

# Cable support systems

# Building Connections

Digitalisation, the Energiewende (energy transition), mobility – the future is gathering speed. At OBO Bettermann, we're proud to be a driving force. And as a facilitator, we make connections. Today, we are already developing the innovative electrical infrastructure systems and solutions of tomorrow. Reliably, flexibly, sustainably.

Already today, OBO is one of the leading manufacturers of installation systems for the electrical infrastructure in buildings and plants. When it comes to the friction-free flow of power, energy and data, engineers and tradespeople worldwide rely on the comprehensive range from OBO.



OBO applies its slogan "Building Connections" to around 30,000 high-quality branded electrical products and services, which are used in application solutions for projects in industry, business and infrastructure.

OBO operates a global network and employs more than 4,200 people in more than 60 countries. The headquarters of the family company, which was founded in 1911, is located in Menden, Germany. In addition, more than 40 subsidiaries are present in markets on all continents.

Industriestallationen - Kabelsysteme / en / 2023/07/28 08:38:14 08:38:14 3:37:53 (LLExpport\_03618) / 2023/07/28 08:38:14 08:38:14



# Improved structure, sharpened profile



Each of our products carries a benefit which only the OBO brand can offer. Products are developed, manufactured and tested with a high level of competence – from the idea through to the final check. From flawless logistics through to practical information – we can provide support at every level. We can offer additional security through certificates on the conformity of our products with the most important standards and directives. In a nutshell – OBO helps you more. In every location and in every phase of a project.

To maintain this, we continually challenge ourselves. Not as an end in itself but for the better processing of each customer's requests – fast, reliably and future-oriented. That is the reason we have not only established our three central application areas, but also reworked our catalogue structure. In this way, we can display our service offers more clearly, highlight the product benefits more effectively and illustrate the respective application areas more tangibly.

# OBO Product Worlds



## Industrial installations

- Cable support systems
- Connection and routing systems
- Fastening material



## Building installations

- Cable routing systems
- Device installation ducts, trunking and poles
- Floor installation systems and underfloor applications
- Installation systems



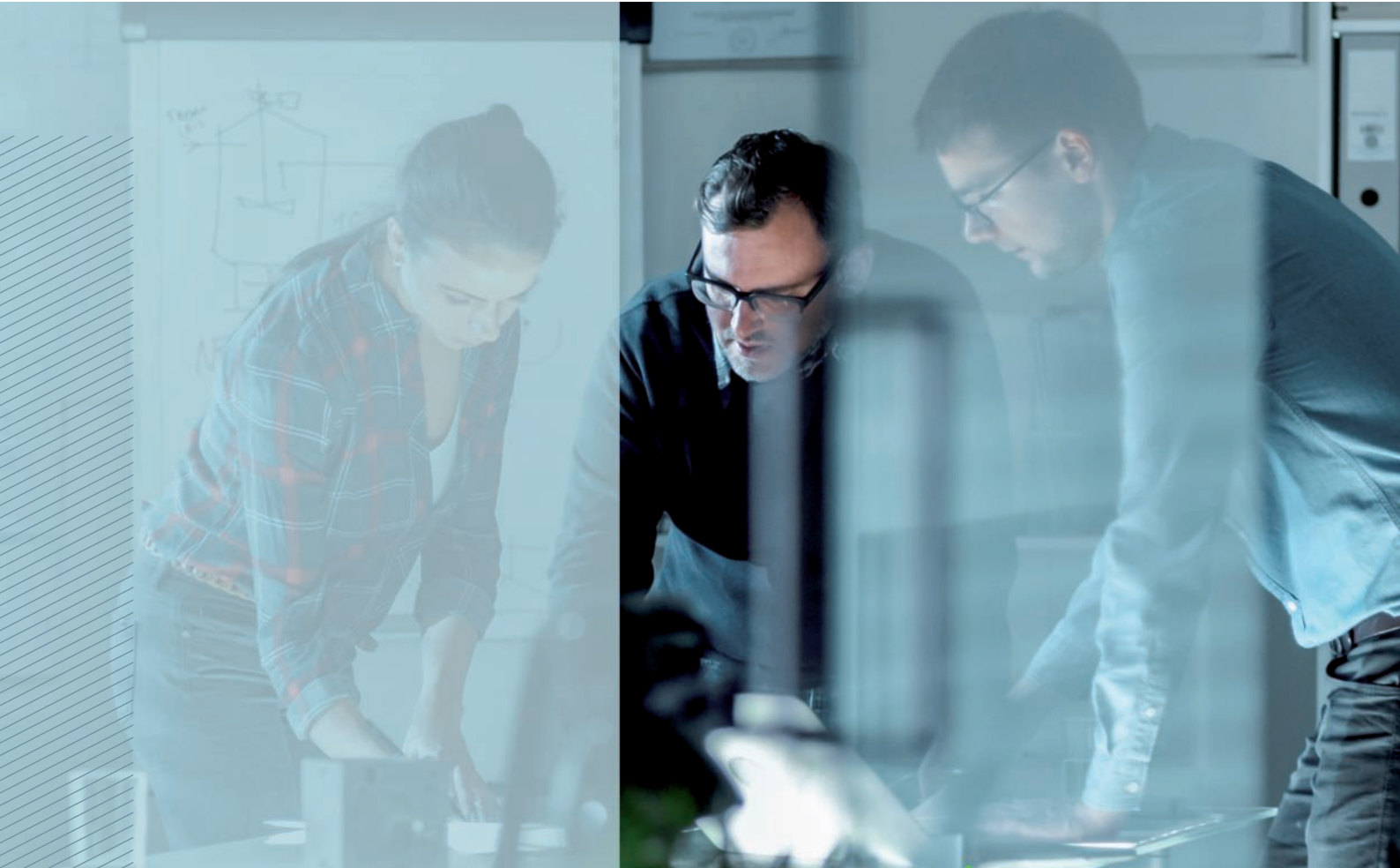
## Safety and protection installations

- Surge protection
- External lightning protection
- Equipotential bonding and earthing
- Insulation and cable bandages
- Fire-tested support and routing systems
- Fire protection ducts



It's your choice – from now on there's a catalogue for each OBO product category. Simply select the catalogues and order together with a collection case.

# OBO Support & *contact*



***You have a  
problem?  
We have the  
solution!***

OBO Bettermann is more than the sum of its products. In any situation, we are the reliable partner right by your side. You have a problem? We have the solution!

It doesn't matter in which area of industry our support is needed – from industrial and plant engineering to private, public and administrative buildings, as well as in the areas of mobility and renewable energies – we have everything that you need.

OBO can not only provide the entire electro-technical infrastructure with the best possible products. We can also support you with sound expert knowledge and more than 100 years of experience, right from the planning phase through to the realisation of your projects. OBO – solutions you can rely on.

You can contact our Customer Service department on:

**Customer Service**

**Tel.:+49 23 73 89 - 17 00**

**Monday–Thursday**  
07.30–17.00

**Friday**  
07.30–15.00

**export@obo.de**

## What is OBO Support?

Every OBO product carries a plus inside it, which only a branded product can offer. It is developed, manufactured and tested with a high level of competence, from the idea right through to the final check. In addition, our specialists are available for consultation and can offer you assistance and training courses for products at any time.

Together with you, we plan your project and help you choose the right products, and are also available to you at any time should you need us. From flawless logistics through to practical information – we can provide support at every level. We can offer security through certificates on the conformity of our products with the most important standards and directives.

We are as flexible as you are – because we know how practical people work and what is important to them. Each step is a plus – that is the OBO Support concept.



Service



Training



Handling



Certification

### Service – OBO can help

Everywhere and in every project phase:

- Highly competent hotline
- Product and system information, digitally or printed
- Selection and planning aids on the web, as an app, as a CAD application or in printed form
- 2D and 3D product data for planning
- Field service, branch offices and subsidiaries in 60 countries
- Engineering services for major projects

### Training courses from OBO

- Seminars and workshops
- Local consultation and training courses
- Planner days

### Handling – OBO delivers reliably

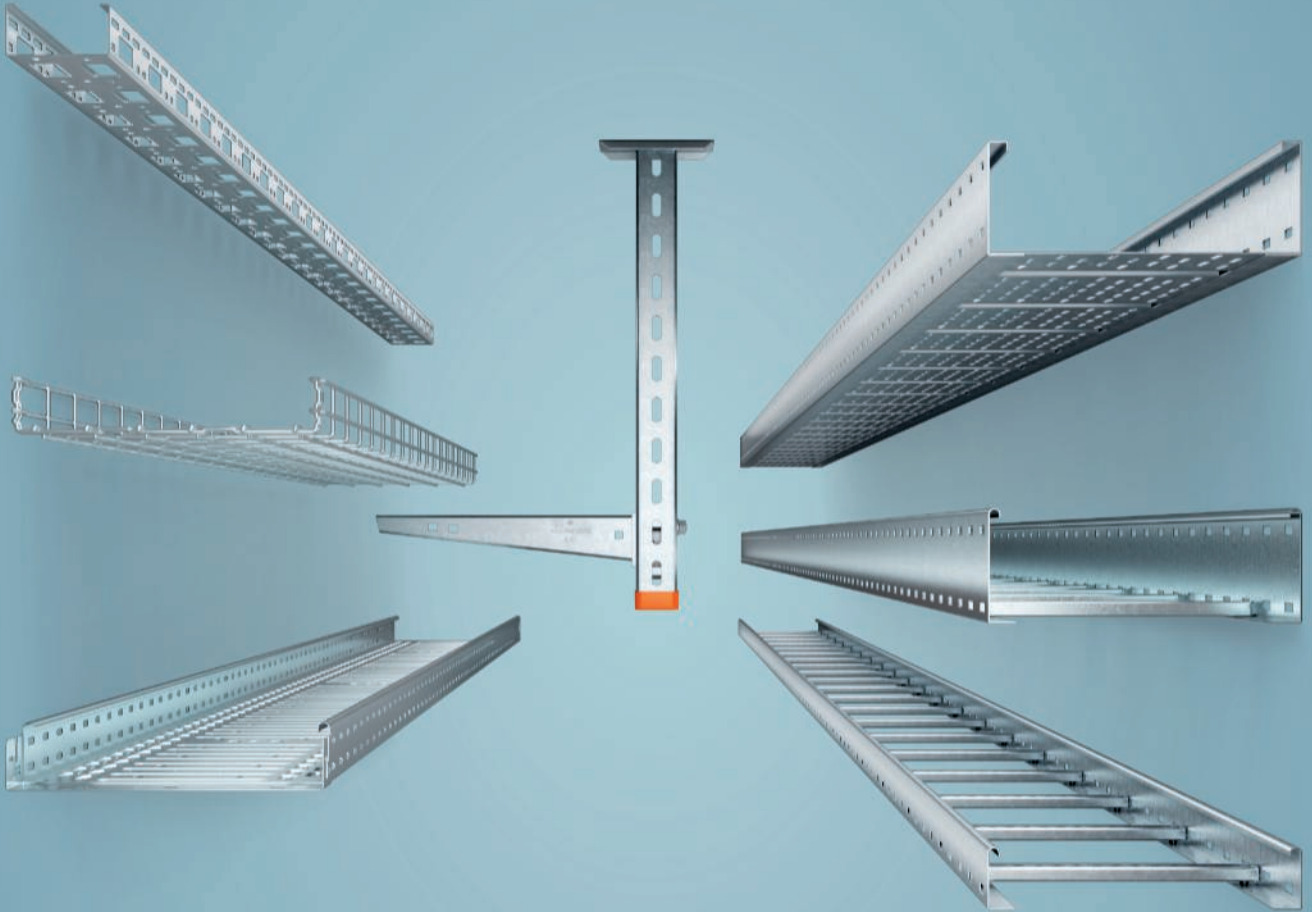
With optimised delivery processes:

- Reliable logistics
- Practical transport systems and packaging
- Loading gear handling and disposal concepts

### Certification and guarantee

OBO offers safety. Our products fulfil the most important country-specific regulations:

- Conformity (e.g. IEC, VDE, CE, KEMA, KEUR, UL)
- Certification (e.g. DIN EN, DGNB)
- 5-year guarantee for surge protection products
- Guarantee management





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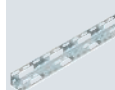
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# Planning aids

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<b>Transfer impedance of cable support systems</b>
<b>Maintenance of electrical function</b>
<b>OBO Construct - planning software and product configurators</b>
<b>Standards, certifications and test marks</b>
<b>First-hand support and knowledge</b>
<b>Every test mark at a glance</b>



# Metal: corrosion and corrosion protection



## Corrosion

(from the Latin *corrodere*, “to eat or gnaw to pieces”) in a technical context is a reaction between a material (generally a metal) and its surroundings, leading to a measurable change in the material and potentially impairing the functionality of a component or system.

A large number of products used in industrial installations are made of metal. Metals are much tougher than many other materials and are less sensitive to mechanical loading. The OBO metal products are made of aluminium, die-cast zinc, stainless steel or steel.

Steel (St), the most commonly used material, is very strong and has good elasticity and chemical resistance. However, steel is susceptible to corrosion and must therefore be protected accordingly.

Stainless steels consist mainly of alloyed, very hard and rustproof steels. The stainless steels are divided into quality classes according to the percentage of alloys. These are indicated by the material number according to DIN EN 10027.

Aluminium (Al), as a light metal, has comparatively low strength but good electrical conductivity and high corrosion resistance.

Die-cast zinc components (Zn) are very strong and hard. The manufacturing process enables the production of very precise components with good corrosion resistance.

## Corrosion protection

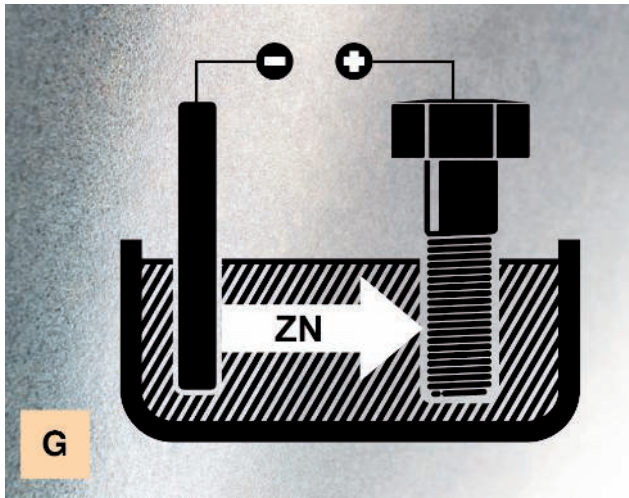
Corrosion protection means all steps taken to prevent corrosion damage to metallic components. It is impossible to prevent corrosion permanently, so corrosion protection measures generally aim to reduce the speed of corrosion so that the component is not damaged by corrosion for the duration of its service life. The term “passive corrosion protection” refers to all measures designed to shield products from corrosive media. Coatings are one way of achieving passive corrosion protection. At OBO, most steel products are protected from corrosion by a layer of zinc. Zinc coatings can be applied to components using a variety of methods.

## Zinc slat covering

Zinc slat coverings are coatings applied in a non-electrolytic manner. They offer cathodic protection and thus have excellent corrosion protection, while at the same time, there is no risk of hydrogen-induced breakage. Due to these properties, this coating type is used for connection components with a high strength classification or structural parts with high tensile strength. The low layer thickness of the zinc slat covering allows a thin, homogeneous coating, which is particularly important for maintaining the accuracy of screw threads. This coating achieves a resistance of 480 hours in the salt spray test for the connection elements.

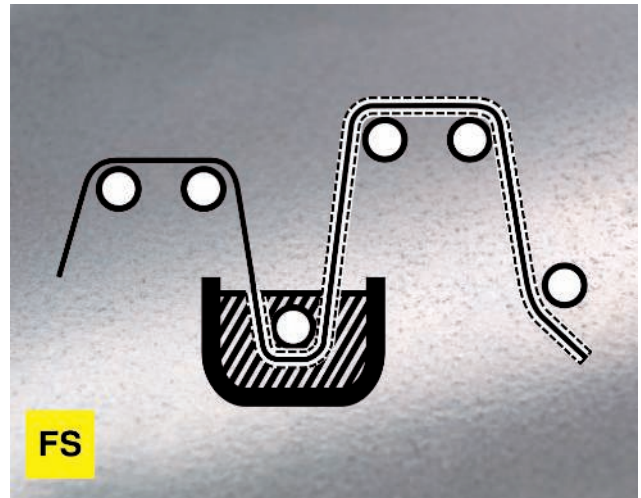


# Galvanisation types



## Electrogalvanisation – electrolytic galvanisation in accordance with DIN EN ISO 2081

In electrogalvanisation or electrolytic galvanisation, the component is coated by dipping it not in molten zinc, but in a zinc electrolyte, through which a direct electric current is passed.



## Strip galvanising – hot galvanised according to the strip-galvanising method in accordance with DIN EN 10346 (formerly DIN EN 10147 and DIN EN 10142)

Strip galvanisation or Sendzimir galvanisation is where a continuous ribbon of steel is galvanised in a continuous line.



## Hot-dip galvanisation – hot galvanisation using the dipping method according to DIN EN ISO 1461

Batch galvanisation is mainly used for galvanising prefabricated steel parts, by dipping them in molten zinc at a temperature of around 450 °C.



## Hot-dip coating – zinc-aluminium coating in accordance with DIN EN 10346

In contrast to conventional coating systems, the material being galvanised in the double-dip process passes through two baths in succession: the first contains pure zinc, the second a zinc-aluminium alloy.

# Surface testing and corrosion categories



## Classification of corrosion resistance

All the system components must show sufficient resistance against corrosion in agreement with the standard DIN EN 61537. The minimum zinc layer thicknesses are determined through a measurement. The grouping into the appropriate class is detailed in the table "Classification of corrosion resistance". The table "Corrosion categories according to DIN EN ISO 12944" shows the area of application and the zinc loss to be expected.

## Classification of corrosion resistance

All components, depending on the environment, must show sufficient resistance against corrosion in agreement with the standard DIN EN 61537. This is how corrosion categories are determined, e.g. with a salt spray test. In this procedure, components are sprayed with salt for a certain time period. The resulting level of red rust is the basis for allocation to a corrosion category, i.e. in which environment the component is resistant to corrosion.



### Classification of corrosion resistance according to EN 61537

Class	Reference material and surface treatment
0*	None
1	Electroplated to a minimum thickness of 5 µm
2	Electroplated to a minimum thickness of 12 µm
3	Pre-galvanised to grade 275 to EN 10327 and EN 10326
4	Pre-galvanised to grade 350 to EN 10327 and EN 10326
5	Post-galvanised to a zinc mean coating thickness (minimum) of 45 µm according to ISO 1461
6	Post-galvanised to a zinc mean coating thickness (minimum) of 55 µm according to ISO 1461
7	Post-galvanised to a zinc mean coating thickness (minimum) of 70 µm according to ISO 1461
8	Post-galvanised to a zinc mean coating thickness (minimum) of 85 µm according to ISO 1461 (usually high-silicon steel)
9A	Stainless steel manufactured to ASTM: A 240/A 240M – 95a designation S30400 or EN 10088 grade 1-4301 without a post-treatment *
9B	Stainless steel manufactured to ASTM: A 240/A 240M – 95a designation S31603 or EN 10088 grade 1-4404 without a post-treatment *
9C	Stainless steel manufactured to ASTM: A 240/A 240M – 95a designation S30400 or EN 10088 grade 1-4301 with a post-treatment **
9D	Stainless steel manufactured to ASTM: A 240/A 240M – 95a designation S31603 or EN 10088 grade 1-4404 with a post-treatment **

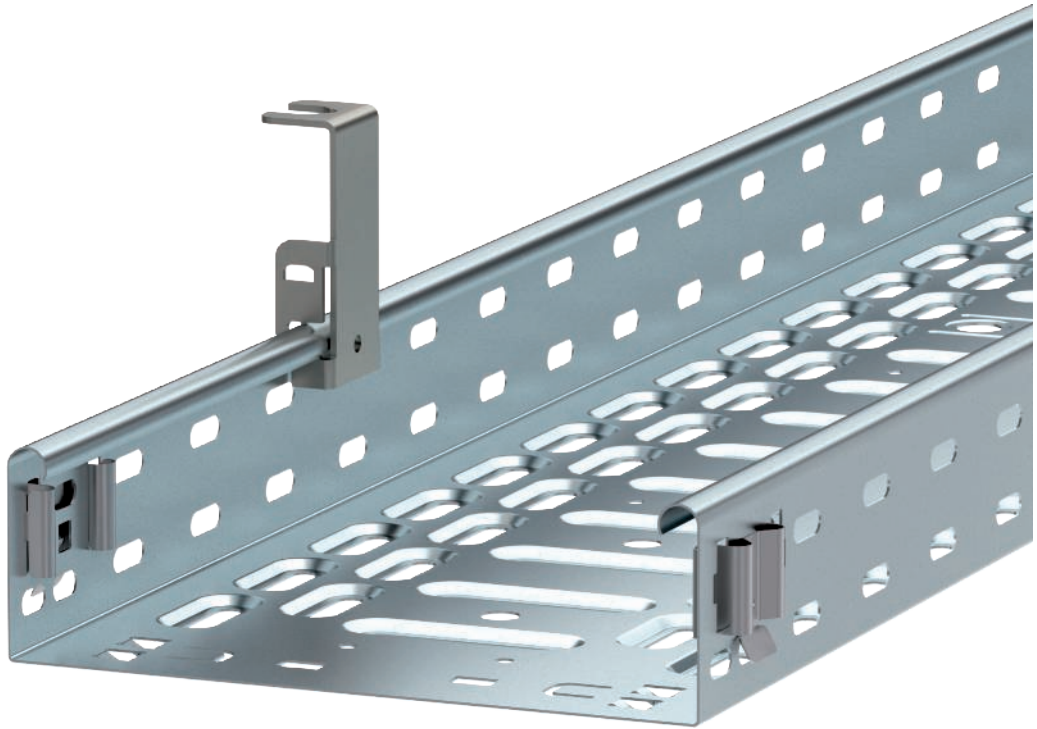
\* For materials which do not have a declared corrosion resistance classification

\*\* The end treatment process is used to improve the protection against crack corrosion and the contamination of other steels

### Corrosion categories to DIN EN ISO 12944

Corrosion category	Typical environment, inside	Typical environment, outside	Corrosion load	Average zinc removal
C 1	Heated buildings with neutral atmospheres, e.g. offices, shops, schools, hotels	-	Insignificant	<0.1 µm/a
C 2	Unheated buildings in which condensation can occur, e.g. warehouse, sports halls	Atmosphere with low level of impurities, often rural areas	Low	0.1 to 0.7 µm/a
C 3	Production facilities with a high level of humidity and some air impurities, e.g. plants for food production, laundries, breweries, dairies	City and industrial atmosphere, considerable impurities through sulphur dioxide, coastal areas with low salt load	Medium	0.7 to 2.1 µm/a
C 4	Chemical plants, swimming pools, boat sheds over seawater	Industrial areas and coastal areas with low salt load	Strong	2.1 to 4.2 µm/a
C 5-I	Buildings or areas with almost constant condensation and with high levels of impurities	Industrial areas with high levels of humidity and aggressive atmosphere	Very strong (industry)	4.2 to 8.4 µm/a
C 5-M	Buildings or areas with almost continuous condensation and with high levels of impurities	Coastal or offshore areas with salt load	Very strong (sea)	>4.2 to 8.4 µm/a

# Contact corrosion



If two different metals are conductively connected with each other, contact corrosion can occur. This poses a considerable risk to the load capacity and lifespan of the components used.

The level of contact corrosion is determined primarily by the level of the potential difference between the contact partners. Contact corrosion occurs at potential differences of 100 mV or greater and the anodic (electrically negative) partner is at risk of corrosion. Therefore, strongly non-precious metals should never be brought into contact with precious metals.

#### **Additional contact corrosion criteria:**

- Level of electrical resistance between the contact partners. The higher the resistance, the lower the contact corrosion. Positive on Al and Ti.
- Occurrence of an electrolyte. An electrolyte, such as perspiration or condensation, attacks the protective layers, increasing conductivity. Dirt increases this effect through released ions.
- Length of the impact of the electrolyte. The longer the electrolyte is active, the greater the corrosion will be.
- The surface ratios of the contact partners influence the current density. The best thing to have is a small surface ratio of the "precious" to the "less precious" contact partner.
- Different environments or atmospheres can increase or influence the risk of contact corrosion to varying degrees.






# Installation locations



Whether indoors or outdoors, in aggressive atmospheres or under special hygienic conditions, OBO can offer the perfect surface and materials for your installation, no matter what the requirements may be. OBO metal products are machined from high-quality sheet steel or

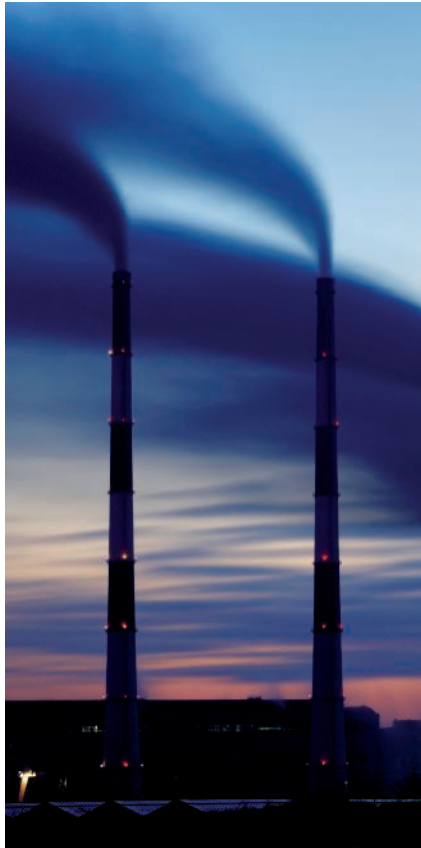
steel wire and are available with various surfaces. Different hardening and coating methods ensure tailor-made corrosion protection, specially tailored to the appropriate application:

Application	Material	Surface protection
<b>Indoors</b> 	<b>St</b> Steel	<b>L</b> Painted/powder-coated
	<b>St</b> Steel	<b>FS</b> Strip galvanised DIN EN 10346
	<b>St</b> Steel	<b>G</b> Electrogalvanised DIN EN ISO 2081
<b>Outdoors</b> 	<b>St</b> Steel	<b>FT</b> Hot galvanised DIN EN ISO 1461
	<b>St</b> Steel	<b>DD</b> Hot galvanised DIN EN ISO 1461
	<b>VA</b> Stainless steel A2	
	<b>VA</b> Stainless steel A4	
<b>Especially corrosive areas</b> 	<b>VA</b> Stainless steel A2	
	<b>VA</b> Stainless steel A4	

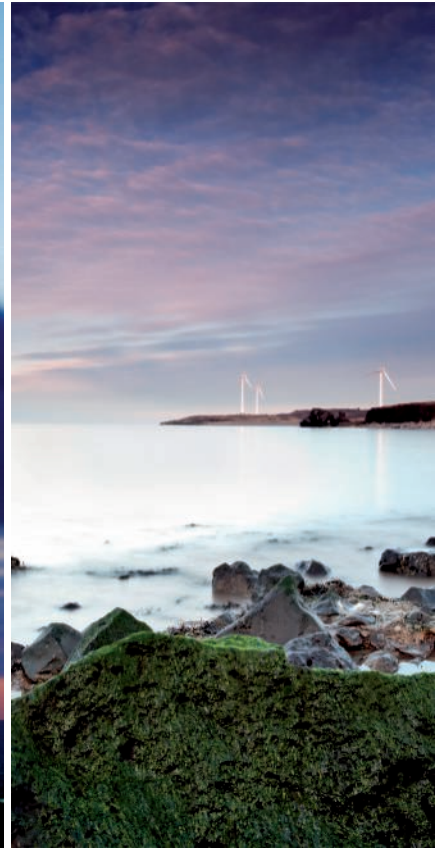
# Contact corrosion in different environments



Land climate



Industrial atmosphere



Sea climate

Small/large	Zn	FT	Al	Cu	VA	CuZn
Zn		✓	○	✗	✗	○
FT	✓		○	✗	✗	○
Al	✓	✓		✗	✗	○
Cu	✓	✓	✓		✓	✓
VA	✓	✓	✓	✓		✓
CuZn	✓	✓	✓	✓	✓	

✓ Little to no corrosion

○ Moderate corrosion

✗ Heavy corrosion

The precondition for corrosion is a conductive medium that connects the metal combination. The more damp and contaminated the atmosphere is, the more pronounced the contact corrosion.

# Surfaces for special visual requirements or special environmental loads



## Applications with specific optical requirements or special environmental conditions

Colour-coated products are becoming ever more popular. The coating may be required for optical reasons or for reasons of corrosion protection.

## Colour coatings for reasons of corrosion protection

- Products in FT (hot-dip galvanised version)
- All RAL colours available
- Coating of the visible surfaces or the complete system
- Suitable for the colour of the structure when routed openly
- Separation of different voltages/functions (e.g. blue 230/400 V power supply; red weak current such as telephone cables and IT)

Colour-coated systems are not specifically indicated in this Industrial installation product catalogue. You can obtain details of these systems by contacting our telephone hotline on +49 23 73 89 - 17 00.

# Plastic: materials and properties

Essentially plastics can be of one of three types: thermoplastics, elastomers and Duroplast.

## Thermoplastics

are plastics that can be shaped within a specific temperature range. This process is reversible, in other words, thermoplastics can theoretically be cooled and then melted down again any number of times. Another unique advantage of thermoplastics is that they can be welded.

## Elastomers

have a fixed shape, but can be elastically deformed. They can elastically deform under tensile and compressive stresses, but afterwards will return to their original shape. Elastomers are used for producing seals and membrane entries.

## Duroplast

or thermosetting polymers/plastics, are plastics that can no longer be deformed following curing. Duroplasts produce hard, glass-like (brittle) polymeric materials with a high thermo-mechanical strength.

## Properties

The area of application for which plastic OBO products are suitable depends mainly on the properties of the material being used. The most important material properties are:

- Temperature resistance
- Risk of stress cracks
- Chemical resistance
- Halogen freedom
- UV resistance
- Flame resistance

		Material	Max. temperature resistance Permanent	Max. temperature resistance Short-time	Min. temperature resistance Static
Thermoplast	ABS AVA	Acrylonitrile butadiene styrene	70 °C	85 °C	-25 °C
	EVA	Ethylene vinyl acetate	55 °C	70 °C	-15 °C
	PA	Polyamide	120 °C	150 °C	-25 °C
	PA GF	Polyamide, fibreglass reinforced	120 °C	160 °C	-25 °C
	PBPT	Polybutylene terephthalate	120 °C	140 °C	-25 °C
	PC	Polycarbonate	110 °C	125 °C	-25 °C
	PE	Polyethylene	70 °C	90 °C	-25 °C
	PP	Polypropylene	90 °C	110 °C	-25 °C
	PS	Polystyrene	70 °C	80 °C	-15 °C
	PVC	Polyvinyl chloride	65 °C	80 °C	-25 °C
Elastomers	NBR SBR	Rubber mixture	100 °C	110 °C	-25 °C
	NBR	Nitrile rubber	100 °C	110 °C	-25 °C
Duroplast	UF	Duroplast, aminoplast, type 131.5	65 °C	90 °C	-25 °C
	MF	Duroplast, melamine resin, type 150	80 °C	110 °C	-25 °C



# Plastic: stress crack risk and chemical resistance

## Risk of stress cracks

Medium	ABS/ASA	UF	MF	EVA	NBR SBR	NBR	PA	PA/GF	PBPT	PC	PE	PP	PS	PVC
Risk of stress cracks	✗	✓	✓	✓	✓	✓	✓	○	○	✓	!	✓	✗	○

Danger of tension cracks: ✓ Virtually negligible ○ Low ! High ✗ Very high

## Chemical resistance

Medium	ABS/ASA	UF	MF	EVA	NBR SBR	NBR	PA	PA/GF	PBPT	PC	PE	PP	PS	PVC
Petroleum	✓	✓	✓	○	✓	○	✓	✓	✓		○	○	○	✓
Fat	✓	✓	✓	✓	✓	○	✓	✓	✓				○	✓
Benzole	!	✓	✓	○	✓	!	✓	✓	○	!	!	○	!	!
Solvents	!						✓	✓	○				!	!
Formic acid	✓	!									!	○		
Citric acid	✓	!		○							!			
Lactic acid	✓	!		○							!	○	!	!
Hydrochloric acid	○	!									✓			!
Sulphuric acid	○	!									✓			!
Acetone	!	✓					✓	✓	○	!	!	○	!	!
Petrol	!	✓	✓	○	○	!	✓	✓	✓	✓	!	○	!	✓
Butyric acid	!	!		○							!	○		!
Chlorine	!						!	!	!	!	!	!	!	
Acetic acid	!	!		○							!		!	
Nitric acid	!	!									✓		!	
Ester		✓	✓	○	!	!								
Alcohol		✓	✓	○			✓						✓	
Mild alkalis		✓	✓	✓	✓	✓	○	○	!		✓	✓		✓
Mild acids		○	○	✓	✓	✓	!	!	✓	✓	✓			✓
Ether		✓	✓	○									!	
Water		✓	✓	✓	✓	✓								
Strong acids		!	!	○					!	!	!			!
Strong alkalis		!	!	✓					!		✓	✓		✓
Hydrofluoric acid				○							✓			
Paraffin hydrocarbon				○								○		
Haloalkanes				!										
Ketones				!	!								!	
Aldehyde				✓										
Organic acids				○							!	○		
Seawater					✓	✓								
Diesel fuel							✓	✓	✓		○	○	!	
Ammoniac									○				!	

Resistance: ✓ Resistant ○ Limited resistance ! Not resistant

# Plastic: material properties



## Halogen freedom

Estimates suggest that around 95% of fire victims die not due to the immediate effects of the fire, but of poisoning from the smoke. In addition, the corrosive fire gases created during fires cause immense damage to property and can permanently damage the structure of a building. Therefore, halogen-free installation systems must, or should, always be used in public areas (emergency routes, lifts, etc.). The chemical composition of these halogen-free systems is designed in such a way that, in the event of fire, they produce less hazardous

(toxic/corrosive) gases, which could combine with extinguishing agents to form hydrochloric acid. In the sense of the standard DIN VDE 0472, this means that materials are considered halogen-free when "the proportions of the halogens chlorine, bromine and iodine are  $\leq 0.2\%$  for chlorine and  $\leq 0.1\%$  for fluorine". OBO Bettermann offers a wide range of halogen-free products that reduce the risk of harm to people and property to a minimum in case of fire.



## UV resistance

Outdoor installations should always be viewed particularly critically with regard to the mounting locations and the selection of the installation materials.

UV radiation is damaging to many plastics, causing them to turn yellow and/or brittle or lose their elasticity. However, plastics can be protected against UV damage through the addition of UV stabilisers. Products made

from UV-resistant materials are specially marked. In general, besides UV radiation, installations outdoors must also take other environmental influences into account. Factors such as maximum temperatures, regularity of (extreme) temperature changes, humidity and the location of use/mounting (housing, industry, town, region, continent) all have an important role to play here.



### Flame resistance/fire resistance

Materials are described as flame-resistant if they prevent the spread of fire or are sufficiently fire-resistant. According to DIN EN 60695-2-11 (VDE 0471 Part 2-11), electrical connection materials must be subjected to a glow wire test in order to evaluate the fire risk of the end product. When the glow wire test is being carried out, a

glowing wire (for temperature see table below) is inserted into the component to be tested for a period of 30 seconds and then removed. After a further 30 seconds at the latest, the object, if it has caught light, must have extinguished again, in order to specify the flame resistance.



### Types of installation systems

Types of samples Test temperatures in °C	Surface-mounted	Flush-mounted	In-plaster	Cavity wal- l/furniture	Concrete structure	Installation duct
Connection sockets	650	650	750	850	650	750
Device sockets and device connection sockets	750	650	-	850	650	750
Ceiling lights, connection sockets	750	650	-	850	650	750
Wall luminaire connection boxes	750	650	-	850	650	750
Device connection sockets	750	650	-	850	650	750
Connection sleeves	750	-	-	-	-	750
Insulation sections, which support active parts	960	-	-	-	-	-
Lid for installation sockets	750	-	-	-	-	-

# Protection ratings



## IP protection rating

The IP protection rating specifies how far a component is protected against contact and foreign bodies and the ingress of water. The IP protection ratings are controlled by the standard DIN EN 60529 (VDE 0470 Part 1). The IP is always made up of two digits.

The first digit designates the contact and foreign body protection. On the one hand, it specifies how far a housing prevents access to dangerous parts, by preventing or limiting the ingress of body parts or objects held by a person. On the other hand, it specifies how far the housing protects the installed resources against the ingress of solid foreign bodies.

## Protection rating

First code digit	...against access to the hazardous parts	...against solid foreign bodies
0	Protected against access to hazardous parts with the back of the hand	Non-protected
1	Protected against access to hazardous parts with a finger	Protected against solid foreign bodies of 50 mm diameter and larger
2	Protected against access to hazardous parts with a tool	Protected against solid foreign bodies of 12.5 mm diameter and larger
3	Protected against access to hazardous parts with a wire	Protected against solid foreign bodies of 2.5 mm diameter and larger
4	Protected against access to hazardous parts with a wire	Protected against solid foreign bodies of 1.0 mm diameter and larger
5	Protected against access to hazardous parts with a wire	Dust-protected
6	Protected against access to hazardous parts with a wire	Dust-proof





The second digit specifies the protection against water. It specifies how far the resource is protected against incoming water and the resulting damage.

**Protection rating against the entry of water with a damaging impact**

Second code digit	Short description	Definition
0	Non-protected	-
1	Protected against water droplets	Droplets falling vertically must not have a damaging impact.
2	Protected against drip water when enclosure tilted up to 15°	Vertically falling drops must not have harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical.
3	Protected against spray water	Water being sprayed at an angle of 60° on both sides of the vertical must not have any damaging impact.
4	Protected against spray water	Water spraying the housing from any direction must not have any damaging impact.
5	Protected against water jets	Jets of water pointing at the housing from any direction must not have any damaging impact.
6	Protected against strong water jets	Strong jets of water pointing at the housing from any direction must not have any damaging impact.
7	Protected against the effects of being temporarily immersed in water	If the housing is sometimes underwater under standard pressure and time conditions, then water may not enter in such volumes as would have a damaging impact.
8	Protected against the effects of being continuously immersed in water	Ingress of water in quantities causing harmful effects must not be possible when the housing is continuously immersed in water under conditions which shall be agreed between manufacturer and user. However, the conditions are more difficult to fulfil than for number 7.



**IK code**

The IK code to DIN EN 50102 indicates the protection rating of housings against external mechanical loads. It is made up of the code letters IK and a two-digit number from 00 to 10. Each group of numbers stands for a load energy value in joules (J). The IK code always applies to

the complete housing, which guarantees the protection of resources against the damaging effects of mechanical loads. The housings are tested by knocking them with different testing hammers.

IK code	00	01	02	03	04	05	06	07	08	09	10
Stress energy value [J]	-	0.15	0.20	0.35	0.50	0.70	1	2	5	10	20

# Nominal values of electrical equipment



When using junction boxes, connection sockets and connection terminals, the resources are assigned nominal values. In the designation, a distinction is made between the maximum approved voltage (nominal voltage), the

maximum approved current (nominal current) and the maximum approved cross-section (nominal cross-section of the cables to be connected).

**2,5  
mm<sup>2</sup>**

**Nominal cross-section**

Largest tested-approved cross-section of the cables to be connected.

**16  
A**

**Nominal current**

The nominal current is the highest permissible operating current that can be continuously passed through connections (e.g. terminals) marked with that value.

**660  
V**

**Nominal voltage**

Greatest approved voltage at the connection point.

In addition to the nominal values, the number of entries for junction boxes and the number of poles of clamp connectors are also possible labels.

**12**

**No. of poles**

Number of connection points of the clamp connector.

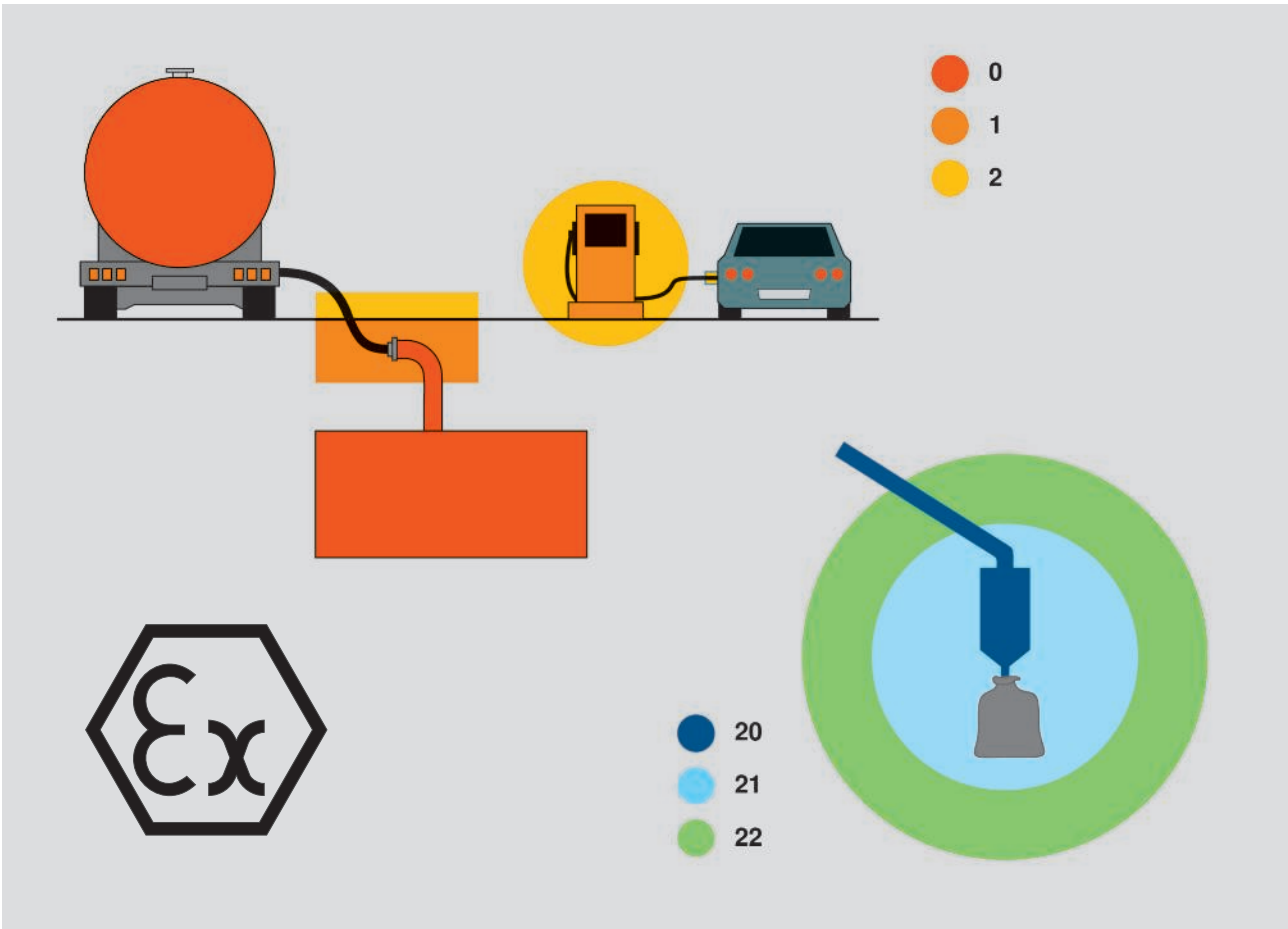
**7**

**Number of entries**

Number of entries in an electrical connection box or connection socket.



# Zone division for explosive areas



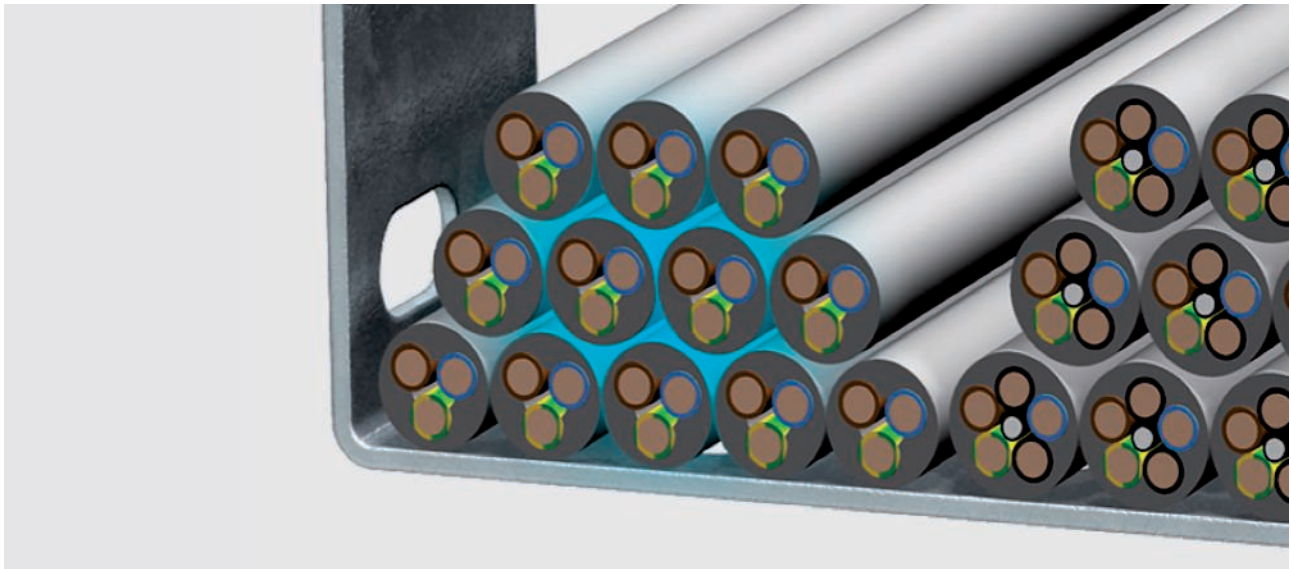
Products used in potentially explosive areas must comply with the ATEX directives. The ATEX workplace directive 1999/92/EC sets out the minimum requirements for improving the safety and health protection of workers at risk from potentially explosive atmospheres. The directive

divides areas with dangerous, potentially explosive atmospheres into zones. Ex-tested products may be used in the respective zones in accordance with their approval.

## Zone allocation of device group II (applied)

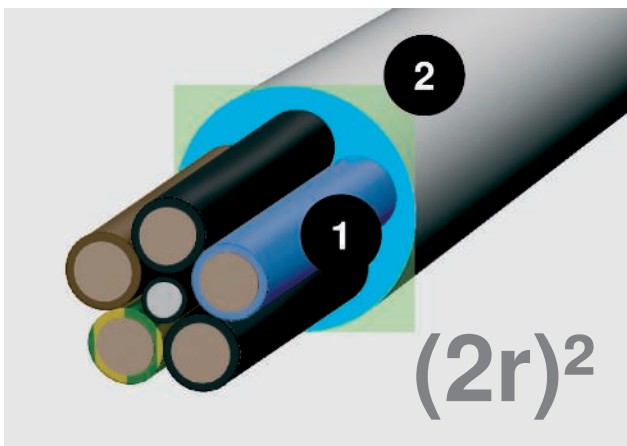
Gas	Dust
<b>Explosive gas atmosphere, zone division to DIN EN 60079-10</b>	<b>Explosive dust/air mixtures, zone division to DIN EN 61214-10</b>
Zone 0	Zone 20
An area in which it can be expected that, under normal conditions, an explosive atmosphere of gas occurs continuously or for long periods of time.	An area in which it can be expected that, under normal conditions, an explosive atmosphere of dust/air occurs continuously or for long periods of time.
Zone 1	Zone 21
An area in which it can be expected that, under normal conditions, an explosive atmosphere of gas occasionally occurs.	An area in which it can be expected that, under normal conditions, an explosive atmosphere of dust/air occasionally occurs.
Zone 2	Zone 22
Area, in which it can be expected that, under normal conditions, an explosive atmosphere of gas seldom or only briefly occurs.	Area, in which it can be expected that, under normal conditions, an explosive atmosphere of dust/air seldom or only briefly occurs.

# Cable sizes



The term “cable” means a jacketed electrical cable for the transmission of electrical energy and data. Cables are given according to their nominal cross-section. The external diameter and usable cross-section depend on their nominal cross-section and the number of individual wires contained in the cable. When fastening clips or

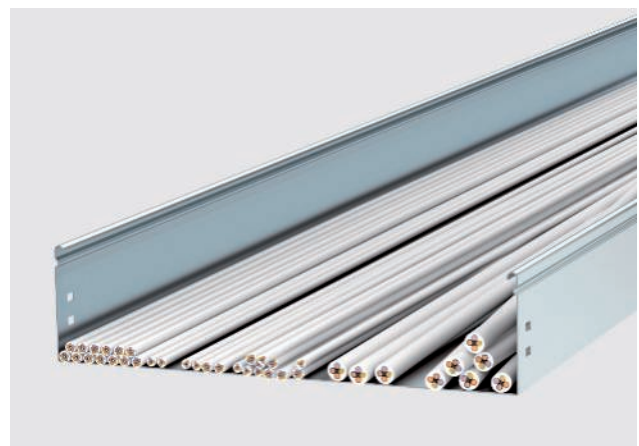
cable support systems are used, it is important to know the actual space requirements of the individual cables. It is not sufficient to take only the diameter as a basis for the calculation of the cable volume.



Circular area (1) and space required (2)

### Calculation with the formula $(2r)^2$

The diameter says little about the actual space required by a cable. Calculate:  $(2r)^2$ . This value reflects the realistic space requirements, including the compartments.



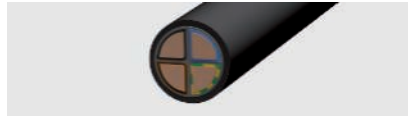
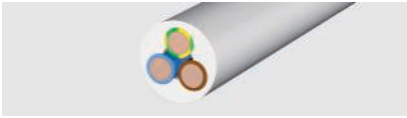
To save you work, we have listed the diameter and usable cross-section of the most important cable types below.

### Important:

These values are average values, which may vary from manufacturer to manufacturer. Please refer to the manufacturer's specifications for the exact values.



# Basic values for the calculation of the cable volume



## Insulated power cables

Type	Diameter mm	Usable cross-section cm <sup>2</sup>
1 x 4	6.5	0.42
1 x 6	7	0.49
1 x 10	8	0.64
1 x 16	9.5	0.9
1 x 25	12.5	1.56
3 x 1.5	8.5	0.72
3 x 2.5	9.5	0.9
3 x 4	11	1.21
4 x 1.5	9	0.81
4 x 2.5	10.5	1.1
4 x 4	12.5	1.56
4 x 6	13.5	1.82
4 x 10	16.5	2.72
4 x 16	19	3.61
4 x 25	23.5	5.52
4 x 35	26	6.76
5 x 1.5	9.5	0.9
5 x 2.5	11	1.21
5 x 4	13.5	1.82
5 x 6	14.5	2.1
5 x 10	18	3.24
5 x 16	21.5	4.62
5 x 25	26	6.76
7 x 1.5	10.5	1.1
7 x 2.5	13	1.69

## Insulated power cables

Type	Diameter mm	Usable cross-section cm <sup>2</sup>
1 x 10	10.5	1.1
1 x 16	11.5	1.32
1 x 25	12.5	1.56
1 x 35	13.5	1.82
1 x 50	15.5	2.4
1 x 70	16.5	2.72
1 x 95	18.5	3.42
1 x 120	20.5	4.2
1 x 150	22.5	5.06
1 x 185	25	6.25
1 x 240	28	7.84
1 x 300	30	9
3 x 1.5	11.5	1.32
3 x 2.5	12.5	1.56
3 x 10	17.5	3.06
3 x 16	19.5	3.8
3 x 50	26	6.76
3 x 70	30	9
3 x 120	36	12.96
4 x 1.5	12.5	1.56
4 x 2.5	13.5	1.82
4 x 6	16.5	2.72
4 x 10	18.5	3.42
4 x 16	21.5	4.62
4 x 25	25.5	6.5
4 x 35	28	7.84
4 x 50	30	9
4 x 70	34	11.56
4 x 95	39	15.21
4 x 120	42	17.64
4 x 150	47	22
4 x 185	52	27
4 x 240	58	33.6
5 x 1.5	13.5	1.82
5 x 2.5	14.5	2.1
5 x 6	18.5	3.42
5 x 10	20.5	4.2
5 x 16	22.5	5.06
5 x 25	27.5	7.56
5 x 35	34	11.56
5 x 50	40	16

## Telecommunications cables

Type	Diameter mm	Usable cross-section cm <sup>2</sup>
2 x 2 x 0.6	5	0.25
4 x 2 x 0.6	5.5	0.3
6 x 2 x 0.6	6.5	0.42
10 x 2 x 0.6	7.5	0.56
20 x 2 x 0.6	9	0.81
40 x 2 x 0.6	11	1.12
60 x 2 x 0.6	13	1.69
100 x 2 x 0.6	17	2.89
200 x 2 x 0.6	23	5.29
2 x 2 x 0.8	6	0.36
4 x 2 x 0.8	7	0.49
6 x 2 x 0.8	8.5	0.72
10 x 2 x 0.8	9.5	0.9
20 x 2 x 0.8	13	1.69
40 x 2 x 0.8	16.5	2.72
60 x 2 x 0.8	20	4
100 x 2 x 0.8	25.5	6.5
200 x 2 x 0.8	32	10.24



## IT cables type Cat...

Type	Diameter mm	Usable cross-section cm <sup>2</sup>
Cat. 5	8	0.64
Cat. 6	8	0.64



## Coax cable (Standard)

Type	Diameter mm	Usable cross-section cm <sup>2</sup>
SAT/BK cable	6.8	0.48

# Selection of the correct fastening clip



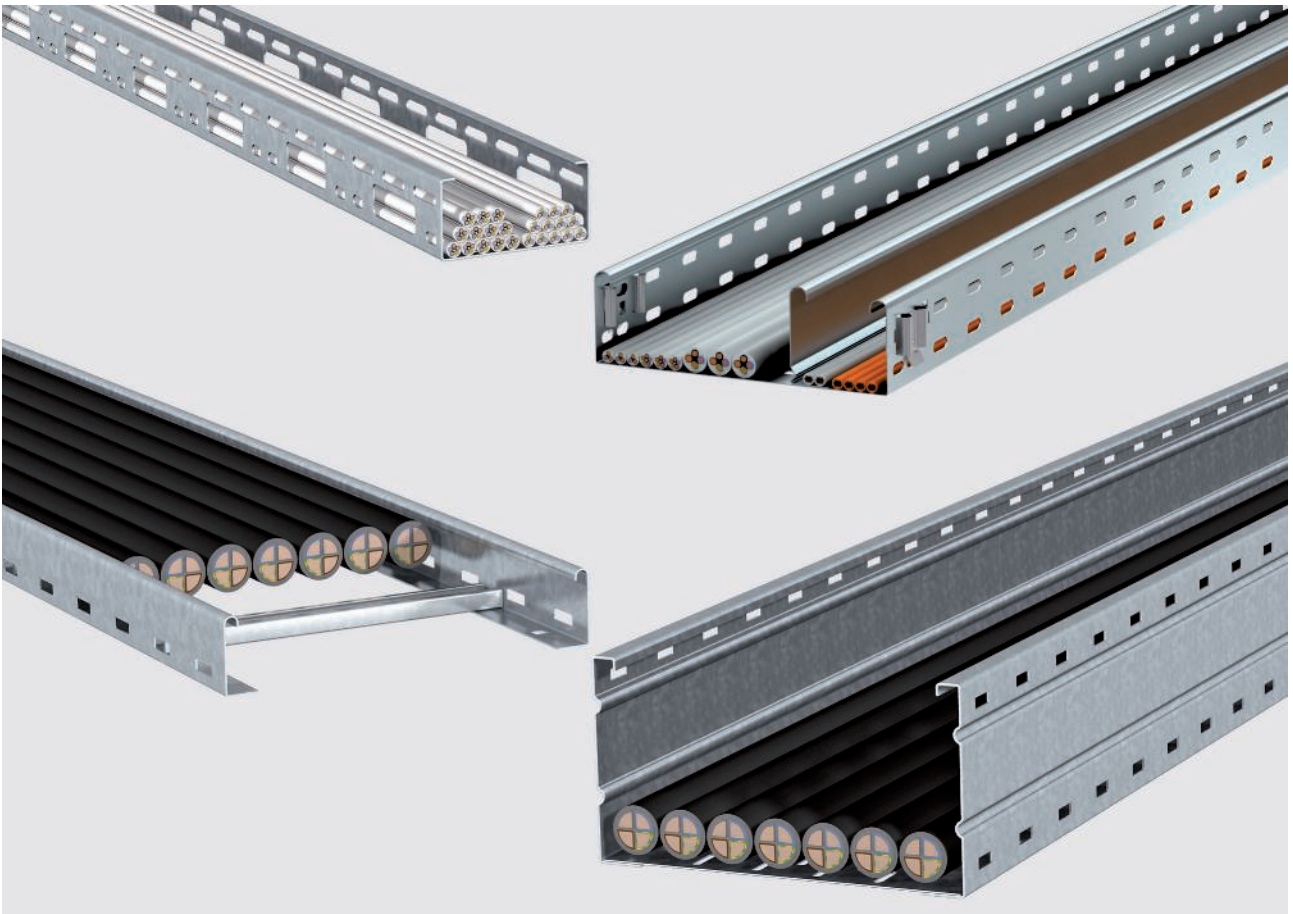
Fastening clips are given with their maximum span distance as a nominal size in mm. This makes it easy to determine the appropriate clip for the planned cable volume. If the necessary clamping range is between two nominal sizes, e.g. 16 mm, we recommend using the smaller nominal size.

If cables are not fastened directly in the clip, but routed through an installation pipe for example, the relationship between the external diameter and metric or PG sizes must be observed when selecting the correct fastening clip. You will find more information on this in the table below.

## Overview of external diameters, metric and PG sizes

External diameter in mm	Metric size	PG size
Up to 12	M12	PG 7
Up to 16	M16	PG 9/PG 11
Up to 20	M20	PG 13.5/PG 16
Up to 25	M25	PG 21
Up to 32	M32	PG 21
Up to 40	M40	PG 36
Up to 50	M50	PG 42/PG 48
Up to 63	M63	-

# Selection of the correct cable support system

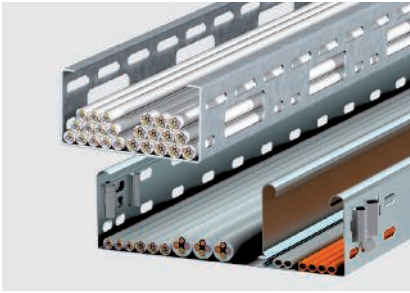


When selecting the right cable support system, the cable volume is not the only decisive factor. The type of cabling, method of laying and cable weight all play an important role. The most important aspects are explained on the following pages.

## Cable types

Not all cables are the same. To select the perfect cable support system, you need to know which type of cables are to be laid: Are they sensitive data cables, which must be laid at a certain distance from each other on account of the necessary shielding? Or power cables, for which a not inconsiderable heat build-up must be taken into account? For all these applications OBO can offer tailor-made system solutions.

# System types



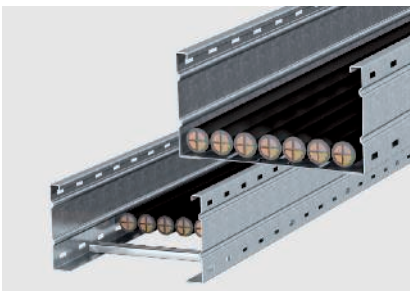
**Universal cable trays**  
Areas of application: From low-voltage cabling to power supply.



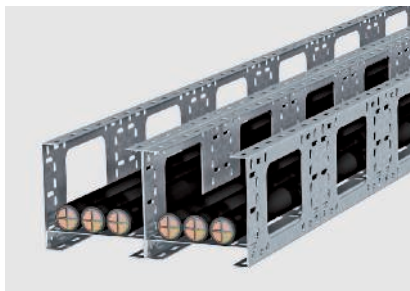
**Mesh cable trays for the installation of light cables**  
Areas of application: IT cabling, telephone cabling and control cables. Also suitable for use in false ceilings and cavity floors.



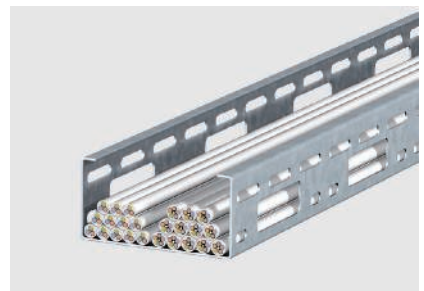
**Cable ladders for power cables with a large cross-section**  
Areas of application: Cables and power conductors with large cross-sections. These can be fastened to the rungs using clamp clips. The high load capacity and good ventilation ensure perfect cable laying.



**Wide span cable trays and ladders for large support distances**  
Areas of application: For installations in which the support distances are more than three metres, on account of the construction conditions.



**Modular system for special tasks**  
The product range that knows no bounds. The range of individually combinable products is particularly suited to complex installation tasks.



**AZ small duct for universal use**  
Areas of application: for luminaire support systems through to low-voltage cabling and power supply.



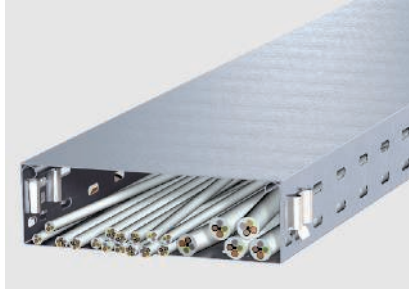


# Finding the appropriate system for the planned cable volume



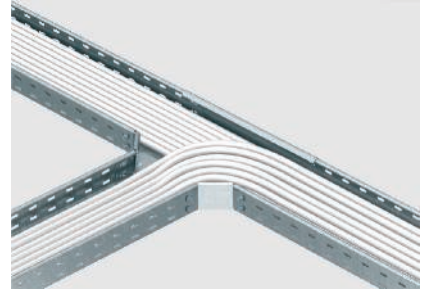
## Cable height

The cable height may not exceed the edge height of the cable tray.



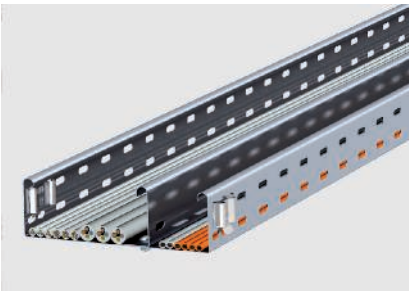
## Volume reserve

When selecting the system, a volume reserve of at least 30% should be planned for possible later installations.



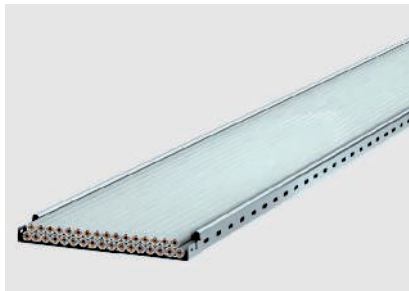
## Branches

When dimensioning branches, the bending radii of the cables must be taken into account.



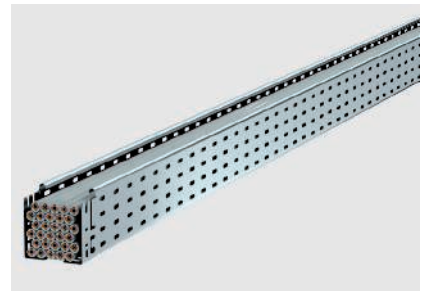
## Separation of system levels

When selecting the volume, pay attention to the different conductors. To separate different voltage levels, you must take the required spacings into account.



## Same usable cross-section, different requirements

There are different requirements for laying data and power cables. Even if the usable cross-section or cable volume is the same, data cables tend to have a narrow, high tray, whereas power cables require a wide, flat version to avoid heat build-up.



## Examples

Flat, wide variant:

- e.g. for power cables
- Cable tray width: 300 mm
- Side height: 35 mm
- Usable cross-section: 103 cm<sup>2</sup>

Narrow, high variant:

- e.g. for data cables
- Cable tray width: 100 mm
- Side height: 110 mm
- Usable cross-section: 108 cm<sup>2</sup>

# Calculating the cable load



100 mm = 15 kg/m



200 mm = 30 kg/m



300 mm = 45 kg/m



400 mm = 60 kg/m



500 mm = 75 kg/m



600 mm = 90 kg/m

Of equal significance for the selection of the most suitable cable support system is the load capacity. This must be matched with the expected cable weight (including the reserve for later installation). There are three variants for determining the cable weight:

### Variant 1: Orientation to experience values

The average load capacity of a cable tray can be calculated roughly using experience values. For a system with a strut height of 60 mm, a value of 15 kg per 100 mm width is valid for each metre of cable tray or cable ladder. However, more accurate than orientation to experience values is to calculate the cable load using the formula from DIN VDE 0639 Part 1 (Variant 2) or the manufacturer's specifications (Variant 3).

The graphics show the load capacities, based on experience values, of cable trays with a rail height of 60 mm, relative to cable tray widths of 100 to 600 mm.

### Variant 2: Calculation formula according to VDE 0639 T1

DIN VDE 0639 Part 1 (cable support systems) offers a formula for calculating the maximum permitted cable load. In the example calculation below, the maximum approved cable load for a cable tray is worked out using the dimension 60 x 300 mm and a usable cross-section of 178 cm<sup>2</sup>.

### Variant 3: Exact calculation according to manufacturer's specifications

Most cable manufacturers offer a very accurate method of calculating cable weights, and appropriate lists or tables can be obtained from them. Important: The following tables only provide a rough overview. They are average values, which may vary from manufacturer to manufacturer. Please refer to the manufacturer's specifications for the exact values.

	0.028 N	
Cable load (F) =	-----	x Usable cross-section
	m x mm <sup>2</sup>	

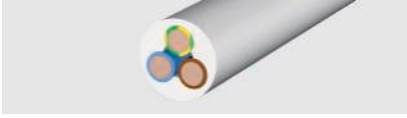
	0.028 N	
1. Cable load (F) =	-----	x 17,800 mm <sup>2</sup> = 500 N/m
	m x mm <sup>2</sup>	

2. Conversion from Newtons (N) to kilogrammes (kg)		
10 N ~ 1 kg – in our example, this means: 500 N/m = 50 kg/m		

3. Maximum occurring load = 50 kg/m		
-------------------------------------	--	--

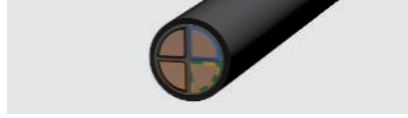


# Actual cable load of different cable types



## Insulated power cables

Type	Cable load kg/m
1 x 4	0.08
1 x 6	0.105
1 x 10	0.155
1 x 16	0.23
1 x 25	0.33
3 x 1.5	0.135
3 x 2.5	0.19
3 x 4	0.265
4 x 1.5	0.16
4 x 2.5	0.23
4 x 4	0.33
4 x 6	0.46
4 x 10	0.69
4 x 16	1.09
4 x 25	1.64
4 x 35	2.09
5 x 1.5	0.19
5 x 2.5	0.27
5 x 4	0.41
5 x 6	0.54
5 x 10	0.85
5 x 16	1.35
5 x 25	1.99
7 x 1.5	0.235
7 x 2.5	0.35



## Insulated power cables

Type	Cable load kg/m
1 x 10	0.18
1 x 16	0.24
1 x 25	0.35
1 x 35	0.46
1 x 50	0.6
1 x 70	0.8
1 x 95	1.1
1 x 120	1.35
1 x 150	1.65
1 x 185	2
1 x 240	2.6
1 x 300	3.2
3 x 1.5	0.19
3 x 2.5	0.24
3 x 10	0.58
3 x 16	0.81
3 x 50	1.8
3 x 70	2.4
3 x 120	4
4 x 1.5	0.22
4 x 2.5	0.29
4 x 6	0.4
4 x 16	1.05
4 x 25	1.6
4 x 35	1.75
4 x 50	2.3
4 x 70	3.1
4 x 95	4.2
4 x 120	5.2
4 x 150	6.4
4 x 185	8.05
4 x 240	11
5 x 1.5	0.27
5 x 2.5	0.35
5 x 6	0.61
5 x 10	0.88
5 x 16	1.25
5 x 25	1.95
5 x 35	2.4
5 x 50	3.5



## Telecommunications cables

Type	Cable load kg/m
2 x 2 x 0.6	0.03
4 x 2 x 0.6	0.035
6 x 2 x 0.6	0.05
10 x 2 x 0.6	0.065
20 x 2 x 0.6	0.11
40 x 2 x 0.6	0.2
60 x 2 x 0.6	0.275
100 x 2 x 0.6	0.445
200 x 2 x 0.6	0.87
2 x 2 x 0.8	0.04
4 x 2 x 0.8	0.055
6 x 2 x 0.8	0.08
10 x 2 x 0.8	0.115
20 x 2 x 0.8	0.205
40 x 2 x 0.8	0.38
60 x 2 x 0.8	0.54
100 x 2 x 0.8	0.875
200 x 2 x 0.8	1.79



## Coax cable (standard)

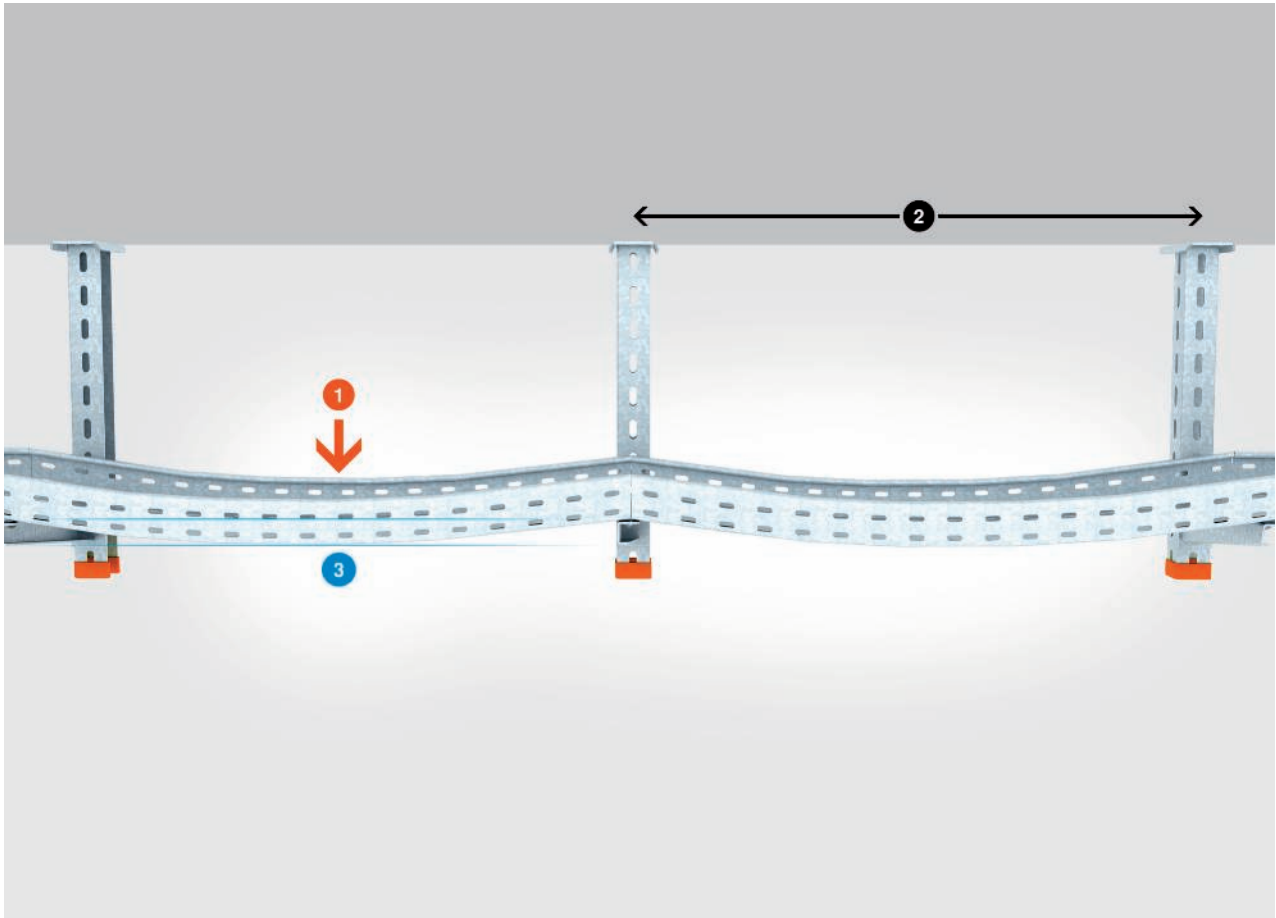
Type	Cable load kg/m
SAT/BK cable	0.06



## IT cables type Cat...

Type	Cable load kg/m
Cat. 5	0.06
Cat. 6	0.06

# Finding the appropriate system for the cable load



Explanation of the pictograms: 1 = load in kN without man load, 2 = support width in m, 3 = strut bend in mm

## Load tests for cable support systems

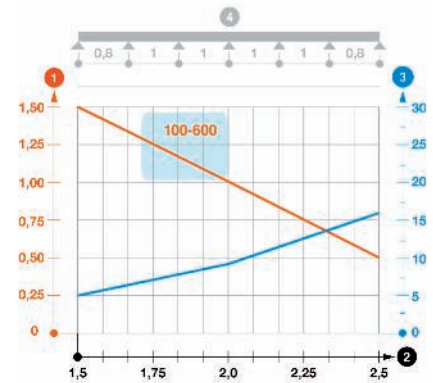
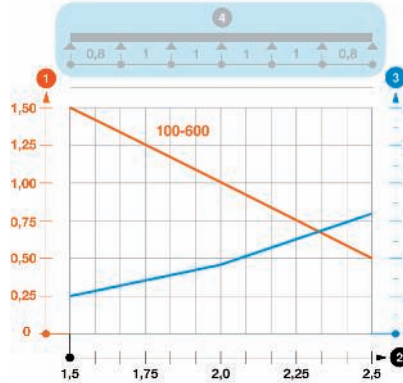
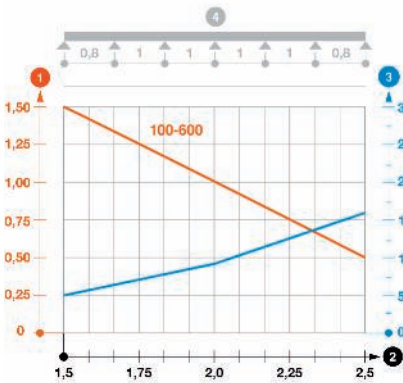
All OBO products and systems are subjected to practical load testing. The basic principles for the tests of OBO cable support systems are DIN EN 61537 and DIN VDE 0639. After the load test, the maximum load capacity can be determined for each component, depending on the support distances and specific article parameters, such as component dimensions. This is all shown in a chart,

included with each component.

You can find additional information on the load tests for cable trays, brackets and suspended supports on the following pages. The values given do not take into account resistance against environmental forces such as snow, wind and other outside influences.



# Finding the appropriate system for the cable load



## Load diagram, legend

- 1 = Load in kN/m without human load
- 2 = Support width in m
- 3 = Strut bending in mm
- 4 = Schematic diagram of the support widths during the testing process
- = Approved load according to the support widths for the different tray widths
- = Rail bending according to support width

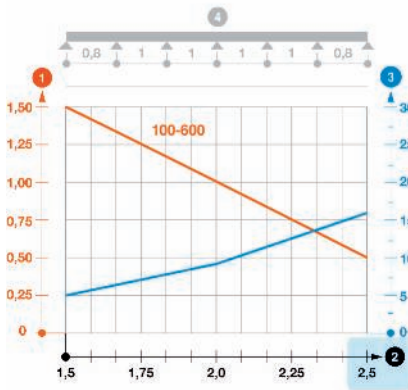
## Information 1: The testing process

The basic principles of the tests of OBO cable support systems come from VDE 0639 Part 1 and DIN EN 61537. The purpose of the tests is to determine the maximum load capacities for each component, depending on parameters such as component width, support spacing, etc. and to present this in a diagram to be included with each component. The area highlighted in blue in the example schematises the experiment set-up with a variable support spacing (L) in the central area and a factor of 0.8 x L at the front and rear ends of the cable tray.

## Information 2: Load curves for selected cable tray or cable ladder widths

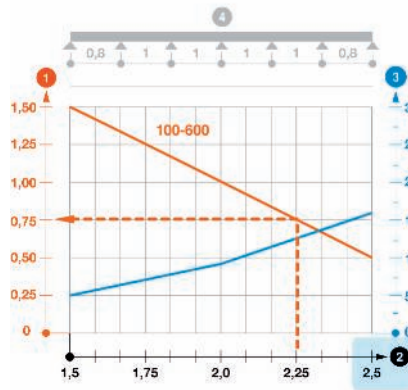
The load capacity of the cable trays according to the support width can be read off in the diagram using the load curves – this is an example for a cable tray for the tray widths 100 to 600 mm. It may occur that in the load curves, width differences must be made, allowing multiple curves to be visible simultaneously in the diagram. A key factor for the load capacity of the cable trays is (in addition to the support spacing and side height) the material thickness, which varies according to type.

# Finding the appropriate system for the cable load



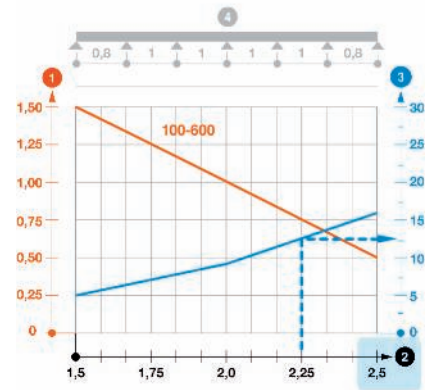
### Information 3: Possible support spacings

The theoretically possible spans for the cable tray can be read off on the axis at the foot of the table. Using the load curves, it is easy to read off to what extent the load capacity of the system falls as the support spacing grows. On all OBO cable support systems (with the exception of the wide span trays), we recommend not exceeding a support spacing of 1.5 m, if possible.



### Information 4: Ratio: load/span

Which load is possible at which support spacing? With the diagram, you can find the appropriate information at a glance. In our example (with the blue background), a span of 2.25 m for the tray produces a maximum load capacity of 0.75 kN for each running metre of cable tray. Please note that in this example, the volume of the cable tray may exceed the permitted load. Therefore if at all possible, do not exceed the support spacing of 1.5 m, as recommended by OBO.

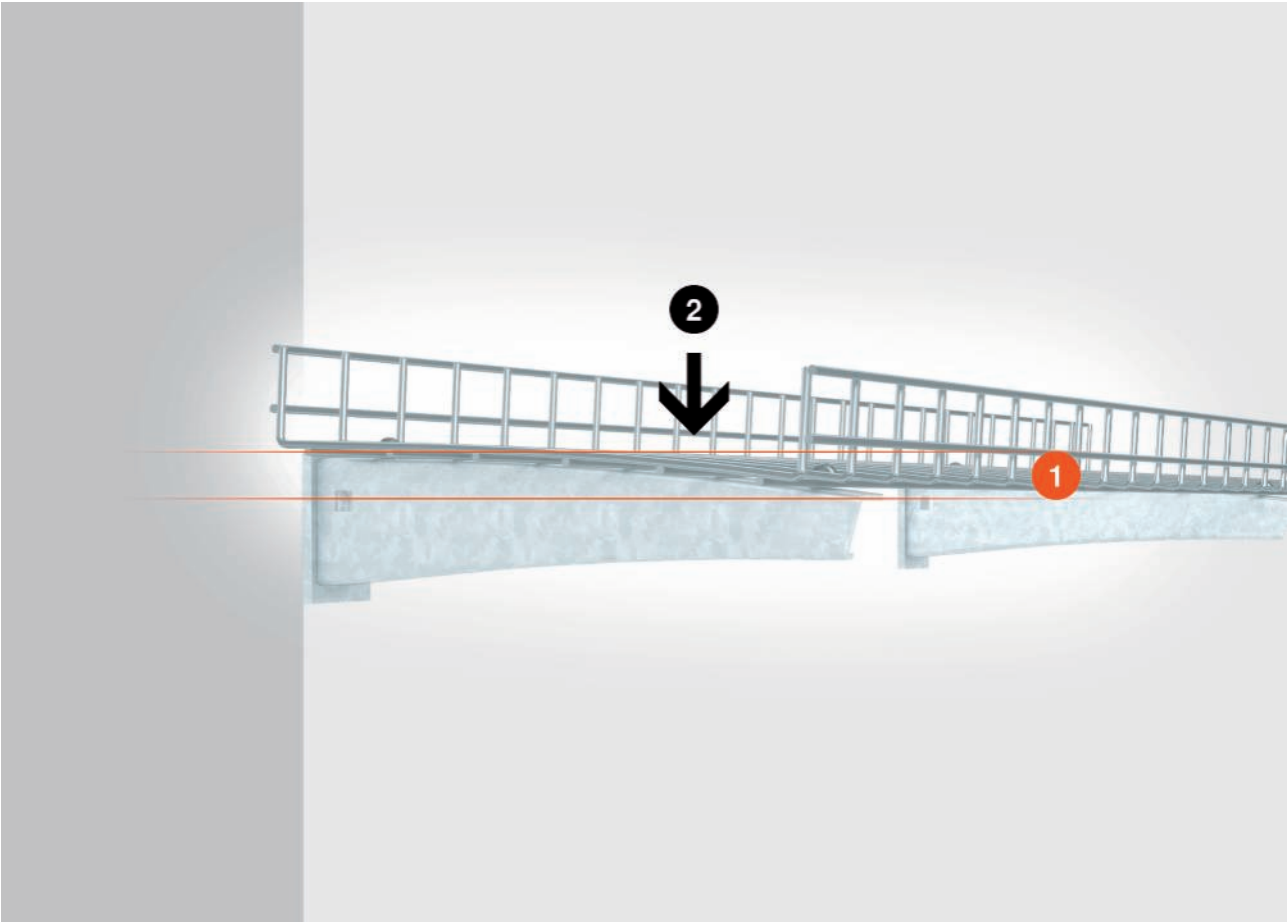


### Information 5: W = Rail bending

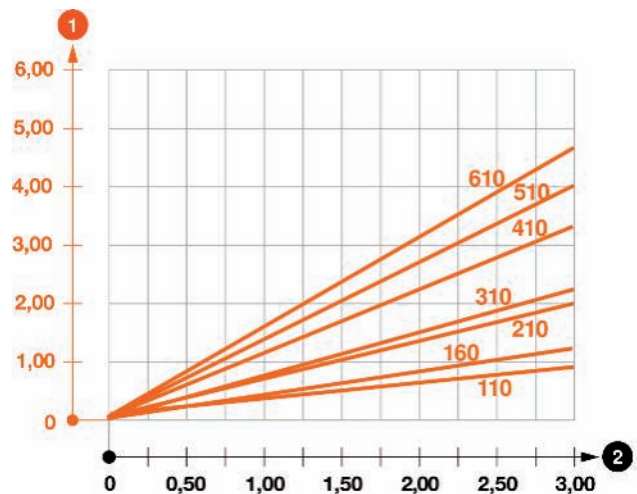
To what extent does the load on a cable tray cause the rail to bend? This information is supplied by the blue curve (w) in millimetres (orientation values on the axis on the right-hand side of the diagram).

The course of the blue curve clearly shows how quickly the cable tray will sag as the support spacing increases. In our example, the bend at a support spacing of 2.25 m is shown, here approximately 12 mm.

# Finding the appropriate bracket for the cable load

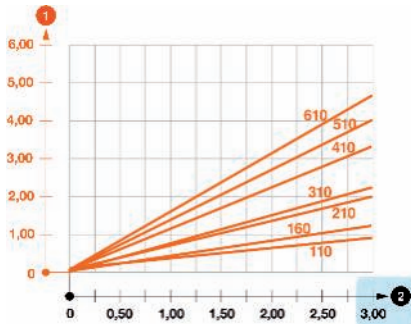


Key components of the OBO cable support systems are the parts for mounting, in particular the brackets and suspended supports. They connect the cable trays and ladders to the wall and to the ceiling, and are thus an important construction element of the overall system. When calculating the load capacity of a cable support system, the brackets and suspended supports must not be forgotten. The test diagram is also useful in selecting the right products.



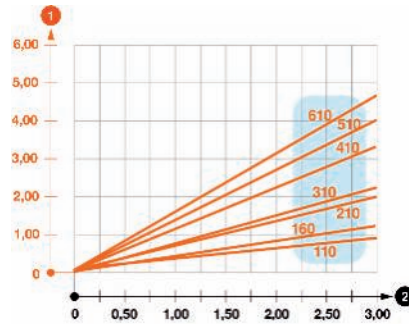
Load diagram, legend  
 1 = Bend in mm at the bracket tip  
 2 = Load without man load  
 in kN/m  
 -- = Load curves for the  
 different bracket lengths

# Finding the appropriate bracket for the cable load



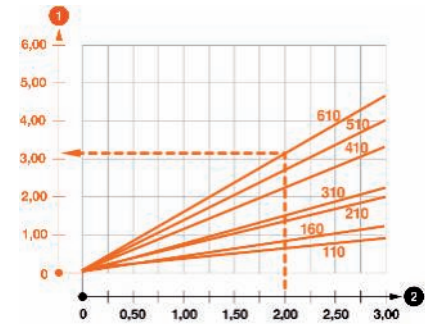
### Information 1: Recommended maximum load of the brackets

The bracket is the part of the installation system upon which the cable tray or mesh cable tray is located. It is either directly connected to the wall or is connected to the ceiling using supports. The grey bar on the right edge of the diagram provides information on the maximum load capacity of the bracket.



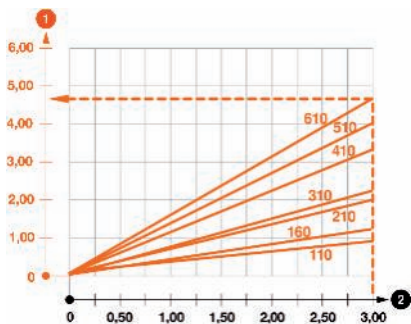
### Information 2: Load curves for all bracket widths

The bending of the bracket is dependent on its width, which in our example, can range from 110 mm to 610 mm. The load curves are assigned to the appropriate bracket type.



### Information 3: Bending of the bracket tip at a specific load

The load curve in the diagram provides information on the bending of the boom tip at a specific load. In our example (dotted orange line), a 610 mm-wide bracket with a load of 2 kN bends by approx. 3.1 mm. A basic rule of thumb is: The shorter the bracket, the less the bend will be.

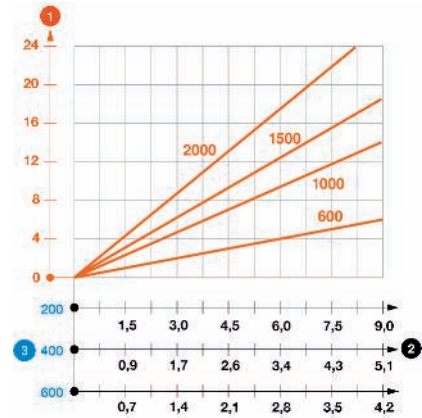
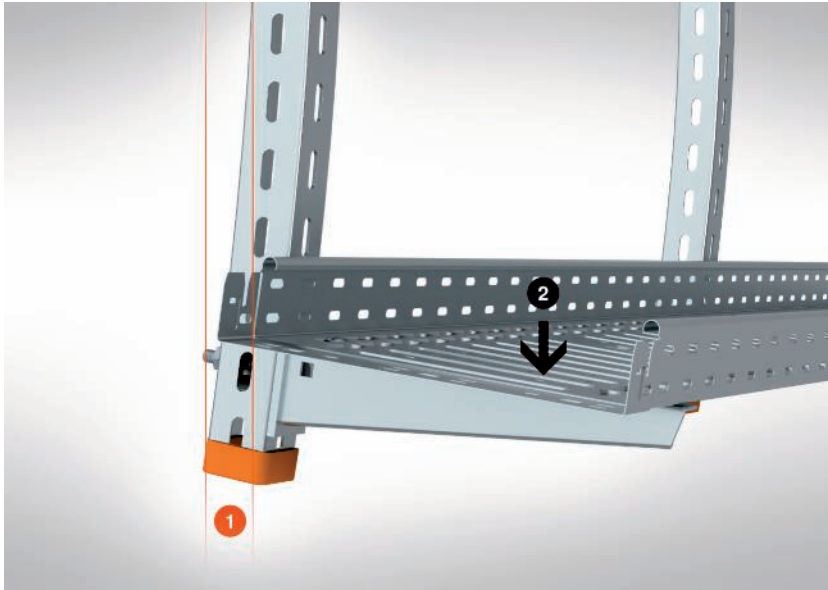


### Information 4: Bending of the bracket tip at maximum load

The bending factor of the bracket at maximum load can also be seen in the diagram. In our example (shown in orange), the bend value for a 610 mm-wide bracket at a maximum load of approx. 3.0 kN is approximately 4.5 mm. To minimise the bend, the centre of gravity of the cable load should be as close as possible to the wall or the support fastening.

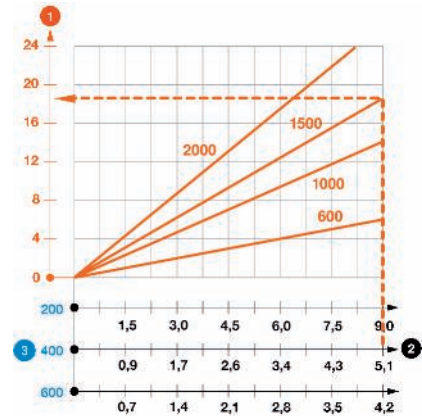
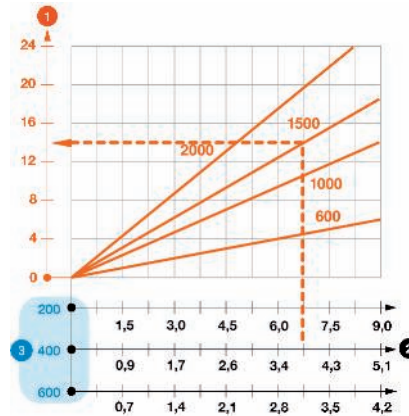
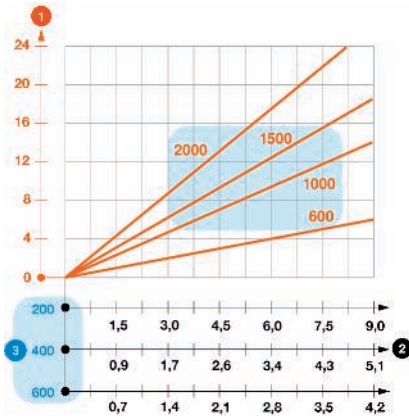


# Finding the appropriate support for the cable load



**Load diagram, legend**

- 1 = Bend in mm at the bracket tip
- 2 = Load without man load in kN/m
- = Load curves for the different bracket lengths



### Information 1: Various support lengths and bracket widths

The load capacity of a cable support system is not just dependent on the width of a bracket, but also on the length of a suspended support. The load curves in the diagram provide information on the load capacity of a suspended support of length 600, 1,000, 1,500 or 2,000 mm, taking the bracket width into account.

### Information 2: Calculation of the deflection for the example

The weight of the total suspended support/bracket/cable tray system causes an excursion of the suspended support from the vertical. The excursion value can be read off from the axis on the left edge of the diagram. In our example (blue background), a 1,500 mm-long suspended support, together with a 400 mm-wide bracket and a weight load of 4 kN at the end of the support, will produce an excursion of approximately 14 mm.

### Information 3: Calculation of the excursion at maximum load for the example

The excursion of the suspended support at a maximum load can also be read off on the diagram. Our blue example shows an excursion of roughly 18 mm at the end of the support for a 1,500 mm-long suspended support, in combination with a 400 mm-wide bracket at a maximum cable load of approximately 5 kN.

# Cable glands and the DIN EN 62444 standard

Cable glands are manufactured and tested according to DIN EN 62444. Amongst other things, this standard controls the retaining ability and strain relief of cables. The V-TEC cable glands from OBO Bettermann correspond to version "A". Table 2A indicates the extraction forces that these cable glands must withstand according to the standard. The V-TEC cable glands also fulfil the requirements of DIN EN 62444 with regard to the

twist protection of cables (see Table 3). To ensure the tested dust and moisture protection of the cable glands, continuous perforations should correspond to the mounting openings specified in the standard DIN EN 62444 according to Table 1. The on-site specialist must ensure that these parameters are complied with in order to hand over a functioning system.

**Table 1**

Size of the penetration hole	mm	6	8	10	12	16	20	25	32	40	50	63	75
Thread of the cable gland	M	M6	M8	M10	M12	M16	M20	M25	M32	M40	M50	M63	M75
Diameter of the mounting hole (+0.2/-0.4)	mm	6.5	8.5	10.5	12.5	16.5	20.5	25.5	32.5	40.5	50.5	63.5	75.5

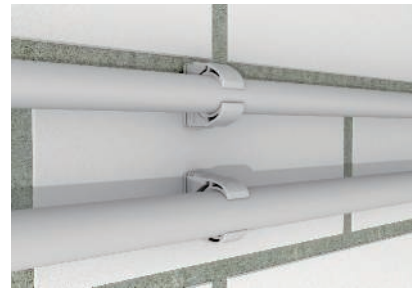
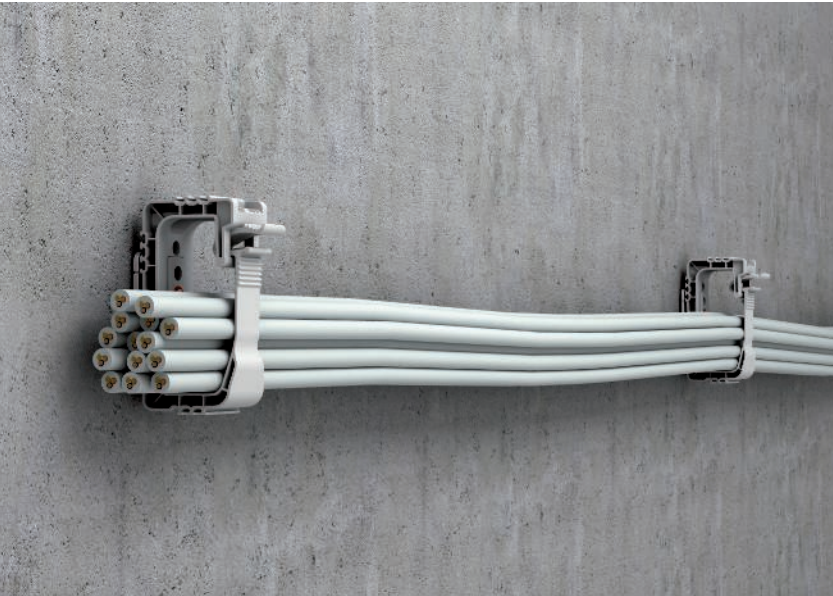
**Table 2 A**

Cable diameter	Retaining capacity	Strain relief, version A
mm	N	N
to 4	5	–
>4 to 8	10	30
>8 to 11	15	42
>11 to 16	20	55
>16 to 23	25	70
>23 to 31	30	80
>31 to 43	45	90
>43 to 55	55	100
>55	70	115

**Table 3**

Cable diameter	Torque Version A and B
mm	Nm
>4 to 8	0.10
>8 to 11	0.15
>11 to 16	0.35
>16 to 23	0.60
>23 to 31	0.80
>31 to 43	0.90
>43 to 55	1.00
>55	1.20

# Information on cable fastenings



## Cable fastening

The standard DIN EN 61914 "Cable holders for electrical installations" specifies that cable holders "must be able to accept cables or cable bundles of the diameter specified by the manufacturer or responsible retailer, without tearing or breaking or shearing off the threads of bolts".

During the installation of cables, the current national and international standard must be taken into account, such as DIN VDE 0100 520. "Suitable tools and methods, which prevent damage or changes to the shape" must be used for fastening.

In addition, with masses of cables, DIN VDE 0298 requires the appropriate "load capacities of cables for fixed laying in and on buildings..." to be taken into account when selecting the fastening systems.

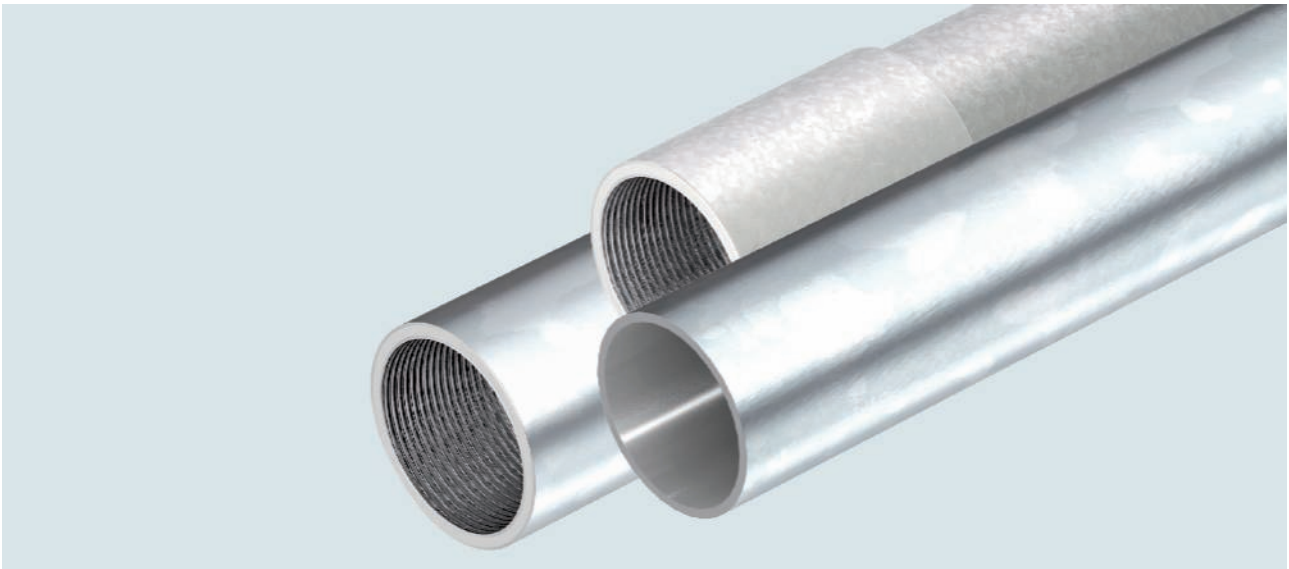
Besides these standardising aspects, the end customer's or client's particular laying specifications can/must be taken into account.

The fastening spacing for cables is given in DIN VDE 0100-520, June 2013. For example, cables laid horizontally require a spacing of 20x the cable diameter. However, a spacing of 80 cm should not be exceeded. With vertical routing, the clip spacings may be increased but should not exceed 1.5 m.

The table below shows the maximum fastening spacings for cables according to the cable diameter. The laying spacings given in the Industrial installation product catalogue, e.g. for bus holders or Quick clips, are guide values and can only be treated as such.

External diameter of the cables	Maximum spacing for horizontal fastening	Maximum spacing for vertical fastening
mm	mm	mm
$D \leq 9$	250	400
$9 < D \leq 15$	300	400
$15 < D \leq 20$	350	450
$20 < D \leq 40$	400	550

# IEC classification in accordance with DIN EN 61386-1

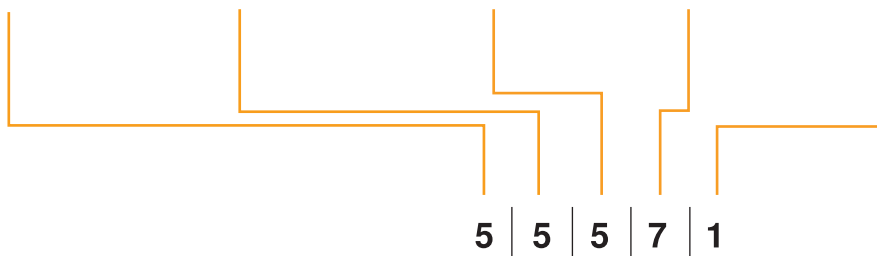


The OBO Bettermann pipe systems are machined and tested according to DIN EN 61386 (Electrical installation pipe systems for electrical energy and information) and DIN EN 60423 (External diameters of electrical installation pipes and thread for electrical installation pipes and their accessories).

### Numeric code

DIN EN 61386-1 classifies installation pipes using a 12-digit numeric code, which provides information on the pressure resistance, impact resistance or use temperatures. You can find the first five digits in the product descriptions of the pipe systems.

First digit	Second digit	Third digit	Fourth digit	Fifth digit
Pressure resistance	Impact resistance	Lower temperature range	Upper temperature range	Bending behaviour
1 Very light (125 N)	1 Very light (0.5 kg/100 mm)	1 +5 °C	1 +60 °C	1 Rigid
2 Light (320 N)	2 Light (1.0 kg/100 mm)	2 -5 °C	2 +90 °C	2 Bendable
3 Medium (750 N)	3 Medium (2.0 kg/100 mm)	3 -15 °C	3 +105 °C	3 Pliable, self-recovering
4 Heavy (1,250 N)	4 Heavy (2.0 kg/300 mm)	4 -25 °C	4 +120 °C	4 Flexible
5 Very heavy (4,000 N)	5 Very heavy (6.8 kg/300 mm)	5 -45 °C	5 +150 °C	
			6 +250 °C	
			7 +400 °C	





### Classification according to IEC EN 61386-1: Composition of the IP code

7th digit		8th digit	
	Ingress of solid bodies		Ingress of water
0		0	None declared
1		1	Protected against vertically falling water drops
2		2	Protected against vertically falling water drops, when the pipe system is tilted up to an angle of 15°
3	Protected against solid foreign objects of 2.5 mm Ø and greater	3	Protected against spraying water
4	Protected against solid foreign bodies of 1.0 mm Ø and larger	4	Protected against splashing water
5	Dust-protected	5	Protected against water jets
6	Dust-proof	6	Protection against powerful water jets
7		7	Protected against the effects of temporary immersion in water

### Classification according to IEC EN 61386-1: Corrosion protection

9th digit		Suitable surfaces
Resistance against corrosion		
1	Low protection, inside and outside	
2	Medium protection, inside and outside	<ul style="list-style-type: none"> <li>• Black coated (SW)</li> <li>• Electrogalvanised (G)</li> <li>• Strip galvanised (FS)</li> </ul>
3	Medium protection inside, high protection outside	
4	High protection inside and outside	<ul style="list-style-type: none"> <li>• Hot-dip galvanised (FT)</li> <li>• Stainless steel (V2A, V4A)</li> </ul>



#### Protection against mechanical loads

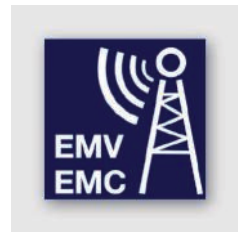
OBO metal pipes are particularly suited to use under tough industrial conditions. They provide reliable protection against very heavy mechanical loads during cable routing.

The different material and surface qualities, from galvanised to painted, allow perfect adaptation to the requirements of the appropriate environment.

#### Maintenance of electrical function to E30/E90

Our steel pipes guarantee the maintenance of electrical function to E30/E90. They are thus ideal for the connection of safety-relevant equipment, such as smoke extraction systems.

# Definition of electromagnetic compatibility (EMC)



Recent years have seen the use of electronic circuits increase continually. Whether in industrial systems, medicine, households, telecommunications systems or electrical building installations – we find powerful electrical equipment and systems everywhere, and these switch ever greater currents, achieve greater radio ranges and transport ever more power in smaller spaces.

However, the use of state-of-the-art technology means that the complexity of applications also increases. The consequence of this is that ever more opposing influences (electromagnetic interferences) can occur from system parts and cables, causing damage and economic losses.

**Here, we talk of electromagnetic compatibility:**

Electromagnetic compatibility (EMC) is the ability of an electrical unit to function satisfactorily in its electromagnetic environment, without inappropriately influencing this environment, to which other units also belong (VDE 0870-1). In terms of standardisation, electromagnetic compatibility is dealt with by the EMC Directive 2004/108/EC. This means that electrical resources emit electromagnetic interferences (emissions), which are picked up by other devices or units (immission) that act as receivers (interference sink). This in turn means that the function of an interference sink can be severely reduced and, in the worst-case scenario, result in total failure and economic losses. The interferences can then spread along cables or in the form of electromagnetic waves.

**Path of faults**

Fault source (transmitting emissions)	Coupling of interference variables (spreading of interference)	Fault sink (receiving emissions)
For example - Mobile telephones - Switching components - Ignition systems - Frequency converters - Lightning strike - Welding devices	- Galvanic - Inductive - Capacitive - Electromagnetic	- Process computer - Radio receiver systems - Controllers - Converters - Measuring units



## Guaranteeing EMC

A systematic planning process is necessary to guarantee EMC. The interference sources must be identified and quantified. The coupling describes the spread of the interference from the interference source up to the device being influenced, the interference sink. The task of EMC planning is to ensure the compatibility at the source, coupling path and sink using suitable measures. During their daily work, planners and installation engineers are confronted with this subject on an increasingly regular basis. This means that EMC is a basic factor to be taken into consideration during the planning of installations and cabling systems.

Due to the high complexity of electromagnetic compatibility, the problems of EMC must be analysed and solved using simplifying hypotheses and models, as well as experiments and measurements.

### Cable support systems and their contribution to EMC

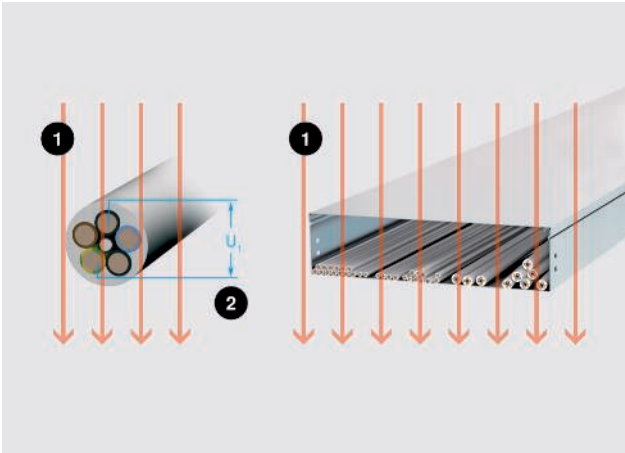
Cable support systems can make an important contribution to the improvement of EMC. They are passive and can thus make a safe, long-lasting

contribution to EMC through the fact that cables are run within cable support systems or are shielded by them. Routing cables inside cable support systems greatly reduces the galvanic decoupling and coupling due to electrical and magnetic fields in the cables. Thus, cable support systems can make a contribution to the reduction of coupling from the source to the sink. The shielding action of cable support systems can be quantified by the coupling resistance and the shield attenuation. This gives the planner important engineering parameters for cable support systems for EMC engineering.

### Lightning discharge

From the analysis of the effectiveness of EMC in buildings (EN 62305-4), we know that lightning discharge is one of the greatest sources of interference to be expected. This causes a direct current feed into the entire equipotential bonding system in the building and/or to magnetic decoupling of interference currents in electrical cables. With regard to these couplings, cable support systems can offer an effective contribution to the reduction of interference voltages.

# Magnetic shield insulation of cable support systems



The magnetic field (H) of strength 3 kA/m in a defined experimental set-up: without cable support system on the left, with cable support system on the right. 1 = Field H, 2 =  $V1 L_{ZUPE}$



The magnetic shield insulation of cable support systems is the ratio in decibels (dB) of an induced voltage into an unprotected cable to the induced voltage into the same cable, when this is in a cable support system.

### Experimental structure to determine the magnetic shield insulation of cable support systems:

An unshielded cable (NYM-J 5x6 mm<sup>2</sup>) is subjected to an 8/20 magnetic field with a strength of 3 kA/m. Here, the induced voltage V1 is measured in the unshielded cable. The same cable is then positioned in the centre of a cable support system (once with a cover, once without) and subjected to the same magnetic field of 3 kA/m. Here, the induced voltage V2 is measured in the unshielded cable. The magnetic shield insulation is calculated from the measured values according to the formula:

$$\alpha S = 20 \log (V1/V2) \text{ dB}$$

### Experiment result:

The magnetic shield effect  $\alpha S$  of a cable support system could be clearly proved by the experiments and the simulation with an FEM program. The best result of around 50 dB was achieved with cable support systems (cable trays) with covers.

### Note:

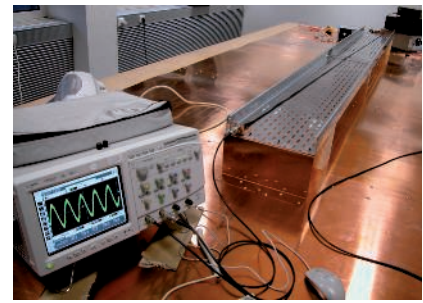
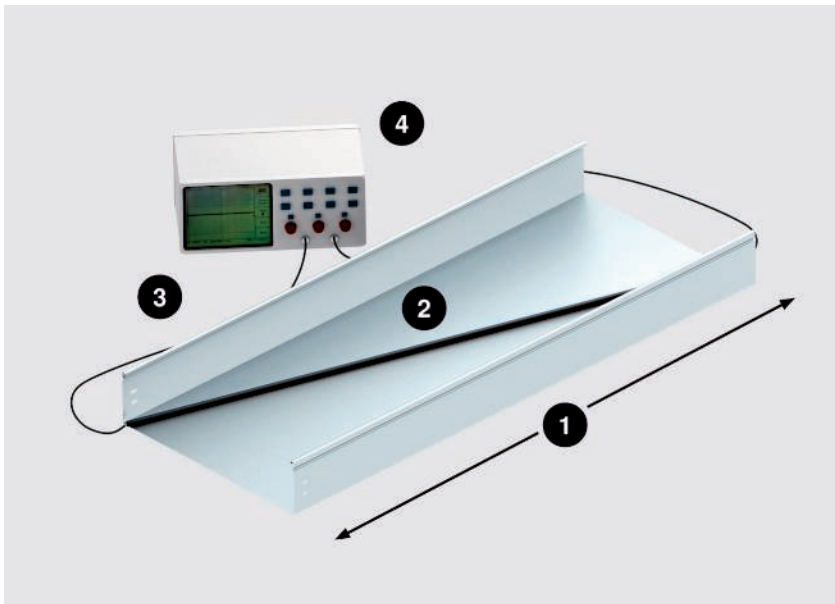
The shield insulation against electrical fields is almost perfect, as it is with a Faraday cage.

### Magnetic shield insulation 8/20 dB

Type, cable tray/cable ladder	Without cover	With cover
RKSM 630 FS	20	50
MKS 630 FS	20	50
MKS 630 FT	20	50
MKSU 630 FS	20	50
MKSU 630 FT	20	50
MKSU 630 VA	20	50
GRM 55/300 FS	15	25
LG 630 NS FT	10	15



# Transfer impedance of cable support systems



$$Z'_T = \frac{U_{\text{Stör}}}{I_{\text{Stör}} * L}$$

Experimental structure for transfer impedance: 1 = Length l, 2 = U, 3 = I, 4 = Pulse source 8/20

$Z'_T$ : Transfer impedance

$V_{\text{Interference}}$ : Interference voltage measured in cable

$I_{\text{Interference}}$ : Interference current, fed into the shield from outside (KTS)

L: Length of the cable support system

## Transfer impedance (coupling resistance) of cable support systems

The transfer impedance of a cable support system is the ratio of the measured voltage  $V_{\text{Interference}}$ , measured in the lengthwise direction within the cable support system, to the coupled current  $I_{\text{Interference}}$ .

The transfer impedance is determined in the same way as with the measurement of the electrical conductivity properties in Chapter 11.1 (DIN EN 61537).

If there is a lightning strike in a building, partial currents will flow through the entire equipotential bonding system. Installed cables are best run within a cable support system. Installed cable support systems are always included in the equipotential bonding system. In so doing, the partial current flows via the cable support system. A

very small component can therefore still flow along the cables laid within the cable support system. This component is determined by the transfer impedance of the cable support system.

The following applies for the transfer impedance:

$$Z_T = V_{\text{Interference}} / (I_{\text{Interference}} \times L) \text{ [m}\Omega\text{/m]}$$

The values given are based on measurements, in which a pulse current of the wave shape 8/20 was passed through a defined length of a cable support system.

### Experiment result:

The effect of the cable support system against galvanic coupling was clearly proved by the experiments.

The best result was achieved with cable support systems (cable trays) with covers.

## Transfer impedance 8/20 mOhm/m

Type, cable tray/cable ladder	Without cover	With cover
MKS 630 FS	1.14	0.71
MKS 630 FT	1.14	0.71
MKSU 630 FS	0.44	0.09
MKSU 630 FT	0.44	0.09
GRM 55/300 FS	6.17	5.5

# Maintenance of electrical function



## Safety in the event of fire

To ensure that emergency and escape routes and important technical equipment such as emergency lighting, fire alarm systems and smoke exhaust systems remain usable in case of fire, it is absolutely essential to provide special protection for the power supply for these systems. The use of special cables and routing systems means that it is possible to maintain the power supply, even in the event of fire, thus guaranteeing the maintenance of electrical function.

You can find detailed information on the subject of fire protection in the OBO protective installation catalogue.

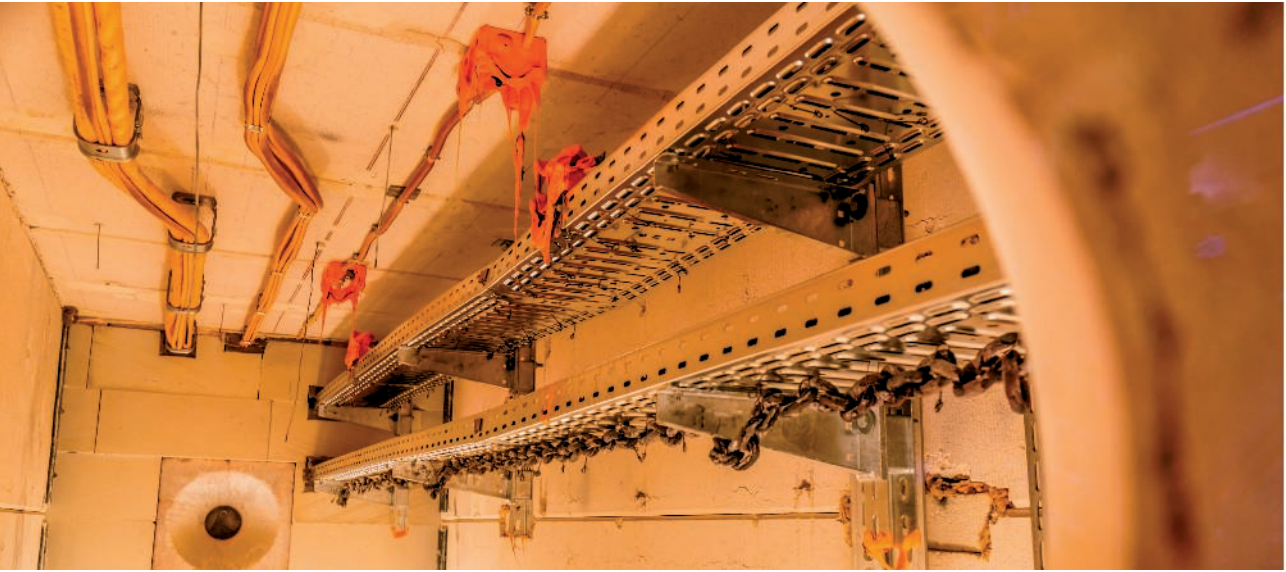
The maintenance of electrical function is particularly important in buildings regularly frequented by large numbers of people. These include public buildings such as schools, hospitals, meeting places, civic buildings and underground stations, but also industrial plants, high-rise buildings, shopping centres and large car parks.

## Fire loads of installation systems

According to rules governing wiring systems in the individual German federal states, no fire loads may be installed in emergency and escape routes. OBO's fire-tested steel fastenings fulfil these requirements.



Junction boxes which have the capability to maintain electrical function ensure the fireproof connection of the safety cables. The boxes in the FireBox series are tested and approved to maintain electrical function for 30 to 90 minutes in accordance with DIN 4102-12.



## E30

### **30 minutes: Maintaining electrical function for an evacuation.**

The first 30 minutes after the start of a fire are decisive when clearing the affected building.

During this time, the maintenance of electrical function must be guaranteed for the following units:

- Safety lighting systems
- Lifts with fire control
- Fire alarm systems
- Alarm systems and systems to issue instructions to visitors and employees
- Smoke extraction systems

## E90

### **90 minutes: Maintenance of electrical function for better firefighting**

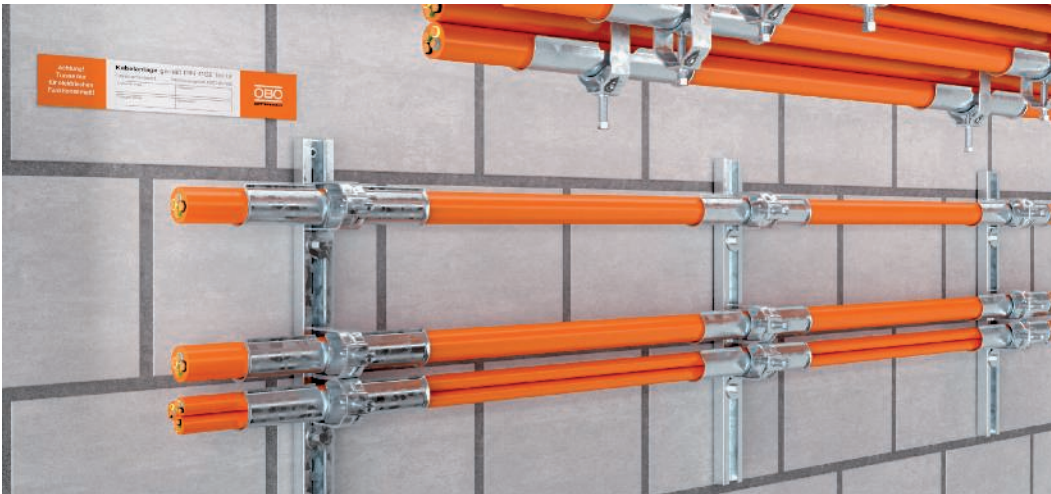
To support firefighting operations, it is imperative that certain technical equipment is supplied with sufficient power even up to 90 minutes after a fire breaks out in a building. This equipment includes:

- Systems to increase the pressure of the water for fighting the fire
- Mechanical smoke extraction and smoke protection pressure systems
- Fire brigade lifts, bed lifts in hospitals

# Individual routing systems for the maintenance of electrical function

With the individual laying systems, OBO Bettermann can offer a range of practical, flexible mounting options for electrical installations with the maintenance of electrical function. The systems are suited to vertical and horizontal installation and are approved for the fire protection classes E30 to E90. Standardised supporting

constructions as defined in the testing standard, DIN 4102 Part 12, include: The routing of cables with individual clips and the routing of cables with profile rail, clamp clip and a long trough.



E30

E60

E90

### Standard routing type, clamp clip type 2056

Standard support construction consisting of clamp clip without long trough for individual laying or bundling cables.

- Wall or ceiling mounting
- Horizontal installation
- Rail mounting: max. 0.3 m
- Anchor spacing in the rail: max. 0.25 m
- Individual cable assignment: diameters of up to 100 mm possible
- Assignment with bunched cables: Max. 3 cables with max. diameter 25 mm



E30

E60

E90

### Cable tidy

Cable-specific laying type with cable tidies for individual laying, horizontal/vertical mounting on wall or ceiling.

### Type 2031/M 30

- Fastening distance: max. 0.5 m
- Cable assignment: max. 2.5 kg/m

### Type 2031/M 15

- Fastening distance: max. 0.5 m
- Cable assignment: max. 1.1 kg/m

### Type 2031/M 70

- Fastening distance: max. 0.8 m
- Cable assignment: max. 6.0 kg/m



E30

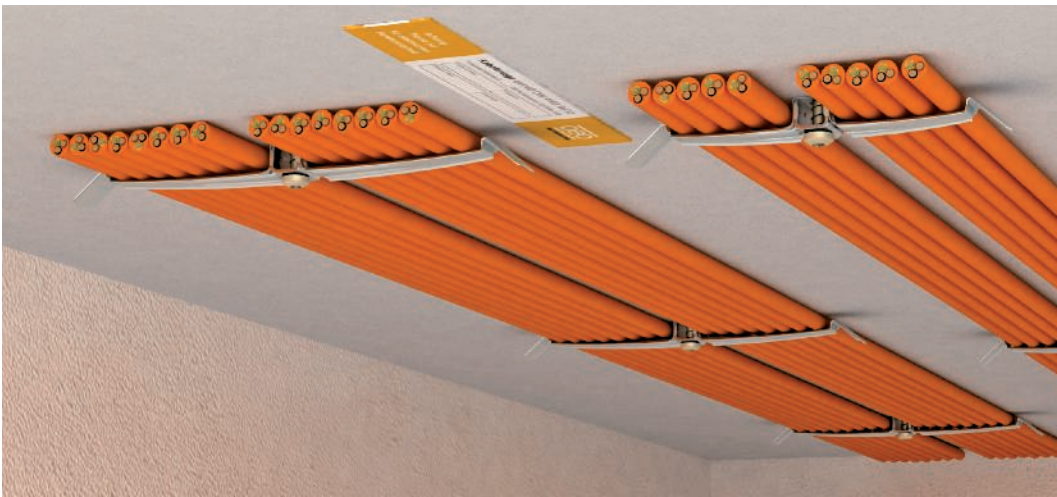
E60

E90

**Standard routing type, single clip type 732/733**

Standard support construction consisting of spacer clips for individual laying or bundling cables.

- Wall or ceiling mounting
- Vertical or horizontal mounting
- Mounting spacing: max. 0.3 m
- Individual cable assignment: diameters of up to 50 mm possible
- Assignment with bunched cables: Max. three cables with max. diameter 25 mm



E30

**Pressure clip**

Cable-specific laying type with pressure clips for individual laying, mounting on the ceiling.

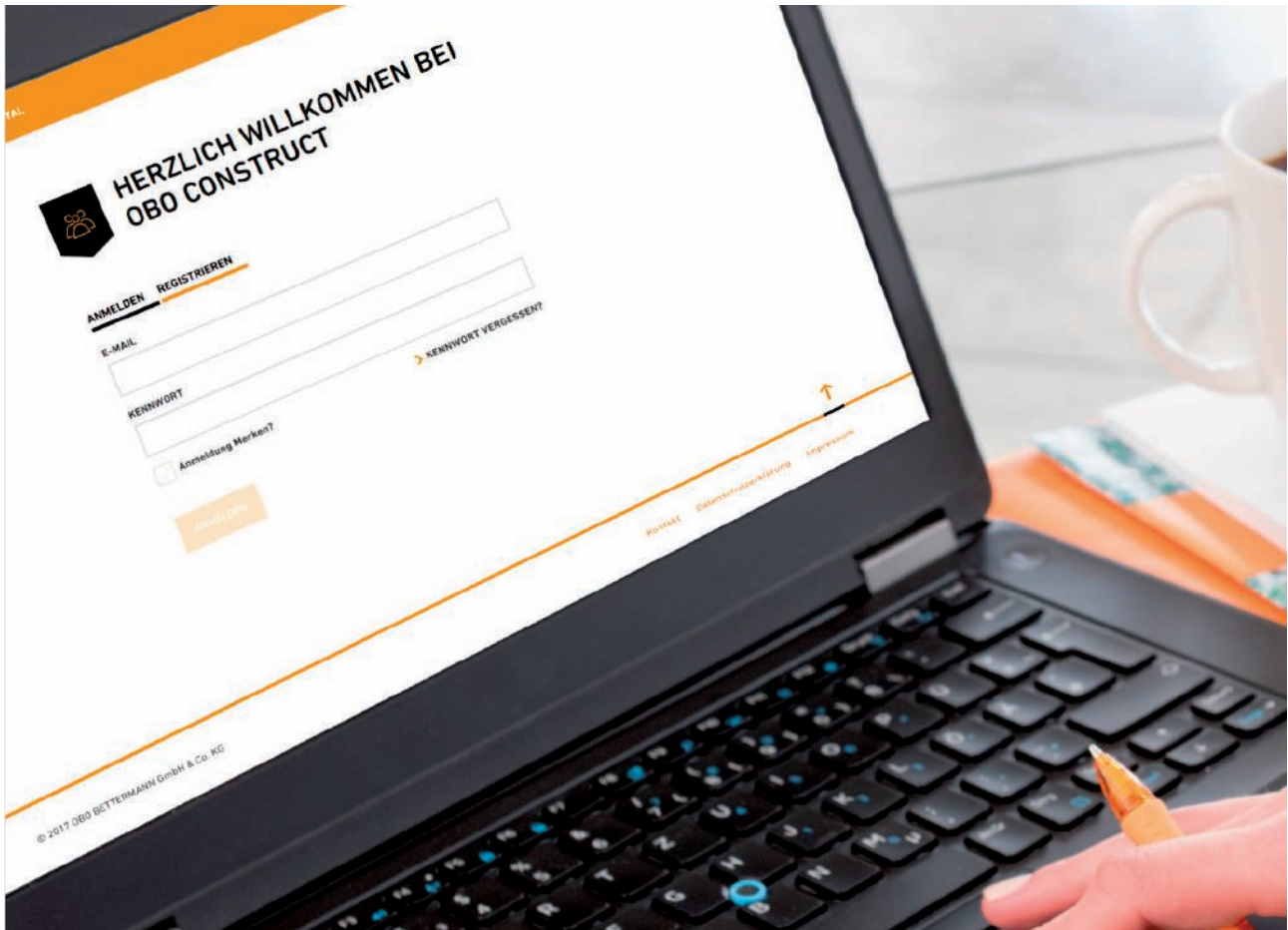
**Type 2033 M**

- Fastening distance: max. 0.5 m

**Type 2034 M**

- Fastening distance: max. 0.5 m

# OBO Construct – planning software and product configurators



The OBO Construct programs are electronic planning aids – developed in order to support electrical engineers and planners in their planning of electrical installation projects.

Due to the systematic search of technically relevant planning parameters, these programs simplify the search for suitable products and the appropriate accessories.

All new OBO Construct apps have a responsive design. They can be opened on any device, independent from the operating system.

**Benefits:**

- Work aid independent of time and place
- Transfer planning requirements into complete product systems
- Find suitable products quickly and simply
- Calculate quantities automatically
- Download configuration results as Excel or Word files

**Currently available versions:**

- Cable support systems  
AutoCAD Plug-in Version 3.0  
(AutoCAD full version from 2013)
- Underfloor systems  
Planning Tool Version 3.0  
(web app for all devices)
- Transient and lightning protection systems  
Earthing systems Version 1.0  
(web app for all devices)
- Fire protection systems  
Selection aid for insulations, Version 3.0  
(web app for all devices)
- Transient and lightning protection systems  
Surge protection Version 1.0  
(web application)
- Cable support systems  
Cable assignment Version 3.0  
(web app for all devices)

**More information**

[www.obo-construct.com](http://www.obo-construct.com)

# Standards, specifications and certifications



## Standards

OBO offers products for professionals, made by professionals. Our products are manufactured and tested according to the respective specifications of the standards. For example, DIN EN 61537 describes all the relevant parameters for cable support systems, such as the area of application, test conditions, corrosion resistance and temperature classification. As a highly competent manufacturer, OBO subjects itself to these requirements on a daily basis. Comprehensive test procedures guarantee that systems which conform to standards function safely.

## Specifications

All the OBO products and systems are CE-compliant according to the appropriate EC guidelines. This also applies to standard parts such as bolts, washers and nuts that are components of various product systems. The appropriate EC declaration of conformity certifies agreement with the named directives or standards, but does not guarantee properties. The safety instructions in the product information and the general safety regulations must be complied with during installation and use.

## Certifications

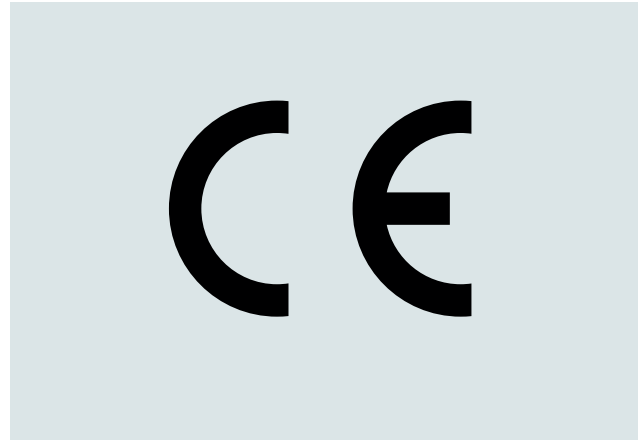
For OBO, product quality is closely connected to continuous testing and checking – which is why we manufacture almost all our products ourselves. This enormous depth of production is an expression of our demand for quality. From construction, and the materials used through production, right up to logistics, our employees personally guarantee the quality and availability of OBO products. The multitude of approvals emphasise our high demand for quality and product functionality. Our integrated quality management system forms the solid basis of our ISO 9001 certification, which we have held since 1994. The confirmation of suitability enables defined and workable processes in accordance with KTA 1401 and 10 CFR 50.

# Certificates and test marks



### VDE

VDE is the Association for Electrical, Electronic and Information Technologies, their study and the technologies and applications based upon them. The VDE mark on electrical equipment is proof that the equipment complies with VDE regulations and/or European or international harmonised standards, and meets the safety requirements of the applicable directives. The VDE mark indicates that a product is safe in relation to electrical, mechanical, thermal, toxic, radiological and other hazards.



### CE symbol

Technical resources included in a legal ordinance, i.e. electrical resources, machines and safety components, must have a CE symbol, with which the manufacturer confirms that the safety requirements of the ordinances are fulfilled. In addition, there must also be a declaration of conformity and technical documentation. The CE symbol is not a quality mark, but simply a declaration by the manufacturer that they have complied with the legal requirements and the codes of practice.



### UL

Underwriters Laboratories (UL) is an independent organisation that tests and certifies product safety. UL certification is generally required if a product is to be sold on the US market.

UL offers various certification options: The "UL Listed"



test mark indicates that UL has tested representative samples of a product and that it conforms to UL's safety requirements. The "UL Recognized" component test mark entitles a product to be used in a product or system bearing the "UL Listed" test mark.





## **OBO seminars: First-hand knowledge**

With a comprehensive programme of training courses and seminars, OBO supports its customers with first-hand specialist knowledge. Besides the theoretical principles, practical everyday implementation is also dealt with. Special calculation and application examples round off the comprehensive programme of knowledge transfer.

## **Invitations to tender, product information and data sheets**








































We can make life easier for you, with our comprehensive selection of materials designed for practical applications, which provide you with effective support with the planning and calculation of a project. These include:

- Invitations to tender
- Product information
- Data sheets

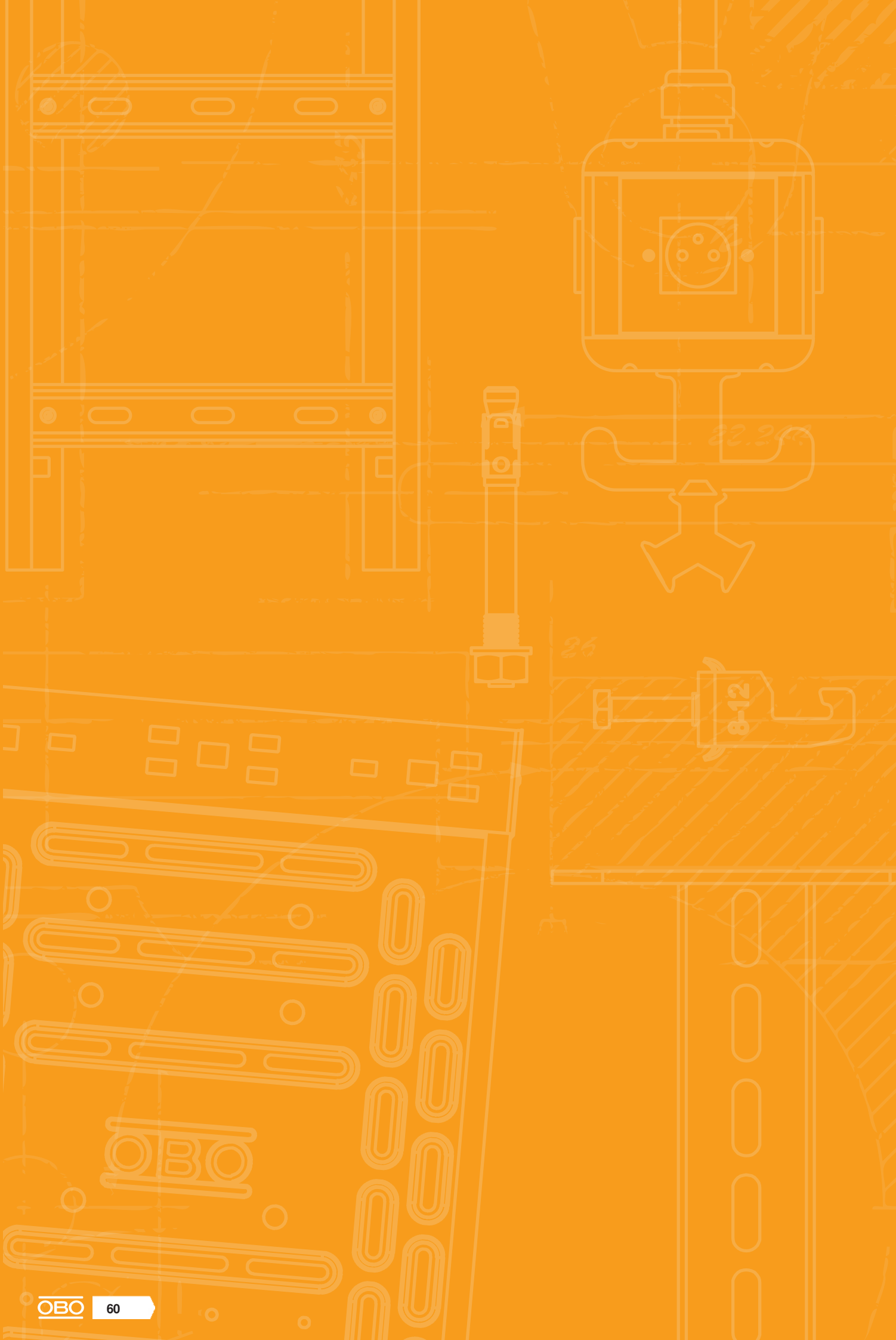
## **Invitations to tender on the Internet at [www.ausschreiben.de](http://www.ausschreiben.de)**

More than 10,000 entries from the different ranges can be called up free of charge. Regular updates and extensions mean that you always have a comprehensive overview of the OBO products. All the current file formats (PDF, DOC, GAEB, HTML, TEXT, XML, ÖNORM) are available. [www.ausschreiben.de](http://www.ausschreiben.de)

# Test marks

	American Bureau of Shipping, USA		Underwriters Laboratories Inc., USA + CSA, Canada
	AENOR, Producto Certificado, Spain		Österreichischer Verband für Elektrotechnik, Austria
	STOWARZYSZENIE ELEKTRYKÓW POLSKICH, Poland		ISTITUTO ITALIANO DEL MARCHO DI QUALITÀ, Italy
	Lightning current-tested		RINA 1861, Ship Classification, Certification and Services
	Lightning current-tested, Class H (100 kA)		Underwriters Laboratories Inc., USA
	CEBEC, Belgium		SEMKO An Inchcape Testing Services Company, Sweden
	Canadian Standards Association, Canada		Eidgenössisches Starkstrominspektorat, Switzerland
	DEMKO, Danmarks Elektriske Materielkontrol, Denmark		South African Bureau of Standards
	Deutsches Institut für Bautechnik Berlin, Germany		Shock-tested, Bundesamt für Zivilschutz, Germany
	Det Norske Veritas		Sähkötarkastuskeskus Elinspektionscentralen Electrical Inspectorate, Finland
	ENEC Austria		Underwriters Laboratories Inc., USA
	ATEX certificate for explosive areas		Underwriters Laboratories Inc., USA
	ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV, Czech Republic		Verband der Elektrotechnik, Elektronik, Informationstechnik e.V., Germany
	FIMKO, Finland		German Association of Electricians, tested safety
	Forschungs- und Materialprüfungsanstalt, Germany		5-year warranty
	Russia, GOST The State Committee for Standards		
	Test marks for technical resources, VDE Prüf- und Zertifizierungsinstitut Offenbach, Germany		
	Halogen-free; without chlorine, fluorine and bromine		
	INMETRO, Brazil		
	KEMA-KEUR, Netherlands		
	Indication of metric products		
	MAGYAR ELEKTROTECHNIKAI ELLENŐRZŐ INTÉZET Budapest, Hungary		
	NEMKO, Norway		
	AFNOR Quality symbol of the French standardisation institute		





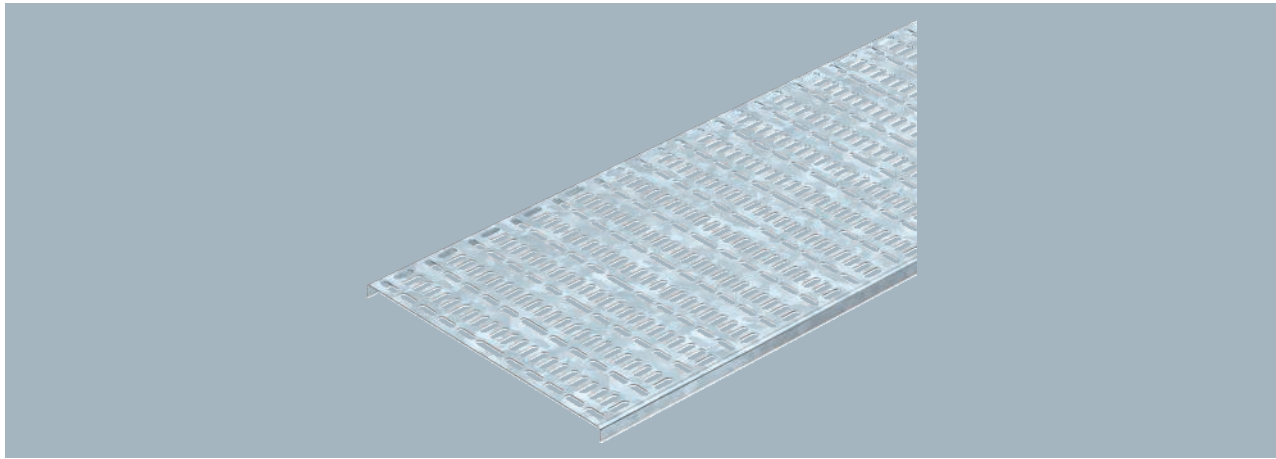
# Cable trays

	Side height 15 mm	62
	Side height 35 mm	64
	Side height 60 mm	76
	Side height 85 mm	104
	Side height 110 mm	106
	System accessories, cable trays	110



## Cable tray, marine standard MKR 15

St FT

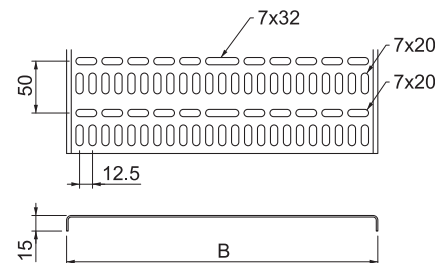


Type	Width mm	Metal thick- ness mm	Pack m	Weight kg/100 m	Item no.
MKR 15 300 FT	300	1.50	2	294.150	6045308

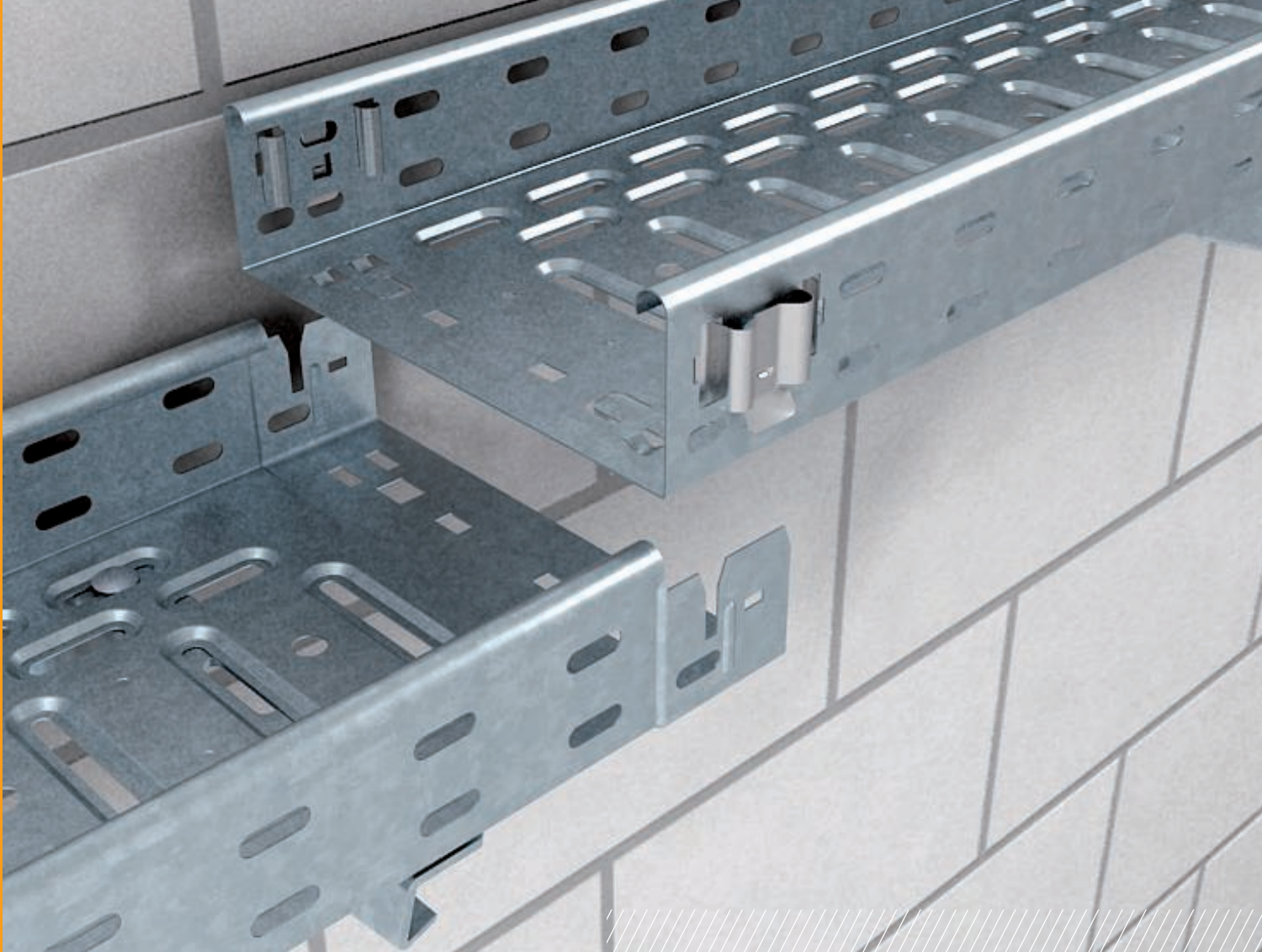
Cable tray for use in ship construction, produced according to the marine standard VG 88900-1.

Type	Length mm	Dim. B mm	Side height mm
MKR 15 300 FT	2000	300	15

### Dimensions



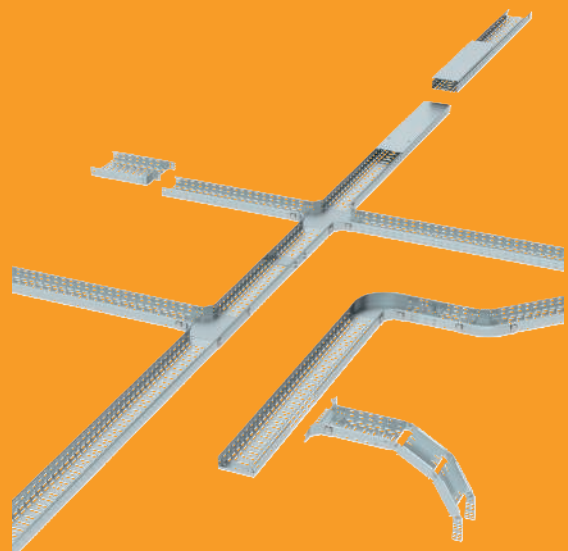




## RKS-Magic® cable tray system

The RKS-Magic® cable tray system permits even faster straight connection of the cable trays. The innovative, screwless straight connector can be mounted in the blink of an eye. Just connect the ends of the cable tray, lock them in place - and you're done!

- Fast and secure connection through patented plug connection
- Locking system accessory, such as the barrier strip
- Maintenance of electrical function, tested
- Equipotential bonding without additional components
- VDE and UL approved cable tray system





## System description



The RKS-Magic® cable tray system permits particularly fast straight connection of the cable trays. The innovative, screwless straight connector can be mounted in the blink of an eye. Just connect the ends of the cable tray, lock them in place – and you're done! The long-lasting, static straight connectors can be permanently stabilised by bending the connection flaps. The RKS-Magic® cable tray is available with the side heights 35 and 60 mm. A comprehensive range of fittings with bends (45° and 90°), T branch pieces, add-on tees and cross-overs completes the system. Also 90° bends and adjustable bends (rising/falling) are available for vertical changes of direction. When mounting fittings, always plan additional

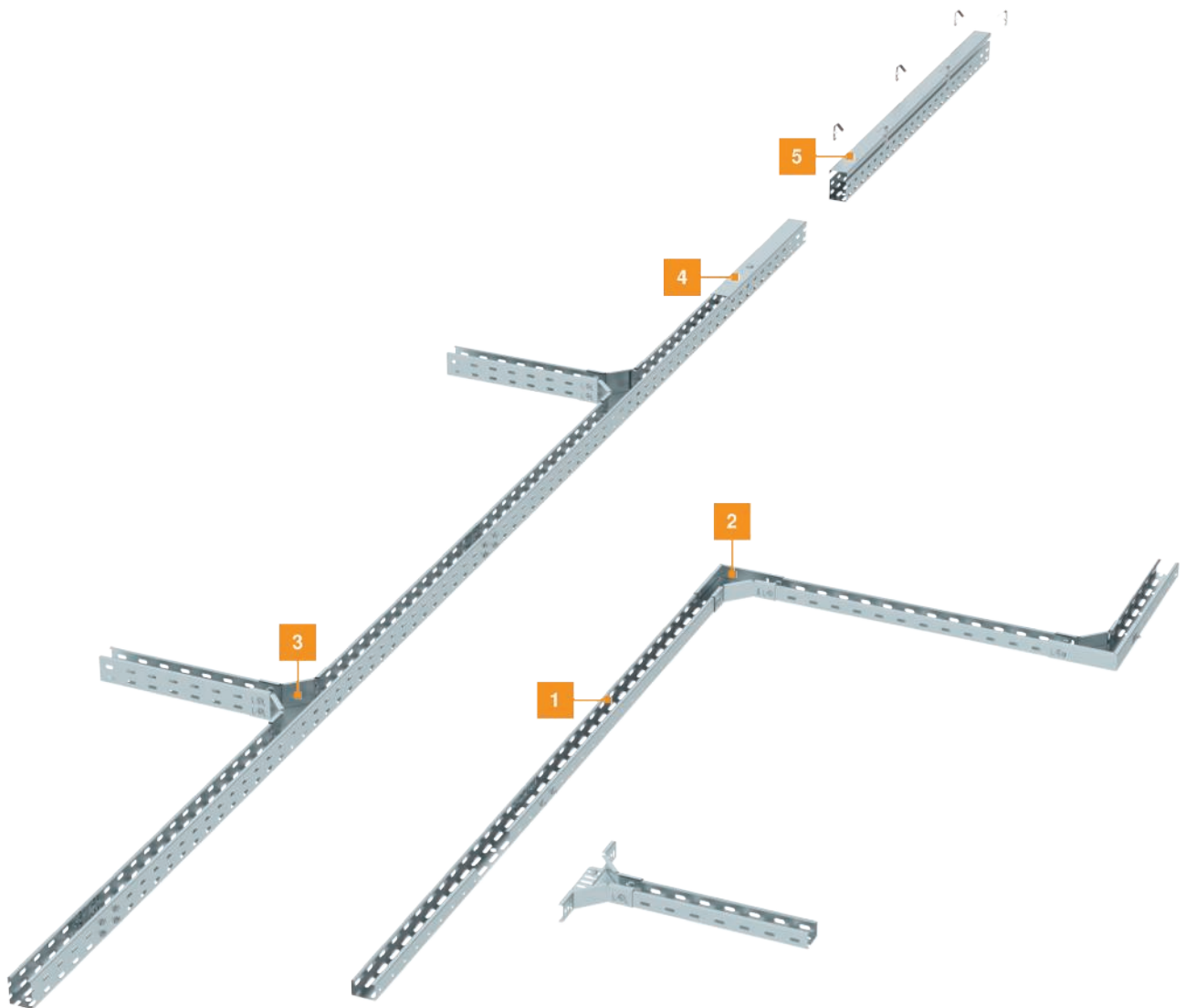
supports.

Besides the various fittings, the system also includes all types of connectors (straight, angle and adjustable connectors) and additional accessories such as barrier strips, joint plates, mounting plates and covers.

You can find detailed mounting examples and article descriptions on the following pages. The RKS-Magic® cable tray is tested for routing with the maintenance of electrical function. You can find comprehensive information on this in our new Safety and protective installations product catalogue.

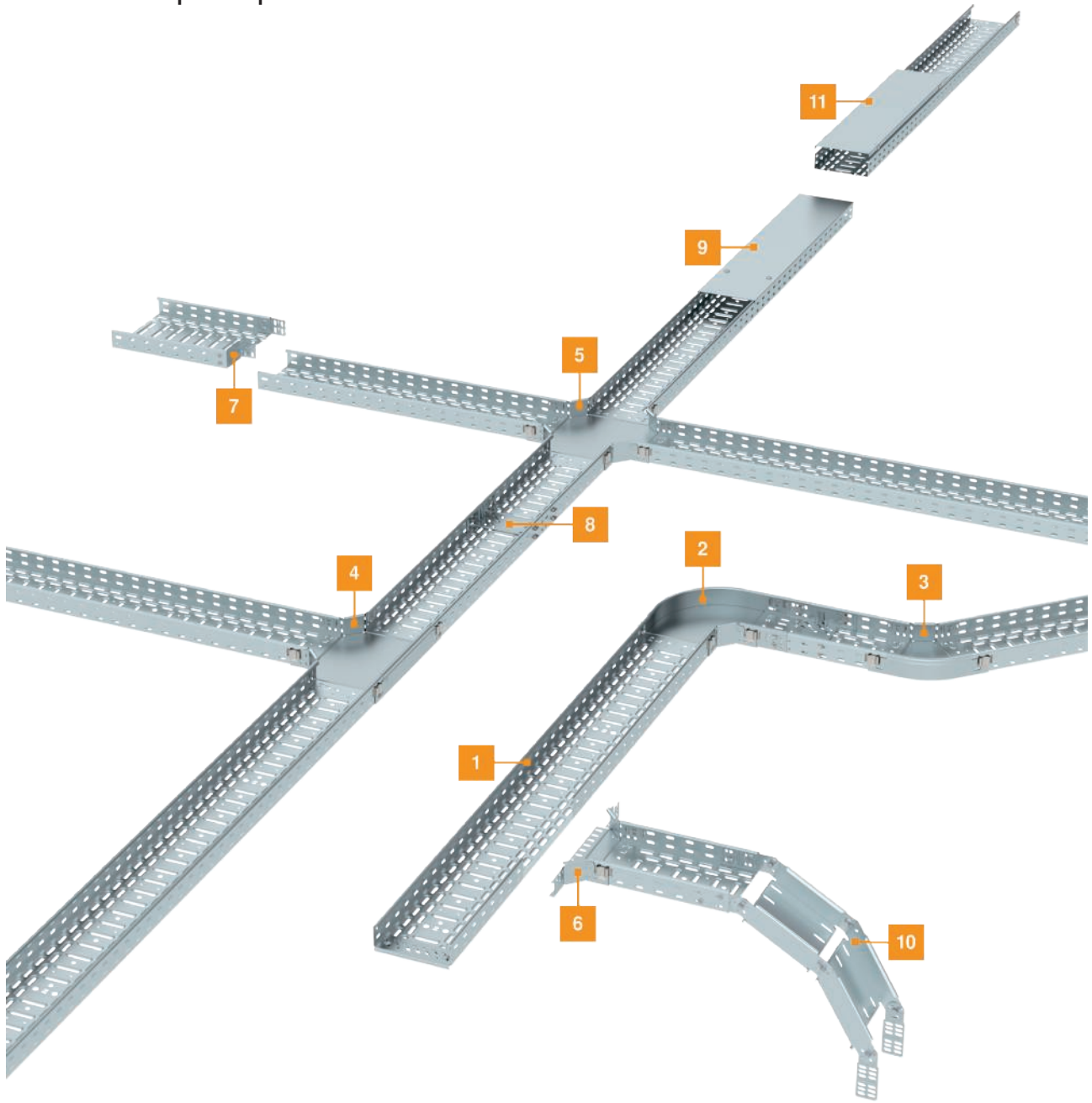
# RKS cable tray system

## Installation principle



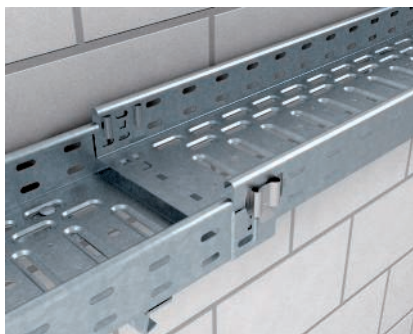
- |   |                                     |
|---|-------------------------------------|
| 1 | RKS cable tray                      |
| 2 | 90° bend                            |
| 3 | T branch piece                      |
| 4 | Cover with turn buckle              |
| 5 | Unperforated cover with cover clamp |

# Installation principle



- |    |                                     |
|----|-------------------------------------|
| 1  | RKSM cable tray                     |
| 2  | 90° Magic bend                      |
| 3  | 45° Magic bend                      |
| 4  | Magic T branch piece                |
| 5  | Magic horizontal cross-over         |
| 6  | Magic add-on tee                    |
| 7  | Reducer/stop-end                    |
| 8  | Magic straight connector set        |
| 9  | Cover with turn buckle              |
| 10 | Adjustable bend element             |
| 11 | Unperforated cover with cover clamp |

## Mounting aid



### Straight connection, cable tray interconnection

The spring element of the cable tray to be connected is snapped into the spring seat of the preceding cable tray from above.



### Cable tray fastening

The connected cable trays are fixed in place by bending the connection straps in the base with a screwdriver.



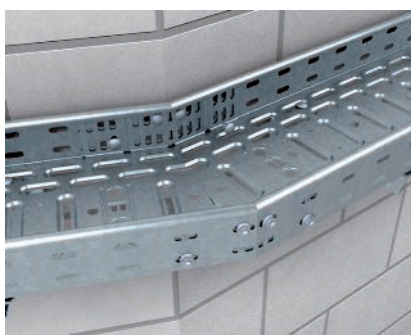
### Slackening the connection

The straight connector can be released again at any time. To do this, push a screwdriver under the spring element to release the lock.



### Mounting of Magic KTSMV straight connector set

To strengthen the connection, we recommend screwing on the joint plate for widths of more than 400 mm.



### Horizontal angle connection of cable trays

Horizontal angle connection of cable trays for brackets created during construction and cut cable tray ends.



### Vertical adjustable connection of cable trays

Vertical adjustable connection of cable tray for construction-side height jumps of any angle.



### Width change and end closure

Illustration of a width change through the installation of the reducer. This component allows the implementation of an end closure of cable trays.



### Mounting of Magic bend

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



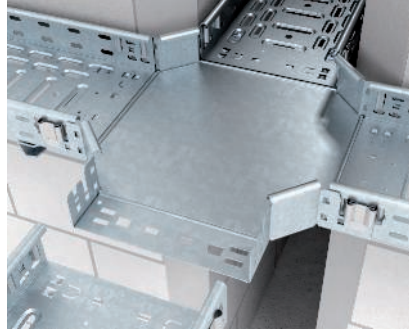
### Mounting of Magic mounting/branch piece

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



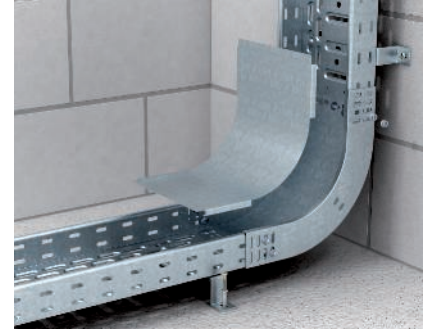
#### Mounting of Magic vertical mounting/branch piece (bottom view)

Vertical mounting of the add-on tee as length-wise funnel. Perforation in the cable tray is created on-site. For widths > 400 mm, please order connectors separately.



#### Mounting of Magic cross-over

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



#### 90° bend (rising/falling)

The 90° vertical bend is pushed over the rail of the cable tray and bolted with truss-head bolts, FRSB M6 x 12 mm. The cover is placed on loosely and fastened using the incoming cable tray covers. The cover clamp DKU can be used for additional fastening.



#### Installation of rising adjustable vertical bend

Adjustable vertical bend to bridge height off-sets or when changing from horizontal to vertical. The adjustable vertical bend is fastened to the cable tray directly using the adjustable connectors.



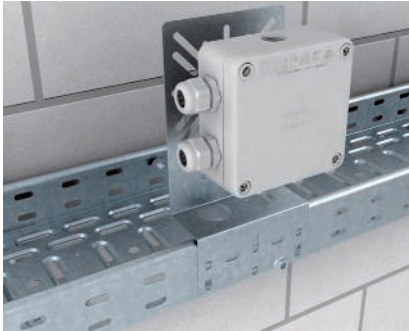
#### Installation of falling adjustable vertical bend

Installation of the adjustable vertical bend, falling, to bridge height differences and changes from the horizontal to the vertical.



#### Installation of bottom end plate

The bottom end plate is fastened to the end of the cable tray. It is used to protect outgoing cables.



#### Mounting plate with quick fastening

Fastening of the mounting plate, type MP, on the side rail of the cable tray. The mounting plate can be fastened to the rail with quick connectors, and permanently fastened using truss-head bolts of type FRSB 6x12 mm.



#### Installation of cover with turn buckle

The cover is fastened to the cable tray using turn-buckles; this is done by clamping the turn buckle under the rolled up side rail of the cable tray with a 90° turn.

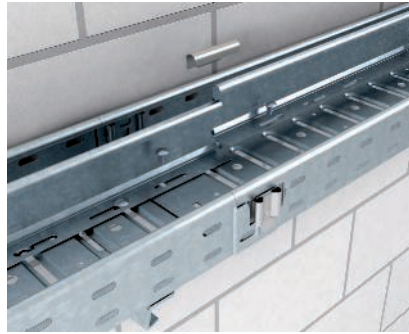


#### Screwless cover fastening with cover clamp

Screwless cover mounting takes place with unperforated covers and the cover clamps, type DK DRLU. The cover clamp is simply fixed in the rail of the cable tray.

**Installation of cover for fitting**

The fitting cover is fastened to the cable tray using turn buckles; this is done by clamping the turn buckle under the rolled up side rail of the cable tray with a 90° turn.

**Screwed barrier strip mounting**

Screwed barrier strip fastening of the barrier strip, TSG 60, with truss-head bolts M6x12. The barrier strip can simply be run over the joint and connected without bolts using the barrier strip connector TSGV.

St FS



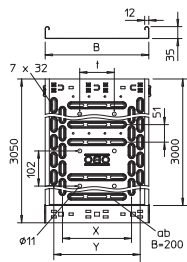
Cable tray RKS-Magic® 35



Cable tray with integrated quick fastening system. The usable length of the cable tray is 3,000 mm. The cable tray has continuous side perforations of 7 x 20 mm for the installation of additional connection and mounting components. The perforation for direct threaded rod suspension has a diameter of 11 mm.

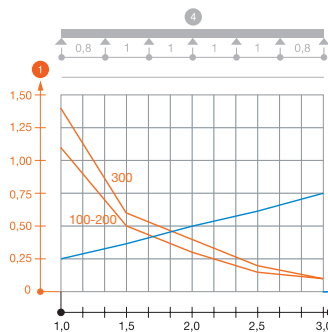
Type	Width mm	Metal thickness mm	Weight kg/100 m	Item no.
RKSM 310 FS	100	0.75	104.328	6047417
RKSM 320 FS	200	0.75	155.738	6047433
RKSM 330 FS	300	0.75	209.840	6047460

Dimensions



Type	Length mm	Dim. B mm	Usable cross-section cm²	Dim. t mm	Dim. x mm	Dim. y mm	Dimension mm
RKSM 310 FS	3050	100	33	—	—	50	
RKSM 320 FS	3050	200	68	—	100	150	
RKSM 330 FS	3050	300	103	100	200	250	

Load



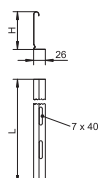
	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
RKSM 310 FS	1.1	0.5	0.3	0.15
RKSM 320 FS	1.1	0.5	0.3	0.15
RKSM 330 FS	1.4	0.6	0.4	0.2

Load diagram, cable tray, type RKSM 35

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Separating retainer 30

St FS



Type	Metal Dim. H		thick- ness	Dim. L	Pack m	Weight kg/100 m	Item no.
	mm	mm	mm	mm			
TSG 30 FS	30	0.75	3000		3	38.000	6062050

Separating retainer for separation of cables of different voltages or functions.

## Separating retainer connector

VA 2B

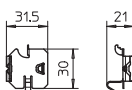
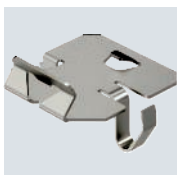


Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

## Hold-down clamp for separating retainer fastening in RKSM

VA 2B

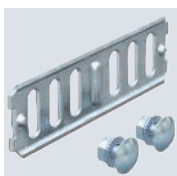


Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KR A2	30	0.537	6062280

Hold-down clamp for screwless fastening of separating retainers in the cable tray types RKSM, MKS and SKS.

## Straight connector 35

St FS

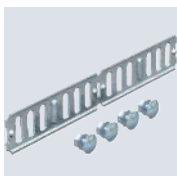


Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RLVK 35 FS	35	10	5.100	6067085

Straight connector for connections of cable trays and fittings with a side height of 35 mm. Including appropriate fastening material.

## Straight and angle connector 35

St FS



Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RWVL 35 FS	35	10	10.500	6067107

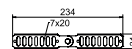
Straight and angle connector for cable trays and fittings with a side height of 35 mm. Including appropriate fastening material.



St FS

### Adjustable connector 35

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGV 35 FS	35	10	11.000	7082002

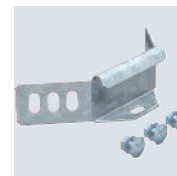
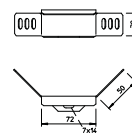


Adjustable connector for cable trays with a side height of 35 mm. Including appropriate fastening material.

St FS

### Angle connector 35

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
WKV 35 FS	35	5	6.800	6043038

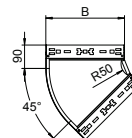


Angle connector for cable trays with a side height of 35 mm. Including appropriate fastening material.

St FS

### 45° Magic bend 35

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBM 45 320 FS	35	200	1	74.500	6041002

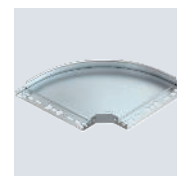
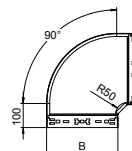


45° bend with quick connector system. For all cable tray types of 35 mm side height.

St FS

### 90° Magic bend 35

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBM 90 320 FS	35	200	1	106.200	6041012
RBM 90 330 FS	35	300	1	173.000	6041014

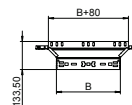


90° bend with quick connector system. For all cable tray types of 35 mm side height.

St FS

### Magic 35 add-on tee

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RAAM 330 FS	35	300	1	56.300	6041024



Add-on tee with quick connector system. For all cable tray types of 35 mm side height.

## Separating retainer 30

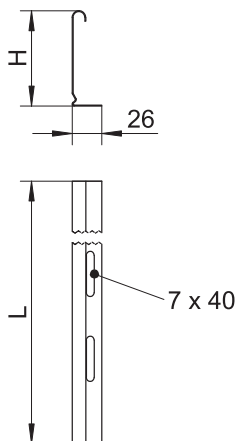
St FS  
D'E



Type	Metal			Pack m	Weight kg/100 m	Item no.
	Dim. H mm	thick- ness mm	Dim. L mm			
TSG 30 FS	30	0.75	3000	3	38.000	6062050

Separating retainer for separation of cables of different voltages or functions.

### Dimensions



## Separating retainer connector

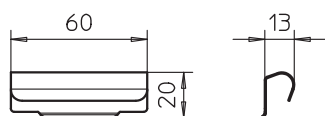
VA 2B  
D'E



Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

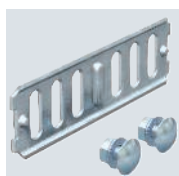
Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

### Dimensions



## Straight connector 35

St FS  
D'E cULus



Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RLVK 35 FS	35	10	5.100	6067085

Straight connector for connections of cable trays and fittings with a side height of 35 mm.  
Including appropriate fastening material.

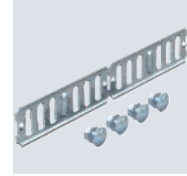
St FS



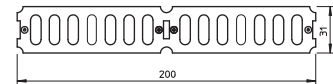
### Straight and angle connector 35

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RWVL 35 FS	35	10	10.500	6067107

Straight and angle connector for cable trays and fittings with a side height of 35 mm. Including appropriate fastening material.



#### Dimensions



St FS



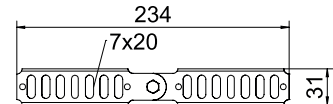
### Adjustable connector 35

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGV 35 FS	35	10	11.000	7082002

Adjustable connector for cable trays with a side height of 35 mm. Including appropriate fastening material.



#### Dimensions



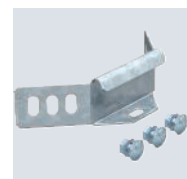
St FS



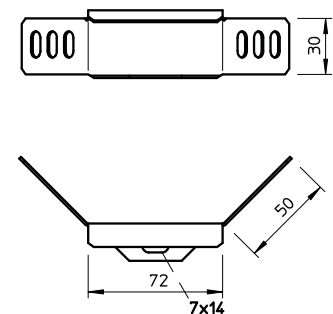
### Angle connector 35

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
WKV 35 FS	35	5	6.800	6043038

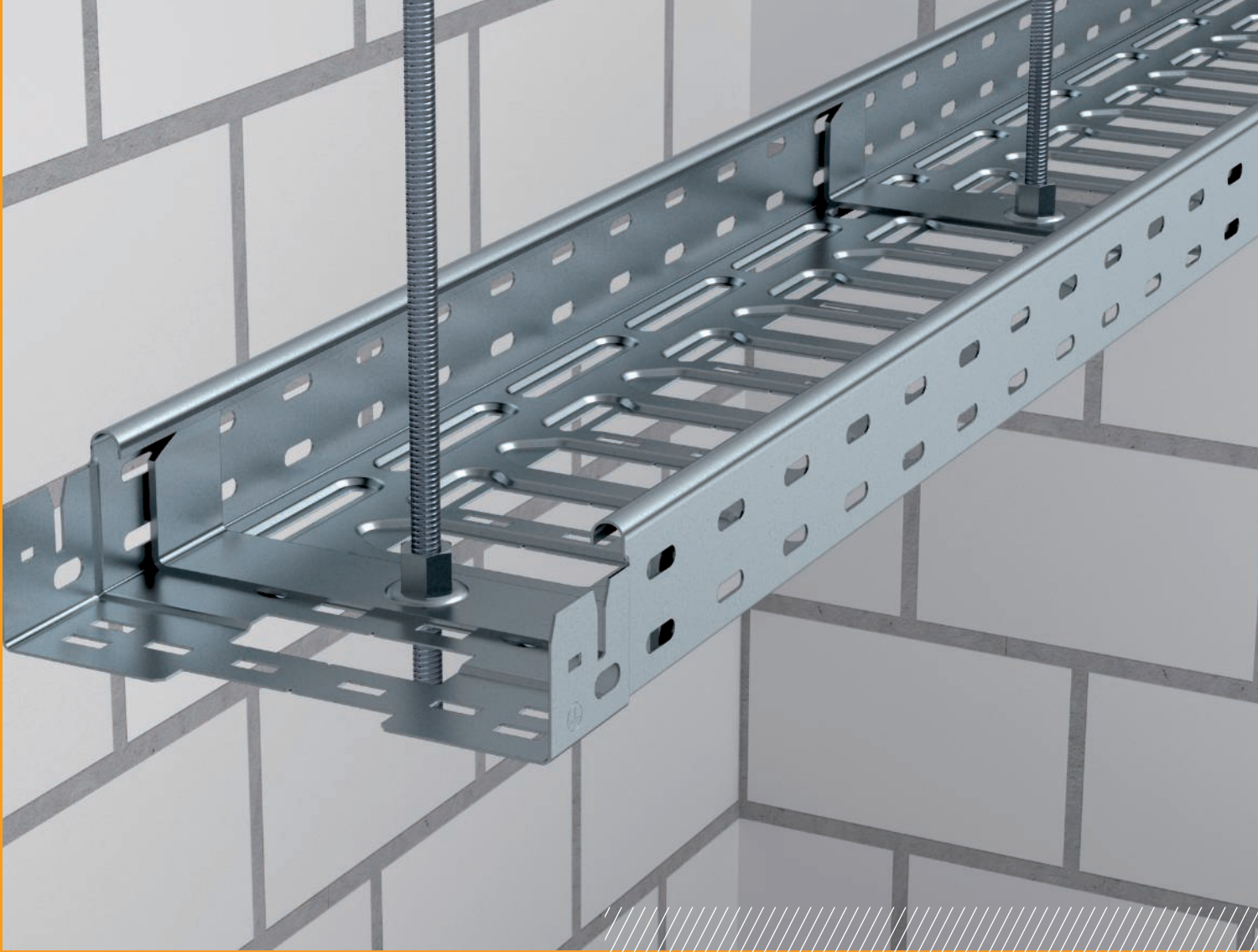
Angle connector for cable trays with a side height of 35 mm. Including appropriate fastening material.



#### Dimensions



Industrieanstaltungen - Kabeltragsysteme / en / 2023/07/28 08:37:53 (LLExport\_03618) / 2023/07/28 08:38:14 08:38:14



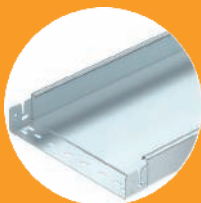
## MKS-Magic® cable tray system

The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task.

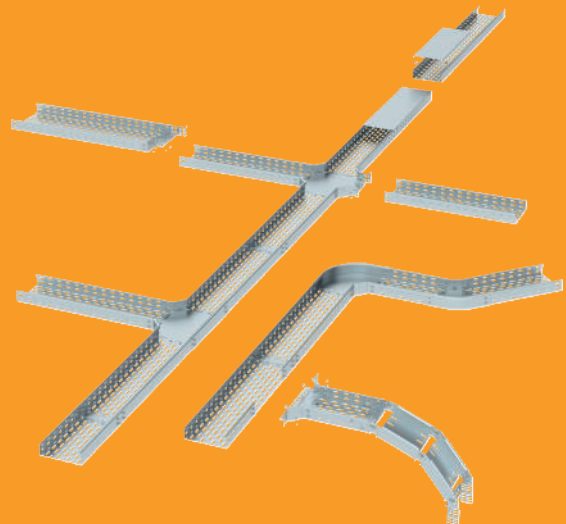
- Snap-in fittings with screwless Magic connection
- Side height 60, 85 and 110 mm



MKS-Magic® cable tray

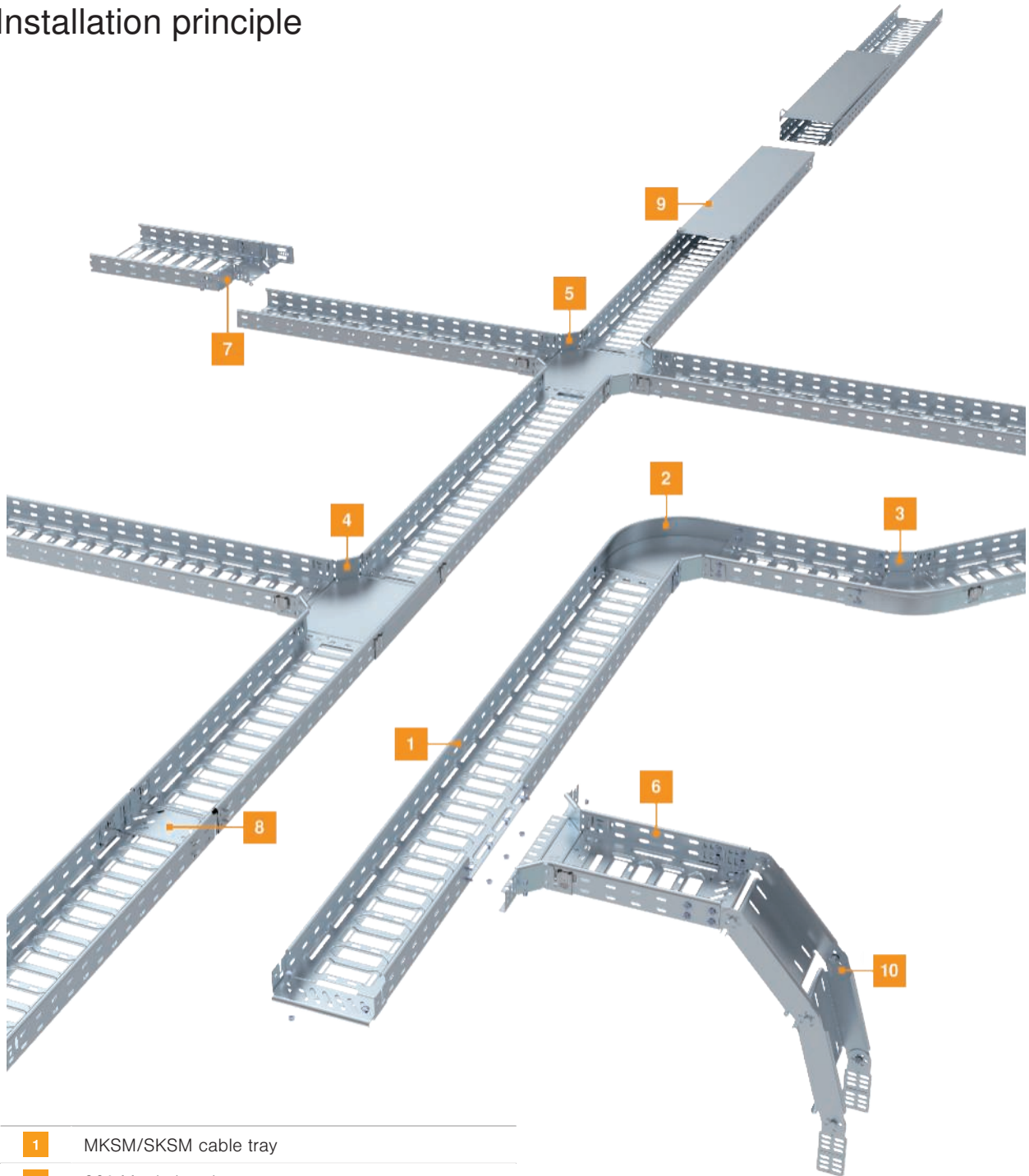


MKS-Magic® cable tray unperforated



# MKS-Magic® cable tray system

## Installation principle



- |    |                              |
|----|------------------------------|
| 1  | MKSM/SKSM cable tray         |
| 2  | 90° Magic bend               |
| 3  | 45° Magic bend               |
| 4  | Magic T branch piece         |
| 5  | Magic horizontal cross-over  |
| 6  | Magic add-on tee             |
| 7  | Reducer/stop-end             |
| 8  | Magic straight connector set |
| 9  | Cover with turn buckle       |
| 10 | Adjustable bend element      |



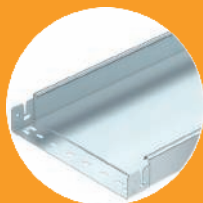
## SKS-Magic® cable tray system

The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task.

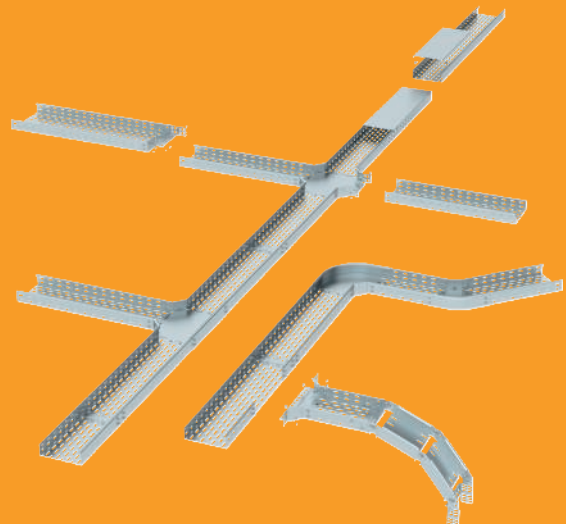
- Snap-in fittings with screwless Magic connection
- Side height 60, 85 and 110 mm



Cable tray SKS-Magic®

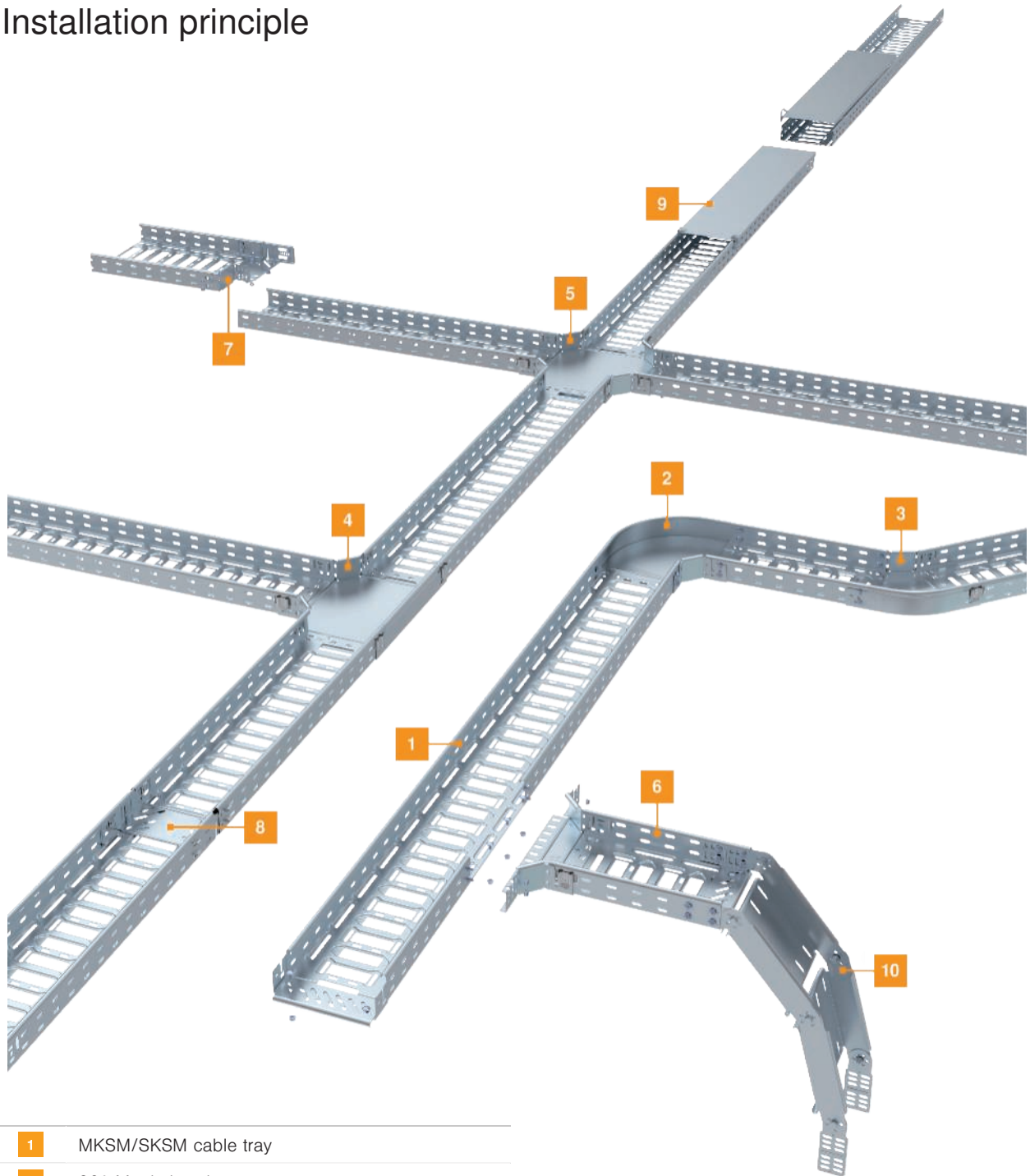


Cable tray SKS-Magic®  
unperforated



# SKS-Magic® cable tray system

## Installation principle



- |    |                              |
|----|------------------------------|
| 1  | MKSM/SKSM cable tray         |
| 2  | 90° Magic bend               |
| 3  | 45° Magic bend               |
| 4  | Magic T branch piece         |
| 5  | Magic horizontal cross-over  |
| 6  | Magic add-on tee             |
| 7  | Reducer/stop-end             |
| 8  | Magic straight connector set |
| 9  | Cover with turn buckle       |
| 10 | Adjustable bend element      |

## Mounting aid



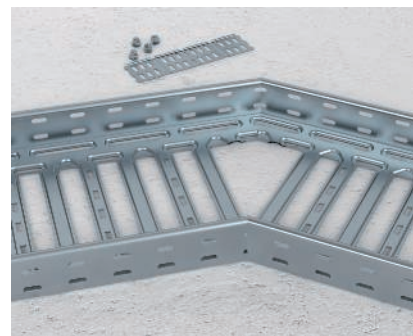
### Mounting of Magic KTSMV straight connector set

Simply clamp the two side sections of the connector set in the side rail.

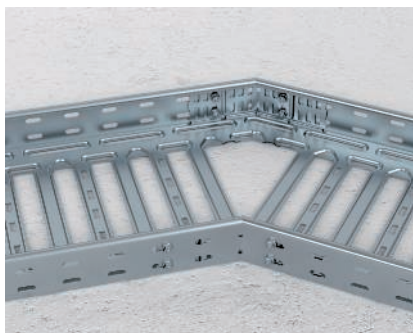


### Mounting of Magic KTSMV straight connector set

Insert the corresponding joint plate, push it down and simply lock it in place. To strengthen the connection, we recommend screwing on the joint plate for widths of more than 400 mm.

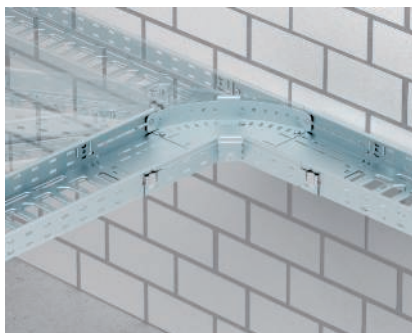


**Change of direction by cutting the cable tray**  
Cut and bend the cable tray, then fix the cut rail with an angle connector, type RWVL.



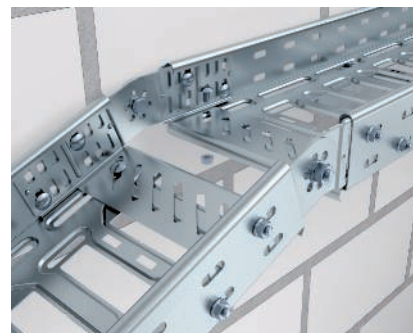
### Change of direction with separate cable trays

Combine the cut trays and fix them from the inside at the joint using angle connectors, type RWVL.



### Creating a change of direction with the variable Magic bend

The variable Magic bend, type RBMV..., can be used to install infinitely variable direction changes of 0° – 90° to the route.



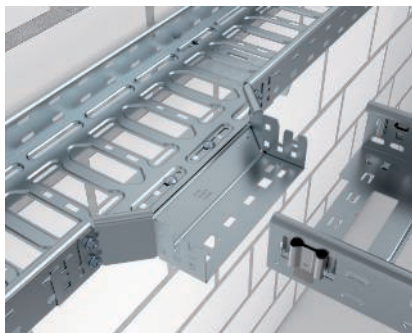
### Vertical adjustable connection of cable trays

Vertical adjustable connection of cable tray for construction-side height jumps of any angle.



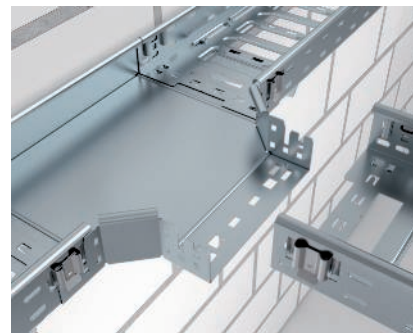
### Mounting of Magic bend

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



### Mounting of Magic mounting/branch piece

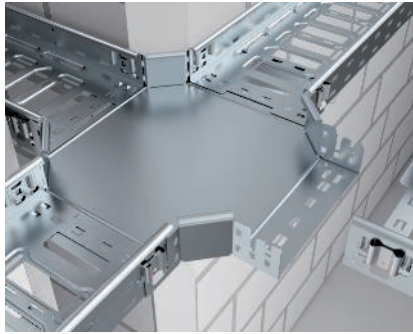
Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



### Mounting of Magic T branch piece

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.





#### Mounting of Magic intersection

Mounting of fittings by simple interconnection. For this, the cable tray with the spring side is locked into the fitting connection from above.



#### 90° bend (rising/falling)

90° bend, rising or falling, for the creation of simple vertical changes of direction.



#### Installation of adjustable vertical bend element

Mounting of the adjustable vertical bend element for the creation of adjustable bends. The adjustable vertical bend element is connected to the cable tray using adjustable connectors.



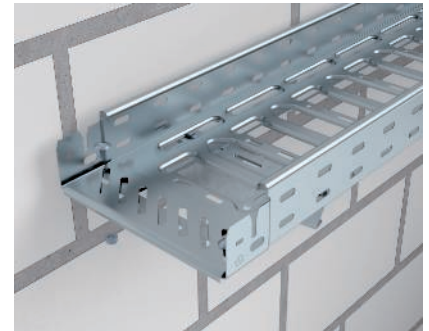
#### Installation of rising adjustable vertical bend

Adjustable vertical bend to bridge height offsets. The adjustable vertical bend is connected with to the cable tray using the adjustable connectors.



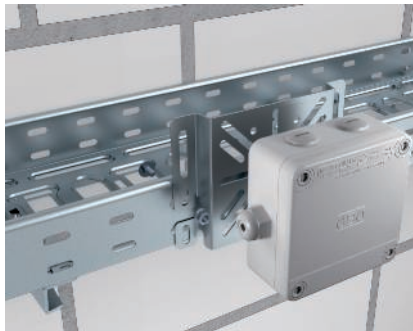
#### Screwless cover mounting

Unperforated covers are mounted using cover clamps, type DK DRLU. The cover clamps are first clamped to the cover edge and then snapped on to the cable tray rail with the cover.



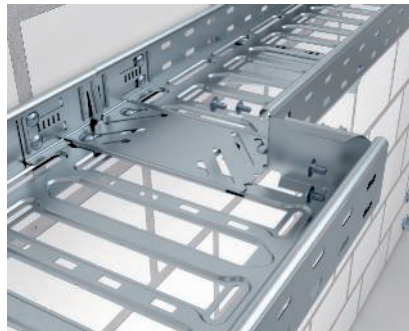
#### Installation of bottom end plate

Fastening of the bottom end plate, type BEB, to protect the cables.



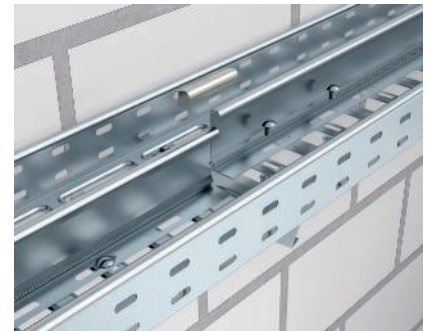
#### Universal mounting plate

Fastening of the mounting plate, type MP UNI, on the cable tray.



#### Installation of reducer / stop-end

The reducer / stop-end plate component is used as closure and to reduce the width of cable trays.



#### Barrier strip mounting with screw connection

Screwed barrier strip fastening of the barrier strip, TSG 60, with truss-head bolts M6x12. The barrier strip can simply be run over the joint and connected without bolts using the barrier strip connector TSGV.

## Cable tray RKS-Magic® 60

St FS

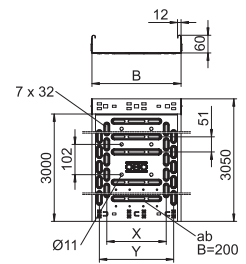


Type	Width mm	Metal thick- ness mm	BS	Pack m	Weight kg/100 m	Item no.
RKSM 610 FS	100	0.75	🔥	3	134.334	6047611
RKSM 615 FS	150	0.75		3	154.885	6047630
RKSM 620 FS	200	0.75	🔥	3	181.508	6047638
RKSM 630 FS	300	0.75	🔥	3	233.803	6047654
RKSM 640 FS	400	0.90	🔥	3	338.459	6047689
RKSM 650 FS	500	0.90		3	401.246	6047719
RKSM 660 FS	600	0.90		3	464.000	6047735

Cable tray with integrated quick fastening system. The usable length of the cable tray is 3,000 mm. The cable tray has continuous side perforations of 7 x 20 mm for the installation of additional connection and mounting components. The perforation for direct threaded rod suspension has a diameter of 11 mm.

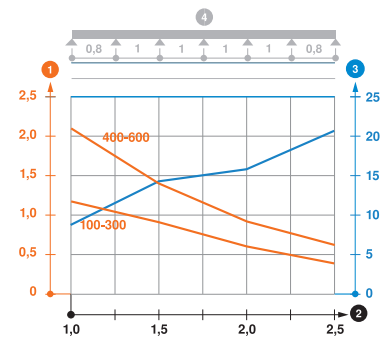
Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>	Dim. x mm	Dim- en- sion y mm
RKSM 610 FS	3050	100	58	—	50
RKSM 615 FS	3050	150	88	50	100
RKSM 620 FS	3050	200	118	100	150
RKSM 630 FS	3050	300	178	200	250
RKSM 640 FS	3050	400	238	300	350
RKSM 650 FS	3050	500	298	400	450
RKSM 660 FS	3050	600	358	450	550

### Dimensions



	1.0 m kN/m	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m	NEMA load class
RKSM 610 FS	1.2	0.9	0.6	0.4	8AA
RKSM 615 FS	1.2	1	0.6	0.4	8AA
RKSM 620 FS	1.2	1	0.55	0.4	8AA
RKSM 630 FS	1.2	1	0.55	0.4	8AA
RKSM 640 FS	2.1	1.35	0.8	0.6	8AA
RKSM 650 FS	2.1	1.35	0.8	0.6	8AA
RKSM 660 FS	2.1	1.4	0.8	0.6	8AA

### Load



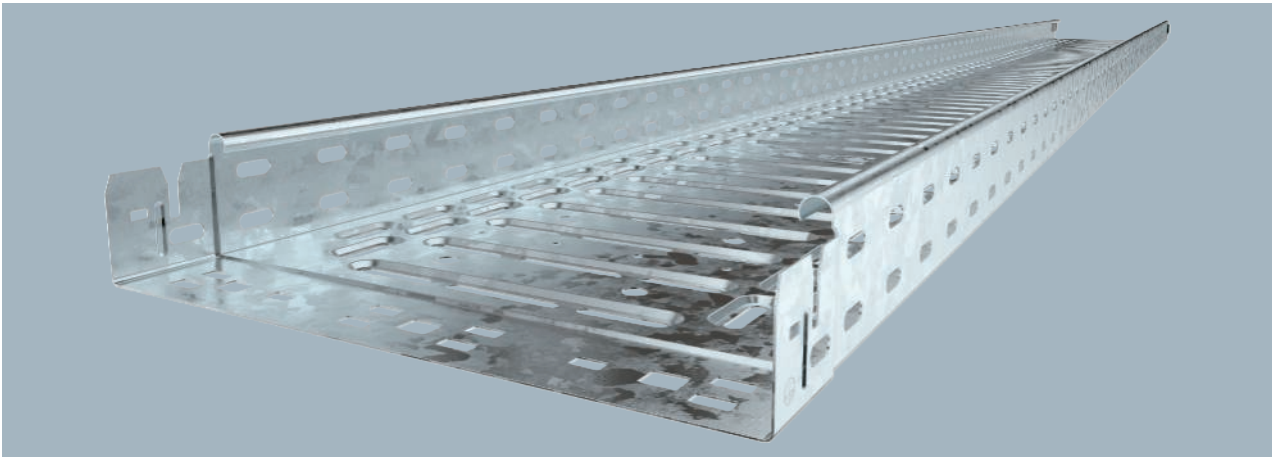
### Load diagram, cable tray, type RKSM 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

St FT



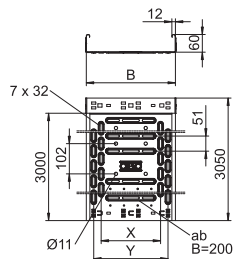
Cable tray RKS-Magic® 60



Cable tray with integrated quick fastening system. The usable length of the cable tray is 3,000 mm. The cable tray has continuous side perforations of 7 x 20 mm for the installation of additional connection and mounting components. The perforation for direct threaded rod suspension has a diameter of 11 mm.

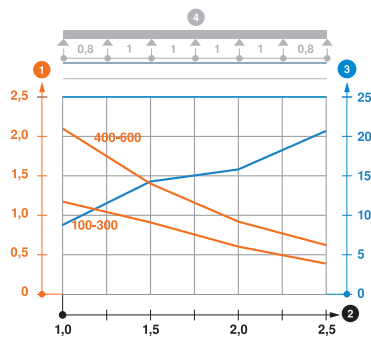
Type	Width mm	Metal thickness		Pack m	Weight kg/100 m	Item no.
		mm	BS			
RKSM 610 FT	100	1.00		3	197.410	6047612
RKSM 620 FT	200	1.00		3	251.115	6047639
RKSM 630 FT	300	1.00		3	356.295	6047655
RKSM 640 FT	400	1.00		3	437.180	6047690

Dimensions



Type	Usable Length mm	Dim. B mm	Usable cross-section cm <sup>2</sup>	Dimension	
				Dim. x mm	Dim. y mm
RKSM 610 FT	3050	100	58	—	50
RKSM 620 FT	3050	200	118	100	150
RKSM 630 FT	3050	300	178	200	250
RKSM 640 FT	3050	400	238	300	350

Load

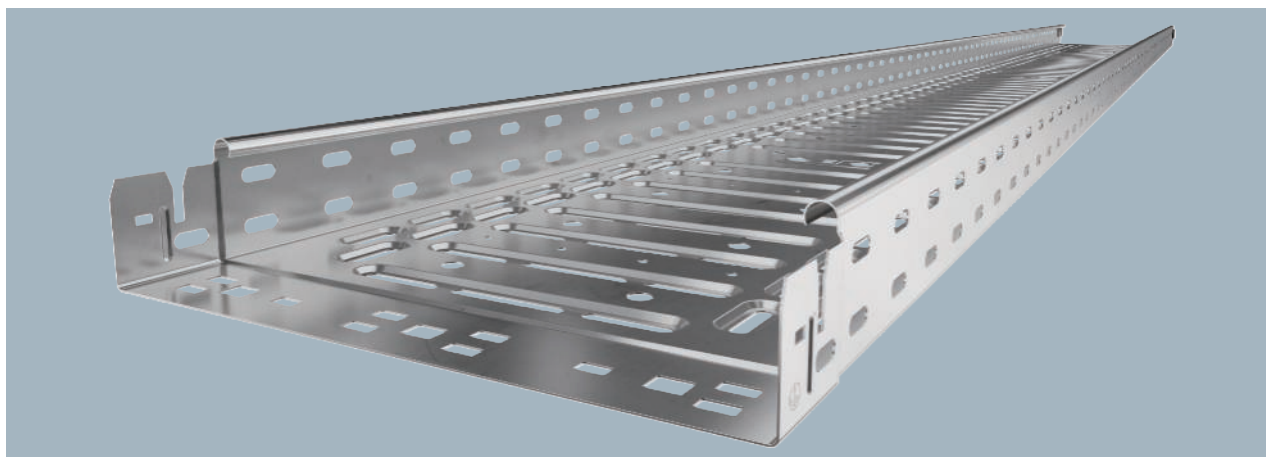


Type	1.0 m	1.5 m	2.0 m	2.5 m	NEMA
	kN/m	kN/m	kN/m	kN/m	load class
RKSM 610 FT	1.2	0.9	0.6	0.4	8AA
RKSM 620 FT	1.2	0.9	0.6	0.4	8AA
RKSM 630 FT	1.2	0.9	0.6	0.4	8AA
RKSM 640 FT	2.1	1.35	0.9	0.6	8AA

Load diagram, cable tray, type RKSM 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Cable tray RKS-Magic® 60

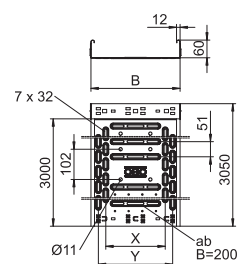


Type	Width mm	Metal thick- ness mm	Pack m	Weight kg/100 m	Item no.
RKSM 620 A2	200	0.75	3	200.984	6047640
RKSM 630 A2	300	0.75	3	259.344	6047656
RKSM 640 A2	400	0.90	3	358.361	6047691
RKSM 650 A2	500	0.90	3	424.590	6047721
RKSM 660 A2	600	0.90	3	491.148	6047737

Cable tray with integrated quick fastening system. The usable length of the cable tray is 3,000 mm. The cable tray has continuous side perforations of 7 x 20 mm for the installation of additional connection and mounting components. The perforation for direct threaded rod suspension has a diameter of 11 mm.

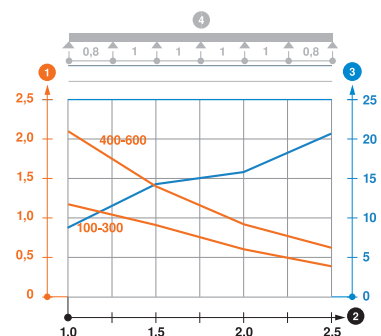
Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>	Dim. x mm	Dim- en- sion y mm
RKSM 620 A2	3050	200	118	100	150
RKSM 630 A2	3050	300	178	200	250
RKSM 640 A2	3050	400	238	300	350
RKSM 650 A2	3050	500	298	400	450
RKSM 660 A2	3050	600	358	450	550

### Dimensions



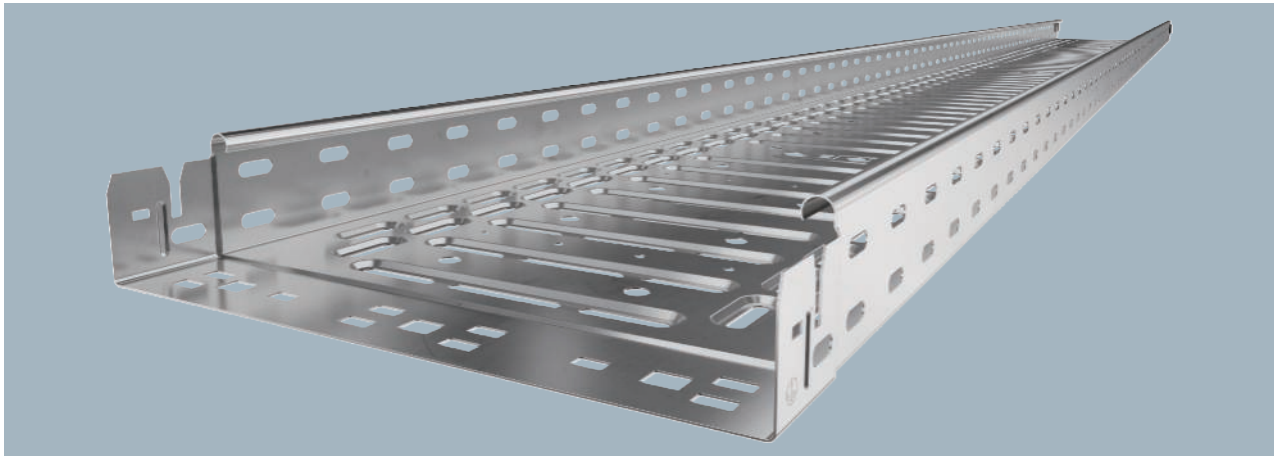
	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
RKSM 620 A2	1.2	0.9	0.6	0.4
RKSM 630 A2	1.2	0.9	0.6	0.4
RKSM 640 A2	2.1	1.35	0.9	0.6
RKSM 650 A2	2.1	1.35	0.9	0.6
RKSM 660 A2	2.1	1.35	0.9	0.6

### Load



### Load diagram, cable tray, type RKSM 60

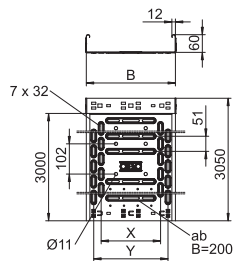
- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



Cable tray with integrated quick fastening system. The usable length of the cable tray is 3,000 mm. The cable tray has continuous side perforations of 7 x 20 mm for the installation of additional connection and mounting components. The perforation for direct threaded rod suspension has a diameter of 11 mm.

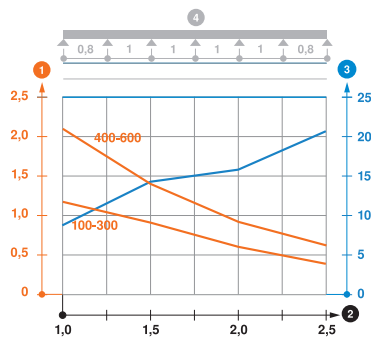
Type	Width mm	Metal thickness mm	Pack m	Weight kg/100 m	Item no.
RKSM 610 A4	100	0.75	3	144.590	6047614
RKSM 620 A4	200	0.75	3	200.984	6047641
RKSM 630 A4	300	0.75	3	259.344	6047657
RKSM 640 A4	400	0.90	3	358.361	6047692
RKSM 650 A4	500	0.90	3	424.590	6047722
RKSM 660 A4	600	0.90	3	491.148	6047738

Dimensions



Type	Length mm	Dim. cross- B mm	Usable cross- section cm <sup>2</sup>	Dim. x mm	Dim. y mm
RKSM 610 A4	3050	100	58	—	50
RKSM 620 A4	3050	200	118	100	150
RKSM 630 A4	3050	300	178	200	250
RKSM 640 A4	3050	400	238	300	350
RKSM 650 A4	3050	500	298	400	450
RKSM 660 A4	3050	600	358	450	550

Load



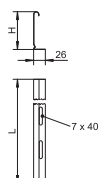
	1.0 m kN/m	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m
RKSM 610 A4	1.2	0.9	0.6	0.4
RKSM 620 A4	1.2	0.9	0.6	0.4
RKSM 630 A4	1.2	0.9	0.6	0.4
RKSM 640 A4	2.1	1.35	0.9	0.6
RKSM 650 A4	2.1	1.35	0.9	0.6
RKSM 660 A4	2.1	1.35	0.9	0.6

Load diagram, cable tray, type RKS-Magic 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Separating retainer 45

St FS



Type	Metal			Pack	Weight	Item no.
	Dim. H	thick-ness	Dim. L			
TSG 45 FS	45	0.75	3000	3	46.700	6062033

Separating retainer for separation of cables of different voltages or functions.

## Separating retainer connector

VA 2B

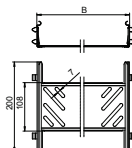
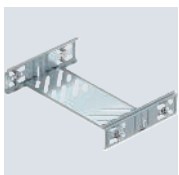


Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

## Magic straight connector set 60

St FS DD



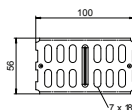
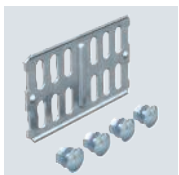
Type	Side height	Dim. B	Pack	Weight	Item no.
	mm	mm	Piece	kg/100 pc.	
KTSMV 610 FS	60	100	1	30.500	6068914
KTSMV 610 DD	60	100	1	30.500	6068936

Cable tray connector with quick fastening for the screwless connection of perforated cable trays with a side height of 60 mm.

The optimised design means that the connector can be used to create radii and as a length compensation piece for large temperature deviations.

## Straight connector 60

St FS FT



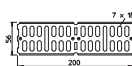
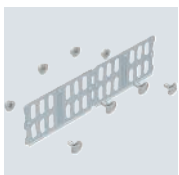
Type	Side height	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
RLVK 60 FS	60	10	9.976	6067093
RLVK 60 FT	60	10	10.300	6067603

Straight connector for straight connection of cable trays and fittings with a side height of 60 mm.

Including appropriate fastening material.

## Straight and angle connector 60

St FS FT



Type	Side height	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
RWVL 60 FS	60	10	16.400	6067115
RWVL 60 FT	60	10	17.400	6067611

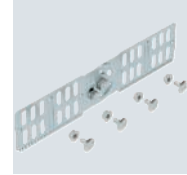
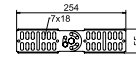
Straight and angle connector for cable trays and fittings with a side height of 60 mm.

Including appropriate fastening material.

St FS

### Adjustable connector 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RGV 60 FS	60		10	25.100	7082010

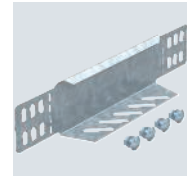
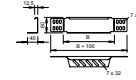


Adjustable connector for cable trays with a side height of 60 mm. Including appropriate fastening material.

St FS

### Reducer/stop-end 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RWEB 610 FS	60	100	1	12.300	7109105

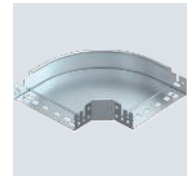
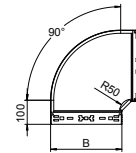


Reducer/stop-end plate for cable trays with side height 60 mm. From a width of 150 mm, a perforated lower flange is available. Including appropriate fastening material.

St FS FT

### 90° Magic bend 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBM 90 610 FS	60	100	1	65.700	6041130
RBM 90 610 FT	60	100	1	70.700	6041150

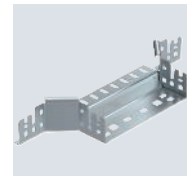
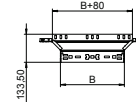


90° bend with quick connector system. For all cable tray types of 60 mm side height.

St FS

### Add-on tee 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RAAM 630 FS	60	300	1	60.940	6041236

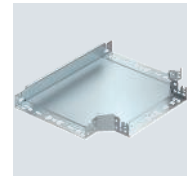
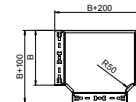


Magic add-on tee with quick connector system. For all cable tray types of 60 mm side height.

St FS

### Magic 60 T branch piece

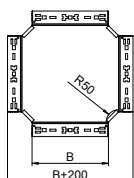
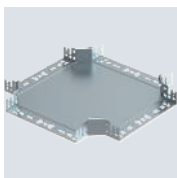
Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RTM 610 FS	60	100	1	83.600	6041320
RTM 630 FS	60	300	1	228.420	6041326



Tee branch piece with quick connector system. For all cable tray types of 60 mm side height.

## Magic 60 cross-over

St FS FT

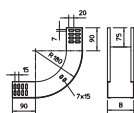
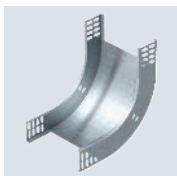


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RKM 610 FS	60	100	1	92.500	7027001
RKM 615 FS	60	150	1	123.800	7027003
RKM 610 FT	60	100	1	100.000	7027021

Cross-over with quick connector system. For all cable tray types of 60 mm side height.

## 90° vertical bend, rising 60

St FS



Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBV 610 S FS	60	100	1	66.000	7007005

90° rising vertical bend, for all cable tray types of 60 mm side height.  
The vertical bend is pushed over the end of the cable tray and screwed tight.  
Fastening materials should be ordered separately.

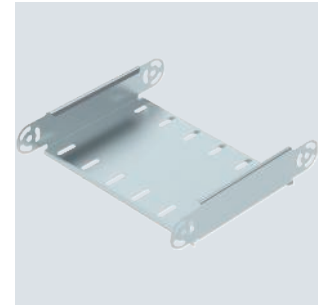


St FT

### Adjustable bend element, vertical 60

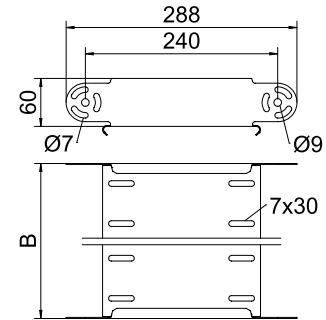
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGBEV 610 FT	60	1	52.400	7075103

Adjustable vertical bend element, for all cable tray types with a side height of 60 mm.  
RGV 60 adjustable connectors should be ordered separately and in the appropriate quantity.



Type	Dim. B mm	Metal thickness mm
RGBEV 610 FT	100	1.00

#### Dimensions



Radius table	
Quantity of elements	Radius
1	Approx. 300 mm
2	Approx. 450 mm
3	approx. 600 mm
4	Approx. 750 mm
5	approx. 900 mm

Please order two RGV 60 adjustable connectors separately.

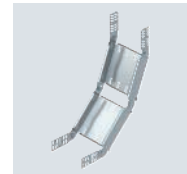
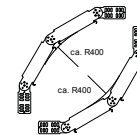
#### Installation

St FT

### 90° adjustable bend, vertical 60

Type	Side height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
RGBV 610 FT	60	100	1	186.000	7079109

The bend is shipped in an unmounted state. No additional fastening materials are required.  
90° adjustable vertical bend, for all cable tray types with a side height of 60 mm.

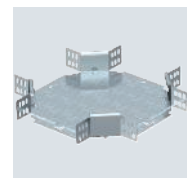
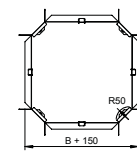


St FS

### Cross-over 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RK 610 FS	60	100	1	89.500	6043615

Horizontal cross-over for all cable tray types of 60 mm side height.  
The fitting is shipped in an unmounted state. All the sides are designed for the same cable tray width.  
Including appropriate fastening material.

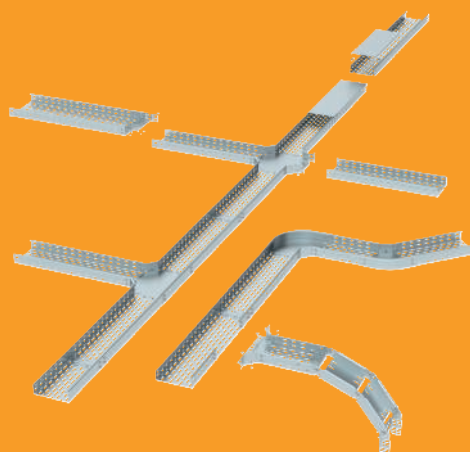




## Cable tray system MKS

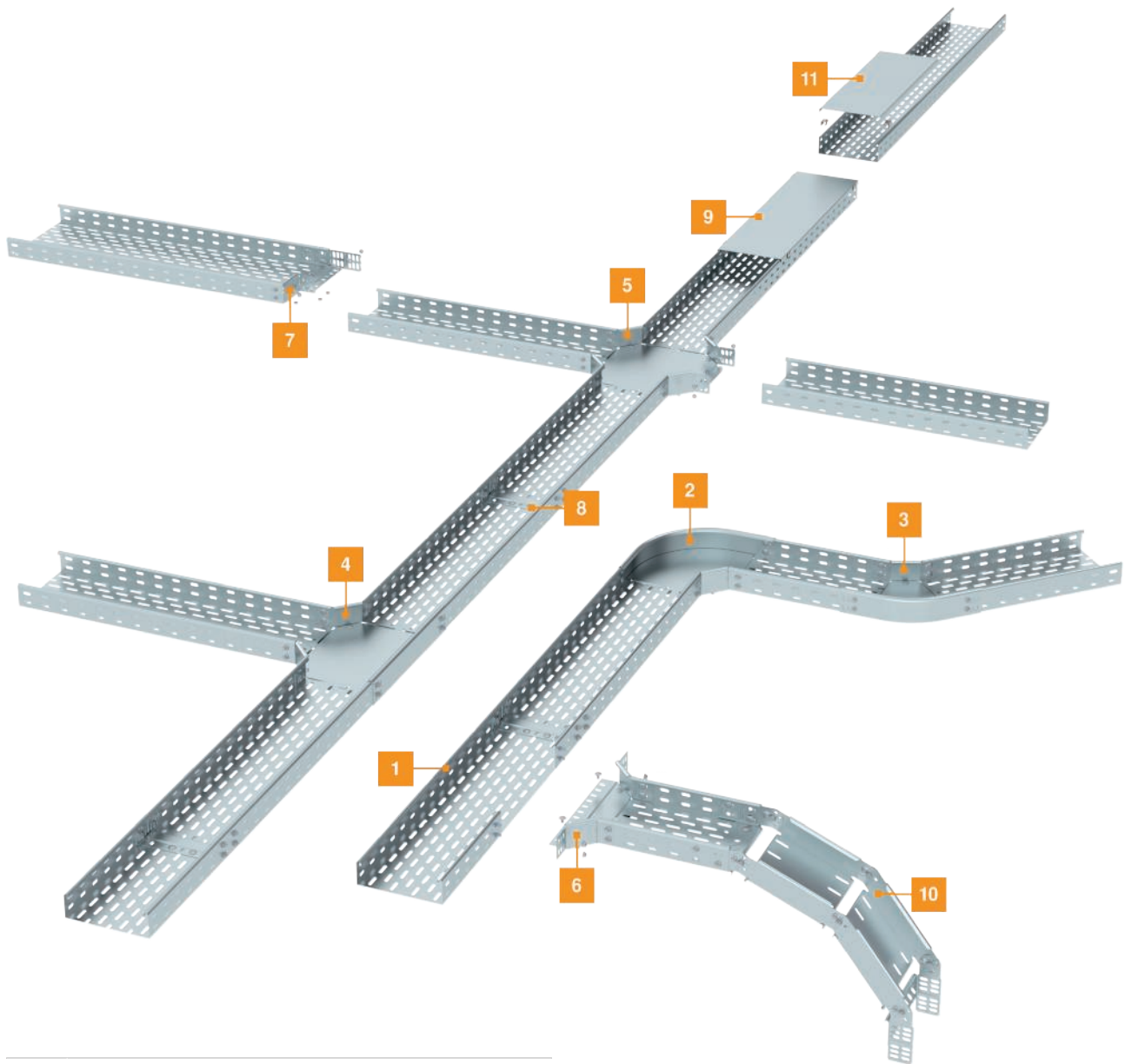
The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task. No matter whether used in dry inner areas or in aggressive atmospheres: Different surface versions and materials ensure safe corrosion protection.

- Medium-duty cable tray system with side heights of 35, 60 and 85 mm
- Various fittings, functional connectors and additional accessories



# Cable tray system MKS

## Installation principle



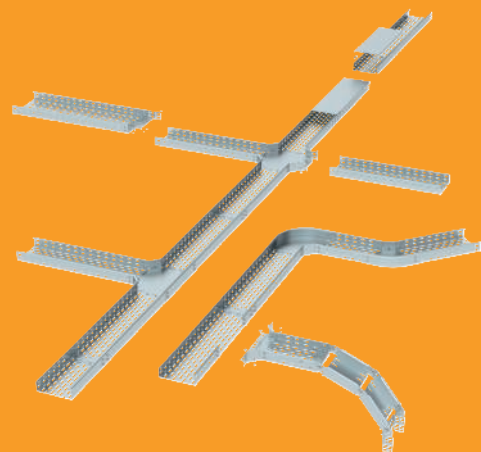
- |    |                                     |
|----|-------------------------------------|
| 1  | Cable tray MKS                      |
| 2  | 90° bend                            |
| 3  | 45° bend                            |
| 4  | T branch piece                      |
| 5  | Cross-over                          |
| 6  | Add-on tee                          |
| 7  | Reducer/stop-end                    |
| 8  | Straight connectors and joint plate |
| 9  | Cover with turn buckle              |
| 10 | Adjustable bend element             |
| 11 | Unperforated cover with cover clamp |



## Cable tray system SKS

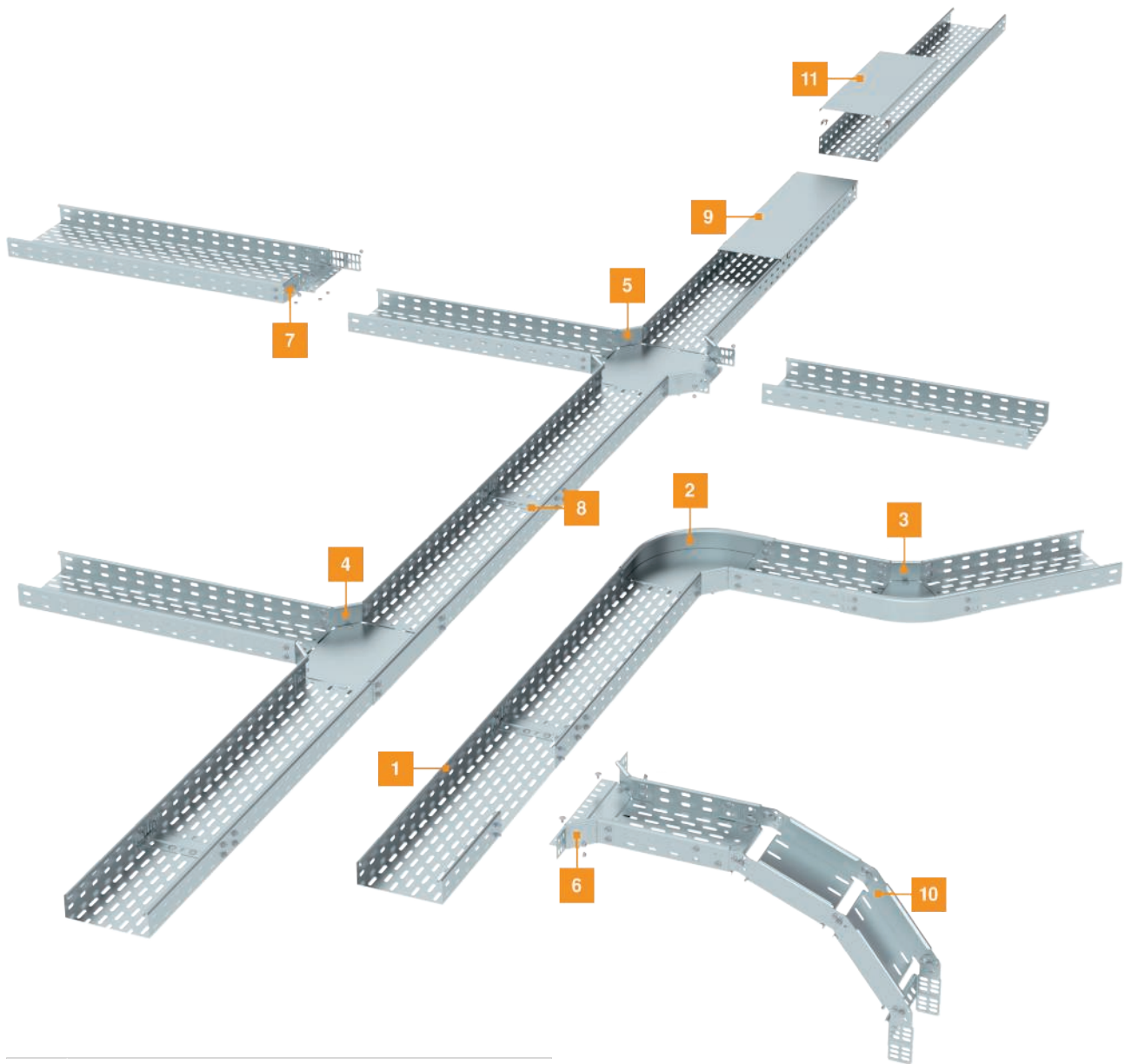
The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task. No matter whether used in dry inner areas or in aggressive atmospheres: Different surface versions and materials ensure safe corrosion protection.

- Medium-duty cable tray system with side heights of 60, 85 and 110 mm
- Various fittings, functional connectors and additional accessories

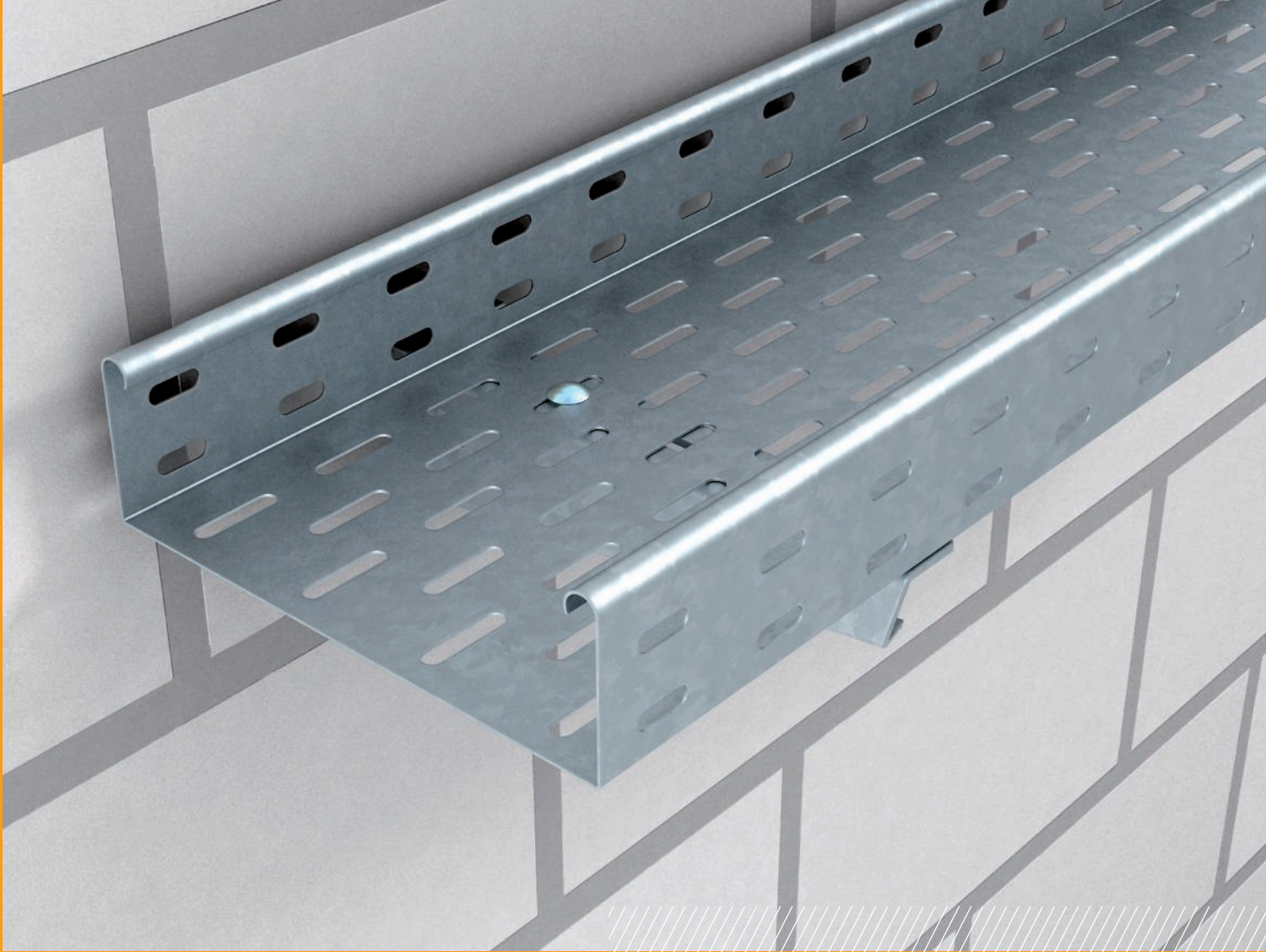


# Cable tray system SKS

## Installation principle



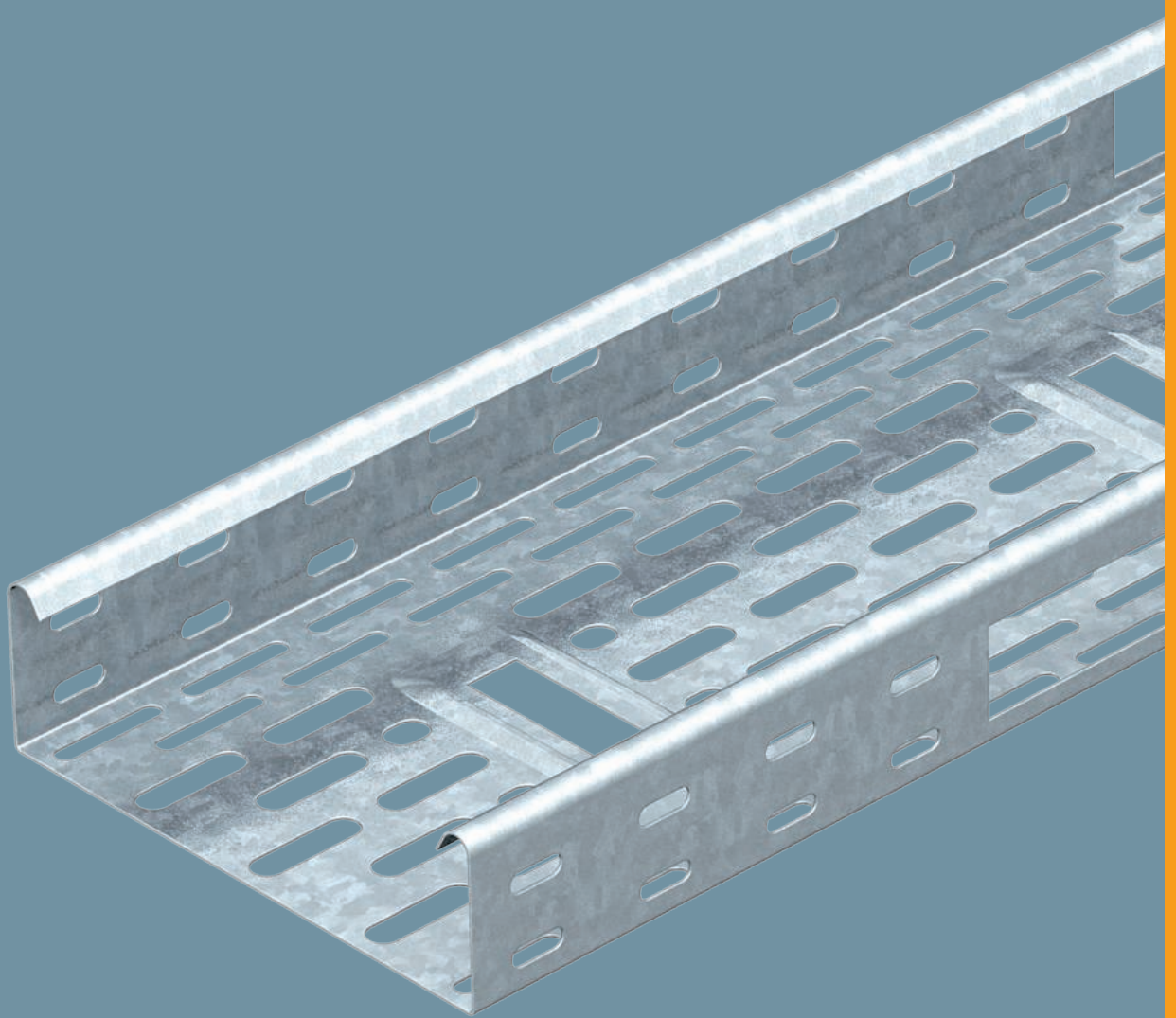
- |    |                                     |
|----|-------------------------------------|
| 1  | Cable tray SKS                      |
| 2  | 90° bend                            |
| 3  | 45° bend                            |
| 4  | T branch piece                      |
| 5  | Cross-over                          |
| 6  | Add-on tee                          |
| 7  | Reducer/stop-end                    |
| 8  | Straight connectors and joint plate |
| 9  | Cover with turn buckle              |
| 10 | Adjustable bend element             |
| 11 | Unperforated cover with cover clamp |



## Cable tray system EKS

The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task. No matter whether used in dry inner areas or in aggressive atmospheres: Different surface versions and materials ensure safe corrosion protection.

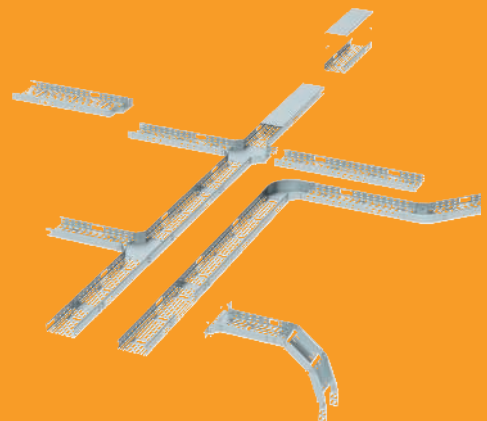
- Extra-heavy cable tray system with 60 mm side height
- Various fittings, functional connectors and additional accessories



## Cable tray system IKS

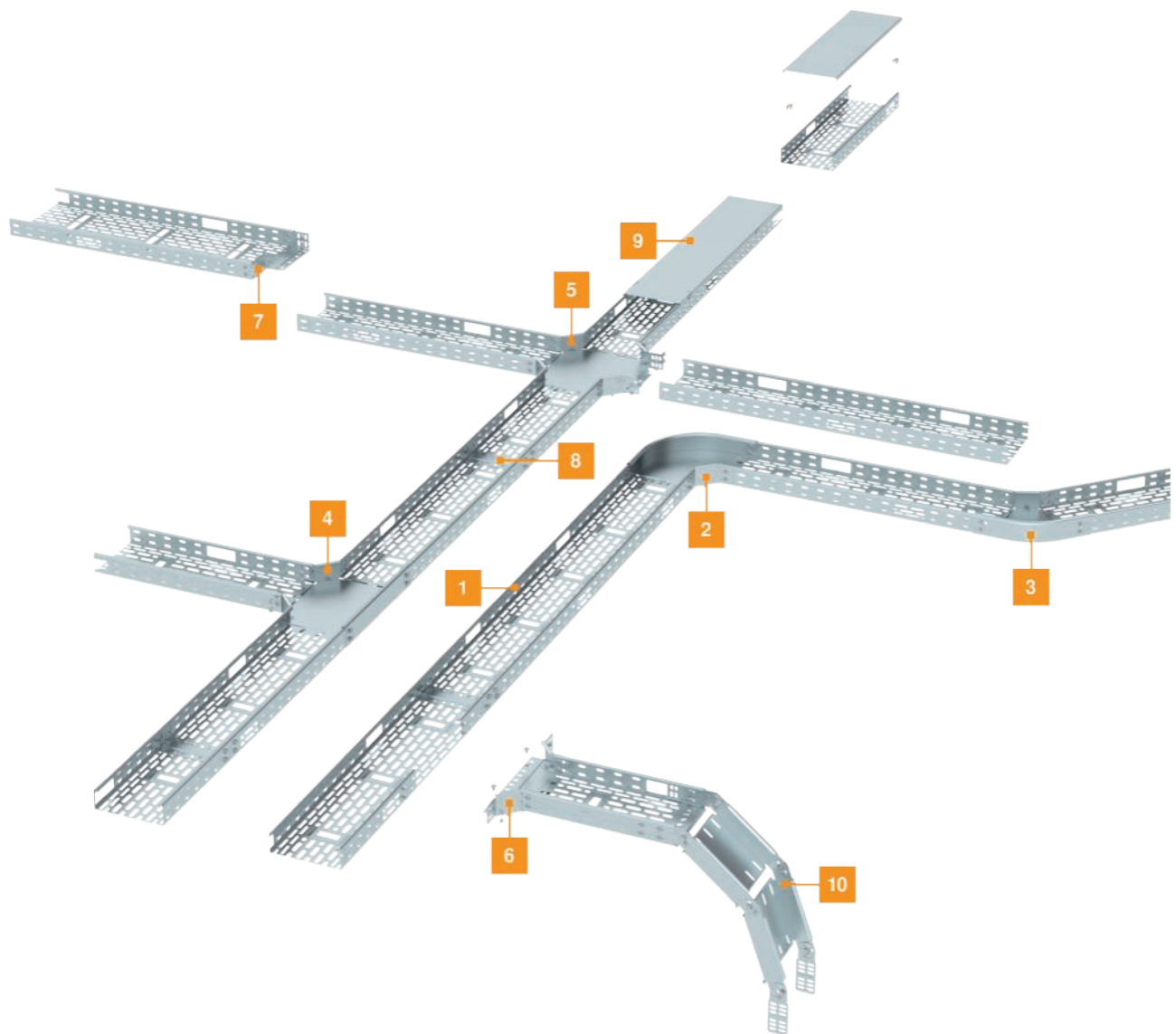
The cable tray is suitable for universal cable routing. From low-voltage cabling to power supplies, from data cables to telecommunications networks. A full product range, with suitable system components, can create perfect solutions for any task. No matter whether used in dry inner areas or in aggressive atmospheres: Different surface versions and materials ensure safe corrosion protection.

- Installation cable tray system with 60 mm side height
- 30% hole surface for use under sprinkler systems
- Various fittings, all types of connectors and additional accessories



# Cable tray system IKS

## Installation principle



- |    |                                     |
|----|-------------------------------------|
| 1  | Cable tray IKS                      |
| 2  | 90° bend                            |
| 3  | 45° bend                            |
| 4  | T branch piece                      |
| 5  | Cross-over                          |
| 6  | Add-on tee                          |
| 7  | Reducer/stop-end                    |
| 8  | Straight connectors and joint plate |
| 9  | Unperforated cover with cover clamp |
| 10 | Adjustable bend element             |



## Mounting aid



### Installation of RV straight connector set

Straight connection of the cable trays through simply clamping the connector set RV into the side rail.



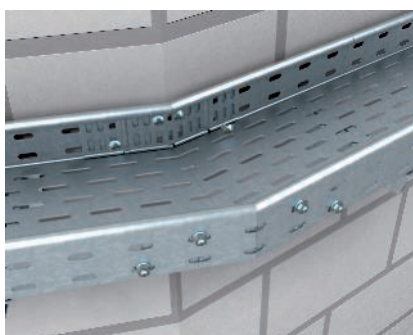
### Screwless straight connector set, type RV

Press the corresponding joint plate downwards and snap it in place.



### Straight connection with joint cover

Cable tray with screwed straight connection and joint plate, type SSLB. The joint plate can also be mounted above the bar of the RV straight connector set.



### Horizontal angle connection of cable trays

Horizontal angle connection of cable trays for brackets created during construction and cut cable tray ends.



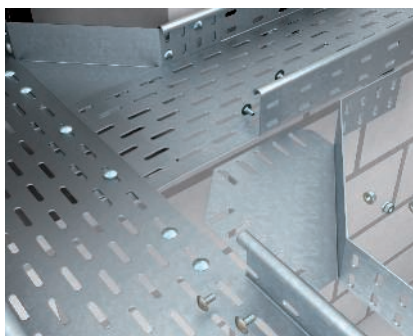
### Vertical adjustable connection of cable trays

Vertical adjustable connection of cable tray for construction-side height jumps of any angle.



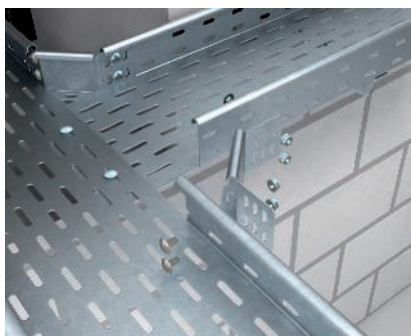
### Bend creation with corner connector

For 90° bends to be created at site, the corner connector, type REV, can be used to increase the internal radius.



### Direct connection with corner connectors

Corner connector, type REV, to increase the angle when creating tees without fittings. Additional supports should be planned for the area of the branches.



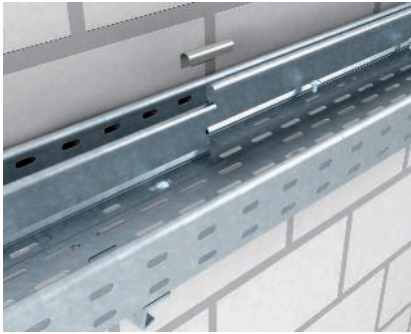
### Branch with angle connectors

Installation of built T exit with angle connectors, type WKV. Additional supports should be planned for the area of the branches.



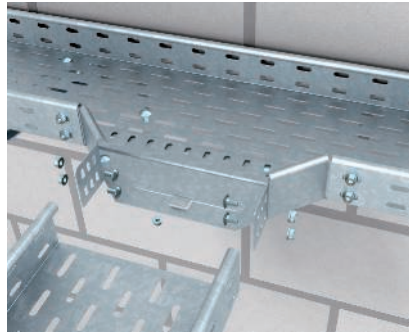
### Installation of reducer / stop-end

The reducer / stop-end plate component is used as closure and to reduce the width of cable trays.



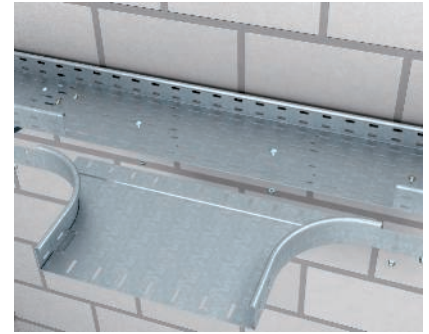
#### Barrier strip mounting with screw connection

Screwed barrier strip fastening of the barrier strip, TSG 60, with truss-head bolts M6x12. The barrier strip can simply be run over the joint and connected without bolts using the barrier strip connector TSGV.



#### Installation of add-on tee (width 100 – 300 mm)

To mount the add-on tee, separate the cable tray rail and screw it tight. Additional supports should be planned for the area of the fittings.



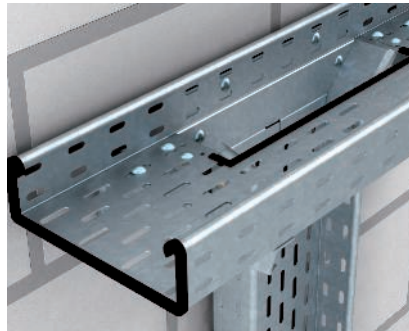
#### Installation of add-on tee (width 400 – 600 mm)

To mount the add-on tee, separate the cable tray rail and screw it tight. Additional supports should be planned for the area of the fittings.



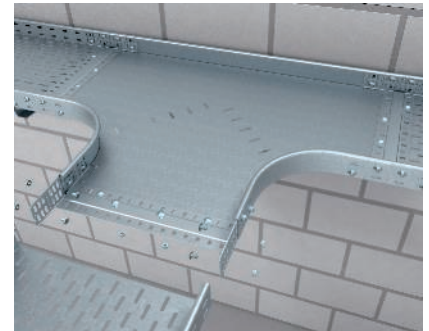
#### Installation of vertical add-on tee

Vertical mounting of the add-on tee as length-wise funnel.



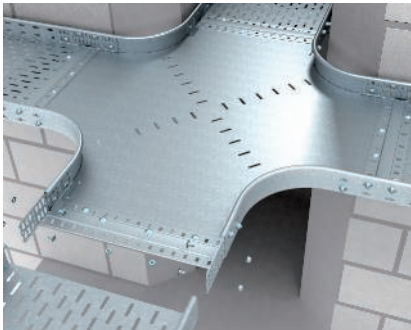
#### Installation of vertical add-on tee

Vertical mounting of the add-on tee as length-wise funnel.



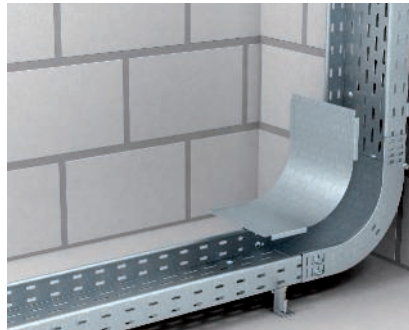
#### Installation of tee

The tee in widths is connected to the cable tray using connectors and a joint plate. Additional supports should be planned for the area of the fittings.



#### Installation of cross-over

The cross-over is connected to the cable tray using connectors and a joint plate. Additional supports should be planned for the area of the fittings.



#### 90° bend (rising/falling)

90° bend, rising or falling, for the creation of simple vertical changes of direction.



#### Installation of adjustable vertical bend element

Installation of the adjustable vertical bend element for the creation of adjustable bends. The adjustable vertical bend element is connected to the cable tray using adjustable connectors.



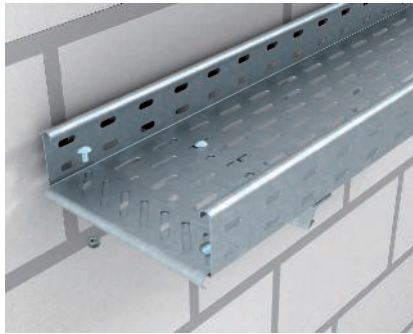
**Installation of falling adjustable vertical bend**  
Adjustable vertical bend to bridge height offsets. The adjustable vertical bend is connected with to the cable tray using the adjustable connectors.



**Installation of rising adjustable vertical bend**  
Adjustable vertical bend to bridge height offsets. The adjustable vertical bend is connected with to the cable tray using the adjustable connectors.



**Screwless cover mounting**  
Unperforated covers are mounted using cover clamps, type DK DRLU. The cover clamps are first clamped to the cover edge and then snapped on to the cable tray rail with the cover.

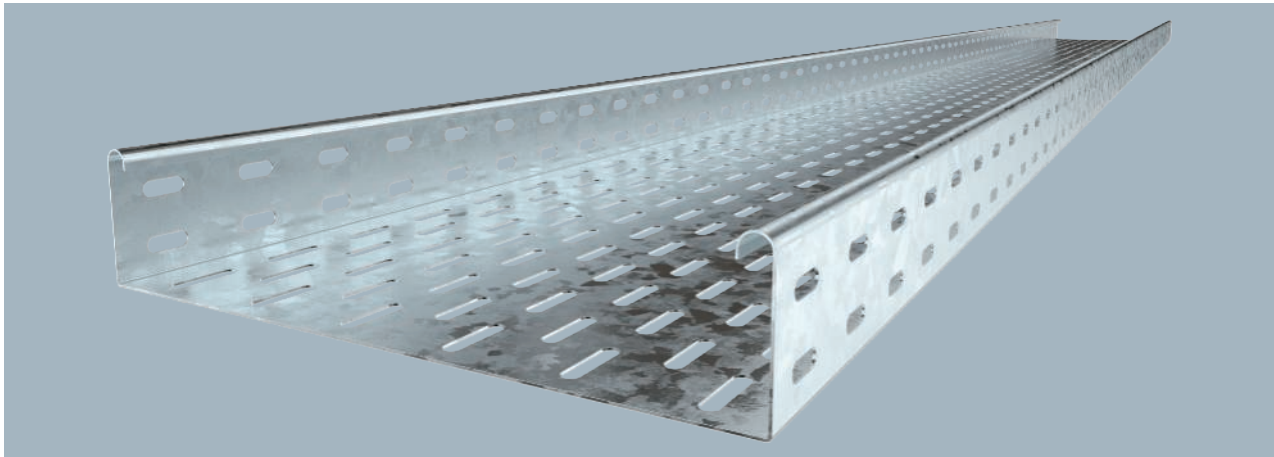


**Installation of bottom end plate**  
Fastening of the bottom end plate, type BEB, to protect the cables.



**Mounting plate with quick fastening**  
Fastening of the mounting plate, type MP, on the cable tray. The mounting plate can be fastened to the rail with quick connectors, and permanently fastened using truss-head bolts of type FRS B.

## Cable tray MKS 60

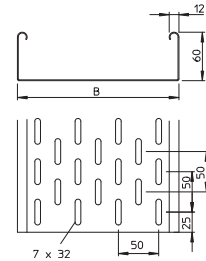


Type	Width mm	Metal thick- ness mm	Pack m	Weight kg/100 m	Item no.
MKS 610 FT	100	1.00	3	190.100	6055532

MKS 60 = Medium-duty cable tray system with a side height of 60 mm.

Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
MKS 610 FT	3000	100	58

### Dimensions

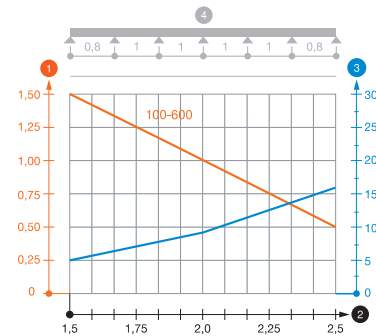


Type	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m
MKS 610 FT	1.5	1	0.5

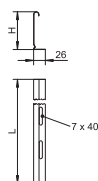
### Load

#### Load diagram, cable tray, type MKS 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



## Separating retainer 45



Type	Dim. H mm	Metal thick- ness mm	Dim. L mm	Pack m	Weight kg/100 m	Item no.
TSG 45 FS	45	0.75	3000	3	46.700	6062033

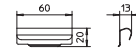
Separating retainer for separation of cables of different voltages or functions.

VA 2B

### Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

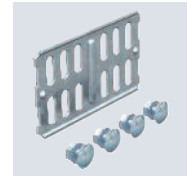
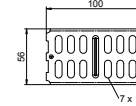


St FS FT

### Straight connector 60

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RLVK 60 FS	60	10	9.976	6067093
RLVK 60 FT	60	10	10.300	6067603

Straight connector for straight connection of cable trays and fittings with a side height of 60 mm. Including appropriate fastening material.

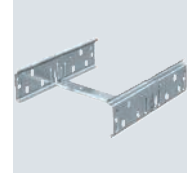
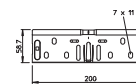


St FS

### Straight connector set 60

Type	Side height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
RV 607 FS	60	75	10	18.800	6068150
RV 610 FS	60	100	10	19.400	6068154

Quick connector set for straight, screwless connections of cable trays and fittings with a side height of 60 mm. The continuous earthing connection is guaranteed without a screw connection.

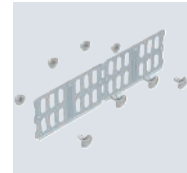
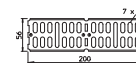


St FS FT

### Straight and angle connector 60

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RWVL 60 FS	60	10	16.400	6067115
RWVL 60 FT	60	10	17.400	6067611

Straight and angle connector for cable trays and fittings with a side height of 60 mm. Including appropriate fastening material.

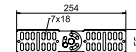


St FS

### Adjustable connector 60

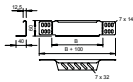
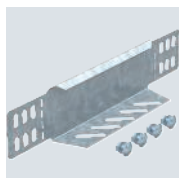
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGV 60 FS	60	10	25.100	7082010

Adjustable connector for cable trays with a side height of 60 mm. Including appropriate fastening material.



## Reducer/stop-end 60

St FS

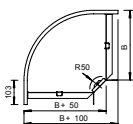
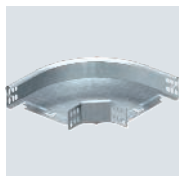


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RWEB 610 FS	60	100	1	12.300	7109105

Reducer/stop-end plate for cable trays with side height 60 mm.  
From a width of 150 mm, a perforated lower flange is available.  
Including appropriate fastening material.

## 90° bend 60

St FS FT

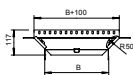
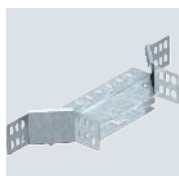


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RB 90 610 FS	60	100	1	71.900	6043216
RB 90 620 FS	60	200	1	110.300	6043224
RB 90 610 FT	60	100	1	77.600	7125100

90° bend, horizontal, for all cable tray types of 60 mm side height.  
The fitting is shipped in an unmounted state.  
Including appropriate fastening material.

## Add-on tee 60

St FS

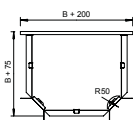
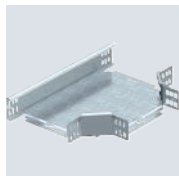


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RAA 610 FS	60	100	1	44.200	6040403

Add-on tee for horizontal and vertical use. For all cable tray types of 60 mm side height.  
The fitting is shipped in an unmounted state.  
Including appropriate fastening material.

## T branch piece 60

St FT

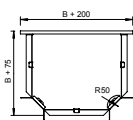
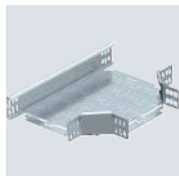


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RT 610 FT	60	100	1	89.900	7117116

Horizontal T branch piece, for all cable tray types of 60 mm side height.  
The fitting is shipped in an unmounted state. All the sides are designed for the same cable tray width.  
Including appropriate fastening material.

## T branch piece 60

St FS



Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RT 610 FS	60	100	1	83.200	6043410

Horizontal T branch piece, for all cable tray types of 60 mm side height.  
The fitting is shipped in an unmounted state. All the sides are designed for the same cable tray width.  
Including appropriate fastening material.

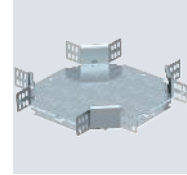
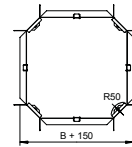
St FT

## Cross-over 60

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RK 610 FT	60	100	1	97.000	7113110

Horizontal cross-over for all cable tray types of 60 mm side height.

The fitting is shipped in an unmounted state. All the sides are designed for the same cable tray width. Including appropriate fastening material.

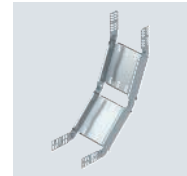
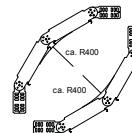


St FT

## 90° adjustable bend, vertical 60

Type	Side height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
RGBV 610 FT	60	100	1	186.000	7079109

The bend is shipped in an unmounted state. No additional fastening materials are required.  
90° adjustable vertical bend, for all cable tray types with a side height of 60 mm.

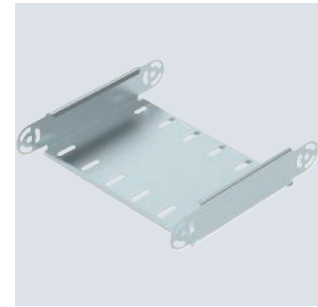


St FT

## Adjustable bend element, vertical 60

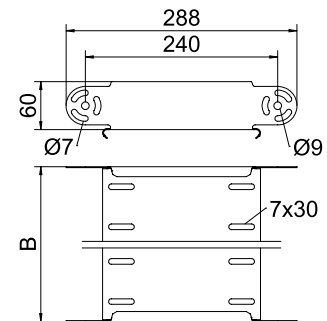
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGBEV 610 FT	60	1	52.400	7075103

Adjustable vertical bend element, for all cable tray types with a side height of 60 mm.  
RGV 60 adjustable connectors should be ordered separately and in the appropriate quantity.



Type	Dim. B mm	Metal thickness mm
RGBEV 610 FT	100	1.00

### Dimensions



### Radius table

Quantity of elements	Radius
1	Approx. 300 mm
2	Approx. 450 mm
3	approx. 600 mm
4	Approx. 750 mm
5	approx. 900 mm

Please order two RGV 60 adjustable connectors separately.

### Installation

# Cable trays, side height 85

## Separating retainer connector

VA 2B



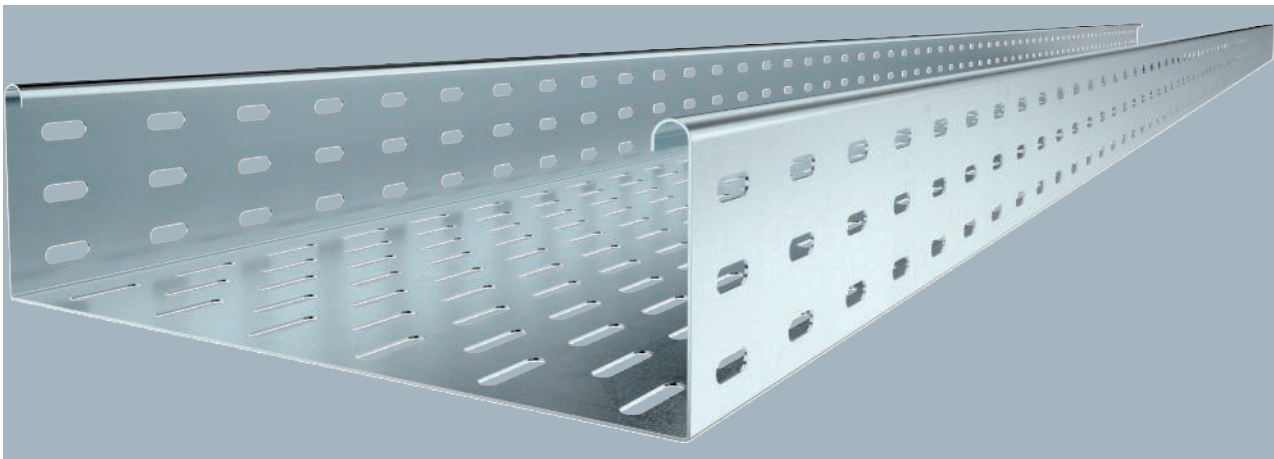
Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

# Cable trays, side height 85

## Cable tray MKS 85

St FS

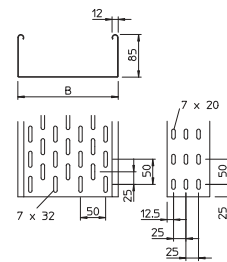


Type	Width mm	Metal thickness mm	Pack m	Weight kg/100 m	Item no.
MKS 830 FS	300	1.00	3	357.667	6057306

Including connector, type RLVL 85.  
MKS 85 = medium-duty cable tray system with a side height of 85 mm.

Type	Length mm	B mm	Usable Dim. cross-section cm <sup>2</sup>
MKS 830 FS	3000	300	253

### Dimensions

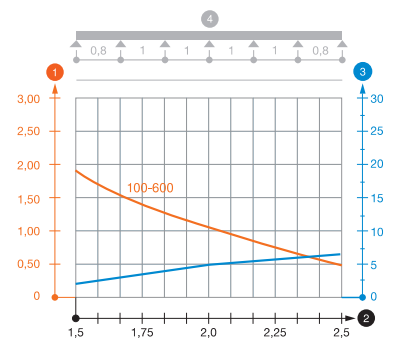


	1.5 m	2.0 m	2.5 m
MKS 830 FS	1.75	1.1	0.5

### Load diagram, cable tray, type MKS 85

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width
- From width 300 mm, tested with joint plate SSLB

### Load



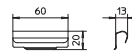


VA 2B

## Separating retainer connector

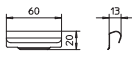
Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.



## Separating retainer connector

VA 2B

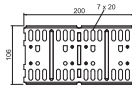


Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2		10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

## Straight and angle connector 110

St FS

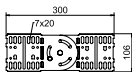
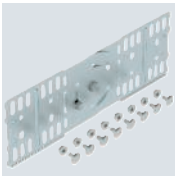


Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RLVL 110 FS	110	10	33.800	6067131

Straight and angle connector for cable trays and fittings with a side height of 110 mm. Including appropriate fastening material.

## Adjustable connector 110

St FT

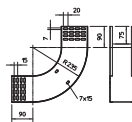


Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RGV 110 FT	110	10	64.300	7082436

Adjustable connector for cable trays with a side height of 110 mm. Including appropriate fastening material.

## 90° vertical bend, rising, 110

St FS

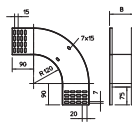
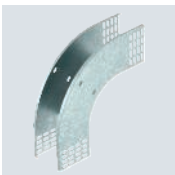


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBV 130 S FS	110	300	1	182.400	7007318

90° rising vertical bend, for all cable tray types of 110 mm side height. The vertical bend is pushed over the end of the cable tray and screwed tight. Fastening materials should be ordered separately.

## 90° vertical bend, falling, 110

St FS

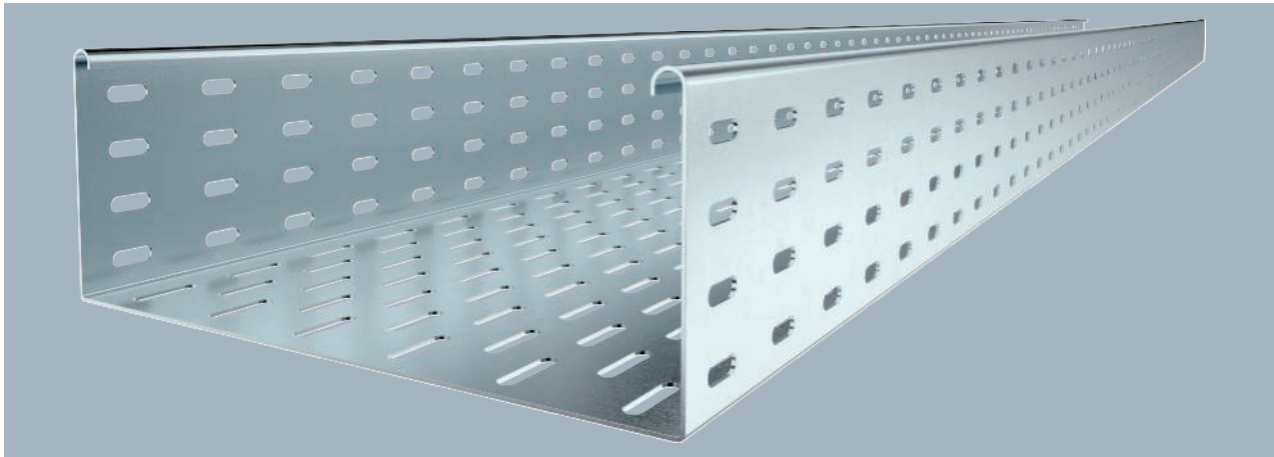


Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBV 130 F FS	110	300	1	141.600	7007358

90° vertical bend, falling, for all cable tray types of 110 mm side height. The vertical bend is pushed over the end of the cable tray and screwed tight. Fastening materials should be ordered separately.

St FS

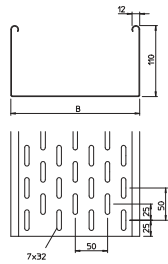
Cable tray SKS 110



FS version includes connector, type RLVL 110.  
SKS 110 = heavy-duty cable tray system with 110 mm side height.

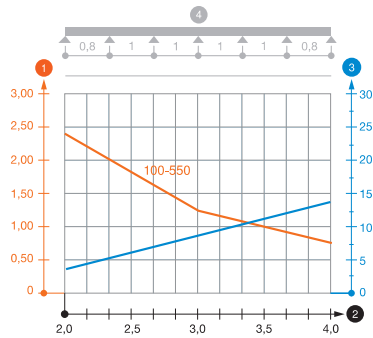
Type	Width mm	Metal thick- ness mm	Pack m	Weight kg/100 m	Item no.
SKS 130 FS	300	1.50	3	584.000	6061303

Dimensions



Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
SKS 130 FS	3000	300	328

Load

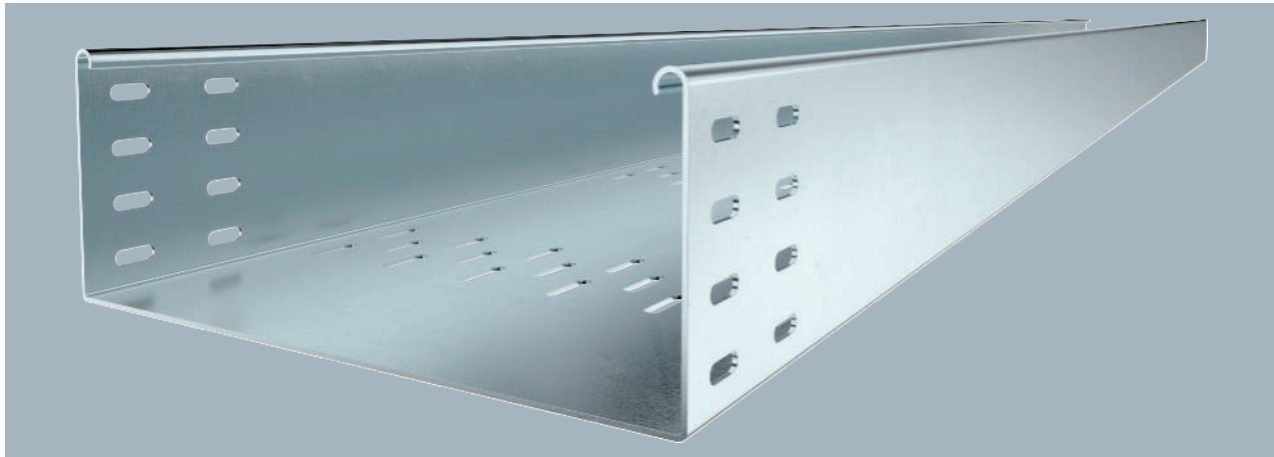


	1.5 m kN/m	2.0 m kN/m	3.0 m kN/m	4.0 m kN/m
SKS 130 FS	3	2.4	1.2	0.8

Load diagram, cable tray, type SKS 110

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

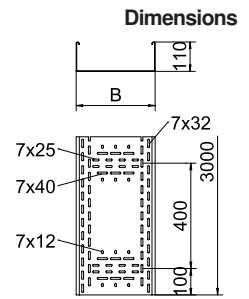
## Cable tray BKRS 110



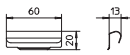
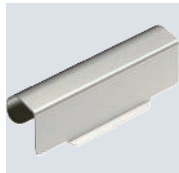
Type	Side height mm	Dim. H mm	Dim. B mm	Dim. L mm	Metal thickness mm	Pack m	Weight kg/100 m	Item no.
BKRS 1130 FS	110	110	300	3000	2.00	3	806.833	6061985

The cable tray has connector perforations on both sides. Straight connectors should be ordered separately and in the appropriate quantity. Heavy-duty, walkable cable tray system BKRS with base perforation, in 110 mm side height.

Type	Dim. L mm	Dim. B mm	Dim. H mm	Metal thickness mm	Usable cross-section cm <sup>2</sup>
BKRS 1130 FS	3000	300	110	2.00	296



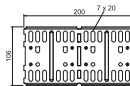
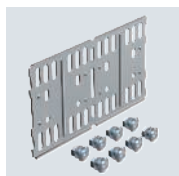
## Separating retainer connector



Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

## Straight and angle connector 110



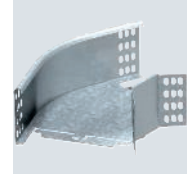
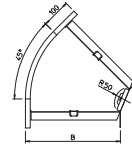
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
RLVL 110 FS	110	10	33.800	6067131

Straight and angle connector for cable trays and fittings with a side height of 110 mm. Including appropriate fastening material.

St FS FT

## 45° bend 110

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RB 45 130 FS	110	300	1	135.000	700677
RB 45 130 FT	110	300	1	145.000	7068328



45° bend, horizontal, for all cable tray types of 110 mm side height.

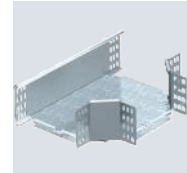
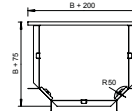
The fitting is shipped in an unmounted state. The WKV 110 angle connector is designed for 90° bends and can be adjusted to 45° on site.

Including appropriate fastening material.

St FT

## T branch piece 110

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RT 130 FT	110	300	1	250.000	7119313



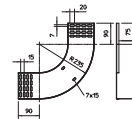
Horizontal T branch piece, for all cable tray types of 110 mm side height.

The fitting is shipped in an unmounted state. Including appropriate fastening material.

St FS

## 90° vertical bend, rising, 110

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBV 130 S FS	110	300	1	182.400	7007318



90° rising vertical bend, for all cable tray types of 110 mm side height.

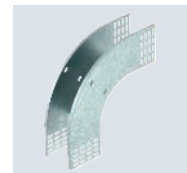
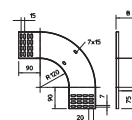
The vertical bend is pushed over the end of the cable tray and screwed tight.

Fastening materials should be ordered separately.

St FS

## 90° vertical bend, falling 110

Type	Side height mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
RBV 130 F FS	110	300	1	141.600	7007358



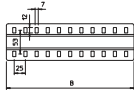
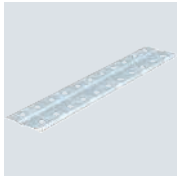
90° vertical bend, falling, for all cable tray types of 110 mm side height.

The vertical bend is pushed over the end of the cable tray and screwed tight.

Fastening materials should be ordered separately.

## Joint plate

St FS



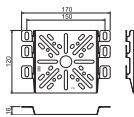
Type	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
SSLB 150 FS	150	20	14.000	7070209
SSLB 300 FS	300	20	29.200	7070217

Wide joint plate for use in all cable trays and wide span cable trays.  
Including appropriate fastening material.

## Mounting plates

### Mounting plate

St FS DD

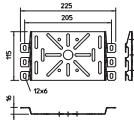
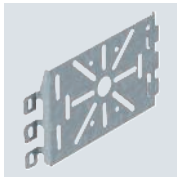


Type	Height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MP UNI FS	120	170	1	11.000	7084773
MP UNI DD	120	170	1	11.000	7085114

Please order the truss-head bolt, type FRSB 6 x 12, separately.  
Mounting plate, for fastening on the side rail of cable support systems.

### Mounting plate

St FS

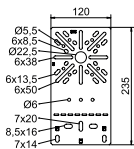


Type	Height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MP 225 UNI FS	115	225	1	20.000	7084870

Please order the truss-head bolt, type FRSB 6 x 12, separately.  
Mounting plate for universal use on side rails of cable trays and mesh cable trays.

### Mounting plate, flat

St FS DD

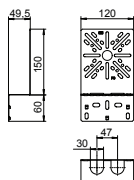
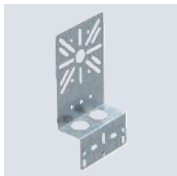


Type	Height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MP FL FS	235	120	1	19.200	7084757
MP FL DD	235	120	1	19.200	7085108

Please order the truss-head bolt, type FRS B6 x 12, separately.  
Flat mounting plate, for fastening on the side rail of the cable tray.

### Mounting plate, angled

St FS DD



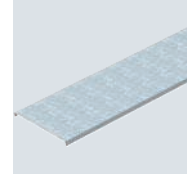
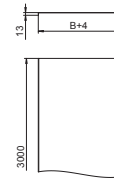
Type	Height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MP WI KL. FS	210	120	1	20.200	7084765
MP WI KL. DD	210	120	1	20.200	7085111

Please order the truss-head bolt, type FRS B6 x 12, separately.  
Curved mounting plate, for fixing on the side rail of the cable tray.

St FS

Unperforated cover

Type	Dim. B mm	Metal thick- ness mm	Length mm	Pack m	Weight kg/100 m	Item no.
<b>DRLU 100 FS</b>	100	1.00	3000	3	99.000	<b>6052103</b>

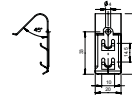


Cover for cable trays and mesh cable trays.  
When using covers outdoors, additional measures against the influence of wind must be taken.  
Transverse bead from 500 mm width.

VA 2B

Cover clamp, universal

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>DKU A2</b>	20	0.794	<b>6065600</b>

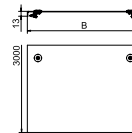


Cover clamp for universal fastening of covers on cable trays, mesh cable trays and AZ small ducts.  
The cover clamp is not suitable for use with mesh cable trays with a side height of 35 mm.  
Depending on the tray width, 4–6 cover clamps are required for secure fastening of a 3 m cover.

St DD

Cover with turn buckle

Type	Dim. B mm	Metal thick- ness mm	Length mm	Pack m	Weight kg/100 m	Item no.
<b>DRL 300 DD</b>	300	1.00	3000	3	263.340	<b>6052712</b>
<b>DRL 400 DD</b>	400	1.00	3000	3	342.070	<b>6052715</b>

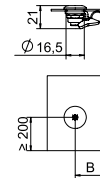


Transverse bead from 500 mm width.  
Cover for cable trays and cable ladders with turn buckles.  
When using covers outdoors, additional measures against the influence of wind must be taken.

St FT

Turn buckle for screwing

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>DRL H S FT</b>	20	3.260	<b>6065018</b>

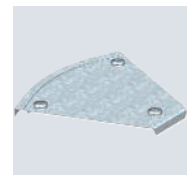
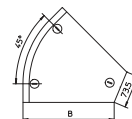


Turn buckle for additional installation or installation at a later date.  
Depending on the cover version, dimension B varies as follows:  
DRL / DRLU = 27 mm  
DBKR = 27 mm  
WDRL = 38 mm  
WKLD = 58 mm  
Single-sided turn buckle. Use for cover widths of 100–600 mm.

St FS

Cover for 45° bend

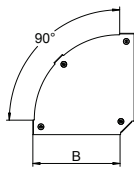
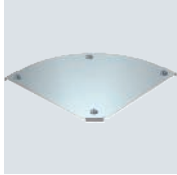
Type	Dim. B mm	Metal thick- ness mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>DFB 45 300 FS</b>	300	1.00	1	60.200	<b>7128851</b>



The cover can be used with fittings of all side heights.  
Cover for 45° bend with pre-mounted turn buckle.

## Cover for 90° Magic bend

St FS

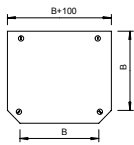
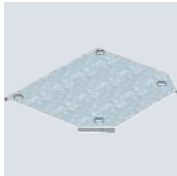


Type	Dim. B mm	Metal thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
DFBM 90 300 FS	300	1.25	1	81.600	7138506

The cover can be used with fittings of all side heights.  
Cover for 90° bend with premounted turn buckles.

## Cover for T-branch piece

St DD



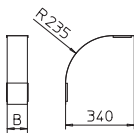
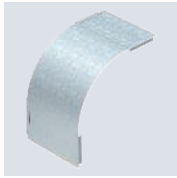
Type	Dim. B mm	Metal thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
DFT 300 DD	300	1.00	1	125.000	7129351

Cover for tee with pre-mounted turn buckle.  
The cover can be used with fittings of all side heights.

## Cover, vertical bend, falling

### Cover for 90° vertical bend 110, falling

St FS

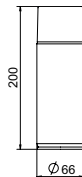


Type	Side height mm	Dim. B mm	Metal thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
DBV 110 300 F FS	110	300	0.75	1	83.400	7131038

Cover for falling vertical bends of side height 110 mm.  
The fastening is guaranteed by the overlap of the cable tray covers. The cover can also be fastened using cover clamps.

## Zinc touch-ups

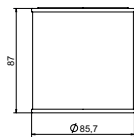
### Zinc repairs



Type	Pack Piece	Weight kg/100 pc.	Item no.
ZSF	1	45.000	2362970

The zinc spray can be used in the temperature range - 20 °C to 150 °C.  
Zinc spray for treatment of unprotected surfaces and cutting edges. Can contents: 400 ml.

### Zinc repair paint

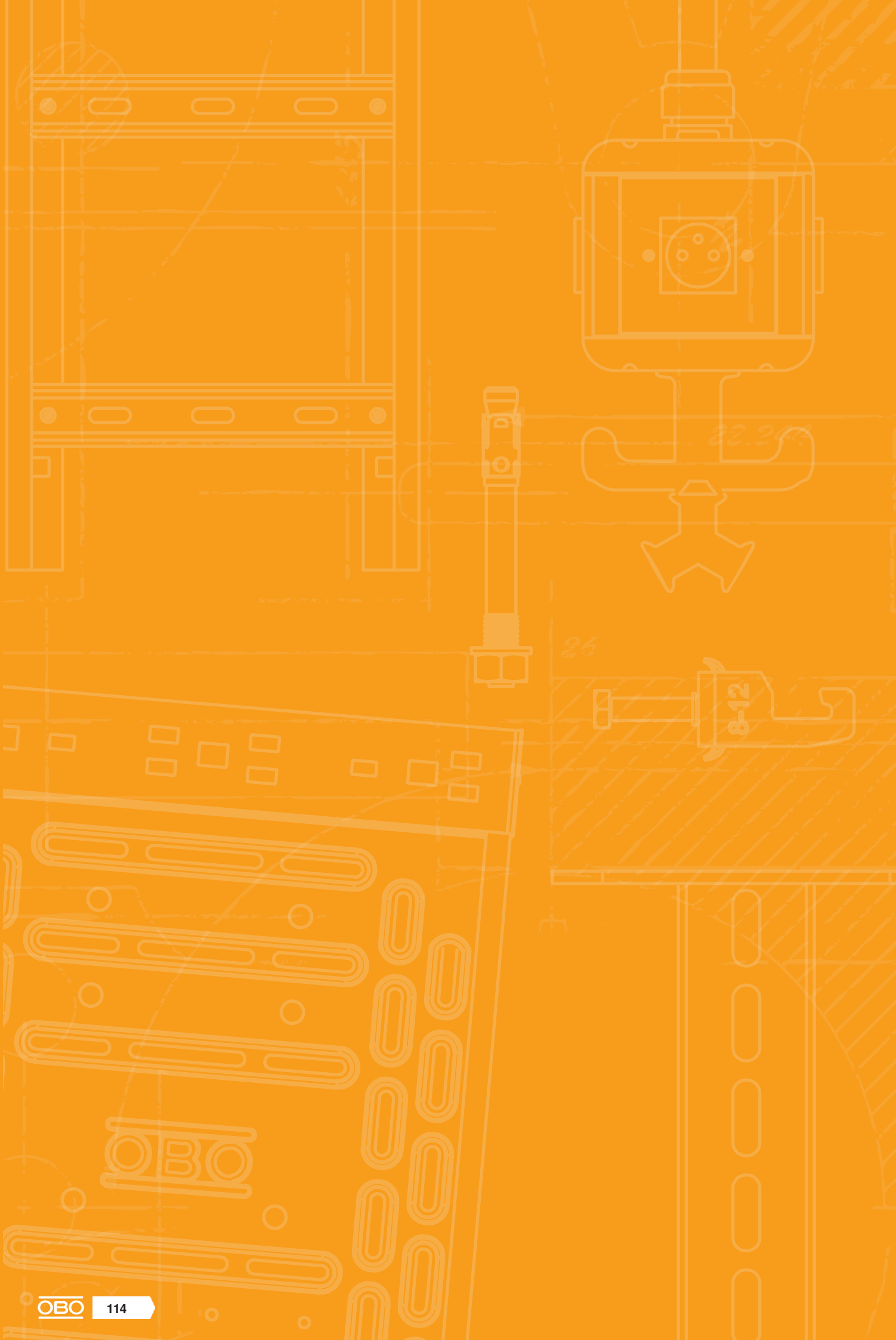


Type	Pack Piece	Weight kg/100 pc.	Item no.
ZABF	1	86.000	2362979

Zinc repair paint for blank areas on the hot galvanised steel parts, to eliminate grinding and welding damage on the galvanisation and to adapt ungalvanised small parts on galvanised structures.  
Resistant to normal weathering influences. Light shade, similar to zinc. Before paint application, the substrate must be carefully cleaned and roughened. Paint application with a brush.







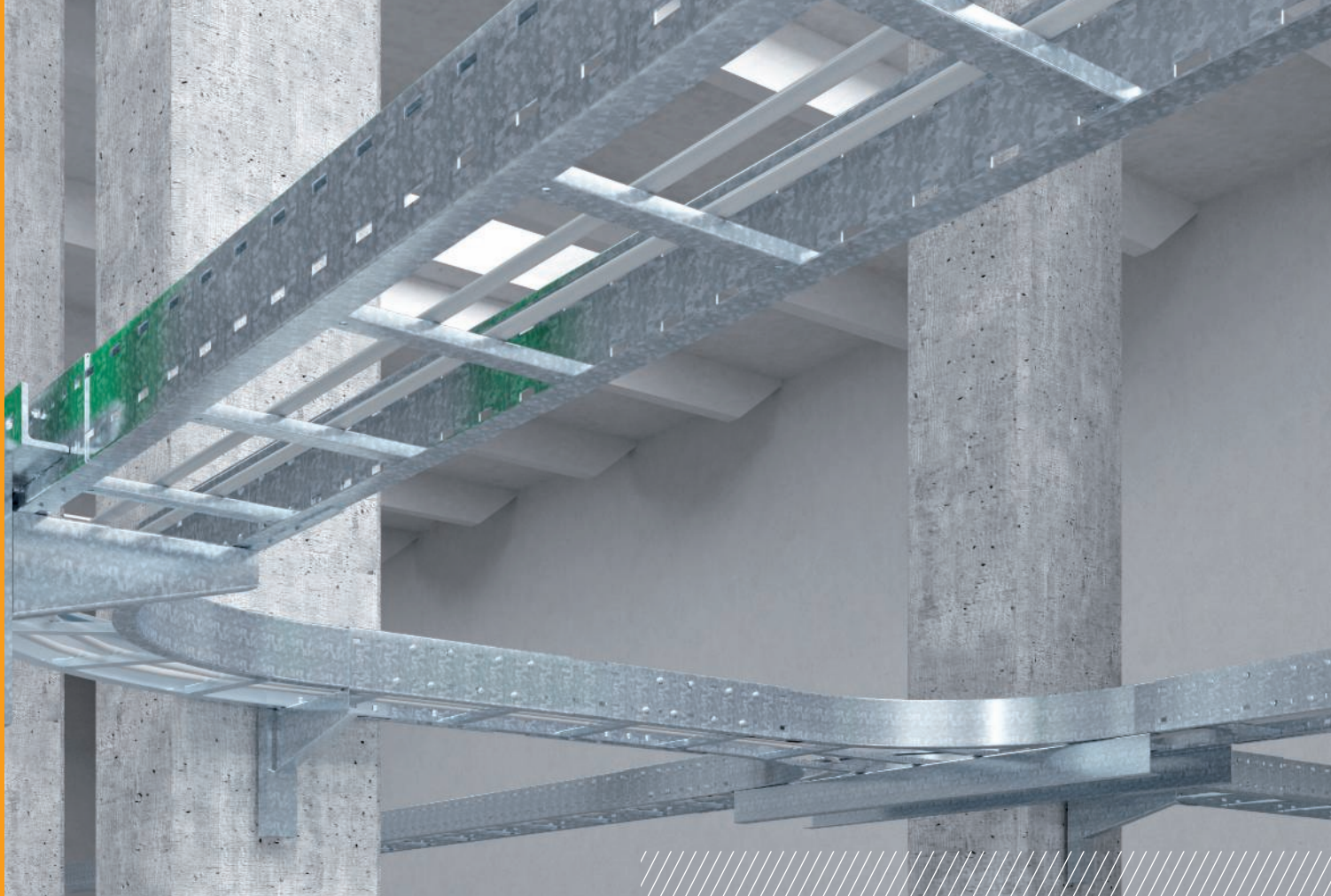
# Wide span systems



Wide span ladders

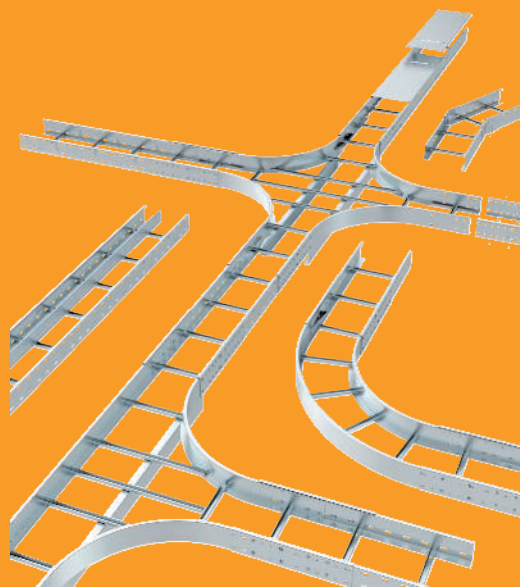
114





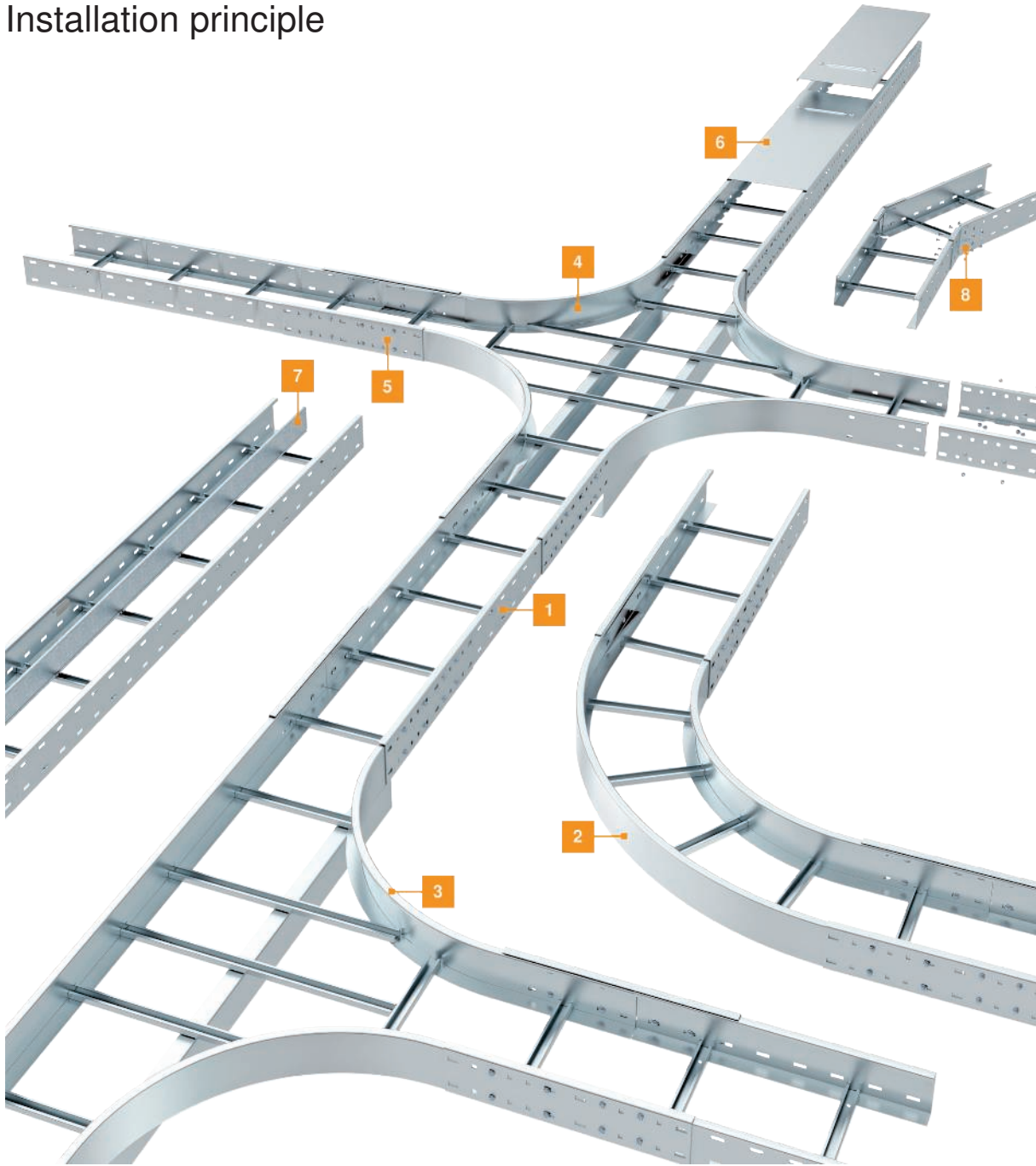
## Wide span cable ladder systems

When you need to bridge wide spans and support high cable loads, the OBO wide span systems are the perfect solution. The product range comprises cable trays and cable ladders with widths of between 200 and 600 mm and side heights of 110 to 200 mm. Comprehensive system accessories, such as fittings and all the fastening materials for concrete and steel mounting, round off this product range perfectly.



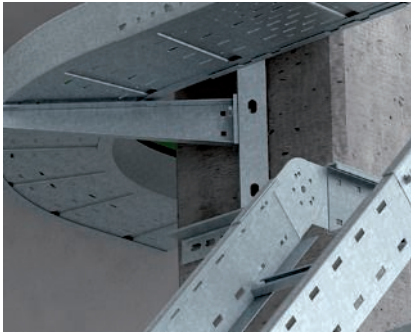
# Wide span cable ladder systems

## Installation principle



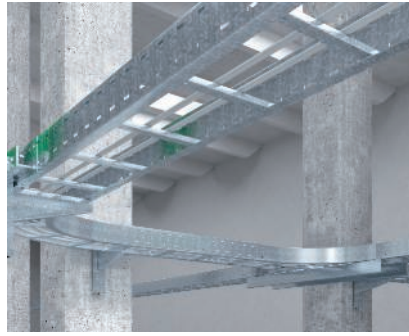
- |   |                         |
|---|-------------------------|
| 1 | Wide span cable ladders |
| 2 | 90° bend                |
| 3 | T branch piece          |
| 4 | Cross-over              |
| 5 | Straight connector      |
| 6 | Cover with turn buckle  |
| 7 | Barrier strip           |
| 8 | Adjustable connector    |

## Mounting aid



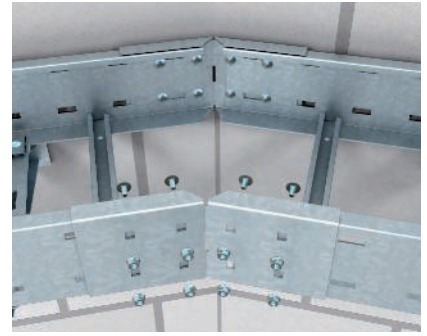
### Wide span fittings application

Mounting examples for horizontal and vertical changes of direction for wide span systems.



### Girder clamping application

Mounting of a wide span system clamped to steel girders.



### Horizontal wide span angle connection

Horizontal angle connection of wide span cable ladders with angle connectors, type WRWVK.



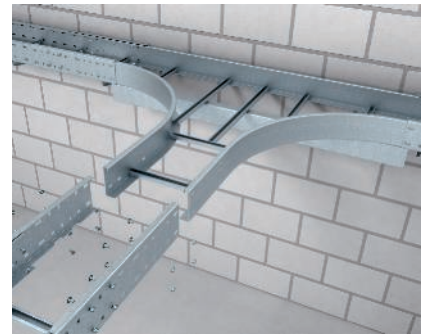
### Vertical wide span adjustable connection

Vertical angle connection of wide span cable ladders with adjustable connectors, type WRGV.



### Installation of 90° bend

Bend in combination with wide span cable ladder. The bend is connected to the wide span cable ladder using external connectors.



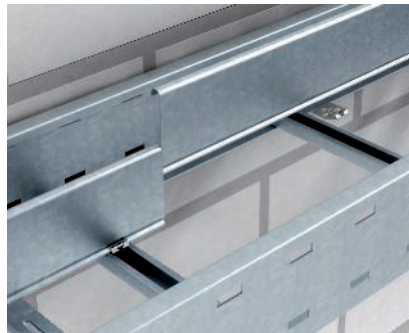
### Installation of tee

Tee in conjunction with wide span cable ladder. The tee is connected to the wide span cable ladder using external connectors.



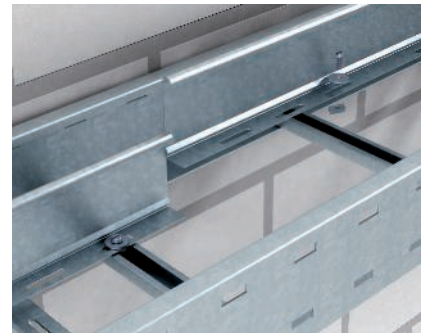
### Installation of cross-over

Cross-over in combination with wide span cable ladder. The cross-over is connected to the wide span cable ladder using external connectors.



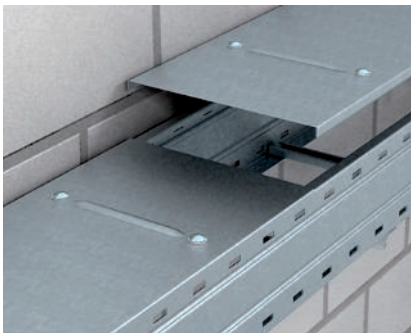
### Screwless barrier strip fastening

Screwless fastening of a barrier strip in wide span cable trays and cable ladders with hold-down clamp, type KS KL.



### Screwed barrier strip fastening

Barrier strip mounting in wide span cable ladders. Fasten using slide nuts and hexagonal bolts.



### Cover mounting

Installation of covers with turn buckles.

St FS

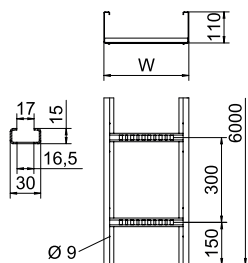
## Wide span cable ladder WKLG 110



Straight connectors of type WRVL 110 should be ordered separately and in the appropriate quantity.  
Wide span cable ladder with perforated side rails of side height of 110 mm. Fastening of cables with clamp clip, type 2056.

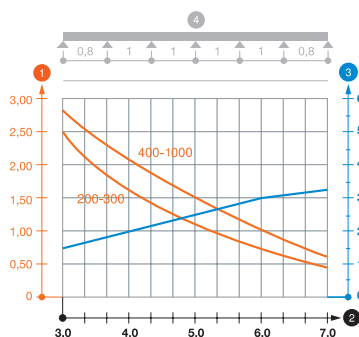
Type	Width mm	Rail thick- ness mm	Pack m	Weight kg/100 m	Item no.
WKLG 1130 FS	300	2	6	583.000	6311012

### Dimensions



Type	Dim. L mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
WKLG 1130 FS	6000	300	281

### Load



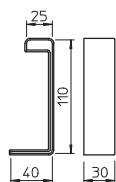
	4.0 m kN/m	5.0 m kN/m	6.0 m kN/m	7.0 m kN/m
WKLG 1130 FS	1.6	1.1	0.8	0.4

#### Load diagram, wide span cable ladder, type WKLG 110

- ① Permitted cable ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## End cap 110

PVC



Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKHW 110 OR	Pastel orange	20	4.400	6310398

End cap to cover the ends of wide span cable ladders.

## Separating retainer connector

VA 2B

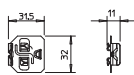


Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

## Hold-down clamp for separating retainer fastening

VA 2B

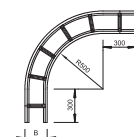


Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KL A2	30	0.512	6062284

Hold-down clamp for screwless fastening of the separating retainer in cable ladders.

## 90° bend 110

St FS

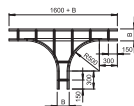
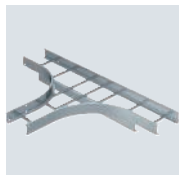


Type	Rail Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLB 90 116 FS	600	2	1	1,330.000	6312373

For further stabilisation, additional supports should be planned for the area of the fittings.  
90° bend, horizontal, for all wide span cable ladders of 110 mm side height.

## T branch piece 110

St FS



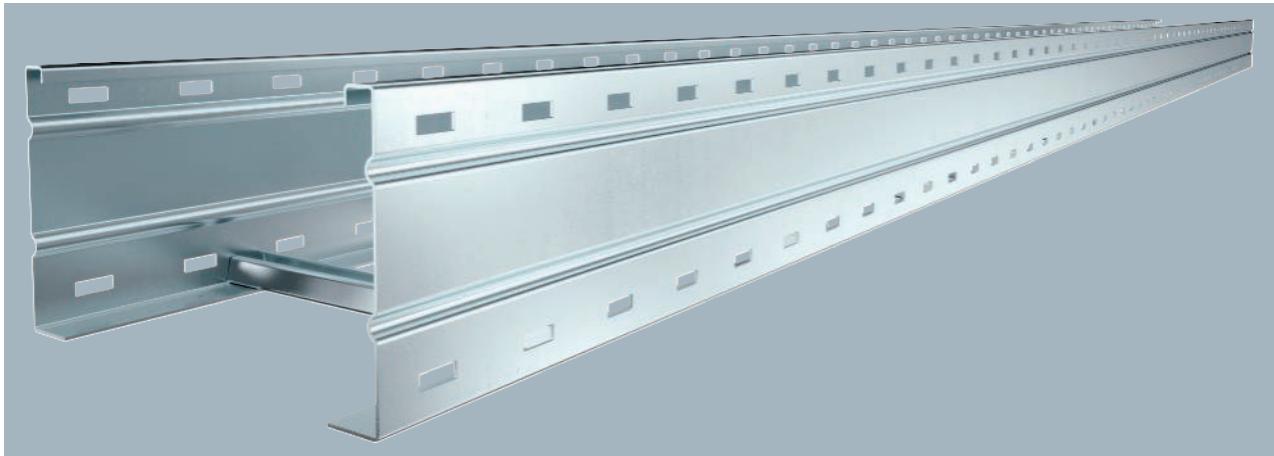
Type	Rail Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLT 1160 FS	600	2	1	2,340.000	6312675

For further stabilisation, additional supports should be planned for the area of the fittings.  
Horizontal T branch piece, for all wide span cable ladders of 110 mm side height.



St FS

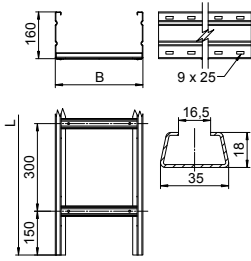
## Wide span cable ladder WKLG 160



Wide span cable ladder with perforated side rail of side height of 160 mm. Fastening of cables with clamp clip, type 2056. Straight connectors of type WRV 160 should be ordered separately and in the appropriate quantity.

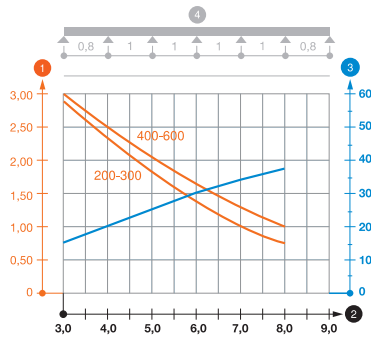
Type	Width mm	Rail thick- ness mm	Pack m	Weight kg/100 m	Item no.
WKLG 1640 FS	400	2	6	797.834	6227058
WKLG 1660 FS	600	2	6	859.334	6227074

### Dimensions



Type	Dim. L mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
WKLG 1640 FS	6000	400	572
WKLG 1660 FS	6000	600	857

### Load

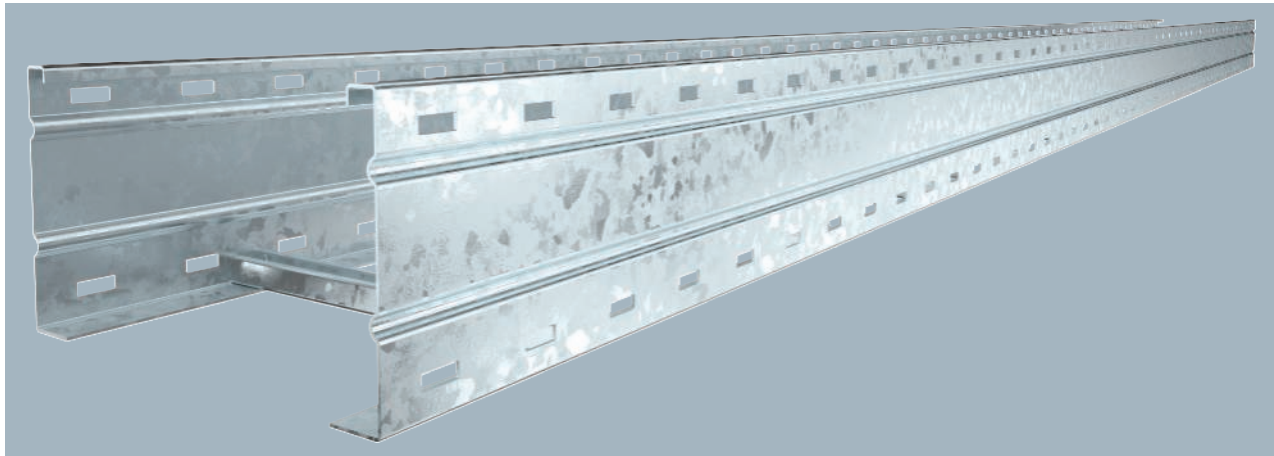


	5.0 m kN/m	6.0 m kN/m	7.0 m kN/m	8.0 m kN/m
WKLG 1640 FS	2	1.6	1.3	1
WKLG 1660 FS	2	1.6	1.3	1

#### Load diagram, wide span cable ladder, type WKLG 160

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Wide span cable ladder WKLG 160

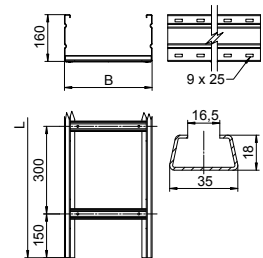


Type	Width mm	Rail thick- ness mm	Pack m	Weight kg/100 m	Item no.
WKLG 1620 FT	200	2	6	770.667	6227120
WKLG 1630 FT	300	2	6	802.500	6227139
WKLG 1640 FT	400	2	6	835.000	6227147
WKLG 1650 FT	500	2	6	867.334	6227155
WKLG 1660 FT	600	2	6	900.000	6227163

Wide span cable ladder with perforated side rail of side height of 160 mm. Fastening of cables with clamp clip, type 2056. Straight connectors of type WRV 160 should be ordered separately and in the appropriate quantity.

Type	Dim. L mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
WKLG 1620 FT	6000	200	282
WKLG 1630 FT	6000	300	427
WKLG 1640 FT	6000	400	572
WKLG 1650 FT	6000	500	717
WKLG 1660 FT	6000	600	857

### Dimensions

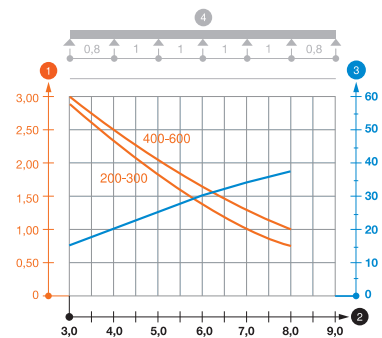


	5.0 m kN/m	6.0 m kN/m	7.0 m kN/m	8.0 m kN/m
WKLG 1620 FT	1.8	1.4	1	0.7
WKLG 1630 FT	1.8	1.4	1	0.7
WKLG 1640 FT	2	1.6	1.3	1
WKLG 1650 FT	2	1.6	1.3	1
WKLG 1660 FT	2	1.6	1.3	1

### Load diagram, wide span cable ladder, type WKLG 160

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

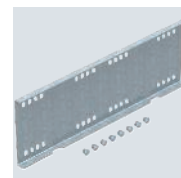
### Load



St FS FT

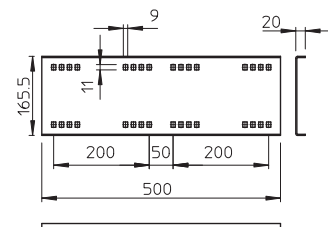
## Straight connector 160

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
WRVL 160 FS	160	2	218.000	6227708
WRVL 160 FT	160	2	218.000	6227716



Straight connector for the connection of wide span cable trays and ladders of types WKSG and WKLГ with a side height of 160 mm.  
Including appropriate bolts, washers and nuts.

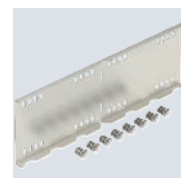
### Dimensions



A2 2B

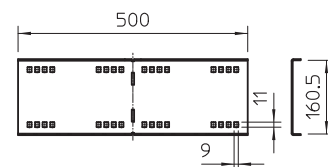
## Angle connector 160

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
WRWVK 160 A2	160	2	199.800	6227836



Including appropriate bolts, washers and nuts.  
Angle connector for wide span cable trays and ladders with a side height of 160 mm.

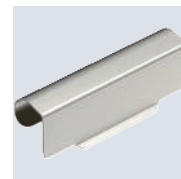
### Dimensions



VA 2B

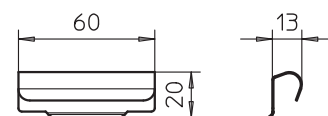
## Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970



Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

### Dimensions



## Hold-down clamp for separating retainer fastening

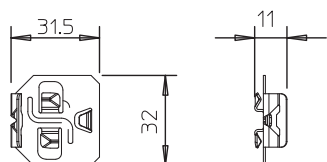
VA 2B



Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KL A2	30	0,512	6062284

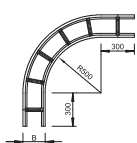
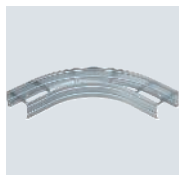
Hold-down clamp for screwless fastening of the separating retainer in cable ladders.

### Dimensions



## 90° bend 160

St FS FT



Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLB 90 164 FS	400	2	1	1,355.000	6229352
WLB 90 162 FT	200	2	1	1,200.000	6229425
WLB 90 166 FT	600	2	1	1,996.000	6229476

For further stabilisation, additional supports should be planned for the area of the fittings.  
90° bend, horizontal, for all wide span cable ladders of 160 mm side height.

## 90° vertical bend, falling 160

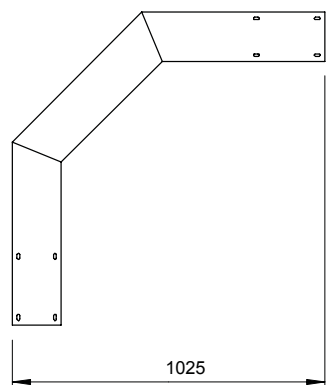
St FT



Type	Width mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLBF 90 162 FT	200	2	1	1,275.000	6230725
WLBF 90 164 FT	400	2	1	1,385.000	6230741
WLBF 90 166 FT	600	2	1	1,495.000	6230776

For further stabilisation, additional supports should be planned for the area of the fittings.  
90° vertical bend, for all wide span cable ladders of 160 mm side height.

### Dimensions

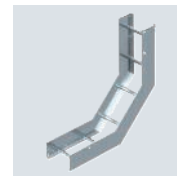


# WKLG wide span cable ladder system, side height 160

St FT

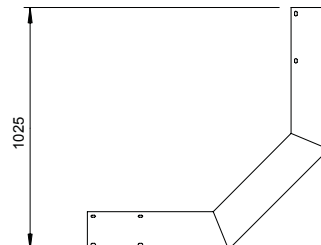
## 90° vertical bend, rising 160

Type	Width mm	Rail thick- ness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLBS 90 162 FT	200	2	1	1,275.000	6230423
WLBS 90 164 FT	400	2	1	1,385.000	6230458



For further stabilisation, additional supports should be planned for the area of the fittings.  
90° vertical bend, for all wide span cable ladders of 160 mm side height.

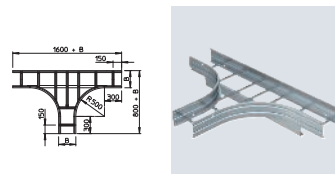
### Dimensions



St FT

## T branch piece 160

Type	Dim. B mm	Rail thick- ness mm	Pack Piece	Weight kg/100 pc.	Item no.
WLT 1660 FT	600	2	1	3,040.000	6229778



For further stabilisation, additional supports should be planned for the area of the fittings.  
Horizontal T branch piece, for all wide span cable ladders of 160 mm side height.

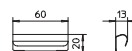
# WKLG wide span cable ladder system, side height 200

VA 2B

## Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

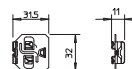


VA 2B

## Hold-down clamp for separating retainer fastening

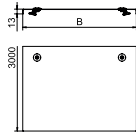
Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KL A2	30	0.512	6062284

Hold-down clamp for screwless fastening of the separating retainer in cable ladders.



**Cover incl. turn buckles**

St DD



Type	Dim. B mm	Metal thick- ness mm	Length mm	Pack	Weight	Item no.
				m	kg/100 m	
<b>WDRL 1116 20 DD</b>	200	1.00	3000	3	185.000	<b>6227600</b>
<b>WDRL 1116 40 DD</b>	400	1.00	3000	3	505.000	<b>6227608</b>
<b>WDRL 1116 60 DD</b>	600	1.50	3000	3	744.333	<b>6227616</b>

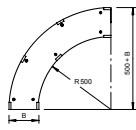
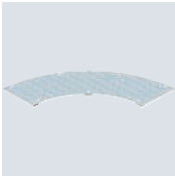
Cover with turn buckles for wide span cable trays and wide span cable ladders with side heights of 110 and 160 mm.

Take appropriate constructive protection measures if there are high wind speeds.

Transverse bead from 500 mm width.

**Cover for 90° bend WDBRL**

St DD



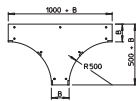
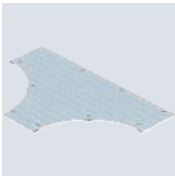
Type	Dim. B mm	Metal thick- ness mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>WDBRL 90 20 DD</b>	200	1.00	1	165.100	<b>6231527</b>
<b>WDBRL 90 40 DD</b>	400	1.00	1	548.000	<b>6231543</b>
<b>WDBRL 90 60 DD</b>	600	1.00	1	945.000	<b>6231578</b>

As the connector is mounted from the outside, the fitting cover is 300 mm shorter than the corresponding fitting. This must be considered when installing the track elements.

Cover for wide span 90° bend with pre-mounted turn buckles.

**Cover for WDTRL T branch piece**

St DD

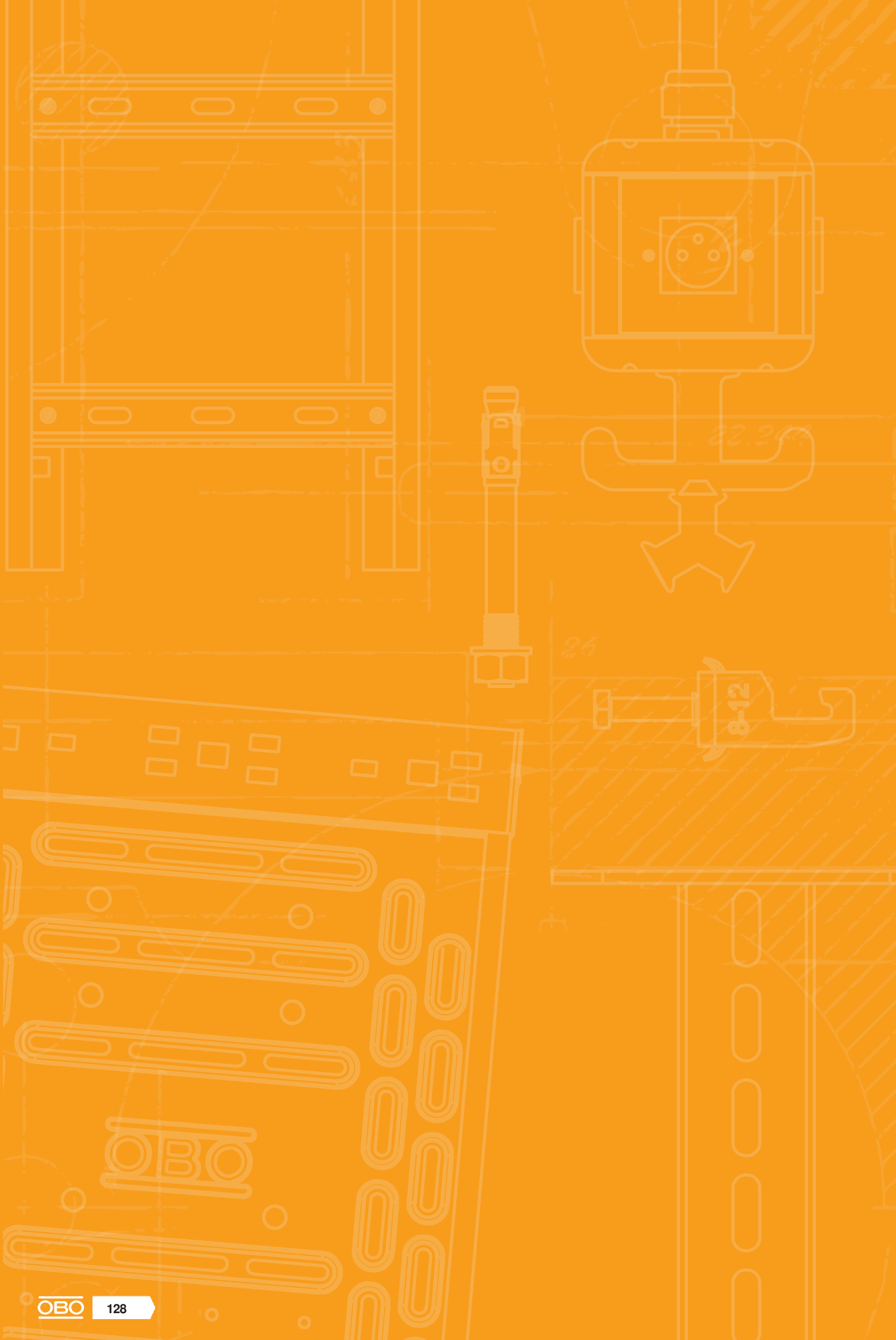


Type	Dim. B mm	Metal thick- ness mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>WDTRL 400 DD</b>	400	1.00	1	1,085.000	<b>6231683</b>
<b>WDTRL 600 DD</b>	600	1.25	1	1,729.500	<b>6231705</b>

As the connector is mounted from the outside, the fitting cover is 300 mm shorter than the corresponding fitting. This must be considered when installing the track elements.


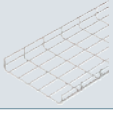

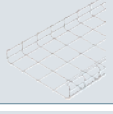
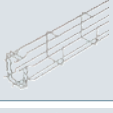

Cover for wide span T branch piece with pre-mounted turn buckles.



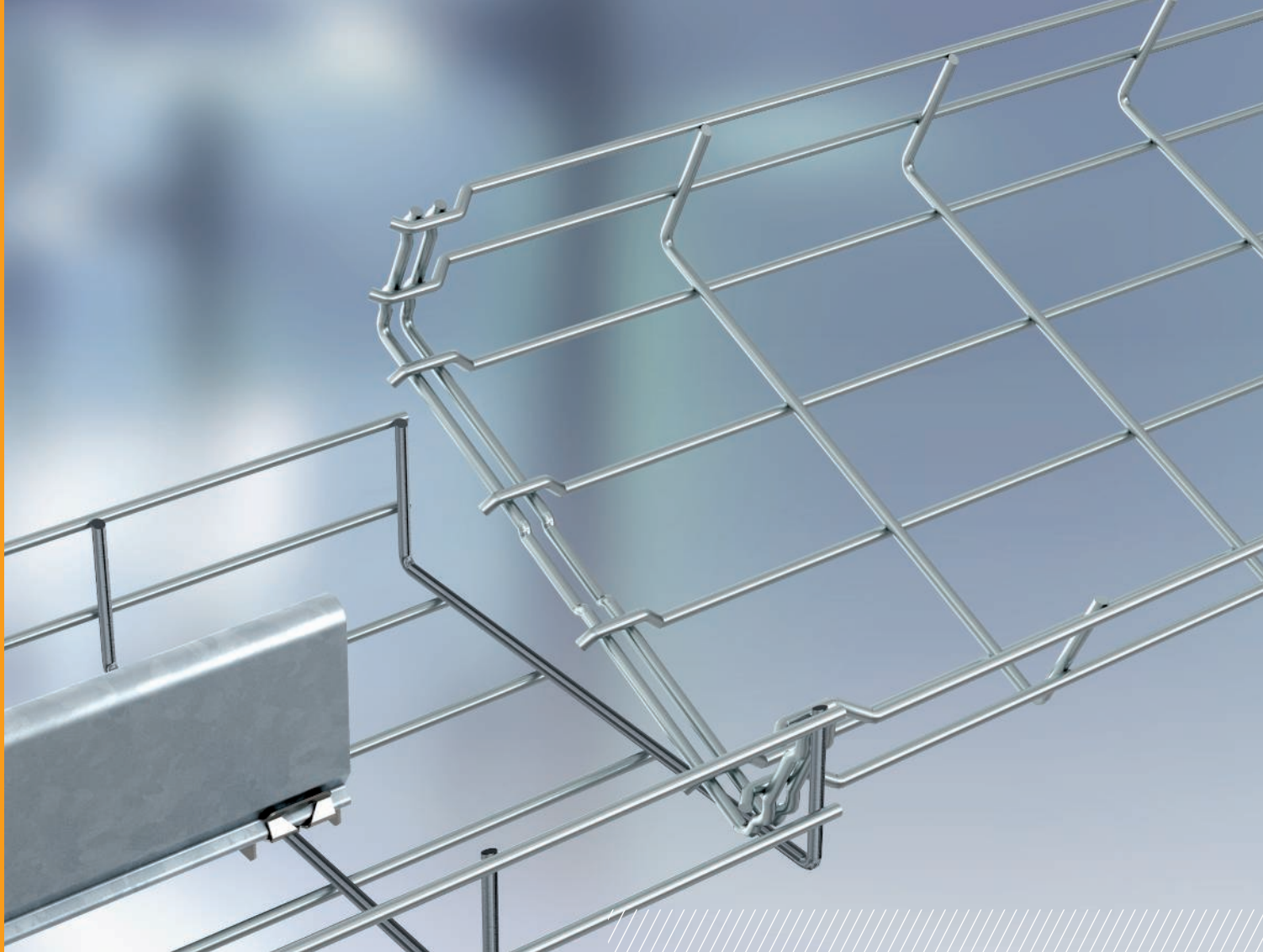




# Mesh cable trays

	Side height 35 mm	130
	Side height 55 mm	140
	Side height 105 mm	150
	C mesh cable tray	154
	G mesh cable tray	158
	System accessories, mesh cable tray systems	162



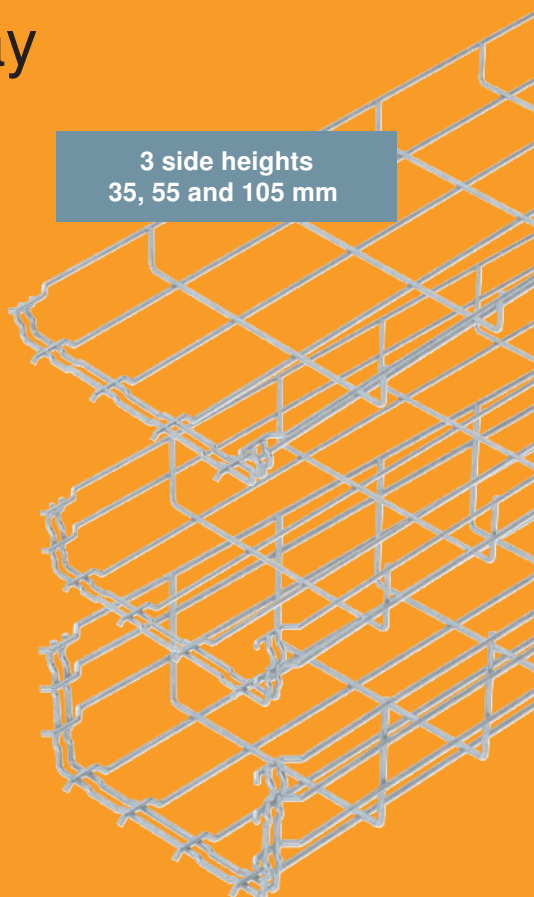


## GR-Magic® mesh cable tray

The GR-Magic® mesh cable tray system with shaped connector for screwless quick mounting guarantees the shortest possible mounting times, even for complex installation operations.

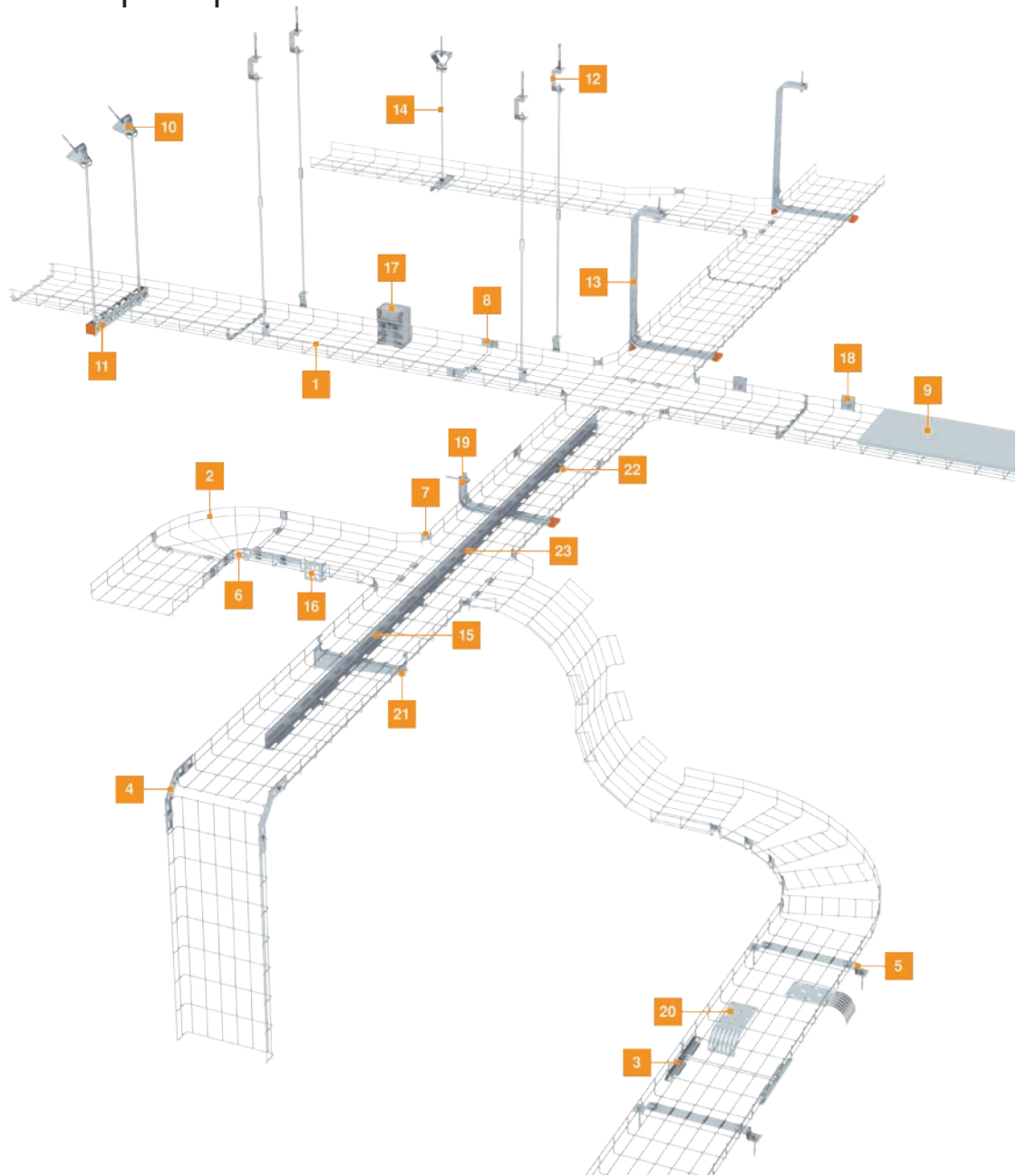
- Fast and secure connection through plug connection
- Locking system accessory, such as the barrier strips
- Maintenance of electrical function, tested
- Equipotential bonding without additional components
- VDE and UL approved mesh cable tray system

3 side heights  
35, 55 and 105 mm



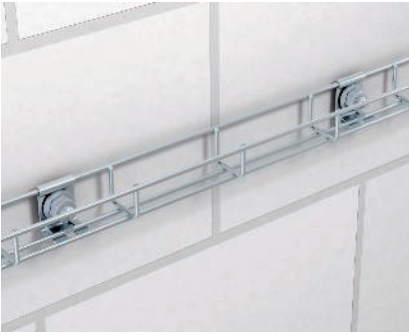
# GR-Magic® mesh cable tray

## Installation principle



1	GR-Magic mesh cable tray	13	TP suspended support
2	90° mesh cable tray bend	14	Centre suspension, GMS
3	Mesh cable tray connector, long	15	Barrier strip
4	90° mounting bracket	16	Mounting plate
5	Stand-off bracket	17	Fastening element for junction box
6	Slotted steel strap, bent	18	Wall and ceiling bracket
7	Corner connector	19	Wall and support bracket TPSAG
8	Joint connector	20	Cable exit plate
9	Cover, unperforated	21	AWG 15 wall and support bracket
10	Ceiling clamp, variable	22	Hold-down clamp for barrier strip fastening
11	Mounting rail, MS 41	23	Barrier strip connector
12	Ceiling bracket		

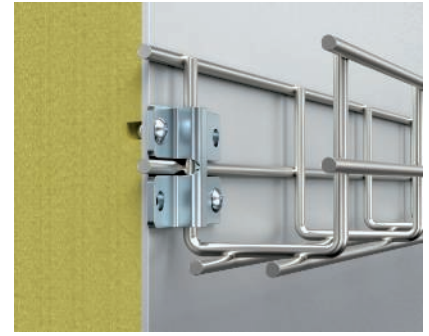
## Mounting aid



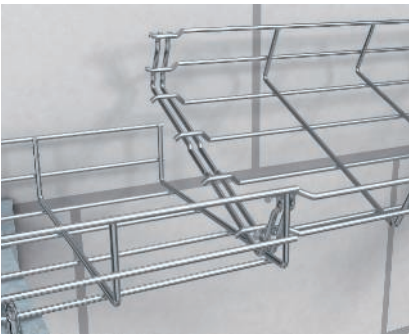
**Wall mounting GRM 35 50**  
Wall mounting for direct wall fastening of mesh cable trays GRM 35 50.



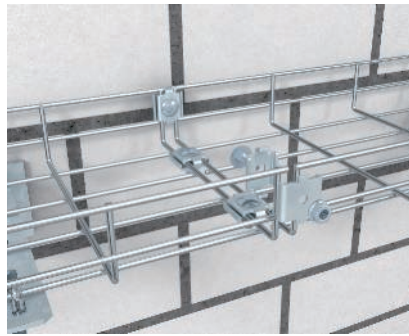
**Wall mounting of mesh cable trays**  
Wall mounting of mesh cable trays with wall bracket, type K 12 1818. Maximum mesh cable tray width 200 mm.



**Wall and floor fastener WB GR**  
Fastening component for direct mounting of mesh cable trays to the wall and floor. Can be screwed or riveted on. Suitable for wire thickness of 3.9 mm.



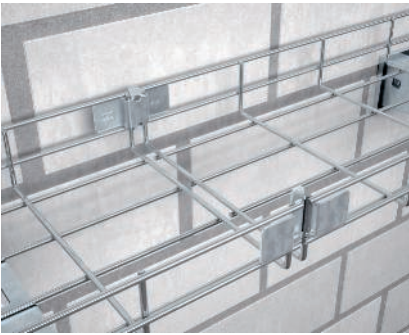
**Straight connection of Magic® mesh cable tray**  
Creation of a screwless straight connection of the mesh cable tray, type GR-Magic®, by interconnecting two stock lengths.



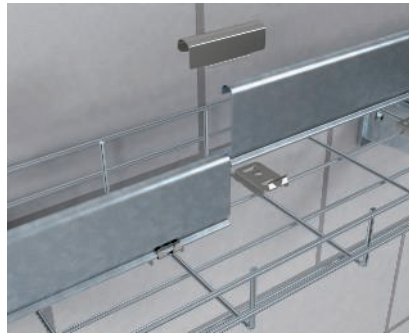
**Screwed straight connection of mesh cable trays**  
Creation of a screwed straight connection of mesh cable trays with joint connectors, type GSV 34.



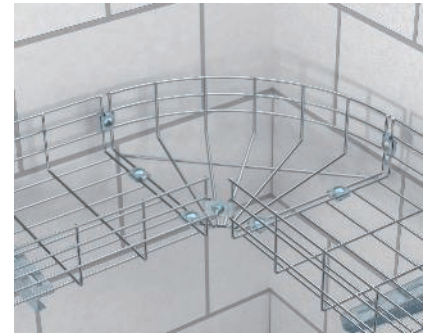
**Screwless straight connection with quick connectors**  
Creation of a screwless straight connection of mesh cable trays using a quick connector, type GRV.



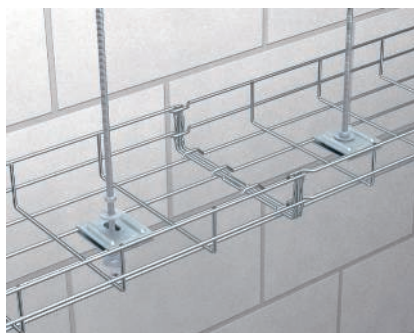
**Screwless straight connection of mesh cable trays**  
Creation of a screwless straight connection of mesh cable trays with joint connectors, type GRS.



**Screwless barrier strip fastening**  
Screwless fastening of a barrier strip in mesh cable trays with hold-down clamp, type KS GR. The screwless straight connection of the barrier strip is made using the barrier strip connector TSGV.



**Installation of a mesh cable tray bend**  
Mounting of a mesh cable tray bend, type GRB 90.



#### Centre suspension

Suspension of a mesh cable tray using a threaded rod, type 2078, and a wall and floor fastener, type K12 1818. Use with widths of up to 200 mm.



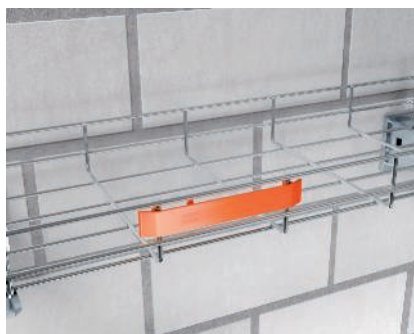
#### Side holder

Installation of the conduit take off bracket, type SH KAB, for accepting cable glands.



#### Mounting plate

Screwless quick fastening of the mounting plate, type MP UNI.



#### Identification plate

Mounting of the identification plate, type KS-GR, in the side rail of the mesh cable tray.



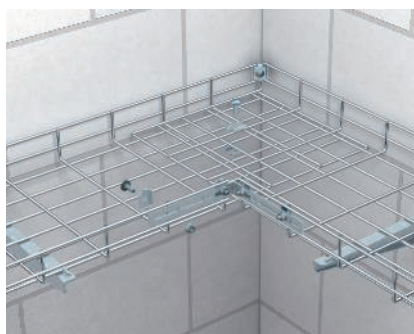
#### Cover mounting

Cover with snap-on function for easy locking to the mesh cable tray.



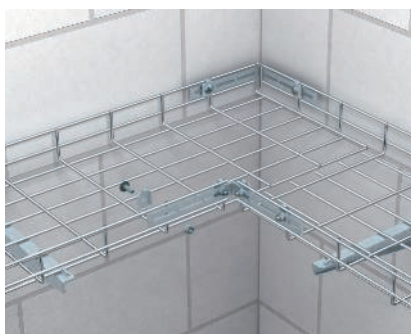
#### Installation of mesh angle

Fastening of the mesh angle, type GW 40/80, to steel girders using beam clamps, type KL 20 or KL 30.



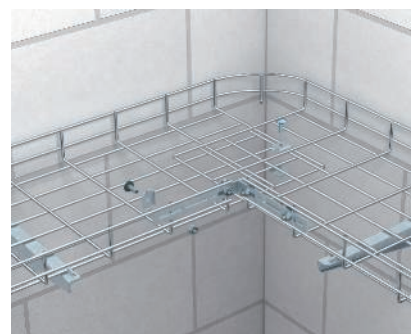
#### Creation of a mesh cable tray bend – angular, overlapping

After the mesh cable trays have been cut to size, they can, together with joint connectors, type GSV 34, and a bent slotted steel strap, be installed overlapping to form an angular mesh cable tray bend.



#### Creation of a mesh cable tray bend – angular

After the mesh cable trays have been cut to size, they can, together with joint connectors, type GSV 34, and a bent slotted steel strap, be installed as a non-overlapping, angular mesh cable tray bend.



#### Creation of a mesh cable tray bend – round, overlapping

After the mesh cable trays have been cut to size, they can, together with joint connectors, type GSV 34, and a bent slotted steel strap, be installed overlapping to form a round mesh cable tray bend.



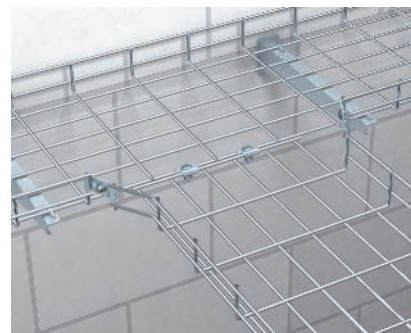
#### Creation of a mesh cable tray bend - round

Cutting out every second grid allows the creation of mesh cable tray bends with a larger radius. Fixing takes place using corner connectors, type GEV 36.



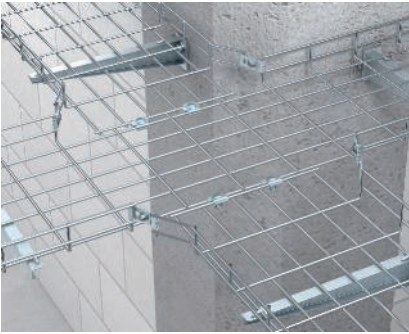
#### Rising and falling bends

Rising and falling vertical bends can be created by cutting into every second grid of the mesh cable tray edge and bending the mesh cable tray accordingly.



#### Creation of a mesh cable tray tee

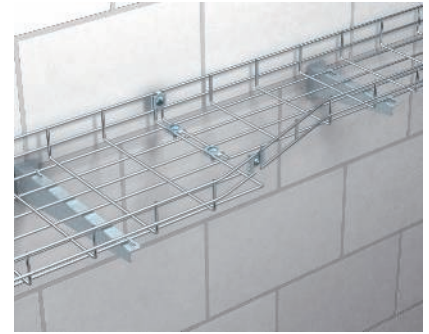
After cutting the side rails and bending the straps, the corner connector, type GEV 36, and the joint connector, type GSV 34, can be used to create tees.



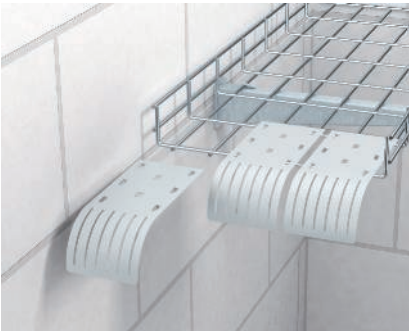
**Creation of a mesh cable tray cross-over**  
 After cutting the side rails and bending the straps, the corner connector, type GEV 36, and the joint connector, type GSV 34, can be used to create cross-overs.



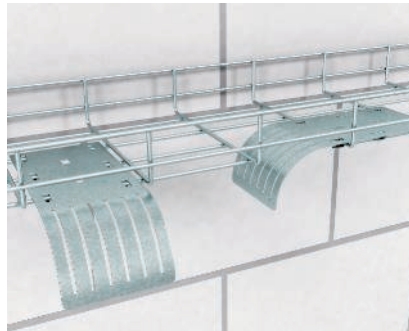
**Creation of a vertical exit**  
 After cutting the mesh cable tray base, the vertically branching, cut mesh cable tray can be fixed using the joint connector, type GSV 34.



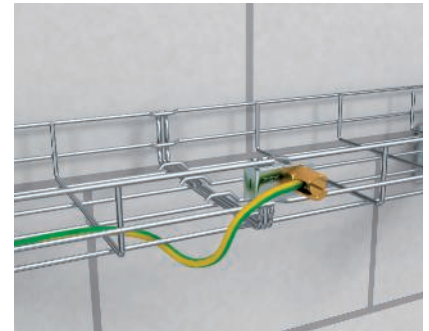
**Creation of a reduction**  
 Reductions are possible by single-sided cutting of the different mesh cable tray widths, bending the flaps in the required direction and using the corner connectors, type GEV 36, and the joint connector, type GSV 34.



**Mesh cable tray with cable exit plate**  
 Cable exit plate for screwless mounting in mesh cable trays. The cable exit plate allows maintenance of pre-specified bend radii.



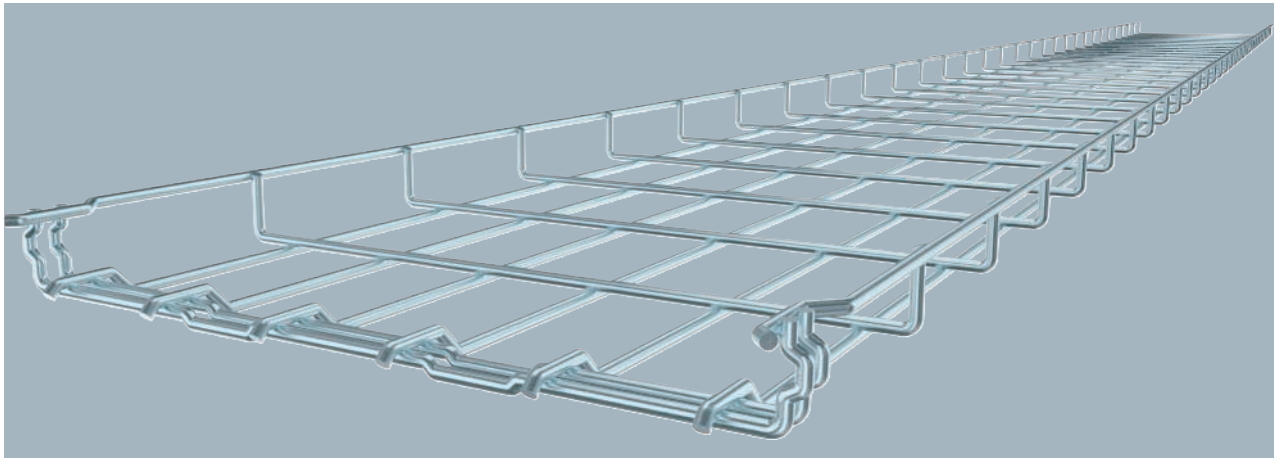
**Mesh cable tray with cable exit plate**  
 The cable exit plate can be installed in length-wise and transverse directions.



**Earthing terminal/earth connection**  
 Earthing terminal for fastening the equipotential bonding wire to the cable support system.

St G

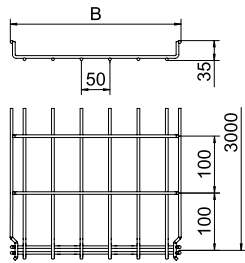
Mesh cable tray GR-Magic® 35



Mesh cable tray with shaped connector of side height 35 mm.

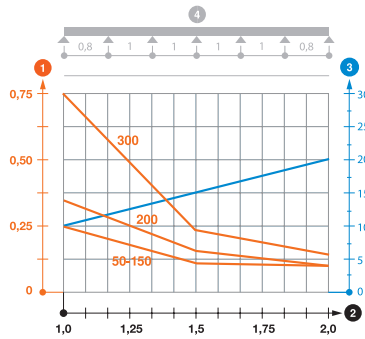
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
GRM 35 100 G	100	3.9	3	50.333	6000062

Dimensions



Type	Length mm	Dim. B mm	Usable
			cross-section cm <sup>2</sup>
GRM 35 100 G	3000	100	35

Load



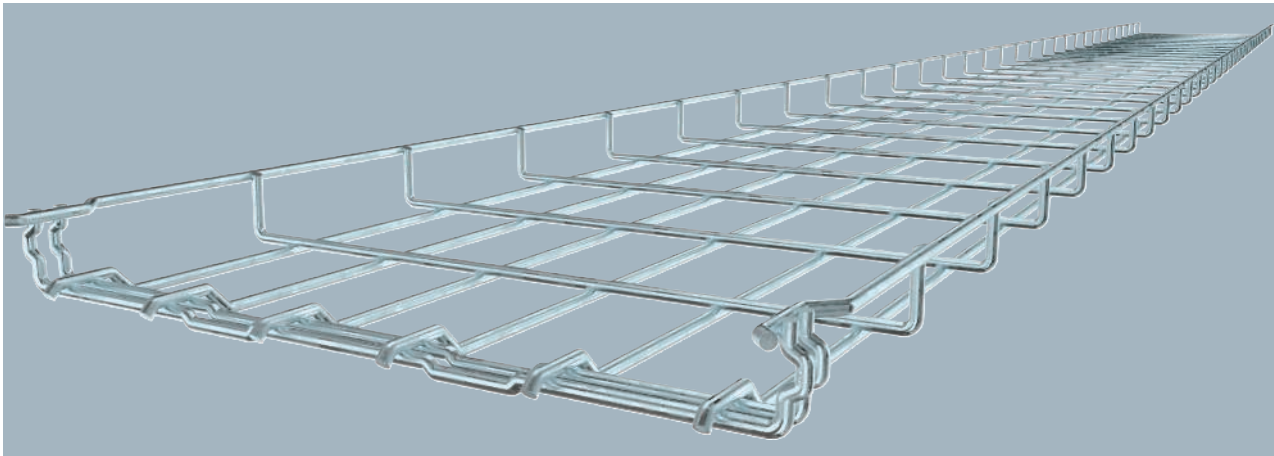
GRM 35 100 G	1.0 m	1.5 m	2.0 m
	kN/m	kN/m	kN/m
	0.25	0.11	0.1

Load diagram, GR-Magic mesh cable tray, type GRM 35

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Mesh cable tray GR-Magic® 35

St FT



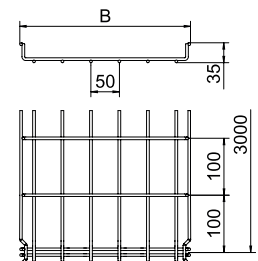
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
GRM 35 100 FT	100	3.9	3	50.333	6000071
GRM 35 150 FT	150	3.9	3	64.333	6000072
GRM 35 200 FT	200	3.9	3	78.333	6000073

No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm (exception: GRM 35/50 = 20 x 100 mm).

Mesh cable tray with shaped connector of side height 35 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.

Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
GRM 35 150 FT	3000	150	52.5
GRM 35 200 FT	3000	200	70

### Dimensions

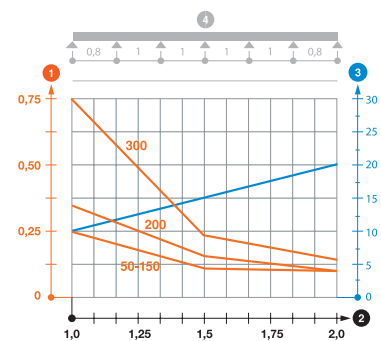


Type	1.0 m	1.5 m	2.0 m
	kN/m	kN/m	kN/m
GRM 35 100 FT	0.25	0.11	0.1
GRM 35 150 FT	0.25	0.11	0.1
GRM 35 200 FT	0.3	0.14	0.3

### Load

#### Load diagram, GR-Magic mesh cable tray, type GRM 35

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width





St FS

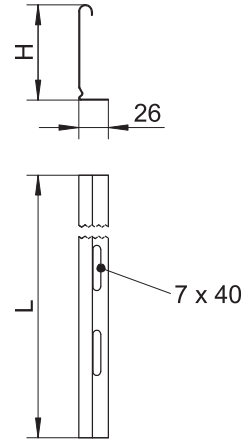
Separating retainer 30

Type	Metal			Pack m	Weight kg/100 m	Item no.
	Dim. H mm	thick- ness mm	Dim. L mm			
TSG 30 FS	30	0.75	3000	3	38.000	6062050



Separating retainer for separation of cables of different voltages or functions.

Dimensions



VA 2B

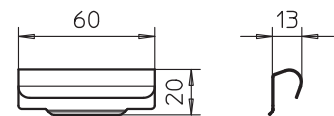
Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970



Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

Dimensions



Hold-down clamp for separating retainer fastening in GRM

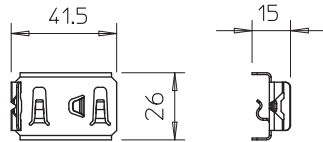
VA 2B



Type	Pack Piece	Weight kg/100 pc.	Item no.
KS GR A2	30	0.830	6062282

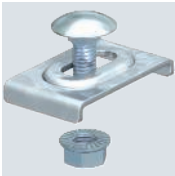
Hold-down clamp for fastening separating retainer in mesh cable trays.

Dimensions



GKT 38 hold-down clamp

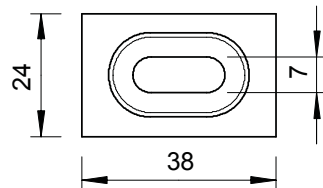
St G



Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 G	20	2.123	6017037

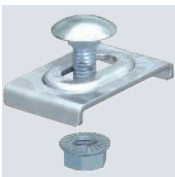
Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

Dimensions



GKT 38 hold-down clamp

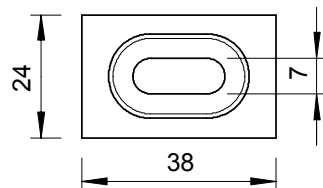
St FT



Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 FT	20	2.123	6017061

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

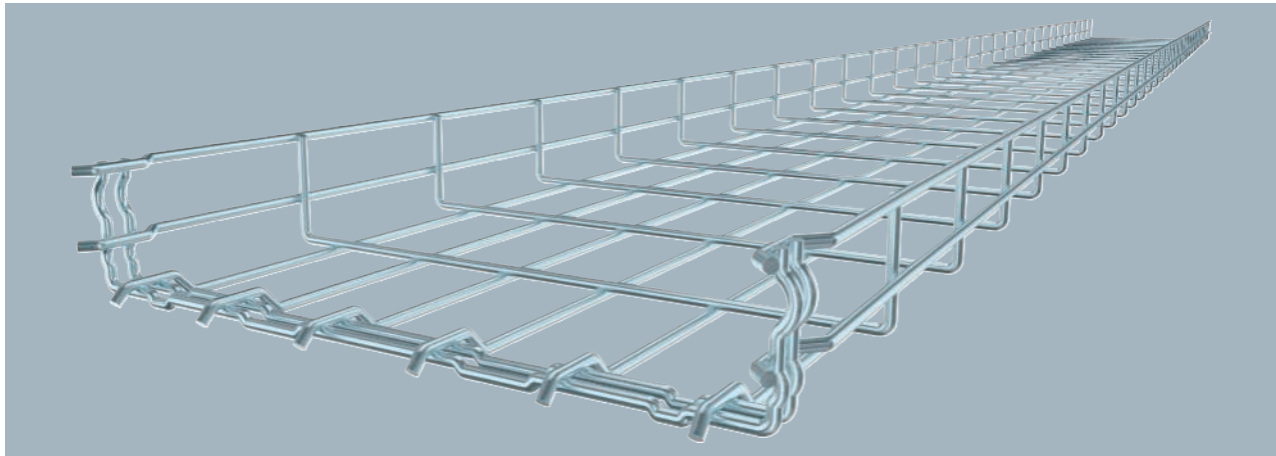
Dimensions





## GR-Magic® 55 mesh cable tray

St G



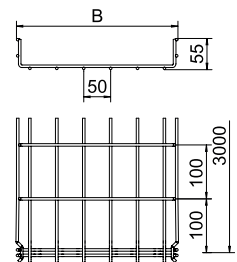
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm BS			
GRM 55 50 G	50	3.9	3	67.000	6001441
GRM 55 100 G	100	3.9	3	72.000	6001442
GRM 55 150 G	150	3.9	3	85.667	6001444
GRM 55 200 G	200	3.9	3	100.667	6001446
GRM 55 300 G	300	4.8	3	192.333	6001448
GRM 55 400 G	400	4.8	3	234.667	6001450
GRM 55 500 G	500	4.8	3	276.667	6001452
GRM 55 600 G	600	4.8	3	320.000	6001454

Mesh cable tray with shaped connector of side height 55 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
You can find detailed information regarding the UL classification in the respective certification.

No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm (exception: GRM 55/50 = 20 x 100 mm). Tested for the maintenance of electrical function according to DIN 4102 Part 12 (type: GRM 55 200 4.8 G, GRM 55 300 G, GRM 55 400 G, mounting work and parameters according to valid test certificate).  
Tested for installation above suspended fire protection ceilings (type: GRM 55 100 G, GRM 55 200 G, GRM 55 300 G, GRM 55 400 G, fire load 30 minutes, mounting work and parameters according to fire protection reports).

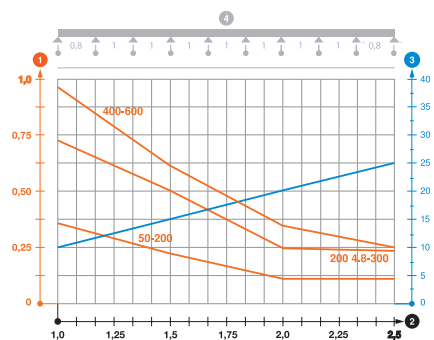
Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
GRM 55 100 G	3000	100	40
GRM 55 150 G	3000	150	63
GRM 55 200 G	3000	200	87
GRM 55 300 G	3000	300	129
GRM 55 400 G	3000	400	175
GRM 55 500 G	3000	500	220
GRM 55 600 G	3000	600	265

### Dimensions



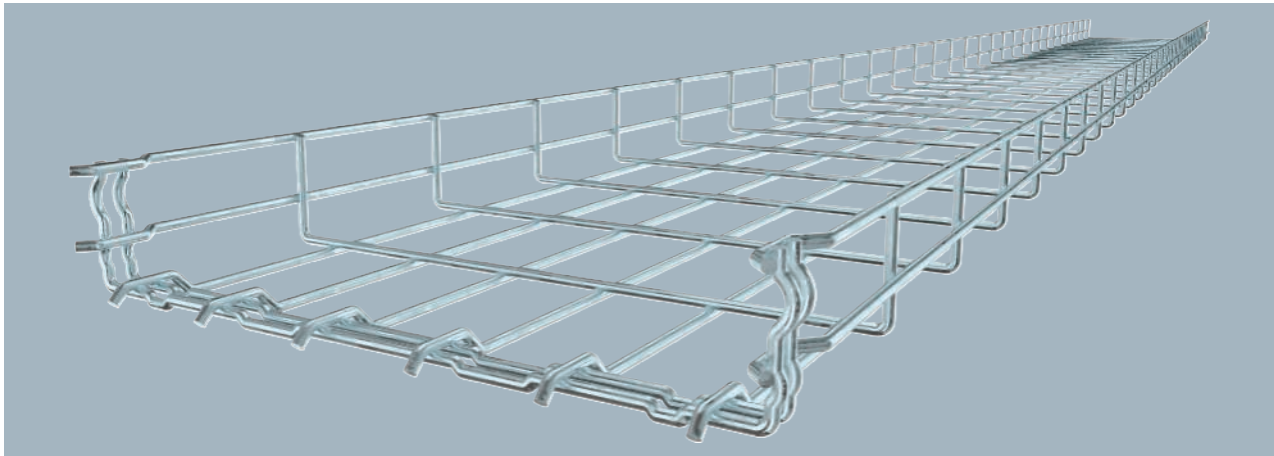
Type	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
GRM 55 50 G	0.35	0.2	0.1	0.1
GRM 55 100 G	0.35	0.2	0.1	0.1
GRM 55 150 G	0.35	0.2	0.1	0.1
GRM 55 200 G	0.35	0.2	0.1	0.1
GRM 55 300 G	0.7	0.5	0.25	0.2
GRM 55 400 G	0.9	0.6	0.3	0.25
GRM 55 500 G	0.9	0.6	0.3	0.25
GRM 55 600 G	0.9	0.6	0.3	0.25

### Load



### Load diagram, GR-Magic mesh cable tray, type GRM 55

- ① Permitted cable tray/ladder load in kN/m without man load
  - ② Support width in m
  - ③ Rail bend in mm at permitted kN/m
  - ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
  - Strut bend curve according to support width

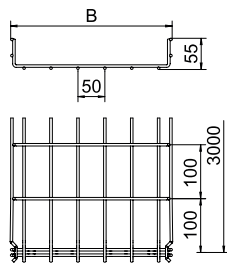


Mesh cable tray with shaped connector of side height 55 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
You can find detailed information regarding the UL classification in the respective certification.

No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm (exception: GRM 55/50 = 20 x 100 mm).

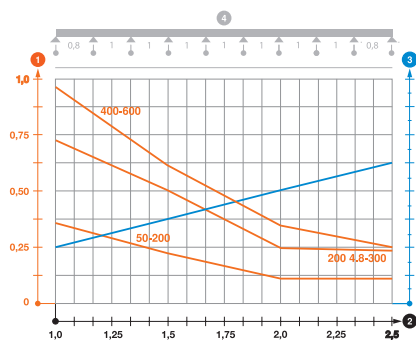
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
GRM 55 100 FT	100	3.9	3	74.667	6001416
GRM 55 200 FT	200	3.9	3	102.000	6001420
GRM 55 600 FT	600	4.8	3	331.333	6001436

Dimensions



Type	Length mm	Usable Dim. cross-section	
		B mm	cm²
GRM 55 100 FT	3000	100	40
GRM 55 200 FT	3000	200	87
GRM 55 600 FT	3000	600	265

Load



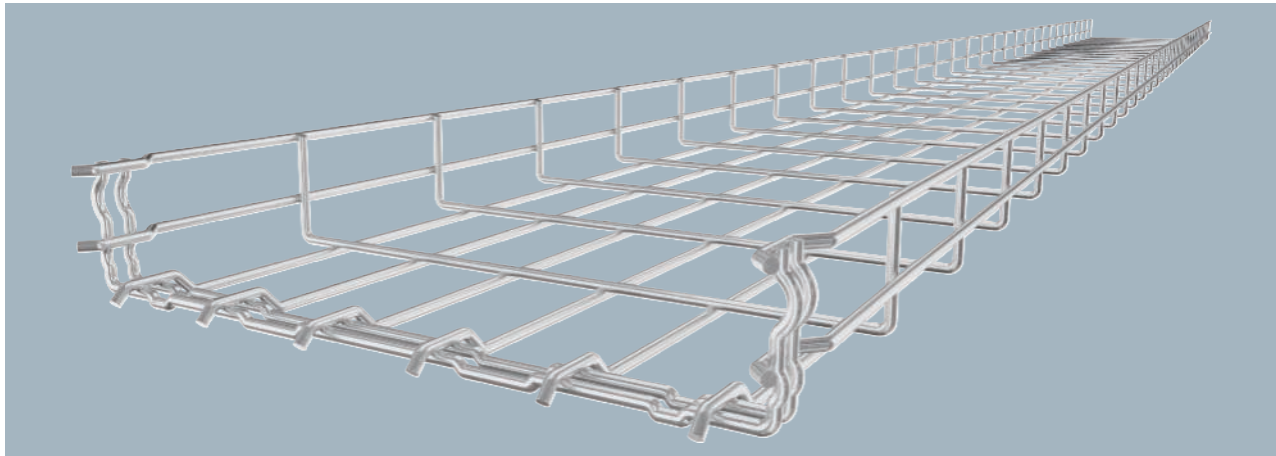
	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
GRM 55 100 FT	0.35	0.2	0.1	0.1
GRM 55 200 FT	0.35	0.2	0.1	0.1
GRM 55 600 FT	0.9	0.6	0.3	0.25

Load diagram, GR-Magic mesh cable tray, type GRM 55

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Mesh cable tray GR-Magic® 55

A2 2B

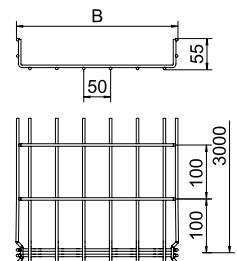


Type	Wire			Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm	BS			
GRM 55 50 A2	50	3.9		3	67.000	6001070
GRM 55 150 A2	150	3.9		3	85.667	6001074
GRM 55 600 A2	600	4.8		3	320.000	6001085

Mesh cable tray with shaped connector of side height 55 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm (exception: GRM 55/50 = 20 x 100 mm).

Type	Length mm	Usable	
		Dim. B mm	cross-section cm²
GRM 55 50 A2	3000	52	16
GRM 55 150 A2	3000	150	63
GRM 55 600 A2	3000	600	265

### Dimensions

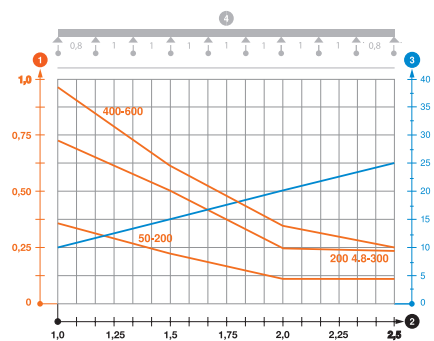


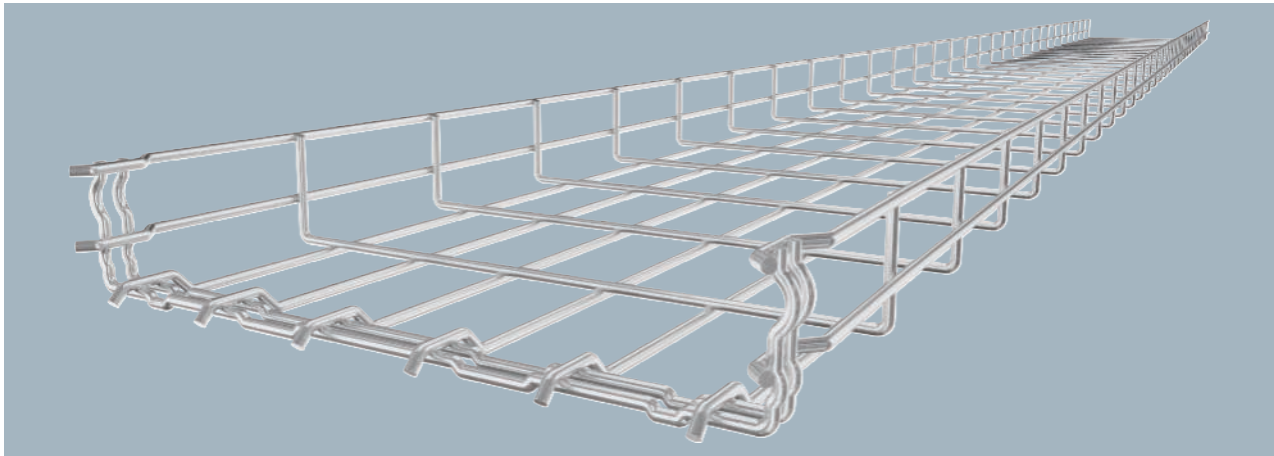
	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
GRM 55 50 A2	0.35	0.2	0.1	0.1
GRM 55 150 A2	0.35	0.2	0.1	0.1
GRM 55 600 A2	0.9	0.6	0.3	0.25

### Load diagram, mesh cable tray GRM 55 VA

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

### Load

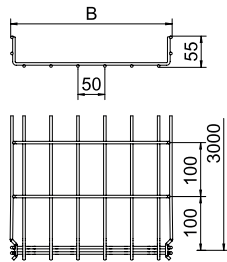




Mesh cable tray with shaped connector of side height 55 mm.  
 Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
 No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm (exception: GRM 55/50 = 20 x 100 mm).

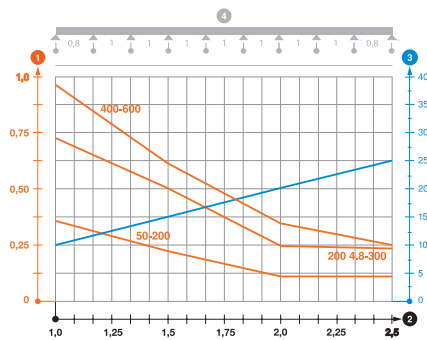
Type	Wire			Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm	BS			
GRM 55 50 A4	50	3.9		3	67.000	6001087
GRM 55 100 A4	100	3.9		3	72.000	6001088
GRM 55 200 A4	200	3.9		3	99.000	6001091
GRM 55 400 A4	400	4.8		3	234.667	6001095

Dimensions



Type	Length mm	Dim. B mm	Usable
			Dim. cross-section cm <sup>2</sup>
GRM 55 50 A4	3000	52	16
GRM 55 100 A4	3000	100	40
GRM 55 200 A4	3000	200	87
GRM 55 400 A4	3000	400	175

Load



	1.0 m	1.5 m	2.0 m	2.5 m
	kN/m	kN/m	kN/m	kN/m
GRM 55 50 A4	0.35	0.2	0.1	0.1
GRM 55 100 A4	0.35	0.2	0.1	0.1
GRM 55 200 A4	0.35	0.2	0.1	0.1
GRM 55 400 A4	0.9	0.6	0.3	0.25

Load diagram, mesh cable tray GRM 55 VA

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Separating retainer 45

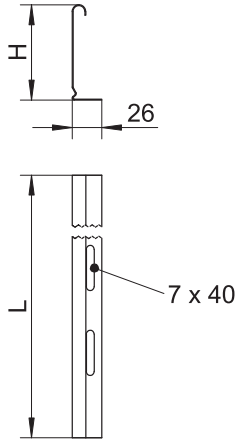
St FS



Type	Metal			Pack m	Weight kg/100 m	Item no.
	Dim. H mm	thick- ness mm	Dim. L mm			
TSG 45 FS	45	0.75	3000	3	46.700	6062033

Separating retainer for separation of cables of different voltages or functions.

### Dimensions



Type	Dim.	Dim.
	H mm	L mm
TSG 45 FS	45	3000

## Separating retainer connector

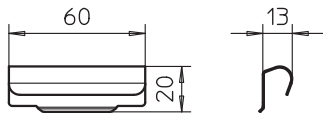
VA 2B



Type	Pack Piece	Weight kg/100 pc.	Item no.

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

### Dimensions





VA 2B

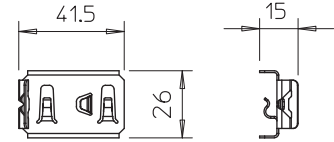
### Hold-down clamp for separating retainer fastening in GRM

Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
KS GR A2	30	0.830	6062282

Hold-down clamp for fastening separating retainer in mesh cable trays.



#### Dimensions

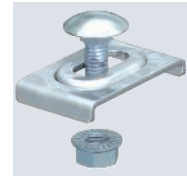


St G

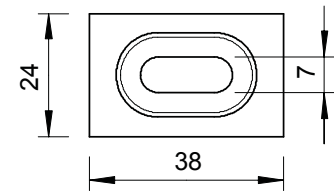
### GKT 38 hold-down clamp

Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
GKT 38 G	20	2.123	6017037

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.



#### Dimensions

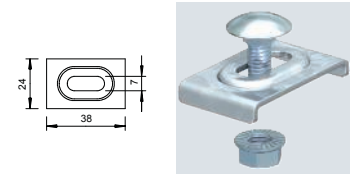


St FT

### GKT 38 hold-down clamp

Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
GKT 38 FT	20	2.123	6017061

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

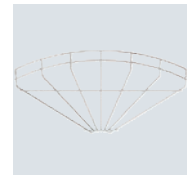
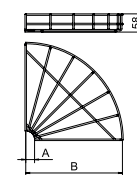


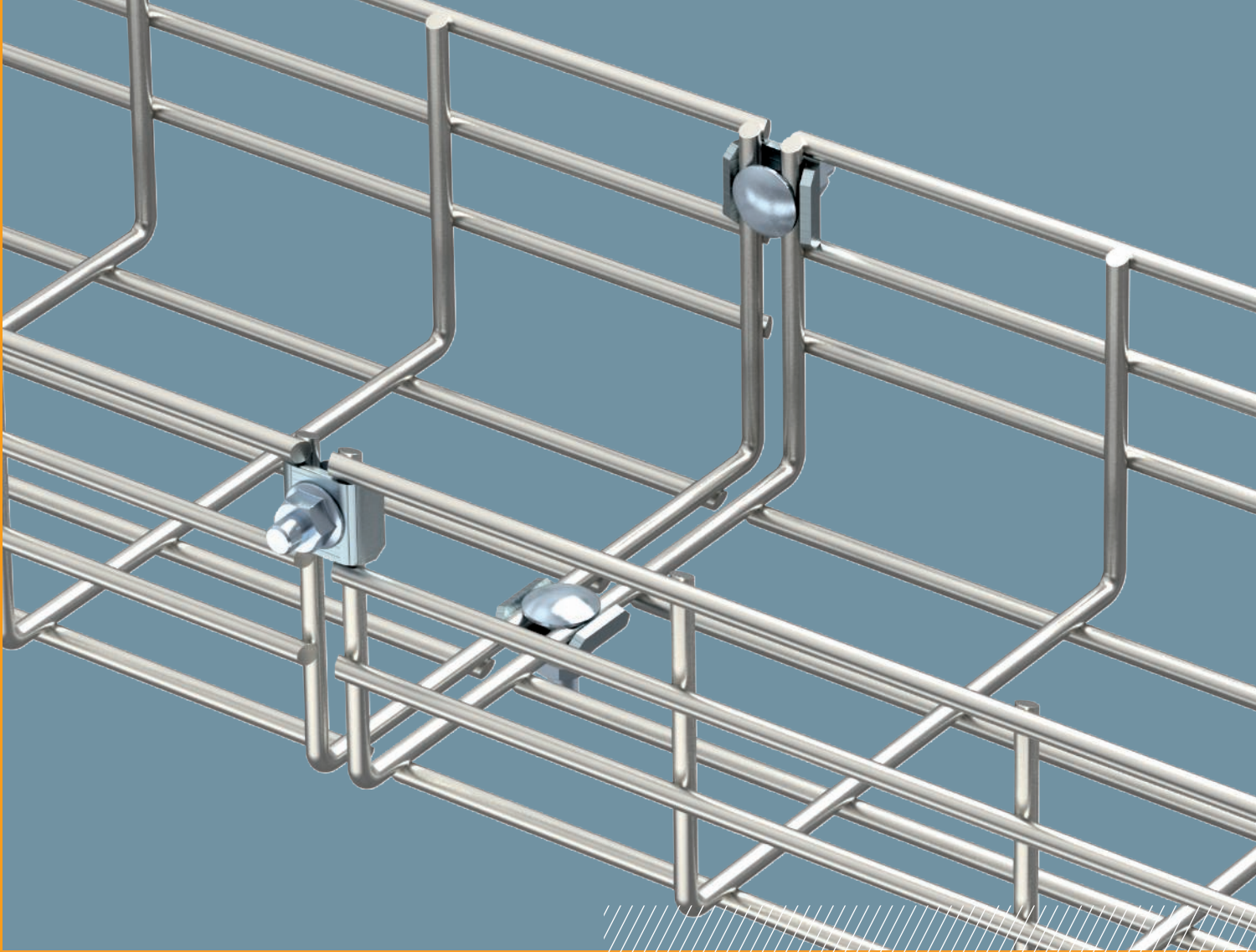
St G

### 90° mesh cable tray bend, 55

Type	Wire		Pack	Weight	Item no.
	Width	Ø			
	mm	mm	Piece	kg/100 pc.	
GRB 90 560 G	600	4.8	1	114.100	6001971

90° bend, horizontal, for all mesh cable trays of 55 mm side height.

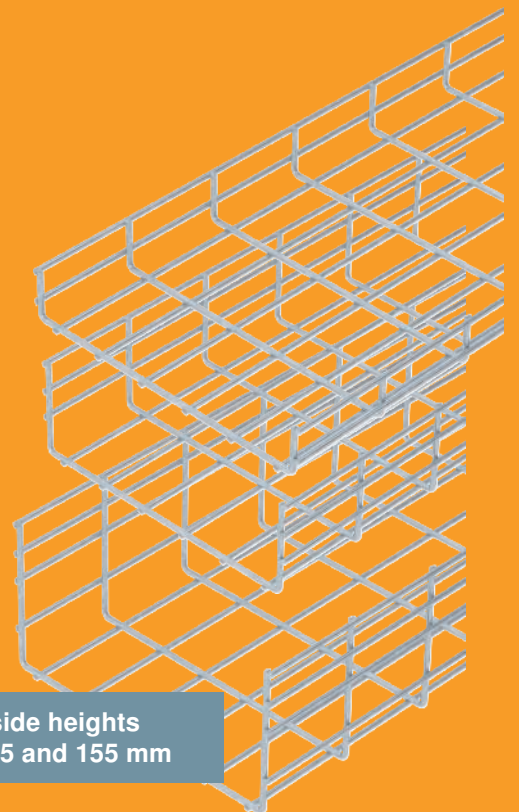




## Heavy-duty SGR mesh cable tray made of 6 mm wire

Today, due to the wide range of applications, the requirements for mesh cable trays differ a great deal. Besides simple mounting, a high load capacity, dirt-repelling qualities, good ventilation behaviour and high-quality surface refinement are particularly in demand.

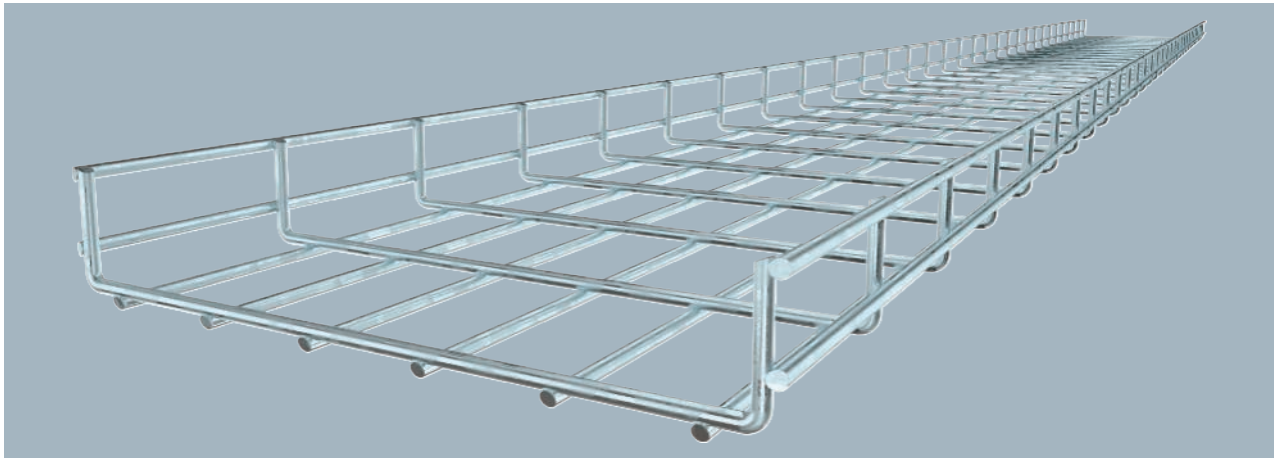
The new heavy-duty mesh cable tray of type SGR, made of 6 mm-thick wire in a U profile, combines many advantages all at the same time. The strong wire design means that the SGR, with its low intrinsic weight, can withstand load capacities of up to 110% more than the comparable mesh cable trays of competitors and can thus also be used for larger support spacings of up to 4.0 m.



3 side heights  
55, 105 and 155 mm

St FT

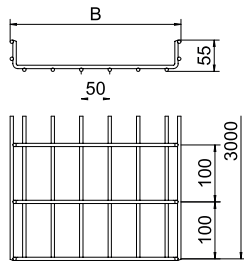
## Heavy-duty cable tray SGR 55



Mesh cable tray made of spot-welded steel wire of side height 55 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
The grid width is 50 x 100 mm.

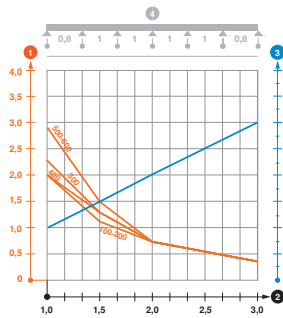
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
SGR 55 200 FT	200	6	3	238.667	6000209
SGR 55 400 FT	400	6	3	372.667	6000451
SGR 55 600 FT	600	6	3	507.000	6000775

### Dimensions



Type	Length mm	Usable Dim.	
		B mm	cross-section cm <sup>2</sup>
SGR 55 200 FT	3000	200	87
SGR 55 400 FT	3000	400	175
SGR 55 600 FT	3000	600	265

### Load

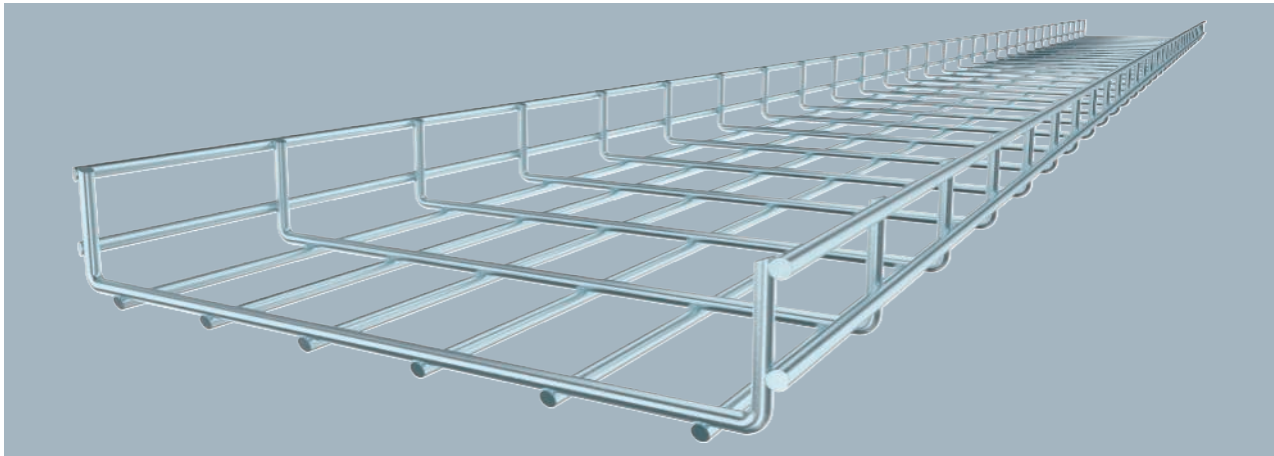


	1.0 m	1.5 m	2.0 m	3.0 m
	kN/m	kN/m	kN/m	kN/m
SGR 55 200 FT	2	1.15	0.75	0.4
SGR 55 400 FT	2.3	1.3	0.75	0.4
SGR 55 600 FT	2.9	1.5	0.75	0.4

#### Load diagram, mesh cable tray, type SGR 55

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Heavy-duty cable tray SGR 55

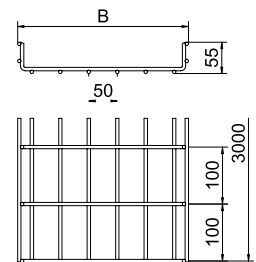


Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
SGR 55 100 G	100	6	3	166.333	6005470
SGR 55 200 G	200	6	3	230.067	6005474
SGR 55 300 G	300	6	3	293.233	6005476
SGR 55 500 G	500	6	3	426.333	6005480
SGR 55 600 G	600	6	3	491.667	6005482

Mesh cable tray made of spot-welded steel wire of side height 55 mm.  
 Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
 The grid dimension is 50 x 100 mm.  
 Stainless steel version on request.

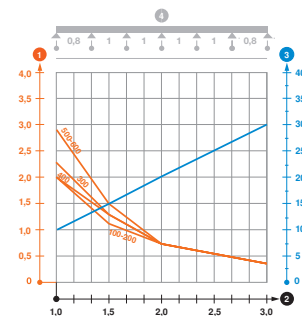
Type	Length mm	Dim. B mm	Usable cross- section cm <sup>2</sup>
SGR 55 100 G	3000	100	40
SGR 55 200 G	3000	200	87
SGR 55 300 G	3000	300	129
SGR 55 500 G	3000	500	220
SGR 55 600 G	3000	600	265

### Dimensions



	1.0 m	1.5 m	2.0 m	3.0 m
	kN/m	kN/m	kN/m	kN/m
SGR 55 100 G	2	1.15	0.75	0.4
SGR 55 200 G	2	1.15	0.75	0.4
SGR 55 300 G	2	1.3	0.75	0.4
SGR 55 500 G	2.9	1.5	0.75	0.4
SGR 55 600 G	2.9	1.5	0.75	0.4

### Load



### Load diagram, mesh cable tray, type SGR 55

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

A2 2B

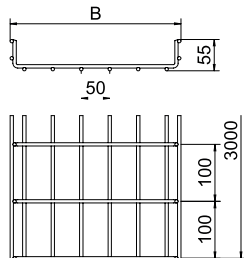
## Heavy-duty cable tray SGR 55



Mesh cable tray made of spot-welded steel wire of side height 55 mm.  
 Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
 The grid width is 50 x 100 mm.

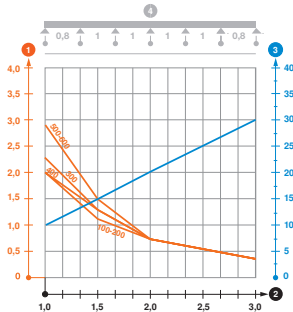
Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
SGR 55 400 A2	400	6	3	361.333	6000933
SGR 55 600 A2	600	6	3	491.667	6000958

### Dimensions



Type	Length mm	Usable Dim. cross-section	
		B mm	section cm <sup>2</sup>
SGR 55 400 A2	3000	400	175
SGR 55 600 A2	3000	600	265

### Load



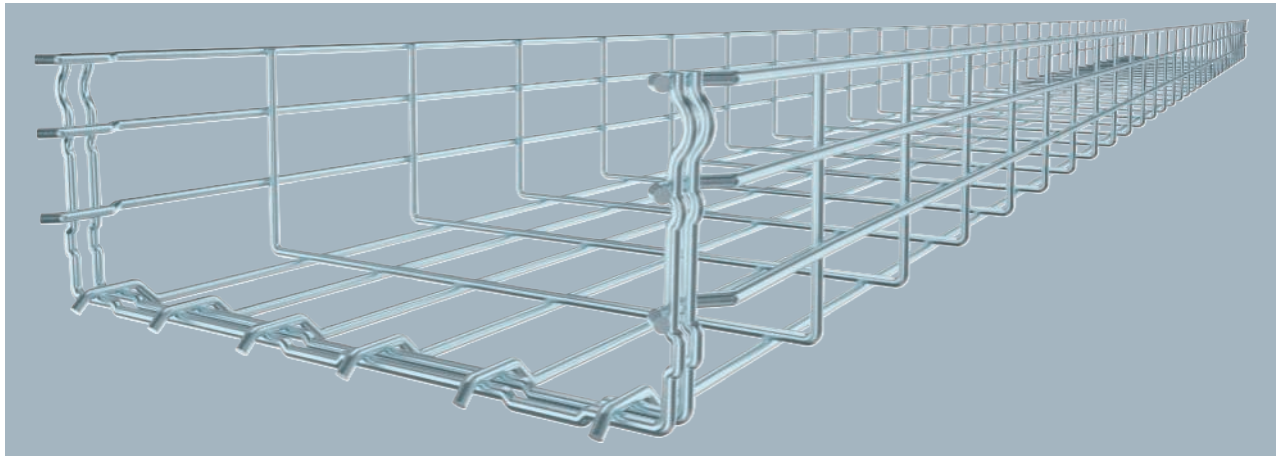
	1.0 m	1.5 m	2.0 m	3.0 m
	kN/m	kN/m	kN/m	kN/m
SGR 55 400 A2	2.3	1.3	0.75	0.4
SGR 55 600 A2	2.9	1.5	0.75	0.4

#### Load diagram, mesh cable tray, type SGR 55

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Mesh cable tray GR-Magic® 105

St G

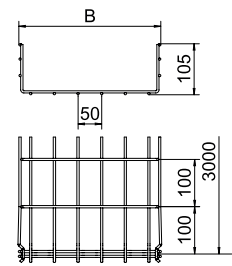


Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
GRM 105 100 G	100	3.9	3	99.333	6002402
GRM 105 150 G	150	3.9	3	111.667	6002404
GRM 105 300 G	300	4.8	3	234.667	6002408

Mesh cable tray with shaped connector of side height 105 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm.

Type	Length mm	Dim. B mm	Usable
			cross-section cm <sup>2</sup>
GRM 105 100 G	3000	100	82
GRM 105 150 G	3000	150	130
GRM 105 300 G	3000	300	268

### Dimensions

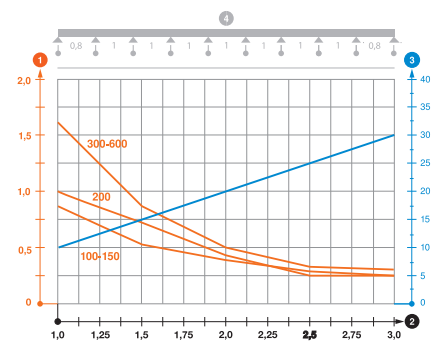


Type	1.0 m	1.5 m	2.0 m	3.0 m
	kN/m	kN/m	kN/m	kN/m
GRM 105 100 G	0.8	0.55	0.37	0.25
GRM 105 150 G	0.8	0.55	0.37	0.25
GRM 105 300 G	1.6	0.8	0.5	0.3

### Load

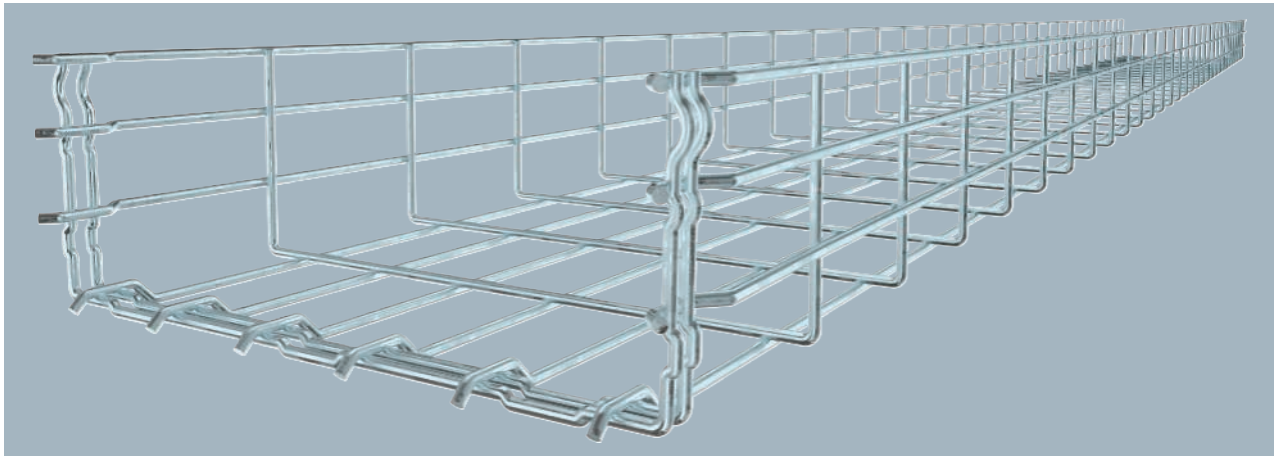
#### Load diagram, mesh cable tray, type GRM 105

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



St FT

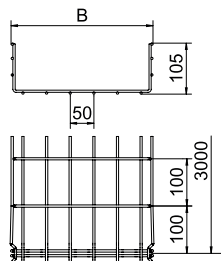
Mesh cable tray GR-Magic® 105



Mesh cable tray with shaped connector of side height 105 mm. Magnetic shield insulation without cover 15 dB, with cover 25 dB. No additional connection components are required for the mesh cable tray, it is simply interlocked. The grid width is 50 x 100 mm.

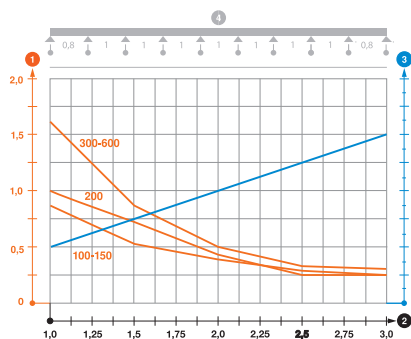
Type	Width mm	Wire Ø mm	Pack m	Weight kg/100 m	Item no.
GRM 105 200 FT	200	4.8	3	202.333	6002435

Dimensions



Type	Length mm	Dim. B mm	Usable cross-section cm²
GRM 105 200 FT	3000	200	175

Load



Type	1.0 m kN/m	1.5 m kN/m	2.0 m kN/m	3.0 m kN/m
GRM 105 200 FT	1	0.7	0.4	0.25

Load diagram, mesh cable tray, type GRM 105

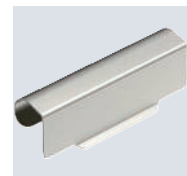
- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

VA 2B

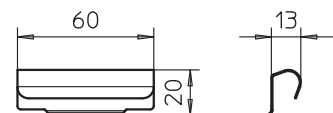
Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.



Dimensions



Hold-down clamp for separating retainer fastening in GRM

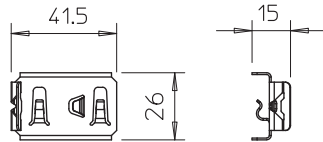
VA 2B



Type	Pack Piece	Weight kg/100 pc.	Item no.
KS GR A2	30	0.830	6062282

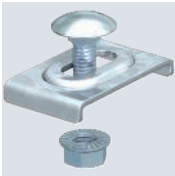
Hold-down clamp for fastening separating retainer in mesh cable trays.

Dimensions



GKT 38 hold-down clamp

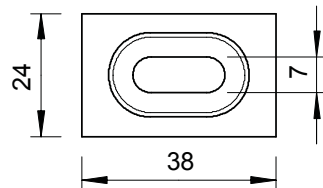
St G



Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 G	20	2.123	6017037

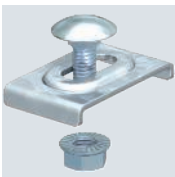
Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

Dimensions



GKT 38 hold-down clamp

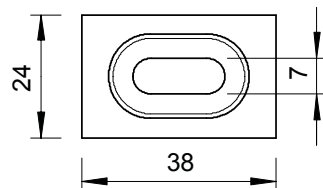
St FT



Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 FT	20	2.123	6017061

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

Dimensions



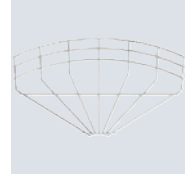
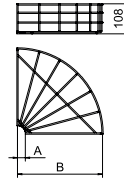


St G

## 90° mesh cable tray bend, 105

Type	Width mm	Dim.	Dim.	Dim.	Wire	Pack Piece	Weight kg/100 pc.	Item no.
		A	B	H	Ø			
GRB 90 115 G	150	28	156	108	3.9	1	18.800	6002372

90° bend, horizontal, for all mesh cable trays of 105 mm side height.



# SGR mesh cable tray system, side height 105

St FT

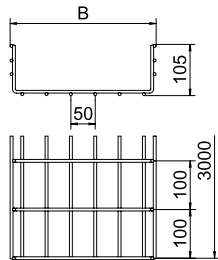
## Heavy-duty cable tray SGR 105



Mesh cable tray made of spot-welded steel wire of side height 105 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
The grid width is 50 x 100 mm.

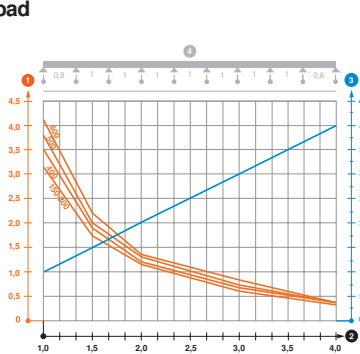
Type	Width mm	Wire Ø mm	Pack m	Weight kg/100 m	Item no.
SGR 105 200 FT	200	6	3	305.667	6003214

### Dimensions



Type	Length mm	Usable Dim. B mm	Usable cross-section cm <sup>2</sup>
SGR 105 200 FT	3000	200	175

### Load



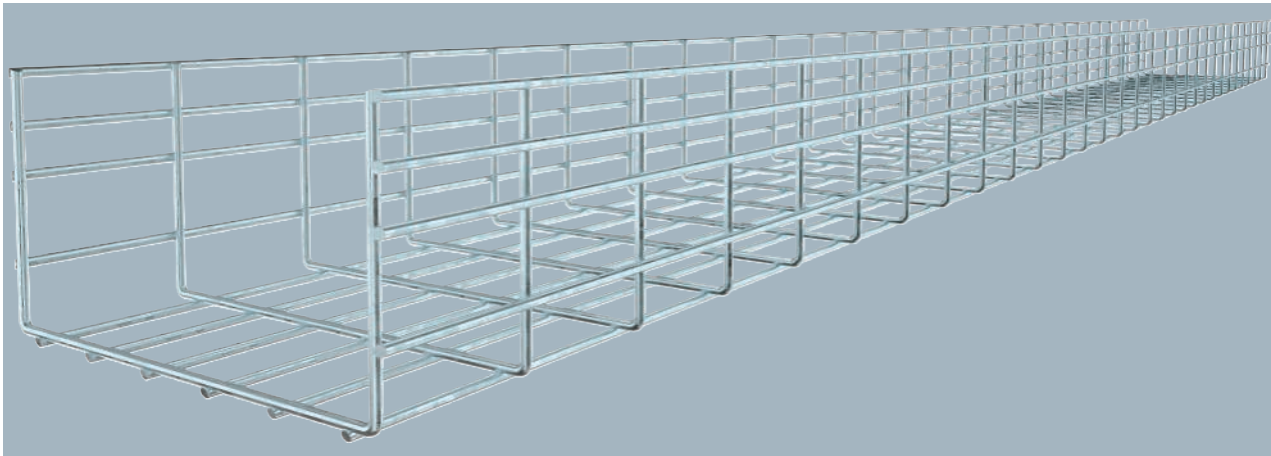
	1.0 m	1.5 m	2.0 m	3.0 m	4.0 m
SGR 105 200 FT	3.1	1.75	1.15	0.6	0.4

### Load diagram, mesh cable tray, type SGR 105

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

Heavy-duty cable tray SGR 155

St FT

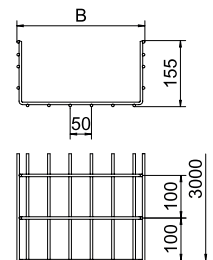


Type	Wire		Pack m	Weight kg/100 m	Item no.
	Width mm	Ø mm			
SGR 155 300 FT	300	6	3	439.667	6003692
SGR 155 500 FT	500	6	3	574.667	6003696

Mesh cable tray made of spot-welded steel wire of side height 155 mm.  
Magnetic shield insulation without cover 15 dB, with cover 25 dB.  
The grid width is 50 x 100 mm.

Type	Length mm	Dim. B mm	Usable
			Dim. cross-section cm <sup>2</sup>
SGR 155 300 FT	3000	300	438
SGR 155 500 FT	3000	500	738

Dimensions

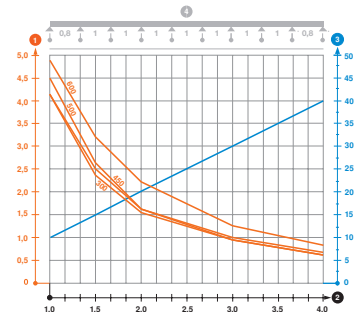


Type	1.0 m	1.5 m	2.0 m	3.0 m	4.0 m
	kN/m	kN/m	kN/m	kN/m	kN/m
SGR 155 300 FT	4.1	2.4	1.55	0.95	0.6
SGR 155 500 FT	4.5	2.6	1.6	1	0.65

Load

Load diagram, mesh cable tray, type SGR 155

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



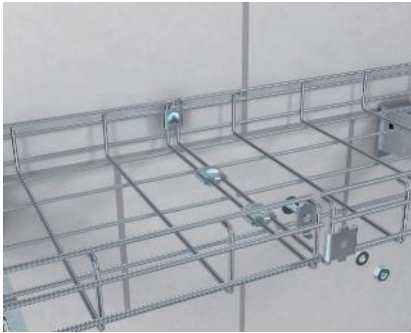


## C mesh cable tray

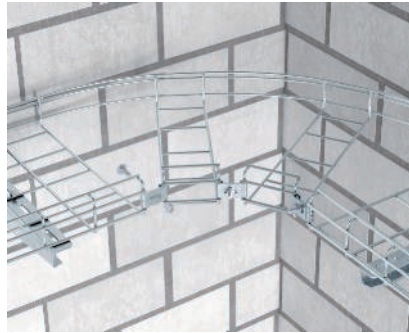
The C mesh cable tray system from OBO Bettermann fulfils the highest requirements for load capacities and versatility. The C shape allows support widths of up to three metres. This system, with its 50 mm side height, together with the optimised accessories such as hold-down clamps,

Quick connectors, barrier strips, suspension profiles, mounting brackets, etc. is an ideal addition to the overall mesh cable tray system. It is used both in industry and in all other areas of professional electrical installations.

## Mounting aid



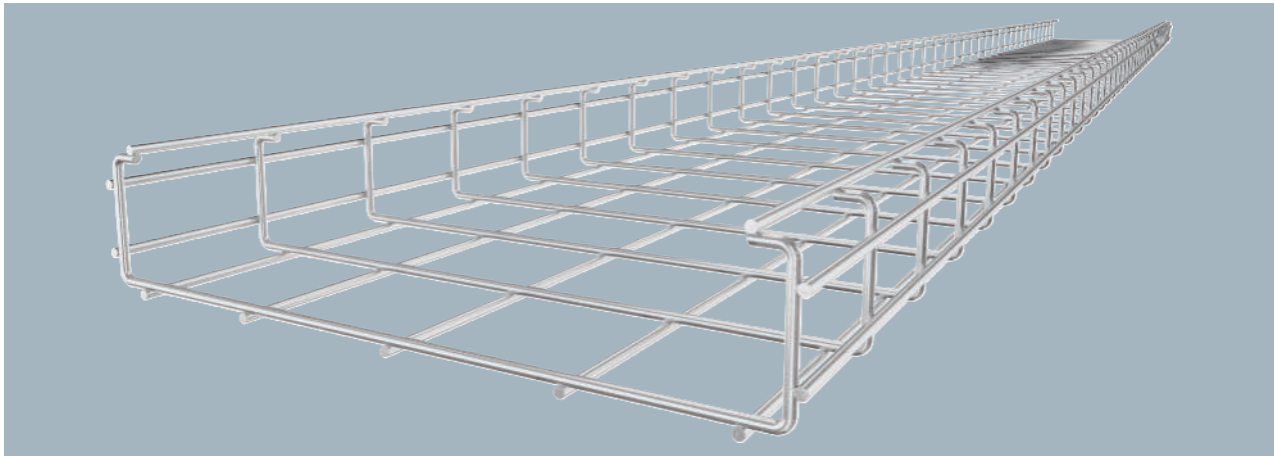
**Straight connection of C mesh cable tray**  
Creation of a straight connection on C mesh cable trays with the joint connector, type GSV 34.



**Horizontal bends**  
Implementation of a horizontal bend for C mesh cable trays with corner connector, type GEV 36.



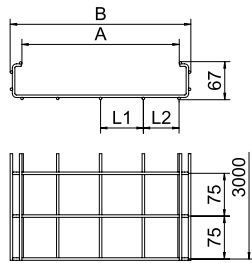
**Vertical bend application**  
Vertical bend mounting with 90° installation profile.



C-shaped mesh cable tray made of spot-welded steel wire of side height 50 mm.  
Magnetic shield insulation 15 dB.

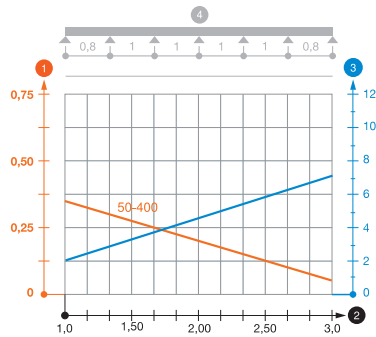
Type	Side height mm	Wire Ø mm	Pack m	Weight kg/100 m	Item no.
CGR 50 200 A2	50	4.5	3	173.200	6016251

Dimensions



Type	Length mm	Dim. A mm	Dim. B mm	Usable cross-section cm <sup>2</sup>
CGR 50 200 A2	3000	176	217	74

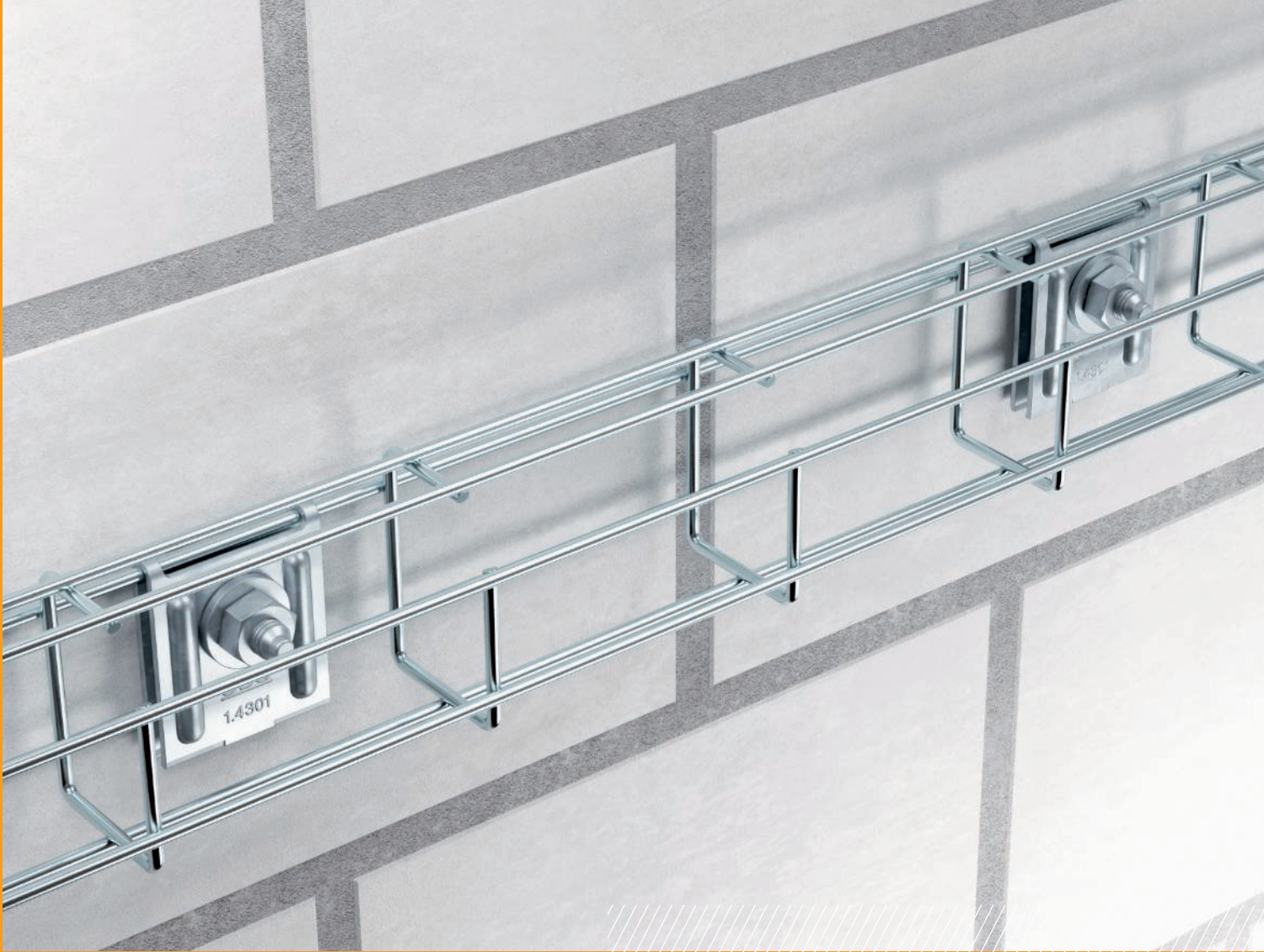
Load



Type	1.0 m kN/m	1.5 m kN/m	2.0 m kN/m
CGR 50 200 A2	1.1	0.7	0.4

Load diagram, C mesh cable tray CGR 50 VA

- 1 Permitted cable tray/ladder load in kN/m without man load
- 2 Support width in m
- 3 Rail bend in mm at permitted kN/m
- 4 Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

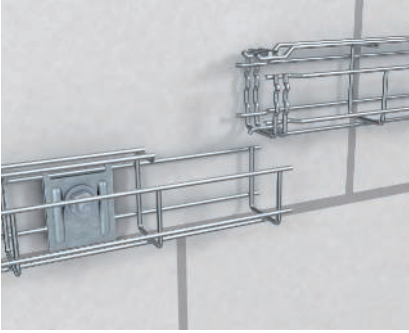


## Magic G mesh cable tray

The Magic G mesh cable tray is the ideal extension of the Magic solutions for the OBO Bettermann mesh cable tray systems. The quick Magic connection means that a screwless and easy-to-mount variant is now offered for the G mesh cable

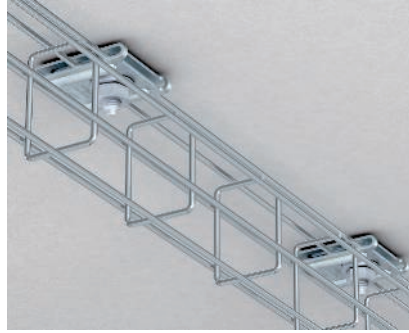
tray system as well. Even in false ceiling mounting, it is an ideal alternative through direct wall or ceiling mounting. The Magic G mesh cable tray is available in four sizes and three surfaces, thus offering ideal solutions for all kinds of tasks.

## Mounting aid



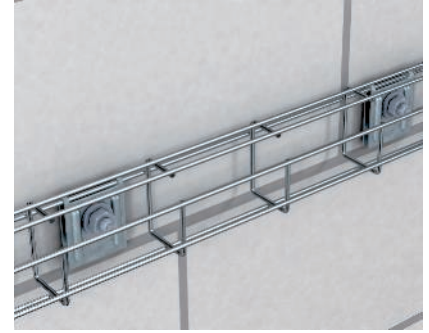
### **Straight connection of Magic G mesh cable tray**

Creation of a screwless straight connection of the G mesh cable tray, type G GRM, by interconnecting two stock lengths.



### **Direct ceiling mounting**

Direct ceiling mounting of the Magic G mesh cable tray using the hold-down clamp, type K 12 1818.



### **Wall mounting of G mesh cable trays**

Wall mounting of G mesh cable trays with wall bracket, type K 12 1818.



## G mesh cable tray Magic® 150

St G



Type	Side height mm	Wire Ø mm	Pack m	Weight kg/100 m	Item no.
G-GRM 150 100 G	150	3.9	3	127.333	6005544

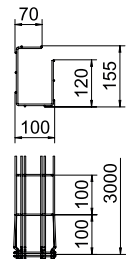
G-shaped mesh cable tray made of spot-welded steel wire with different side heights and widths.

Direct wall or ceiling mounting possible. Load capacity details regarding the different mounting methods are available upon request.

Magnetic shield insulation 15 dB.

Type	Length mm	Dim. B mm	Dim. H mm	Dim. C mm	Dim. A mm
G-GRM 150 100 G	3000	100	155	68	120

### Dimensions



G-GRM 150/100	Support spacing [m]	Load [kN/m]		
		1.5	2	2.5
Fastening variant	1			
Bracket MWAG 12-11	0.6	0.5	0.35	0.3
Wall fastening K12 1818	0.25	0.2	0.15	0.1
Ceiling fastening K12 1818	0.25	0.25	0.15	0.1

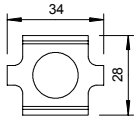
### Load





### Joint connector GSV 34

St G

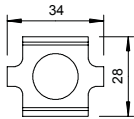


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GSV 34 G</b>	20	3.155	<b>6016596</b>

Screwed version of joint connector for mesh cable trays.  
 Figure: Positioning and quantity of mesh cable tray connectors.  
 50–150 mm = 2 units  
 200–300 mm = 3 units  
 400–450 mm = 4 units  
 500–600 mm = 5 units  
 Including FRS M6 x 20 bolt with flange nut.

### Joint connector GSV 34

St FT

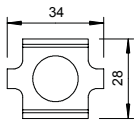


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GSV 34 FT</b>	20	3.150	<b>6016634</b>

Screwed version of joint connector for mesh cable trays.  
 Figure: Positioning and quantity of mesh cable tray connectors.  
 50–150 mm = 2 units  
 200–300 mm = 3 units  
 400–450 mm = 4 units  
 500–600 mm = 5 units  
 Including FRS M6 x 20 bolt with flange nut.

### Joint connector GSV 34

A2 VA 2B

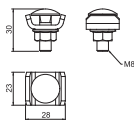


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GSV 34 A2</b>	20	2.572	<b>6016642</b>
<b>GSV 34 A4</b>	20	3.000	<b>6016648</b>

Screwed version of joint connector for mesh cable trays.  
 Figure: Positioning and quantity of mesh cable tray connectors.  
 50–150 mm = 2 units  
 200–300 mm = 3 units  
 400–450 mm = 4 units  
 500–600 mm = 5 units  
 Including screw of type FRS M6 x 20.

### GUV 6 joint connector

St FT



Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GUV 6 FT</b>	20	4.226	<b>6016573</b>

Joint connector for mesh cable tray, type SGR.  
 Figure: Positioning and quantity of mesh cable tray connectors.  
 50–150 mm = 2 units  
 200–300 mm = 3 units  
 400–450 mm = 4 units  
 500–600 mm = 5 units  
 Including FRS M8 x 25 bolt with flange nut.

A2 2B

### GUV 6 joint connector

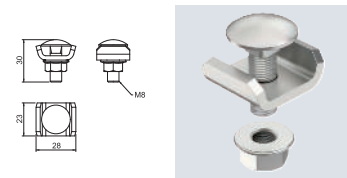
Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GUV 6 A2</b>	20	4.154	<b>6016574</b>

Joint connector for mesh cable tray, type SGR.

Figure: Positioning and quantity of mesh cable tray connectors.

- 50–150 mm = 2 units
- 200–300 mm = 3 units
- 400–450 mm = 4 units
- 500–600 mm = 5 units

Including FRS M8 x 20 bolt with flange nut.



St G

### GUV 6 joint connector

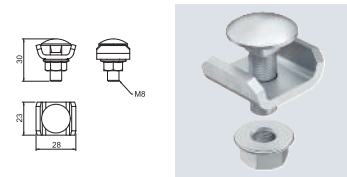
Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GUV 6 G</b>	20	3.945	<b>6016572</b>

Including FRS M8 x 25 bolt with flange nut.

Joint connector for mesh cable tray, type SGR.

Figure: Positioning and quantity of mesh cable tray connectors.

- 50–150 mm = 2 units
- 200–300 mm = 3 units
- 400–450 mm = 4 units
- 500–600 mm = 5 units



St FS

### GRV 245 mesh cable tray connector, long

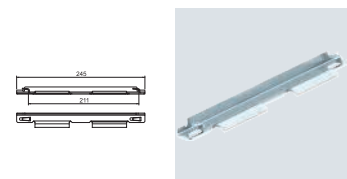
Type	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>GRV 245 FS</b>	30	20	13.500	<b>6016680</b>

Long mesh cable tray connectors for screwless straight connection of mesh cable trays.

Two straight connectors, type GRV 245, are used for each connection point.

Can be used from a mesh cable tray width of 100 mm.

The FS variant is used to connect electrogalvanised mesh cable trays, the DD variant to connect hot/hot-dip galvanised mesh cable trays and the VA variant to connect stainless steel mesh cable trays.



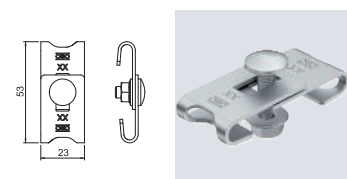
St G

### GEV 36 corner connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GEV 36 G</b>	20	3.040	<b>6016715</b>

Including FRS M6 x 12 bolt with flange nut.

Corner connector for the creation of mesh cable tray bend elements.



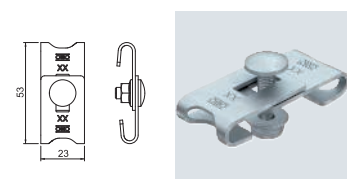
St FT

### GEV 36 corner connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GEV 36 FT</b>	20	3.160	<b>6016723</b>

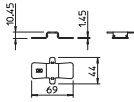
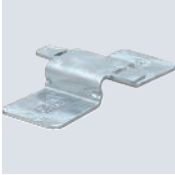
Including FRS M6 x 12 bolt with flange nut.

Corner connector for the creation of mesh cable tray bend elements.



### GRS quick connector

St DD



Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GRS 3.9 DD</b>	50	2.500	<b>6016545</b>

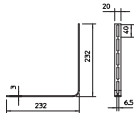
Quick connector for screwless straight connection of mesh cable trays without special tools, for mesh cable trays up to a width of 150 mm.

Figure: Positioning and quantity of mesh cable tray connectors.  
50–150 mm = 2 units

When selecting the connector, please take the appropriate wire thickness of the mesh cable tray into account.

### Slotted steel strap, bent

St FT

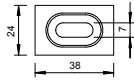


Type	Dimension mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>OSG 20X3 FT</b>	20x3	25	15.800	<b>6017371</b>

Bent slotted steel strap for creation of bends and tees.

### GKT 38 hold-down clamp

St G

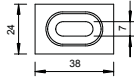
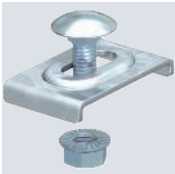


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GKT 38 G</b>	20	2.123	<b>6017037</b>

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

### GKT 38 hold-down clamp

St FT

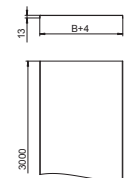
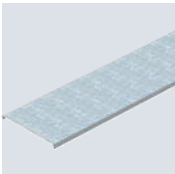


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GKT 38 FT</b>	20	2.123	<b>6017061</b>

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

### Unperforated cover

St FS



Type	Dim. B mm	Metal thickness mm	Length mm	Pack m	Weight kg/100 m	Item no.
<b>DRLU 100 FS</b>	100	1.00	3000	3	99.000	<b>6052103</b>

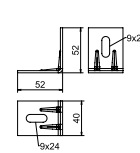
Cover for cable trays and mesh cable trays.  
When using covers outdoors, additional measures against the influence of wind must be taken.  
Transverse bead from 500 mm width.

St FS

### Ceiling bracket K6

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>K 6 101 FS</b>	40	7.000	<b>6343090</b>

Ceiling bracket for universal fixing to ceiling and wall, or on suspension profile, type AP 45.



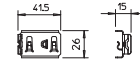
### Hold-down clamps

VA 2B

### Hold-down clamp for separating retainer fastening in GRM

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>KS GR A2</b>	30	0.830	<b>6062282</b>

Hold-down clamp for fastening separating retainer in mesh cable trays.

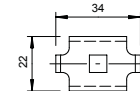


St G

### GKS 34 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GKS 34 G</b>	20	2.188	<b>6016855</b>

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fixing mesh cable trays to wall or support brackets.

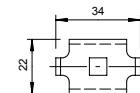


St FT

### GKS 34 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GKS 34 FT</b>	20	2.021	<b>6016820</b>

Including FRS M6 x 20 bolt with flange nut.  
Hold-down clamp for fixing mesh cable trays to wall or support brackets.

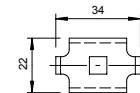


A2 VA 2B

### GKS 34 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>GKS 34 A2</b>	20	2.000	<b>6016839</b>
<b>GKS 34 A4</b>	10	1.976	<b>6016859</b>

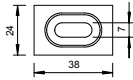
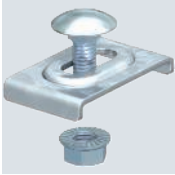
Including FRS M6 x 20 bolt with nut and washer.  
Hold-down clamp for fixing mesh cable trays to wall or support brackets.



# Hold-down clamps

## GKT 38 hold-down clamp

St G

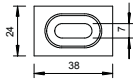
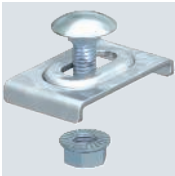


Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 G	20	2.123	6017037

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

## GKT 38 hold-down clamp

St FT

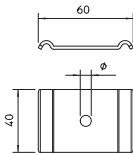
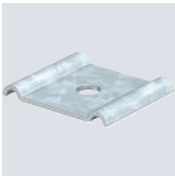


Type	Pack Piece	Weight kg/100 pc.	Item no.
GKT 38 FT	20	2.123	6017061

Including FRS M6 x 20 bolt with flange nut.  
Clamp for fastening barrier strip in mesh cable trays.

## GKS 50 hold-down clamp

St FS FT

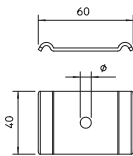


Type	Hole Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
GKS 50 07 FS	7	50	3.522	6015263
GKS 50 07 FT	7	50	3.590	6015271

Use on mesh cable trays with 50 x 100 mm grid only.  
Hold-down clamp for fastening mesh cable trays on the ground or on stand-off brackets of type DBL.

## Hold-down clamp GKS 50

VA 2B



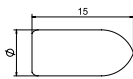
Type	Hole Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
GKS 50 11 A4	11	20	4.000	6015280

Use on mesh cable trays with 50 x 100 mm grid only.  
Clamp for fastening mesh cable trays.

# End caps

## Protective caps

PVC



Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
GR KS 3.9 OR	Pure orange	500	0.045	6003750
GR KS 4.8 OR	Pure orange	500	0.030	6003754

Protective cap to cover cut wire ends of mesh cable trays.

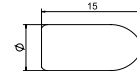
Mesh cable trays

PVC

End cap

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
SGR KS OR	Pure orange	500	0.036	6003758

End cap to cover cut wire ends of mesh cable trays.



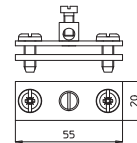
Equipotential bonding and earthing

St G

Earthing terminal for cables and flat conductors

Type	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
939	150	25	5.932	5043107

- For cables to 16 mm<sup>2</sup> and flat conductors
- Fit: cable to 16 mm<sup>2</sup> x max. FL 30
- With riveted brass connection terminal and one cylinder bolt, M5 x 12, with two cylinder bolts, M6 x 16



Mounting elements, junction box

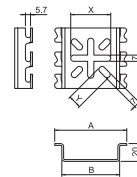
St FT

Mounting plate for mesh cable tray



Type	Pack Piece	Weight kg/100 pc.	Item no.
MPG 65 FT	30	9.100	6006486
MPG 90 FT	30	16.800	6006487

Mounting plate for screwless wall fastening of mesh cable trays.

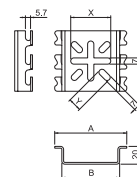


VA 2B

Mounting plate for mesh cable tray

Type	Pack Piece	Weight kg/100 pc.	Item no.
MPG 65 A4	30	8.800	6006488
MPG 90 A4	30	16.100	6006489

Accessories can be fastened to the mounting plate. In addition, the plate can be used for wall brackets.  
Mounting plate for screwless wall fastening of mesh cable trays.



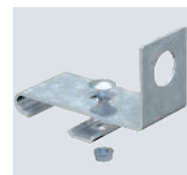
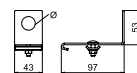
Side holder

St FS

Side holder for cable gland

Type	Hole Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
SH KAB 20 FS	20	10	15.000	6015425

Side holder with punched hole for accepting cable glands.



**Bolt cutter**

St



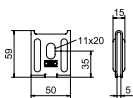
Type	Pack Piece	Weight kg/100 pc.	Item no.
GR BS	1	85.000	6017698

Bolt cutter for cutting mesh cable trays.

**Holders and fastenings**

**Wall clamp/central hanger**

St FS

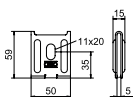


Type	Pack Piece	Weight kg/100 pc.	Item no.
K 12 1818 FS	25	7.800	6437109

As wall fastening up to max. mesh cable tray width 200 mm.  
 As centre suspension up to max. mesh cable tray width 200 mm.  
 As a pendulum suspension from a width of 300 mm.  
 Wall clamp and central hanger for mesh cable trays.

**Wall clamp/central hanger**

A2 2B

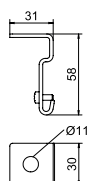


Type	Pack Piece	Weight kg/100 pc.	Item no.
K12 1818 A2	25	7.700	6016421

As wall fastening up to max. mesh cable tray width 200 mm.  
 As centre suspension up to max. mesh cable tray width 200 mm.  
 As a pendulum suspension from a width of 300 mm.  
 Wall clamp and central hanger for mesh cable trays.

**Side holder**

St FS

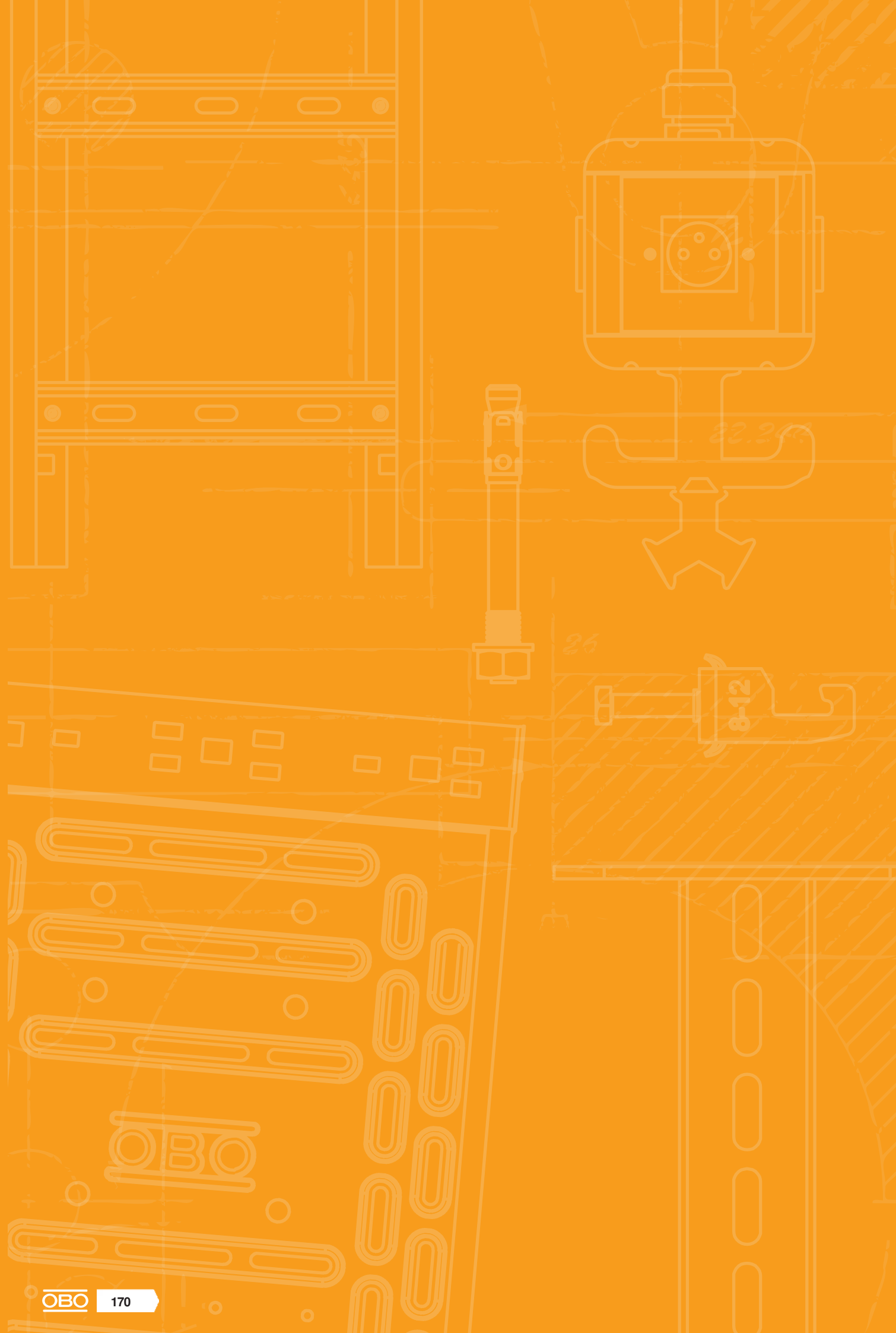


Type	Pack Piece	Weight kg/100 pc.	Item no.
SH M10 FS	50	5.800	6015336

Side holder for suspension of mesh cable trays.







# Cable ladder systems



Cable ladders

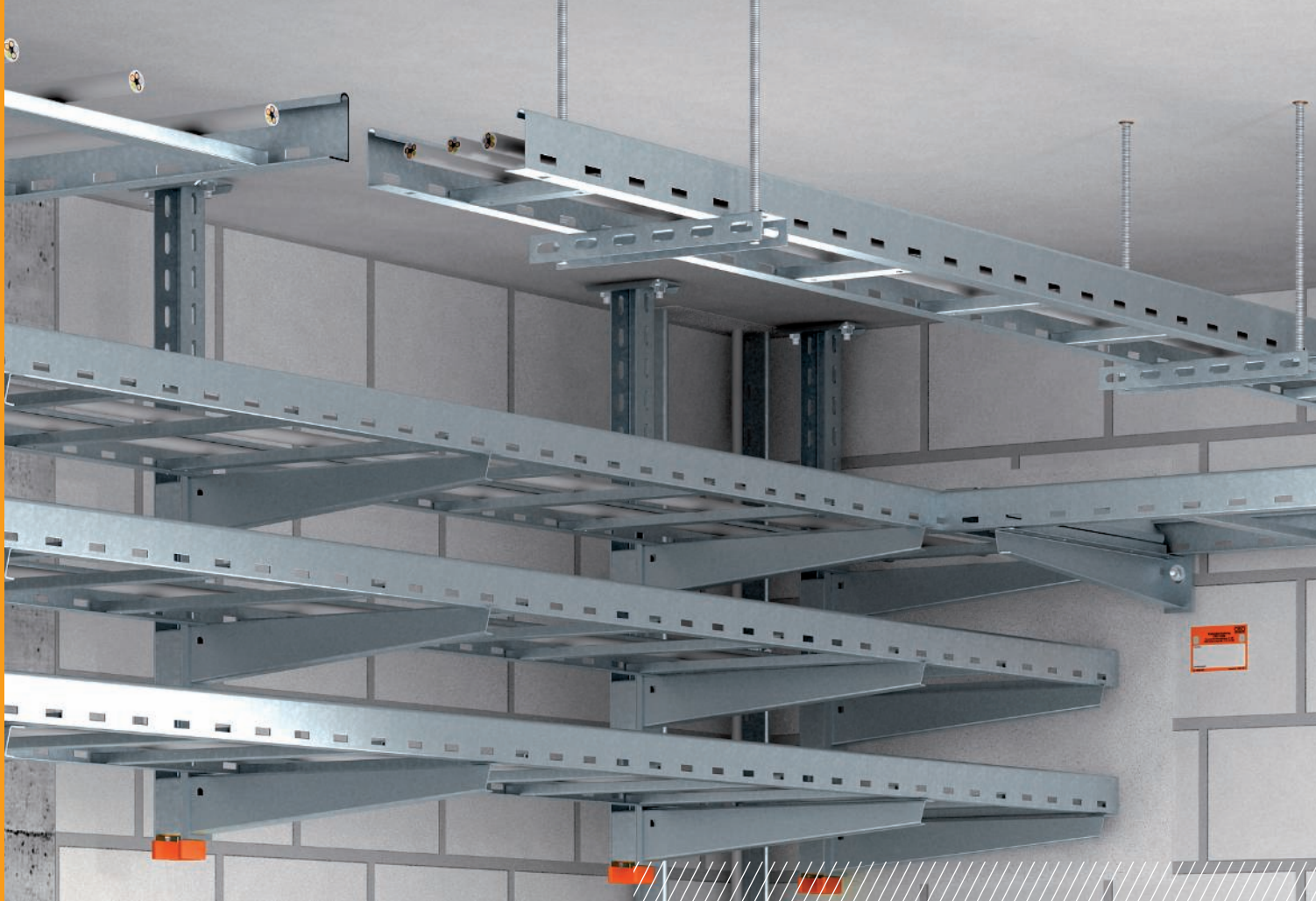
172



Vertical ladders

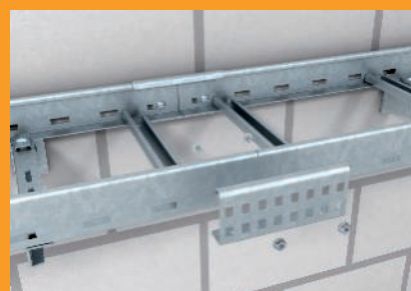
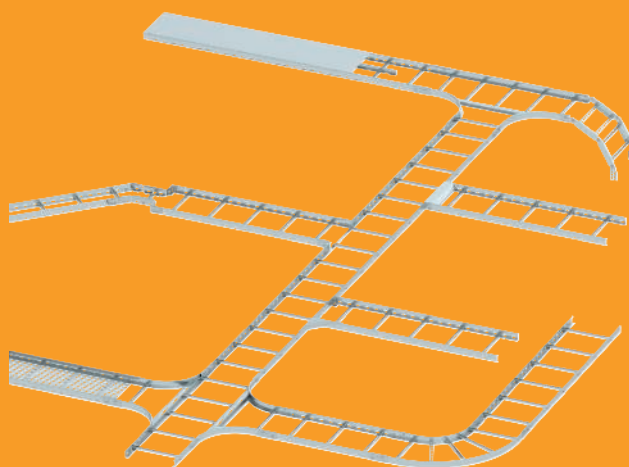
194





## Riveted cable ladder systems

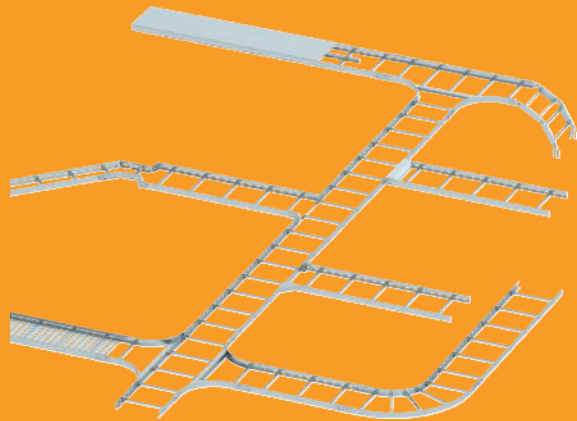
The high load capacity and good ventilation of the OBO cable ladder systems can offer tangible benefits, in particular during the installation of power cables. OBO Bettermann's cable ladder systems can be used universally and, due to the continuous rail and rung perforation, can offer countless installation benefits. A factor guaranteeing easy mounting is the option of integrated fastening of cables using OBO U clamps to the rungs, which are available in various different versions.





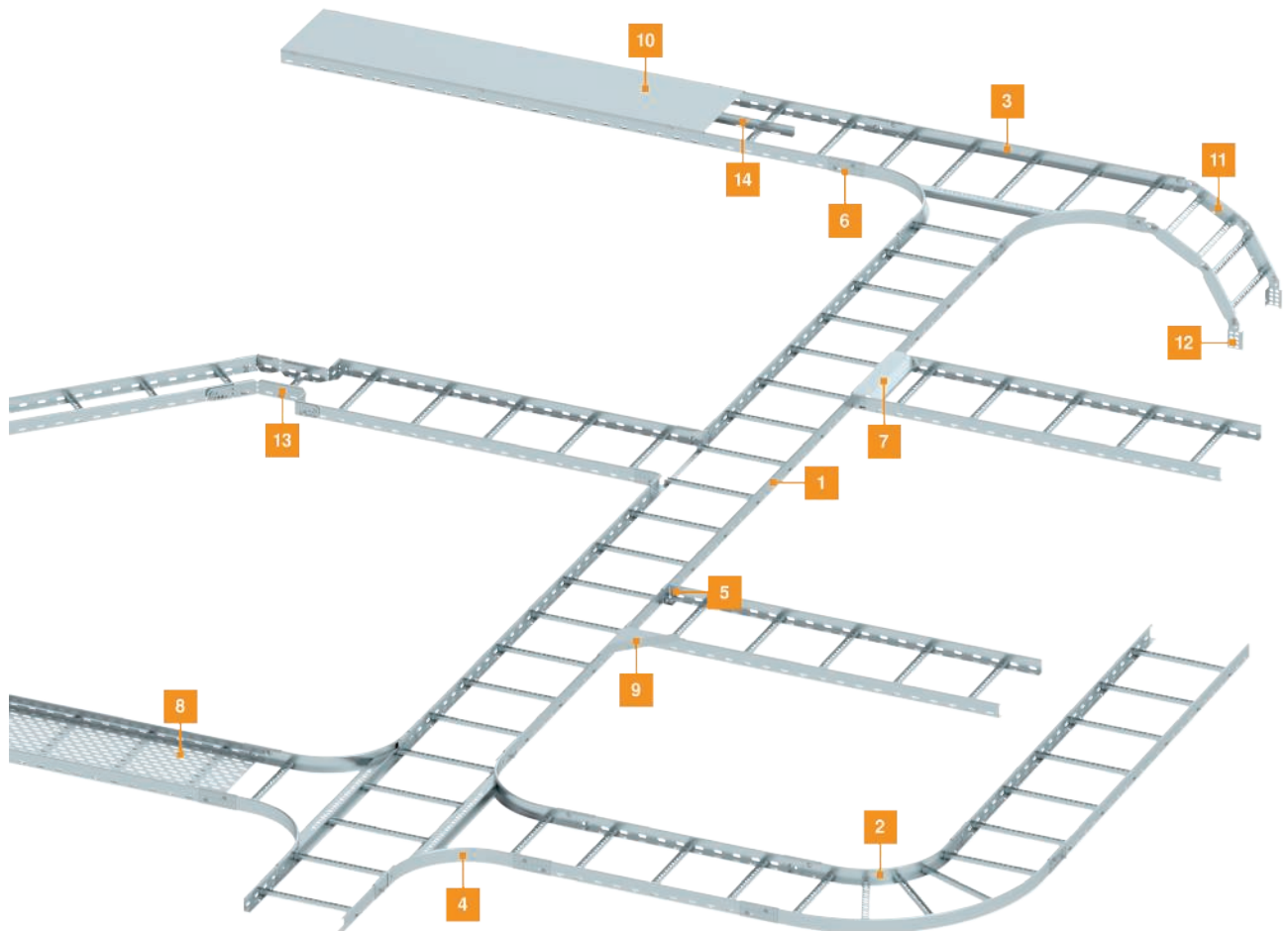
## Welded cable ladder systems

The high load capacity and good ventilation of the OBO cable ladder systems can offer tangible benefits, in particular during the installation of power cables. OBO Bettermann's cable ladder systems can be used universally and, due to the continuous rail and rung perforation, can offer countless installation benefits. A factor guaranteeing easy mounting is the option of integrated fastening of cables using OBO U clamps to the rungs, which are available in various different versions.



# Riveted cable ladder systems

## Installation principle



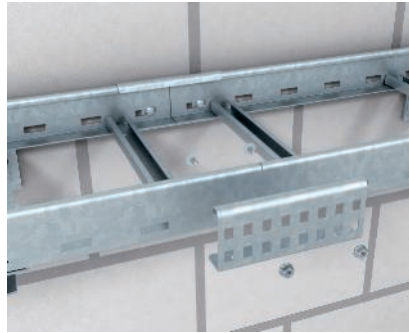
1	Cable ladders	11	Adjustable bend element
2	90° bend, welded	12	Adjustable connector
3	Tee, welded	13	Multifunctional connector
4	Add-on tee, welded	14	Barrier strip
5	Connection piece		
6	Straight connector		
7	Support plate		
8	Insertion plate		
9	Corner plate		
10	Cover with cover clamp		



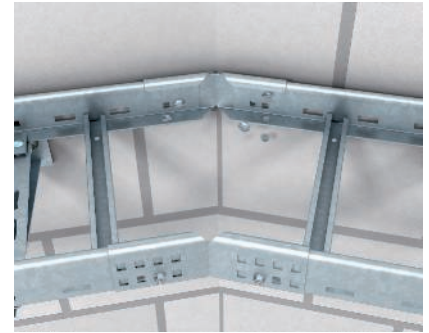
# Mounting aid



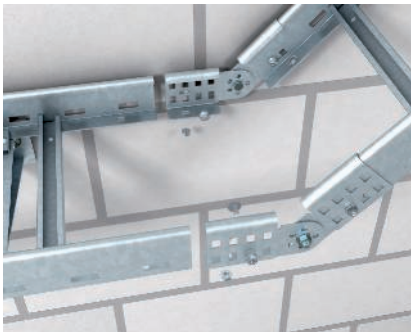
**Jump application**  
Implementation of vertical jumps with adjustable connectors, e.g. for ceiling joists.



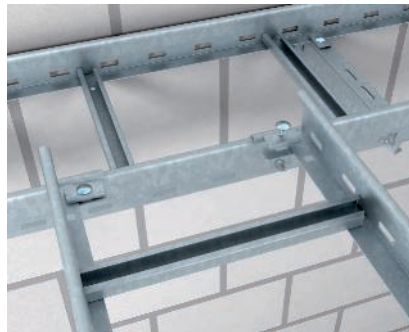
**Straight connection of cable ladders**  
Straight connection of cable ladder with straight connector, type LVG.



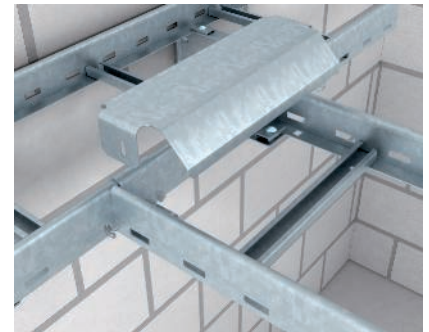
**Horizontal angle connection of cable ladders**  
Horizontal angle connection with straight and angle connectors, type LWVG.



**Vertical angle connection of cable ladders**  
Creation of a vertical angle connection using adjustable connectors, type LGVG.



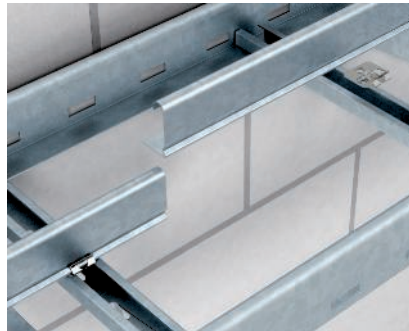
**Installation of tee**  
Creation of a horizontal tee exit of two cable ladders at different heights. The support angle, type LAW, is required to fix two cable ladders.



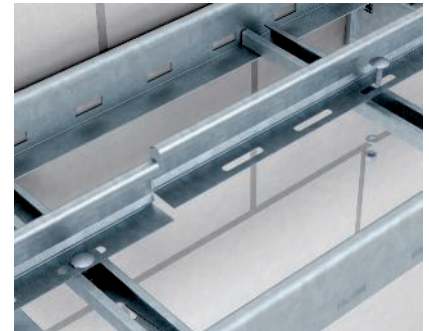
**Tee with support plate**  
Creation of horizontal tees for cable ladders running at the same height. To increase the cable supporting surface and to protect the cables, use support plates, type LALB. Additional supports should be planned for the area of the exits.



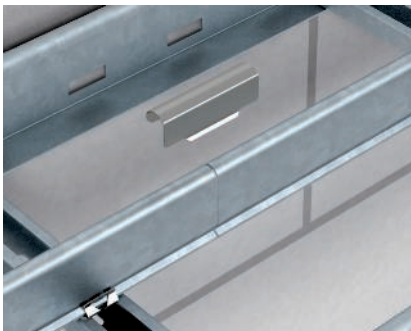
**Vertical cable exit**  
The exit plate, type LAB, is used to increase the cable supporting surface for vertically exiting cables and as cable protection.



**Screwless barrier strip fastening**  
Screwless fastening of a barrier strip in cable ladders with hold-down clamp, type KS KL.



**Screwed barrier strip fastening**  
Screwed mounting of the TSG barrier strip through the perforated rung of the cable ladders.



**Straight barrier strip connection**  
Screwless straight connection of barrier strips in cable ladders using the barrier strip TSGV.

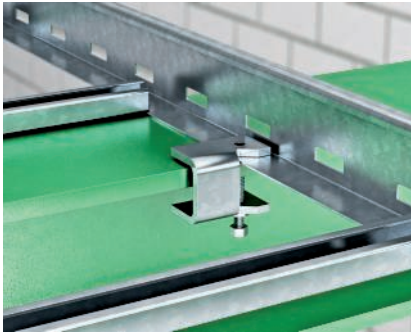


**Installation of insert plate**  
Installation of insert plates, type ELB-L.

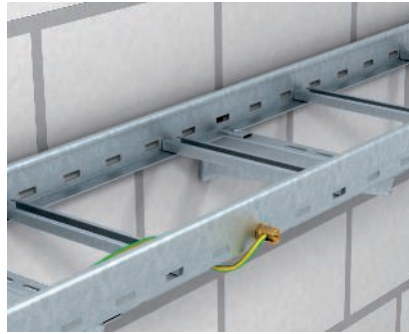


**Cover mounting**  
Covers for cable trays and cable ladders can be extended to a locking cover using the cover clamp DK DRLU A2.





**Cable ladder hold-down clamp**  
Cable ladder hold-down clamp KLL for direct mounting of cable ladders to steel girders.



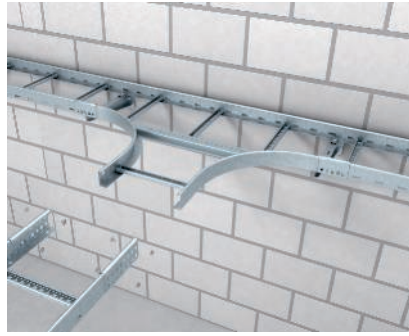
**Earthing terminal/earth connection**  
Earthing terminal for fastening the equipotential bonding wire to the cable support system.



# Mounting aid



**Adjustable vertical bend**  
Adjustable bend from adjustable bend elements of the type LGBE with adjustable connector for the bridging of height offsets.



**Tee**  
Creation of a one-sided branch with a tee of the type LAA.



**Add-on tee, symmetrical**  
Mounting two add-on tees, type LAA, on a cable ladder as symmetrical cross-over.



**Mounting of a tee**  
Mounting of a tee of the type LT to create a one-sided branch for cable ladders.



**90° bend**  
Connection of two cable ladders at a horizontal 90° angle with a bend, type LB 90.



**Multifunctional connector for cable ladders**  
Creation of a one-sided branch with a multifunctional connector of the type LMFV.

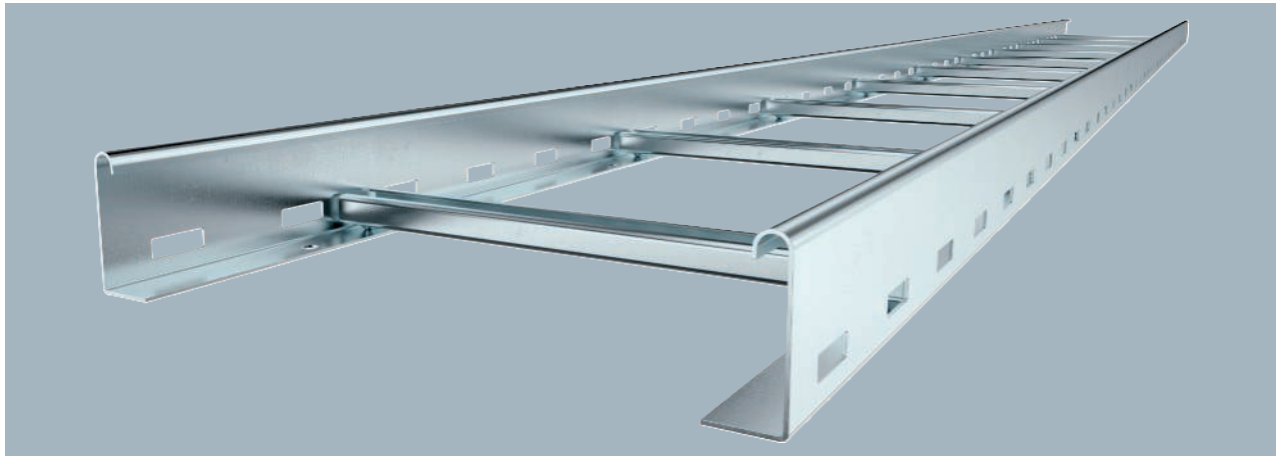


**Multifunctional connector for cable ladders**  
Creation of a reduction, including 45° angle, using a multifunctional connector, type LMFV.



## Cable ladder LCIS 60, 3 m C30

St FS

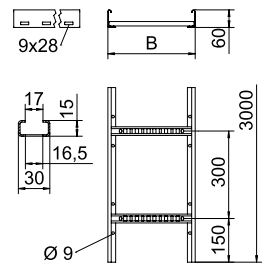


Type	Width mm	Pack m	Weight kg/100 m	Item no.
LCIS 620 3 FS	200	3	266.670	6209610
LCIS 630 3 FS	300	3	288.670	6209612
LCIS 640 3 FS	400	3	310.340	6209614
LCIS 650 3 FS	500	3	332.340	6209616
LCIS 660 3 FS	600	3	354.000	6209618

Cable ladder with a 60 mm side height with welded C30 profile rungs which are open in an upwards direction. Rolled side rail for reinforcement and as edge protection. Fastening to the bracket takes place using hold-down clamps, type LKS 40. The slot dimension of the rung is 16.5 mm and the appropriate clamp clip is type 2056.

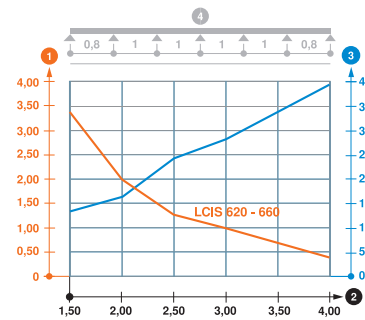
Type	Length mm	Dim. B mm	Rail thick- ness mm	Usable cross- section cm <sup>2</sup>	Rung spacing mm
LCIS 620 3 FS	3000	200	1.5	80	300
LCIS 630 3 FS	3000	300	1.5	120	300
LCIS 640 3 FS	3000	400	1.5	160	300
LCIS 650 3 FS	3000	500	1.5	200	300
LCIS 660 3 FS	3000	600	1.5	240	300

### Dimensions



	1.5 m	2.0 m	2.5 m	3.0 m	4.0 m
	kN/m	kN/m	kN/m	kN/m	kN/m
LCIS 620 3 FS	3.3	2	1.3	1	0.4
LCIS 630 3 FS	3.3	2	1.3	1	0.4
LCIS 640 3 FS	3.3	2	1.3	1	0.4
LCIS 650 3 FS	3.3	2	1.3	1	0.4
LCIS 660 3 FS	3.3	2	1.3	1	0.4

### Load



### Load diagram LCIS 60

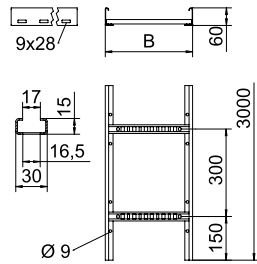
- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



Cable ladder with a 60 mm side height with welded C30 profile rungs which are open in an upwards direction. Rolled side rail for reinforcement and as edge protection. Fastening to the bracket takes place using hold-down clamps, type LKS 40. The slot dimension of the rung is 16.5 mm and the appropriate clamp clip is type 2056.

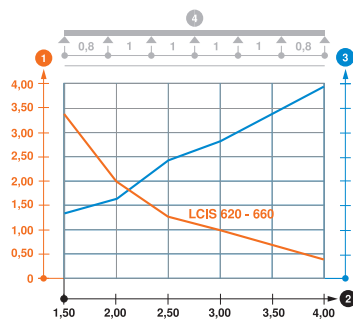
Type	Width mm	Pack m	Weight kg/100 m	Item no.
LCIS 620 3 FT	200	3	283.000	6209721
LCIS 630 3 FT	300	3	306.000	6209723
LCIS 640 3 FT	400	3	329.340	6209725
LCIS 650 3 FT	500	3	352.340	6209727
LCIS 660 3 FT	600	3	375.340	6209729

Dimensions



Type	Length mm	Dim. B mm	Rail thickness mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LCIS 620 3 FT	3000	200	1.5	80	300
LCIS 630 3 FT	3000	300	1.5	120	300
LCIS 640 3 FT	3000	400	1.5	160	300
LCIS 650 3 FT	3000	500	1.5	200	300
LCIS 660 3 FT	3000	600	1.5	240	300

Load



	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m	3.0 m kN/m	4.0 m kN/m
LCIS 620 3 FT	3.3	2	1.3	1	0.4
LCIS 630 3 FT	3.3	2	1.3	1	0.4
LCIS 640 3 FT	3.3	2	1.3	1	0.4
LCIS 650 3 FT	3.3	2	1.3	1	0.4
LCIS 660 3 FT	3.3	2	1.3	1	0.4

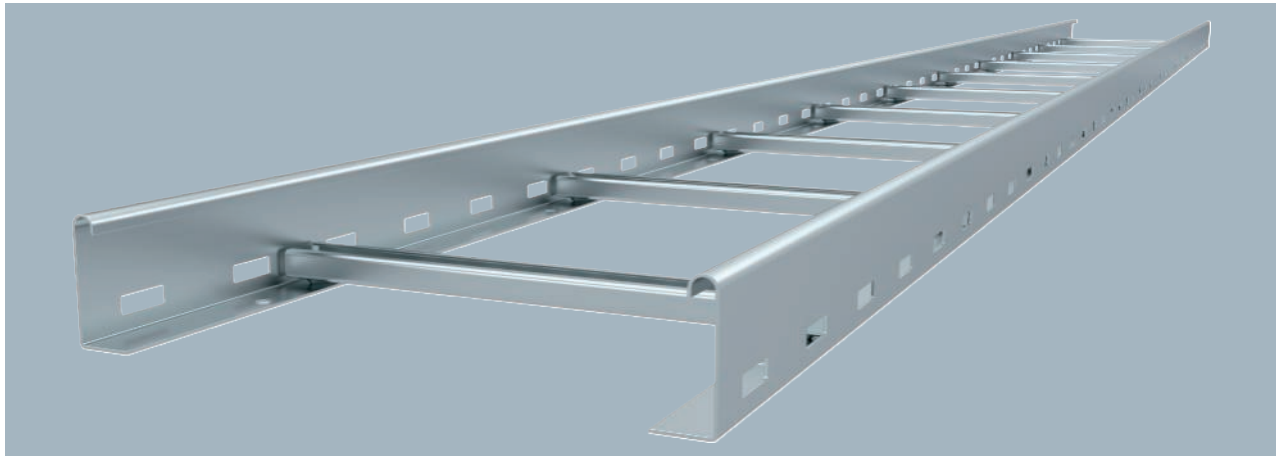
Load diagram LCIS 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



## Cable ladder LCIS 60, 6 m C30

St FS

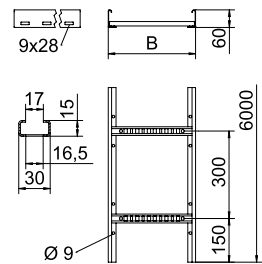


Type	Width mm	Pack m	Weight kg/100 m	Item no.
LCIS 620 6 FS	200	6	267.170	6209630
LCIS 630 6 FS	300	6	288.840	6209632
LCIS 640 6 FS	400	6	310.670	6209634
LCIS 650 6 FS	500	6	332.340	6209636
LCIS 660 6 FS	600	6	354.000	6209638

Cable ladder with a 60 mm side height with welded C30 profile rungs which are open in an upwards direction. Rolled side rail for reinforcement and as edge protection. Fastening to the bracket takes place using hold-down clamps, type LKS 40. The slot dimension of the rung is 16.5 mm and the appropriate clamp clip is type 2056.

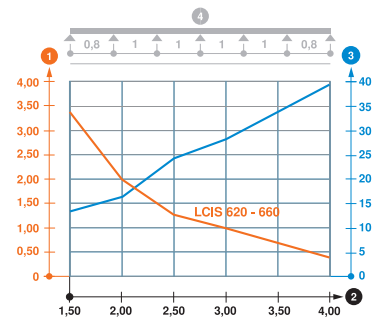
Type	Length mm	Dim. B mm	Rail thickness mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LCIS 620 6 FS	6000	200	1.5	80	300
LCIS 630 6 FS	6000	300	1.5	120	300
LCIS 640 6 FS	6000	400	1.5	160	300
LCIS 650 6 FS	6000	500	1.5	200	300
LCIS 660 6 FS	6000	600	1.5	240	300

### Dimensions



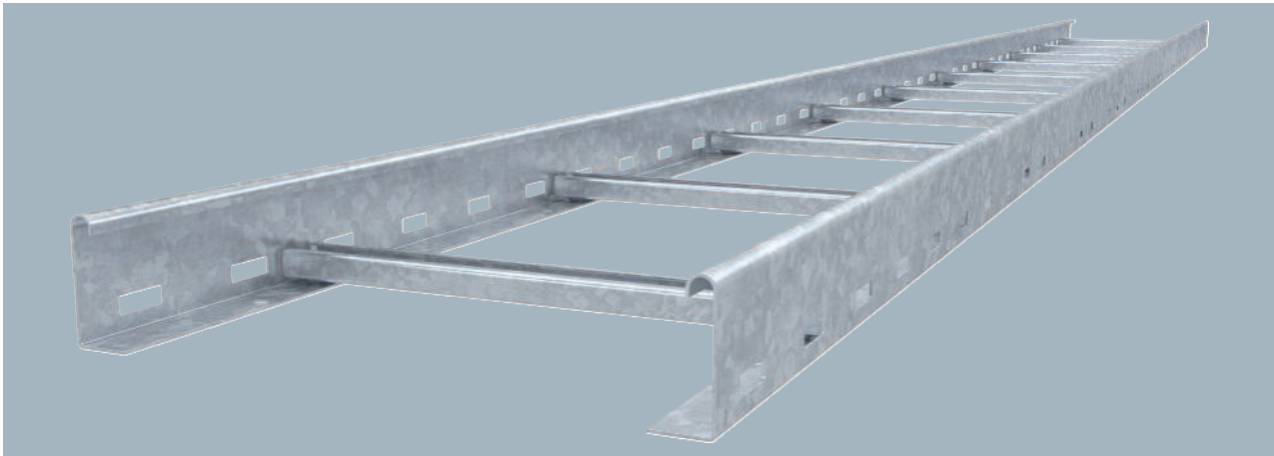
	1.5 m	2.0 m	2.5 m	3.0 m	4.0 m
	kN/m	kN/m	kN/m	kN/m	kN/m
LCIS 620 6 FS	3.3	2	1.3	1	0.4
LCIS 630 6 FS	3.3	2	1.3	1	0.4
LCIS 640 6 FS	3.3	2	1.3	1	0.4
LCIS 650 6 FS	3.3	2	1.3	1	0.4
LCIS 660 6 FS	3.3	2	1.3	1	0.4

### Load



### Load diagram LCIS 60

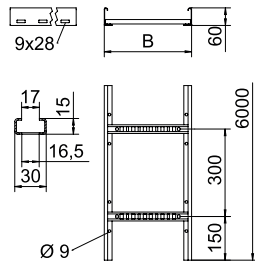
- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



Cable ladder with a 60 mm side height with welded C30 profile rungs which are open in an upwards direction. Rolled side rail for reinforcement and as edge protection. Fastening to the bracket takes place using hold-down clamps, type LKS 40. The slot dimension of the rung is 16.5 mm and the appropriate clamp clip is type 2056.

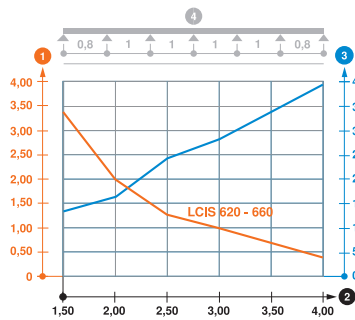
Type	Width mm	Pack m	Weight kg/100 m	Item no.
LCIS 620 6 FT	200	6	283.170	6209643
LCIS 630 6 FT	300	6	306.170	6209645
LCIS 640 6 FT	400	6	329.170	6209647
LCIS 650 6 FT	500	6	352.340	6209649
LCIS 660 6 FT	600	6	375.340	6209651

### Dimensions



Type	Length mm	Dim. B mm	Rail thickness mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LCIS 620 6 FT	6000	200	1.5	80	300
LCIS 630 6 FT	6000	300	1.5	120	300
LCIS 640 6 FT	6000	400	1.5	160	300
LCIS 650 6 FT	6000	500	1.5	200	300
LCIS 660 6 FT	6000	600	1.5	240	300

### Load



	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m	3.0 m kN/m	4.0 m kN/m
LCIS 620 6 FT	3.3	2	1.3	1	0.4
LCIS 630 6 FT	3.3	2	1.3	1	0.4
LCIS 640 6 FT	3.3	2	1.3	1	0.4
LCIS 650 6 FT	3.3	2	1.3	1	0.4
LCIS 660 6 FT	3.3	2	1.3	1	0.4

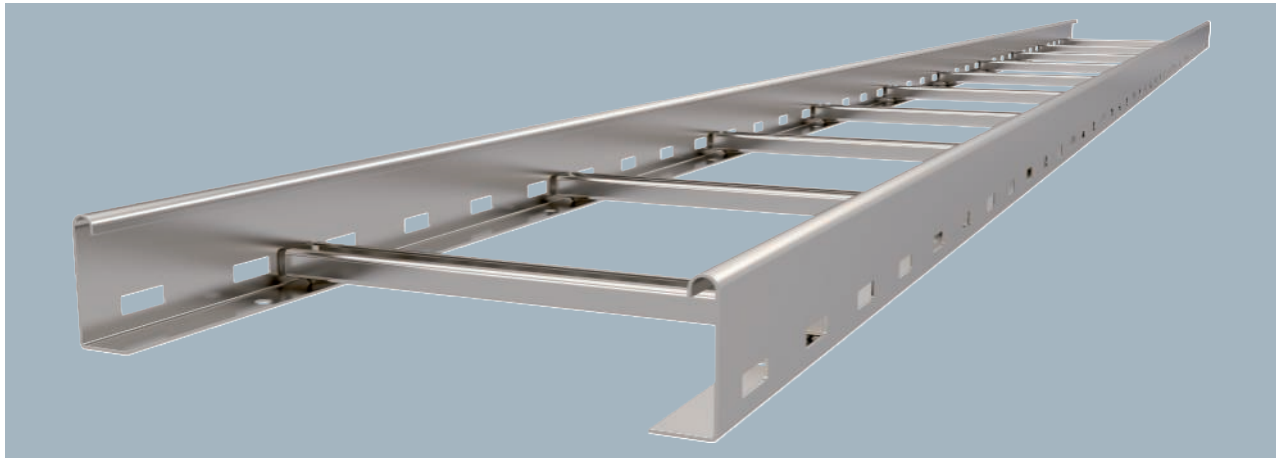
#### Load diagram LCIS 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



## Cable ladder LCIS 60, 6 m C30

A4 2B

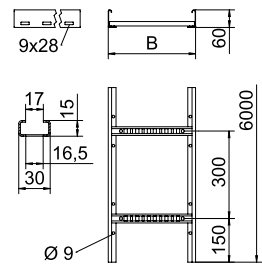


Type	Width mm	Pack m	Weight kg/100 m	Item no.
LCIS 620 6 A4	200	6	267.000	6207202
LCIS 630 6 A4	300	6	288.833	6207204
LCIS 640 6 A4	400	6	310.500	6207206
LCIS 650 6 A4	500	6	332.340	6207208
LCIS 660 6 A4	600	6	354.000	6207210

Cable ladder with 60 mm side height with welded C30 profile rungs which are open in an upwards direction. Rolled side rail for reinforcement and as edge protection. Fastening to the bracket takes place using clamps, type LKS 40. The slot dimension of the frame is 16.5 mm and the appropriate clamp clip is type 2056.

Type	Length mm	Dim. B mm	Rail thickness mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LCIS 620 6 A4	6000	200	1.5	80	300
LCIS 630 6 A4	6000	300	1.5	120	300
LCIS 640 6 A4	6000	400	1.5	160	300
LCIS 650 6 A4	6000	500	1.5	200	300
LCIS 660 6 A4	6000	600	1.5	240	300

### Dimensions

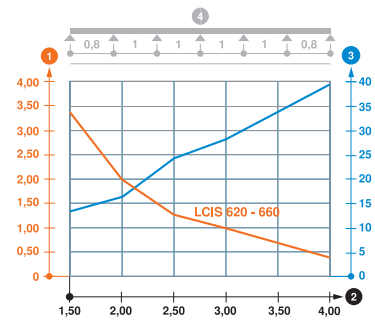


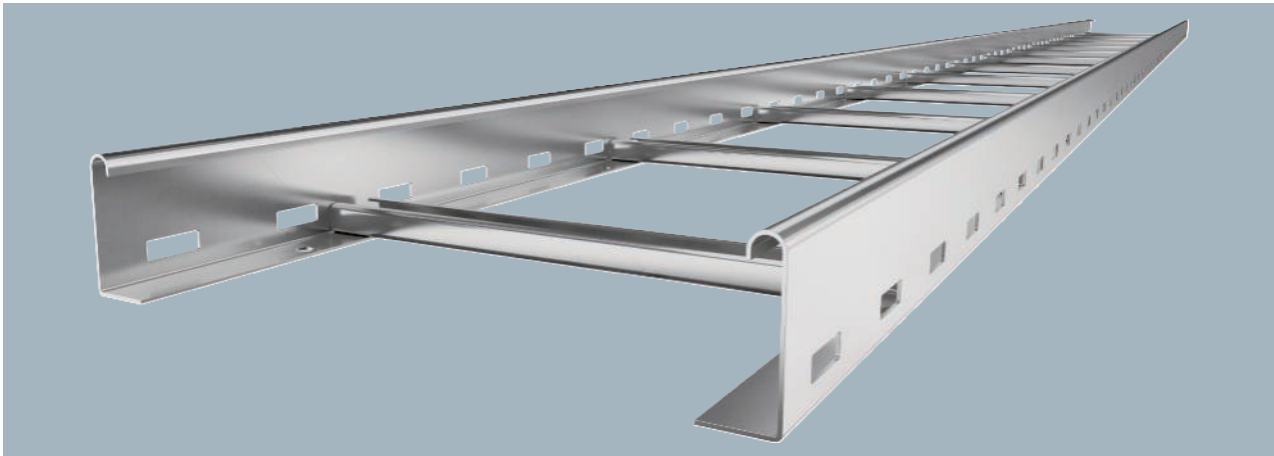
	1.5 m	2.0 m	2.5 m	3.0 m	4.0 m
	kN/m	kN/m	kN/m	kN/m	kN/m
LCIS 620 6 A4	3.3	2	1.3	1	0.4
LCIS 630 6 A4	3.3	2	1.3	1	0.4
LCIS 640 6 A4	3.3	2	1.3	1	0.4
LCIS 650 6 A4	3.3	2	1.3	1	0.4
LCIS 660 6 A4	3.3	2	1.3	1	0.4

### Load

#### Load diagram LCIS 60

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

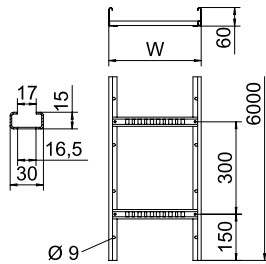




The cable ladder is shipped folded up.  
 You can find the appropriate type 2056 clamp clip in the vertical ladder systems section.  
 Cable ladder with perforated side rail of side height 60 mm with riveted C profile frames, open in an upwards direction (VS version).

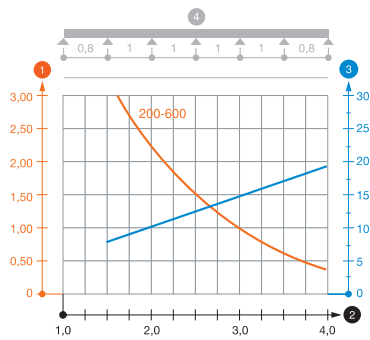
Type	Width mm	Pack m	Weight kg/100 m	Item no.
LG 660 VS6 A4	600	6	354.000	6101232

Dimensions



Type	Length mm	Dim. B mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LG 660 VS6 A4	6000	600	298	300

Load



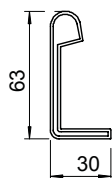
	1.5 m	2.0 m	2.5 m	3.0 m	3.5 m	4.0 m
	kN/m	kN/m	kN/m	kN/m	kN/m	kN/m
LG 660 VS6 A4	3.1	2.25	1.5	1.1	0.75	0.45

Load diagram, LG 60 VS

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



### Protective cap 60

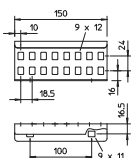
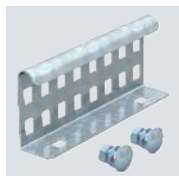


Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKH 60 OR	Pastel orange	40	1.072	622537

Protective cap to cover cable ladder ends of side height 60 mm.

### Straight connector 60

St FS FT



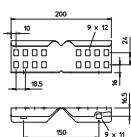
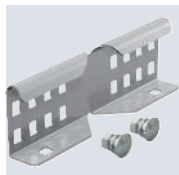
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LVG 60 FS	60	10	22.000	6208840
LVG 60 FT	60	10	23.000	6208843

Straight connector as external connector to connect cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

The bolt fastening ensures the continuity of the equipotential bonding.

### Angle connector 60

A2 2B



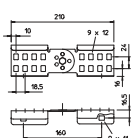
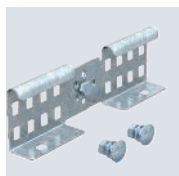
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LWVG 60 A2	60	10	24.000	6208898

The bolt fastening ensures the continuity of the equipotential bonding.

Angle connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

### Adjustable connector 60

St FS FT



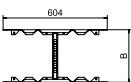
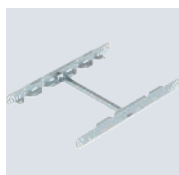
Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LGVG 60 FS	60	10	28.500	6208941
LGVG 60 FT	60	10	29.900	6208944

Adjustable connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation. Angle can be adjusted vertically.

The bolt fastening ensures the continuity of the equipotential bonding.

### Multifunctional connector 60

St FS



Type	Dim. B mm	Side height mm	Metal thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LMFV 640 FS	400	60	1.50	1	136.200	6225714

Multifunctional connector for joining cable ladders with a side height of 60 mm. Symmetrical and asymmetrical reductions, infinitely-adjustable bends between 0–60° and add-on tees can be created.

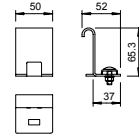


St FS

## Connection piece 60

Type	Pack Piece	Weight kg/100 pc.	Item no.
LAS 60 FS	10	13.000	6221351

Connector for creation of branches at the same height at a later date.  
To increase the cable supporting surface, use a conjunction of corner plates of type LEB.

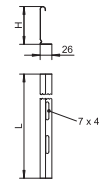


St FS

## Separating retainer 45

Type	Dim. H mm	Metal thickness mm	Dim. L mm	Pack m	Weight kg/100 m	Item no.
TSG 45 FS	45	0.75	3000	3	46.700	6062033

Separating retainer for separation of cables of different voltages or functions.

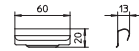


VA 2B

## Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

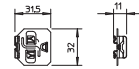


VA 2B

## Hold-down clamp for separating retainer fastening

Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KL A2	30	0.512	6062284

Hold-down clamp for screwless fastening of the separating retainer in cable ladders.

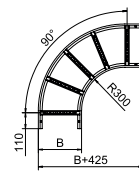


St FS FT

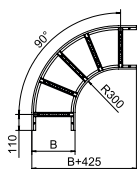
## 90° bend 60

Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LB 90 630 R3 FS	300	1.5	1	318.300	6225044
LB 90 640 R3 FS	400	1.5	1	368.700	6225046
LB 90 650 R3 FS	500	1.5	1	458.600	6225048
LB 90 660 R3 FS	600	1.5	1	524.600	6225050
LB 90 620 R3 FT	200	1.5	1	269.800	6225062
LB 90 630 R3 FT	300	1.5	1	338.500	6225064
LB 90 640 R3 FT	400	1.5	1	392.100	6225066
LB 90 650 R3 FT	500	1.5	1	492.600	6225068
LB 90 660 R3 FT	600	1.5	1	562.700	6225070

90° bend, horizontal, with welded rung for all cable ladder types of 60 mm side height.  
Connectors should be ordered separately and in the appropriate quantity.



## 90° bend 60

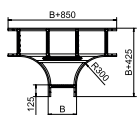


Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LB 90 620 R3 A2	200	1.5	1	257.800	6225082
LB 90 630 R3 A2	300	1.5	1	322.300	6225084
LB 90 640 R3 A2	400	1.5	1	373.400	6225086
LB 90 650 R3 A2	500	1.5	1	458.600	6225088
LB 90 660 R3 A2	600	1.5	1	524.600	6225090
LB 90 620 R3 A4	200	1.5	1	261.000	6225102
LB 90 630 R3 A4	300	1.5	1	326.400	6225104
LB 90 640 R3 A4	400	1.5	1	378.200	6225106
LB 90 650 R3 A4	500	1.5	1	458.600	6225108
LB 90 660 R3 A4	600	1.5	1	524.600	6225110

90° bend, horizontal, with welded rung for all cable ladder types of 60 mm side height. Connectors should be ordered separately and in the appropriate quantity.

## T piece 60

St FS

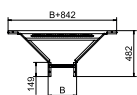


Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LT 630 R3 FS	300	1.5	1	531.000	6225212
LT 640 R3 FS	400	1.5	1	619.700	6225214
LT 650 R3 FS	500	1.5	1	688.600	6225216

T piece, horizontal, with welded rung for all cable ladder types of 60 mm side height. Connectors should be ordered separately and in the appropriate quantity.

## Add-on tee 60

St FS FT



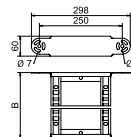
Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LAA 620 R3 FS	200	1.5	1	306.000	6225850
LAA 630 R3 FS	300	1.5	1	328.000	6225852
LAA 640 R3 FS	400	1.5	1	351.000	6225854
LAA 650 R3 FS	500	1.5	1	373.000	6225856
LAA 660 R3 FS	600	1.5	1	395.000	6225858
LAA 620 R3 FT	200	1.5	1	316.000	6225870
LAA 630 R3 FT	300	1.5	1	339.000	6225872
LAA 640 R3 FT	400	1.5	1	363.000	6225874
LAA 650 R3 FT	500	1.5	1	387.000	6225876
LAA 660 R3 FT	600	1.5	1	410.000	6225878

Mounting/branch with welded rung for use in the cable ladder types with a side height of 60 mm. Connectors should be ordered separately and in the appropriate quantity.

A2 VA 2B

## Adjustable bend element 60

Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LGBE 620 A2	200	1.5	1	84.000	6225460
LGBE 630 A2	300	1.5	1	97.000	6225462
LGBE 640 A2	400	1.5	1	109.900	6225464
LGBE 650 A2	500	1.5	1	122.900	6225466
LGBE 660 A2	600	1.5	1	135.900	6225468
LGBE 620 A4	200	1.5	1	84.000	6225480
LGBE 630 A4	300	1.5	1	97.000	6225482
LGBE 640 A4	400	1.5	1	109.900	6225484
LGBE 650 A4	500	1.5	1	122.900	6225486
LGBE 660 A4	600	1.5	1	135.900	6225488

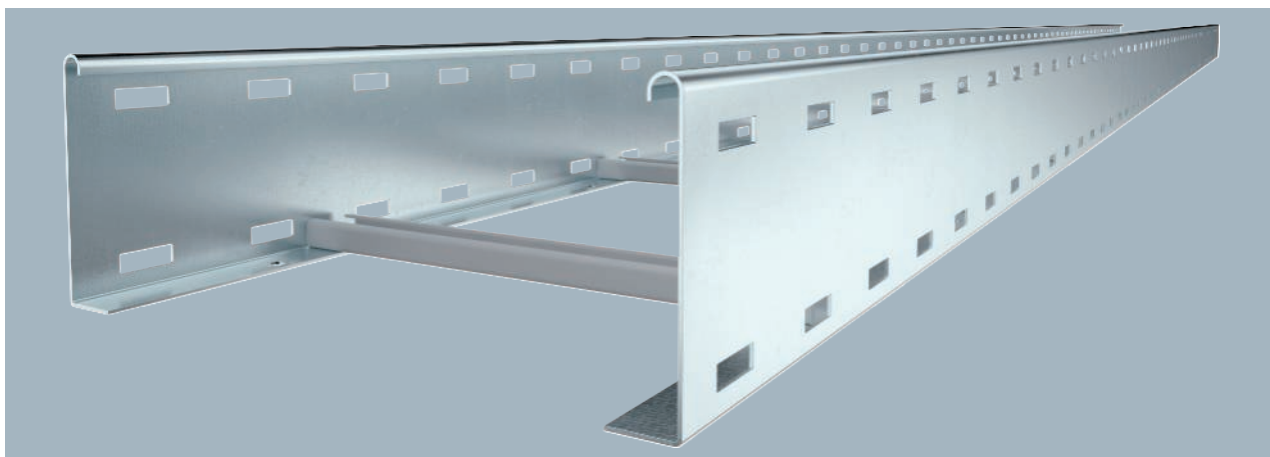


Adjustable bend element with welded rung for use in cable ladder types with a side height of 60 mm.



## Cable ladder LG 110, 6 m VS

St FS



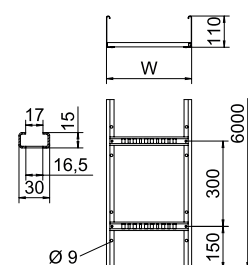
Type	Width mm	Pack m	Weight kg/100 m	Item no.
LG 114 VS 6 FS	400	6	422.300	6216448

The cable ladder is shipped folded up. You can find the appropriate type 2056 clamp clip in the vertical ladder systems section.

Cable ladder with perforated side rail of side height 110 mm with riveted C profile rungs, open in an upwards direction.

Type	Length mm	Dim. B mm	Rail Dim. thick- ness mm	Usable cross- section cm <sup>2</sup>	Rung spacing mm
LG 114 VS 6 FS	6000	400	1.5	378	300

### Dimensions

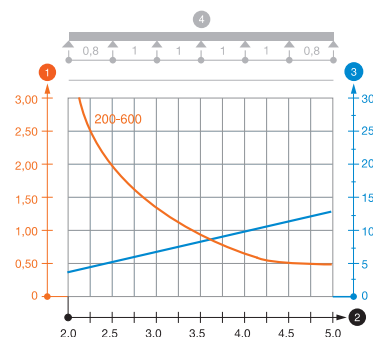


Type	2.0 m kN/m	3.0 m kN/m	4.0 m kN/m	5.0 m kN/m
LG 114 VS 6 FS	3.1	1.4	0.65	0.5

### Load diagram, cable ladder, type LG 110 VS

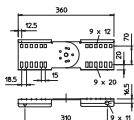
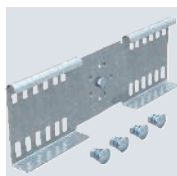
- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

### Load



## Adjustable connector 110

St FS



Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LGVG 110 FS	110	10	77.900	6216650

Adjustable connector as internal connector to join cable ladders and fittings with a side height of 110 mm. Angle can be adjusted vertically.

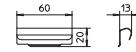
The bolt fastening ensures the continuity of the equipotential bonding.

VA 2B

## Separating retainer connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
TSGV A2	10	0.899	6067970

Separating retainer connector for screwless connection of the TSG separating retainer in all side heights.

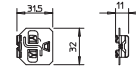


VA 2B

## Hold-down clamp for separating retainer fastening

Type	Pack Piece	Weight kg/100 pc.	Item no.
KS KL A2	30	0.512	6062284

Hold-down clamp for screwless fastening of the separating retainer in cable ladders.

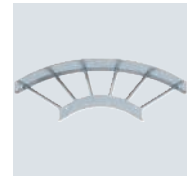
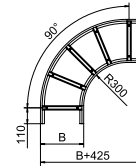


St FT

## 90° bend 110

Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
SLB 90 1120R3 FT	200	2	1	493.100	6225172
SLB 90 1130R3 FT	300	2	1	593.200	6225174
SLB 90 1140R3 FT	400	2	1	678.300	6225176
SLB 90 1150R3 FT	500	2	1	809.600	6225180
SLB 90 1160R3 FT	600	2	1	919.200	6225182

90° bend, horizontal, with welded rung for all cable ladder types of 110 mm side height. Connectors should be ordered separately and in the appropriate quantity.

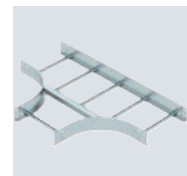
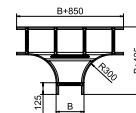


St FS FT

## T piece 110

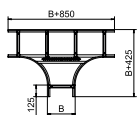
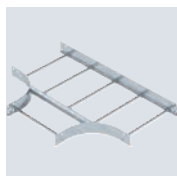
Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LT 1120 R3 FS	200	1.5	1	611.800	6225290
LT 1130 R3 FS	300	1.5	1	680.000	6225292
LT 1140 R3 FS	400	1.5	1	774.500	6225294
LT 1150 R3 FS	500	1.5	1	849.300	6225296
LT 1160 R3 FS	600	1.5	1	924.000	6225298
LT 1120 R3 FT	200	1.5	1	651.500	6225310
LT 1130 R3 FT	300	1.5	1	781.100	6225312
LT 1140 R3 FT	400	1.5	1	882.600	6225314
LT 1150 R3 FT	500	1.5	1	963.100	6225318
LT 1160 R3 FT	600	1.5	1	982.900	6225320

T piece, horizontal, with welded rung for all cable ladder types of 110 mm side height. Connectors should be ordered separately and in the appropriate quantity.



## T piece 110

St FT

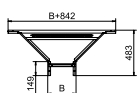
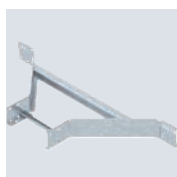


Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
SLT 1120 R3 FT	200	2	1	807.400	6225350
SLT 1130 R3 FT	300	2	1	969.800	6225352
SLT 1140 R3 FT	400	2	1	1,099.200	6225354
SLT 1150 R3 FT	500	2	1	1,200.500	6225358
SLT 1160 R3 FT	600	2	1	1,251.100	6225360

T piece, horizontal, with welded rung for all cable ladder types of 110 mm side height. Connectors should be ordered separately and in the appropriate quantity.

## Add-on tee 110

St FT

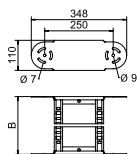


Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
SLAA 1120 R3 FT	200	2	1	524.000	6225950
SLAA 1130 R3 FT	300	2	1	545.000	6225952
SLAA 1140 R3 FT	400	2	1	587.000	6225954
SLAA 1150 R3 FT	500	2	1	617.000	6225958
SLAA 1160 R3 FT	600	2	1	649.000	6225960

Add-on tee with welded rung for all cable ladder types of 110 mm side height. Connectors should be ordered separately and in the appropriate quantity.

## Adjustable bend element 110

St FS FT

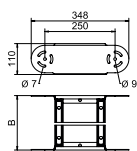


Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
LGBE 1120 FS	200	1.5	1	128.000	6225490
LGBE 1130 FS	300	1.5	1	142.100	6225492
LGBE 1140 FS	400	1.5	1	155.300	6225494
LGBE 1150 FS	500	1.5	1	168.600	6225496
LGBE 1160 FS	600	1.5	1	181.800	6225498
LGBE 1120 FT	200	1.5	1	136.900	6225510
LGBE 1130 FT	300	1.5	1	150.900	6225512
LGBE 1140 FT	400	1.5	1	165.100	6225514
LGBE 1150 FT	500	1.5	1	179.300	6225518
LGBE 1160 FT	600	1.5	1	193.300	6225520

Adjustable bend element with welded rung for use in the cable ladder types with a side height of 110 mm.

## Adjustable bend element 110

St FT



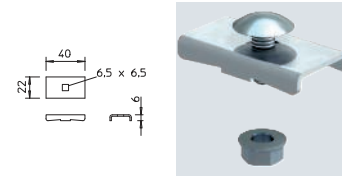
Type	Dim. B mm	Rail thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
SLGBE 1120 FT	200	2	1	172.800	6225530
SLGBE 1130 FT	300	2	1	191.800	6225532
SLGBE 1140 FT	400	2	1	210.800	6225534
SLGBE 1150 FT	500	2	1	229.600	6225538
SLGBE 1160 FT	600	2	1	248.600	6225540

Adjustable bend element, heavy-duty, with welded rung for use in the cable ladder types with a side height of 110 mm.

St FS FT

### LKS 40 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
LKS 40 FS	10	2.300	6221076
LKS 40 FT	10	2.400	6221084

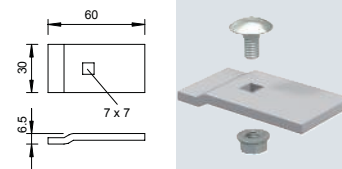


Hold-down clamp for fastening cable ladders.  
Fastening on brackets, type MWA 12, AW 15, AW 30 and AW 55, using the enclosed truss-head bolt FRS M6 x 20.

A4 2B

### LKS 60/4 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
LKS 60 4 A4	10	6.363	6221157

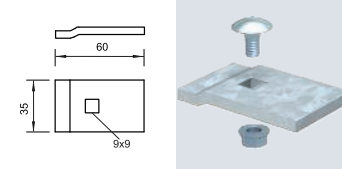


Hold-down clamp for fastening cable ladders.  
Fastening on brackets, type AW 15, AW 30 and AW 55, using the enclosed truss-head bolt FRS M6x20.

St FT

### LKS 60/5 hold-down clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
LKS 60 5 FT	10	10.000	6232485

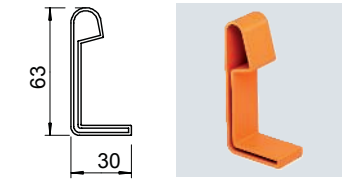


Hold-down clamp for fastening wide span cable ladders.  
Fastening on bracket, type AW 80, and AWSS using the enclosed truss-head bolt FRS M8x20.

PE

### Protective cap 60

Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKH 60 OR	Pastel orange	40	1.072	6222537

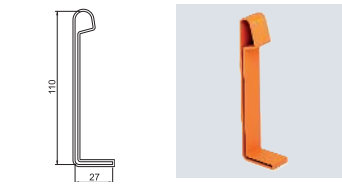


Protective cap to cover cable ladder ends of side height 60 mm.

PE

### End cap 110

Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKH 110 OR	Pastel orange	20	1.345	6222553

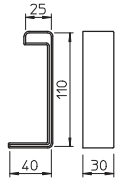


End cap to cover cable ladder ends of side height 110 mm.



### End cap 110

PVC

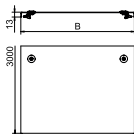


Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKHW 110 OR	Pastel orange	20	4.400	6310398

End cap to cover the ends of wide span cable ladders.

### Cover with turn buckle

St DD



Type	Dim. B mm	Metal thickness mm	Length mm	Pack m	Weight kg/100 m	Item no.
DRL 300 DD	300	1.00	3000	3	263.340	6052712
DRL 400 DD	400	1.00	3000	3	342.070	6052715

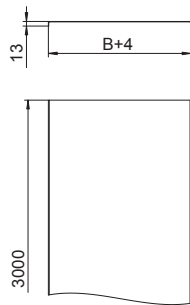
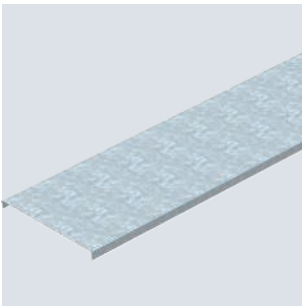
Transverse bead from 500 mm width.

Cover for cable trays and cable ladders with turn buckles.

When using covers outdoors, additional measures against the influence of wind must be taken.

### Unperforated cover

St FS



Type	Dim. B mm	Metal thickness mm	Length mm	Pack m	Weight kg/100 m	Item no.
DRLU 100 FS	100	1.00	3000	3	99.000	6052103

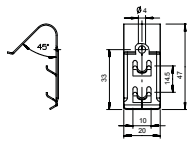
Cover for cable trays and mesh cable trays.

When using covers outdoors, additional measures against the influence of wind must be taken.

Transverse bead from 500 mm width.

### Cover clamp, universal

VA 2B



Type	Pack Piece	Weight kg/100 pc.	Item no.
DKU A2	20	0.794	6065600

Cover clamp for universal fastening of covers on cable trays, mesh cable trays and AZ small ducts.

The cover clamp is not suitable for use with mesh cable trays with a side height of 35 mm.

Depending on the tray width, 4-6 cover clamps are required for secure fastening of a 3 m cover.



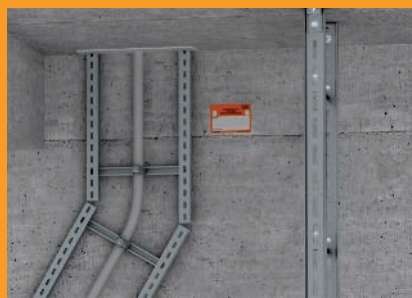






## Vertical ladder systems

OBO vertical ladder systems for vertical routing of all kinds of cables. Available as light-duty vertical ladders with a side height of 45 mm, as a heavy-duty vertical ladder with U profiles and industrial vertical ladders with I profiles. Both the heavy-duty and industrial vertical ladders can be assembled in variable lengths.



# Vertical ladder systems

## Installation principle



- 1 Light-duty vertical ladder
- 2 Heavy-duty vertical ladder
- 3 Industrial vertical cable ladder
- 4 Cover with spacer
- 5 Rung seat with MS4022 rung



# Mounting aid



**Wall mounting application**  
Wall mounting of a vertical ladder with mounting angles.



**Change of direction application**  
Implementation of a change of direction with heavy-duty vertical ladder, type SLM.



**Free-standing vertical ladder application**  
Mounting example for free-standing industrial vertical ladders, type SLS, fastened to the ceiling and floor.



**Straight connection of vertical ladders**  
Connection of vertical ladders, types LG and SSL 60, with connectors, type LVG.



**Angle connection of cable ladders**  
Creation of flexible vertical ladder angles with angle connector, type LWVG.



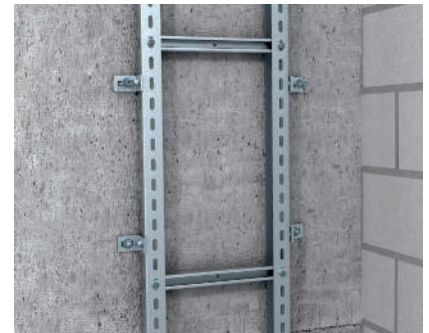
**Adjustable connection of cable ladders**  
Creation of flexible vertical ladder angles with adjustable connector, type LGVG.



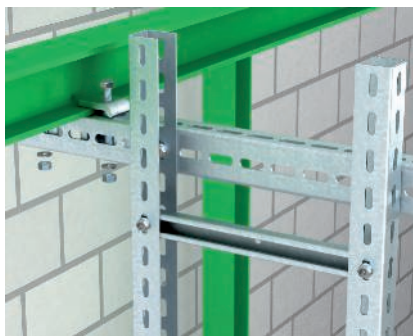
**Wall mounting, light-duty vertical ladder**  
Wall mounting of light-duty vertical ladder, type SLL 45, with wall bracket, type WB 30/75.



**Direct wall mounting**  
Direct fastening of the vertical ladders LG and SSL with anchor bolts on the wall.



**Wall mounting, heavy-duty vertical ladder**  
Wall mounting of heavy-duty vertical ladder, type SLM 50, with mounting angle, type BW.



**Vertical ladder mounting on steel**  
Installation of the heavy-duty vertical ladder, type SLM 50, with cantilever beam made of U profile, on a steel construction.



**Cable fastening with U clamp**  
Fastening of cables to the rung with clamp clips.



**Fastening of industrial vertical ladder**  
Wall mounting of industrial vertical ladder with mounting angle, type BW 80/55.





**Fastening of C profile rung**  
Fastening of C profile rung, type CK 40, in industrial vertical ladders, type SLS 80.



**Fastening of angle rung**  
Fastening of the angle rung, type WSK 40, in industrial vertical ladders, type SLS 80.



**Ceiling fastening**  
Fastening of an industrial vertical ladder, type SLS 80, to the ceiling using mounting angle, type BW.



**Illustration of vertical shaft**  
Illustration of complete vertical ladder mounting.



**Rung seat fixed to IS 8 support**  
Fastening of the rung seat, type SA, with profile rail, type MS 4022, in I support.



**Rung seat in steel girder**  
Direct fastening (clamping) of the rung seat, type SAA, with profile rail, type MS 4022, on steel girder.

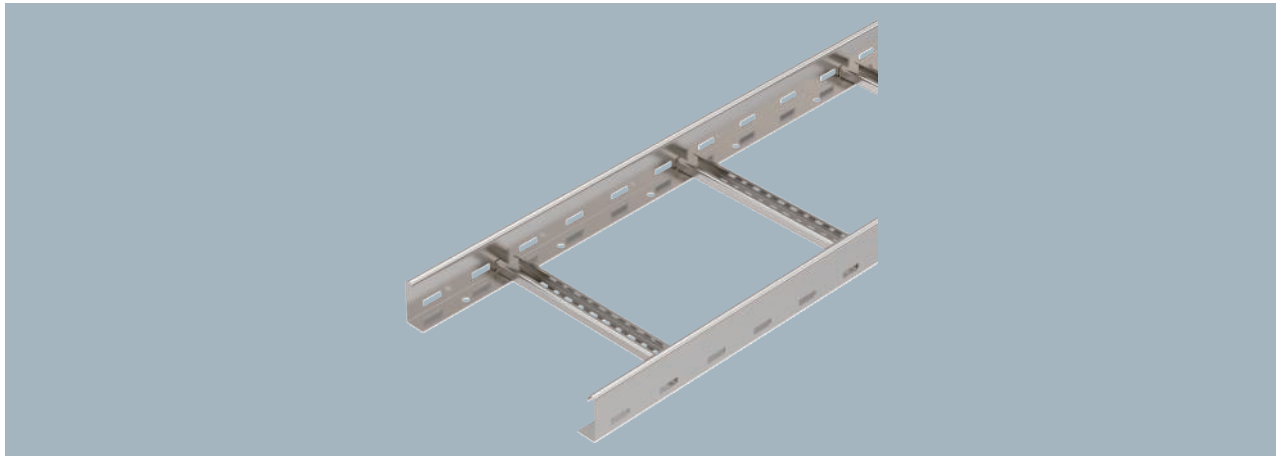


**Cover mounting, vertical**  
Installation of the cover with spacer on a vertical ladder.



## Cable ladder LG 60, 6 m VS

A4 2B



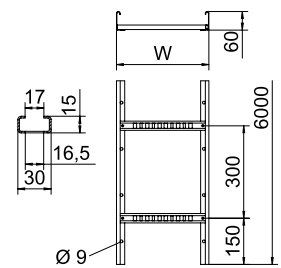
Type	Width mm	Pack m	Weight kg/100 m	Item no.
LG 660 VS6 A4	600	6	354.000	6101232

The cable ladder is shipped folded up. You can find the appropriate type 2056 clamp clip in the vertical ladder systems section.

Cable ladder with perforated side rail of side height 60 mm with riveted C profile frames, open in an upwards direction (VS version).

Type	Length mm	Dim. B mm	Usable cross-section cm <sup>2</sup>	Rung spacing mm
LG 660 VS6 A4	6000	600	298	300

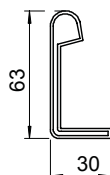
### Dimensions



## System accessories

### Protective cap 60

PE

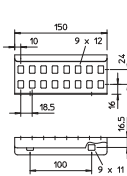
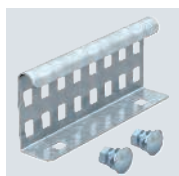


Type	Colour	Pack Pair	Weight kg/100 pairs	Item no.
SKH 60 OR	Pastel orange	40	1.072	6222537

Protective cap to cover cable ladder ends of side height 60 mm.

### Straight connector 60

St FS FT



Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LVG 60 FS	60	10	22.000	6208840
LVG 60 FT	60	10	23.000	6208843

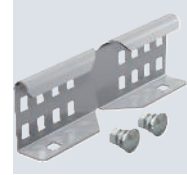
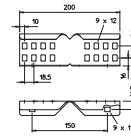
Straight connector as external connector to connect cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

The bolt fastening ensures the continuity of the equipotential bonding.

A2 2B

### Angle connector 60

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LWVG 60 A2	60	10	24.000	6208898



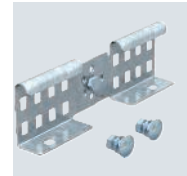
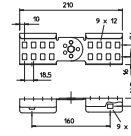
The bolt fastening ensures the continuity of the equipotential bonding.

Angle connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

St FS FT

### Adjustable connector 60

Type	Side height mm	Pack Piece	Weight kg/100 pc.	Item no.
LGVG 60 FS	60	10	28.500	6208941
LGVG 60 FT	60	10	29.900	6208944



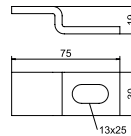
Adjustable connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation. Angle can be adjusted vertically.

The bolt fastening ensures the continuity of the equipotential bonding.

St FT

### Wall bracket

Type	Pack Piece	Weight kg/100 pc.	Item no.
WB 30 75 FT	10	18.100	6019617



Wall bracket for the fastening of light-weight vertical ladders type SLL, to concrete walls and masonry.



## US 5 support

St FT

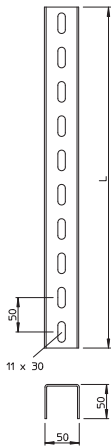


Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
US 5 300 FT	3000	2.5		1	795.000	6340989

U support in fixed lengths. Dimensions 50 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 45.

### Dimensions



## VUS 5 U support connector

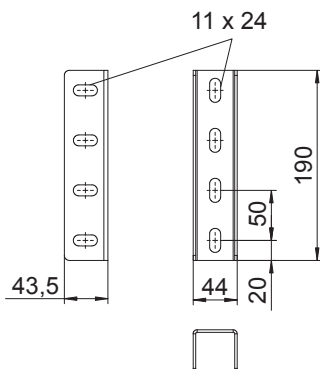
St FT



Type	Pack Piece	Weight kg/100 pc.	Item no.
VUS 5 FT	10	61.000	6018505

U support connector to connect US 5 supports.  
Including appropriate fastening material.

### Dimensions





PE

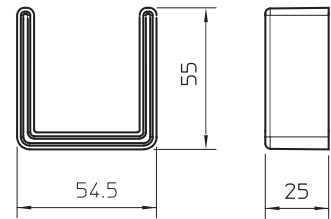
## Protective cap

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 5 KS OR	Pastel orange	20	1.300	6338462

Protective cap to cover the ends of US 5 supports.



### Dimensions



St FT

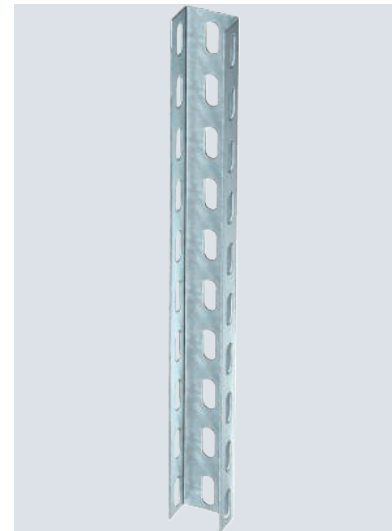
US3

## US 3 support

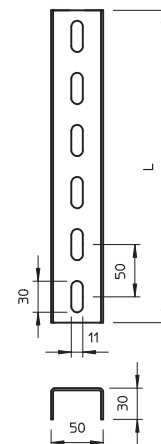
Type	Length mm	Material thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
US 3 600 FT	6000	2	1	834.000	6342450

U support in fixed lengths. Dimensions 30 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 25.

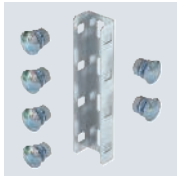


### Dimensions



## VUS 3 U support connector

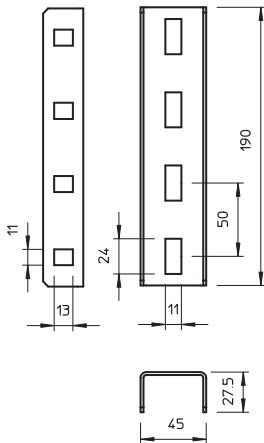
St FT  
US3



Type	Pack Piece	Weight kg/100 pc.	Item no.
VUS 3 FT	10	48.300	6018513

U support connector to connect US 3 supports.  
Including appropriate fastening material.

### Dimensions



## Protective cap

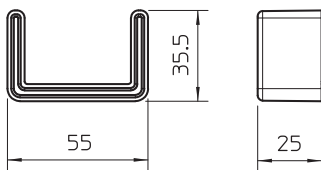
PE



Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 3 KS OR	Pastel orange	20	1.068	6338458

Protective cap to cover the ends of US 3 supports.

### Dimensions



St FT



## US 7 support

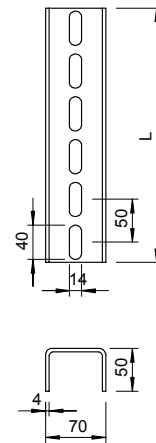
Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
US 7 600 FT	6000	4		1	2,490.000	6340318

U support in fixed lengths. Dimensions 70 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 61.

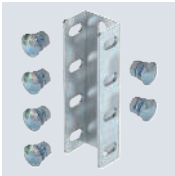


### Dimensions



## VUS 7 U support connector

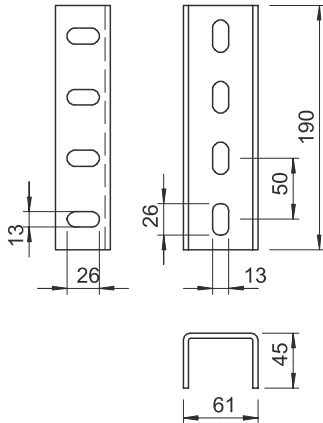
St FT  
US7



Type	Pack Piece	Weight kg/100 pc.	Item no.
VUS 7 FT	10	112.800	6018378

U support connector to connect US 7 supports.  
Including appropriate fastening material.

### Dimensions



## End cap

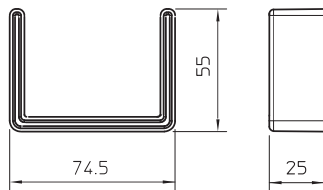
PE  
US7



Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 7 KS OR	Pastel orange	20	1.806	6338497

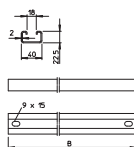
Protective cap to cover the ends of US 7 supports.

### Dimensions



## MS4022 profile rail, heavy-duty, slot 18 mm

St FT  
18 U



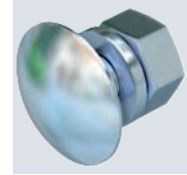
Type	Material thickness mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
MS4022P0592FT	2	592	1	96.000	6007252

MS4022 profile rail for use as rung in heavy-duty ladders.

St F

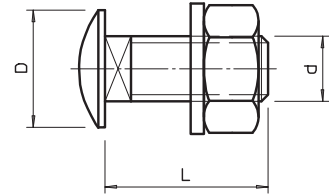
## Truss-head bolt with nut and washer

Type	Dimen- sion mm	Dim. L mm	Dim. d mm	Dim. D mm	Resist- ance grade	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRS 8x16 F 8.8</b>	M8x16	16	8	20	8.8	50	1.947	<b>6406963</b>
<b>FRS 8x25 F</b>	M8x25	25	8	20	8.8	50	2.217	<b>6406998</b>
<b>FRS 8x35 F</b>	M8x35	35	8	20	5.6	50	2.431	<b>6407048</b>



Truss-head bolt with square neck. With washer and hexagonal nut.  
The truss-head bolt can be used in combination with hot-dip and double-dip galvanised articles.

### Dimensions

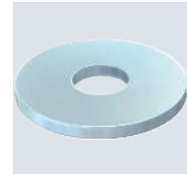
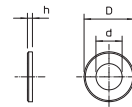


St F

## Large washer

Type	Thread	Dim. d mm	Dim. D mm	Dim. h mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>DIN440 9 F</b>	M8	9	28	3	100	1.057	<b>6408710</b>

Washer of particularly large outer diameter.



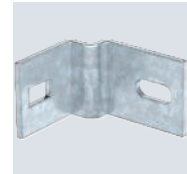
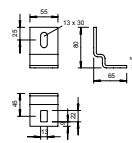
## System accessories

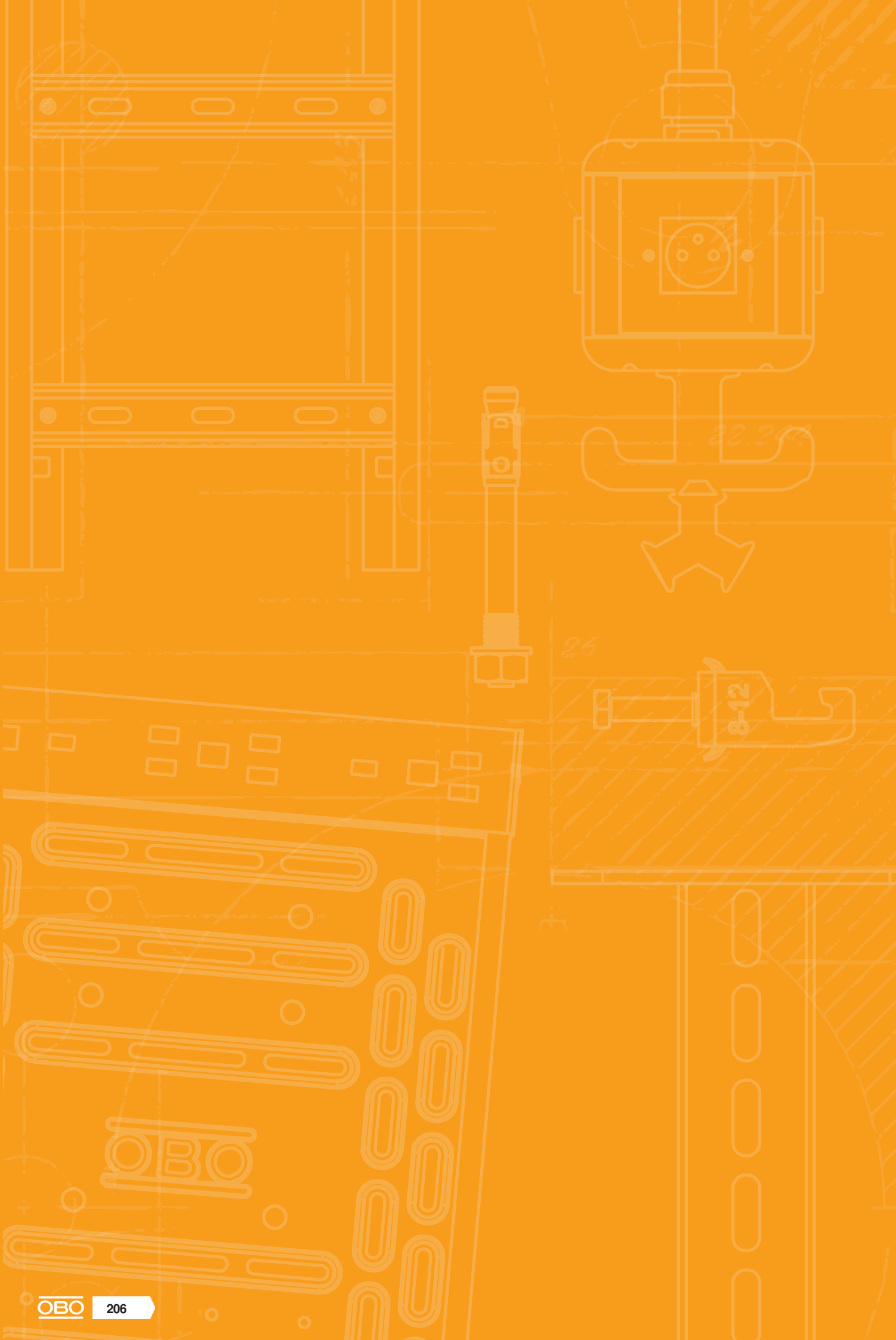
St FT

### Mounting angle BW 80

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>BW 80 55 FT</b>	10	32.900	<b>6019528</b>

The mounting angle can also be used in conjunction with the heavy-duty vertical ladder, type SLS 80.  
Including fastening bolt M12x30.  
Mounting angle for mounting IS 8 supports on the wall.





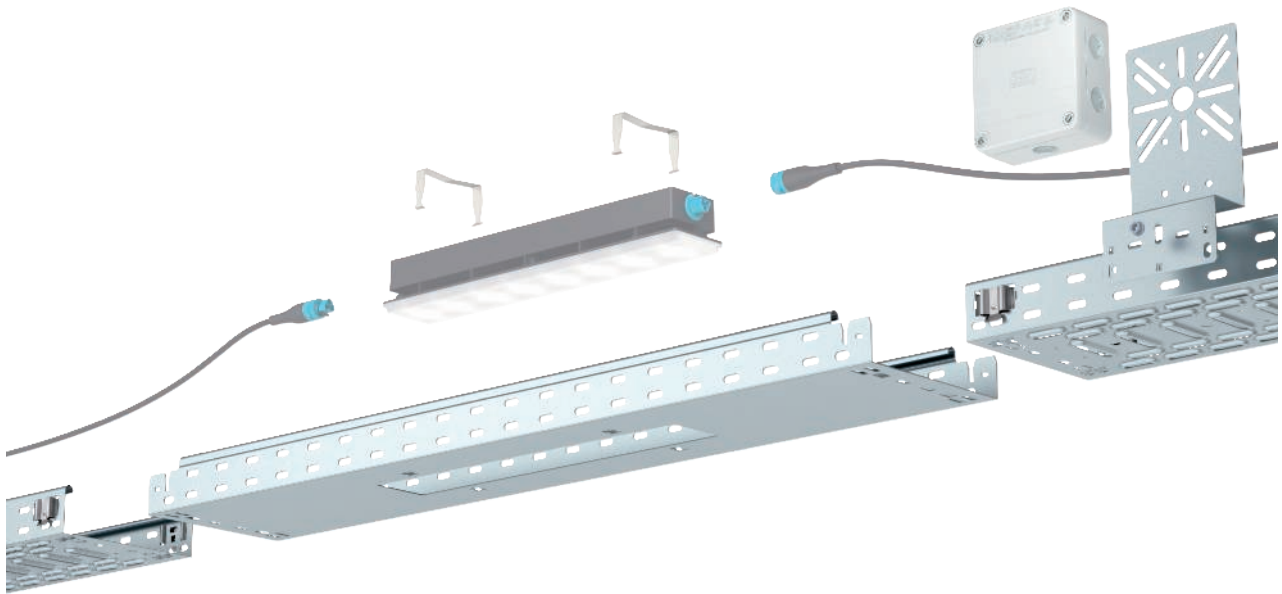
# Luminaire support systems



Luminaire support tray

206

## System description

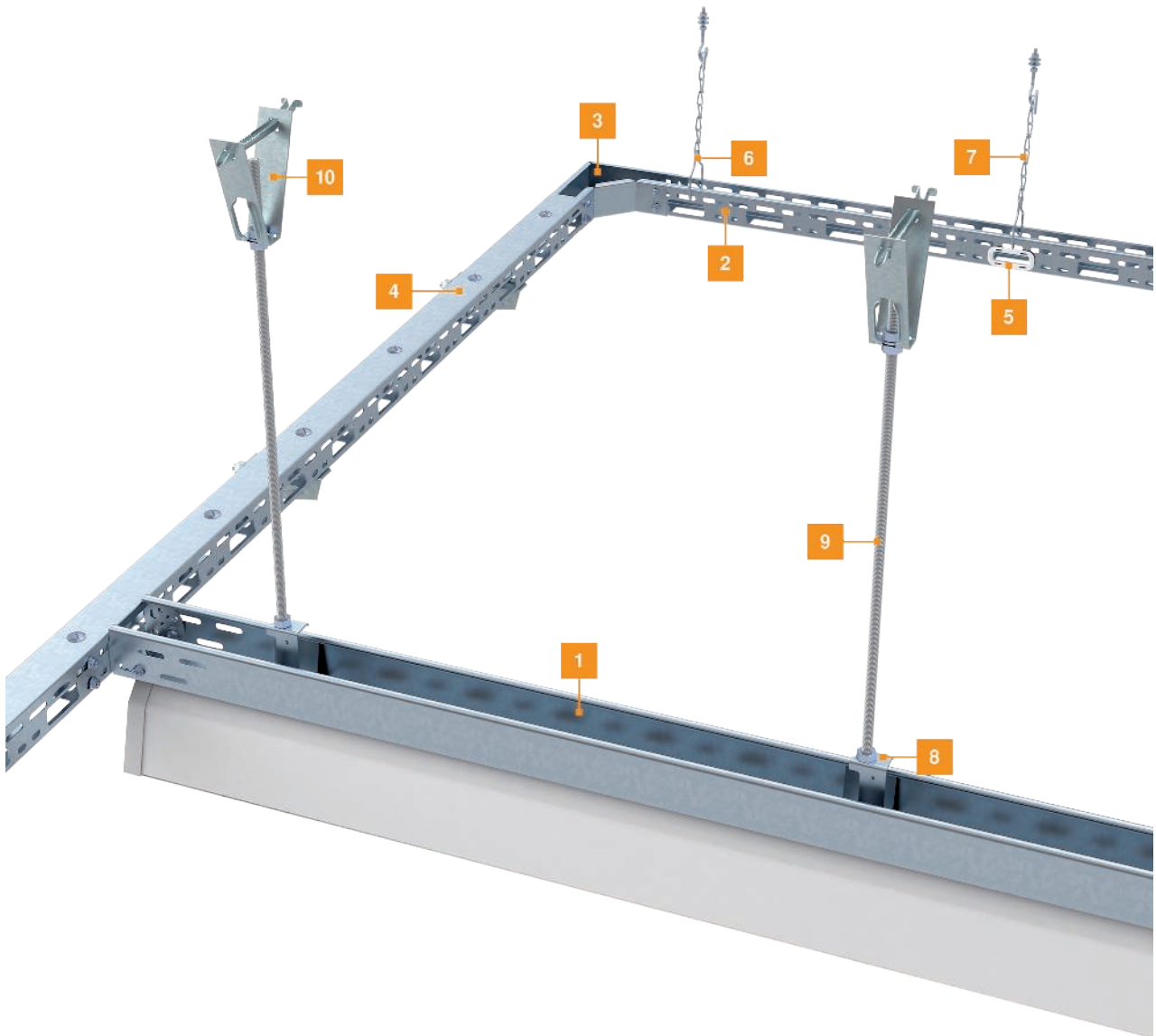


Whether in industry, in purpose-built buildings or in especially attractive buildings, OBO luminaire support systems simplify the installation of light systems in many areas of industry and buildings. They are also suitable for flexible power and data supply to machines and

workstations. The OBO luminaire support system makes cable laying and the optimum positioning of lighting for any possible application simply child's play.



## Installation principle



- |    |                           |
|----|---------------------------|
| 1  | Luminaire support tray    |
| 2  | Luminaire support channel |
| 3  | 90° bend                  |
| 4  | Cover with turn buckle    |
| 5  | Edge protection ring      |
| 6  | Suspension bracket        |
| 7  | Suspension chain          |
| 8  | Centre suspension         |
| 9  | Threaded rod              |
| 10 | Trapezoidal fastening     |

## Mounting aid



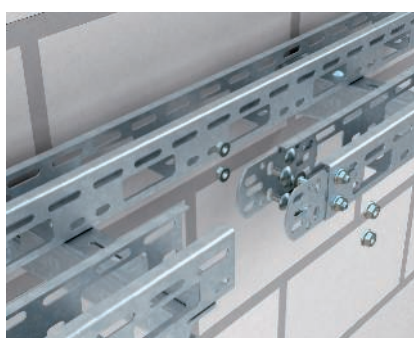
**Luminaire support tray application**  
Suspension of the luminaire support tray with chain and suspension bracket.



**Luminaire support tray application**  
Suspension of a luminaire support tray with centre suspension MAH and threaded rod.



**Straight connection of luminaire support tray**  
Horizontal straight connection of the luminaire support tray, type LTR with straight connector set, type RV 607.



**Longitudinal connection of luminaire support channel**  
Horizontal longitudinal connection of the luminaire support channel, type LTS, with straight and angle connectors, type VF AZK.



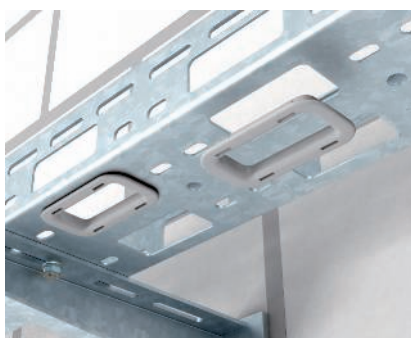
**Horizontal angle connection**  
Horizontal angle connection of the luminaire support channel, type LTS, with straight and angle connectors, type VF AZK.



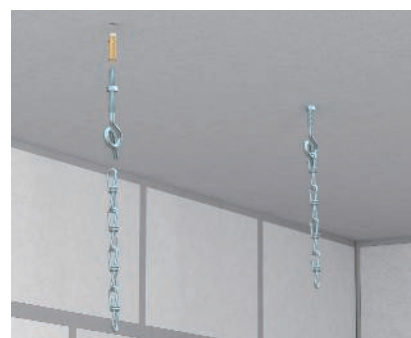
**Vertical straight connection**  
Vertical straight connection of the luminaire support tray, type LTS, with two straight and angle connectors, type VF AZK.



**Side rail cable protection ring**  
Insertion of the cable protection rings, type KSR 910, in the side rail of the luminaire support channel.



**Floor cable protection ring**  
Insertion of the cable protection rings, type KSR 915, in the base of the luminaire support channel.



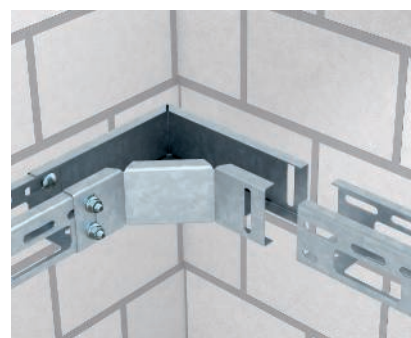
**Chain suspension**  
Implementation of a chain suspension for luminaire support systems with anchors, ceiling hook, type 948/TG6 and suspension chain, type LTK-K.



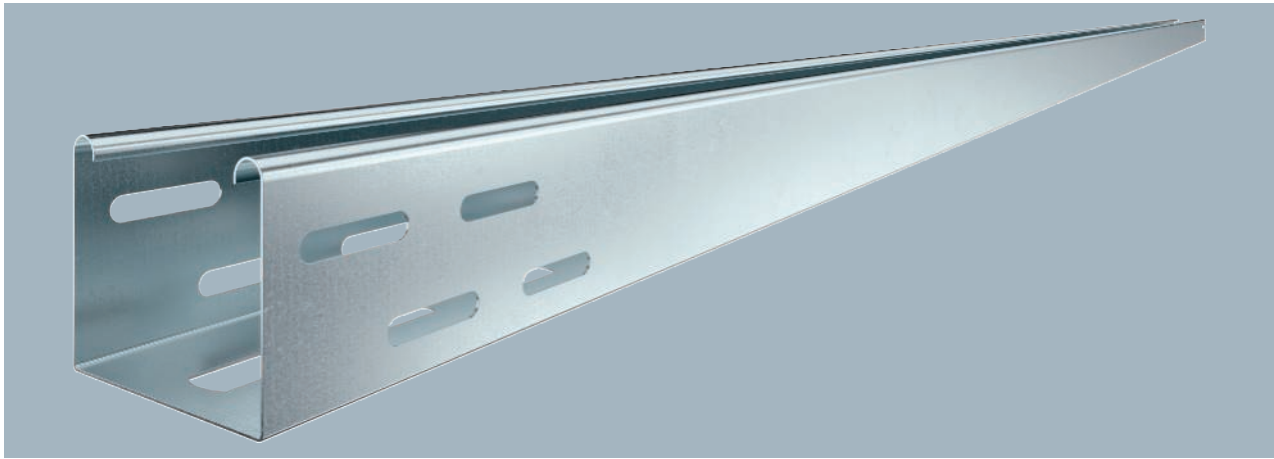
**Centre suspension**  
Efficient creation of centre suspensions. The luminaire support tray is fastened to the centre suspension hanger without bolts.



**Pre-wired luminaire supports**  
Mounting of a pre-terminated luminaire beneath a luminaire support tray.



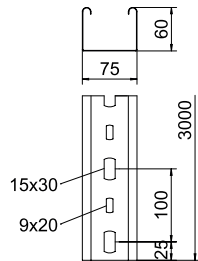
**Mounting of luminaire support fitting**  
Mounting of luminaire support fitting by simple interconnection of fitting and luminaire support tray.



The white version has a visible surface coating.  
Luminaire support tray with perforated base for fastening luminaires and cable penetration.

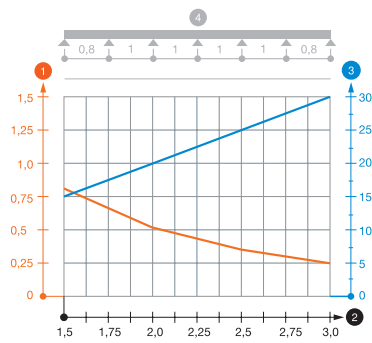
Type	Width mm	Metal thick- ness mm	Pack m	Weight kg/100 m	Item no.
LTR 3000 FS	75	0.75	3	125.700	6055810
LTR 6000 FS	75	0.75	6	126.020	6055812

Dimensions



Type	Length mm	Width mm	Usable cross- section cm <sup>2</sup>	Metal thick- ness mm
LTR 3000 FS	3000	75	42	0.75
LTR 6000 FS	6000	75	42	0.75

Load



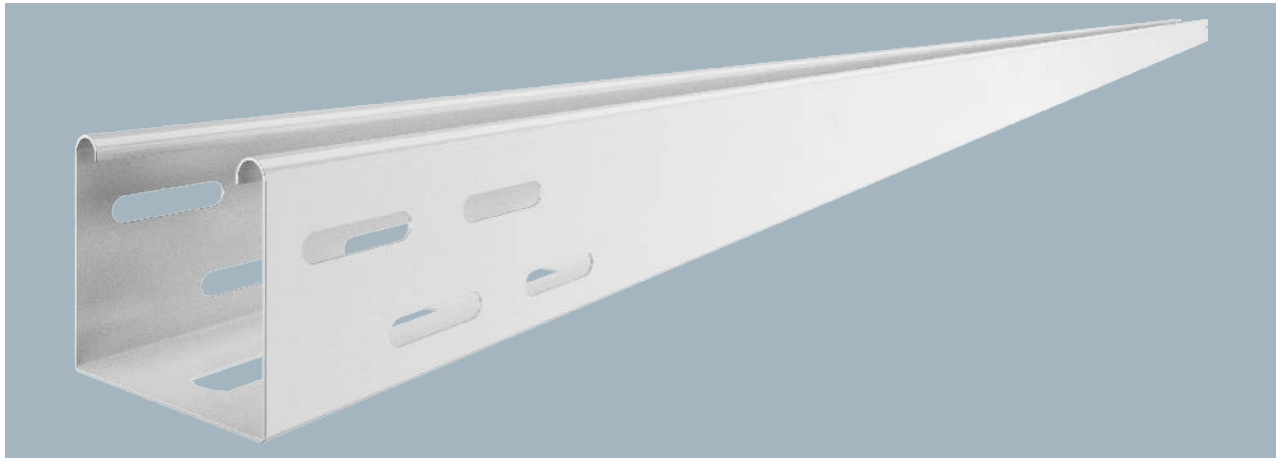
	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m	3.0 m kN/m
LTR 3000 FS	0.8	0.55	0.35	0.25
LTR 6000 FS	0.8	0.55	0.35	0.25

Load diagram, luminaire support tray, type LTR

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width

## Luminaire support tray, pure white

St PE50



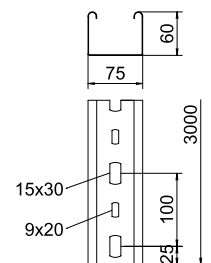
Type	Width mm	Metal thick- ness mm	Colour	Pack m	Weight kg/100 m	Item no.
LTR 3000 FSK RW	75	0.75	Pure white	6	129.540	6055820

The luminaire support tray's surface is strip-galvanised and is also powder-coated in white (RAL 9010).

Luminaire support tray with perforated base for fastening luminaires and cable penetration.

Type	Length mm	Width mm	Usable cross- section cm <sup>2</sup>
LTR 3000 FSK RW	3000	75	42

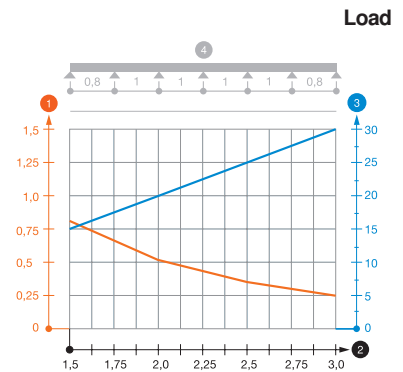
### Dimensions



Type	1.5 m kN/m	2.0 m kN/m	2.5 m kN/m	3.0 m kN/m
LTR 3000 FSK RW	0.8	0.55	0.35	0.25

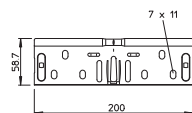
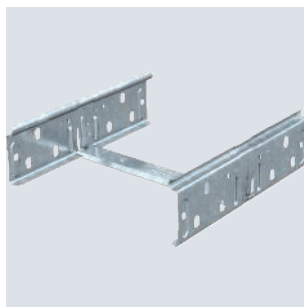
### Load diagram, luminaire support tray, type LTR

- ① Permitted cable tray/ladder load in kN/m without man load
- ② Support width in m
- ③ Rail bend in mm at permitted kN/m
- ④ Load scheme during testing
- Load curve with cable tray/ladder width in mm
- Strut bend curve according to support width



## Straight connector set 60

St FS



Type	Side height mm	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
RV 607 FS	60	75	10	18.800	6068150

Quick connector set for straight, screwless connections of cable trays and fittings with a side height of 60 mm.

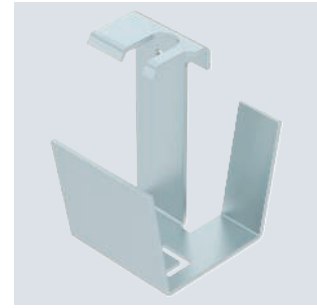
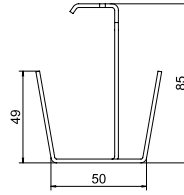
The continuous earthing connection is guaranteed without a screw connection.

St FS

### Centre suspension for luminaire support tray

Type	for width mm	For threaded rod	Pack Piece	Weight kg/100 pc.	Item no.
MAH LTR FS	75	M10	25	12.000	6358810

The central hanger can be used with all cable trays of width 75 mm and side height 60 mm.  
Central hanger for luminaire support tray, type LTR, for threaded rod and chain suspension.

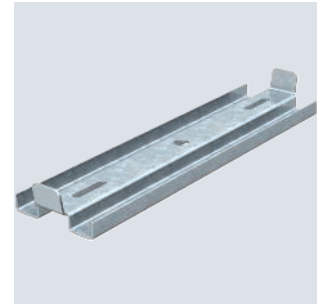
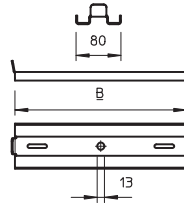


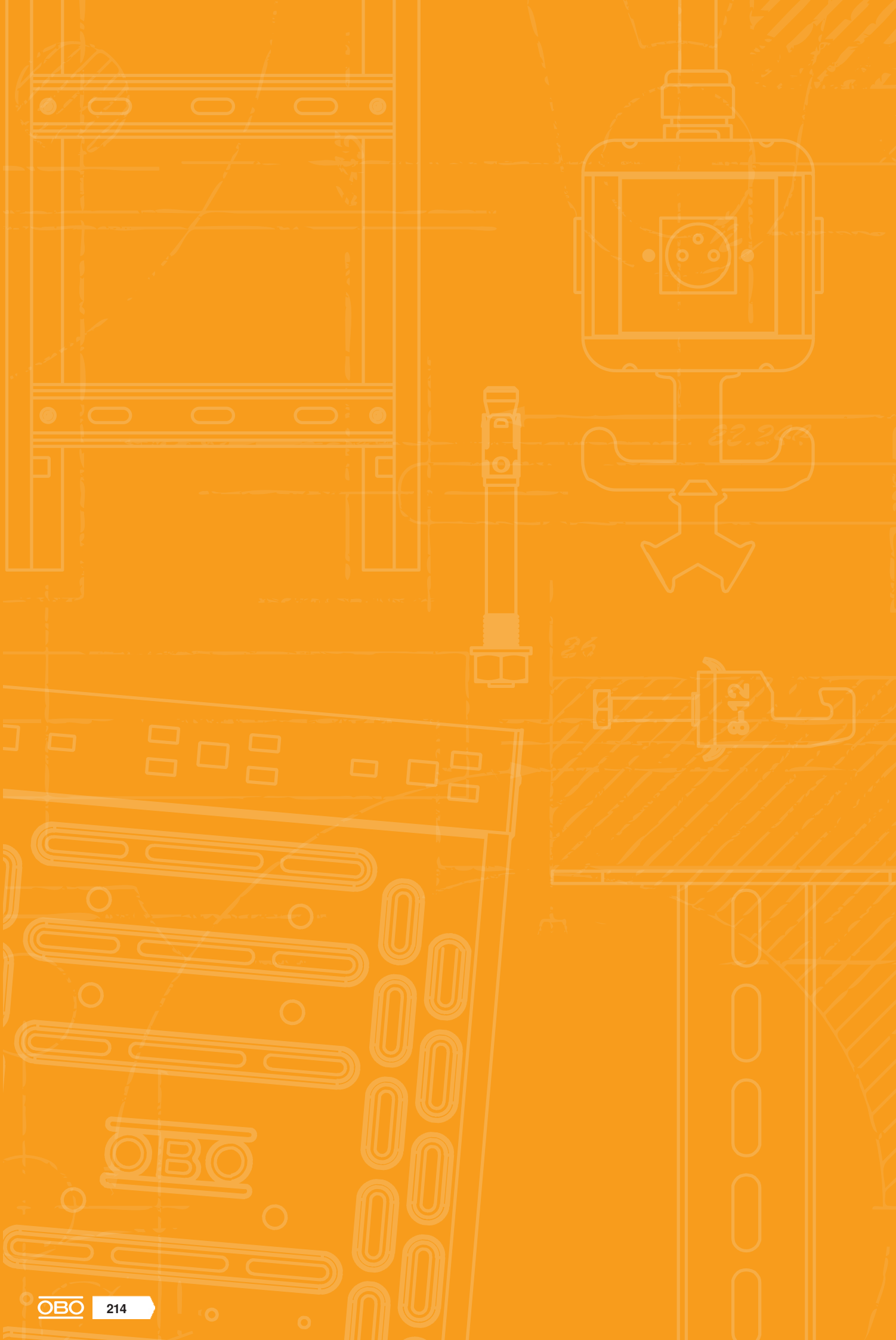
St FT

### Centre suspension, cable ladder




Type	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MAHL 200 FT	200	1	41.900	6358659
MAHL 300 FT	300	1	61.800	6358667
MAHL 400 FT	400	1	81.800	6358675
MAHL 500 FT	500	1	101.700	6358683
MAHL 600 FT	600	1	121.700	6358687

On filling, please ensure an even load distribution (no one-sided filling).  
Centre suspension for cable ladders.





# Mounting systems








	Brackets	216
	Supports	226
	Alternative suspension systems	240



# Selection aid

## Support and bracket combinations

### Bracket arrangement, one-sided

				US 3 K		US 5 K		US 7 K	
									
		Bracket	Support length	200 – 600	700 – 1200	200 – 600	700 – 1200	200 – 600	700 – 1200
MWA12 ...			100	–	DSK25	–	DSK45	–	–
			200	–	DSK25	–	DSK45	–	–
			300	–	DSK25	–	DSK45	–	–
			400	DSK25	DSK25	DSK45	DSK45	DSK61	DSK61
AW 15 ...			100	–	DSK25	–	DSK45	–	–
			200	–	DSK25	–	DSK45	–	–
			300	–	DSK25	–	DSK45	–	–
			400	DSK25	DSK25	DSK45	DSK45	DSK61	DSK61
			500			DSK45*	DSK45*	DSK61	DSK61
			600			DSK45*	DSK45*	DSK61	DSK61
AW 30 ...			100			DSK45	DSK45	–	–
			200			DSK45	DSK45	–	–
			300			DSK45*	DSK45*	–	–
			400			DSK45*	DSK45*	DSK61	DSK61
			500					DSK61	DSK61
			600					DSK61	DSK61
			700					DSK61	DSK61
AW 55 ...			200			DSK45**	DSK45**	DSK61	DSK61
			300			DSK45**	DSK45**	DSK61	DSK61
			400			DSK45**	DSK45**	DSK61*	DSK61*
			500					DSK61*	DSK61*
			600					DSK61*	DSK61*
			700					DSK61*	DSK61*

- No DSK required

\* Observe the overall load, adapt the support distances, refer to the load tables in the catalogue

\*\* Only use with maintenance of electrical function

*A spacer must always be used for support lengths > 600 mm and bracket arrangements at the bottom end of the support.*



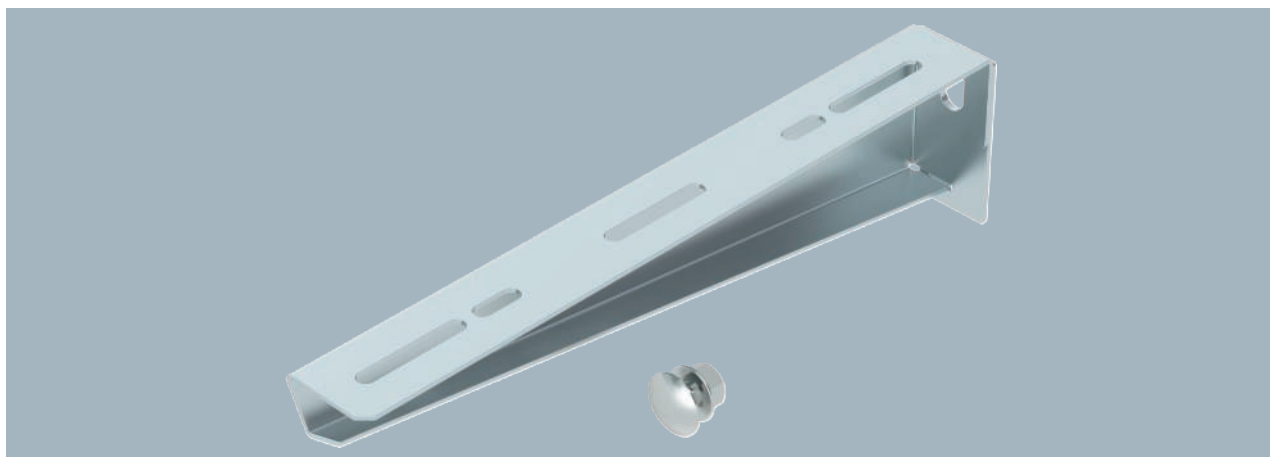
*With DSK (spacer)*



*Without DSK (spacer)*



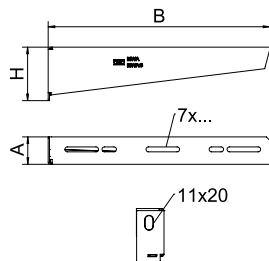
Wall and support bracket MWA 12



Including truss-head bolt M10 x 25 for fastening to U supports.  
Light-duty wall and support bracket.

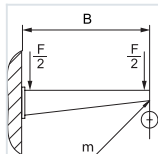
Type	Width mm	F in kN	BS	Pack Piece	Weight kg/100 pc.	Item no.
MWA 12 31S FS	310	1.2		1	50.300	6424740

Dimensions



Type	Dim. B mm	Dim. A mm	Dim. H mm	Hole Ø mm
MWA 12 31S FS	310	38	75	11

Load

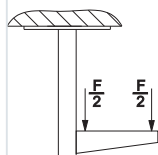


Load characteristics wall and support bracket MWA 12

Item on test	Force F (SWL)	Width B
MWA 12 11S FS	1.2 kN	110 mm
MWA 12 21S FS	1.2 kN	210 mm
MWA 12 31S FS	1.2 kN	310 mm
MWA 12 41S FS	1.2 kN	410 mm

Deformation measurement point m  
According to IEC 61537, chapter 10.8.1

Max. total load F = Cable weight + cable tray + bracket



Load values for MWA 12 on suspended support - ceiling fastening

Max. total load F in kN				
Bracket length in mm	100	200	300	400
Support				
US 3 K/ 20-60	1.2	1.2	1.2	1.2
US 3 K/ 70-120	1.2	1.2	1.2	1.2
US 5 K/ 20-60	1.2	1.2	1.2	1.2
US 5 K/ 70 120	1.2	1.2	1.2	1.2

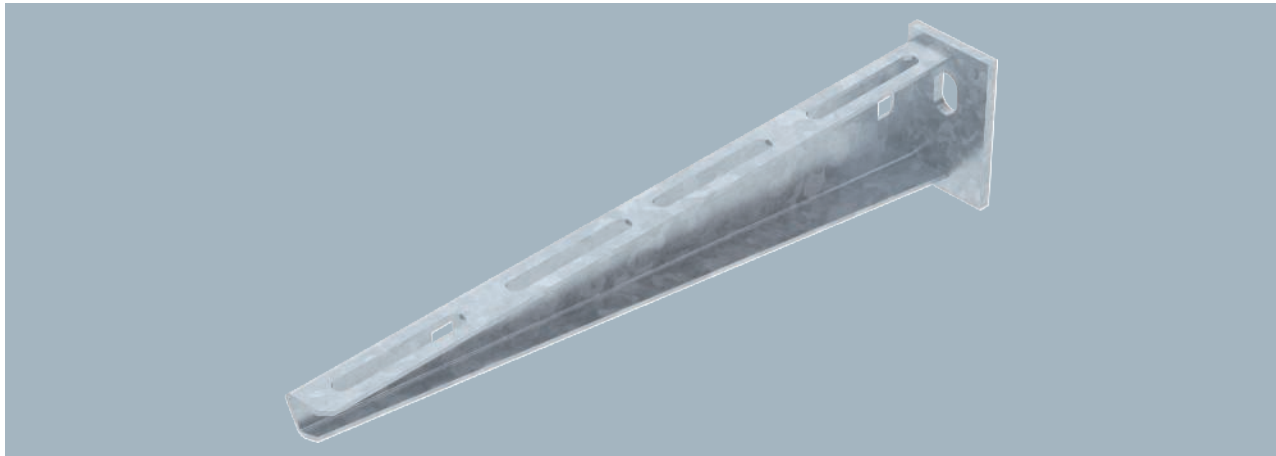
Max. total load F = cable weight + cable tray + bracket. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25. Observe the installation conditions of the DIBt approval (anchors).

Characteristic anchor load values for wall and support bracket MWA 12 - wall fastening

Load [kN]				
Bracket width [mm]	110%	210	310	410
Anchor type				
BZ3 10x90/0-30	1.2	1.2	1.2	1.2

The load capacity values increase considerably when used in uncracked concrete. The stated values are based on cracked concrete of compressive strength C20/25. Please comply with the installation conditions of ETA(anchors).

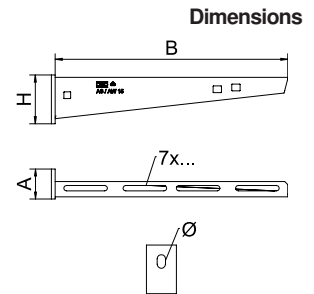
## Wall and support bracket AW 15



Type	Width mm	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
AW 15 16 FT	160	1.5	1	20.000	6420664
AW 15 21 FT	210	1.5	1	24.000	6420680
AW 15 31 FT	310	1.5	1	38.400	6420710
AW 15 41 FT	410	1.5	1	54.000	6420745
AW 15 51 FT	510	1.5	1	67.300	6420788
AW 15 61 FT	610	1.5	1	85.000	6420826

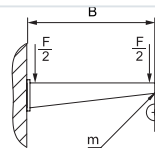
Fastening of the bracket to the U support of width 400 mm or greater using a hexagonal bolt through both sides of the support. Please insert suitable spacers.  
Light-duty wall and support bracket with welded head plate.

Type	Dim. B mm	Dim. A mm	Dim. H mm
AW 15 16 FT	160	40	55
AW 15 21 FT	210	40	60
AW 15 31 FT	310	40	65
AW 15 41 FT	410	40	70
AW 15 51 FT	510	40	75
AW 15 61 FT	610	40	80



### Characteristic anchor load values for wall bracket AW 15 - wall fastening

Item on test	Force F (SWL)	Width B
AW 15 11 FT	1.5 kN	110 mm
AW 15 16 FT	1.5 kN	160 mm
AW 15 21 FT	1.5 kN	210 mm
AW 15 31 FT	1.5 kN	310 mm
AW 15 36 FT	1.5 kN	360 mm
AW 15 41 FT	1.5 kN	410 mm
AW 15 51 FT	1.5 kN	510 mm
AW 15 56 FT	1.5 kN	560 mm
AW 15 61 FT	1.5 kN	610 mm



Deformation measuring point m

According to IEC 61537, Chapter 10.8.1

Max. total load F = cable weight + cable tray + bracket

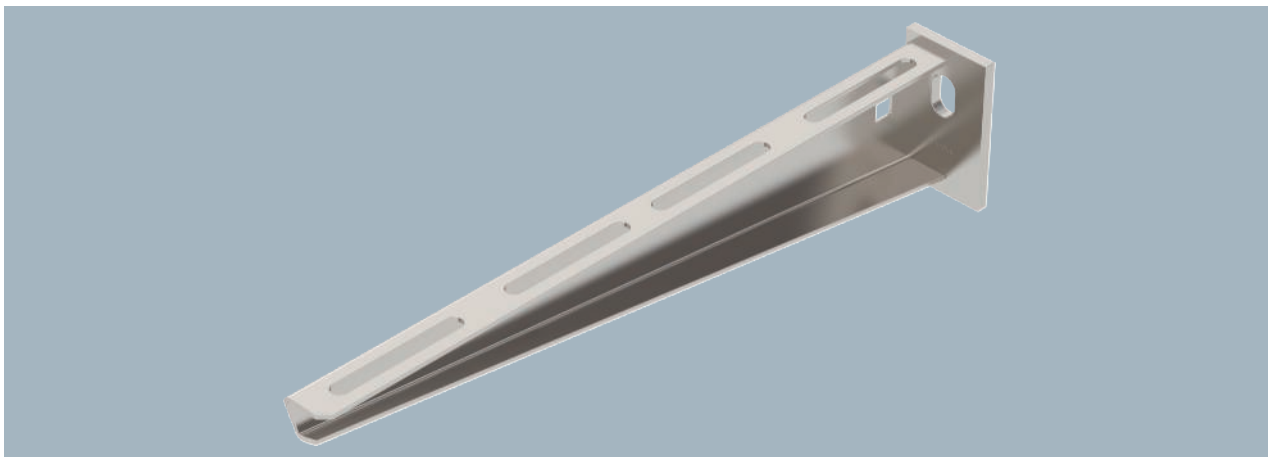
### Characteristic anchor load values for AW15 wall bracket – wall fastening

Load [kN]	110%	160	210	310	410	510	560	610
Bracket width [mm]								
Anchor type								
BZ3 10x90/0-30	1.5	1.5	1.5	1.47	1.25	1.13	0.95	0.94

The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance grade C20/25. Please comply with the installation conditions of the DIBt approval (anchors).

Load

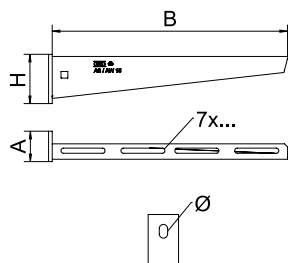
Wall and support bracket AW 15



Fastening of the bracket to the U support of width 400 mm or greater using a hexagonal bolt through both sides of the support. Please insert suitable spacers.  
Light-duty wall and support bracket with welded head plate.

Type	Width mm	F in kN kN	Pack Piece	Weight kg/100 pc.	Item no.
AW 15 21 A4	210	1.5	1	24.000	6392016
AW 15 31 A4	310	1.5	1	37.400	6392024
AW 15 41 A4	410	1.5	1	55.000	6392032

Dimensions



Type	Dim. B mm	Dim. A mm	Dim. H mm	Dim. Hole Ø mm
AW 15 21 A4	210	40	60	11
AW 15 31 A4	310	40	65	11
AW 15 41 A4	410	40	70	11

Load

**Characteristic anchor load values for wall bracket AW 15 - wall fastening**

Item on test	Force F (SWL)	Width B
AW 15 11 A4	0.15 kN	110 mm
AW 15 21 A4	0.15 kN	210 mm
AW 15 31 A4	0.15 kN	310 mm
AW 15 41 A4	0.15 kN	410 mm
AW 15 51 A4	0.15 kN	510 mm
AW 15 61 A4	0.15 kN	610 mm

Deformation measuring point m  
According to IEC 61537, Chapter 10.8.1  
Max. total load F = Cable weight + cable tray + bracket

**Characteristic anchor load values for AW15 wall bracket – wall fastening**

Load [kN]	Bracket width [mm]	110	210	310	410
Anchor type					
BZ-U 8-10-21/75		1.2	0.95	0.7	0.65
BZ-U 10-10-30/90		1.2	1.2	1.2	1.2

The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance grade C20/25. Please comply with the installation conditions of the DIBt approval (anchors).

## Wall and support bracket AWG 15

St FT



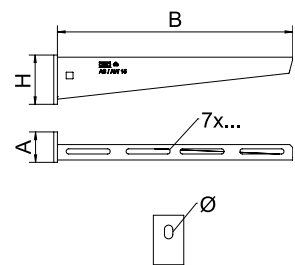
Type	Width mm	F in kN kN		Pack Piece	Weight kg/100 pc.	Item no.
AW G 15 11 FT	110	1.5		1	14.000	6420606
AW G 15 21 FT	210	1.5		1	26.000	6420608
AW G 15 31 FT	310	1.5		1	35.000	6420610
AW G 15 41 FT	410	1.5		1	56.000	6420612
AW G 15 51 FT	510	1.5		1	69.000	6420614
AW G 15 61 FT	610	1.5		1	84.000	6420616

Fastening of the bracket to the U support of width 400 mm or greater using a hexagonal bolt through both sides of the support. Please insert suitable spacers.

Light-duty wall and support bracket with welded head plate for screwless mesh cable tray fastening.

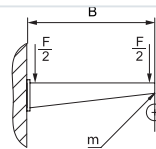
Type	Dim. B mm	Dim. A mm	Dim. H mm	Hole Ø mm
AW G 15 11 FT	110	40	50	11
AW G 15 21 FT	210	40	60	11
AW G 15 31 FT	310	40	65	11
AW G 15 41 FT	410	40	70	11
AW G 15 51 FT	510	40	75	11
AW G 15 61 FT	610	40	80	11

### Dimensions



### Characteristic anchor load values for wall bracket AWG 15 – wall fastening

Item on test	Force F (SWL)	Width B
AWG 15 11 FT	0.15 kN	110 mm
AWG 15 16 FT	0.15 kN	160 mm
AWG 15 21 FT	0.15 kN	210 mm
AWG 15 31 FT	0.15 kN	310 mm
AWG 15 41 FT	0.15 kN	410 mm
AWG 15 51 FT	0.15 kN	510 mm
AWG 15 61 FT	0.15 kN	610 mm



### Load

Deformation measuring point m

According to IEC 61537, Chapter 10.8.1

Max. total load F = Cable weight + cable tray + bracket

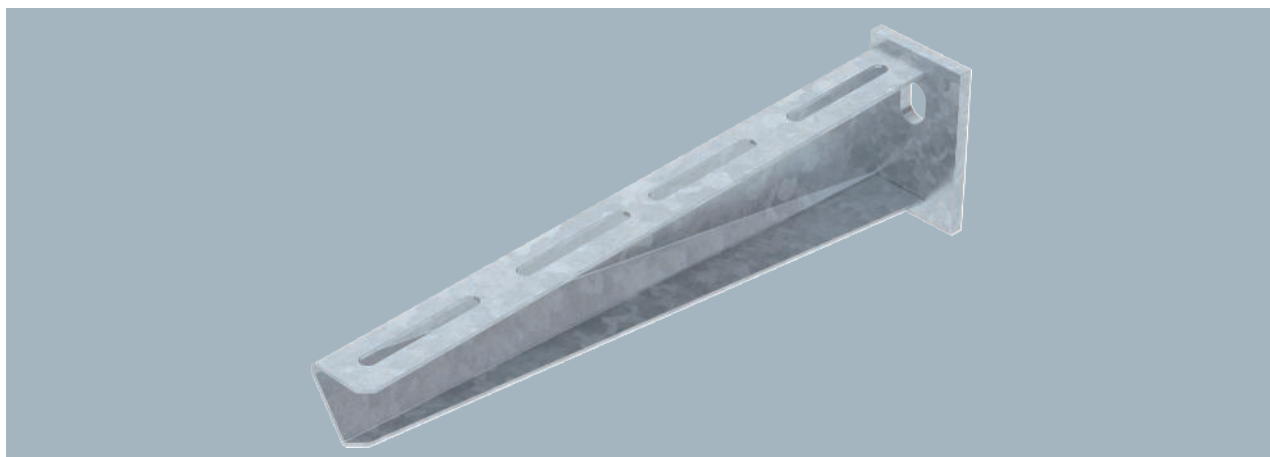
### Characteristic anchor load values for AW G 15 wall bracket – wall fastening

Load [kN]	110%	160	210	310	410	510	560	610
Bracket width [mm]								
Anchor type								
BZ3 10x90/0-30	1.5	1.5	1.5	1.47	1.25	1.13	0.95	0.94

The load capacity values increase considerably when used in uncracked concrete.

The specified values are based on concrete of resistance grade C20/25. Please comply with the installation conditions of the DIBt approval (anchors).

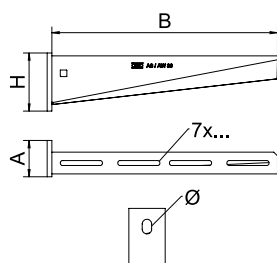
Wall and support bracket AW 30



Fastening of the bracket to the U support of width 400 mm or greater using a hexagonal bolt through both sides of the support. Please insert suitable spacers.  
Medium-duty wall and support bracket with welded head plate.

Type	Width F in kN			Pack Piece	Weight kg/100 pc.	Item no.
	mm	kN	BS			
AW 30 41 FT	410	3		1	88.500	6419763
AW 30 61 FT	610	3		1	157.000	6419828

Dimensions



Type	Dim.	Dim.	Dim.	Hole Ø
	B	A	H	
AW 30 41 FT	410	50	80	13
AW 30 61 FT	610	50	100	13

Load

**Characteristic anchor load values for wall bracket AW 30 - wall fastening**

Item on test	Force F (SWL)	Width B
AW 30 11 FT	3 kN	110 mm
AW 30 16 FT	3 kN	160 mm
AW 30 21 FT	3 kN	210 mm
AW 30 31 FT	3 kN	310 mm
AW 30 41 FT	3 kN	410 mm
AW 30 51 FT	3 kN	510 mm
AW 30 61 FT	3 kN	610 mm
AW 30 71 FT	3 kN	710 mm

Deformation measuring point m  
According to IEC 61537, Chapter 10.8.1

Max. total load F = cable weight + cable tray + bracket

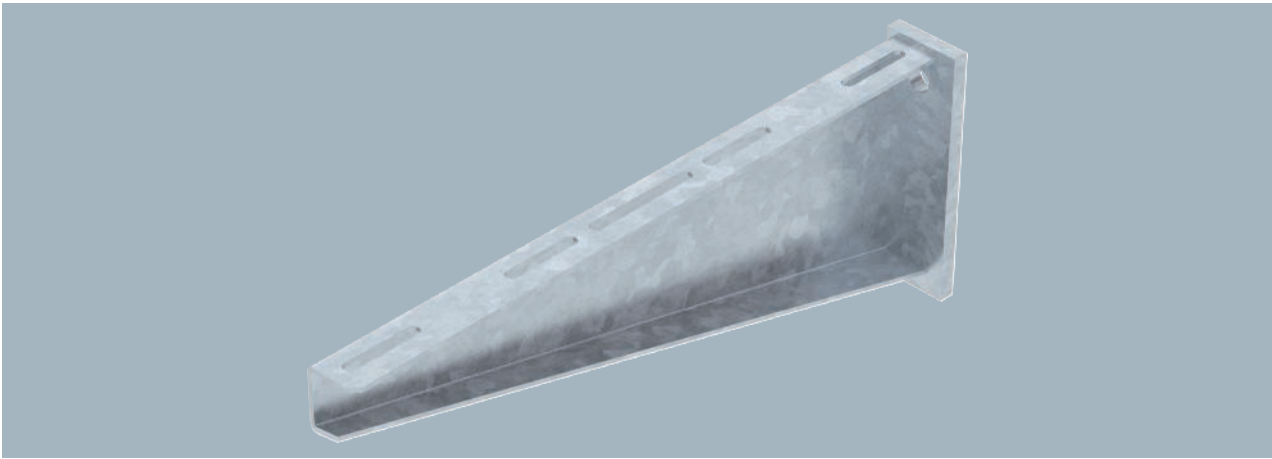
**Characteristic anchor load values for AW 30 wall and support bracket – wall fastening**

Load [kN]									
Bracket width [mm]	110%	160	210	310	410	510	560	610	710
Anchor type									
BZ3 10x90/0-30	3.00	2.10							
BZ3 12x110/0-35			3.00	2.71	2.07	2.02	1.98	1.98	1.51

The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance grade C20/25. Please comply with the installation conditions of the DIBt approval (anchors).

## Wall bracket AW 80

St FT

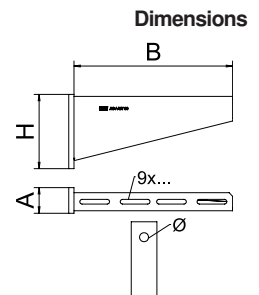


Type	Width mm	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
AW 80 31 FT	310	8	1	160.000	6417779
AW 80 51 FT	510	8	1	355.000	6417817
AW 80 61 FT	610	8	1	433.000	6417833

When fastening cable trays and ladders with truss-head bolts of size M6, please order large washers separately (perforation in bracket 9 x ...).

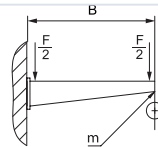
Heavy-duty wall bracket with welded head plate.

Type	Dim. B mm	Dim. A mm	Dim. H mm	Hole Ø mm
AW 80 31 FT	310	50	145	17.5
AW 80 51 FT	510	60	195	17.5
AW 80 61 FT	610	60	210	17.5



### Characteristic anchor load values for wall bracket AW 80 - wall fastening

Item on test	Force F (SWL)	Width B
AW 80 21 FT	8 kN	210 mm
AW 80 31 FT	8 kN	310 mm
AW 80 41 FT	8 kN	410 mm
AW 80 51 FT	8 kN	510 mm
AW 80 61 FT	8 kN	610 mm
AW 80 71 FT	8 kN	710 mm
AW 80 81 FT	8 kN	810 mm



Deformation measuring point m

According to IEC 61537, Chapter 10.8.1

Max. total load F = Cable weight + cable tray + bracket

### Characteristic anchor load values for AW 80 wall and support bracket – wall fastening

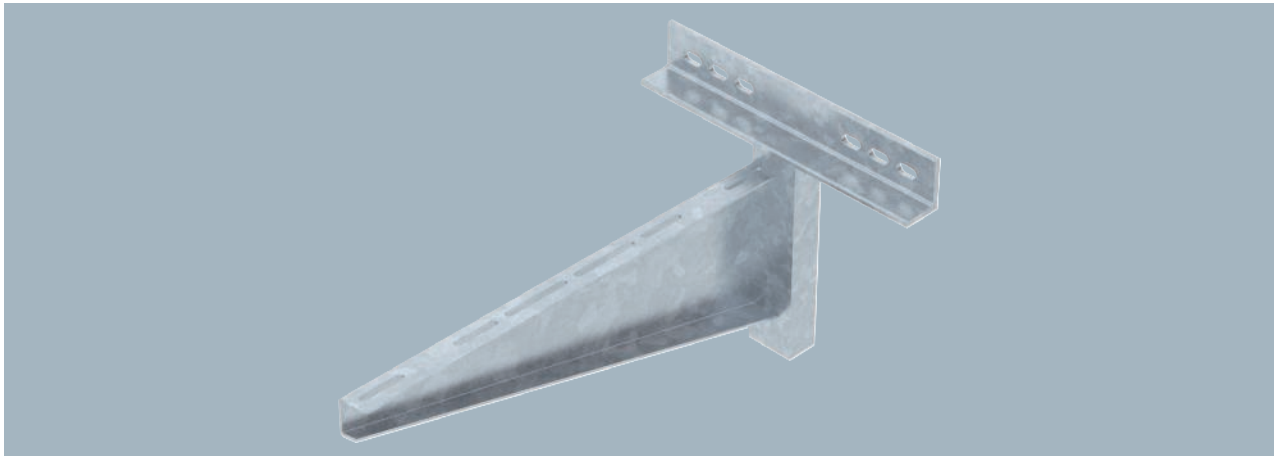
Load [kN]								
Bracket width [mm]	210	310	410	510	610	710	810	
Anchor type								
BZ3 16x135/0-35	7.31	7.66	6.87	6.38	5.90	5.17	4.69	

The load capacity values increase considerably when used in uncracked concrete.

The specified values are based on concrete of resistance grade C20/25. Please comply with the installation conditions of the DIBt approval (anchors).

Load

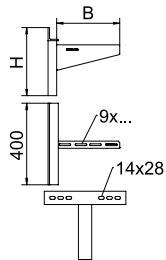
Wall and clamping bracket AWSS



The heavy-duty wall bracket can be used in conjunction with wide span systems or for large support distances of cable tray or cable ladder systems.  
Wall bracket, heavy duty.

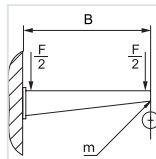
Type	Width	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
AWSS 61 FT	610	10	1	742.300	6417922

Dimensions



Type	Dim. B	Dim. A	Dim. H	Hole Ø
AWSS 61 FT	610	400	335	14

Load



Characteristic anchor load values for wall and clamping bracket AWSS - wall fastening

Item on test	Force F (SWL)	Width B
AWSS 21 FT	10 kN	210 mm
AWSS 31 FT	10 kN	310 mm
AWSS 41 FT	10 kN	410 mm
AWSS 51 FT	10 kN	510 mm
AWSS 61 FT	10 kN	610 mm
AWSS 71 FT	8 kN	710 mm
AWSS 81 FT	7 kN	810 mm
AWSS 91 FT	6.5 kN	910 mm
AWSS 101 FT	6 kN	1,010 mm

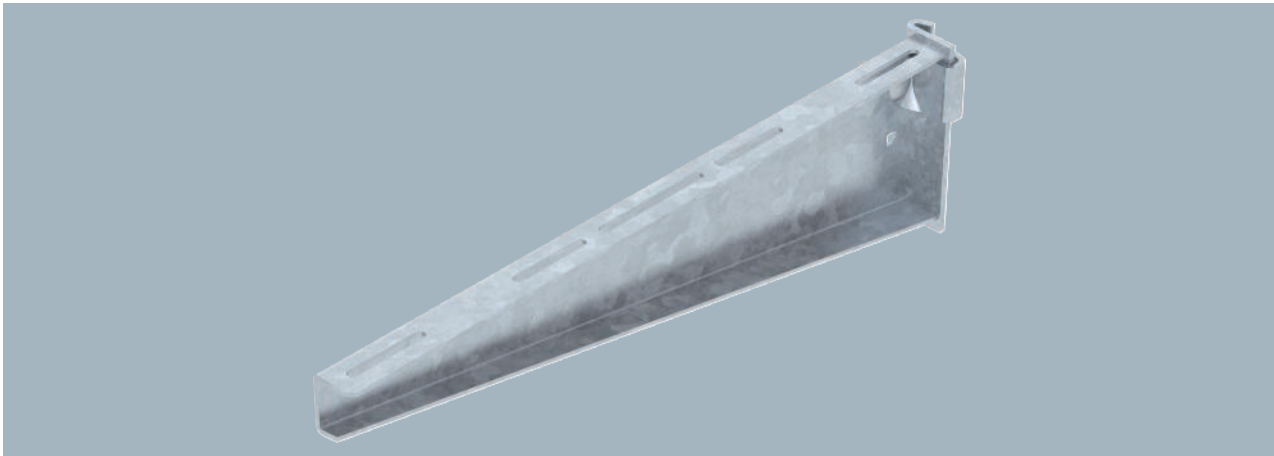
Deformation measuring point m  
According to IEC 61537, Chapter 10.8.1  
Max. total load F = Cable weight + cable tray + bracket

Characteristic anchor load values for AWSS wall bracket – wall fastening

Load [kN]	Bracket width [mm]								
Anchor type	210	310	410	510	610	710	810	910	1,010
BZ3 12x110/0-35	9.31	10.0	9.47	8.55	7.60	5.98	5.01	4.56	3.90

Max. total load F = Cable weight + cable tray + bracket. The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance grade C20/25. Comply with the installation conditions of the DIBt approval (anchors). The testing of the widths 710–1,010 mm took place at the maximum route width (600 mm) with the load at the end of the bracket.

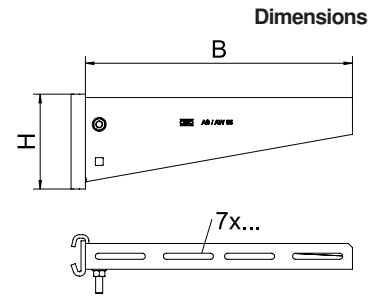
## Support bracket AS 55



Type	Width mm	F in kN kN	Pack Piece	Weight kg/100 pc.	Item no.
AS 55 31 FT	310	5.5	1	133.000	6419292

The support bracket can be fastened to both sides of the I support.  
The individual clamping lug, including bolt, nut and washer can also be ordered separately under the item no. 6419007.  
Heavy-duty support bracket for infinitely adjustable fastening on IS 8 support.

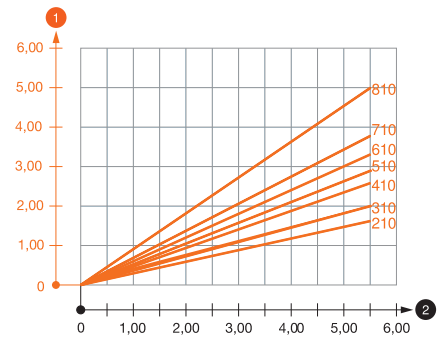
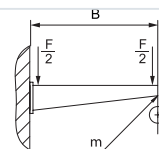
Type	Dim. B mm	Dim. H mm
AS 55 31 FT	310	110



### Load diagram, bracket type AS 55

- 1 Bending of the bracket tip at permitted bracket load
  - 2 Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm

Item on test	Force F (SWL)	Width B
AS 55 21 FT	0.950 kN	210 mm
AS 55 31 FT	0.950 kN	310 mm
AS 55 41 FT	0.950 kN	410 mm
AS 55 51 FT	0.950 kN	510 mm
AS 55 56 FT	0.950 kN	560 mm
AS 55 61 FT	0.950 kN	610 mm
AS 55 71 FT	0.950 kN	710 mm
AS 55 81 FT	0.950 kN	810 mm
AS 55 91 FT	0.950 kN	910 mm
AS 55 101 FT	0.950 kN	1,010 mm



Max. total load  $F = \text{Cable weight} + \text{cable tray} + \text{bracket}$ . The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance grade C20/25. Comply with the installation conditions of the DIBt approval (anchors). The testing of the widths 710–1010 mm took place at the maximum route width (600 mm) with the load at the end of the bracket.

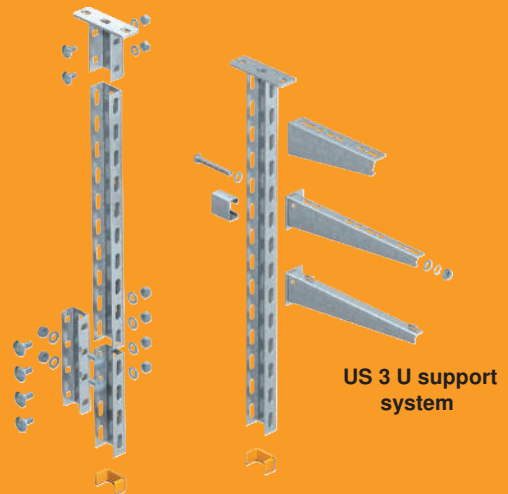




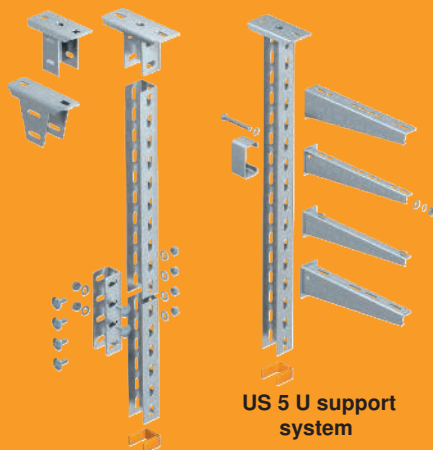


## U support family

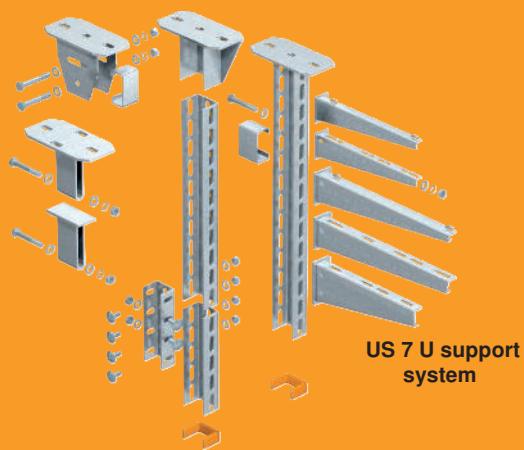
The perfectly matched U support family consists of US 3 (light-duty system), US 5 (medium-duty system) and US 7 (heavy-duty system). The U support range is particularly noted for its versatility. The U supports can be used as ceiling suspension, floor stand-off or as construction profiles.



US 3 U support system



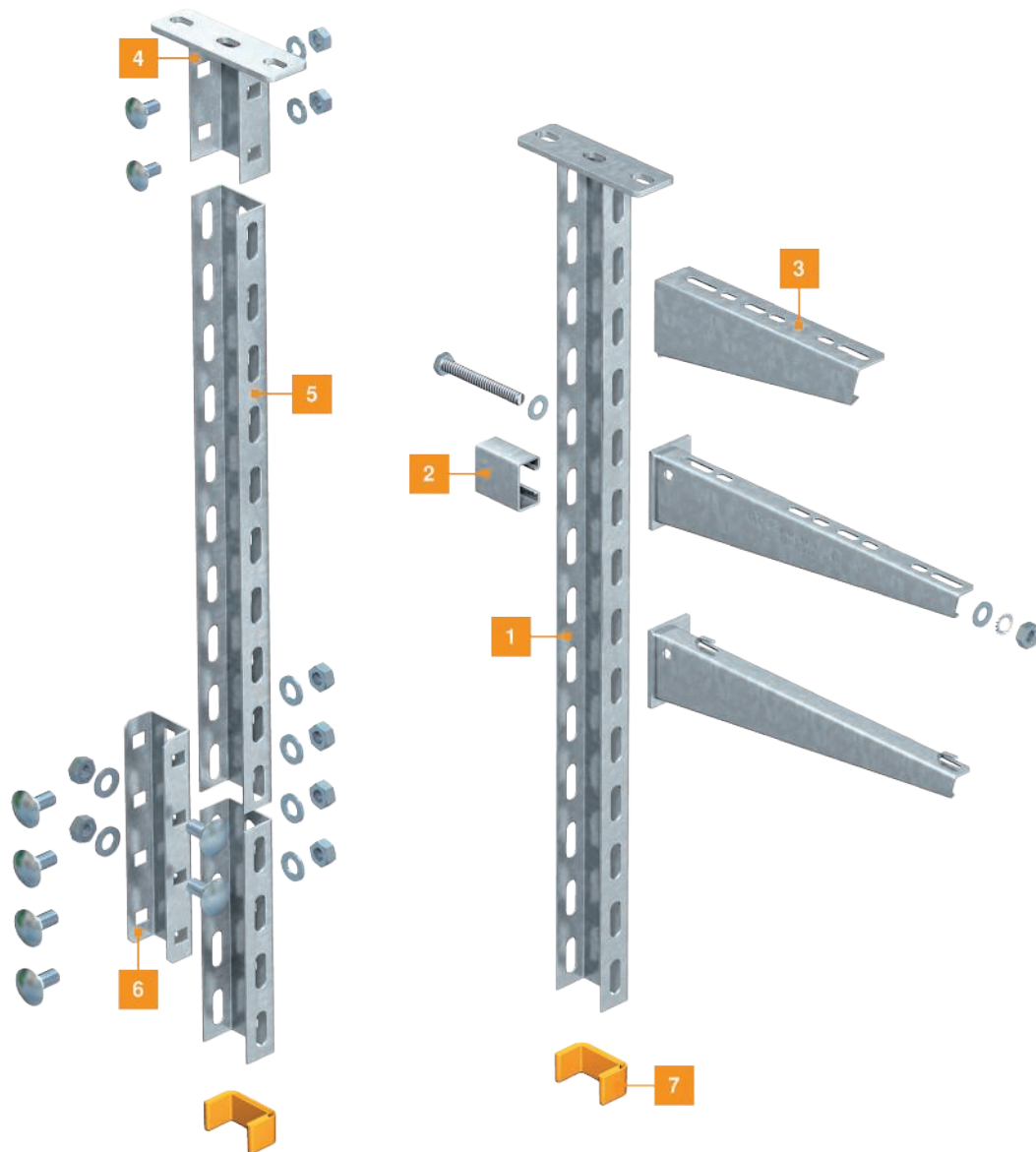
US 5 U support system



US 7 U support system

# US 3 U support system

## Installation principle



- |   |                           |
|---|---------------------------|
| 1 | US 3 suspended support    |
| 2 | Spacer                    |
| 3 | Wall and support brackets |
| 4 | Head plate                |
| 5 | US 3 support              |
| 6 | U support connector       |
| 7 | End cap                   |

# Mounting aid

## U supports and brackets



**Standard mounting of suspended support with wall bracket, single-sided without spacer**  
Ceiling fastening of a suspended support with single-sided bracket fastening. A spacer is not always required for widths up to and including 300 mm.



**Standard mounting of support with wall and support bracket, single-sided with spacer**  
Cover fixing of a suspended support with single-sided bracket fixing. For widths of over 400 mm, we recommend using a spacer.



**Standard mounting of support with wall and support bracket, double-sided**  
Cover fixing of a suspended support with double-sided bracket mounting.



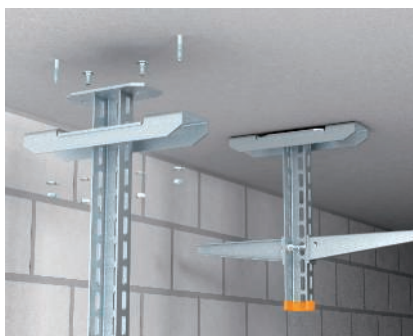
**Ceiling mounting**  
Standard mounting of U supports US 3 K, US 5 K and US 7 K on the ceiling with fastening of the wall and support brackets.



**Head plate mounting**  
Mounting of the standard head plate to support and ceiling. Use with spacer DSK 25 (US 3), DSK 45 (US 5) or DSK 61 (US 7).



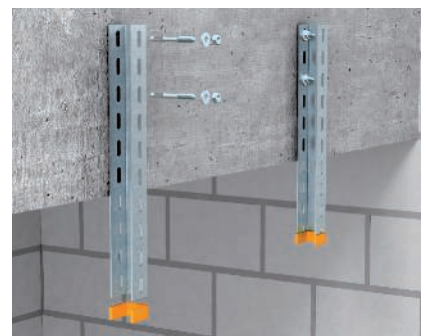
**Adapter head plate, asymmetrical**  
Asymmetrical head plate KA-ASY to increase the load capacity for the combination with suspended supports, type US 7 K and IS 8 K.



**Adapter head plate, symmetrical**  
Symmetrical head plate KA-SY to increase the load capacity for the conjunction with supports, types US 7 K and IS 8 K.



**Traverse**  
Mounting of U suspended supports US 3 K, US 5 K and US 7 K under the ceiling using bolt ties and a trapeze, consisting of U profile US 3, US 5 or US 7.



**U support wall mounting**  
U supports are mounted on walls or girders using bolt ties, directly through the system perforation in the U support.



#### U support connection

To connect U supports, use the appropriate U support connectors, types VUS 3, VUS 5 and VUS 7.



#### Installation of spacer

Installation of the spacer DSK 47 with US 5 supports or DSK 45 with US 7 supports in conjunction with a variable head plate KU 5 V or KU 7 VQP.



#### Variable head plate with US 3 support

Installation of the variable head plate, type KU 3 V on US 3 support.



#### Variable head plate

Fastening of the variable head plate KU 5 V to sloping concrete ceilings using bolt ties and spacer DSK 47.



#### Variable head plate

Fastening of the variable head plate KU 7 VQP to sloping concrete ceilings using bolt ties and spacer DSK 45.



#### 45° adapter plate, concrete mounting

Installation of the 45° adapter plate, type KA-E, on a concrete wall. For additional support and implementation of trays at room corners.



#### 45° adapter plate, steel clamping

Mounting of the 45° adapter plate, type KA-E 45, on the steel girder using clamping angles or chuck jaws. For additional support of routes in angles and at room corners.



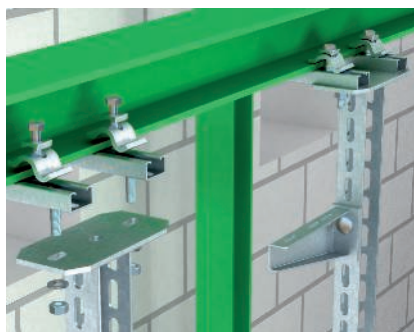
#### Direct girder clamping

Direct girder clamping of a U suspended support using KWS clamping angle. Route in longitudinal direction of steel girder.



#### Steel clamping with C profile, route in longitudinal direction

U suspended support mounting, clamped to steel girder with C profile, type MS 4022, and TKH-L-25 light-duty chuck jaw. Route along steel girder.



#### Steel clamping with C profile, route in transverse direction

U suspended support mounting, clamped to steel girder with C profile, type MS 4022, and TKH-L-25 light-duty chuck jaw. Route transverse to steel girder.



#### Head plate mounting

Installation of the head plate using the example KU 7 AOX for direct welding on steel girders.



#### Cantilever beam on steel

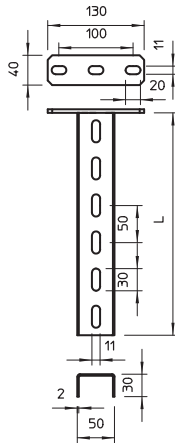
U supports can be used as cantilever beams on steel girders with chuck jaws of type TKS-L-25. Use DSK spacers for safe functioning.

US 3 support



For fastening to horizontal concrete ceilings and steel girders. For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 25.

Suspended support (U profile) of dimensions 50 x 30 mm with welded head plate.



Type	Length mm	Material thickness mm	Tensile load		Pack Piece	Weight kg/100 pc.	Item no.
			kN	BS			
US 3 K 20 FT	200	2	5	🔥	1	50.500	6342351
US 3 K 30 FT	300	2	5	🔥	1	64.400	6342353
US 3 K 40 FT	400	2	5	🔥	1	78.300	6342355
US 3 K 50 FT	500	2	5	🔥	1	92.300	6342357
US 3 K 60 FT	600	2	5	🔥	1	106.200	6342359
US 3 K 70 FT	700	2	5	🔥	1	120.200	6342362
US 3 K 80 FT	800	2	5	🔥	1	134.100	6342364
US 3 K 90 FT	900	2	5	🔥	1	147.800	6342366
US 3 K 100 FT	1000	2	5	🔥	1	162.000	6342368
US 3 K 110 FT	1100	2	5	🔥	1	175.900	6342370
US 3 K 120 FT	1200	2	5	🔥	1	189.900	6342372

Load

**Testing of the bending torque on the ceiling plate**

Item on test	US 3 K 80
Deformation measuring point m	
Length L	800 mm
Force F	0.462 kN
Bending torque M1 (SWL)	370 Nm

According to IEC 61537, Chapter 10.8.2.1

**Testing of the tensile strength**

Item on test	US 3 K 80
Deformation measuring point m	
Force F (SWL)	20 kN

According to IEC 61537, Chapter 10.8.2.2

**Testing of the bending torque on the support with bracket**

Item on test	US 3 K 80	US 3 K 120
	AW 15 31	AW 15 31
Deformation measuring point m		
A1 lever arm	310 mm	310 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	0.947 kN	0.790 kN
Bending torque M2 (SWL)	180 Nm	150 Nm

**Testing of the bending torque on the support with bracket with spacer**

Item on test	US 3 K 80	US 3 K 120
	AW 15 61	AW 15 61
Deformation measuring point m		
A1 lever arm	610 mm	610 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	0.850 kN	0.850 kN
Bending torque M2 (SWL)	290 Nm	290 Nm

According to IEC 61537, Chapter 10.8.2.3, without spacer

A4 2B

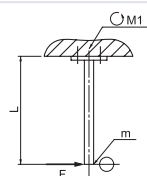
Type	Length mm	Material thickness mm	Tensile load kN	Pack Piece	Weight kg/100 pc.	Item no.
US 3 K 60 A4	600	2	5	1	97.000	6342389

**Load**

**Testing of the bending torque on the ceiling plate**

Item on test	US 3 K 80
Deformation measuring point m	
Length L	800 mm
Force F	0.462 kN
Bending torque M1 (SWL)	370 Nm

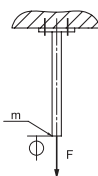
According to IEC 61537, Chapter 10.8.2.1



**Testing of the tensile strength**

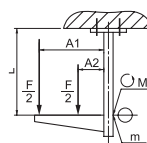
Item on test	US 3 K 80
Deformation measuring point m	
Force F (SWL)	20 kN

According to IEC 61537, Chapter 10.8.2.2



**Testing of the bending torque on the support with bracket**

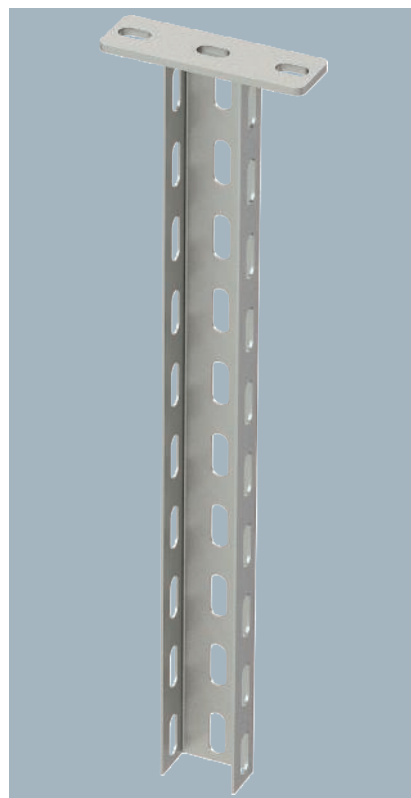
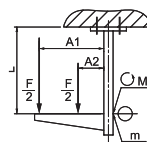
Item on test	US 3 K 80	US 3 K 120
Deformation measuring point m	AW 15 31	AW 15 31
A1 lever arm	310 mm	310 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	0.947 kN	0.790 kN
Bending torque M2 (SWL)	180 Nm	150 Nm



**Testing of the bending torque on the support with bracket with spacer**

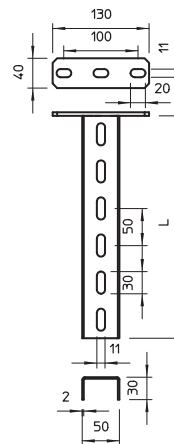
Item on test	US 3 K 80	US 3 K 120
Deformation measuring point m	AW 15 61	AW 15 61
A1 lever arm	610 mm	610 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	0.850 kN	0.850 kN
Bending torque M2 (SWL)	290 Nm	290 Nm

According to IEC 61537, Chapter 10.8.2.3, without spacer



For fastening to horizontal concrete ceilings and steel girders. For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 25.

Suspended support (U profile) of dimensions 50 x 30 mm with welded head plate.

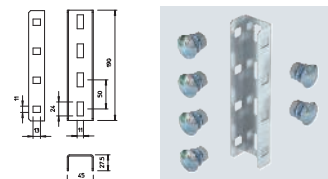


St FT

**VUS 3 U support connector**

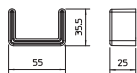
Type	Pack Piece	Weight kg/100 pc.	Item no.
VUS 3 FT	10	48.300	6018513

U support connector to connect US 3 supports.  
Including appropriate fastening material.



## Protective cap

PE

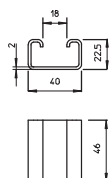


Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 3 KS OR	Pastel orange	20	1.068	6338458

Protective cap to cover the ends of US 3 supports.

## DSK 25 spacer

St FT

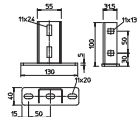


Type	Pack Piece	Weight kg/100 pc.	Item no.
DSK 25 FT	20	7.500	6416446

Spacer for use in US 3 supports.

## Head plate

St FT

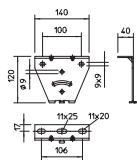


Type	Pack Piece	Weight kg/100 pc.	Item no.
KU 3 FT	1	42.300	6348874

The head plate can be mounted to fixed lengths of the U support, type US 3. Including appropriate fastening material.  
Head plate for mounting on US 3 supports.

## Head plate, variable

St FS



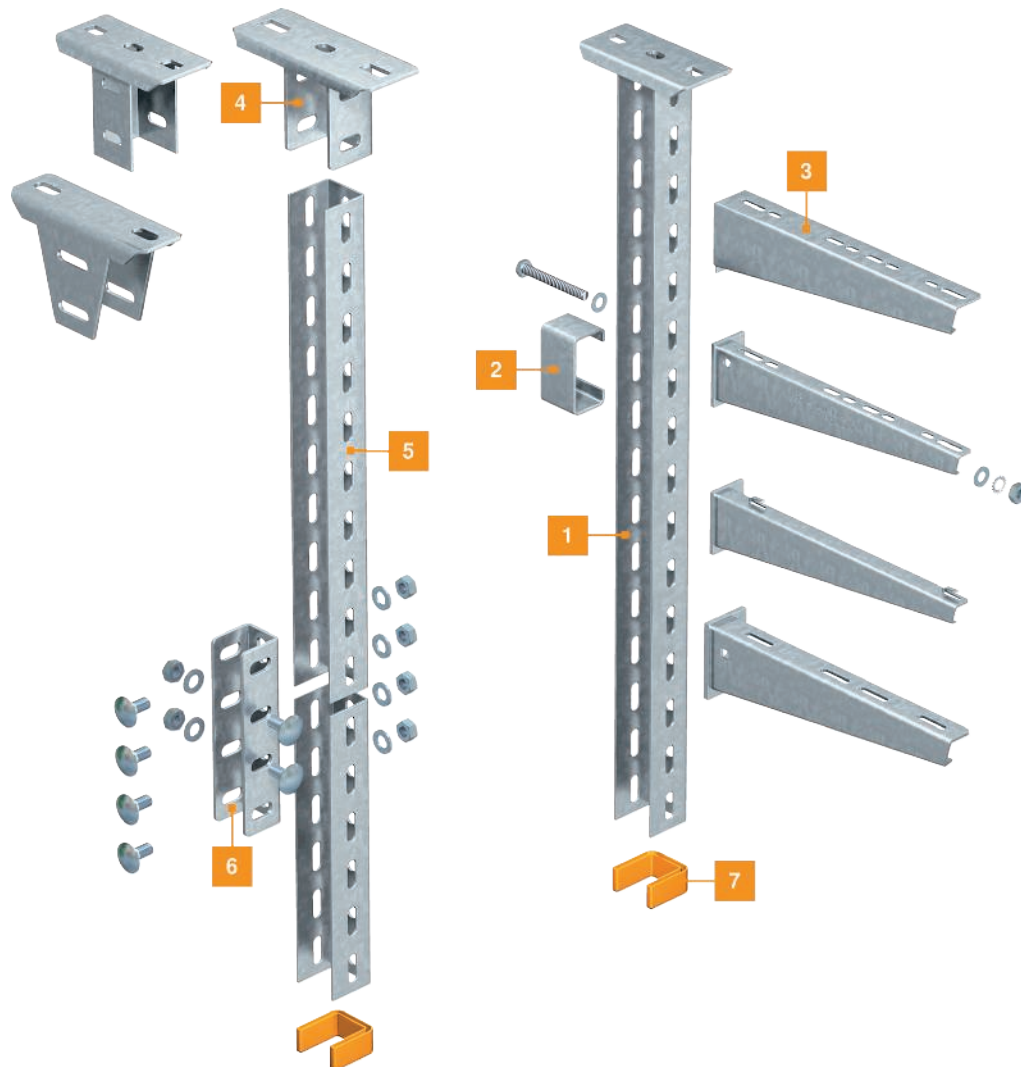
Type	Pack Piece	Weight kg/100 pc.	Item no.
KU 3 V FS	1	40.000	6348881

The variable head plate can be mounted to fixed lengths of the U support, type US 3, or profile rails, type AML3518/AMS3518 and CML3518/CMS3518. The maximum angle adjustment is 20° on one side.  
Variable head plate for installation on US 3 supports and profile rails, type AML3518/AMS3518 and CML3518/CMS3518.



# US 5 U support system

## Installation principle



- |   |                           |
|---|---------------------------|
| 1 | US 5 suspended support    |
| 2 | Spacer                    |
| 3 | Wall and support brackets |
| 4 | Head plate                |
| 5 | US 5 support              |
| 6 | U support connector       |
| 7 | End cap                   |

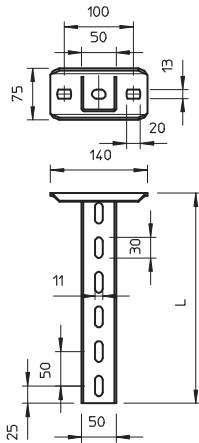
## US 5 support

St FT



For fastening to horizontal concrete ceilings and steel girders. For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 45.

U support of dimensions 50 x 50 mm with welded head plate.



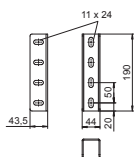
Type	Length mm	Material thickness mm	Tensile load		Pack Piece	Weight kg/100 pc.	Item no.
			kN	BS			
US 5 K 40 FT	400	2.5	10	🔥	1	136.000	6341543
US 5 K 50 FT	500	2.5	10	🔥	1	161.000	6341551
US 5 K 80 FT	800	2.5	10	🔥	1	236.000	6341594
US 5 K 90 FT	900	2.5	10	🔥	1	261.000	6341608
US 5 K 100 FT	1000	2.5	10	🔥	1	286.000	6341616
US 5 K 120 FT	1200	2.5	10	🔥	1	337.000	6341632

### Load

Testing of the bending torque on the ceiling plate		
Item on test	US 5 K 80	
Deformation measuring point m		
Length L	800 mm	
Force F	0.950 kN	
Bending torque M1 (SWL)	760 Nm	
According to IEC 61537, Chapter 10.8.2.1		
Testing of the tensile strength		
Item on test	US 5 K 80	
Deformation measuring point m		
Force F (SWL)	26 kN	
According to IEC 61537, Chapter 10.8.2.2		
Testing of the bending torque on the support with bracket		
Item on test	US 5 K 80	US 5 K 120
	AW 30 31 FT	AW 30 31 FT
Deformation measuring point m		
A1 lever arm	310 mm	310 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	1.253 kN	1.358 kN
Bending torque M2 (SWL)	240 Nm	260 Nm
Testing of the bending torque on the support with bracket with spacer		
Item on test	US 5 K 80	US 5 K 120
	AW 30 71 FT	AW 30 71 FT
Deformation measuring point m		
A1 lever arm	710 mm	710 mm
A2 lever arm	10 mm	10 mm
Length L	500 mm	1,000 mm
Force F	1.272 kN	1.094 kN
Bending torque M2 (SWL)	500 Nm	430 Nm
According to IEC 61537, Chapter 10.8.2.3		

## VUS 5 U support connector

St FT



Type	Pack Piece	Weight kg/100 pc.	Item no.

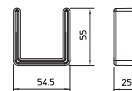
U support connector to connect US 5 supports.  
Including appropriate fastening material.

PE

## Protective cap

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 5 KS OR	Pastel orange	20	1.300	6338462

Protective cap to cover the ends of US 5 supports.



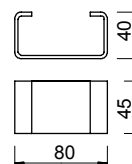
St FT

## Spacer DSK 45

Type	Pack Piece	Weight kg/100 pc.	Item no.
DSK 45 FT	20	18.000	6416500

For static reasons, the spacer is always used to increase stability to prevent the support from deforming when the bracket is tightened with the hexagonal bolts.

Spacer for use in US 5 support and in the head plate, type KU 7 VQP.



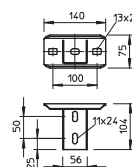
St FT

## Head plate US 5

Type	Pack Piece	Weight kg/100 pc.	Item no.
KUS 5 FT	1	61.900	6348904

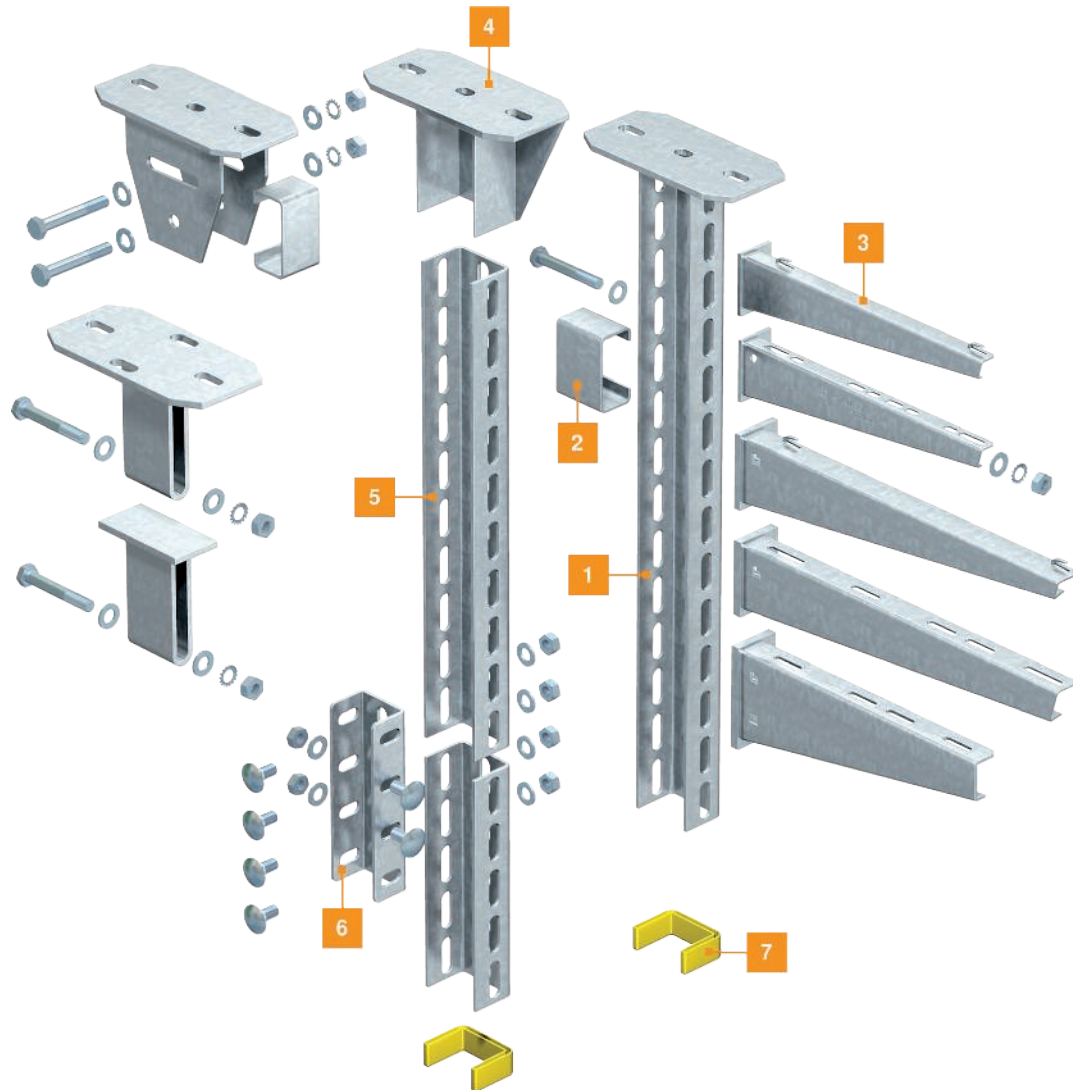
When installing the head plate, please use the spacer, type DSK 45.

Head plate for installation in US 5 support.



# US 7 U support system

## Installation principle



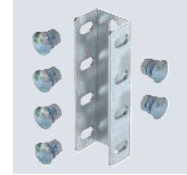
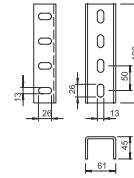
- |   |                           |
|---|---------------------------|
| 1 | US 7 suspended support    |
| 2 | Spacer                    |
| 3 | Wall and support brackets |
| 4 | Head plate                |
| 5 | US 7 support              |
| 6 | U support connector       |
| 7 | Protective cap            |

St FT

VUS 7 U support connector

Type	Pack Piece	Weight kg/100 pc.	Item no.
VUS 7 FT	10	112.800	6018378

U support connector to connect US 7 supports.  
Including appropriate fastening material.

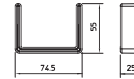


PE

End cap

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
US 7 KS OR	Pastel orange	20	1.806	6338497

Protective cap to cover the ends of US 7 supports.

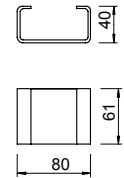


St FT

DSK 61 spacer

Type	Pack Piece	Weight kg/100 pc.	Item no.
DSK 61 FT	20	25.000	6416519

For static reasons, the spacer is always used to increase stability to prevent the support from deforming when the bracket is tightened with the hexagonal bolts.  
Spacer for use in US 7 supports.



U supports

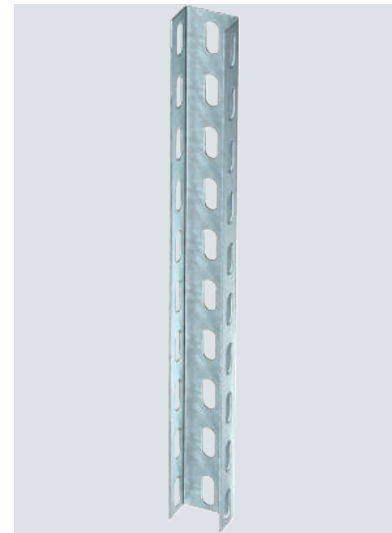
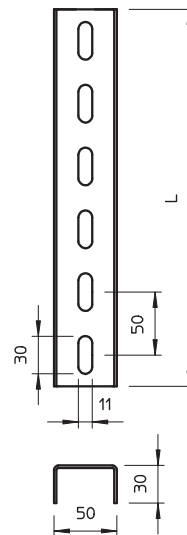
St FS FT

US 3 support

Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
US 3 200 FS	2000	2		1	266.000	6342338
US 3 300 FS	3000	2		1	399.000	6342340
US 3 600 FS	6000	2		1	798.000	6342345
US 3 600 FT	6000	2		1	834.000	6342450

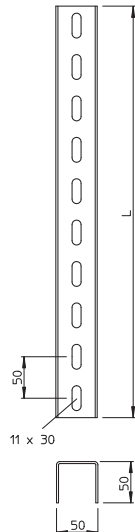
U support in fixed lengths. Dimensions 30 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 25.



## US 5 support

St FT



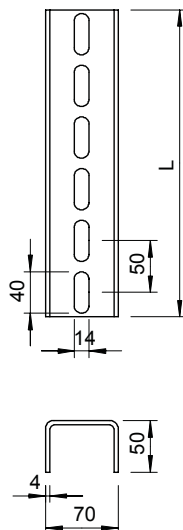
Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
US 5 300 FT	3000	2.5		1	795.000	6340989

U support in fixed lengths. Dimensions 50 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 45.

## US 7 support

St FT



Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
US 7 600 FT	6000	4		1	2,490.000	6340318

U support in fixed lengths. Dimensions 70 x 50 mm.

For bracket widths of 400 mm or more, or if the bracket is mounted at the end of a suspended support, we recommend the use of the spacer, type DSK 61.



## System description

### TP supports and brackets

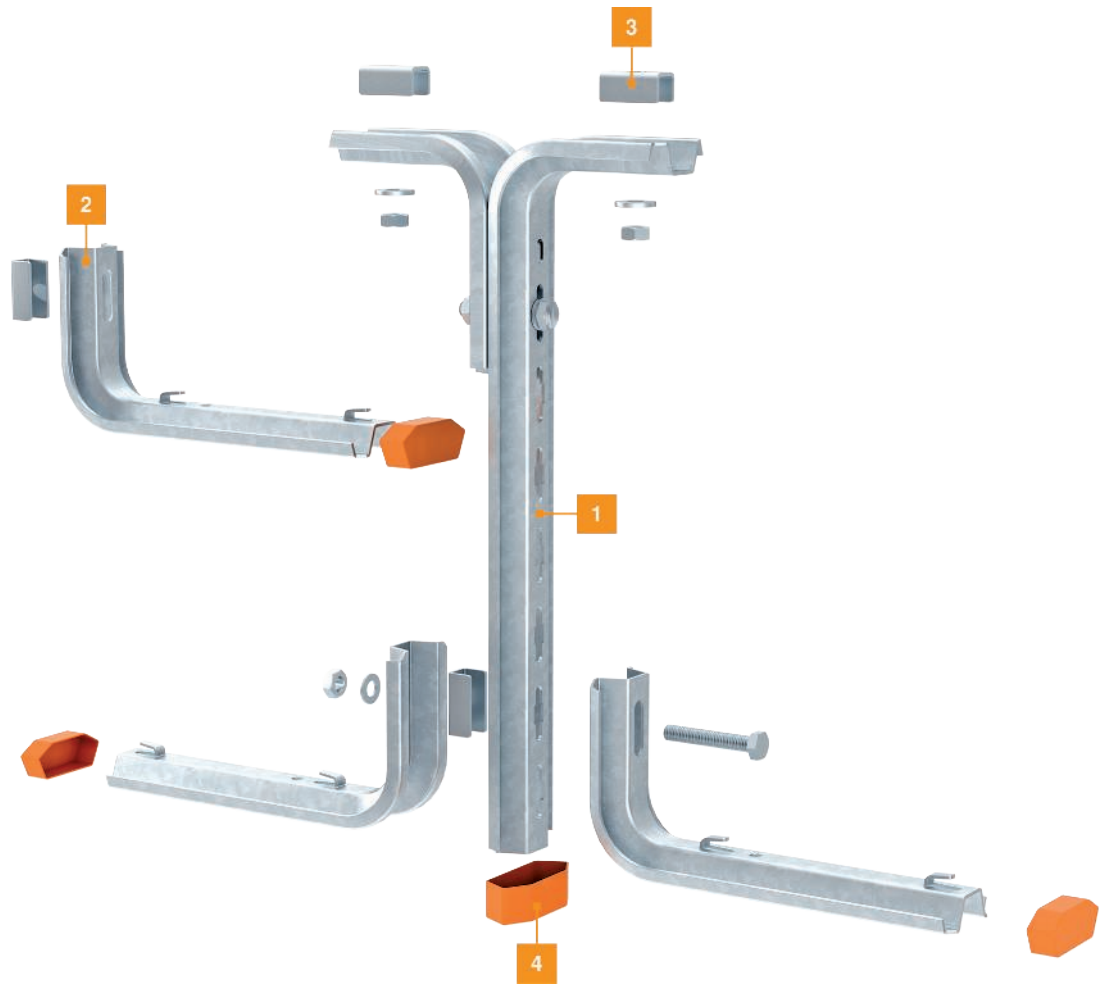


The TP system is a range of light supports and brackets. This product range, which consists of TP suspended supports and brackets, can be used universally as ceiling and wall mounting.



# Installation principle

## TP supports and brackets



- 1 TP suspended support
- 2 TP support/wall and support brackets
- 3 Spacer
- 4 End cap

## Mounting aid

### TP supports and brackets



#### **Ceiling mounting of TP wall and ceiling bracket**

Universal mounting of the TPD wall and ceiling bracket on the ceiling (with DS 4 spacer). Maximum tray width 300 mm.



#### **Installation of TP support with single-sided bracket fixing**

Ceiling mounting of a TP support with spacer DS 4 and one-sided bracket mounting. Maximum tray width 300 mm.



#### **Complete mounting of a TP system**

Installation of the TP support with head reinforcement and double-sided bracket mounting and mounting directly on the wall.

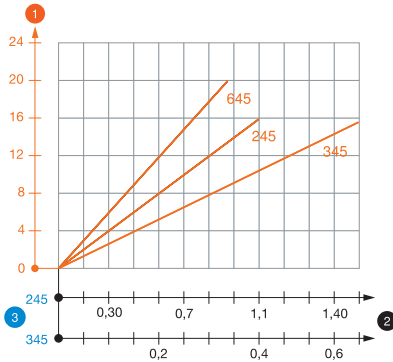
St FS

TP support

Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
TPS 445 FS	445	1	73.000	6364322
TPS 645 FS	645	1	99.000	6364365

Load

Load diagram, TP supports, type TPS



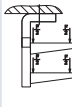

- 1 Bending of the end of the suspended support at permitted bracket load
  - 2 Permitted bracket load in kN without man load
  - 3 Bracket length in mm
- Load curves with support lengths in mm



If the profile is fastened directly to the ceiling or the profile is screwed together as head reinforcement, then, for reasons of stability, always use the spacer, type DS 4. Important: only use brackets of length 345 mm or less.

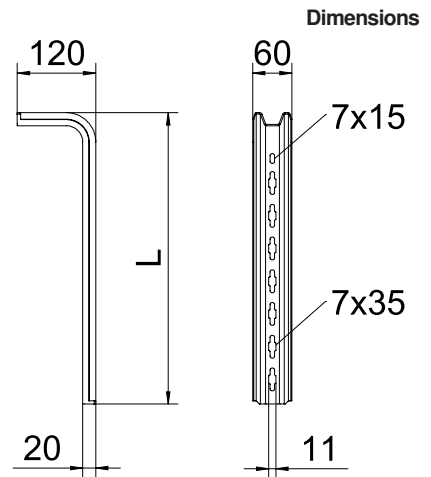
TP support for fastening to horizontal concrete ceilings.

Characteristic anchor load values for TP support

		Single-sided load			
		Max. load [kN]			
		Bracket width [mm]			
		145	245	345	
	Anchor type BZ3 8x75/0-20	1,48	0,93	0,68	
	Anchor type BZ3 10x90/0-30	1,48	0,93	0,68	
		Double-sided load			
		Max. load [kN]			
		Bracket width [mm]			
		145	245	345	
	Anchor type BZ3 8x75/0-20	2,38	1,84	1,55	
	Anchor type BZ3 10x90/0-30	2,38	1,50	1,50	

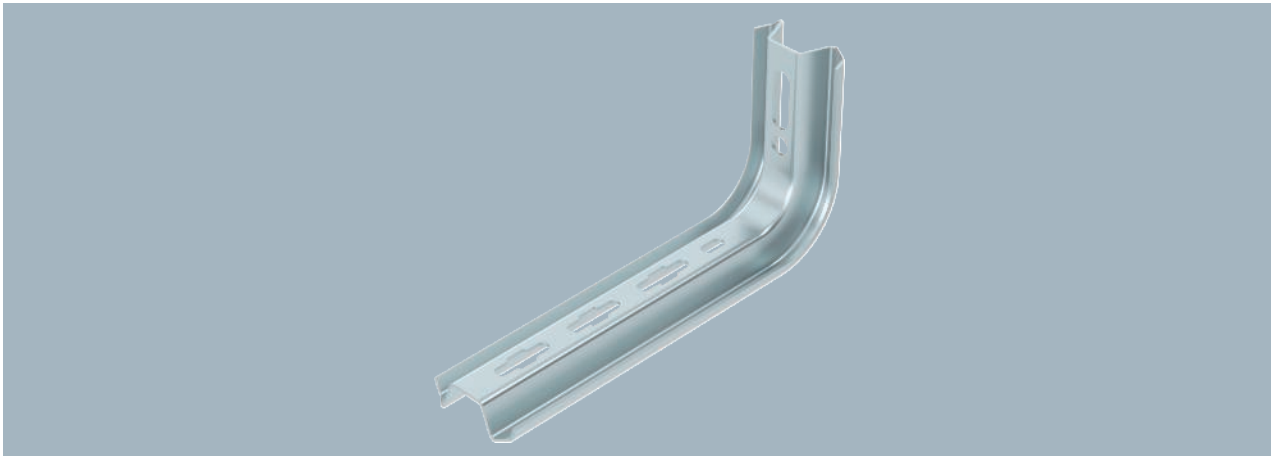
Max. total load  $F = \text{cable weight} + \text{cable tray} + \text{bracket} + \text{suspended support}$ . The tabular values for double-sided loads take the available axis spacing  $a_i = 17 \text{ cm}$  into account. The load capacity values increase considerably when used in uncracked concrete. The specified values are based on concrete of resistance class C20/25. Comply with the installation conditions of the DIBt approval (anchors).

Type	Dim. L mm
TPS 445 FS	445
TPS 645 FS	645



TPSA TP support/wall and support bracket

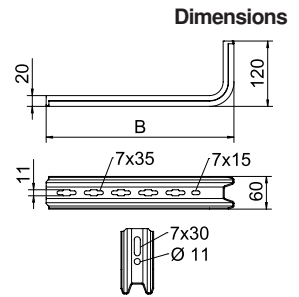
St FS



	for width mm	Pack Piece	Weight kg/100 pc.	Item no.	
Type	TPSA 245 FS	200	1	46.000	6364209

If the profile is fastened directly to the ceiling or the profile is screwed together as head reinforcement, then, for reasons of stability, always use the spacer, type DS 4.  
TP support/bracket for fastening to horizontal concrete ceilings and walls.

	Dim. B mm
Type	TPSA 245 FS
	245

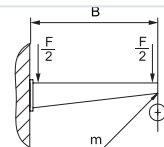


Load diagram, bracket TPSA

- 1 Bending of the bracket tip at permitted bracket load
- 2 Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm

**Characteristic anchor load values for TP bracket - wall fastening**

Item on test	Force F (SWL)	Width B
TPSA 145 FS	1.5 kN	145 mm
TPSA 245 FS	0.9 kN	245 mm
TPSA 345 FS	0.55 kN	345 mm
TPSA 245 FS SP	0.9 kN	245 mm



Max. total load F = cable weight + cable tray + bracket. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25. Observe the installation conditions of the DIBt approval (anchors).

Characteristic anchor load values for TP brackets

Wall fastening

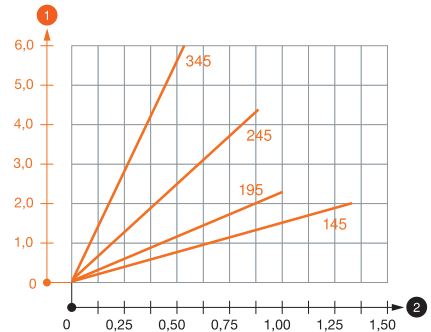
Anchor type	Max. load F [kN]		
	Bracket width [mm]		
	145	195	245
BZ-U 8-30-41/95	1	1.3	0.7
BZ-U 10-30-50/110	1.5	1	0.9

Characteristic anchor load values for TP bracket

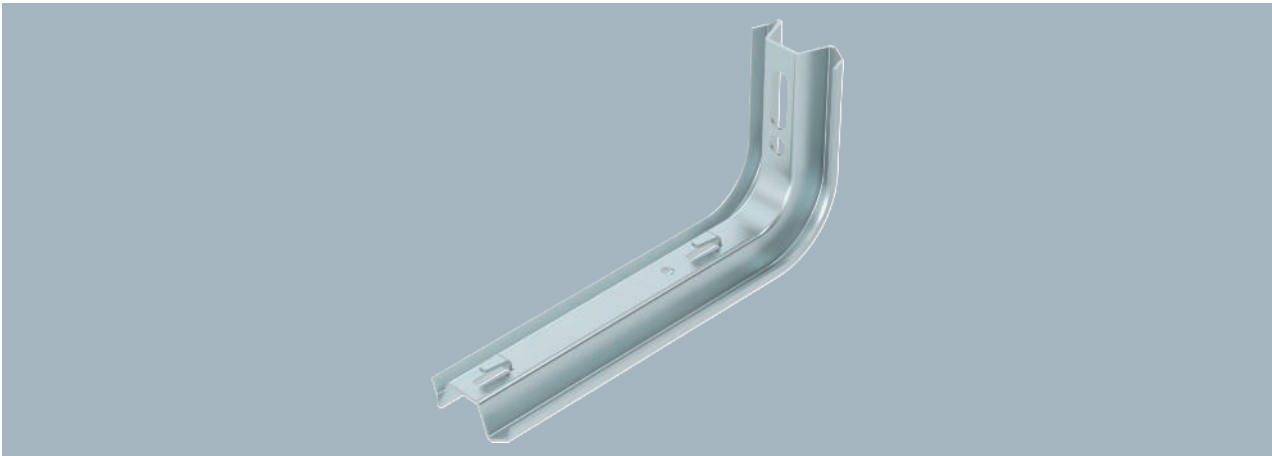
Wall fastening

Anchor type	Max. load [kN]			
	Bracket width [mm]			
	145	195	245	345
BZ3 10x90/0-30	1,30	0,93	0,60	0,55

Load



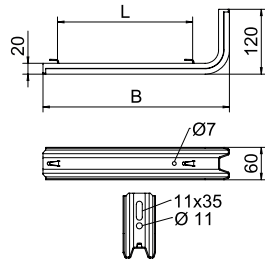
TPSAG TP support/wall and support bracket



If the bracket is fastened directly to the wall or the profiles are screwed together, then, for reasons of stability, always use the spacer, type DS 4.  
TP bracket with clamping lugs for screwless mesh cable tray fastening.

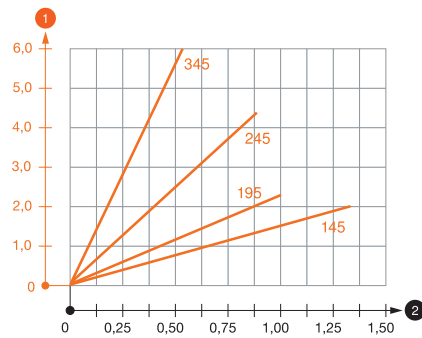
Type	for width mm	Pack Piece	Weight kg/100 pc.	Item no.
TPSAG 145 FS	100	1	30.540	6366015
TPSAG 195 FS	150	1	41.000	6366023
TPSAG 245 FS	200	1	48.000	6366031
TPSAG 345 FS	300	1	61.000	6366066

Dimensions



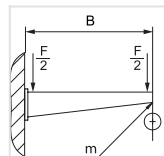
Type	Dim. B mm	Dim. L mm
TPSAG 145 FS	145	50
TPSAG 195 FS	195	100
TPSAG 245 FS	245	150
TPSAG 345 FS	345	250

Load



Load diagram, bracket TPSAG

- 1 Bending of the bracket tip at permitted bracket load
  - 2 Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm



Characteristic anchor load values for TP bracket - wall fastening

Item on test	Force F (SWL)	Width B
TPSA 145 FT	0.15 kN	145 mm
TPSA 195 FT	1 kN	195 mm
TPSA 245 FT	0.950 kN	245 mm
TPSA 345 FT	0.55 kN	345 mm

Max. total load F = cable weight + cable tray + bracket. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25. Observe the installation conditions of the DIBt approval (anchors).

Characteristic anchor load values for TP brackets

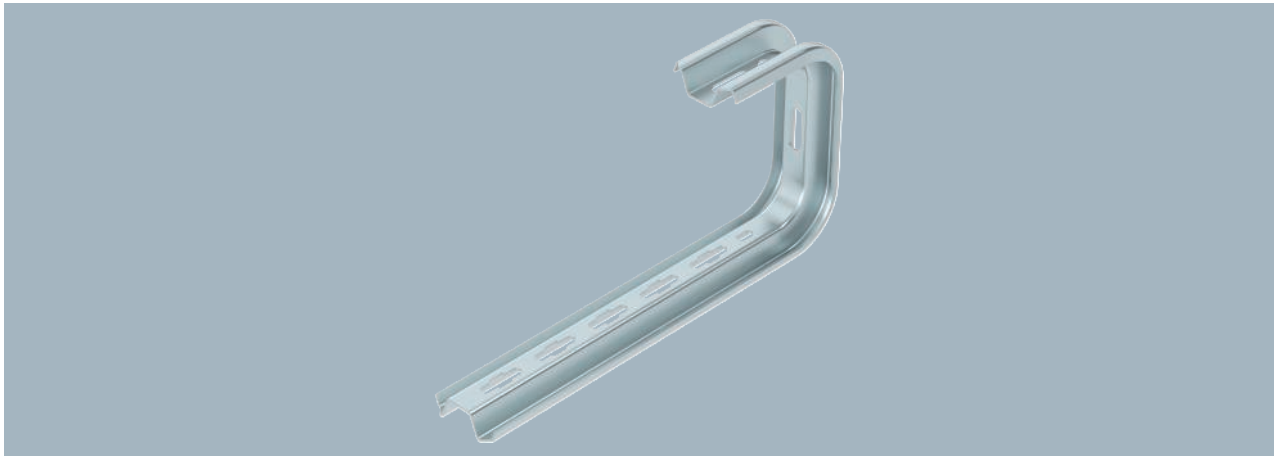
Wall fastening	Max. load F [kN]			
	Bracket width [mm]			
Anchor type	145	195	245	345
BZ-U 8-30-41/95	1	1.3	0.7	2.4
BZ-U 10-30-50/110	1.5	1	0.9	0.55

Characteristic anchor load values for TP bracket

	Wall fastening			
	Max. load [kN]			
	Bracket width [mm]			
Anchor type	145	195	245	345
BZ3 10x90/0-30	1,30	0,93	0,60	0,55

TP wall and ceiling bracket

St FS

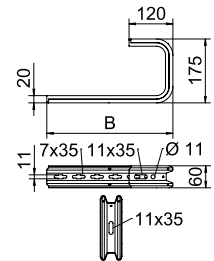


Type	for width mm	F in kN ceiling	F in kN wall	Pack Piece	Weight kg/100 pc.	Item no.
TPD 145 FS	100	1.3	1.4	1	48.000	6363806

Important! If the wall and ceiling bracket is fastened directly to the wall or ceiling, then, for reasons of stability, always use the spacer, type DS 4.  
Max. side height of the cable support system 60 mm.  
TP wall and ceiling bracket for universal use.

Type	Dim. B mm
TPD 145 FS	145

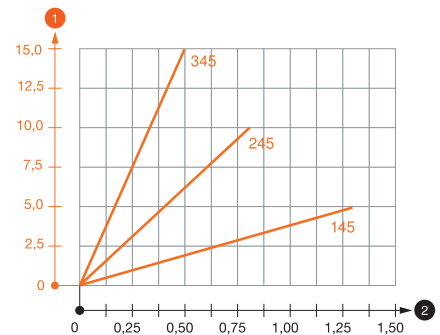
Dimensions



Load diagram, ceiling bracket TPD

- 1 Bending of the bracket tip at permitted bracket load
- 2 Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm

Load



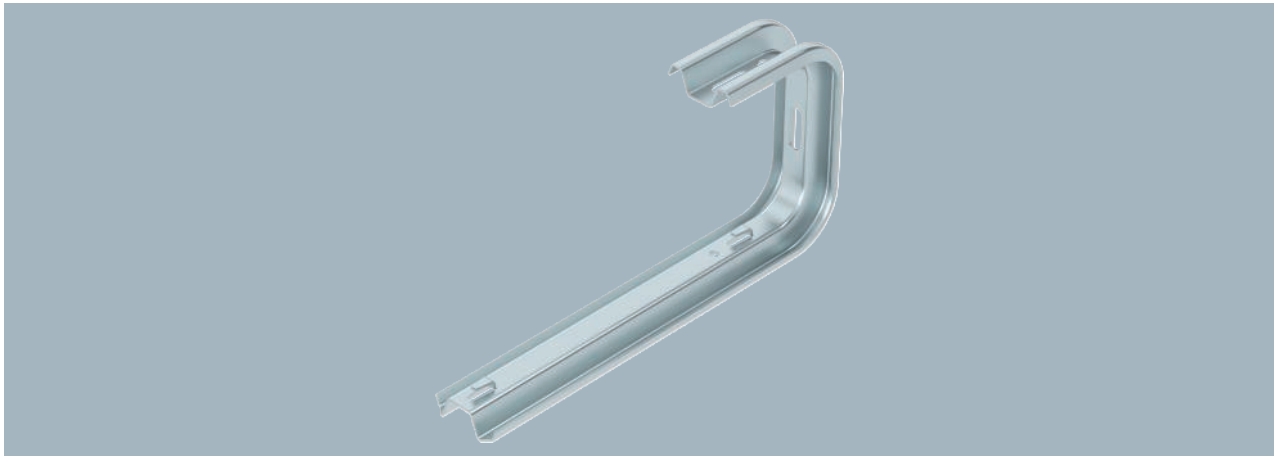
Characteristic anchor load values for TPD wall and ceiling bracket

		Wall fastening				
		Max. load [kN]				
		Bracket length [mm]				
Anchor type	n	145	245	345	445	545
		BZ3 8x95/0-40	0,56	0,53	0,50	0,47
BZ3 10x90/0-30		1,03	0,96		0,68	0,54

		Ceiling fastening				
		Max. load [kN]				
		Bracket width [mm]				
Anchor type	n	145	245	345	445	545
		BZ-U 8-30-41/95	1,48	0,93	2,40	0,35
BZ3 10x90/0-30		1,45	0,93	2,40	0,35	0,25

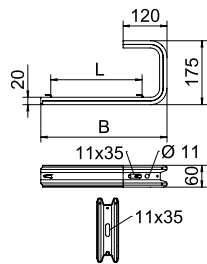
Max. total load F = cable weight + cable tray + ceiling bracket. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25.



If the wall and ceiling bracket is fastened directly to the wall or ceiling, then, for reasons of stability, always use the spacer, type DS 4.  
 Max. side height of the cable support system 60 mm.  
 TP wall and ceiling bracket with clamping lugs for screwless mesh cable tray fastening.

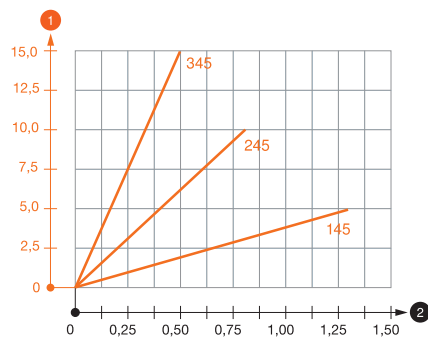
Type	for width mm	F in kN ceiling	F in kN wall	Pack Piece	Weight kg/100 pc.	Item no.
TPDG 145 FS	100	1.3	1.4	6	52.000	6365906
TPDG 195 FS	150	0.95	1.05	6	60.000	6365914
TPDG 245 FS	200	0.8	0.87	5	67.000	6365922
TPDG 345 FS	300	0.5	0.55	5	81.000	6365949

Dimensions



Type	Dim. B mm	Dim. L mm
TPDG 145 FS	145	50
TPDG 195 FS	195	100
TPDG 245 FS	245	150
TPDG 345 FS	345	250

Load



Load diagram, ceiling bracket TPDG

- ① Bending of the bracket tip at permitted bracket load
  - ② Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm

Characteristic anchor load values for TPDG wall and ceiling bracket

		Wall fastening				
		Max. load [kN]				
		Bracket length [mm]				
Anchor type		145	245	345	445	545
BZ3 8x95/0-40		0,56	0,53	0,50	0,47	0,44
BZ3 10x90/0-30		1,03	0,96	0,96	0,68	0,54

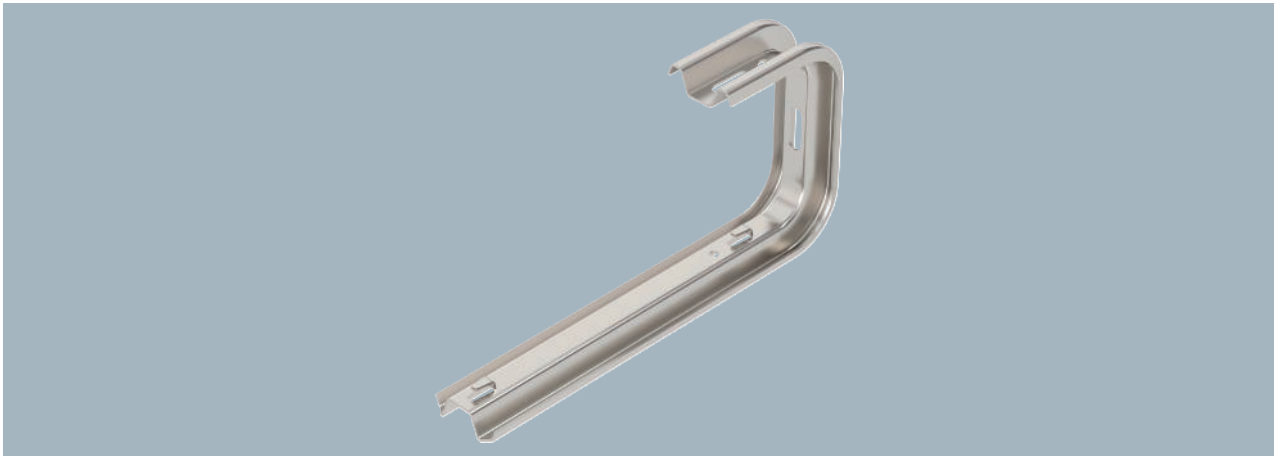
  

		Ceiling fastening				
		Max. load [kN]				
		Bracket width [mm]				
Anchor type		145	245	345	445	545
BZ-U 8-30-41/95		1,48	0,93	0,50	0,35	0,25
BZ3 10x90/0-30		1,45	0,93	0,50	0,35	0,25

Max. total load F = cable weight + cable tray + ceiling bracket. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25.

TP wall and ceiling bracket

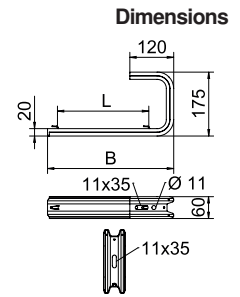
A2 2B



Type	for width mm	F in kN ceiling	F in kN wall	Pack Piece	Weight kg/100 pc.	Item no.
TPDG 245 A2	200	0.8	0.87	5	67.000	6365993

If the wall and ceiling bracket is fastened directly to the wall or ceiling, then, for reasons of stability, always use the spacer, type DS 4.  
 Max. side height of the cable support system 60 mm.  
 TP wall and ceiling bracket with clamping lugs for screwless mesh cable tray fastening.

Type	Dim. B mm	Dim. L mm
TPDG 245 A2	245	150



Load diagram, ceiling bracket TPDG

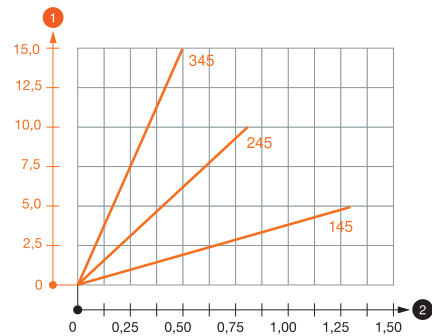
- 1 Bending of the bracket tip at permitted bracket load
- 2 Permitted bracket load in kN without man load
- Load curve with bracket lengths in mm

Characteristic anchor load values for TPDG wall and ceiling bracket

		Wall fastening				
		Max. load [kN]				
		Bracket length [mm]				
Anchor type		145	245	345	445	545
BZ3 8x95/0-40		0,56	0,53	0,50	0,47	0,44
BZ3 10x90/0-30		1,03	0,96	0,68		0,54

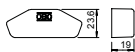
		Ceiling fastening				
		Max. load [kN]				
		Bracket width [mm]				
Anchor type		145	245	345	445	545
BZ-U 8-30/95		1,48	0,93	0,50	0,35	0,25
BZ3 10x90/0-30		1,45	0,93	0,50	0,35	0,25



Max. total load F = cable weight + cable tray + ceiling clamp. The load capacity values increase considerably when used in uncracked concrete. The values given are based on concrete of strength class C20/25.

End cap

PE



Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
TPS KS OR	Pastel orange	10	0.700	6364625

End cap to cover ends of TP supports.

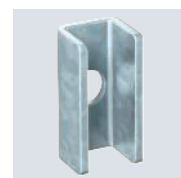


St FS FT

Type	Pack Piece	Weight kg/100 pc.	Item no.
DS 4 FS	20	3.390	6416551
DS 4 FT	20	3.800	6416586

For static reasons, the spacer is always used to prevent the profile from deforming when the fastening bolts are tightened.

Spacer for use in profiles, type TP.



Spacer

A2 2B

Type	Pack Piece	Weight kg/100 pc.	Item no.
DS 4 A2	10	3.700	6416594

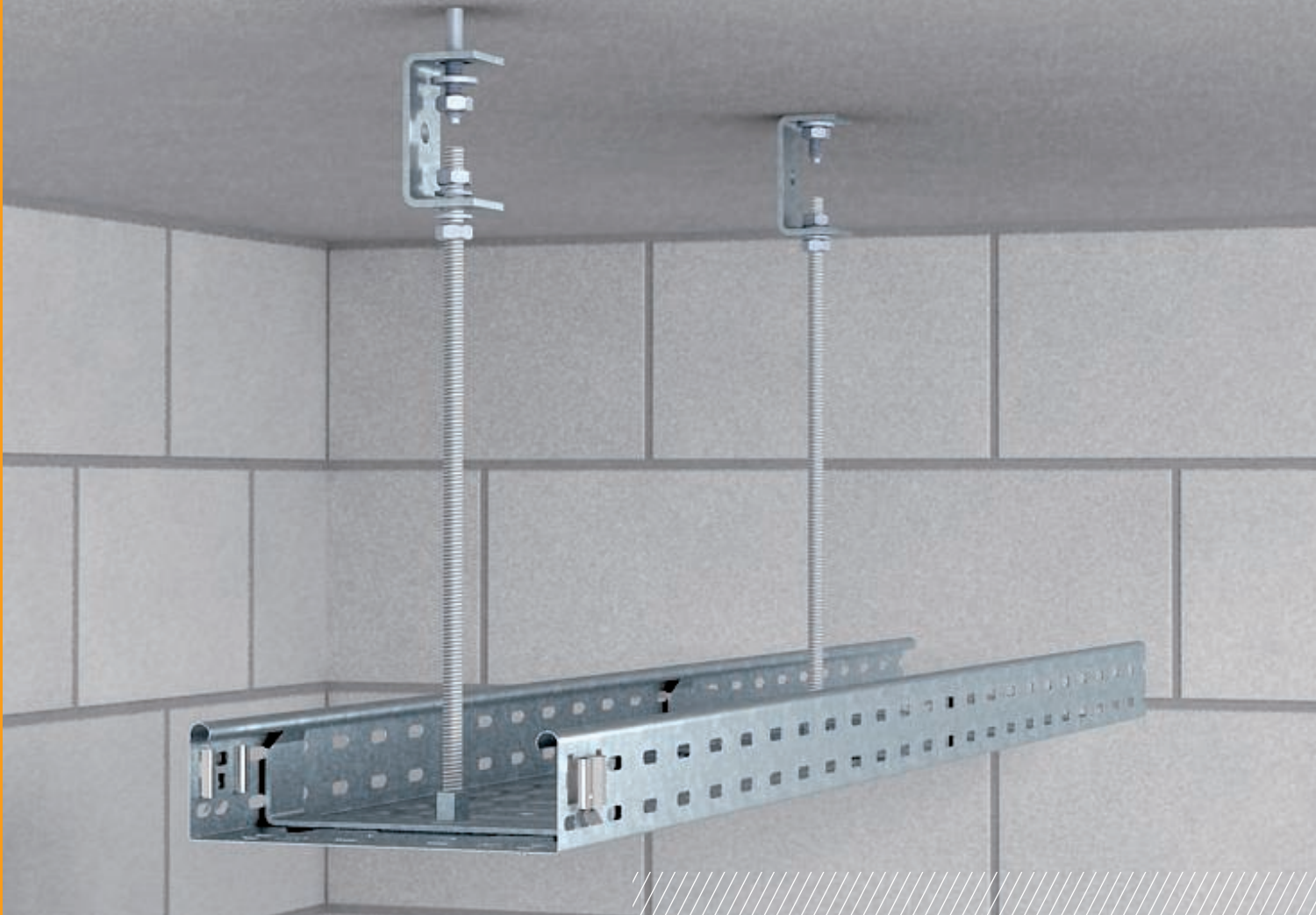
For static reasons, the spacer is always used to prevent the profile from deforming when the fastening bolts are tightened.

Spacer for use in profiles, type TP.



Spacer

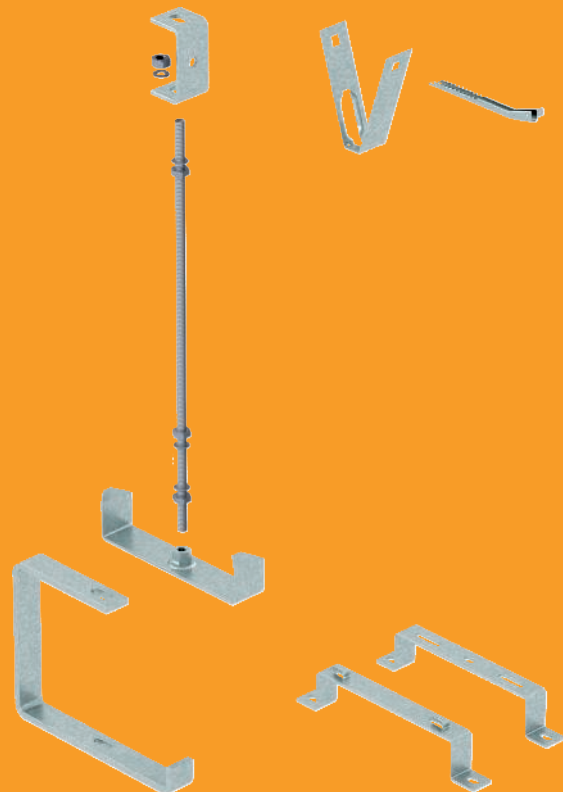




## Universal systems

Universal systems for cable support structures are used for small loads. Whether the installation is to be a ceiling fastening, wall fastening or a floor stand-off: In the universal systems, you can find functional fastenings with matching system accessories for any application.

- Simple suspension
- Centre suspension
- Suitable for mesh cable trays and cable trays
- Floor mounting
- Matching system accessories



## System description



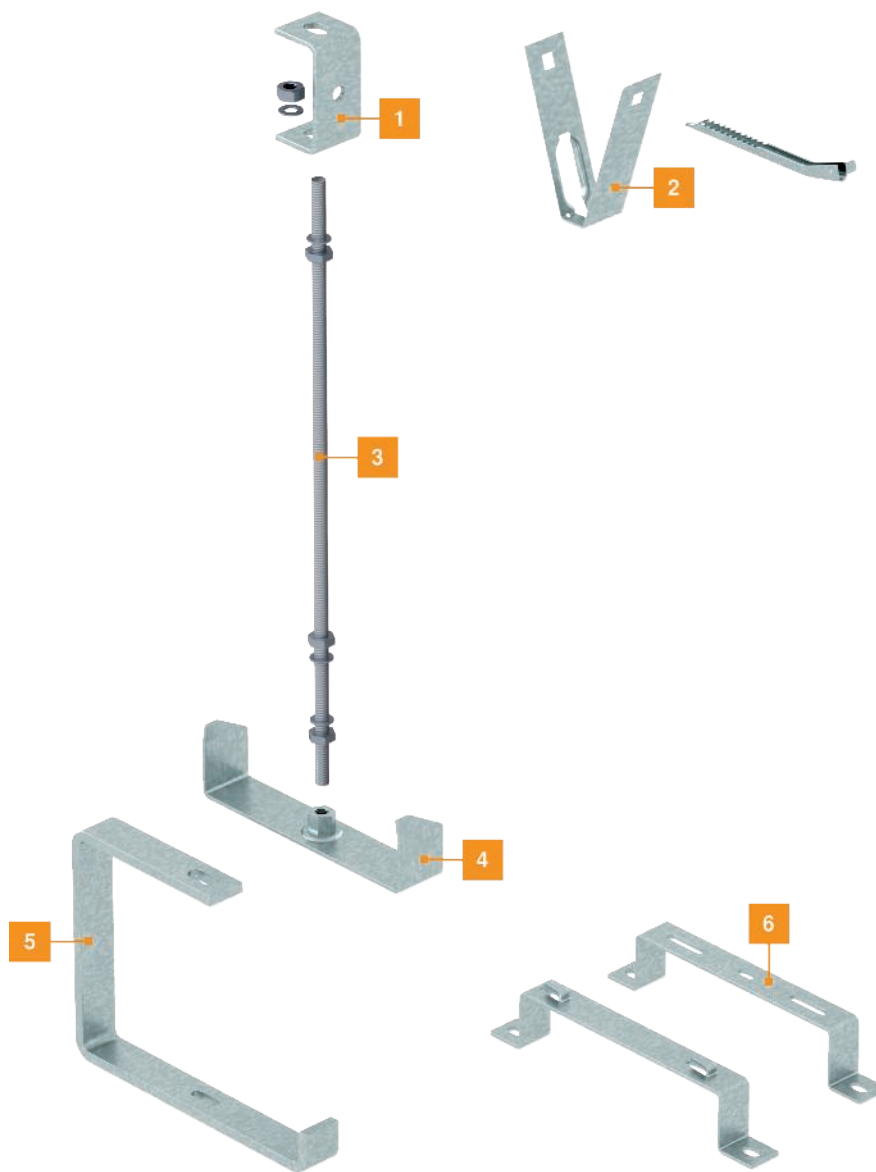
The universal systems are used for small loads. Whether the installation is to be a ceiling fastening, wall fastening or as a floor stand-off: in the Universal systems, you can find functional fittings with matching system accessories for any application.

These suspension systems, which can be called basic installations, include centrally loaded ceiling clamps or

trapezoidal fastenings, which are used with threaded rods and centre suspensions. When using central suspensions, the load should be even on both sides of the system. If an even load cannot be guaranteed, then other systems should be used.

# Universal systems

## Installation principle



- |   |                       |
|---|-----------------------|
| 1 | Ceiling bracket       |
| 2 | Trapezoidal fastening |
| 3 | Threaded rod          |
| 4 | Centre suspension     |
| 5 | Suspension clamp      |
| 6 | Stand-off bracket     |

# Mounting aid



**Installation of centre suspension**  
Installation of the centre suspension MAH 60 on the ceiling using threaded rod 2078/M10 and ceiling bracket 12050. Maximum cable tray width 300 mm.



**Universal mounting on the ceiling**  
The variable ceiling bracket, type DBV, allows threaded rod suspensions on straight and sloping ceilings.



**Centre suspension with threaded rod**  
Direct centre suspension at low loads of a cable tray with threaded rod 2078/M10.



**Installation of centre suspension**  
Insertion and alignment of the centre suspension, MAH, in the cable tray.



**Threaded rod suspension RKSM > 400 mm**  
The threaded rod suspension of RKSM cable trays > 400 mm can take place using two threaded rods.



**Cable ladder centre suspension with threaded rod**  
Installation of a cable ladder with centre suspension MAHU and a threaded rod.



**Trapezoidal plate application**  
Simple, quick fastening of a cable support system to trapezoidal metal roofs.



**Installation of trapeze suspension**  
Installation of a cable tray on a trapezoidal ceiling using a ceiling bracket, type TPB 100 and centre suspension, type MAH 60. Maximum cable tray width 300 mm. The trapezoidal fastening is mounted using the lock, type TPB R.

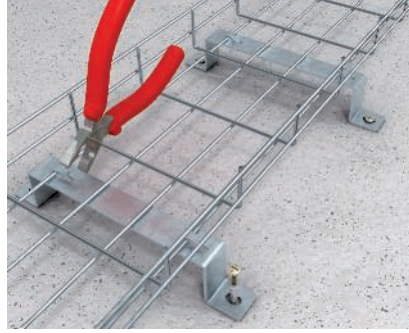


**Threaded rod suspension with ceiling bracket**  
Ceiling mounting of a cable tray with AHB ceiling bracket and threaded rod 2078/M10. Maximum cable tray width 400 mm.



**Floor fastening at a distance**

Mounting of a cable tray at a distance using the DBL stand-off bracket. Maximum cable tray width 600 mm.



**Stand-off of mesh cable trays**

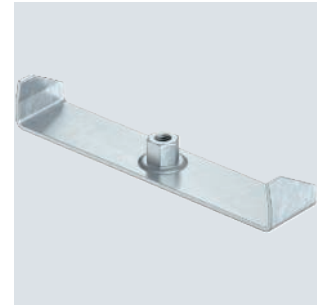
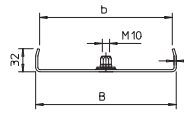
Floor stand-off of mesh cable trays with the stand-off bracket, type DBLG 20/... Screwless fastening of the mesh cable tray on the stand-off bracket using clamping lugs.

St FS

### Centre suspension for cable tray, 35

Type	for width mm	For threaded rod	Dim. B mm	Dim. b mm	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
MAH 35 100 FS	100	M10	95	84	1.3	1	9.400	6358690
MAH 35 200 FS	200	M10	195	184	0.35	1	18.600	6358692
MAH 35 300 FS	300	M10	295	284	0.2	1	27.700	6358694

The centre suspension possesses a rotatable M10 threaded sleeve. When filling, ensure an even distribution of the load (avoid one-sided filling).  
Centre suspension for cable trays with rolled side rail of side height 35 mm.



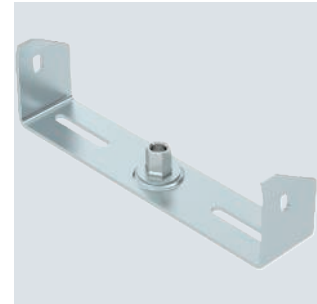
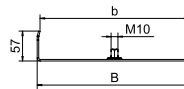
St FS FT

### Centre suspension for cable tray, 60

Type	for width mm	For threaded rod	Dim. B mm	Dim. b mm	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
MAH 60 100 FS	100	M10	94	84	1.3	1	17.250	6358705
MAH 60 200 FS	200	M10	195	184	0.2	1	24.500	6358713
MAH 60 300 FS	300	M10	295	284	0.2	1	36.700	6358717
MAH 60 400 FS	400	M10	395	384	0.1	1	46.000	6358720
MAH 60 100 FT	100	M10	94	84	1.3	1	18.500	6358752
MAH 60 150 FT	150	M10	144	134	0.5	1	23.000	6358756
MAH 60 200 FT	200	M10	195	184	0.2	1	27.600	6358760

The centre suspension possesses a rotatable M10 threaded sleeve. When filling, ensure an even distribution of the load (avoid one-sided filling).  
The widths 100, 150 and 200 mm have additional base perforations, in order to screw the centre suspensions to the tray base when used for the maintenance of electrical functionality according to DIN 4102 Part 12.

Centre suspension for cable trays with rolled side rail of side height 60 mm.

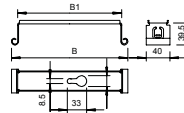


St FS

### Centre suspension for cable trays with rolled side rail

Type	for width mm	Dim. B mm	Dimen-sion B1 mm	Pack Piece	Weight kg/100 pc.	Item no.
MAH 100 FS	100	97	76	1	7.500	6358527

Centre suspension for cable trays for attachment from the side rail of the cable tray.

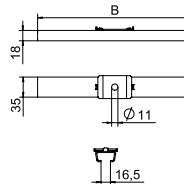


St FS

### Centre suspension mesh cable tray

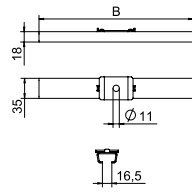
Type	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
GMS 170 FS	170	25	20.000	6015400
GMS 270 FS	270	25	32.000	6015402
GMS 370 FS	370	25	43.000	6015404
GMS 570 FS	570	10	67.000	6015408

Centre suspension including hold-down clamp for mesh cable tray suspensions.



## Centre suspension mesh cable tray

VA 2B

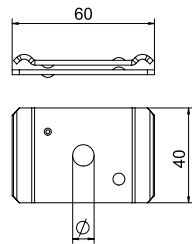


Type	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
GMS 370 A4	370	25	43.000	6015420

Centre suspension including hold-down clamp for mesh cable tray suspensions.

## Centre suspension mesh cable tray

St FS FT

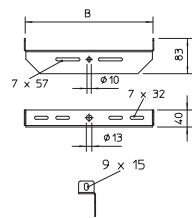


Type	Hole Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
GMA M10 FT	11	25	8.400	6015255

When filling with cables, please ensure an even distribution. The maximum recommended mesh cable tray width is 200 mm.  
Two-part centre suspension of mesh cable trays.

## Centre suspension, universal

St FS

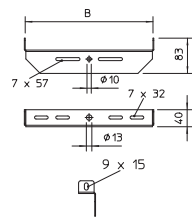


Type	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MAHU 300 FS	300	1	39.300	6358856
MAHU 400 FS	400	1	68.800	6358860
MAHU 500 FS	500	1	85.800	6358864
MAHU 600 FS	600	1	103.300	6358868

Preferred use of this centre suspension in combination with cable ladders and mesh cable trays.  
Universal centre suspension for fastening to threaded rods and supports.

## Centre suspension, universal

St FT



Type	Width mm	Pack Piece	Weight kg/100 pc.	Item no.
MAHU 600 FT	600	1	107.000	6358900

Preferred use of this centre suspension in combination with cable ladders and mesh cable trays.  
Universal centre suspension for fastening to threaded rods and supports.

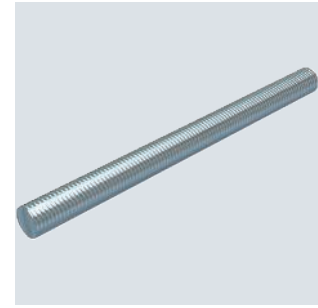


St G

Threaded rod

Type	Thread	Dim. d mm	Dim. L mm	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
TR M8 1M G	M8	8	1000	14.6	10	30.000	3141128
TR M10 1M G	M10	10	1000	23.2	10	49.000	3141209
TR M10 2M G	M10	10	2000	23.2	10	98.000	3141140

Threaded rod to DIN 976.



A4 2B

Threaded rod

Type	Thread	Dim. d mm	Dim. L mm	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
TR M10 1M A4	M10	10	1000	62.8	1	49.000	3141502

Threaded rod to DIN 976.



Trapezoidal fastening

St FS

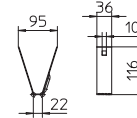
Ceiling bracket, trapezoidal

Type	Material thickness mm	F in kN	Pack Piece	Weight kg/100 pc.	Item no.
TPB 100 FS	1.5	0.8	20	9.900	6357506

Important: Observe the statics of the trapezoidal metal ceiling.

Trapezoidal fastening for suspended mounting of cable support systems on standard trapezoidal ceilings.

When using the holes provided, the trapezoidal fastening can be mounted onto a trapezoidal profile width of up to approx. 80 mm. Fastening takes place with the type TPB R lock or a hexagonal bolt of type SKS 10x110.



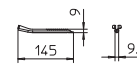
St FS

Splint for trapezoidal ceiling bracket

Type	Material thickness mm	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
TPB R FS	1.5	0.8	20	3.100	6357536

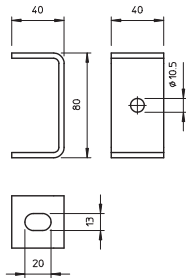
Important: Observe the statics of the trapezoidal metal ceiling.

Splint for fastening and securing the ceiling bracket to trapezoidal ceilings.



## Ceiling bracket

St FT

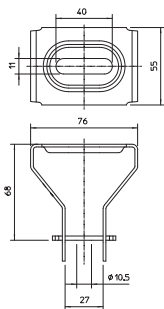
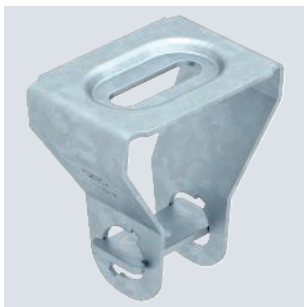


Type	Pack Piece	Weight kg/100 pc.	Item no.
DB FT	20	16.000	6356109

Ceiling bracket for threaded rod suspension.

## Ceiling clamp, variable

St FS

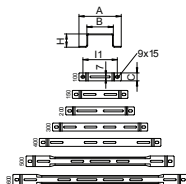


Type	Pack Piece	Weight kg/100 pc.	Item no.
DBV FS	20	18.200	6356055

The locked threaded rod seat offers the option of infinite angle adjustment.  
Ceiling bracket for suspension with threaded rods. The variable adjustment permits universal use.

## Stand-off bracket

St FS FT

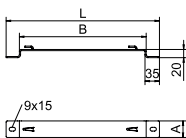


Type	Dim. A mm	Dim. B mm	Dim. H mm	Pack Piece	Weight kg/100 pc.	Item no.
DBL 50 100 FS	160	100	50	20	15.500	6015506
DBL 50 200 FS	260	200	50	20	21.000	6015522
DBL 50 300 FS	360	300	50	20	36.900	6015530
DBL 50 400 FS	460	400	50	20	46.300	6015549
DBL 50 100 FT	160	100	50	20	16.000	6015565

Stand-off bracket for cable trays and mesh cable trays.

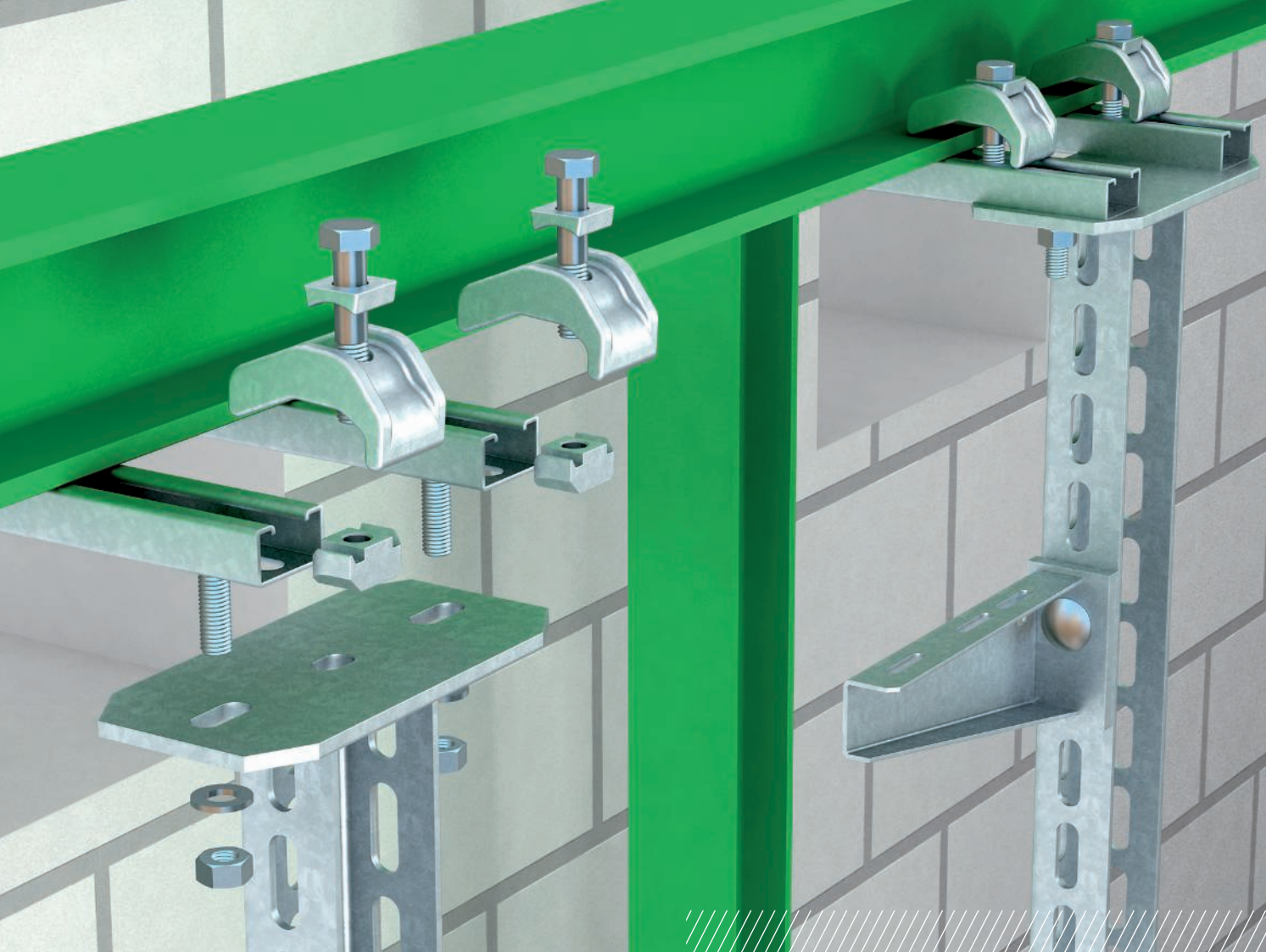
## Stand-off bracket

St FS FT



Type	Height mm	Dim. A mm	Dim. B mm	Dim. L mm	Pack Piece	Weight kg/100 pc.	Item no.
DBLG 20 100 FS	20	30	106	170	20	12.076	6015654
DBLG 20 150 FS	20	30	156	220	20	17.400	6015658
DBLG 20 200 FS	20	30	206	270	20	20.900	6015662
DBLG 20 300 FS	20	40	306	370	20	37.300	6015670
DBLG 20 400 FS	20	40	406	470	20	46.700	6015689
DBLG 20 500 FT	20	40	506	570	25	54.702	6015695

Screwless fastening of the mesh cable tray on the stand-off bracket.  
Stand-off bracket for stand-off of mesh cable trays on the floor or on the wall.  
GRM mesh cable tray types with side heights of 35, 55 and 105 mm can be mounted onto the stand-off bracket.



## Beam clamp systems

The beam clamp systems with reduced installation times and work are a clear argument for the use of this system in all areas of professional electrical installations. The beam clamp can be attached without difficult, often unpermitted, drilling. The load range runs from light-duty clamping angles to heavy-duty chuck jaws.

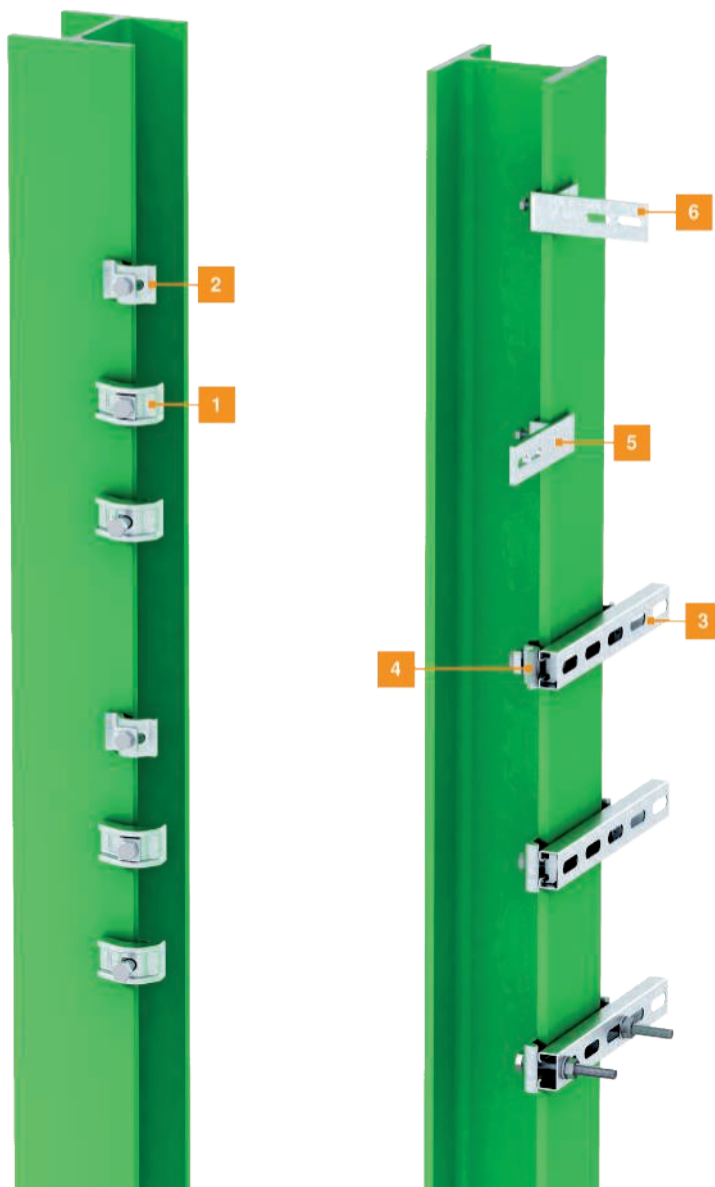
Large support spacings possible

Infinite height adjustment



# Beam clamp systems

## Installation principle

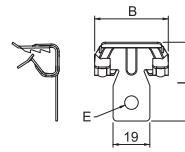


- 1 Chuck jaw, heavy duty
- 2 Chuck jaw, light duty
- 3 Profile rail
- 4 Clamping angle
- 5 Beam clamp, horizontal
- 6 Beam clamp, vertical

St ZL

Type	Flange thickness mm	Fastening hole mm	Breaking load N	Pack Piece	Weight kg/100 pc.	Item no.
<b>BCVH 2-4</b>	2-4	6.5	450	100	1.350	<b>1483601</b>
<b>BCVH 4-8</b>	4-8	6.5	950	100	1.660	<b>1483603</b>
<b>BCVH 8-14</b>	8-14	6.5	950	100	1.800	<b>1483605</b>
<b>BCVH 14-20</b>	14-20	6.5	950	100	1.950	<b>1483607</b>

Beam clamp for knocking in with fastening hole as individual fastening solution on the beam.



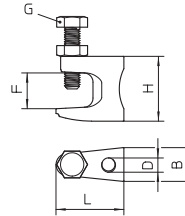
## Beam clamps for screwing-in

TG



Type	Flange thickness mm	Height mm	For threaded rod	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
<b>FL2-G M10 TG</b>	0-20	42	M10	2.5	50	14.000	<b>1488082</b>

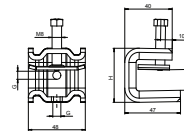
With thread.



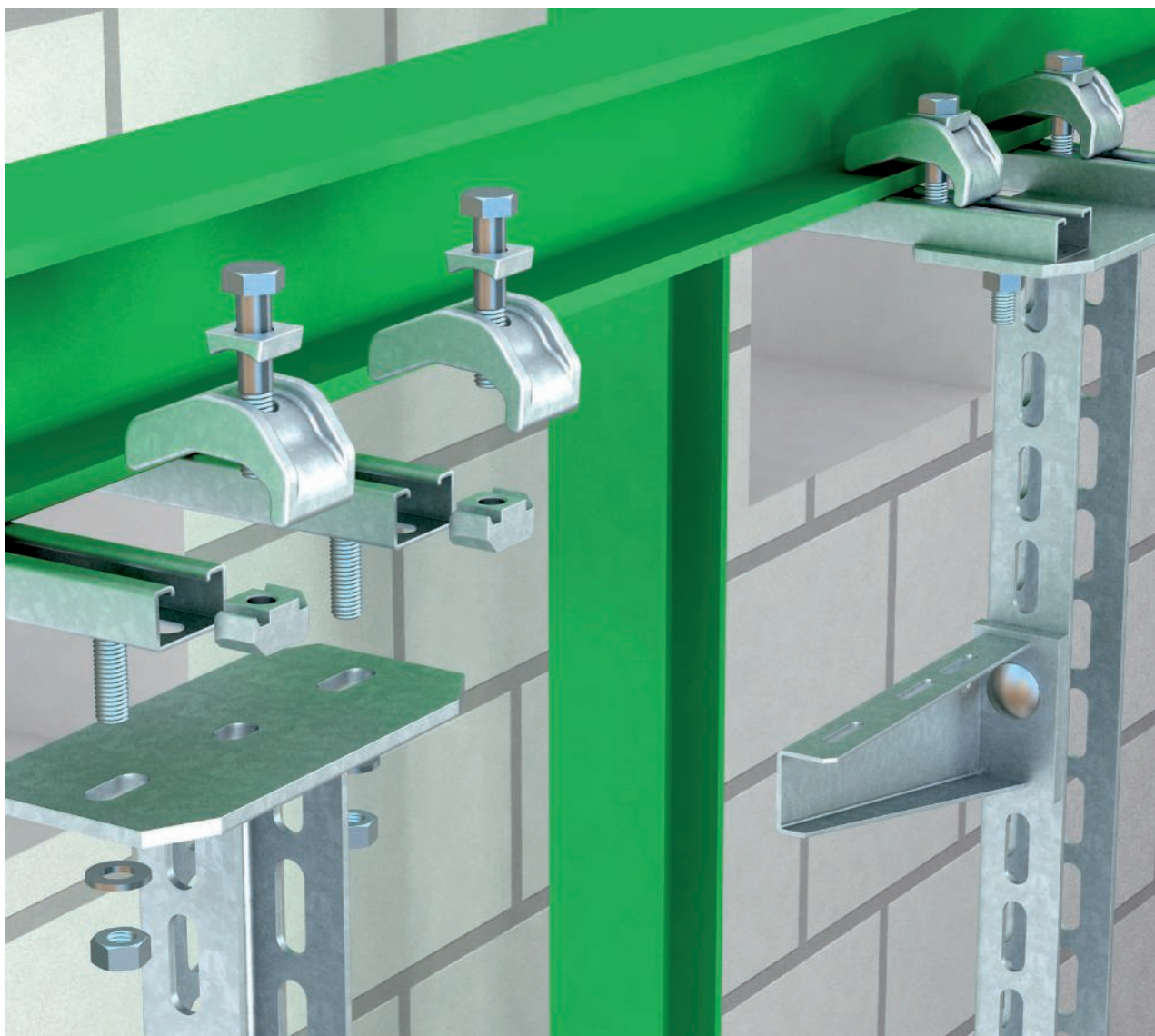
A2 2B

Type	Flange thickness mm	For threaded rod	Breaking load F1 kN	Breaking load F2 kN	Pack Piece	Weight kg/100 pc.	Item no.
<b>SSP 6-21 M8 A2</b>	6-21	M8	1.75	1.5	25	23.200	<b>1486284</b>

This type of beam clamp is pushed onto the support and fixed to the girder or flat iron using a pressure trough and bolt (M8). The hexagonal bolt has a WAF of 10 mm. In the clip element, two additional M6 threads are also incorporated, to fix threaded rods, for example.



## System description



The beam clamp systems with reduced installation times and work are a clear argument for the use of this system in all areas of professional electrical installations. The beam clamp can be attached without difficult, often unpermitted, drilling. The load range runs from light-duty clamping angles to heavy-duty chuck jaws. The clamping

lugs/clamping angles, type KL, KWH and KWS, and the chuck jaws, type TKH and TKS, permit excellent connections without drilling or welding, on account of the perfect matching to additional system articles.

# Installation principle



1	Chuck jaw, heavy duty
2	Chuck jaw, light duty
3	Profile rail
4	Clamping angle
5	Beam clamp, horizontal
6	Beam clamp, vertical

## Mounting aid



**Application on horizontal steel girder**  
Clamp fastenings using clamping angles and chuck jaws on horizontal steel girders.



**Application on sloping steel girder**  
Clamp fastenings using clamping angles and chuck jaws on sloping steel girders.



**Steel clamping, C profile rail**  
Fastening of a C profile, type MS 4022 or MS 5030, to steel girder using clamping angles, type KWS.



**Direct girder clamping**  
Direct girder clamping of an I suspended support using chuck jaw (heavy duty), type TKS-S-30. Route along steel girder.



**Clamp fastening with addition C profile**  
Use of an additional C profile rail, type MS, for wider steel girders. Route along steel girder.



**Clamping transverse to steel girder**  
Use with two C profile rails for tray mounting transverse to the steel girder.



**Cantilever beam on steel**  
Installation of U support as cantilever beam on steel girder. Fastening with clamping angles or chuck jaws depending on load. Fastening with spacers, type DSK.



**Cantilever beam with support**  
Cantilever beams made of U support construction clamped to steel girder for installing supports.



**Clamp fastening on vertical steel girder**  
Mounting of the adapter plate, type KA-AW, on the vertical steel girder using clamping angles or chuck jaws. Wall brackets of type AW are fastened to the adapter plate, using the hexagon head screw SKS 12x40 GF.





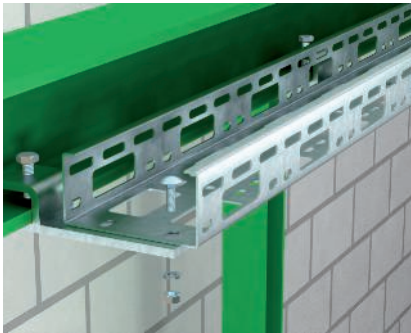
**45° adapter plate, steel clamping**  
 Mounting of the 45° adapter plate, type KA-E 45, on the steel girder using clamping angles or chuck jaws. For additional support of routes in angles and at room corners.



**Vertical clamp fastening**  
 Clamp fastening of a heavy-duty bracket with clamping angles or clamping lugs on a vertical steel girder.



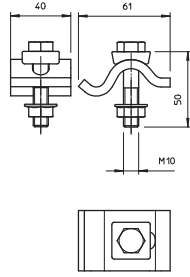
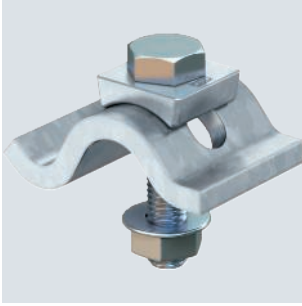
**Vertical clamp fastening**  
 Installation of a mesh cable tray vertically on a steel girder, mounting with a beam clamp BFK and clamp GKS 50.



**Horizontal clamp fastening**  
 Installation of AZ small duct using BFK beam clamp in a longitudinal direction on the steel girder. Maximum cable tray width 100 mm.

## Chuck jaw, light duty TKS

St FT

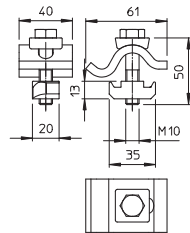
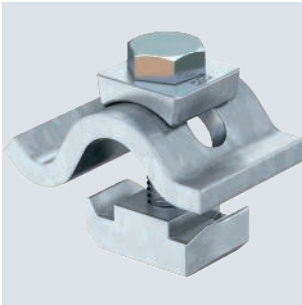


Type	Height F in kN		Bolt	Pack Pair	Weight kg/100 pairs	Item no.
	mm	kN				
<b>TKS-L-25 FT</b>	25	10	M10x50	10	39.200	<b>6355808</b>

Chuck jaw with hexagonal nut for direct fastening of structures to steel girders.  
The clamping range of the chuck jaw is limited to the maximum fastening thickness, 25 mm.

## Chuck jaw, light duty TKH

St FT

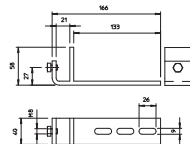


Type	Height F in kN		Bolt	Pack Pair	Weight kg/100 pairs	Item no.
	mm	kN				
<b>TKH-L-25 FT</b>	25	10	M10x25	10	46.000	<b>6355812</b>

Light-duty chuck jaw with slide nut for fixing profile rails to steel girder flanges.  
The clamping range of the chuck jaw is limited to the maximum fastening thickness, 25 mm.  
The chuck jaw is used in combination with profile rails of slot widths 18 mm and 22 mm.

## Beam clamp, vertical BFK 166

St FT

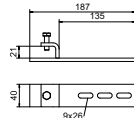
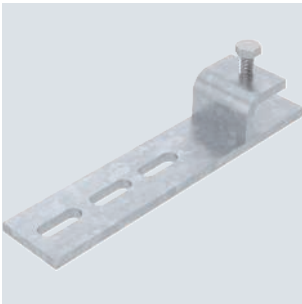


Type	Dim.		Pack Piece	Weight kg/100 pc.	Item no.
	Width mm	b mm			
<b>BFK 166 58 20 FT</b>	166	133	10	45.000	<b>6003888</b>

Beam clamp for clamping on the steel girder.  
The cable support system attached to the beam clamp runs vertically.

## Beam clamp, horizontal BFK 187

St FT



Type	Dim.		Pack Piece	Weight kg/100 pc.	Item no.
	Width mm	b mm			
<b>BFK 187 33 FT</b>	187	135	10	43.000	<b>6003892</b>

Beam clamp for clamping on the steel girder.  
The cable support system attached to the beam clamp runs horizontally.

# Rail systems from OBO

OBO's tried-and-tested rail system is now more logically structured than ever before. It is now easy to choose the right product at a glance from the three load classes: Light duty, medium duty and heavy duty. The matching accessories are also right there in the selection aids. So choosing perfectly matching products is simply a breeze.

Highly versatile

Different perforation patterns

Strip galvanised and hot-dip galvanised

Stainless steel grades V2A and V4A

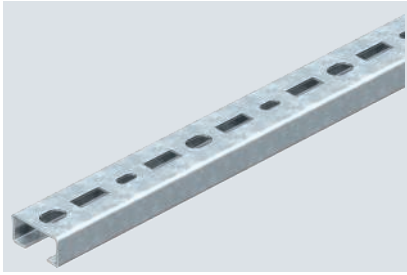
Light duty

Medium duty

Heavy duty

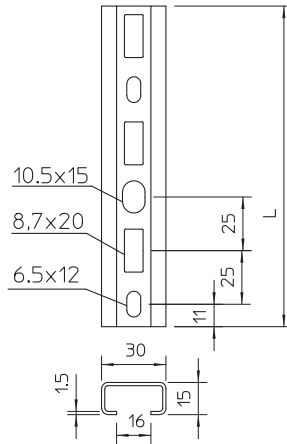
Mounting systems

CM3015 profile rail, slot 16 mm, perforated

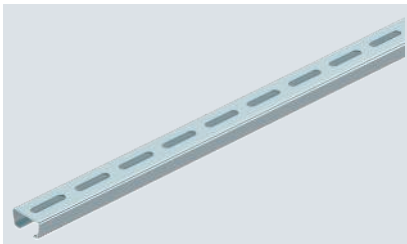


Profile rail, perforated, slot width 16 mm.

Type	Length mm	Material thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
CM3015P0600FT	600	1.5	10	44.000	1109820

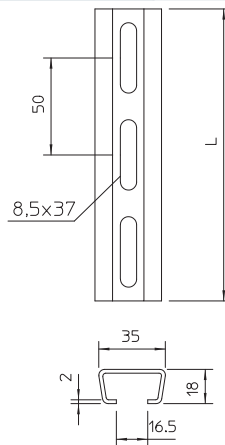


Anchor rail AML3518, slot width 16.5 mm, perforated



Central C profile rail for cable routing, in conjunction with clamp clips with a hammerhead foot. Can also be used as suspension construction for cable support systems.

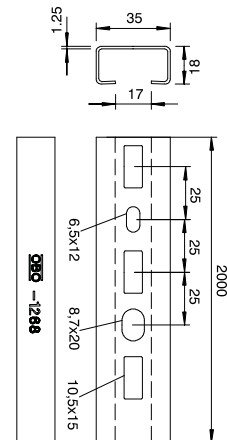
Type	Length m	Material thickness mm	Pack m	Weight kg/100 m	Item no.
AML3518P2000FT	2000	1.5	2	89.000	1119656





### CML3518 profile rail, slot 17 mm, perforated

Type	Length mm	Material thickness mm	Pack m	Weight kg/100 m	Item no.
CML3518P2000FS	2000	1.25	2	71.000	1104500
CMS3518P2000FS	2000	1.75	2	97.800	1104454

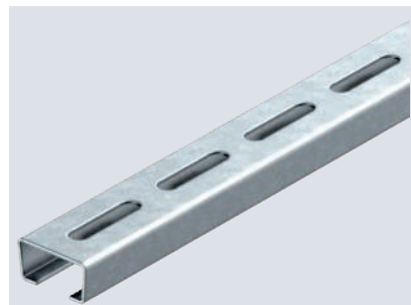
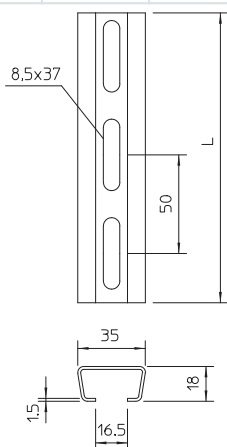


Central C profile rail for cable routing, in conjunction with clamp clips with a hammerhead foot. Can also be used as suspension construction for cable support systems.



### Anchor rail AML3518, slot 16.5 mm, perforated

Type	Length mm	Material thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
AML3518P0500FT	500	1.5	10	44.500	1119687



Central C profile rail for cable routing, in conjunction with clamp clips with a hammerhead foot. Can also be used as suspension construction for cable support systems.



## MS4121 mounting rail

Heavy-duty C profile rail for the individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.

Slot width 22 mm

Double version (clinched)

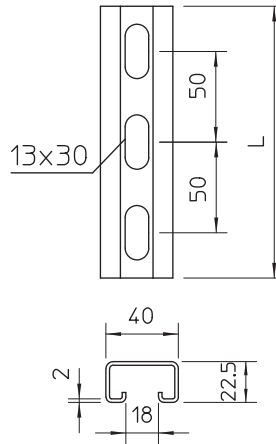
Slot width 22 mm





### MS4022 mounting rail, heavy duty, slot 18 mm, perforated

Type	Length mm	Material thickness mm	Pack m	Weight kg/100 m	Item no.
MS4022P2000FT	2000	2	2	152.500	1121979

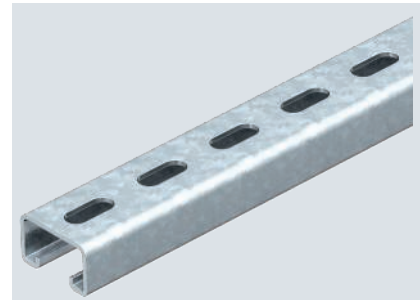
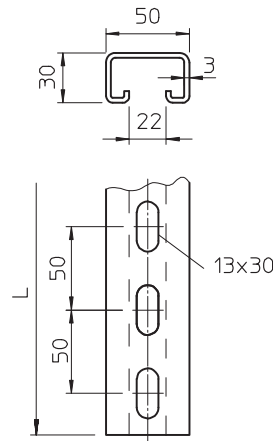


Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.



### MS5030 mounting rail, slot 22 mm, perforated

Type	Length mm	Material thickness mm	Pack m	Weight kg/100 m	Item no.
MS5030P6000FT	6000	3	6	282.500	1121472



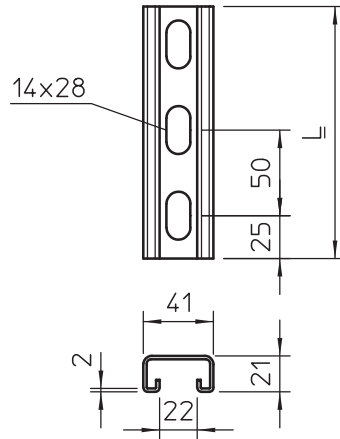
Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.

## MS4121 mounting rail, slot 22 mm, perforated

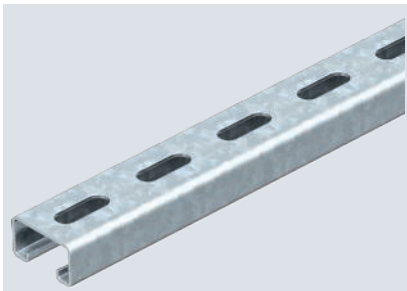


Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.

Type	Length mm	Material thickness mm	Pack m	Weight kg/100 m	Item no.
MS4121P6000FT	6000	2	6	184.000	1122926

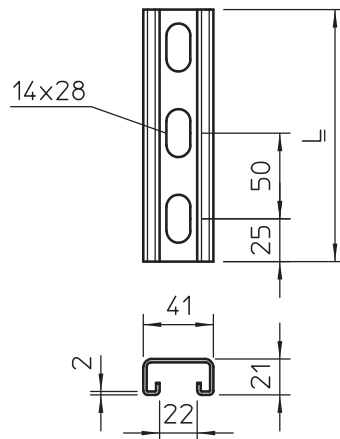


## MS4121 mounting rail, slot 22 mm, perforated



Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.

Type	Length mm	Material thickness mm	BS	Pack Piece	Weight kg/100 pc.	Item no.
MS4121P0200FT	200	2		1	35.100	1122933
MS4121P0300FT	300	2		1	53.000	1122934
MS4121P0500FT	500	2		1	87.000	1122936

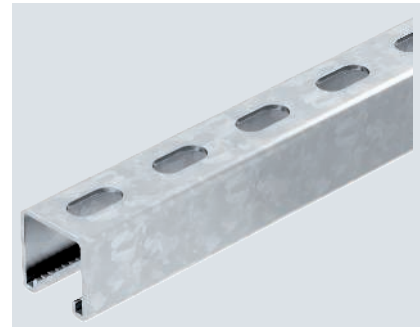
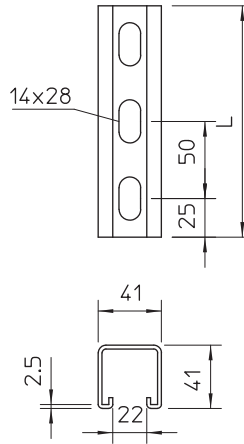






### MS4141 mounting rail, slot 22 mm, perforated

Type	Length mm	Material thickness mm	BS	Pack m	Weight kg/100 m	Item no.
MS4141P3000FT	3000	2.5		3	261.400	1122622
MS4141P6000FT	6000	2.5		6	260.670	1122657

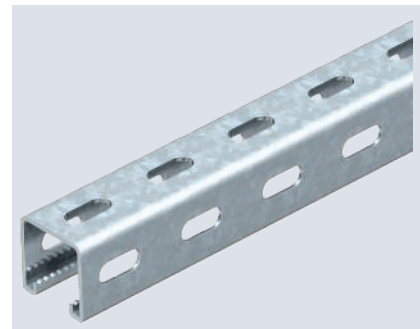
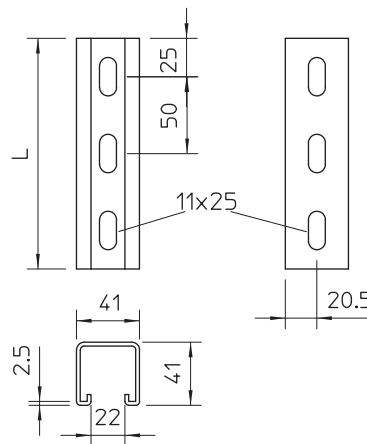


Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.



### MS4141PP mounting rail, slot 22 mm, perforated

Type	Length mm	Material thickness mm	Pack Piece	Weight kg/100 pc.	Item no.
MS4141PP0300FT	300	2.5	1	67.000	1122500



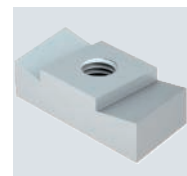
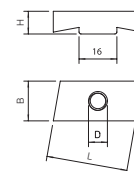
Heavy-duty C profile rail for individual installation of support constructions, e.g. for cable trays or as a panel for switchgear cabinets. Can also be used for cable routing, in conjunction with clamp clips with a U foot.

### Accessories, mounting rails



Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS40SN M8 ZL	35	17	10	M8	50	3.600	1147110
MS40SN M10 ZL	35	17	10	M10	50	3.400	1147114

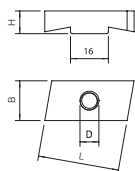
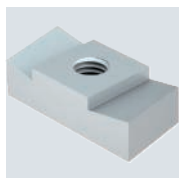
Slide nut for use with MS4022 profile rail



### Slide nut

Slide nut

A4 2B

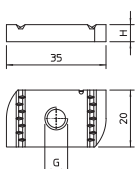
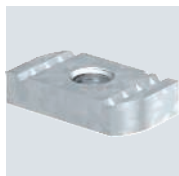


Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS40SN M8 A4	35	17	10	M8	50	3.600	1147130
MS40SN M10 A4	35	17	10	M10	50	3.400	1147134

Slide nut for use with MS4022 profile rail

Slide nut

St ZL

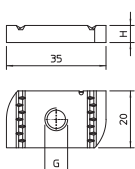
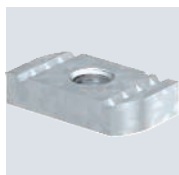


Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS41SN M8 ZL	35	20	6	M8	50	2.800	1147210
MS41SN M10 ZL	35	20	8	M10	50	3.650	1147214

Slide nut for use with MS4121 und MS4141 profile rails

Slide nut

A4 2B

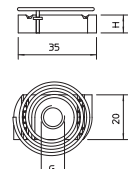


Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS41SN M8 A4	35	20	6	M8	50	2.800	1147230
MS41SN M10 A4	35	20	8	M10	50	3.650	1147234

Slide nut for use with MS4121 und MS4141 profile rails

Slide nut with spring

St F

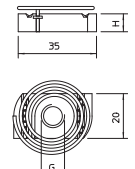


Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS41SNF M8 F	35	20	6	M8	50	3.150	1147310
MS41SNF M10 F	35	20	8	M10	50	4.000	1147314

Slide nut with spring for use with MS4121 und MS4141 profile rails

Slide nut with spring

A4 2B



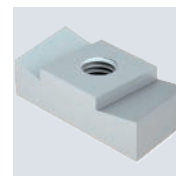
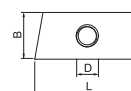
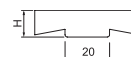
Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS41SNF M8 A4	35	20	6	M8	50	3.150	1147340
MS41SNF M10 A4	35	20	8	M10	50	4.000	1147344

Slide nut with spring for use with MS4121 und MS4141 profile rails

St ZL

Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS50SN M8 ZL	43	21	12	M8	50	6.550	1147160
MS50SN M10 ZL	43	21	12	M10	50	6.350	1147164

Slide nut for use with MS5030 profile rail

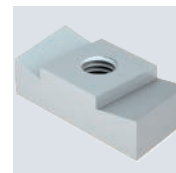
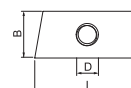
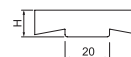


Slide nut

A4 2B

Type	Length mm	Width mm	Height mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
MS50SN M8 A4	43	21	12	M8	50	6.550	1147186
MS50SN M10 A4	43	21	12	M10	50	6.350	1147190

Slide nut for use with MS5030 profile rail

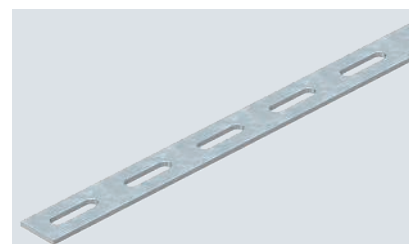
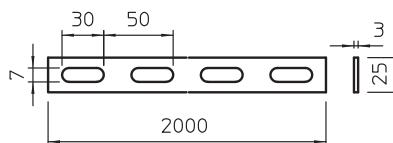


Slide nut

Construction and suspension profiles

St FT

Type	Dimen- sion mm	Length mm	Pack m	Weight kg/100 m	Item no.
SLH 42 2000 FT	25x3	2000	2	51.500	7103611



The profile is available in bright steel on request. Perforated side rail profile of shipbuilding ladders, SL 42, for the creation of suspension and support constructions.

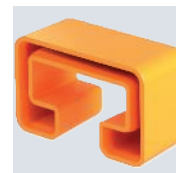
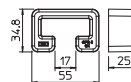
SL42 construction and suspension profile

Accessories, profile rails

PE

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
MS5030 SK	Pastel orange	25	1.147	1124563

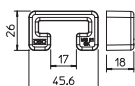
End caps for profile rail, type MS5030.



End cap MS5030

### End cap MS4121

PE

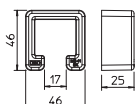


Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
MS4121 SK	Pastel orange	25	0.611	1122902

End cap for profile rail, type MS4121.

### End cap MS4141

PE

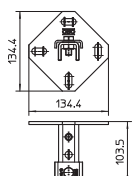


Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
MS4141 SK	Pastel orange	25	1.212	1122900

End cap for profile rail, type MS4141.

### Wall, floor and ceiling bracket with 3 holes

St FT



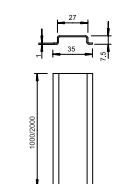
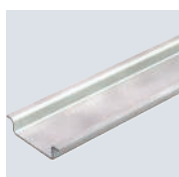
Type	Version	Dimension W x H mm	Material thickness mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
WBDHE 41 FT	Perforated	134x110	5	102	10	73.000	1123191

The wall, floor and ceiling bracket can ideally be used as a panel for wall, floor and ceiling mounting. Also suitable for stand and frame construction in conjunction with the mounting rails MS4141.

### Hat profile and support rail

#### Hat profile rail, unperforated

St BK  
35

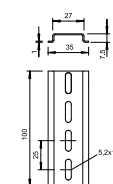


Type	Version	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item no.
2069 2M BK	Unperforated	1	2000	50	36.040	1115618

Hat profile rail 35 x 7.5 mm to DIN EN 60715 (formerly DIN EN 50022).

#### Hat profile rail, perforated

St GTP  
35



Type	Version	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item no.
2069 2M GTP	Perforated	1	2000	50	33.280	1115669

Hat profile rail 35 x 7.5 mm to DIN EN 60715 (formerly DIN EN 50022).

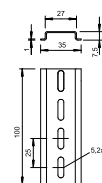
St FS

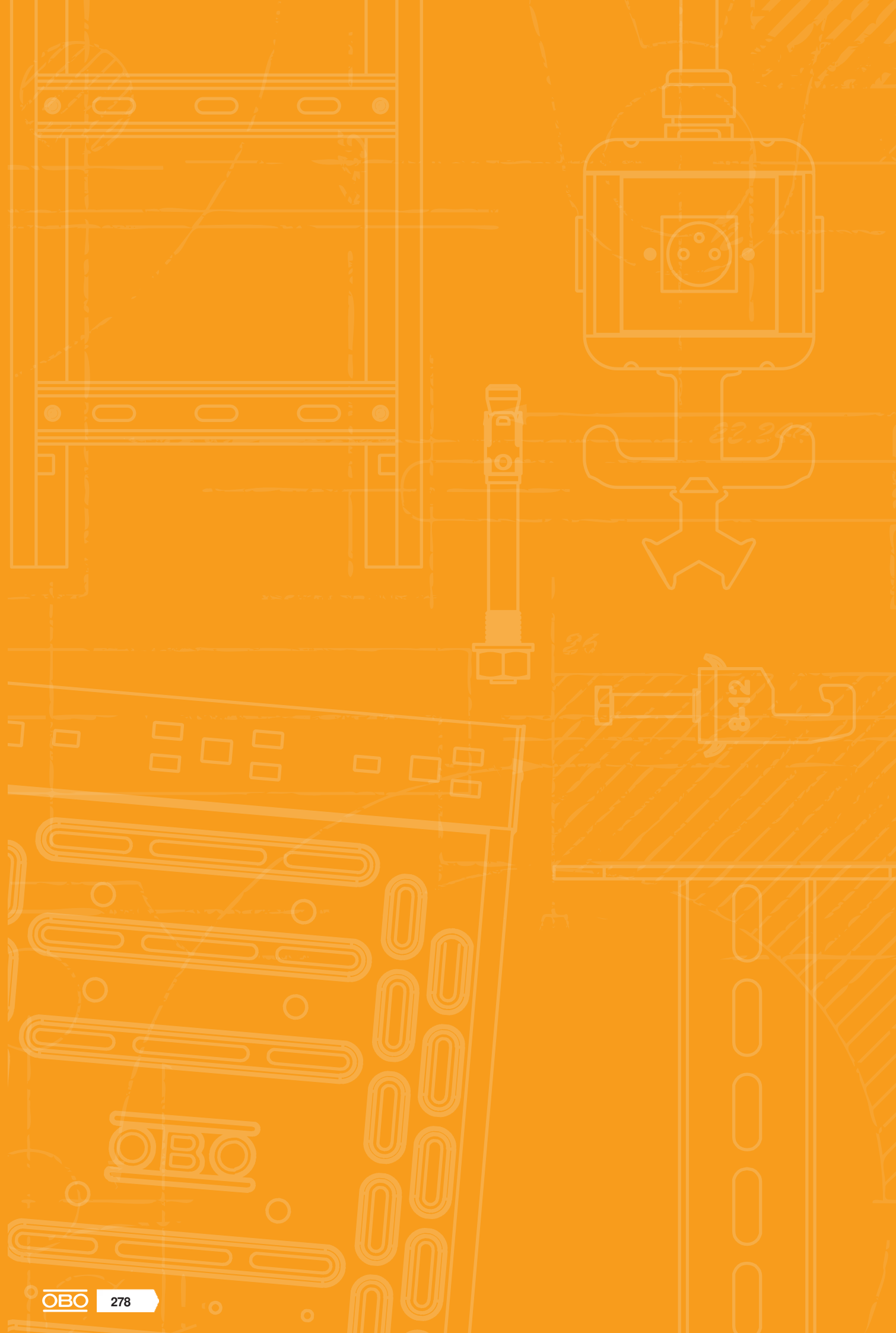


## Hat profile rail, perforated







Type	Version	Material		Length mm	Bundle m	Weight kg/100 m	Item no.
		thickness mm					
2069 L 2M FS	Perforated	1		2000	50	33.280	1115804

Hat profile rail 35 x 7.5 mm to DIN EN 60715 (formerly DIN EN 50022).












































# Directories

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	Pictogram explanation	282
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	For the latest general conditions of sale and delivery please see <a href="http://www.obo.global/general-purchasing-conditions/">www.obo.global/general-purchasing-conditions/</a>	



## Test marks
























	American Bureau of Shipping, USA		Underwriters Laboratories Inc., USA + CSA, Canada
	AENOR, Producto Certificado, Spain		Österreichischer Verband für Elektrotechnik, Austria
	STOWARZYSZENIE ELEKTRYKÓW POLSKICH, Poland		ISTITUTO ITALIANO DEL MARCHO DI QUALITÀ, Italy
	Lightning current-tested		RINA 1861, Ship Classification, Certification and Services
	Lightning current-tested, Class H (100 kA)		Underwriters Laboratories Inc., USA
	CEBEC, Belgium		SEMKO An Inchcape Testing Services Company, Sweden
	Canadian Standards Association, Canada		Eidgenössisches Starkstrominspektorat, Switzerland
	DEMKO, Danmarks Elektriske Materielkontrol, Denmark		South African Bureau of Standards
	Deutsches Institut für Bautechnik Berlin, Germany		Shock-tested, Bundesamt für Zivilschutz, Germany
	Det Norske Veritas		Sähkötarkastuskeskus Elinspektionscentralen Electrical Inspectorate, Finland
	ENEC Austria		Underwriters Laboratories Inc., USA
	ATEX certificate for explosive areas		Underwriters Laboratories Inc., USA
	ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV, Czech Republic		Verband der Elektrotechnik, Elektronik, Informationstechnik e.V., Germany
	FIMKO, Finland		German Association of Electricians, tested safety
	Forschungs- und Materialprüfungsanstalt, Germany		5-year warranty
	Russia, GOST The State Committee for Standards		
	Test marks for technical resources, VDE Prüf- und Zertifizierungsinstitut Offenbach, Germany		
	Halogen-free; without chlorine, fluorine and bromine		
	INMETRO, Brazil		
	KEMA-KEUR, Netherlands		
	Indication of metric products		
	MAGYAR ELEKTROTECHNIKAI ELLENŐRZŐ INTÉZET Budapest, Hungary		
	NEMKO, Norway		
	AFNOR Quality symbol of the French standardisation institute		







# Pictogram explanation






## Surfaces

	Strip galvanised
	Strip galvanised/plastic-coated
	Strip galvanised zinc/aluminium, double dip
	Bright
	Bright, reworked
	Anodised
	Hot-dip galvanised
	Electrogalvanised
	Electrogalvanised/plastic-coated
	Electrogalvanised, yellow-chromatised
	Electrogalvanised, yellow passivated
	Electrogalvanised, transparently passivated
	Primed
	Painted
	Welding primed
	Hot-dip galvanised
	Hot-dip galvanised 85 µm
	Copper-plated
	Nickel-plated
	Galvanised, Deltatone 500
	Galvanised, MAGNI 565
	Zinc-aluminium coated, Galfan
	Zinc scale






## Conformity symbol

	Communautés Européennes, EC declaration of conformity according to EC directives
	RoHS-conformant



















## Quality marks

	Halogen-free; without chlorine, fluorine and bromine
	Flame resistant 650 °C
	Flame resistant 750 °C
	Flame resistant 960 °C
	UV-resistant




## Specific product symbols

	Diameter 60 mm
	Diameter 68 mm
	Protection device to DIN EN 61643-11 or IEC 61643-11
	Transition from LPZ 2 to LPZ 3
	Acoustic signalling

## Applications

	Remote signalling
	Acoustic signalling
	Integrated Service Digital Network, ISDN applications
	Digital Subscriber Line, DSL applications
	Analogue telecommunication
	Category 5 TwisterPair
	Channel Performance to American EIA/TIA standard
	Measuring, controlling and regulating systems
	TV applications
	SAT-TV applications
	MultiBase base
	LifeControl
	Intrinsically safe protection device for potentially explosive areas
	Channel Performance to ISO/IEC 11801
	Power over Ethernet
	230/400 V system
	Protection rating IP 54
	Protection rating IP 65

## Lightning protection classes

	Protection device to DIN EN 61643-11 or IEC 61643-11
	Combination protection device made of type 1 and type 2
	Protection device to DIN EN 61643-11 or IEC 61643-11

## Lightning protection classes

	Protection device to DIN EN 61643-11 or IEC 61643-11
	Protection device to DIN EN 61643-11 or IEC 61643-11

## Lightning protection zone

	Transition from LPZ 0 to LPZ 1
	Transition from LPZ 0 to LPZ 2
	Transition from LPZ 0 to LPZ 3
	Transition from LPZ 1 to LPZ 2
	Transition from LPZ 1 to LPZ 3
	Transition from LPZ 2 to LPZ 3

## BSS maintenance of electrical function installation

	Fire-tested systems
	Escape route ceiling mounting with pressure clip
	OBO Grip, wall routing type
	OBO Grip, ceiling routing type
	Pressure clip for maintenance of electrical function, ceiling mounting

## BSS anchor

	Fire protection anchor
	Fire protection bolt tie

## BSS test marks/material class

	Maintenance of electrical function class E30
	Maintenance of electrical function class E90

## Clamp clip base shapes

	Clamp clip for C profile rail, slot width 11–12 mm
	Clamp clip for C profile rail, slot width 16–17 mm
	Clamp clip for C profile rail, slot width 18–22 mm

## Diameter

	Diameter 60 mm
	Diameter 68 mm
	Diameter 70 mm
	Diameter 74 mm

## Entries

	4 cable entries
	6 cable entries
	7 cable entries
	8 cable entries
	9 cable entries
	10 cable entries
	12 cable entries
	10 cable entries ECO
	12 cable entries ECO
	14 cable entries ECO
	16 cable entries
	18 cable entries ECO
	24 cable entries

## Gland thread

	Thread metric
	Thread Pg

## Entry size

	M20 entry
	M25 entry
	M32 entry
	M40 entry

## KTS side heights










	Cable tray, side height 35 mm
	Cable tray, side height 60 mm
	Cable tray, side height 85 mm
	Mesh cable tray, side height 35 mm
	Mesh cable tray, side height 55 mm

## Materials




	Flat steel
	Angular steel
	U steel
	Round material

# Pictogram explanation





## Nominal cross-section

	Nominal cross-section 1.5 mm <sup>2</sup>
	Nominal cross-section 1.5–2.5 mm <sup>2</sup>
	Nominal cross-section 2.5 mm <sup>2</sup>
	Nominal cross-section 2.5–4 mm <sup>2</sup>
	Nominal cross-section 4 mm <sup>2</sup>
	Nominal cross-section 4–6 mm <sup>2</sup>
	Nominal cross-section 6 mm <sup>2</sup>
	Nominal cross-section 10 mm <sup>2</sup>
	Nominal cross-section 16 mm <sup>2</sup>













## Nominal voltage

	Nominal voltage 400 V
	Nominal voltage 500 V
	Nominal voltage 660 V





## Polarity

	3-pole
	5-pole
	7-pole
	8-pole
	10-pole
	12-pole



## Slot widths

	Slot width 7.5 mm
	Slot width 11 mm
	Slot width 11–12 mm
	Slot width 12 mm
	Slot width 15 mm
	Slot width 16 mm
	Slot width 16.5 mm
	Slot width 16–17 mm
	Slot width 17 mm
	Slot width 18 mm
	Slot width 22 mm
	Slot width 35 mm











## Screw heads

	Phillips screw
	Torx screw
	Phillips screw
	Pozidriv











## Firing devices

	Bolt-firing tool
	Nail device





## Protection rating

	Protection rating IP 20
	Protection rating IP 30
	Protection rating IP 31
	Protection rating IP 44
	Protection rating IP 54
	Protection rating IP 55
	Protection rating IP 65
	Protection rating IP 66
	Protection rating IP 67
	Protection rating IP 68

## Metals

	Aluminium
	Aluminium/steel
	Stainless steel, rustproof
	Stainless steel, rustproof
	Stainless steel, rustproof
	Copper
	Brass
	Steel
	Malleable iron
	Die-cast zinc

## Plastics

	Acrylonitrile butadiene styrene
	Duroplast, Aminoplast, type 131.5
	Duroplast, melamine resin, type 150
	Ethylene vinyl acetate

## Plastics

<b>FA</b>	Fibre-proof material DIN 28091
<b>GFK</b>	Fibreglass-reinforced plastic
<b>NBR SBR</b>	Rubber mixture
<b>NBR</b>	Nitrile rubber
<b>PETR</b>	Petrolatum
<b>PA</b>	Polyamide
<b>PA/ GF</b>	Polyamide, fibreglass reinforced
<b>PBPT</b>	Polybutylene terephthalate
<b>PC</b>	Polycarbonate
<b>PE</b>	Polyethylene
<b>PP</b>	Polypropylene
<b>PP/ GF</b>	Polypropylene, fibreglass reinforced
<b>PS</b>	Polystyrene
<b>PVC</b>	Polyvinylchloride
<b>ZELL PC</b>	Cellular polyethylene



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6445653	<b>6225958</b>	190	6168910	<b>6348904</b>	235	6206957	<b>6419828</b>	221
6445660	<b>6225960</b>	190						
	price/m			price/pair				
6169214	<b>6227058</b>	121	6579075	<b>6355808</b>	266	6662470	<b>6420606</b>	220
6169337	<b>6227074</b>	121	6579259	<b>6355812</b>	266	6662531	<b>6420608</b>	220
6169399	<b>6227120</b>	122				6662593	<b>6420610</b>	220
6169450	<b>6227139</b>	122				6662654	<b>6420612</b>	220
6169511	<b>6227147</b>	122	5373070	<b>6356055</b>	258	6662715	<b>6420614</b>	220
6169573	<b>6227155</b>	122	6195671	<b>6356109</b>	258	6662777	<b>6420616</b>	220
6169634	<b>6227163</b>	122	5523666	<b>6357506</b>	257	6207138	<b>6420664</b>	218
6072613	<b>6227600</b>	126	5523680	<b>6357536</b>	257	6207190	<b>6420680</b>	218
6072910	<b>6227608</b>	126				6207251	<b>6420710</b>	218
6073276	<b>6227616</b>	126	6765676	<b>6358527</b>	255	6207312	<b>6420745</b>	218
	/pc.		6881239	<b>6358659</b>	213	6207374	<b>6420788</b>	218
6170470	<b>6227708</b>	123	6881291	<b>6358667</b>	213	6207497	<b>6420826</b>	218
6170531	<b>6227716</b>	123	6884292	<b>6358675</b>	213			
5767923	<b>6227836</b>	123	6881352	<b>6358683</b>	213	6637034	<b>6424740</b>	217
			5009702	<b>6358687</b>	213			
6171910	<b>6229352</b>	124	5364061	<b>6358690</b>	255	6208876	<b>6437109</b>	168
6172092	<b>6229425</b>	124	5364078	<b>6358692</b>	255	6818839	<b>7000677</b>	109
6172337	<b>6229476</b>	124	5364085	<b>6358694</b>	255			
6172931	<b>6229778</b>	125	6939374	<b>6358705</b>	255	5047322	<b>7007005</b>	88
			6939497	<b>6358713</b>	255	5711759	<b>7007318</b>	106
6173891	<b>6230423</b>	125	6939558	<b>6358717</b>	255	5711834	<b>7007358</b>	106
6174010	<b>6230458</b>	125	6134823	<b>6358720</b>	255			
6174492	<b>6230725</b>	124	6947171	<b>6358752</b>	255	5927389	<b>7027001</b>	88
6174614	<b>6230741</b>	124	6947232	<b>6358756</b>	255	5927396	<b>7027003</b>	88
6174737	<b>6230776</b>	124	6947294	<b>6358760</b>	255	5927471	<b>7027021</b>	88
			5268611	<b>6358810</b>	213			
6504015	<b>6231527</b>	126	5435761	<b>6358853</b>	256	6991402	<b>7068328</b>	109
6504138	<b>6231543</b>	126	5435778	<b>6358856</b>	256			
6504251	<b>6231578</b>	126	5435785	<b>6358860</b>	256	6094820	<b>7070209</b>	110
6504732	<b>6231683</b>	126	5435815	<b>6358864</b>	256	6094943	<b>7070217</b>	110
6977482	<b>6231705</b>	126	5435822	<b>6358868</b>	256			
			5435839	<b>6358884</b>	256	6228072	<b>7075103</b>	89
6175512	<b>6232485</b>	191	5435891	<b>6358900</b>	256			
						6229390	<b>7079109</b>	89
	price/pair		6198610	<b>6363806</b>	246	6230471	<b>7082002</b>	73
5668022	<b>6310398</b>	120				6230532	<b>7082010</b>	87
			6199099	<b>6364209</b>	244	6230952	<b>7082436</b>	106
	price/m		6199334	<b>6364322</b>	243			
6883097	<b>6311012</b>	119	6199457	<b>6364365</b>	243	6146772	<b>7084757</b>	110
			5668084	<b>6364625</b>	248	6146833	<b>7084765</b>	110
	/pc.					6146895	<b>7084773</b>	110
6302116	<b>6312373</b>	120	6511754	<b>6365906</b>	247	5012245	<b>7084870</b>	110
6302659	<b>6312675</b>	120	6042609	<b>6365914</b>	247			
			6511815	<b>6365922</b>	247	5163268	<b>7085108</b>	110
5668039	<b>6338458</b>	202	6984329	<b>6365949</b>	247	5163305	<b>7085111</b>	110
5668046	<b>6338462</b>	201	5617761	<b>6365993</b>	248	5163312	<b>7085114</b>	110
5668060	<b>6338497</b>	204						
			6627554	<b>6366015</b>	245			
6188833	<b>6340318</b>	203	6627615	<b>6366023</b>	245	6582136	<b>7103611</b>	275
6446957	<b>6340989</b>	200	6545353	<b>6366031</b>	245			
			6545292	<b>6366066</b>	245			
6536658	<b>6341543</b>	234						
6536597	<b>6341551</b>	234	6817696	<b>6392016</b>	219	6241637	<b>7109105</b>	87
6536412	<b>6341594</b>	234	6817757	<b>6392024</b>	219			
6536351	<b>6341608</b>	234	6817818	<b>6392032</b>	219	6991709	<b>7113110</b>	103
6536290	<b>6341616</b>	234						
6536177	<b>6341632</b>	234				6812356	<b>7117116</b>	102
			6201259	<b>6406963</b>	205			
6224296	<b>6342338</b>	237	6201372	<b>6406998</b>	205	6812837	<b>7119313</b>	109
5710905	<b>6342340</b>	237						
6224418	<b>6342345</b>	237	6201433	<b>6407048</b>	205	6814091	<b>7125100</b>	102
6224470	<b>6342351</b>	230						
6224531	<b>6342353</b>	230	6480012	<b>6408710</b>	205	6249978	<b>7128851</b>	111
6224593	<b>6342355</b>	230						
6224654	<b>6342357</b>	230				6250455	<b>7129351</b>	112
6224715	<b>6342359</b>	230						
6224777	<b>6342362</b>	230	6229277	<b>6416446</b>	232	5712060	<b>7131038</b>	112
6225019	<b>6342364</b>	230	6202812	<b>6416500</b>	235			
6225071	<b>6342366</b>	230	6202874	<b>6416519</b>	237	5929123	<b>7138506</b>	112
6225132	<b>6342368</b>	230	6202997	<b>6416551</b>	249			
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