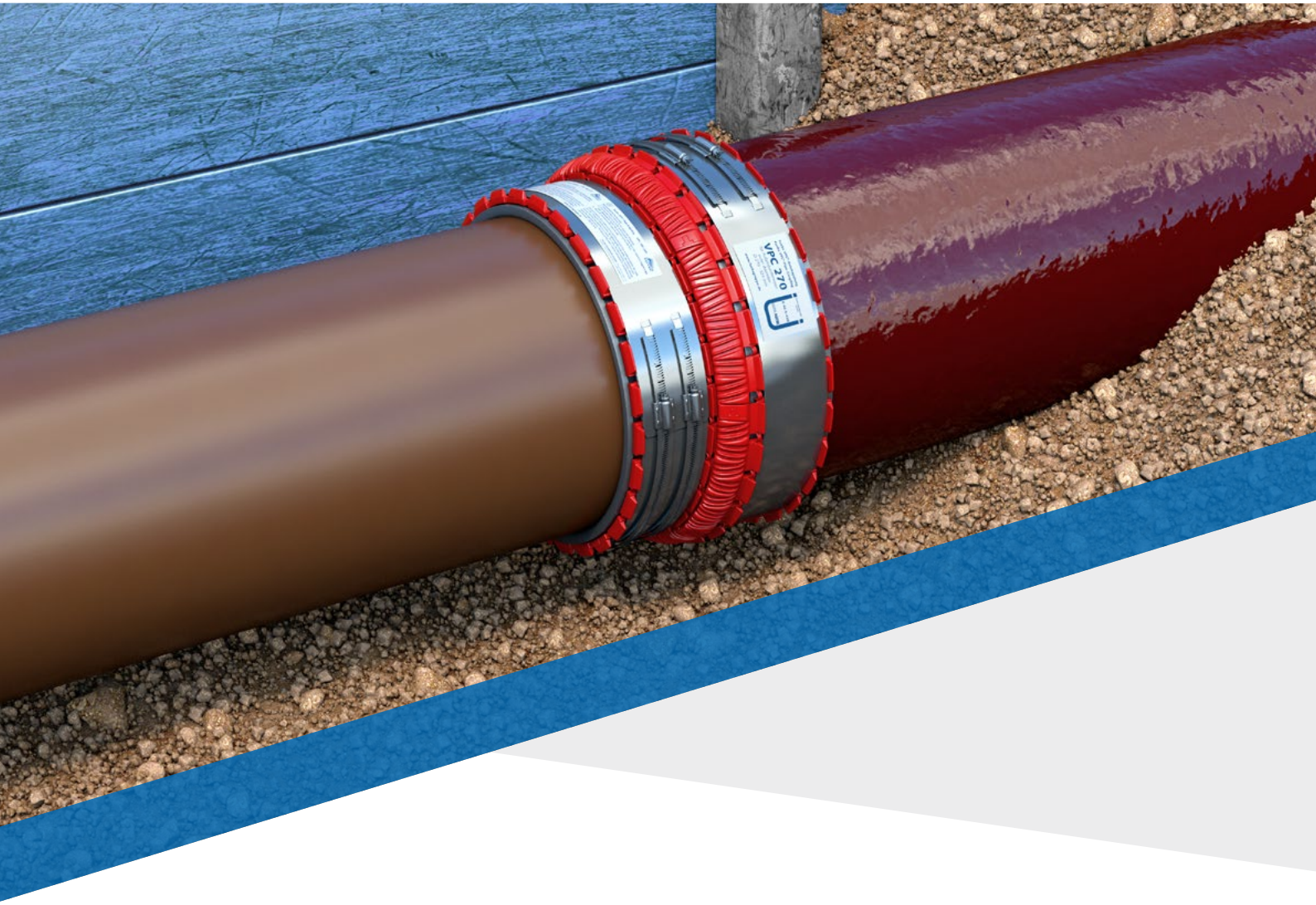
Funke Gruppe



Funke VPC® Pipe Coupling

The perfect connection

With approval from German Institute of Building Technology • DIBt No. Z-42.5-450

The Funke VPC®
Perfectly connected

The product

The innovative Funke VPC® Pipe Coupling optimally and securely connects pipes with the same nominal diameter made of different materials inside gravity pipes. And this despite the different outer diameters determined by their construction! The Funke VPC® Pipe Coupling consists of a reducible elastomer sealing sleeve, a centrically reducible plastic securing cage and two stainless steel bands, enabling separate and stepless diameter adjustment on both sides.

The **sealing sleeve** is made of ethylene propylene diene rubber (EPDM) in accordance with DIN EN 681-1 WC/60 and has a multiple double sealing profile for reliable sealing in accordance with DIN EN 1610. Radial circumferential material recesses or chambers allow the securing cage to interlock with the rubber.

Reduction adjustment

The **securing cage** is made of a highly impact-resistant, break-proof plastic and is resistant to both cold and heat. Its conically deformable middle section and the integrated band guide channels on both sides allow for centric and stepless reduction adjustment of the individual orientation of both contact areas. The reduction process takes place uniformly over the entire circumference, while the jointed middle section enables a separate reduction to be obtained on each side of the Pipe Coupling.

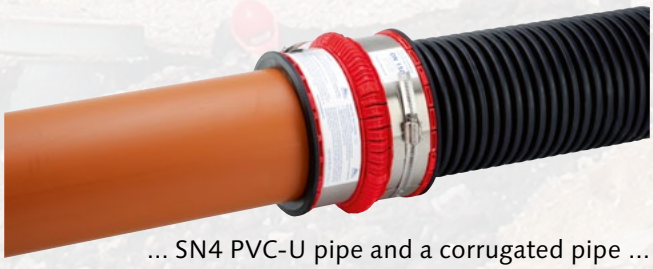
The securing cage and sealing sleeve are designed in a way that ensures the rubber is not pushed up or creased during diameter adjustment. The sealing collar adapts to the different outside diameters of the various pipe materials when tightening the stainless steel clamping bands. Together with the two clamping bands, the sealing sleeve and securing cage form a compact, dimensionally stable yet flexible unit.

The VPC® Pipe Coupling is available in two versions. In the standard version, the steel components are made

Pipe Coupling: materials

of stainless steel V2A (material no. 1.4301). The special version with V4A steel (material no. 1.4404) and a rubber sleeve made of NBR is oil and petrol resistant and particularly resistant to aggressive substances in the soil.

Stock levels for the Funke VPC® Pipe Coupling are reduced to just a few types, as the component covers large differences in diameter. For example, between a ...



... SN4 PVC-U pipe and a corrugated pipe ...

... SN8 PVC-U pipe and a vitrified clay pipe ...

... SN12 (HS®) PVC-U pipe and a ribbed pipe.

Product advantages

- Double-sided bedding channel for safe band guidance
- Cylindrical installation and sealing area
- Multiple double sealing profile
- No wrinkling of the rubber, as the fixing body and sealing sleeve are in neutral position
- Simple, quick and safe installation
- Robust, compact and safe to handle

Practical advantages

- Connects pipes made of different materials with differing outside diameters and with different constructions inside gravity pipelines
- Bridges large differences in diameter without the use of additional bushes
- Stepless adjustment on both sides while securing shear loads
- Large-area, cylindrical installation or clamping of the pipes
- Central stop to ensure a precise fit (up to VPC® 270)

VPC 100 to VPC 1070

Item no.	Outer diameter range/ clamping range		max. Reduction mm
	from mm	up to mm	
VPC100	102	133	31
VPC125	123	161	38
VPC150	160	192	32
VPC150B	Transition from **circular** DN 150 concrete pipe to DN/OD 160 plastic pipe		
VPC150BF	Transition from DN 150 concrete pipe **with base** to DN/OD 160 plastic pipe		
VPC200K	183	226	43
VPC200G	only 200*	261	61
VPC220	218	261	43
VPC250	only 250*	320	70
VPC270	270	320	50
VPC275	230	275	45
VPC290	240	290	50
VPC310	255	310	55
VPC325	265	325	60
VPC345	285	345	60
VPC360	295	360	65
VPC382	315	382	67
VPC400	330	400	70
VPC415	345	415	70
VPC430	360	430	70
VPC455	385	455	70
VPC465	395	465	70
VPC485	415	485	70
VPC500	430	500	70
VPC520	450	520	70
VPC535	465	535	70
VPC555	485	555	70
VPC565	495	565	70

Item no.	Outer diameter range/ clamping range		max. Reduction mm
	from mm	up to mm	
VPC590	520	590	70
VPC605	535	605	70
VPC625	555	625	70
VPC640	570	640	70
VPC660	590	660	70
VPC675	605	675	70
VPC690	620	690	70
VPC710	640	710	70
VPC730	660	730	70
VPC745	675	745	70
VPC765	695	765	70
VPC780	710	780	70
VPC805	735	805	70
VPC820	750	820	70
VPC835	765	835	70
VPC850	780	850	70
VPC870	800	870	70
VPC890	820	890	70
VPC905	835	905	70
VPC925	855	925	70
VPC940	870	940	70
VPC960	890	960	70
VPC980	910	980	70
VPC995	925	995	70
VPC1010	960	1010	50
VPC1030	980	1030	50
VPC1045	995	1045	50
VPC1070	1020	1070	50

Connects all pipes within the specified outside diameter range (for corrugated/ribbed pipes, the geometry or their load-bearing capacity must be checked).
**Eccentric ring for smooth pipes (PVC, PP, PE) for a level invert connection included in the scope of delivery.*

VPC XXL 1090 to VPC XXL 2820

Item no.	Outer diameter range/ clamping range		max. Reduction mm
	from mm	up to mm	
VPCXXL1090	1040	1090	50
VPCXXL1120	1070	1120	50
VPCXXL1140	1090	1140	50
VPCXXL1170	1120	1170	50
VPCXXL1190	1140	1190	50
VPCXXL1220	1170	1220	50
VPCXXL1240	1190	1240	50
VPCXXL1270	1220	1270	50
VPCXXL1290	1240	1290	50
VPCXXL1320	1270	1320	50
VPCXXL1340	1290	1340	50
VPCXXL1370	1320	1370	50
VPCXXL1390	1340	1390	50
VPCXXL1420	1370	1420	50
VPCXXL1440	1390	1440	50
VPCXXL1470	1420	1470	50
VPCXXL1490	1440	1490	50
VPCXXL1520	1470	1520	50
VPCXXL1540	1490	1540	50
VPCXXL1570	1520	1570	50
VPCXXL1590	1540	1590	50
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VPCXXL1670	1620	1670	50
VPCXXL1690	1640	1690	50
VPCXXL1720	1670	1720	50
VPCXXL1745	1695	1745	50
VPCXXL1770	1720	1770	50
VPCXXL1790	1740	1790	50
VPCXXL1820	1770	1820	50
VPCXXL1845	1795	1845	50
VPCXXL1870	1820	1870	50
VPCXXL1890	1840	1890	50
VPCXXL1920	1870	1920	50
VPCXXL1945	1895	1945	50

Item no.	Outer diameter range/ clamping range		max. Reduction mm
	from mm	up to mm	
VPCXXL1970	1920	1970	50
VPCXXL1995	1945	1995	50
VPCXXL2020	1970	2020	50
VPCXXL2045	1995	2045	50
VPCXXL2070	2020	2070	50
VPCXXL2095	2045	2095	50
VPCXXL2120	2070	2120	50
VPCXXL2145	2095	2145	50
VPCXXL2170	2120	2170	50
VPCXXL2195	2145	2195	50
VPCXXL2220	2170	2220	50
VPCXXL2245	2195	2245	50
VPCXXL2270	2220	2270	50
VPCXXL2295	2245	2295	50
VPCXXL2320	2270	2320	50
VPCXXL2345	2295	2345	50
VPCXXL2370	2320	2370	50
VPCXXL2395	2345	2395	50
VPCXXL2420	2370	2420	50
VPCXXL2445	2395	2445	50
VPCXXL2470	2420	2470	50
VPCXXL2495	2445	2495	50
VPCXXL2520	2470	2520	50
VPCXXL2550	2500	2550	50
VPCXXL2575	2525	2575	50
VPCXXL2595	2545	2595	50
VPCXXL2620	2570	2620	50
VPCXXL2645	2595	2645	50
VPCXXL2670	2620	2670	50
VPCXXL2695	2645	2695	50
VPCXXL2720	2670	2720	50
VPCXXL2745	2695	2745	50
VPCXXL2770	2720	2770	50
VPCXXL2795	2745	2795	50
VPCXXL2820	2770	2820	50

These are custom-made products. It is mandatory to provide the exact specification of the outside diameter.
With integrated hybrid tensioner (no tangential tensioner required for assembly).

13 Advantages at a glance

Lower storage costs, as only a few types are required for all applications.

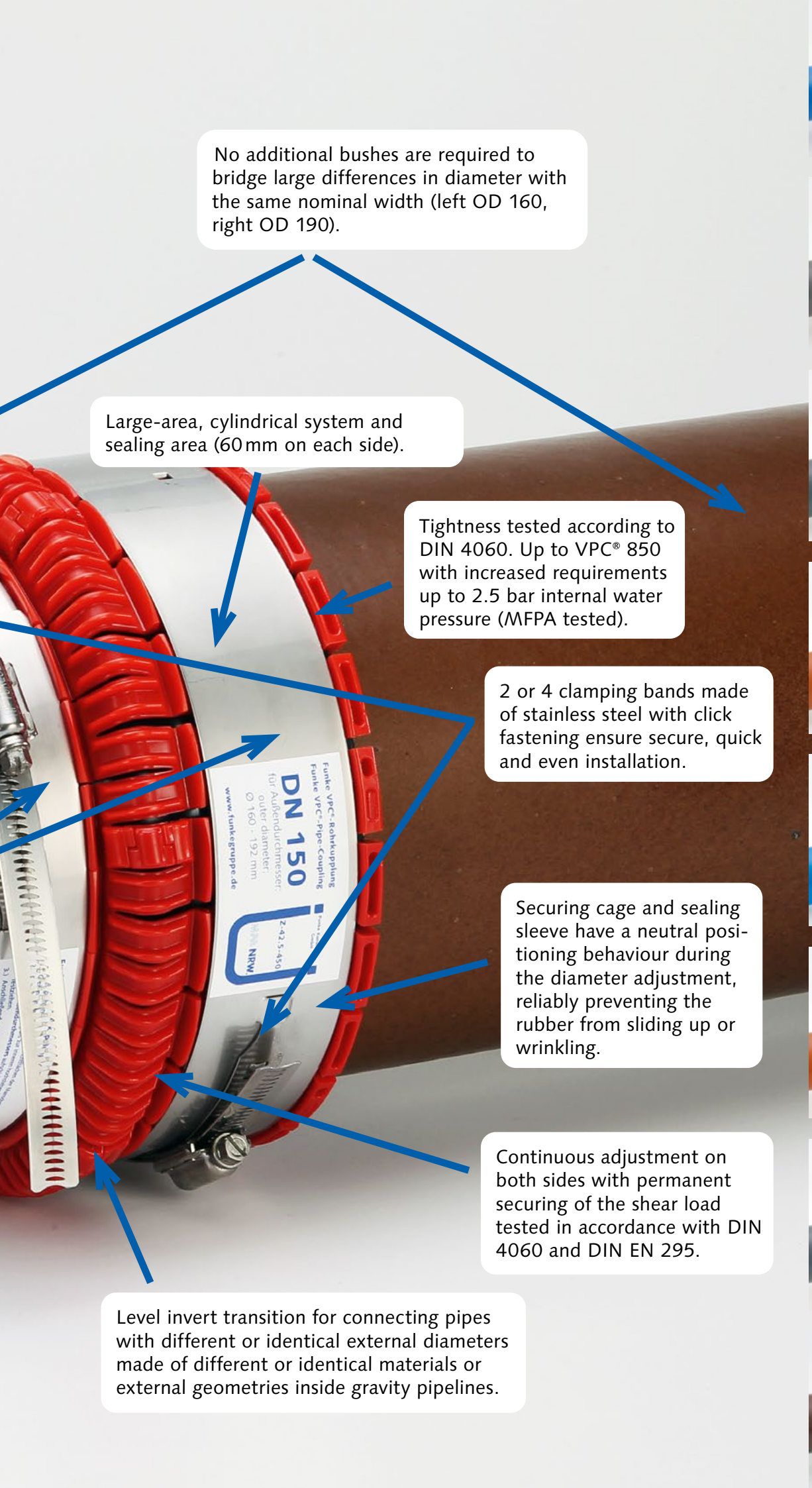
The reduction process is centred evenly and separately on each side of the Pipe Coupling (two-dimensional).

Multiple double sealing profile on each side.

A bedding channel for the clamping bands on both sides ensures secure guidance for the clamping bands.

Thanks to the design of the clamping bands and the size of the support on the securing cage (at least 60 mm wide), the force is applied evenly over the entire circumference of the pipe when adjusting the diameter.

Insertion limiter in the form of a rubber lip (100 – 270) protruding from the centre.



No additional bushes are required to bridge large differences in diameter with the same nominal width (left OD 160, right OD 190).

Large-area, cylindrical system and sealing area (60 mm on each side).

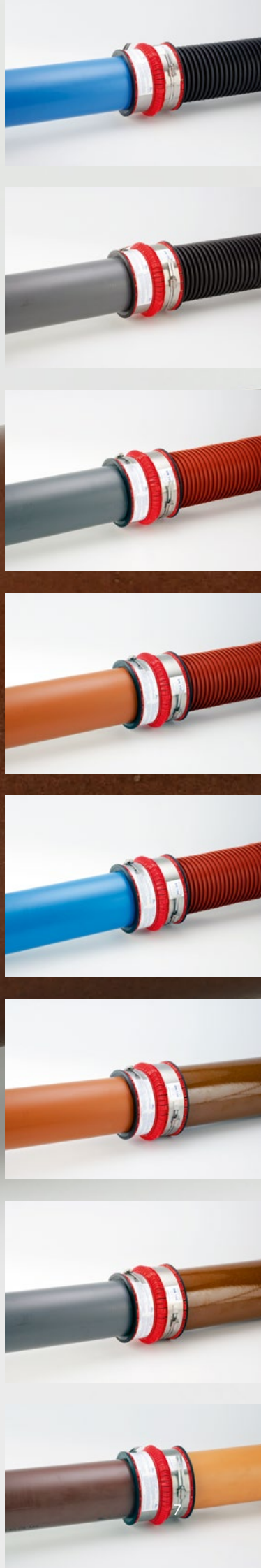
Tightness tested according to DIN 4060. Up to VPC® 850 with increased requirements up to 2.5 bar internal water pressure (MFPA tested).

2 or 4 clamping bands made of stainless steel with click fastening ensure secure, quick and even installation.

Securing cage and sealing sleeve have a neutral positioning behaviour during the diameter adjustment, reliably preventing the rubber from sliding up or wrinkling.

Continuous adjustment on both sides with permanent securing of the shear load tested in accordance with DIN 4060 and DIN EN 295.

Level invert transition for connecting pipes with different or identical external diameters made of different or identical materials or external geometries inside gravity pipelines.



Special design protects against oil and corrosion

Virtually non-decomposable

In the oil-resistant version, the steel components of the VPC® Pipe Coupling are made of stainless V4A steel (material no. 1.4404). The stainless steel used is therefore a particularly corrosion and acid-resistant type of steel. The fitting is resistant to oil and petrol and particularly resistant to aggressive substances in wastewater and soil.

By adding this special version, Funke has responded to market requirements. Clients use the product when the soil surrounding the wastewater pipe contains particularly aggressive components (e.g. saline soils in northern Germany) or the wastewater contains substances that can attack pipes and seals made of conventional materials – such as a sealing collar made of ethylene propylene diene rubber (EPDM) (e.g. pipes in the area of a petrol station). This is why we use acrylonitrile butadiene rubber (NBR) for the oil and petrol-resistant Pipe Coupling. In the oil-resistant version, the spring basket is grey in order to distinguish it visually.

VPC® Item no.	Outer diameter range		max. reduction mm
	from mm	up to mm	
VPC100OEL	102	133	31
VPC125OEL	123	161	38
VPC150OEL	160	192	32
VPC200KOEL	183	226	43
VPC200GOEL	only 200*	261	61
VPC220OEL	218	261	43
VPC250OEL	only 250*	320	70
VPC270OEL	270	324	54
VPC290OEL	240	290	50
VPC360OEL	295	360	65
VPC382OEL	315	382	67
VPC400OEL	330	400	70
VPC415OEL	345	415	70
VPC430OEL	360	430	70
VPC465OEL	395	465	70
VPC485OEL	415	485	70
VPC500OEL	430	500	70
VPC520OEL	450	520	70
VPC565OEL	495	565	70
VPC590OEL	520	590	70
VPC640OEL	570	640	70
VPC660OEL	590	660	70
VPC690OEL	620	690	70
VPC730OEL	660	730	70
VPC835OEL	765	835	70
VPC940OEL	870	940	70
VPC1030OEL	980	1030	50
VPC1070OEL	1020	1070	50

**Eccentric ring for smooth pipes (PVC, PP, PE) for a level invert connection included in the scope of delivery.*

Repair – rehabilitate – rebuild

VPC® brings many advantages on-site in the trench

Funke's fitting has been causing a stir in the civil engineering industry for several years: the VPC® Pipe Coupling optimally and securely connects pipes made of different materials with the same nominal diameter. This is an advantage that more and more clients and contractors are discovering when carrying out sewer rehabilitation work.

It is almost an everyday situation for a civil engineer: when connecting existing sewer connection pipes for rainwater and wastewater to the collector, they often encounter a plethora of materials on private properties. As different materials generally have different diameters, it has been necessary to 'tinker around' in order to create a sensible interim solution. For example, through the use of additional bushes. The VPC® Pipe Coupling makes this a thing of the past.

Regardless of whether you are rehabilitating, repairing or laying a new pipe: thanks to its design-related advantages, the new fitting makes installation considerably easier, even with different external diameters.

Subsequent integration of a repair branch (top) or repair pipe (below) in an existing vitrified clay pipe

Repairing defective pipelines

Hybrid tensioner

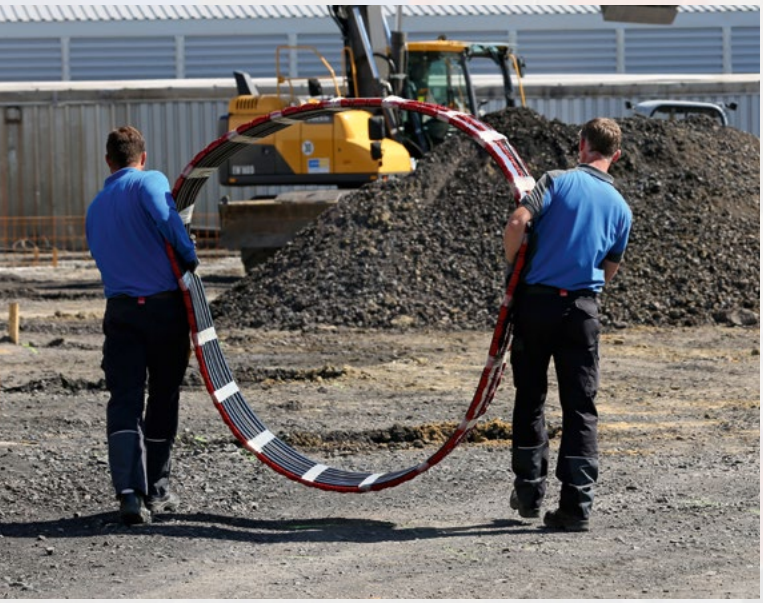
VPC® Pipe Coupling XXL

Large nominal diameters securely connected

The VPC® XXL Pipe Coupling was developed for large nominal diameters. It can be used to securely connect pipes with external diameters of 1000 mm to 2800 mm.

The product

The Funke VPC® Pipe Coupling XXL consists of a reducible sealing sleeve made of elastomer rubber, a centrically reducible plastic securing cage and two stainless steel straps for force transmission, ensuring separate and stepless diameter adjustment on both sides. The design enables reductions of up to max. 50 mm. The reduction process takes place separately and evenly in the centre on each side. The force is transmitted to the stainless-steel belts by a hybrid tensioner system. During installation, the coupling must be positioned so that the hybrid tensioners are freely accessible. The clamping rings can then be tightened from one position and alignment with a torque of 25 Nm. This operation must be checked with a torque wrench.



Large and stable at the same time

Despite the size of the coupling, the contact pressure is evenly distributed on the pipe surface. External tests have proven this. Plastic sleeve profiles ensure the component's dimensional stability and prevent the coupling from collapsing or buckling during assembly. Correct, tight and secure connection of the pipes is ensured by a multiple double sealing profile with an exceptionally large width of 380 mm (insertion depth of 190 mm on each side). The VPC® XXL Pipe Coupling is manufactured and supplied to order.

VPC® Pipe Coupling – the components

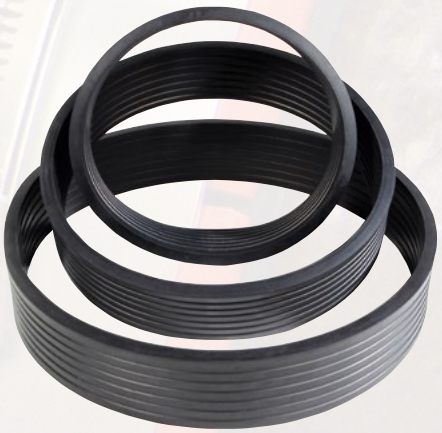
The fastening

The VPC® Pipe Coupling consists of a sealing sleeve made of elastomer rubber, a plastic securing cage and two stainless steel straps that form the fastening. It is a click fastener. No welding or tox clinching techniques are used.

If the screws of the stainless-steel bands are tightened during installation according to the manufacturer's instructions using a torque wrench – from a clamping range ≥ DN 290 using the tangential tensioner – the sealing collar adapts continuously to the different outer diameters of the various pipe materials. The securing cage and sealing sleeve are designed in a way that ensures the rubber is not pushed up or creased during diameter adjustment.

Bushes

For VPC® Pipe Couplings larger than 300 and larger clamping ranges, bushes can be used. They are matched to the product, ensuring that the function and tightness of the Pipe Coupling are not affected. The 15 mm- thick (or 20 mm for VPC® XXL) bushes are manufactured to order. They are available in all cut lengths and diameters and can be supplied together with the corresponding VPC® Pipe Coupling within a very short time if required. When installing, please note that no more than three bushes may be installed on top of each other.



Complete in a set

The VPC® Pipe Coupling in the 100–220 versions is supplied in a plastic film carrier bag containing the product, Installation Instructions and the lubricant required for professional installation. Provided in four languages (German, French, English and Polish), the Installation Instructions clearly illustrate the various installation steps via informative photos.

The VPC® Pipe Couplings in the 250 and larger versions are supplied in a sturdy cardboard box and on pallets for larger quantities.

Accessories

Socket spanner for VPC 100 – 150

Tangential tensioner for VPC 275 – 995

Accessory set in Assembly Toolbox

Reversible ratchet
set for VPC 100 – 270

Torque wrench for VPC 100 – 1070

Installation recommendation

VPC 100/125/150/200 K/220/270

Measure both pipe outside diameters (1) and compare with the clamping range of the Funke VPC® Pipe Coupling.

The clamping range of the Funke VPC® Pipe Coupling can be found on the sticker (2) or determined by measuring the inner diameter of the Pipe Coupling. Measure the insertion depth of the Funke VPC® Pipe Coupling up to the inner, raised lip (3) and mark it on the larger pipe (4).

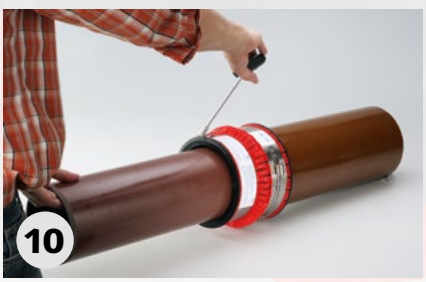
Important! After determining the two outside diameters of the pipes being connected, bring the Funke VPC® Pipe Coupling closer to the larger pipe diameter by turning the two clamps alternately (5).

If necessary, apply a thin layer of lubricant to the spigot end of the pipe requiring connection (e.g. concrete and vitrified clay pipes).

Push the Funke VPC® Pipe Coupling onto the spigot end of the larger pipe up to the marking and ensure that the turnbuckle screws are facing upwards (6+7).

The butt joint in the connection must be maintained in accordance with the specific specifications of the pipe manufacturer in each case (a small gap is recommended with regard to bendability and expansion). After the Funke VPC® Pipe Coupling has been aligned, first tighten the turnbuckle on the larger pipe with a torque according to the table on page 15 (9). Check with a torque wrench if possible. Then actuate the opposite lock with the same torque (10).

We recommend using a hexagon socket wrench (8 mm) with a T-handle as an aid (11) or, for frequent use, a reversible ratchet set (12).



Installation recommendation

VPC 200 G/250

For DN/OD 200 (outer diameter 200 mm) and DN/OD 250 (outer diameter 250 mm) pipes, an eccentric ring (included in the scope of delivery) is required to achieve a level invert connection.

In deviation from the Installation Instructions described on page 11, the following preparations must be made:

Measure the insertion depth of the Funke VPC® Pipe Coupling up to the inner, raised lip (3) and mark it on the pipe with the larger outer diameter (4).

Then carry out points 5 + 7.
Pull the eccentric ring onto the spigot end of the DN/OD 200 pipe (outer diameter 200 mm) or onto the DN/OD 250 pipe (outer diameter 250 mm) up to the inner stop (16).

Guide the prepared pipe with the fitted eccentric ring onto the Funke VPC® Pipe Coupling and ensure that the red marking always remains visible at the crown (17).

Push the pipe in until the eccentric ring is flush with the outside of the Funke VPC® Pipe Coupling (18).

Then proceed as described in points 9-12 of the Installation Instructions and tighten the screws of the clamps to 17 Nm.

Special case of pipe repairs:

When repairing pipes, first push the two Funke VPC® Pipe Couplings completely onto the pipe section requiring insertion (13). Then insert the repair piece into the open pipe string and push the Funke VPC® Pipe Coupling onto the existing pipe end (14) in accordance with the above Installation Instructions (points 3-12). This is particularly advantageous for vitrified clay pipes.

For profiled, corrugated or ribbed pipes make sure that the pipe/profile is capable of bearing the load and check the contact areas with the sealing surface of the Funke VPC® Pipe Coupling. The slot openings must be free of dirt or stones during the reduction process, to ensure that the diameter can be adjusted to the pipe being connected without hindrance. The pipe bedding must be dismantled or compacted using suitable material in accordance with the valid laying guidelines - DIN EN 1610.

Storage
Ensure adequate ventilation in closed rooms; in outdoor storage areas/outdoor areas ensure protection from intensive sun/UV radiation.

Installation recommendation

with tangential tensioner from VPC 275

For VPC® Pipe Couplings 275 to 995, the tangential tensioner must be used when installing the VPC® Pipe Coupling. First, the clamping range of the pipes being connected is determined and the required VPC® Pipe Coupling is selected. The spigot ends are then coated with lubricant and placed on the pipe with the larger nominal diameter. After aligning the Pipe Coupling, the VPC® tangential tensioner with the holding foot is pushed under the turnbuckles. The horn of the spring arm is then hooked into the holding eyelet and tightened with a torque wrench. The two turnbuckles are then tightened alternately. This process is repeated accordingly when connecting the other pipe. The tangential tensioner and detailed Installation Instructions are available from Funke (see table below for tightening torque). From the VPC® 1010 version upwards, hybrid tensioners for assembly are integrated into the VPC® Pipe Couplings.


1


2


3


4


5


6


7


8


9


10

Stepless Diameter-adjustment

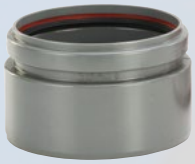
Nominal size VPC®	275 – 590 mm	600 – 790 mm	800 – 995 mm	VPC1010 – 1070 VPCXXL 1090 –2820
Torque on the Tangential tensioner	17 Nm	20 Nm	22 Nm	**Hybrid tensioner** 25 Nm
Torque on the locks	9 Nm	10 Nm	11 Nm	10 Nm

Torque setting, subject to technical changes

Whether circular or with a base

Perfect transition to

Transition from circular concrete pipe to plastic 150–800



Adapter for special solution DN 150

VPC® Adapter KB for transition from plastic (PE, PP, PVC) to concrete pipe, circular DN 250 - DN 800

VPC® Pipe Coupling

An adapter is available for connecting plastic pipes with circular concrete pipes in nominal diameters DN 250 to 800, which compensates for the considerable difference in the thickness of the pipe wall due to the material.

There is a special solution in the form of a small adapter for connecting plastic pipes to round concrete pipes with a nominal diameter of DN 150.

Adapters and sealing collars for the nominal diameter ranges DN 250 to DN 800 are available separately. The transition to a DN 150 circular concrete pipe is available as a set (art. no. VPC® 150 B).

Transition		Item no. VPC® Pipe Coupling		Item no. VPC® Adapter KB	Clamping range of the VPC® Pipe Coupling
DN 250 concrete on DN/OD 250 plastic	=	VPC382	+	VPCBA250	315 – 382 mm
DN 300 concrete on DN/OD 315 plastic	=	VPC455	+	VPCBA300	385 – 455 mm
DN 400 concrete KW[1)] on DN/OD 400 plastic	=	VPC565	+	VPCBA400	495 – 565 mm
DN 500 concrete KW[1)] on DN/OD 500 plastic	=	VPC690	+	VPCBA500	620 – 690 mm
DN 600 concrete KW[1)] on DN/OD 630 plastic	=	VPC805	+	VPCBA600	735 – 805 mm
DN 700 concrete KW[1)] on DN/OD 710 plastic	=	VPC940	+	VPCBA700	870 – 940 mm
DN 800 concrete KW[1)] on DN/OD 800 plastic	=	VPC1070	+	VPCBA800	1020 – 1070 mm

Order list for transition from plastic to circular concrete pipe using VPC® Pipe Coupling and VPC® Adapter KB
[1)] KW = circular, wall-reinforced

Result: Interior view – centric, tight transition!

concrete

Concrete pipe transition with base DN

VPC®-Adapter KB

VPC® Adapter 150 BF

VPC® Pipe Coupling

Concrete pipe with base with mounted VPC® Adapter 150 BF ...

... and in the next step with VPC® Pipe Coupling

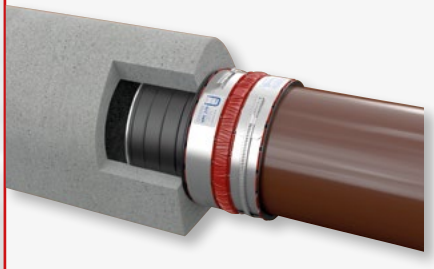
The Funke VPC® Pipe Coupling can also be used in the VPC® 150 BF version (for concrete pipe outer diameters from 210 to 215 mm) for connection to a concrete pipe with a base. In addition to the VPC® Adapter KB, the VPC® Adapter 150 BF is also required. The Funke BI–Adapter® is available for other nominal widths.

During installation, the VPC® Adapter 150 BF is placed on the existing concrete pipe with base so that it is flush with the edge of the concrete. The VPC® Pipe Coupling is then pushed on and installed as described in the Installation Instructions. The VPC® Adapter KB is then positioned in front of the concrete pipe and connected according to the enclosed Installation Instructions. Both components are included in the scope of delivery as a set.

Funke BI-Adapter®

The Funke BI-Adapter® is available as a transition for pipes with non-circular external geometry for nominal diameters from DN 100 to DN 1000.

DN 150 up to DN 1000



Transition for ovoid on request!

DN 100 – 200

Large pipe adapter

In combination with the VPC® Pipe Coupling XXL, the plastic large pipe adapter allows professional transitions between pipes made of different materials and with different geometries from DN 1000.

Ask us, we will find a solution together!

Table of pipe outside diameters

	Item no.	VPC 100	VPC 125	VPC 150	VPC 150 B	VPC 150 BF	VPC 200K	VPC 200G	VPC 220	VPC 250	VPC 270	VPC 275	VPC 290	VPC 310	VPC 325
Pipe type	Outer diameter / Standard	102-133 mm	123-161 mm	160-192 mm	183-226 mm	218-261 mm	183-226 mm	200, 218-261 mm	218-261 mm	250, 270-320 mm	270-320 mm	230-275 mm	240-290 mm	255-310 mm	265-325 mm
PVC-U	DIN EN 1401	110	125	160	Transition from Concrete Pipe **circular** DN/ID 150 to Plastic Pipe DN/OD 160	Transition from Concrete Pipe **with base** DN/ID 150 to Plastic Pipe DN/OD 160	200	200 E	250	250 E	315	250	250		315
Funke Repair pipe							218 (DN 200)		218 (DN 200)	275 (DN 250)	275 (DN 250)	275 (DN 250)	275 (DN 250)	275 (DN 250)	325 (DN 300)
PP-MD	DIN EN 14758	110	125	160			200	200 E	250	250 E	315	250	250		315
PP	DIN EN 1852	110	125	160			200	200 E	250	250 E	315	250	250		315
PE-HD	DIN EN 12666	110	125	160			200	200 E	250	250 E	315	250	250		315
GRP	DIN EN 14364	115 (DN 100)	141 (DN 125)	167 (DN 150)			220 (DN 200)	220 (DN 200)	220 (DN 200)	272 (DN 250)	272 (DN 250)	272 (DN 250)	272 (DN 250)	272 (DN 250)	324 (DN 300)
Ultra Rib PP	DIN EN 13476			170 (DN 150)			225 (DN 200)	225 (DN 200)	225 (DN 200)	280 (DN 250)	280 (DN 250)		280 (DN 250)	280 (DN 250)	280 (DN 250)
Robukan PP	DIN EN 13476			174 (DN 150)				235 (DN 200)	235 (DN 200)	292 (DN 250)	292 (DN 250)			292 (DN 250)	292 (DN 250)
Cast iron (GGG)	DIN EN 598	118 (DN 100)	144 (DN 125)	170 (DN 150)			222 (DN 200)	222 (DN 200)	222 (DN 200)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)
SML		110 (DN 100)	135 (DN 125)	160 (DN 150)			210 (DN 200)			274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)
Vitrified clay N	DIN EN 295	122-131 (DN 100)	159 (DN 125)	178-186 (DN 150)				242 (DN 200)	242 (DN 200)	299 (DN 250)	299 (DN 250)			299 (DN 250)	299 (DN 250)
Vitrified clay H	DIN EN 295							254 (DN 200)	254 (DN 200)	318 (DN 250)	318 (DN 250)				318 (DN 250)
Vitrified clay					213 (DN 150)		213 (DN 150)			276 (DN 200)	276 (DN 200)		276 (DN 200)		
FZ Kl. B	DIN EN 19850 (1996) DIN EN 588	116 (DN 100)	141 (DN 125)	168 (DN 150)			220 (DN 200)	220 (DN 200)	220 (DN 200)	272 (DN 250)	272 (DN 250)	272 (DN 250)	272 (DN 250)	272 (DN 250)	272 (DN 250)
FZ Kl. A	DIN EN 19850 (1996) DIN EN 588														
AZ		116 (DN 100)	141 (DN 125)	168 (DN 150)			220 (DN 200)	220 (DN 200)	220 (DN 200)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)	274 (DN 250)

** Outer diameters of concrete and reinforced concrete pipes can vary greatly from region to region. A wide range of adapters and transition pieces are available. Please contact us. For concrete pipes with a base, we recommend the Funke BI-Adapter®.*

	Item no.	VPC 345	VPC 360	VPC 382	VPC 400	VPC 415	VPC 430	VPC 455	VPC 465	VPC 485	VPC 500	VPC 520	VPC 535	VPC 555	VPC 565
Pipe type	Outer diameter / Standard	285-345 mm	295-360 mm	315-382 mm	330-400 mm	345-415 mm	360-430 mm	385-455 mm	395-465 mm	415-485 mm	430-500 mm	450-520 mm	465-535 mm	485-555 mm	495-565 mm
PVC-U	DIN EN 1401	315	315	315	400	400	400	400	400		500	500	500	500	500
Funke Repair pipe		325 (DN 300)	325 (DN 300)	325 (DN 300)				450 (DN 400)	450 (DN 400)	450 (DN 400)	450 (DN 400)	450 (DN 400)		540 (DN 500)	540 (DN 500)
PP-MD	DIN EN 14758	315	315	315	400	400	400	400	400		500	500	500	500	500
PP	DIN EN 1852	315	315	315	400	400	400	400	400		500	500	500	500	500
PE-HD	DIN EN 12666	315	315	315	400	400	400	400	400		500	500	500	500	500
GRP	DIN EN 14364	324 (DN 300)	324 (DN 300)	324 (DN 300)	376 (DN 350)	376 (DN 350)	376 (DN 350)	427 (DN 400)	427 (DN 400)	427 (DN 400)	478 (DN 450)	478 (DN 450)	478 (DN 450)	530 (DN 500)	530 (DN 500)
Ultra Rib PP	DIN EN 13476	335 (DN 300)	335 (DN 300)	335 (DN 300)	335 (DN 300)			450 (DN 400)	450 (DN 400)	450 (DN 400)	450 (DN 400)	450 (DN 400)			560 (DN 500)
Robukan PP	DIN EN 13476		346 (DN 300)	346 (DN 300)	346 (DN 300)	346 (DN 300)			461 (DN 400)	461 (DN 400)	461 (DN 400)	461 (DN 400)			
Cast iron (GGG)	DIN EN 598	326 (DN 300)	326 (DN 300)	326 (DN 300)			429 (DN 400)	429 (DN 400)	429 (DN 400)	429 (DN 400)			532 (DN 500)	532 (DN 500)	532 (DN 500)
SML		326 (DN 300)	326 (DN 300)	326 (DN 300)	378 (DN 350)	378 (DN 350)	378 (DN 350)	429 (DN 400)	429 (DN 400)	429 (DN 400)			532 (DN 500)	532 (DN 500)	532 (DN 500)
Vitrified clay N	DIN EN 295		355 (DN 300)	355 (DN 300)	355 (DN 300)	355 (DN 300)					486 (DN 400)	486 (DN 400)	486 (DN 400)		
Vitrified clay H	DIN EN 295			376 (DN 300)	376 (DN 300)	376 (DN 300)	376 (DN 300)				492 (DN 400)	492 (DN 400)	492 (DN 400)	492 (DN 400)	
Vitrified clay				361 (DN 250)	361 (DN 250)	361 (DN 250)	417 (DN 300)	417 (DN 300)	417 (DN 300)						557 (DN 400)
FZ Kl. B	DIN EN 19850 (1996) DIN EN 588	324 (DN 300)	324 (DN 300)	324 (DN 300)	378-384 (DN 350)	378-384 (DN 350)	378-384 (DN 350)	432-436 (DN 400)	432-436 (DN 400)	432-436 (DN 400)	432-436 (DN 400)	486-490 (DN 450)	486-490 (DN 450)	540-544 (DN 500)	540-544 (DN 500)
FZ Kl. A	DIN EN 19850 (1996) DIN EN 588							432 (DN 400)	432 (DN 400)	432 (DN 400)	432 (DN 400)			540 (DN 500)	540 (DN 500)
AZ		328 (DN 300)	328 (DN 300)	328 (DN 300)				432 (DN 400)	432 (DN 400)	432 (DN 400)	432 (DN 400)			540 (DN 500)	540 (DN 500)

Dimensions in mm, E = eccentric ring
The dimensions comply with the specified standards and guidelines.

Maximum tolerances were not taken into account.
Manufacturer-related tolerances are also possible.

	Item no.	VPC 590	VPC 605	VPC 625	VPC 640	VPC 660	VPC 675	VPC 690	VPC 710	VPC 730	VPC 745	VPC 765	VPC 780	VPC 805	VPC 820
Pipe type	Outer diameter / Standard	520-590 mm	535-605 mm	555-625 mm	570-640 mm	590-660 mm	605-675 mm	620-690 mm	640-710 mm	660-730 mm	675-745 mm	695-765 mm	710-780 mm	735-805 mm	750-820 mm
PVC-U	DIN EN 1401				630	630	630	630	710	710	710	710	710	800	800
Funke Repair pipe		540 (DN 500)	540 (DN 500)												
PP-MD	DIN EN 14758														
PP	DIN EN 1852	560	560	560	630	630	630	630	710	710	710	710	710	800	800
PE-HD	DIN EN 12666	560	560	560	630	630	630	630	710	710	710	710	710	800	800
GRP	DIN EN 14364	530 (DN 500)		616 (DN 600)	616 (DN 600)	616 (DN 600)	616 (DN 600)			718 (DN 700)	718 (DN 700)	718 (DN 700)	718 (DN 700)		820 (DN 800)
Ultra Rib PP	DIN EN 13476	560 (DN 500)	560 (DN 500)	560 (DN 500)											
Robukan PP	DIN EN 13476	585 (DN 500)	585 (DN 500)	585 (DN 500)	585 (DN 500)				693 (DN 600)	693 (DN 600)	693 (DN 600)				
Cast iron (GGG)	DIN EN 598	532 (DN 500)			635 (DN 600)	635 (DN 600)	635 (DN 600)	635 (DN 600)			738 (DN 700)	738 (DN 700)	738 (DN 700)	738 (DN 700)	
SML		532 (DN 500)			635 (DN 600)	635 (DN 600)	635 (DN 600)	635 (DN 600)							
Vitrified clay N	DIN EN 295	581 (DN 500)	581 (DN 500)	581 (DN 500)	581 (DN 500)			687 (DN 600)	687 (DN 600)	687 (DN 600)	687 (DN 600)			795 (DN 700)	795 (DN 700)
Vitrified clay H	DIN EN 295			609 (DN 500)	609 (DN 500)	609 (DN 500)	609 (DN 500)			725 (DN 600)	725 (DN 600)	725 (DN 600)	725 (DN 600)		
Vitrified clay		557 (DN 400)	557 (DN 400)	557 (DN 400)		644 (DN 500)	644 (DN 500)	644 (DN 500)	644 (DN 500)				765 (DN 600)	765 (DN 600)	765 (DN 600)
FZ Kl. B	DIN EN 19850 (1996) DIN EN 588	540-544 (DN 500)	540-544 (DN 500)			646 -650 (DN 600)	646 -650 (DN 600)	646 -650 (DN 600)	646 -650 (DN 600)			758 (DN 700)	758 (DN 700)	758 (DN 700)	758 (DN 700)
FZ Kl. A	DIN EN 19850 (1996) DIN EN 588	540 (DN 500)	540 (DN 500)			646 (DN 600)	646 (DN 600)	646 (DN 600)	646 (DN 600)			750 (DN 700)	750 (DN 700)	750 (DN 700)	
AZ		540 (DN 500)	540 (DN 500)			646 (DN 500)	646 (DN 500)	646 (DN 500)	646 (DN 500)			750 (DN 700)	750 (DN 700)	750 (DN 700)	

	Item no.	VPC 835	VPC 850	VPC 870	VPC 890	VPC 905	VPC 925	VPC 940	VPC 960	VPC 980	VPC 995	VPC 1010	VPC 1030	VPC 1045	VPC 1070
Pipe type	Outer diameter / Standard	765-835 mm	780-850 mm	800-870 mm	820-890 mm	835-905 mm	855-925 mm	870-940 mm	890-960 mm	910-980 mm	925-995 mm	960-1010 mm	980-1030 mm	995-1045 mm	1020-1070 mm
PVC-U	DIN EN 1401	800	800	800		900	900	900	900			1000	1000	1000	
Funke Repair pipe															
PP-MD	DIN EN 14758														
PP	DIN EN 1852	800	800	800								1000	1000	1000	
PE-HD	DIN EN 12666	800	800	800								1000	1000	1000	
GRP	DIN EN 14364	820 (DN 800)	820 (DN 800)	820 (DN 800)				924 (DN 900)	924 (DN 900)	924 (DN 900)			1026 (DN 1000)	1026 (DN 1000)	1026 (DN 1000)
Ultra Rib PP	DIN EN 13476														
Robukan PP	DIN EN 13476														
Cast iron (GGG)	DIN EN 598		842 (DN 800)	842 (DN 800)	842 (DN 800)	842 (DN 800)			945 (DN 900)	945 (DN 900)	945 (DN 900)				1048 (DN 1000)
SML															
Vitrified clay N	DIN EN 295	795 (DN 700)	795 (DN 700)			895 (DN 800)	895 (DN 800)	895 (DN 800)	895 (DN 800)			1008 (DN 900)	1008 (DN 900)	1008 (DN 900)	
Vitrified clay H	DIN EN 295	831 (DN 700)	831 (DN 700)	831 (DN 700)	831 (DN 700)				941 (DN 800)	941 (DN 800)	941 (DN 800)				
Vitrified clay				862 (DN 800)	862 (DN 800)	862 (DN 800)	862 (DN 800)			970 (DN 800)	970 (DN 800)	970 (DN 800)			
FZ Kl. B	DIN EN 19850 (1996) DIN EN 588			866 (DN 800)	866 (DN 800)	866 (DN 800)	866 (DN 800)			974 (DN 900)	974 (DN 900)	974 (DN 900)			1082 (DN 1000)
FZ Kl. A	DIN EN 19850 (1996) DIN EN 588			856 (DN 800)	856 (DN 800)	856 (DN 800)	856 (DN 800)			962 (DN 900)	962 (DN 900)	962 (DN 900)			1068 (DN 1000)
AZ				856 (DN 800)	856 (DN 800)	856 (DN 800)	856 (DN 800)			961 (DN 900)	961 (DN 900)	961 (DN 900)			1068 (DN 1000)

**Different dimensions possible depending on region.*

For larger diameters, we are happy to develop individual solutions with the VPC® XXL and, if required, with the large pipe adapters. Talk to us!

The VPC® Pipe Coupling on the test rig: Shear load, bendability, tightness

Pipe connections of underground sewers, pipelines and chambers must be permanently tight. The VPC® Pipe Coupling is therefore subjected to various tests. In accordance with DIN 4060 "Joints of sewer and drain pipes with elastomeric seals - Requirements and testing on joints with elastomeric seals" (1998) the proof of tightness of the pipe coupling up to an internal water pressure of 0.5 bar must be provided both with a mutual angular deflection and with a shear load. Accordingly, the VPC® Pipe Connection is tested in an external institute at an angular deflection of 2 % to 5 % (depending on the nominal diameter) and a shear load corresponding to 10 times the nominal diameter in Newtons (e.g. DN 200 with 2,000 N = 2 kN = 200 kg).

Shear load

The shear load effect is performed as a string test on two pipes with a pipe connection (here: VPC® Pipe Coupling). During the test, one pipe is firmly supported, and the other is loaded (e.g. with weights). This creates a load in the area between the two pipes that must be absorbed by the pipe connection without causing damage. In the long-term test, the shear load is measured over three months and the pipe connection is then checked again for watertightness.

Angular deflection

The angular deflection is also checked a string test on two pipes with a pipe connection, whereby one pipe is firmly supported, and the other is bent at the free end. For example, a value of 2 % corresponds to an angular deflection of 20 mm per meter of pipe.

Tightness

In addition to the test program in accordance with DIN 4060 – this applies to pipe connections with elastomer seals of all types – the water pressure of the VPC® Pipe Coupling up to VPC® 850 is increased above the required 0.5 bar to 2.5 bar test pressure without pressure loss.

When connecting vitrified clay pipes, DIN EN 295 "Vitrified clay pipe systems for drains and sewers - Part 1: Requirements for pipes, fittings and joints" also applies. Here, a shear load of 25 times the nominal diameter in Newtons –for a nominal diameter of DN 200, this is 25 x 200 = 5,000 N = 5 kN = 500 kg – is taken as a basis. The following also applies: For nominal diameters up to DN 200, the angular deflection increases from 5 % to 8 %.

With DIBt approval Z-42.5-450 for nominal widths 100-2000.

The Funke VPC® Pipe Coupling has received general building authority approval from the German Institute of Structural Engineering (DIBt) for nominal sizes 100 - 2000. General building authority approvals are granted for construction products and types of construction within the scope of the federal state building regulations for which there are no generally recognised rules of technology, in particular DIN standards, or which deviate significantly from these. It proves the usability or applicability of the fitting within the meaning of the federal state building regulations. This means additional security for clients and users.

Inspection with letter and seal

High-pressure water jet test in accordance with DIN 19523 at iro GmbH Oldenburg

This document is a translation of the German brochure. All mentioned approvals and standards pertain to those in Germany. For details on the corresponding approvals and standards in your country, please contact us.

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