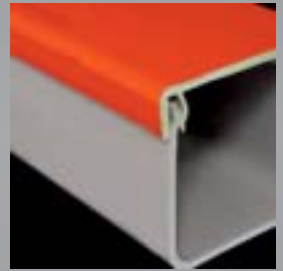
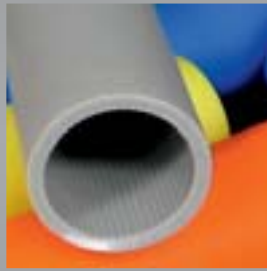




## CABLE PROTECTION DUCTS





**Over 85 of electro-installation and stowage material production**

The beginning of electrotechnic production of KOPOS KOLÍN goes back to the year 1926. Even before the WWII the company reached monopolistic status among keen competition on domestic market. After war the assortment changed slightly to match political needs.

Starting from 1994, new management of the company started with intense investments and development program. To ensure enough of quality raw material, the company has built its own PVC mixture production facility. The peak of the modernization process with regards to the quick growth of the company and its high logistics demands occurred in the year of 2005 and in 2009 there were opened two new storage and administrative production halls.

Within the innovation processes the company progressively introduces a new way of producing the technical documentation and a lot of modern technologies. A lot of new products were introduced, e.g. series of electroinstallation laths, double-coated corrugated pipes, double-coated parapet culverts, lead-free products or wide range of halogen-free products. There are 7000 kinds of products up today in the assortment of KOPOS KOLÍN.

The company's number one production priority is the quality of products. New products are always adjusted to match the EU standard requirements and all the assortment is traditionally tested according requirements of harmonized electrotechnic standards.

KOPOS KOLÍN a.s. is a holder of the certificate ISO 9001 and ISO 14001 as well as the Safe company and the Czech quality certificates. The company provides 100% guarantee on keeping the process stability, and consequently on the quality and safety of the products.

The company is always ready to match increased needs of the market and this helps to keep its permanent leading position. It can be considered a significant success that in the recent years KOPOS KOLÍN a.s. opened up 12 daughter sales companies mainly in Easter Europe, Central America but also and in Asia and it evolved from a domestic supplier to a company with a share in the world's market.

**The most important man in KOPOS KOLÍN is always the customer.  
THANK YOU FOR YOUR PARTNERSHIP**



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Corrugated double-wall cable ducts KOPOFLEX® and KOPODUR®



The duct system KOPOFLEX® and KOPODUR® offers a wide range of applicability. It is particularly suitable for the mechanical protection of all kinds of power and telecommunication cables.

**Benefits of double-wall cable ducts compared to other duct types:**

**Benefits of the materials used:**

- polyethylene, the material of the ducts, offers high resistance to aggressive substances
- possible use in the chemical industry
- halogen-free material
- suitable for the protection of water pipes
- different colours
- possible design with high UV stability
- the zero content of asbestos protects human health



**Benefits of the unique method of production of double-wall ducts:**



- the double wall and the corrugated shape provide high resistance under compression

- possible change of description on the pipe



- easy handling with the ducts when loading and re-loading

**KOPOFLEX® - high flexibility**



**KOPODUR® - high rigidity**



**Installation benefits:**

- can be installed directly in the soil, with no need of a sand bed



- possible installation directly in concrete  
- a slip-over coupling seals the duct joint on IP 40



- sealing rings fitted on both ends of the duct protect the joint against humidity and temporary flooding with water (IP 67)



- well-arranged installation in multiple layers and rows thanks to distance spaces



- broad temperature range for application

- when installing, it is advisable to use at least 1 empty extra pipe in case that additional cables are needed in future



**Benefits for inserting cables:**

- the slight wall corrugation allows easy cable insertion and reduces friction by up to 30%

- the smooth inner surface (compared to concrete pipes) eliminates the possibility of cable damage

- a pull-through string ensures easy cable insertion



Icons - capture

- material
- temperature resistance, scope of application (°C)
- flammability class of construction material
- mechanical resistance / load limit value(N)
- limit of compression strength (kPa)
- level of protection - IP classification

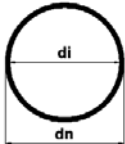
- halogen-free material
- UV stable
- color
- minimum bending radius (mm)
- package
- package dimensions (cm)

**KOPOFLEX®** - flexible doublecoat corrugated pipe



<b>MAT</b>				
HDPE	storage: -45- +60°C assembly: -5 - +60°C	A1	450 N/20 cm	IP40

Halogen-free flexible double-coated pipe designed for mechanical protection of all kinds of power and data wiring. The pipes are made in compliance with ČSN EN 61386-24. The pipe is available in form of a bar, the coupling is put on one end of it. When using a sealing ring, the protection class is IP 67. In case of mechanical compaction of layers above the protector, take care not to exceed the value of the load capacity of the protector.



	conf.					dn mm	di mm	 mm	L m	 cm
	AA	BA	CA	EA	FA					
<b>KF 09040</b>	AA	BA	CA	EA	FA	40	32	230	50	65 x 30
	-	-	CB	-	-				25	50 x 25
<b>KF 09050</b>	AA	BA	CA	EA	FA	50	41	350	50	80 x 35
	-	-	CB	-	-				25	70 x 25
<b>KF 09063</b>	AA	BA	CA	EA	FA	63	52	350	50	95 x 35
	-	-	CB	-	-				25	85 x 30
<b>KF 09075</b>	-	BA	CA	EA	FA	75	61	350	50	100 x 40
	-	-	CB	-	-				25	90 x 35
<b>KF 09090</b>	-	BA	CA	-	FA	90	75	400	50	110 x 45
<b>KF 09110</b>	AA	BA	CA	EA	FA	110	94	400	50	115 x 65
	-	BB	CB	-	-				25	120 x 40
<b>KF 09125</b>	-	BA	-	-	-	125	108	500	50	160 x 60
<b>KF 09160</b>	-	BA	CA	-	FA	160	136	650	50	160 x 80
	-	BB	CB	-	-				25	160 x 45
<b>KF 09200</b>	-	BB	-	-	FB	200	172	850	25	170 x 70

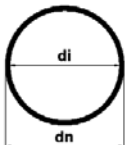
conf.	description
A...	color: orange
B...	color: red
C...	color: blue
E...	color: yellow
F...	color: black
...A	package: 50 m
...B	package: 25 m

**KOPOFLEX®** - UV-stabilized flexible doublecoat corrugated pipe



<b>MAT</b>					
HDPE		storage: -45- +60°C assembly: -5 - +60°C	A1	450 N/20 cm	IP40

Halogen-free UV stable flexible double-coated pipe designed for mechanical protection of all kinds of power and data wiring. The pipes are made in compliance with ČSN EN 61386-24. The pipe is available in form of a bar, the coupling is put on one end of it. When using a sealing ring, the protection class is IP 67. In case of mechanical compaction of layers above the protector, take care not to exceed the value of the load capacity of the protector.

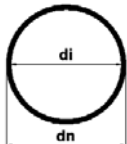


	conf.			dn mm	di mm	 mm	L m	 cm
	UVBA	UVCA	UVFA					
<b>KF 09040</b>	UVBA	UVCA	UVFA	40	32	230	50	65 x 30
<b>KF 09050</b>	UVBA	UVCA	UVFA	50	41	350	50	80 x 35
<b>KF 09063</b>	UVBA	UVCA	UVFA	63	52	350	50	90 x 35
<b>KF 09075</b>	UVBA	UVCA	UVFA	75	61	350	50	110 x 45
<b>KF 09090</b>	UVBA	UVCA	UVFA	90	75	400	50	120 x 45
<b>KF 09110</b>	UVBA	UVCA	UVFA	110	94	400	50	120 x 65
<b>KF 09160</b>	UVBA	UVCA	UVFA	160	136	650	50	160 x 80

conf.	description
UV...	UV-stabilized
...B...	color: red
...C...	color: blue
...F...	color: black
...A	package: 50 m

**KOPODUR®**

- rigid doublecoat corrugated pipe



<b>MAT</b>				
HDPE	storage: -45 - +60°C assembly: -5 - +60°C	A1	450 N/20 cm	IP40

Halogen-free rigid double-coated pipe designed for mechanical protection of all kinds of power and data wiring. The pipes are made in compliance with ČSN EN 61386-24. The pipe is available in form of a bar, the coupling is put on one end of it. The connection is sealed dust/sand resistant. When using a sealing ring, the protection class is IP 67.

In case of mechanical compaction of layers above the protector, take care not to exceed the value of the load capacity of the protector.

conf.	description
B...	color: red
C...	color: blue
F...	color: black
...A	package: 6 m
...C	package: 6 m

	conf.			dn	di	L	
				mm	mm	m	
<b>KD 09040</b>	BC	-	-	40	32	6	45 x 45 x 605
<b>KD 09050</b>	BC	CC	FC	50	41	6	82 x 66 x 605
<b>KD 09063</b>	BC	-	-	63	52	6	80 x 52 x 605
<b>KD 09075</b>	BC	CC	-	75	61	6	104 x 88 x 607
<b>KD 09090</b>	BC	CC	FC	90	75	6	120 x 76 x 607
<b>KD 09110</b>	BC	-	-	110	94	6	112 x 95 x 610
	-	CC	FC				
<b>KD 09125</b>	BC	-	-	125	108	6	112 x 71 x 610
	BA	CC	-				112 x 71 x 610
<b>KD 09160</b>	BC	CC	FC	160	136	6	117 x 83 x 610
<b>KD 09200</b>	BC	-	-	200	175	6	122 x 74 x 615

**Accessories for corrugated pipes KOPOFLEX® and KOPODUR®**

**Couplings** - slip-over couplings are the same for both types of pipes and are used to join the pipes.

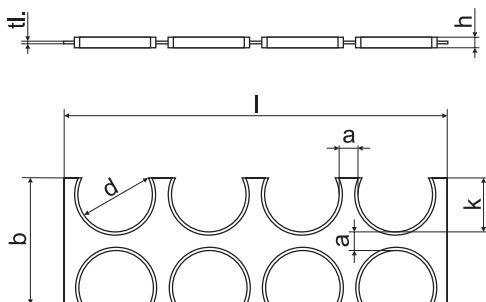
**Sealing rings** - the same for both types of pipes and are used to seal the joint to prevent it against humidity and water.

**Closing plugs** - for blinding of backup lines and for temporary blinding of pipes when installing.

**Distance spacers** - for position fixation of several pipes in one excavation.

Distance spacers are for fixation 8 pipes and spacer can be split for fixation 2, 4 and 6 pipes. Per order only.

pipe dn mm				
	Couplings	Sealing rings	Closing plugs	Distance spacers
40	02040	16040	17040	
50	02050	16050	17050	07050/8
63	02063	16063	17063	07063/8
75	02075	16075	17075	07075/8
90	02090	16090	17090	07090/8
110	02110	16110	17110	07110/8
125	02125		17125	07125/8
160	02160		17160	07160/8
200	02200		17200	07200/8



distance spacer	distance	height	fixing width	fixing height	material thickness	total width	total width after opening		
	a	b	h	k	tl.	l (8x)	l (2x)	l (4x)	l (6x)
<b>07050/8</b>	30	97	12	34	2,5	328	80	160	240
<b>07063/8</b>	30	116	12	43	2,5	381	95	190	280
<b>07075/8</b>	25	125	12	50	2,5	408	105	208	305
<b>07090/8</b>	28	148	14	60	2,5	482	125	247	360
<b>07110/8</b>	30	190	15	80	3	568	142	284	426
<b>07125/8</b>	38	210	20	88	3	658	175	336	497
<b>07160/8</b>	60	270	25	107	5	885	225	450	665
<b>07200/8</b>	80	345	25	133	5	1135	287	575	847

HDPE communication cable ducts



Single-wall protection ducts for fibre-optic and metallic cables.

As requested by the customer:

Colour strips facilitate cable identification when several protection ducts are installed in a single excavation.



The shape of longitudinal grooves ensures easier air-blown installation of cables.



The ducts can be also supplied with the inner surface treated with a special type of oil. This treatment provides another advantage for easier cable installation.



The ducts can be provided with text (including length indications).



The ducts are supplied in harnesses 100 m or 300 m long.

To create a line, it is possible to connect the individual harnesses with couplings.

For larger line sections, a 1750 m package is also available (for the dimension 06050 - 1250 m), supplied on wooden drums.



KOPOS KOLÍN a.s. supplies fibre-optic cable ducts even in large harnesses of 2000 m (06040) and 1250 m (06050) for installation on unwinding metal drums.

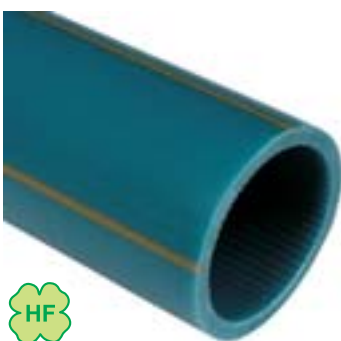
When the drum side plate is removed, the coil is slid onto the drum, the side plate is replaced and the drum is ready for unwinding.

The advantage of this solution consists in cost savings thanks to the transport of a larger quantity of wooden drums.

The air-blown installation technology allows the installation of fibre-optic cables with an outer diameter of 6,5 to 32 mm in suitable protective pipes of polyethylene by means of a large air mass. Thanks to the generated laminar air flow in the duct and the additional mechanical cable drift inside the duct, the fibre-optic cable is carried and moved forward. With a good technological procedure, it is possible to air-blow very long fibre-optic cables in ducts, even exceeding 2000 m. A huge advantage of this method is a very careful installation of the cables - without any pulling force. KOPOS KOLÍN a.s. does not install the ducts; please contact a provider of such services who possesses the necessary technology for duct installation and air-blowing of cables.



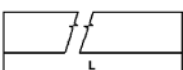
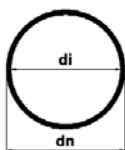
HDPE optical cable protectors



MAT HDPE -5 - +50°C A1 750 N/20 cm

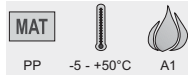
Single-coated pipes designed to protect optical cables. Cable protectors there is possible to deliver with inner wall to be lubricated by mineral oil. For larger volumes different color versions (beyond presented versions), labeling, number of differential stripes, denticular inner surface or inner diameter size (material thickness) can be ordered based on customer needs and specifications. Shock resistance: N (normal, ČSN EN 61386-24) Bend resistance: flexible The protectors are tested under pressure of 1,5 MPa for the time of 1 hour. The packaging on wooden drums and pallets for unwinding drums is delivered just upon previous order according to the customers's specification.

conf.	description
A...	color: orange
B...	color: red
C...	color: blue
D...	color: green
E...	color: yellow
F...	color: black
K...	color: light grey
L...	color: dark grey
...B	drum
...P	harness, pallet
...S100	package: harness 100 m
...S300	package: harness 300 m





	conf.								dn	di		L
	AS100	BS100	CS100	DS100	ES100	FS100	KS100	LS100	mm	mm		mm
06025	AS100	BS100	CS100	DS100	ES100	FS100	KS100	LS100	25	20	400	100
06032	AB	BB	CB	DB	EB	FB	KB	LB	32	26 / 27	400	1750
	AS100	BS100	CS100	DS100	ES100	FS100	KS100	LS100				100
06040	AB	BB	CB	DB	EB	FB	KB	LB	40	33 / 34 / 35	400	1750
	AP	BP	CP	DP	EP	FP	KP	LP				2000
	AS100	BS100	CS100	DS100	ES100	FS100	KS100	LS100				100
	AS300	BS300	CS300	DS300	ES300	FS300	KS300	LS300				300
06050	AB	BB	CB	DB	EB	FB	KB	LB	50	41 / 44	500	1250
	AP	BP	CP	DP	EP	FP	KP	LP				1250
	AS100	BS100	CS100	DS100	ES100	FS100	KS100	LS100				100

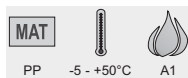
## Screw connectors for HDPE optical cable protectors





The connector is designed to join HDPE optic cable protector when routing and ensures a perfect connection.

	conf.		pipe dn	
			mm	pcs
05025	KB	grey	25	1
05030	KB		32	1
05040	KB		40	1
05050	KB		50	1

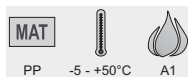
## Push connectors for HDPE optical cable protectors





The connector is designed to join HDPE optic cable protector when routing and ensures a perfect connection. The pipe is pushed onto the connector.

	conf.		pipe dn	
			mm	pcs
05033	KB	grey	32	1
05042	KB		40	1
05053	KB		50	1

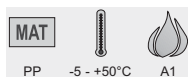
## Fittings for HDPE optical cable protectors





The fitting is used to end the routing.

	conf.		pipe dn	
			mm	pcs
05024	KB	grey	25	1
05031	KB		32	1
05041	KB		40	1
05051	KB		50	1

## Vented fittings for optical cable protectors



Vented fitting is used to check the installed lines using compressed air.

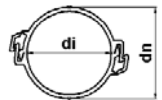
	conf.		pipe dn	
			mm	pcs
05032	KB	black	32	1
05042	KB		40	1



**KOPOHALF®** - divided cable duct



<b>MAT</b>				
HDPE	storage: -45- +75°C assembly: -5 - +75°C	A1	06110/2 - 450 N/20 cm 06160/2 - 750 N/20 cm	IP30



A system of divided cable ducts is suitable mainly for a protection of underground cable laying and for a laying-out of the energy and communication lines.  
Another possible application is a protection of already installed underground cables.  
The protectors consist of two identical parts.  
When installing, the cables are put in the bottom part and then the top part is snapped to the bottom one.  
The divided cable ducts are manufactured and tested in accordance with standard ČSN EN 61386-24.  
Connecting of protectors is performed by overlapping joined lower parts with an upper part at length of approximately 30 cm.

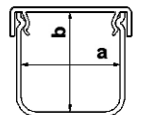


item	conf.			dn	di	L		conf.	description
	BA	CA	EA	mm	mm	m	cm		
06110/2	BA	CA	EA	110	97	3	56 x 85 x 300	B...	color: red
	BAD	CAD	-					C...	color: blue
06160/2	BA	CA	EA	160	136	3	56 x 60 x 300	E...	color: yellow
	BAD	CAD	-					...A...	package: in dismantled condition
							56 x 85 x 300	...AD	package: at completed size

**KOPOKAN** - earthen channel



<b>MAT</b>				
PVC	-25- +70°C	A1 - F	30 sec.	IP30



Earthen channels are intended for mechanical protection of installation of engineering networks to be loaded under ground.  
By its technical parameters those fully replace the earlier used concrete channels.  
There is possible to use them for additional protection already installed earthen engineering networks.  
Floor trunkings are supplied with a colour lid.  
Connected using connectors and folding the lid over, thus interconnecting the individual parts.  
Strength limit on compression tested on length 300 mm.  
Earthen channels are manufactured according to ČSN EN 61386-1 and ČSN EN 61386-24.



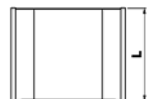
item	conf.		a	b	L		
			mm	mm	m	m	kPa
KOPOKAN 1	CD	grey body / blue lid	100	100	2	140	483
	ZD	grey body / red lid					
KOPOKAN 2	ZD	grey body / red lid	120	100	2	162	223
KOPOKAN 3	ZD	grey body / red lid	130	140	2	224	295
KOPOKAN 4	CD	grey body / blue lid	200	125	2	70	204
	ZD	grey body / red lid					

**connection for KOPOKAN**

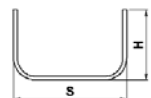


<b>MAT</b>			
PVC	-25- +70°C	A1 - F	30 sec.

Connector is used to connect the ground channels.  
It provides a straight direction.



item	S	H	L	
	mm	mm	m	pcs
SPOJKA K1	120	80	100	1; 50
SPOJKA K2	135	80	100	1; 50
SPOJKA K3	151	80	100	1; 50
SPOJKA K4	221	80	120	1; 35



**Storage cable ducts**

UV-stable corrugated protection ducts KOPOFLEX® can be stored on open, hardened surfaces.  
Other cable ducts (KOPOFLEX®, KOPODUR®, fibre-optic cable ducts HDPE, KOPOHALF® and KOPOKAN) can be stored on open, hardened surfaces, but have to be protected against the long-term effects of sunlight.  
All duct accessories are to be stored in covered halls.

**Manufacturer:** EGÚ Brno, a. s.  
Electrical Network Department

**Client:** KOPOS KOLÍN a.s.,  
Havlíčková 432, 280 94 Kolín IV

**Manufacturer's contract number:** 12 002  
**Client's contract number:** Order 120111

# DOCUMENTS FOR DESIGNING PLASTIC CABLE DUCTS

**Prepared by:** Ing. Petr Lehký  
Helena Kváčová

**Head of Department:** Ing. Petr Lehký

**Director:** Ing. Zdeněk Špaček, CSc.

## INTRODUCTION

Maximum load value determined in the document for the projection of plastic cable ducts is based on “Dimensioning Cable Ducts” methodology that has been prepared for the sphere of power engineering.

Following tables specify the total load values for individual types of surface loading, including the influence of dynamic effects and the load resulting from the soil weight.

The cases of exceeding the permissible load (for the assortment of cable ducts offered) are printed in bold and shaded.

The load capacity of cable ducts has been determined with regard to max. 5% deformation. Cable ducts passing through a track bed may not be deformed by more than 3%. It implies that the load may not exceed the value of permissible stress at the deformation of 3 %.

The permissible load on cable ducts has been determined based on their ring stiffness set in accordance with ČSN EN ISO 9969.

## Flexible corrugated double-wall cable duct KOPOFLEX® KF 09040

Ring stiffness in accordance with ČSN EN ISO 9969: S = 20,9 kPa

Permissible load at the deformation of 3%: Q = 187,0 kPa

Permissible load at the deformation of 5%: Q = 311,7 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX® KF 09050

Ring stiffness in accordance with ČSN EN ISO 9969: S = 20,0 kPa

Permissible load at the deformation of 3%: Q = 181,8 kPa

Permissible load at the deformation of 5%: Q = 303,1 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX®

# KF 09063

Ring stiffness in accordance with ČSN EN ISO 9969: S = 14,45 kPa

Permissible load at the deformation of 3%: Q = 149,7 kPa

Permissible load at the deformation of 5%: Q = 217,4 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX® KF 09075

Ring stiffness in accordance with ČSN EN ISO 9969: S = 11,98 kPa

Permissible load at the deformation of 3%: Q = 135,4 kPa

Permissible load at the deformation of 5%: Q = 219,5 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX® KF 09090

Ring stiffness in accordance with ČSN EN ISO 9969: S = 8,9 kPa  
 Permissible load at the deformation of 3%: Q = 117,6 kPa  
 Permissible load at the deformation of 5%: Q = 185,1 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.



## Flexible corrugated double-wall cable duct KOPOFLEX®

# KF 09110

Ring stiffness in accordance with ČSN EN ISO 9969: S = 9,97 kPa

Permissible load at the deformation of 3%: Q = 123,8 kPa

Permissible load at the deformation of 5%: Q = 192,9 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX®

# KF 09125

Ring stiffness in accordance with ČSN EN ISO 9969: S = 8,4 kPa  
 Permissible load at the deformation of 3%: Q = 112,4 kPa  
 Permissible load at the deformation of 5%: Q = 180,2 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Flexible corrugated double-wall cable duct KOPOFLEX® KF 09160

Ring stiffness in accordance with ČSN EN ISO 9969: S = 6,0 kPa

Permissible load at the deformation of 3%: Q = 100,8 kPa

Permissible load at the deformation of 5%: Q = 160,5 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR® KD 09050

Ring stiffness in accordance with ČSN EN ISO 9969: S = 27,2 kPa

Permissible load at the deformation of 3%: Q = 223,5 kPa

Permissible load at the deformation of 5%: Q = 372,4 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR® KD 09063

Ring stiffness in accordance with ČSN EN ISO 9969: S = 19,33 kPa

Permissible load at the deformation of 3%: Q = 177,9 kPa

Permissible load at the deformation of 5%: Q = 270,24 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR®

# KD 09075

Ring stiffness in accordance with ČSN EN ISO 9969: S = 11,84 kPa

Permissible load at the deformation of 3%: Q = 134,6 kPa

Permissible load at the deformation of 5%: Q = 216,5 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR® KD 09090

Ring stiffness in accordance with ČSN EN ISO 9969: S = 8,1 kPa

Permissible load at the deformation of 3%: Q = 112,9 kPa

Permissible load at the deformation of 5%: Q = 179,9 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR®

# KD 09110

Ring stiffness in accordance with ČSN EN ISO 9969: S = 9,37 kPa

Permissible load at the deformation of 3%: Q = 120,3 kPa

Permissible load at the deformation of 5%: Q = 195,1 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.



## Rigid corrugated double-wall cable ducts KOPODUR® KD 09125

Ring stiffness in accordance with ČSN EN ISO 9969: S = 9,4 kPa

Permissible load at the deformation of 3%: Q = 120,8 kPa

Permissible load at the deformation of 5%: Q = 195,1 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR® KD 09160

Ring stiffness in accordance with ČSN EN ISO 9969:  $S = 7,2 \text{ kPa}$   
 Permissible load at the deformation of 3%:  $Q = 107,8 \text{ kPa}$   
 Permissible load at the deformation of 5%:  $Q = 179,6 \text{ kPa}$

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Rigid corrugated double-wall cable ducts KOPODUR® KD 09200

Ring stiffness in accordance with ČSN EN ISO 9969: S = 5,36 kPa

Permissible load at the deformation of 3%: Q = 97,1 kPa

Permissible load at the deformation of 5%: Q = 156,0 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## HDPE communication cable duct

## 06032

Ring stiffness in accordance with ČSN EN ISO 9969: S = 66,66 kPa

Permissible load at the deformation of 3%: Q = 451,7 kPa

Permissible load at the deformation of 5%: Q = 678,1 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## HDPE communication cable duct 06040

Ring stiffness in accordance with ČSN EN ISO 9969: S = 62,62 kPa

Permissible load at the deformation of 3%: Q = 428,3 kPa

Permissible load at the deformation of 5%: Q = 656,5 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

XXXX

Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Divided cable duct KOPOHALF®

## 06110/2

Ring stiffness in accordance with ČSN EN ISO 9969: S = 9,8 kPa

Permissible load at the deformation of 3%: Q = 122,8 kPa

Permissible load at the deformation of 5%: Q = 204,7 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

XXXX

Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Divided cable duct KOPOHALF® 06160/2

Ring stiffness in accordance with ČSN EN ISO 9969: S = 15,0 kPa

Permissible load at the deformation of 3%: Q = 152,0 kPa

Permissible load at the deformation of 5%: Q = 254,8 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Highlighting the cases, when ducts fail to meet the requirements or their use is on the limit of permissible load.

## Earthen channel KOPOKAN

# KOPOKAN 1

Ring stiffness in accordance with ČSN EN ISO 9969: S = 80,53 kPa

Permissible load at the deformation of 3%: Q = 531,9 kPa

Permissible load at the deformation of 5%: Q = 802,9 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

XXXX

Označení případů, kdy kanály nevyhovují požadavkům nebo je použití na hranici povoleného zatížení.



## Earthen channel KOPOKAN

# KOPOKAN 2

Ring stiffness in accordance with ČSN EN ISO 9969: S = 165 kPa

Permissible load at the deformation of 3%: Q = 87,2 kPa

Permissible load at the deformation of 5%: Q = 131 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

XXXX

Označení případů, kdy kanály nevyhovují požadavkům nebo je použití na hranici povoleného zatížení.

## Earthen channel KOPOKAN

# KOPOKAN 3

Ring stiffness in accordance with ČSN EN ISO 9969: S = 199 kPa

Permissible load at the deformation of 3%: Q = 144 kPa

Permissible load at the deformation of 5%: Q = 186 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Označení případů, kdy kanály nevyhovují požadavkům nebo je použití na hranici povoleného zatížení.

## Earthen channel KOPOKAN

# KOPOKAN 4

Ring stiffness in accordance with ČSN EN ISO 9969: S = 284 kPa

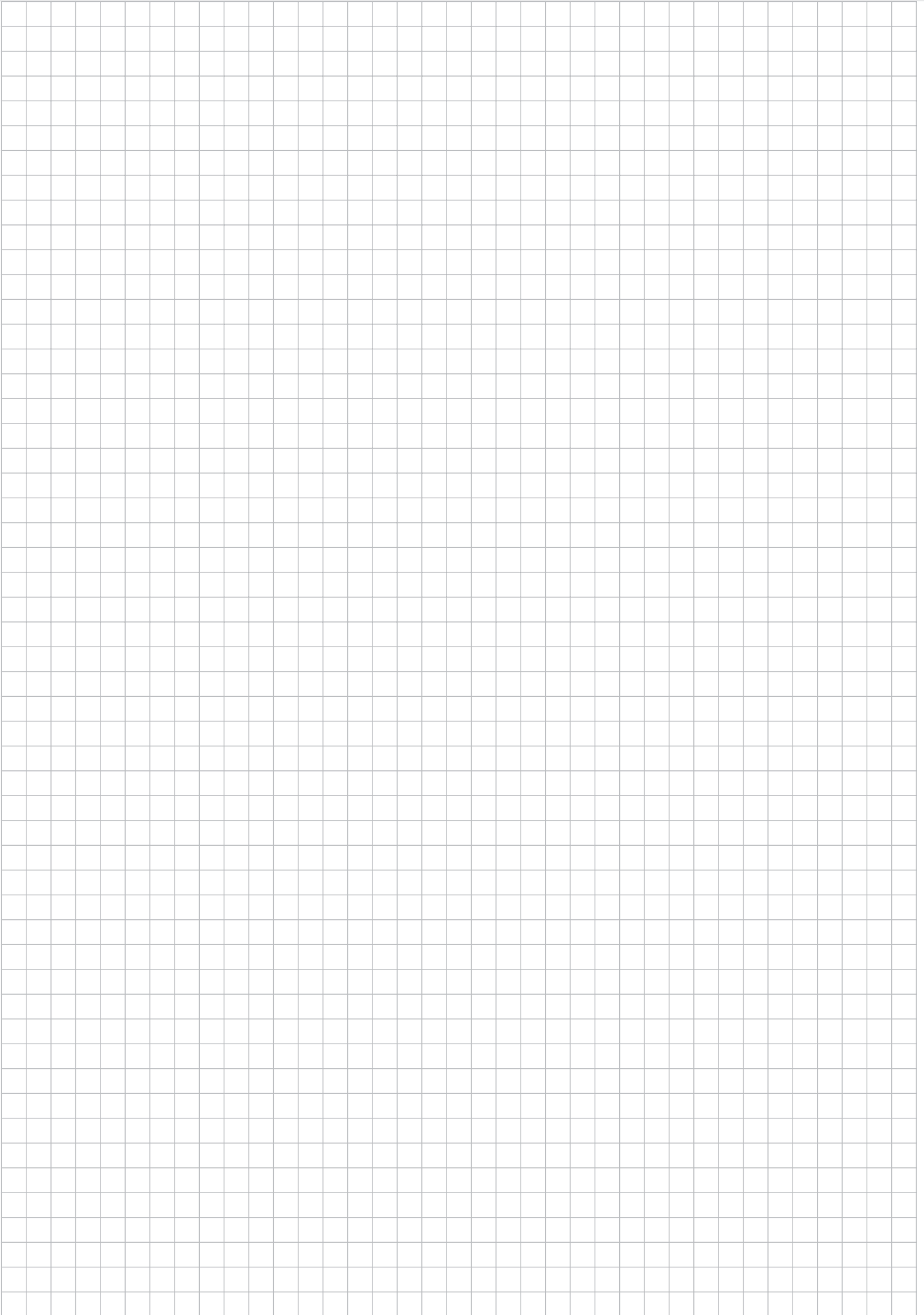
Permissible load at the deformation of 3%: Q = 223 kPa

Permissible load at the deformation of 5%: Q = 283 kPa

type of load	load by soil weight									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	8,55	11,40	14,25	17,10	19,95	22,80	25,65	28,50	31,35	
type of load	road load class A									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	857,6	489,6	315,3	223,6	170,6	138,1	117,1	103,3	93,9	
type of load	road load class B									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	604,7	340,2	221,2	159,1	123,5	102,0	88,6	79,9	74,4	
type of load	drive load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	297,4	170,4	113,8	84,9	68,8	59,6	54,3	51,4	50,1	
type of load	pavement and cycling track load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	63,4	42,0	33,7	30,5	29,8	30,3	31,6	33,3	35,4	
type of load	tram load									
height of protection (m)	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,10	
total load (kPa)	365,6	211,1	141,8	106,1	86,3	74,9	68,4	64,8	63,1	
type of load	single rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,0	105,4	85,7	90,2	98,3	107,9	118,4	129,6	141,4	153,7
type of load	double rail load UIC 71 train									
height of protection (m)	0,8	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
total load (kPa)	137,4	106,2	87,4	93,0	101,9	111,8	122,4	133,5	145,1	157,2

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Označení případů, kdy kanály nevyhovují požadavkům nebo je použití na hranici povoleného zatížení.





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