



CABLE DUCT

Assembly Instruction for Cable Duct I & II

ADVANTAGES OF CABLE DUCTS MADE BY WIRTHWEIN

- No lifting equipment required for laying due to its low weight
- Wide range of application in all railroad areas and many application sites
- Reusability of the cable ducts for changing construction sites
- Simple and economical execution of miter cuts for detour and lowerings
- Change of the route possible (90° on 45 meters)
- Wirthwein cable ducts are maintenance-free

TECHNICAL DATA

	Cable Duct I	Cable Duct II
Length	1.000 mm	1.000 mm
Width (inside/outside)	100 mm / 215 mm	250 mm / 360 mm
Height (inside/outside)	155 mm / 210 mm	155 mm / 215 mm
Weight	4.9 kg	7.3 kg
Material	PP Copolymer (UV-stable)	
Fire protection	K1 according to DIN 53438 part 2	
Dimensional stability	-30°C to +80°C	
Load capacity	Class A15 (9 kN) according to DIN EN 124-1/ DIN EN 1433	Class A15 (15 kN) according to DIN EN 124-1/ DIN EN 1433
Electrical Properties	Surface resistance approx. $10^{15} \Omega \times \text{cm}$ Dielectric strength Ed approx. 0.6/0.8 at 100 kV/mm according to DIN VDE 303-ICE 243	
Additional equipment	<ul style="list-style-type: none"> • Angular elements and T-pieces • Lifting / lowering • Separators • End plates 	<ul style="list-style-type: none"> • Ground screws • Locking screws • Wrench for opening / closing the cable duct cover

ACCESSORIES



Ground screw

Separator

End plate

Turnkey opener (key)

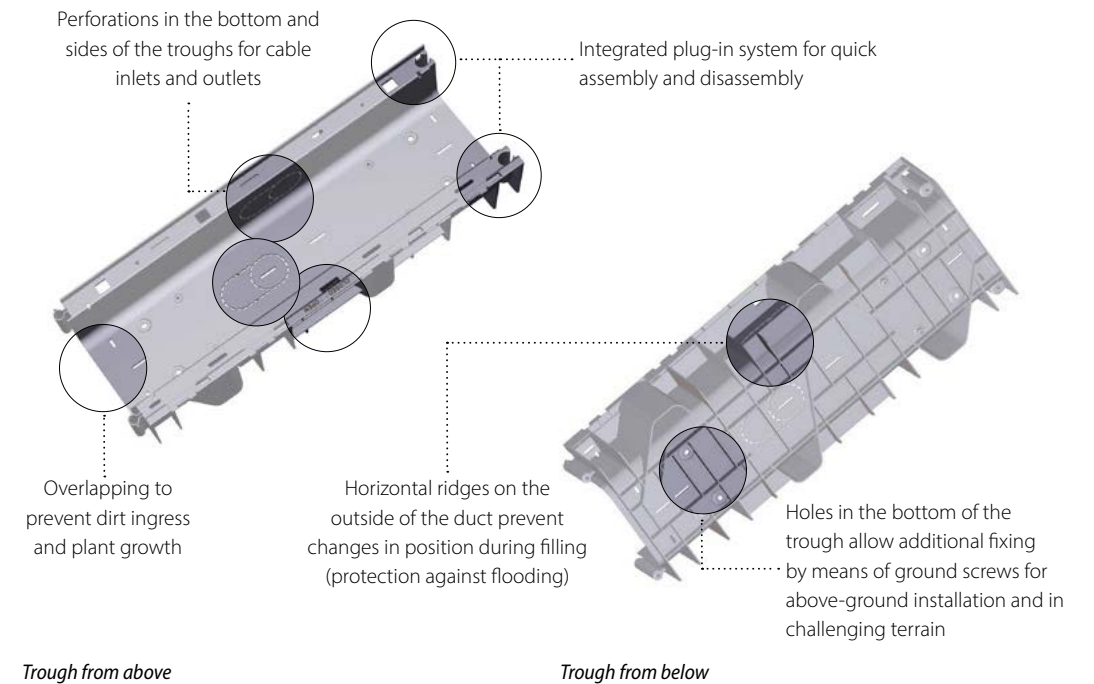
Locking screw M8x40



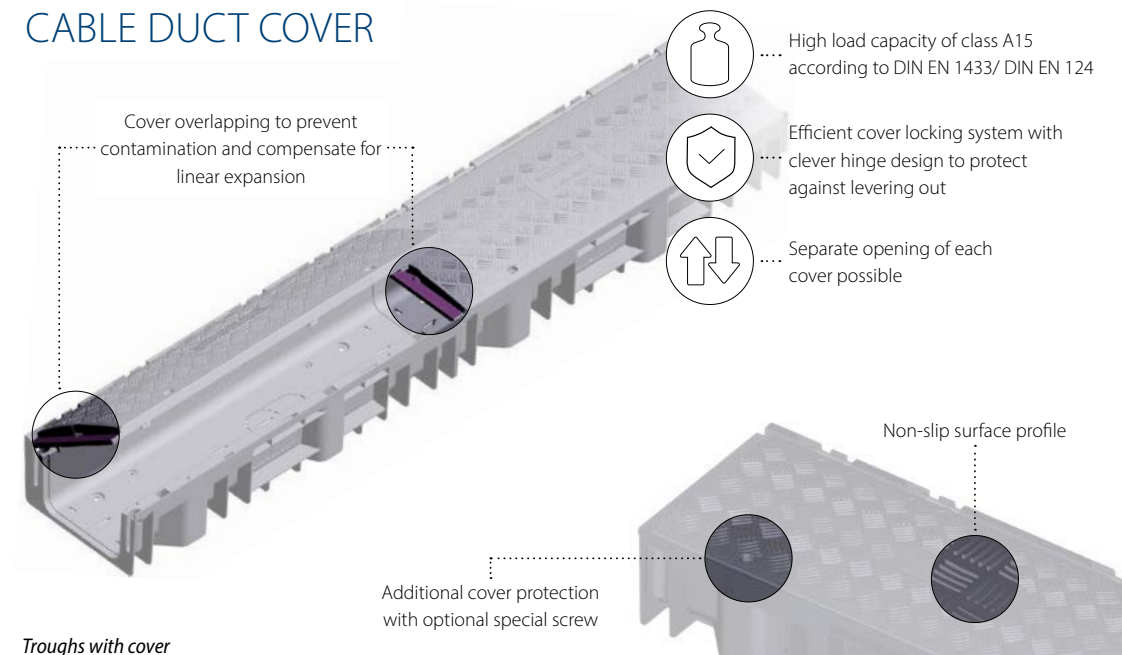
Bit RW40 / RW50

- Ground screws for securing the position of the cable ducts
- Separation and subdivision of the cables by installing separators
- Closure of the cable ducts at the end of the route possible with suitable end plates
- Key for opening and closing the cable duct covers (turnkey opener)
- Special M8x40 screws for additional securing of the cable duct covers

CABLE DUCT TROUGH

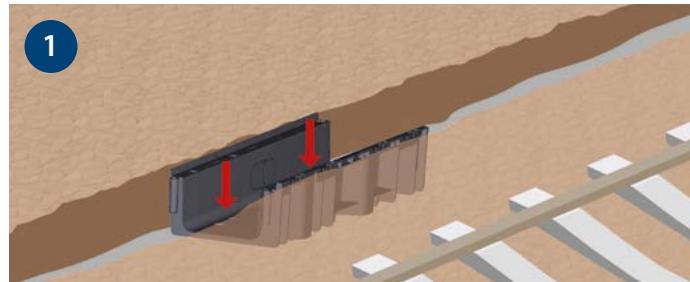


CABLE DUCT COVER

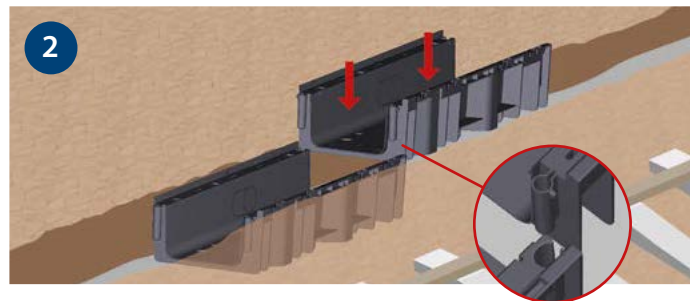


PREPARATION AND INSTALLATION

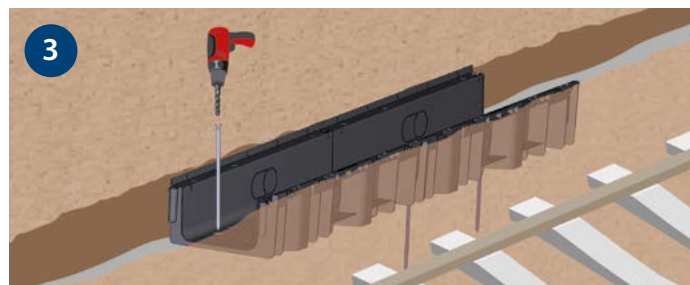
- For optimal cable duct installation, it is necessary to dig a trench. The top edge of the trough must be approx. 2–3 cm above the ground surface to prevent material from penetrating the hinges and screw holes.
- A fleece should be used under the channel to reduce subsequent growth.
- Fill the trough with a leveled installation layer at least 3 cm thick. Chippings, gravel, sand or fine-grained excavated material can be used as filling material.
- By using a straightedge, the cable ducts can be easily laid in line and at the correct height.



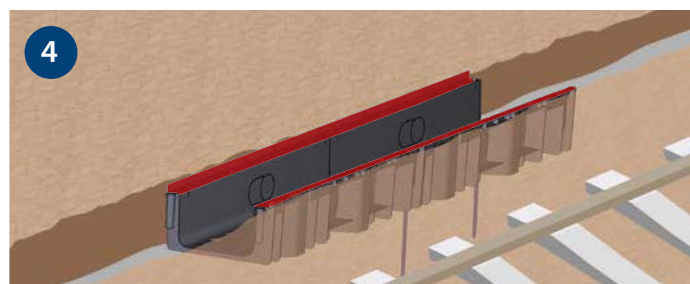
Place the cable duct in the prepared trench and press it straight into the installation layer so that the ribbed base dips in and rests on the full surface.



Connect the cable ducts to each other using the integrated plug-in system.

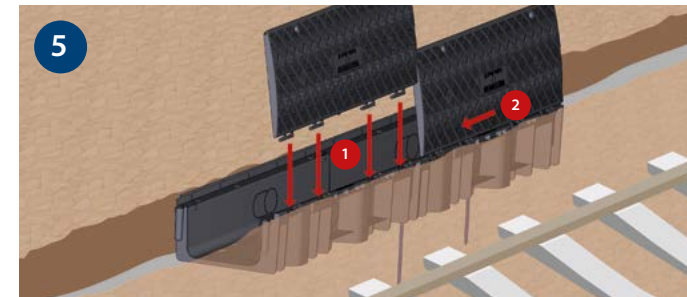


To increase stability in terms of direction and position, ground screws can be driven into the ground through the holes provided. The ground screws are 40 cm long, galvanized steel screws (M10) with RW50 drive.

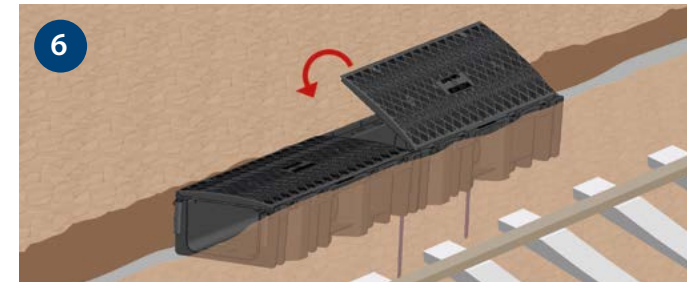


Prior to mounting the cover, please ensure that the hinge area and the contact surfaces are free of contamination!

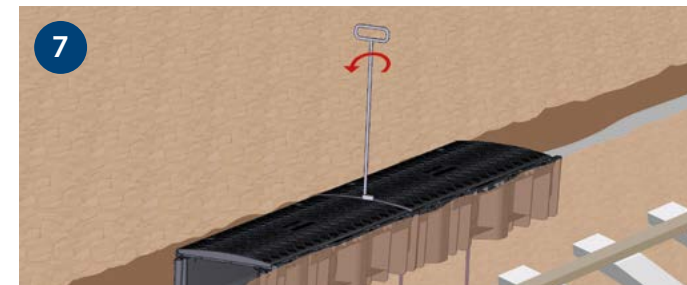
Attention! The installation and function of the cable duct cover must not be impaired during backfilling. If necessary, mount the cover prior to backfilling.



With the cover in the open position, insert it vertically into the hinge area and push it in the direction which the hinge pins are pointing to.



The cover can now be folded down and closed.



For final locking of the cover, use the turnkey, insert it in the recess of the neighboring cover and turn it to the left. To lock the cover, it must lie completely flat on the channel and the hinges must be kept free of any foreign objects!

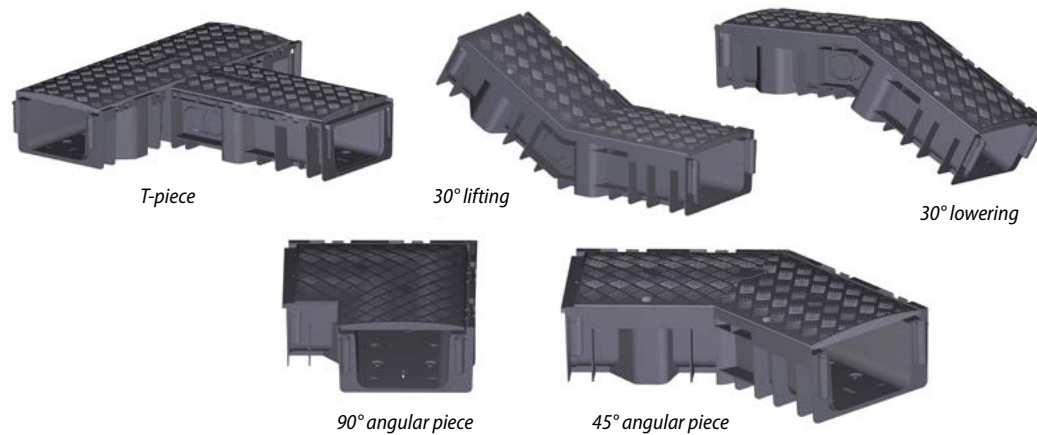
- Buried cable ducts must not be used for ballast edging.
- Laying only permitted outside the pressure range of traffic loads.
- It is forbidden to apply them in tunnels!
- The cable ducts may not impede the drainage of surface water (see Ril 836.4101).
- When using angular elements, the specified installation radii for DB cables must be observed.
- Only covers with the marking "DB" on the inside are permitted for the installation of cable ducts in the Deutsche Bahn rail network.



CABLE DUCT VARIANTS

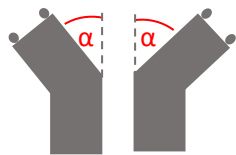
There are three different ways to change the direction of the cable duct section if required.

1. We manufacture tailor-made angular elements, lowered sections and T-pieces according to specific customer requirements (sawing and welding). Please find some examples below.



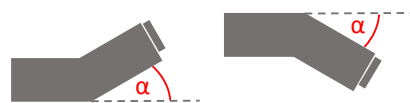
Angles

We offer a wide variety of connectors, which can be custom-made on request. Please specify: cable duct size I or II, bend on the hinge side (left) or opposite (right) and angle (α). Angles are made from a single piece of cable duct (1 m).



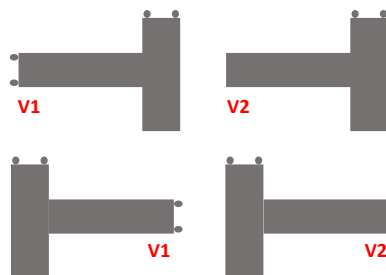
Elevation

We offer a wide range of connectors, which can be customized on request. Please specify: cable duct size I or II, upward or downward, and the angle (α) (standard = 30°). Angles are made from a single piece of cable duct (1 m).

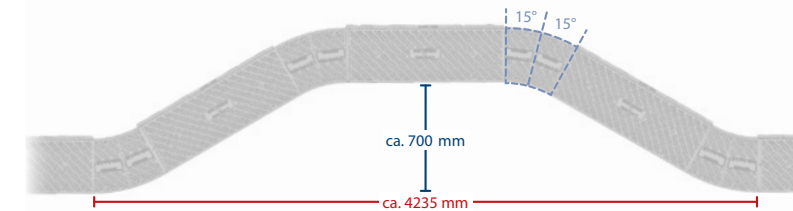


T-junction

We offer a wide range of junctions, which can be custom-made on request. Please specify: cable duct size I or II, outlet on the hinge side (left) or opposite (right) and connector plug or socket. The length of the outlet can be reduced, standard = 1 m.



2. You use our flexible 15° elbow pieces. This allows directional changes from 15 to 90 degrees to the left or right, which significantly reduces the time and effort required for deflections from the planning phase through to installation.



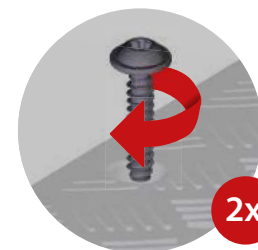
Cable Duct I 15°

Cable Duct II 15°

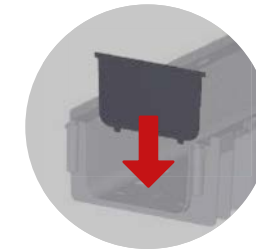
Length	221 mm	241 mm
Width (inside/outside)	100 mm / 201 mm	250 mm / 351 mm
Height (inside/outside)	155 mm / 208 mm	155 mm / 215 mm
Weight	1.12 kg	1.94 kg
Material	PP Copolymer (UV-stable)	
Fire protection	K1 according to DIN 53438 part 2	
Dimensional stability	-30°C to + 80°C	
Load capacity	Class A15 (9 kN)	Class A15 (15 kN)
	according to DIN EN 1433 / DIN EN 124	
Electrical properties	Contact resistance $10^{15} \Omega \times \text{cm}$	
	Dielectric strength from 0.6/0.8 at 100 kV/mm according to DIN VDE 303-ICE 243	
Application	The connecting plugs included in the set allow flexible changes of direction in the cable duct for left and right-hand bends 15°, 30°, 45°, 60°, 75° oder 90°	

3. You make angle pieces yourself on the construction site. When cutting the cable ducts to size, ensure that their functionality is not impaired. Please refer to the next page for instructions on how to make 45° or 90° angle elements.

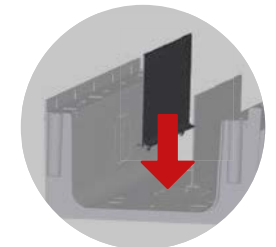
ASSEMBLY ACCESSORIES



For additional securing of the cable duct, the covers can be fixed with special M8x40 screws and an RW40 drive. The tightening torque for the screws here is max. 1.5 Nm.



Vertical end plates are used to close the cable ducts at the ends of the sections.



To subdivide the cables, two separators can be inserted per cable duct and fixed using a plastic hammer.

MANUFACTURING INSTRUCTIONS FOR ANGULAR ELEMENTS

Should you wish to produce angular elements on site, please observe the following instructions:

Notes:

- Prior to manufacturing an angular element, check that the bending radii of the cables to be installed are not below the specified values.
- When cutting the cable ducts, make sure that their functionality is still guaranteed. Therefore, follow the instructions in this manual.
- Wear protective equipment adapted to the sawing tool during work.
- In the case of angular elements manufactured on site, please drive additional ground screws into the ground to secure the position. Holes are provided in the bottom of the troughs for this purpose.

Manufacturing of 45° and 90° angular elements

1. Completely assemble the cable duct prior to manufacturing an angular element (see installation).
2. Mark the cutting lines on the top and sides of the cable duct using the cutting paths shown in Figure 1 and Figure 2 respectively. Observe the color-coded cutting paths for left- and right-sided route changes.
3. Saw the individual angular pieces to size along the previously marked cutting paths.
4. Lock the cable duct cover by moving the cover sideways to the left.
5. Deburr the cut edges with a suitable tool to reduce the risk of injury during subsequent assembly work and to produce a clean butt edge.
6. Align the butt edges of the angular pieces with each other as shown in Figure 3 and Figure 4 to manufacture the required angular element.
7. Fix the angular element in place with ground screws.

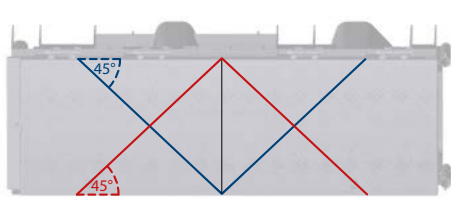


Figure 1: Cutting paths for 90° angular element



Figure 3: Angular piece for 90° angular element

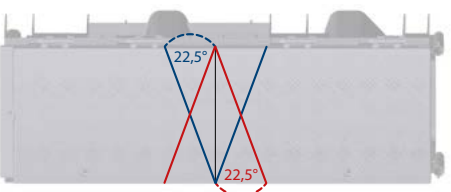


Figure 2: Cutting paths for 45° angular element

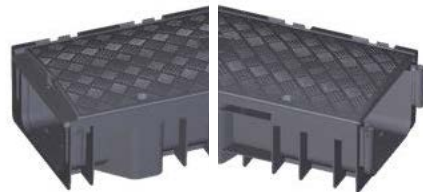
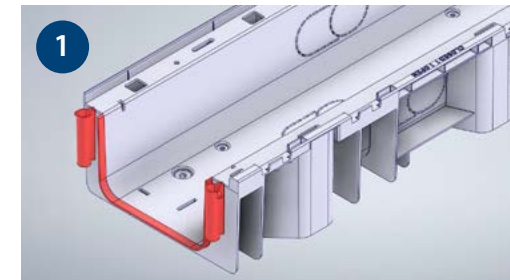
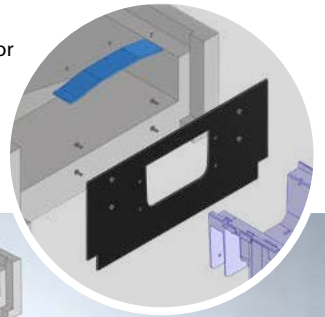
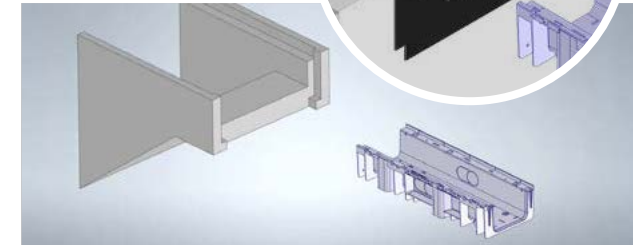
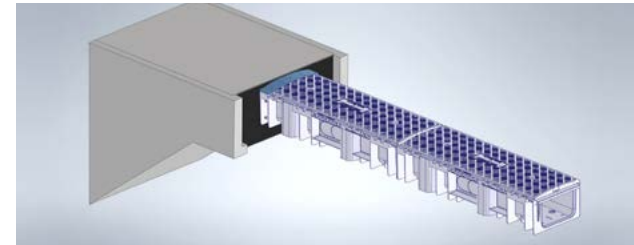


Figure 4: Angular piece for 45° angular element

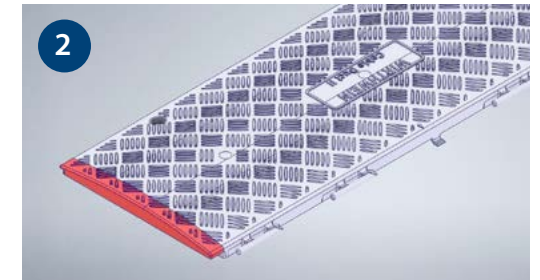
ADAPTER FOR SHAFT CONNECTION KIT CONCRETE

Adapters for connection to a concrete shaft connection kit can be purchased either as a kit or fully assembled on the cut-to-size cable duct.

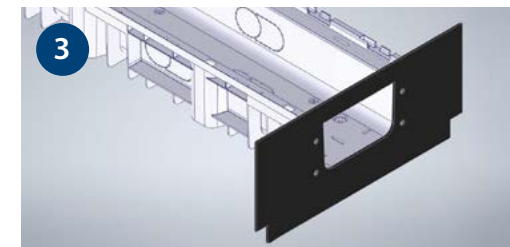
Option 1: Laying away from the shaft



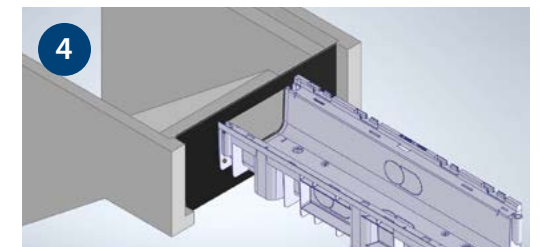
Saw off the area marked in red.



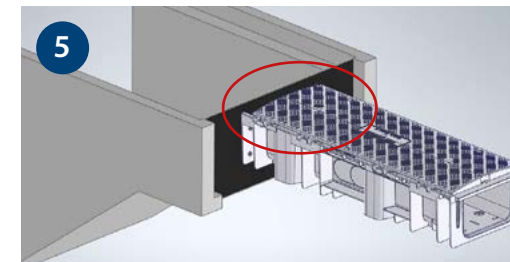
Saw off the area marked in red (20 mm).



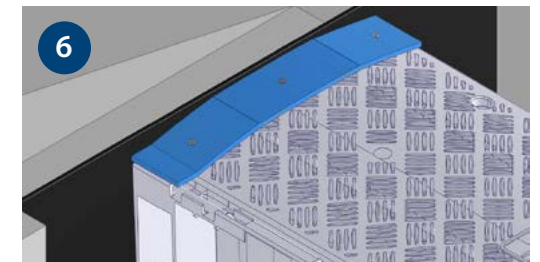
Fasten the adapter plate to the cable duct tray using a screw connection.



Attach to the shaft connection using a suitable fastening device.



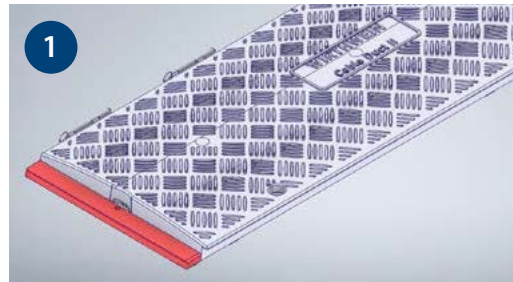
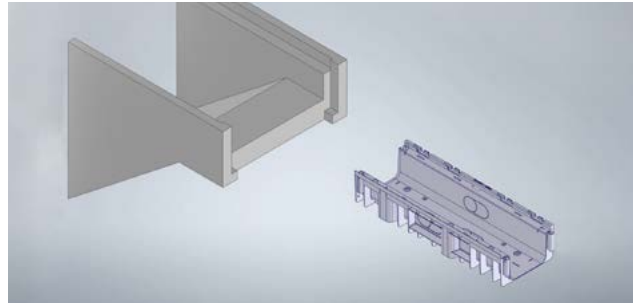
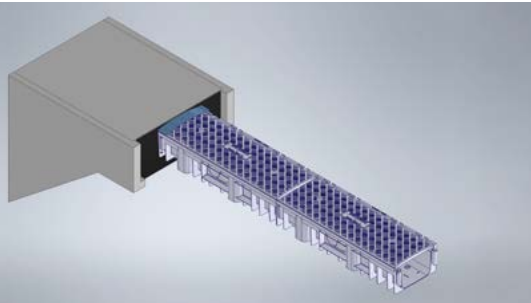
Install and close the cable duct cover, creating a gap.



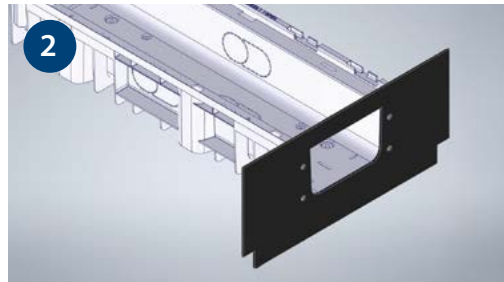
Sealing the gap with the cover strip, which is secured with screws.

ADAPTER FOR SHAFT CONNECTION KIT CONCRETE

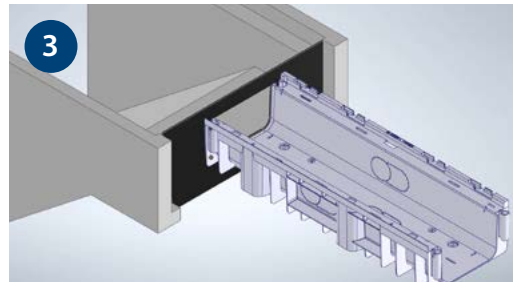
Option 2: Laying in the direction of the shaft



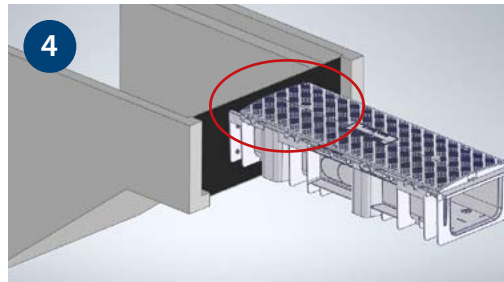
1 Saw off the area marked in red (entire overlap).



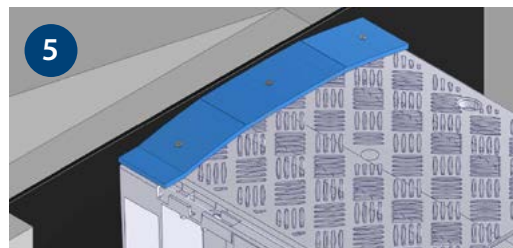
2 Fasten the adapter plate to the cable duct using a screw connection.



3 Secure to the shaft using a suitable fastening device.



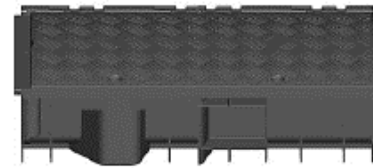
4 Install and close the cable duct cover, creating a gap.



5 Seal the gap with the cover strip, which is secured with screws.

FURTHER ADAPTER KITS

Length compensation adapter



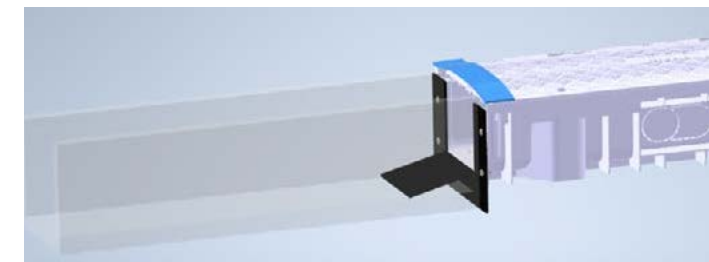
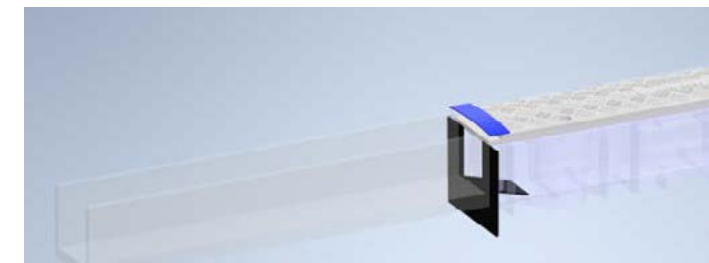
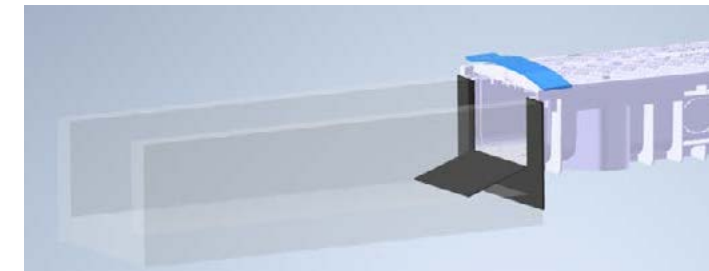
We offer length compensation adapters to close gaps when a standard 1 m element does not fit. Please specify: cable duct size I or II and the required length.



Size adapter



We also offer custom-made size adapters on request, e.g. for connection to existing concrete cable ducts. Installation on site is carried out in the same way as for the shaft connection kit adapter.





Do you have an inquiry, would you like technical advice or a callback?
Please contact us. We are happy to be at your service.

Technical advice

Marco Kinnemann:
Phone +49 3381 619218-23
E-mail: marco.kinnemann@wirthwein.de

Commercial questions

Bernhard Ganter:
Phone +49 7933 702-850
E-mail: bernhard.ganter@wirthwein.de

Wirthwein
GmbH & Co. KG
Walter-Wirthwein-Str. 2-10
97993 Creglingen
Germany

Phone +49 7933 702-0
Fax +49 7933 702-910
info@wirthwein.de
www.wirthwein.de

Wirthwein Brandenburg
GmbH & Co. KG
Uferstraße 96
14774 Brandenburg-Kirchmöser
Germany

Phone +49 3381 619218-0
Fax +49 3381 619218-26
info@wirthwein.de
www.wirthwein.de

Wirthwein Fastening Systems
(Kunshan) Co., Ltd.
Yuan Feng Road 158
Yushan Town, Kunshan City,
Postcode 215301
Jiangsu Province, China

Phone +86 512 8163 8998
Fax +86 512 8163 9118
info@wirthwein-plastics.cn
www.wirthwein.cn