

Funke VPC® Pipe Coupling

*with DIBt Approval
Z-42.5-450
for nominal diameters
100 - 300!*



100 – 690



The perfect connection!

The Funke VPC® Materials p

*with DIBt Approval
Z-42.5-450
for nominal diameters
100 - 300!*

The Product

The new Funke VPC® Pipe Coupling allows pipes of the same nominal diameters made of different materials to be connected to one another safely, reliably, and with the best possible results – despite having different outer diameters incurred by the design type! The Funke VPC® Pipe Coupling consists of a reducible sealing sleeve made of elastomer rubber, a centrally reducible securing cage made of plastic, and two stainless-steel bands for applying force to achieve a uniform circumferential adjustment.

The **sealing sleeve** – In sizes up to 250 mm are made of ethylene-propylene-diene (monomer) rubber (EPDM), and in sizes diameters of 300 mm are of high-strength styrene-butadiene-rubber (SBR), in each case in accordance with DIN EN 681-1 WC/60, and have a multiple double sealing profile for really reliable sealing in accordance with DIN EN 1610. Radial circumferential cut-outs in the material, and single compartments, mean that meshed engagement of the securing cage into the rubber can be achieved with complete reliability.

The **securing cage** consists of a highly impact-resistant plastic, stable under breaking stress, and resistant to both heat and cold. 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.

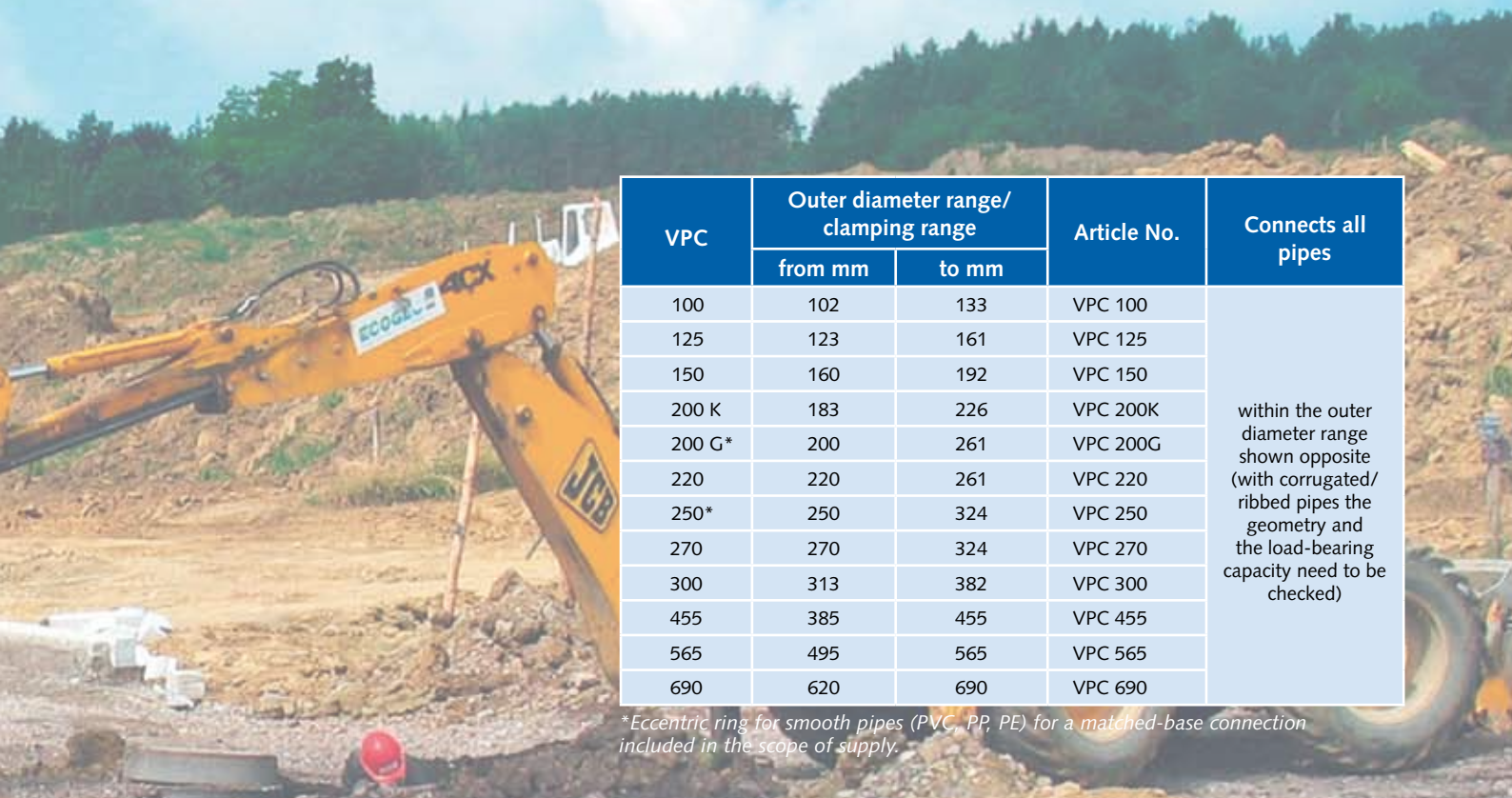
Securing cage and sealing sleeve are designed in such a way that any movement or distortion of the rubber during the diameter adjustment is avoided. The sleeve matches up to the different outer diameters of the different pipe materials while the **tension bands** made of corrosion-free stainless steel are being tightened. Sealing sleeve and securing cage, together with the two tension bands, form a compact, stable shaped, and yet still flexible unit.

The VPC® pipe coupling is available in two design formats. In the Standard version, the components are made of V2A stainless steel, highly rust-resistant (material No. 1.4301). The Special design, with V4A steel (material No. 1.4404) is resistant to hydrocarbons as well, and particularly resistant to aggressive substances in the earth.

Product advantages

- Bedding channel on both sides for secure band guidance
- Cylindrical contact and sealing area
- Multiple double sealing profile
- No distortion in the rubber, thanks to the securing cage and sealing sleeve maintaining a neutral position
- Easy, fast, and secure assembly
- Connection can be angled up to 3° and more, depending on nominal diameter
- Tough, compact, and secure when it comes to handling

Pipe Coupling: perfectly connected



VPC	Outer diameter range/ clamping range		Article No.	Connects all pipes
	from mm	to mm		
100	102	133	VPC 100	within the outer diameter range shown opposite (with corrugated/ ribbed pipes the geometry and the load-bearing capacity need to be checked)
125	123	161	VPC 125	
150	160	192	VPC 150	
200 K	183	226	VPC 200K	
200 G*	200	261	VPC 200G	
220	220	261	VPC 220	
250*	250	324	VPC 250	
270	270	324	VPC 270	
300	313	382	VPC 300	
455	385	455	VPC 455	
565	495	565	VPC 565	
690	620	690	VPC 690	

**Eccentric ring for smooth pipes (PVC, PP, PE) for a matched-base connection included in the scope of supply.*

The stock volumes for Funke VPC® Pipe Couplings can be reduced to just a few types, because the component covers a wide range of different diameters. So, for example, we can have ...



... an SN 4 PVC U-pipe and a corrugated pipe ...



... an SN 8 PVC U-pipe and a vitrified clay pipe ...



... or an SN 12 (HS®) PVC U-pipe and a ribbed pipe.

Practical advantages

- Connects pipes of different outside diameters and pipes made of different materials and different structural designs
- Bridging large diameter differentials without the use of additional compensation rings
- Stepless adjustment on both sides, while maintaining complete security against shear loads
- Large surface cylindrical contact area or meshing of the pipes
- Middle stop for accuracy in assembly (up to VPC 250)

14 advantages at a

Low stock storage costs, because only a few types are needed to meet all operational situations.

The reduction process takes place centrally, uniformly, and separately on each side of the pipe coupling (two dimensional).

Multiple double sealing profile on each side.

A bedding channel on both sides for the tension bands ensures reliable and secure band guidance.

Thanks to the design of the tension bands and the size of the contact surface at the securing cage (min. 60 mm wide), the force application during the diameter adaptation process is spread evenly onto the pipe over the entire circumference.

Insertion is limited by a central protruding rubber lip (100 – 250).

glance

No additional compensation rings are needed to bridge even substantial diameter differences with the same nominal diameter (left OD 160, right OD 190).

Large-surface cylindrical contact and sealing area (60 mm per side).

Sealing tightness up to 2.5 bar – MPA tested.

2 or 4 tension bands respectively, made of stainless steel with click locking, ensure reliable, rapid, and uniform assembly.

Securing cage and sealing sleeve retain a neutral position during the diameter adjustment process, which means that sliding or folding of the rubber can be reliably avoided.

Angle inclination possible on each side, up to at least 3°.

Stepless adjustment on both sides, with permanent securing against shear loads, tested in accordance with DIN 4060 and DIN EN 295 respectively.

Matched-base transition area for connecting the same nominal diameters of the same or different materials with different outer structures (corrugated, ribbed, and smooth pipes).





The VPC® Pipe Coupling as a Special design

Resistant to oil and petrol in
accordance with
DIN EN 681-1 WH

Oil resistant – and keeps out seawater too

In the oil-resistant version, the components of the VPC® Pipe Coupling ready for action are made of V4A stainless steel (material No. 1.4404). This means that the special steel used is one of the steel grades which is particularly effective in its resistance to corrosion and acids. The moulded part is resistant to oil and petrol, and particularly effective in resisting the corrosive substances in waste water and in the earth. And an extra bonus: The material is also resistant to the effect of salty seawater.

Funke introduced this special design as a response to the demands of the market. Those running the projects can take advantage of the product when the soil surrounding a waste water pipe contains particularly corrosive constituents (such as salty soils in North Germany), or if the waste water contains substances which could attack pipes and seals made of conventional materials, such as sleeves made of EPDM

VPC	Outer diameter range		Article No.
	from mm	to mm	
100 OEL	102	133	VPC 100 OEL
125 OEL	123	161	VPC 125 OEL
150 OEL	160	192	VPC 150 OEL
200 K OEL	183	226	VPC 200K OEL
200 G OEL*	200	261	VPC 200G OEL
250* OEL*	250	324	VPC 250 OEL

*Eccentric ring for smooth pipes (PVC, PP, PE) for a matched-base connection included in the scope of supply.

(ethylene-propylene-diene rubber), which is the case, for example, with pipes in the area of fuel filling stations. This is why we use NBR (acrylonitrile butadiene rubber), for pipe couplings which are particularly resistant to oil and petrol. With the oil-resistant design, the spring cage is grey.





Repair – Upgrade – New construction

VPC provides a whole range of advantages, right where you need them – in the trench

A new moulded part from Funke takes care of particular problems in the civil engineering pipelaying sector. The VPC® Pipe Coupling allows for pipes of the same nominal diameter but made of different materials to be connected to one another securely and with best possible results, an advantage which more and more project organizers and contracting companies involved in pipe upgrading work are really coming to appreciate.

For people engaged in trench working, this is already becoming an almost everyday situation. Take, for example, connecting the existing house connection pipes for rain water and waste water to the collecting pipe for the sewage system. On private properties, there is often a right old mix-up of materials present. And because different materials as a rule also feature different diameters, up to now there has had to be a lot of “make do and mend” involved, in trying to come up with a reasonable solution to making the transition. One example might be the use of additional compensation rings.

But all that's in the past, now that the VPC® Pipe Coupling has arrived.

Whether it's an upgrade, a repair, or laying a new pipe, the design advantages of the new moulded component make installation with different outer diameters so much easier.



Connecting new pipes



Retrofitting a branch element into an existing vitrified clay pipe



Repairing defective pipes





Closure element

The VPC® Pipe Coupling consists of a sealing sleeve made of elastomer rubber, a securing cage made of plastic, and two special steel bands, which form the closure element. The element is a click-in closure design, and no welding or tooling is needed.

When the screws of the special steel bands are tightened with a torque wrench during assembly, in accordance with

the manufacturers' instructions – from a tightening range \geq DN 300, the use of what is known as a tangential spanner is recommended – the sleeve will match up steplessly to the different outer diameters of the different pipe materials. The securing cage and sealing sleeve are designed in such a way that there is no risk of the rubber slipping or distorting during the diameter adaptation.

Quality and Tests

Tight pipe connection in accordance with DIN 4060 and DIN EN 295 Part 4

Pipe connectors on buried sewers, pipelines, and shafts must be tight – and they must stay tight. That's why VPC® Pipe Couplings undergo so many different tests. These include tests in accordance with DIN 4060, "Joints of sewers and drain pipes with elastomeric seals – Requirements and testing on joints with elastomeric seals", and DIN EN 295-4, "Vitrified clay pipe systems for drains and sewers – Part 4: Requirements for adaptors, connectors and flexible couplings."

Connectors on pipes which are covered by earth are subjected to high stress loadings, which is why, among other things, the maximum angular deflection is tested. In this situation,

with a maximum permissible angular deflection depending on the nominal diameter, the pipe connector must be able to withstand a constant internal and external pressure over a defined period of time without any perceptible leakage.

The requirements which the VPC® Pipe Coupling must fulfil in this context are appreciably higher with DIN EN 295-4 than with DIN 4060. The same applies to testing for shear load.



The VPC® Pipe Coupling on the test stand: Shear load, angular deflection capacity, tightness

According to DIN 4060 (1998), **proof of tightness** must be provided with an opposite angular deflection as well as under shear load. In this context, proof of tightness of the connector is required up to an internal water pressure of 0.5 bar. For this purpose, the VPC® Pipe Coupling is tested at an outside institution in accordance with DIN 4060, at an angular deflection of 2% to 5% (depending on the nominal diameter) and under a shear load which corresponds to 10 times the nominal diameter in Newtons; for example, with a nominal diameter of DN 200, this is 2000 N = 2 kN = 200 kg.

Shear load

The effect of the shear load is carried out as a pipe string test on two pipes with one connector (in this case the VPC® Pipe Coupling). One pipe is mounted in a securely fixed position and the other is subjected to load (e.g. with weights). This causes a load to be imposed in the area between the two pipes, which must be borne by the connector without it suffering any damage. In the long-term test, the shear load is maintained for three months, and the connector is then again tested for water tightness.

Angular deflection

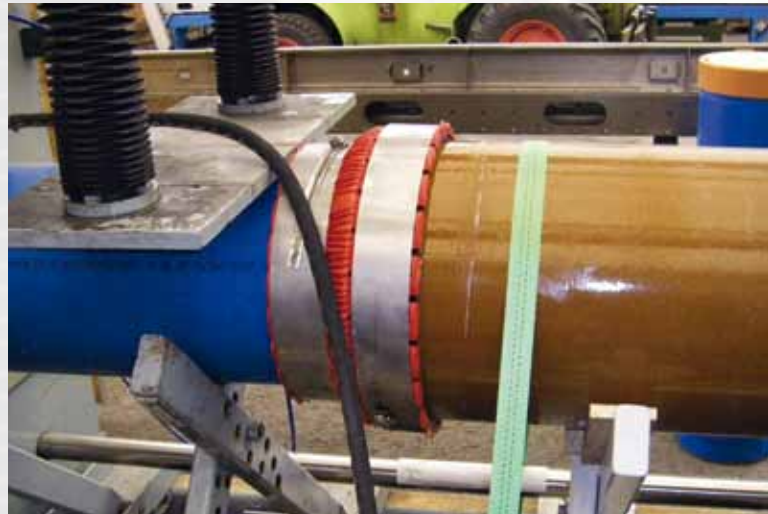
The test of the angular deflection is likewise carried out as a string test on two pipes with a connector. When the test is carried out, one pipe is securely mounted and the other secured at an angle at the free end. In this situation, for example, a value of 2% corresponds to an angular deflection of 20 mm per metre of pipe.

Tightness

As a departure from DIN 4060, the water pressure with the VPC® Pipe Coupling, instead of up to 0.5 bar, is increased up to 2.5 bar without deflection.

DIN 4060 applies to pipe connectors with elastomeric seals of all kinds. In addition to this, when two vitrified clay pipes are connected the somewhat more "stringently" formulated DIN EN 295 comes into effect. In this case, a shear load of 25 times the nominal diameter in Newtons is taken as the basis; with a nominal diameter of DN 200, this amounts to $25 \times 200 = 5,000 \text{ N} = 5 \text{ kN} = 500 \text{ kg}$. And likewise, with nominal diameters up to DN 200, the angular deflection increases from 5% to 8%.

To date, every single VPC® Pipe Coupling in the nominal diameter range up to DN 300 has successfully passed the tests according to DIN 4060, and they have been equally successful in the three-month tests under DIN EN 295.



Testing with certificate and seal



with DIBt Approval Z-42.5-450
for nominal diameters 100 – 300

VPC® Pipe Coupling from Funke have been awarded the General Construction Supervisory Approval from the German Institute for Construction Technology (DIBt) for the nominal diameters 100 – 300. These approvals are issued for building products and construction types in the scope of application of the Provincial building ordinances for which there are no generally recognised rules of the art, in particular no DIN Standards, or which deviate from them.

This means that the suitability for use and application of the moulded part in the meaning of the Provincial building ordinances has been conclusively proved – an added safety bonus for both clients and contractors alike.



Available in
sizes 100 – 690!



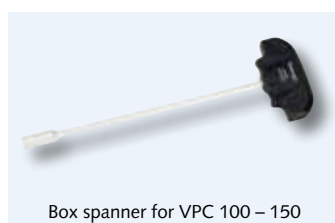
The Complete Set

The VPC® Pipe Coupling in design formats 100 – 220 comes supplied in a carrying bag made of plastic film, which, as well as the product itself, also contains instructions for installation and for the correct application of the lubricant agents required. The four-language instructions (German, French, English, and Polish) provide an easy to follow guide to the different installation steps, based on clearly illustrative photos.

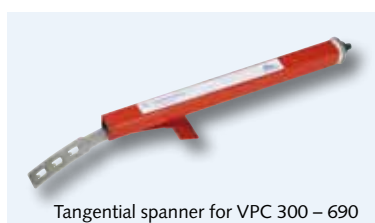
Something new: VPC® Pipe Couplings in formats from 250 and larger are delivered in a sturdy carton, and in larger numbers come on a pallet.



Accessories



Box spanner for VPC 100 – 150



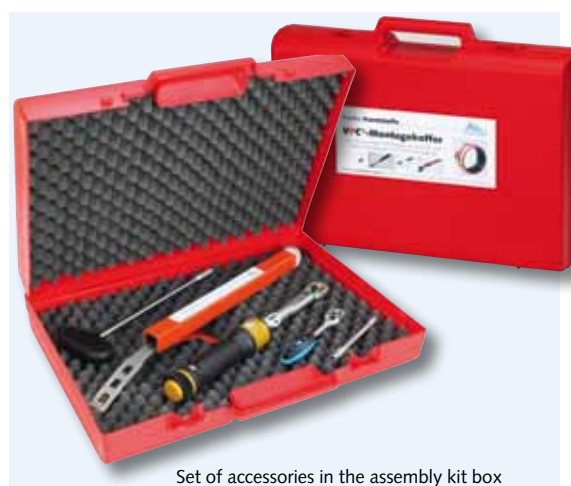
Tangential spanner for VPC 300 – 690



Set of reversible ratchets for
VPC 100 – 250



Torque wrench for VPC 100 – 690



Set of accessories in the assembly kit box

Installation Recommendation

○ VPC 100/125/150/200K/220/270

Measure the outer diameters of both pipes (1) and compare them with the range of the VPC® Pipe Coupling.

The range of the VPC® Pipe Coupling is shown on the label (2), or can be determined by measuring the inner diameter of the coupling. Measure the insertion depth of the Funke VPC® Pipe Coupling as far as the protruding lip on the inside (3) and mark this on the larger pipe (4).

Important: Once the outer diameters have been determined of both pipes which are to be connected, bring the Funke VPC® Pipe Coupling up to the larger pipe diameter by alternating rotation of the two pipe hangers (5).

If necessary, apply the lubricant thinly onto the point end of the pipe which is to be connected (e.g. concrete or vitrified clay pipes).



1

Push the Funke VPC® Pipe Coupling onto the point end of the larger pipe as far as the marking, making sure that the screws of the tension sleeve are facing upwards (6+7).

The joint in the connection is to be maintained in accordance with the specific instructions from the individual pipe manufacturers (a small gap is to be recommended with regard to the angular deflection capacity and expansion). Once the Funke VPC® Pipe Coupling has been aligned, first tighten the tension sleeve on the larger pipe to 17 Nm (9). If possible, check this with a torque wrench. Next, tighten the opposite tension sleeve to the same torque value (10).

We recommend the use of a hexagonal box spanner (8 mm) with a T-grip (11) as an aid, or a set of interchangeable ratchets (12) in cases of frequent use.



2



3



4



5



6



7



8



9



10



11



12



Installation Recommendation

○ VPC 200 G / 250

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

As a departure from the installation instructions described on page 11, the following preparations need to be made:

Measure the insertion depth of the Funke VPC® Pipe Coupling as far as the centre stop on the inside (3) and mark this on the pipe with the larger outer diameter (4).

Then carry out points 5 + 7.

Draw the eccentric ring onto the point end of the DN/OD 200 pipe (outer diameter 200 mm) as far as the inside stop, or onto the DN/OD 250 pipe (outer diameter 250 mm) (16).

Then lead the pipe prepared in this way, with the eccentric ring fitted, to the Funke VPC® Pipe Coupling, making sure that the red marking always remains visible on the apex (17).

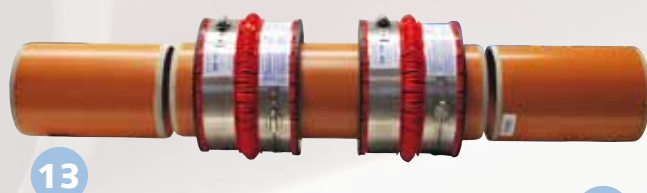
Push the pipe in until the eccentric ring closes on the outside flush with the Funke VPC® Pipe Coupling (18).

Then continue as described under Points 9-12 of the laying instructions, and tighten the screws on the tension sleeves to 17 Nm.



Special case: Pipe repair:

When it comes to repairing a pipe, first push the two Funke VPC® Pipe Couplings complete onto the pipe piece which is to be inserted (13). Then introduce the repair piece into the open pipe string, and push the Funke VPC® Pipe Coupling onto the pipe end presented (14), in accordance with the installation instructions already described (points 3-12). This is of particular advantage with vitrified clay pipes.



When profiled, corrugated, or ribbed pipes are involved, make sure that the load carrying capacity of the pipe/profile is sufficient, and check the contact areas at the seal surface of the Funke VPC® Pipe Coupling. The slot openings must be free of dirt or stones during the reduction process, so that the diameter adjustment to the individual pipe which is to be connected in each case can be carried out unimpeded. The backfill and compaction of the pipe bed is to be carried out with suitable material, in accordance with the applicable installation guidelines – DIN EN 1610.

Storage

In enclosed areas, ensure there is adequate ventilation, and if stored in the open/outside, protect against intense sunlight/UV radiation.

Installation Recommendation

○ with tangential spanner from VPC 300

With ranges from 385 mm to 690 mm, the use of what is referred to as a tangential spanner makes the installation of the VPC® Pipe Coupling considerably easier. First, the range of the pipes which are to be connected is determined, and the sleeve required for this is chosen. The point ends are coated with lubricant and then introduced onto the pipe with the larger nominal diameter. Once the pipe coupling has been aligned, the VPC tangential spanner with the retaining foot

is pushed under the tension sleeves. The spoon of the draw arm is then hooked into the retaining eye and tightened with a torque wrench. Next, the two tension sleeves are tightened alternately. This procedure is repeated accordingly with the introduction of the other pipe (the right to introduce technical modifications is reserved). The tangential spanner and detailed installation instructions are available from Funke (see the table below for the tightening torque values).



Stepless
diameter
adaptation

VPC nominal diameter	382 – 590 mm	600 – 790 mm	800 – 1000 mm
Torque on tangential spanner	17 Nm	20 Nm	22 Nm
Torque on the tensions sleeves	9 Nm	10 Nm	11 Nm

Torque setting, right to introduce technical modifications reserved

Whether round or with a foot

Perfect transition

Circular concrete pipe transition onto plastic 150 – 500



Adapter for transition from plastic (PE, PP, PVC) to circular concrete pipe, DN 250 – DN 500.



Adapter for DN 150 special solution



VPC® Pipe Coupling

An adapter is available for connecting plastic pipes to circular concrete pipes in nominal diameters DN 250 to 500, which compensates for the substantial difference in the thickness of the pipe wall inevitably incurred by the material.

For connecting plastic pipes to circular concrete pipes with nominal diameter of DN 150, a special solution is available in the form of a small adapter.

Adapter and sleeve for the nominal diameter ranges from DN 250 to DN 500 are available individually. The transition element to a circular concrete pipe with DN 150 is provided in the set (Article No. VPC 150 B).



The result: Inside view – centric tight transition!



onto concrete

Transition for concrete pipe with foot (base), DN 150



Concrete pipe with foot, with VPC adapter 150 BF drawn on ...



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



VPC adapter KB



VPC adapter 150 BF



VPC® Pipe Coupling

The Funke VPC® Pipe Coupling in the VPC 150 BF version (for concrete pipes with outer diameters from 210 to 215 mm) can also be used for connection with a concrete pipe with a foot (base). For this, the VPC adapter 150 BF is needed in addition to the VPC adapter KB.

During installation, the VPC adapter 150 BF is placed onto the existing concrete pipe with a foot in such a way that it closes flush with the edge of the concrete. The VPC® Pipe Coupling is then pushed on, and fitted as described in the installation instructions. The VPC adapter KB is then positioned in front of the concrete pipe and connected in accordance with the installation instructions provided. Both components are available as a set within the scope of supply.



Table of pipe outer diameters

	Article-No.	VPC 100	VPC 125	VPC 150	VPC 200K	VPC 200G	VPC 220	VPC 250	VPC 270
Pipe type	Outer diameter Standard	102-133 mm	123-161 mm	160-192 mm	183-226 mm	200-261 mm	220-261 mm	250-324 mm	270-324 mm
KG-PVC	DIN EN 1401	110	125	160	200	200 E	250	250 E	315
KG 2000	DIN EN 14758	110	125	160	200	200 E	250	250 E	315
PP	DIN EN 1852	110	125	160	200	200 E	250	250 E	315
HDPE	DIN EN 12666	110	125	160	200	200 E	250	250 E	315
GFK	DIN EN 14364	116 (DN 100)	142 (DN 125)	167 (DN 150)	220 (DN 200)	220 (DN 200)	220 (DN 200)	272 (DN 250)	272 (DN 250)
Ultra Rib I u. II	DIN EN 13467			170 (DN 150)	225 (DN 200)	225 (DN 200)	225 (DN 200)	280 (DN 250)	280 (DN 250)
Robukan PP	DIN EN 13467			174 (DN 150)		235 (DN 200)	235 (DN 200)	292 (DN 250)	292 (DN 250)
GCI* ¹ (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)
SML		110 (DN 100)	135 (DN 125)	160 (DN 150)	210 (DN 200)			274 (DN 250)	274 (DN 250)
VCP* ² N	DIN EN 295	131 (DN 100)	159 (DN 125)	186 (DN 150)		242 (DN 200)	242 (DN 200)	299 (DN 250)	299 (DN 250)
VCP* ² H	DIN EN 295					254 (DN 200)	254 (DN 200)	318 (DN 250)	318 (DN 250)
VCP* ² Votr.					213 (DN 200)			276 (DN 200)	276 (DN 200)
FZ Kl. B		118 (DN 100)	143 (DN 125)	170 (DN 150)	222 (DN 200)	222 (DN 200)	222 (DN 200)	274 (DN 250)	274 (DN 250)
FZ Kl. A		116 (DN 100)	141 (DN 125)	168 (DN 150)	220 (DN 200)			272 (DN 250)	272 (DN 250)
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)
CCP* ³ , K	DIN 4032		144 (DN 100)		198 (DN 150)	252 (DN 200)	252 (DN 200)	310 (DN 250)	310 (DN 250)

	Artikel-Nr.	VPC 300	VPC 455	VPC 565	VPC 690
Pipe type	Outer diameter Standard	313-382 mm	385-455 mm	495-565 mm	620-690 mm
KG-PVC	DIN EN 1401	315	400	500	630
KG 2000	DIN EN 14758	315	400		
PP	DIN EN 1852	315	400	500	630
HDPE	DIN EN 12666	315	400	500	630
GFK	DIN EN 14364	324 (DN 300)	427	530	
Ultra Rib I u. II	DIN EN 13467	335 (DN 300)	450	560	
Robukan PP	DIN EN 13467	346 (DN 300)			
GCI* ¹ (GGG)	DIN EN 598	326 (DN 300)	439	532	635
SML		326 (DN 300)	429	532	635
VCP* ² N	DIN EN 295	355 (DN 300)	417 (DN 350)		687
VCP* ² H	DIN EN 295	376 (DN 300)	430 (DN 350)	548 (DN 450)	
VCP* ² Votr.		360 (DN 250)	406 (DN 300)	556 (DN 400)	661 (DN 500)
FZ Kl. B		328 (DN 300)	448	556	664
FZ Kl. A			442	552	658
AZ		328 (DN 300)	432	540	646
CCP* ³ , K	DIN 4032	380 (DN 300)			
CCP* ³ , KW	DIN 4032		440-450 (DN 300)	530 (DN 400)	670 (DN 500)
CCP* ³ , KW	FBS DIN EN 1916 DIN V 1201		420 (DN 300)	550 (DN 400)	690 (DN 500)

CGI*¹ = grey cast iron
VCP*² = vitrified clay pipe
CCP*³ = circular concrete pipe

Values in mm, E = Eccentric ring

The dimensions correspond to the standards and guidelines specified. Maximum tolerances have not been taken into account. Tolerances inevitably incurred by the manufacturers are also possible.

Provided by:

MJ Abbott Ltd

Bratch Lane
Dinton, Salisbury, Wiltshire
SP3 5EB
Tel. +44 (0)1722 716361
Fax. +44 (0)1722 716828
sales@mjabbot.co.uk
www.mjabbotdirect.co.uk

Funke Kunststoffe GmbH

Siegenbeckstraße 15 • D-59071 Hamm-Uentrop
(Industriegebiet Uentrop Ost)

Tel.: +49 (0) 2388 3071-0 • Fax: +49 (0) 2388 3071-550

info@funkegruppe.de • www.funkegruppe.de

Right to effect technical modifications is reserved.