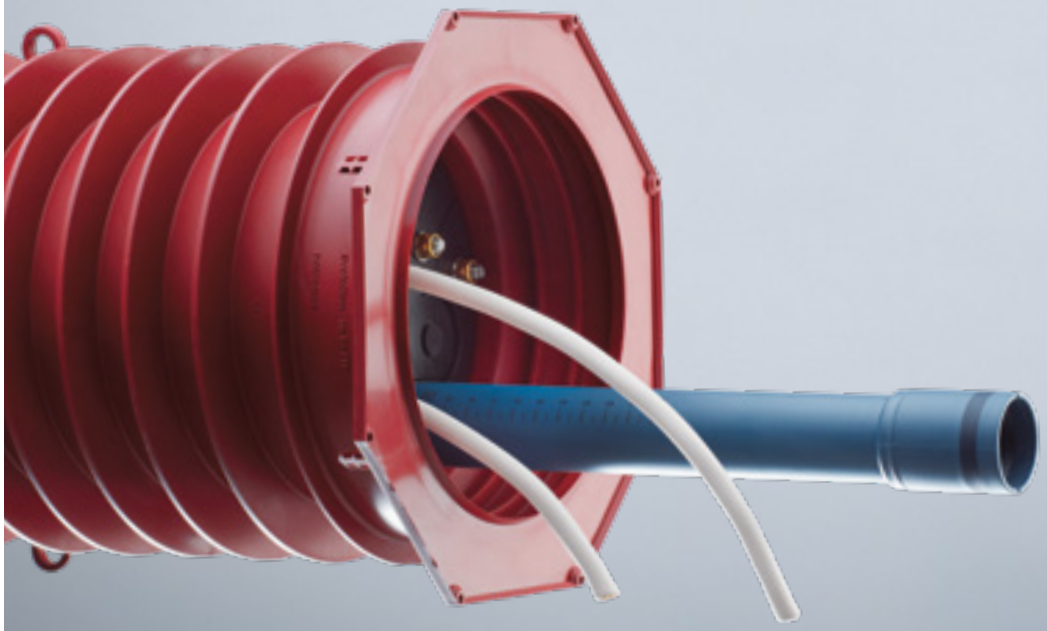
Pipe ducting

# TECHNICAL MANUAL

# POLO-RDS evolution



PURE PROGRESS / poloplast

# CONTENTS

# CONTENTS



**General information**

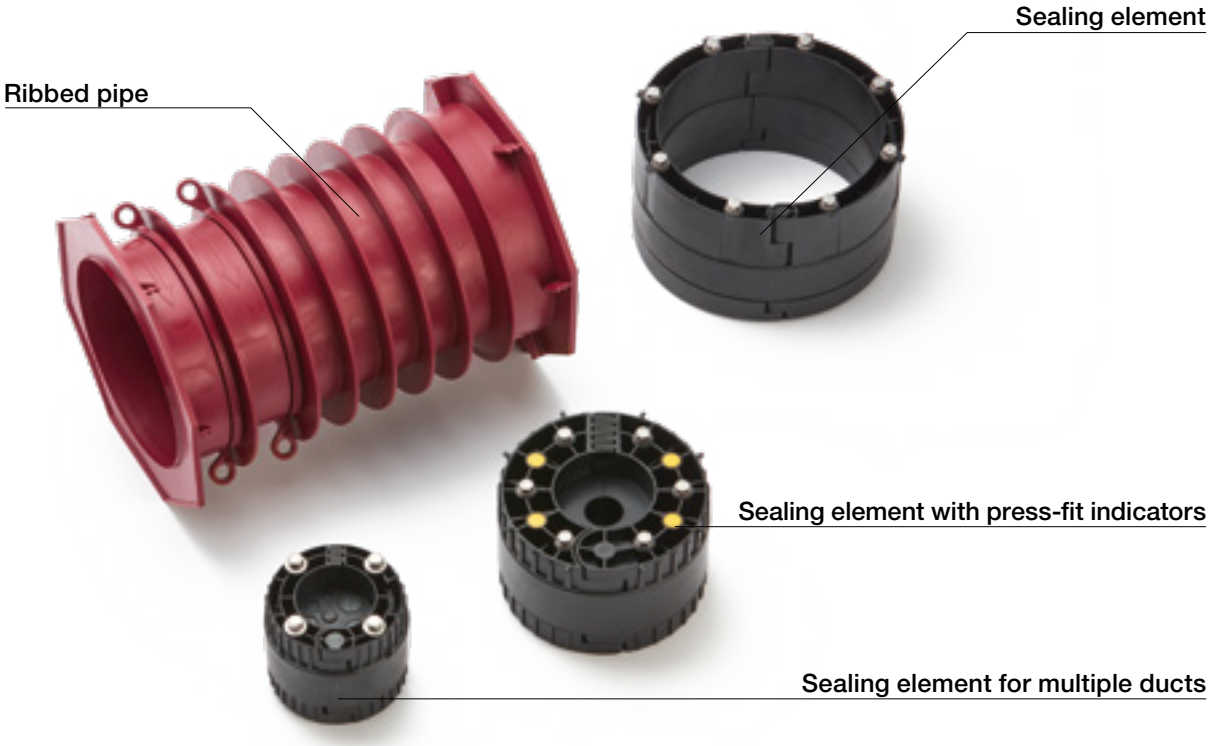
The data contained in the present manual are to help you to select our products for your purposes.
Texts and illustrations have been collated with utmost care. Nevertheless, errors cannot be ruled out entirely.
POLOPLAST cannot take any kind of responsibility for incorrect information and its consequences.
POLOPLAST shall be grateful for any suggestions for improvement.

For further information, please do not hesitate to contact our technical field service.
Or contact our head office at: +43 (0)732 / 38 86-0, office@poloplast.com

## 1.1 Pipe ducting system

**The POLO-RDS evolution cable and pipe ducting system is as well conceived as it is flexible. The smart details make planning easier and speed up installation work to ensure safe and leakproof ducting of cables and piping.**

- **Simple, smart, safe – POLO-RDS evolution**
  ensures that your building is securely sealed and comfy.
- **Ribbed pipe made of polypropylene**
  its tried and tested features ensure safe and easy installation.
- **Hinged sealing elements with onion skin structure**
  and innovative press-fit indicators ensure high levels of flexibility and secure sealing.
- **Quick and easy installation**
  due to clearly comprehensible working steps.
- **Sealed with certainty for the (building's) lifetime.**
- **Environmentally friendly, since PVC- and halogen-free**
  according to Austrian Baubook requirements.



## 1.2 Area of application

The POLO-RDS evolution cable and pipe ducting system ensures permanent leakproof ducting of cables and pipes through concrete walls, floor plates and ceilings into a building. It offers permanent effective protection from **water that is not under pressure**, e.g. surface and seepage water as well as from **water under pressure** like ground water or water coming off slopes with a **water column of up to 10 m (1 bar)** for example. Apart from this, POLO-RDS evolution provides effective protection from the **entry of gas**, like radon, for example, emanating from the ground.

POLO-RDS evolution is highly suitable for ducting **smooth-walled**, **shape-retaining** cables and pipes made from a wide variety of different materials. It is possible to seal medium line with a **diameter of 8–250 mm**.

## 1.3 Polypropylene material

The **ribbed pipe** is made of polypropylene material. This high-quality plastic has been tried and tested for many years in automotive technology, medical technology and in a number of industrial applications.

Polypropylene is an ecologically harmless material, which means that it is also used in the food industry. Polypropylene is **free from heavy metals, chlorides and CFCs**. Due to its outstanding properties, polypropylene is highly suitable for use in building construction and civil engineering.

## 1.4 Impermeability

### 1.4.1 Water leak testing

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MA 39 - 2005K023

Wien, 13. Jänner 2005

**Zusammenfassung der Dichtheitsprüfung des Rohrdurchführungssystems „POLO-RDS evolution" (siehe Untersuchungsbericht MA 39 – VFA 2004-1566.01)**

Die Dichtheitsprüfung des Rohrdurchführungssystems „POLO - RDS evolution" mit einem Lamellenrohr DN 100 mm erfolgte in Anlehnung an die ÖNORM B 3303 („Wassereindringtiefe").

Antragsgemäß wurden die Prüfkörper 14 Tage mit einem Wasserdruck von 1,5 bar beaufschlagt.

Während der gesamten Prüfdauer konnte an der Unterseite der Prüfkörper (drucklose Seite) kein Wasserdurchtritt erkannt werden.

Bei der anschließenden Spaltung der Prüfkörper wurden Wassereindringtiefen von 4,5 cm (bis zur 1. Lamelle) bzw. 10 cm (bis kurz nach der 2. Lamelle) in den Beton festgestellt.

An den Innenflächen der Lamellenrohre waren keinerlei Feuchtigkeitsspuren sichtbar.

Auf Grund der gleichen Geometrie der Lamellenrohre mit DN 200 mm können aus Sicht der MA 39 – VFA die Ergebnisse der Dichtheitsprüfung auch auf diese Dimension angewendet werden.

Der Sachbearbeiter:

Ing.H.Kurz
Techn.Amtsrat

Magistrat der Stadt Wien
Magistratsabteilung 39
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11, Rinnböckstraße 15
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Der Leiter der Versuchs- und Forschungsanstalt:

Dipl.Ing.W.Fleck
Senatsrat

DVR: 0000191 – SO 55

## 1.4.2 Gas leak testing

| ZF-Steyr Werkstofftechnik A-SQ | **Untersuchungsbefund** | Eingangs-datum : 24.5.2006 |
|---|---|---|

| **Benennung:** | **Auftraggeber:** |
|---|---|
| POLO - RDS-evolution Dichtelement | Hr. Schöller Fa.Poloplast |

| | |
|---|---|
| **Grund der Untersuchung:** | Radondichtheit soll beim POLO- RDS Dichtelement nachgewiesen werden. |
| **Erwünschte Prüfung:** | Nachweis der Radondichtheit mittels $H_2$-Spurentestgerät |

**1. Aufgabenstellung:**
Das POLO RDS Element wird zur Einführung erdverlegter Kabel und Rohrleitungen in Kellerräume von Wohnhäuser eingesetzt. Es muss seitens Kundenforderung in der Lage sein, „Radongas" Dichtheit von der Außenseite zur Rauminnenseite zu gewährleisten. Dazu ist erforderlich, dass die eingesetzten Dichtelemente materialmäßig in sich gasdicht sind.
Zur Überprüfung der Dichtheit bietet sich Wasserstoff als Prüfgas an, der nachfolgende Vorzüge aufweist:

- Volumenmäßig das kleinste Gas, welches in der Natur bekannt ist. Das Wasserstoffmolekül, das als Testgas eingesetzt wird, besitzt einen Molekülradius von 60 pm ( $60 \times 10^{-12}$ m ).
- Radon besitzt hingegen einen Atomradius laut Literatur von 120 pm bis134 pm und ist daher als doppelt so großes Gas wie Wasserstoff zu betrachten. Dieser Zusammenhang führt zur Überlegung, Wasserstoff anstelle von Radon als Prüfmittel zu verwenden.
- Sehr gute Detektierbarkeit infolge jahrelanger Erfahrung der Gerätehersteller von Lecktestgeräten.

**2. Eingesetzte Probe:**
Der POLO –RDS Dichtungsgummi besteht aus einer NBR- Mischung. ( Nitril-Butadien-Kautschuk )
Der Dichtgummi wurde auf die Stirnfläche eines Stahlzylinders angepresst. Die Verpressung erfolgt durch den Flanschring mit 4 Innbusschrauben. Die Messstelle liegt in der freigestellten Stirnfläche.
( siehe Anhang )

**3. Versuchsbeschreibung:**
An der Bodenseite des Zylinders wurde ein Anschluss für das Einleiten des Prüfgases angebracht. Als Prüfdruck wurde 0,2 bar, 0,5 bar und 1 bar Überdruck im Zylinder verwendet. Nach festgelegter Prüfdauer ( 10 min und 30 min ) wurde die Dichtstelle am Flansch und bei den Schrauben von außen mit dem Sensor abgefahren, wobei im Suchmodus nach Undichtheiten gesucht wurde und im Analysemodus die Leckage gemessen wurde. Das Gerät wurde zu Beginn mit Kalibriergas abkalibriert. Die Kalibrierung wurde am Ende der Prüfung wiederholt.

**4. Prüfergebnisse:**

| **Prüfdruck: gemessen:** | **0,2 bar nach 10 min** | **0,2 bar nach 30 min** | **0,5 bar nach 10 min** | **0,5 bar nach 30 min** | **1bar nach 10 min** | **1bar nach 30 min** |
|---|---|---|---|---|---|---|
| **Ergebnis der Durchlässigkeit** | 0 ppm $H_2$ | 0 ppm $H_2$ | 0 ppm $H_2$ | 0 ppm $H_2$ | 0 ppm $H_2$ | 0 ppm $H_2$ |

Das Messgerät ist laut Hersteller in der Lage, Wasserstoff- Gehalte von 0,5 ppm $H_2$ zu erkennen. Das bedeutet, dass Leckraten ab $5 \times 10^{-7}$ mbar l/s erfasst werden können.
**5: Anhang** ( auf Folgeseite )
**Messgerät, Probe, Zertifikat des Messgerätes.**

**6. Beurteilung:** Die Wasserstoff-„Gasdichtheit" des POLO-RDS Dicht-Elementes konnte im Druckbereich von 0,2 bis1 bar nachgewiesen werden. Da Radongas einen größeren Radius wie das Wasserstoffmolekül besitzt, ist anzunehmen, dass die erzielten Ergebnisse bei der Verwendung von Radon ebenfalls erreicht werden.
**Aufgrund der Prüfungen kann festgestellt werden, dass das Dichtelement POLO RDS evolution dicht gegen natürlich im Boden vorkommende Gase ist.**

| Datum erledigt: 22.6.2006 | Bearbeiter: Karrer / Haslinger | Unterschrift: A-SQ Kollruss |
|---|---|---|

ZF Steyr
Präzisionstechnik GmbH & Co KG
Schönauer Strasse 5, A-4400 Steyr

### 1.4.3 Ribbed pipe made of polypropylene

The ribbed pipe, which is made of polypropylene, is the basic element of the system. It is used in the formwork of concrete walls or in floor plates and ceilings and is concreted in. Intelligent product details combined with outstanding material properties (like immense rigidity and strength, high levels of impact strength and crack resistance and environmental compatibility) ensure optimum protection of the medium pipe. Sealing lips on the fixed flanges of the ribbed pipe combined with the spring element make possible perfect adaptation to the formwork and prevent laitance from penetrating when concreting. The nail holes in the flange make it possible to easily fix the ribbed pipe without any additional formwork aids. The ribs ensure pressure impermeability to the concrete. The stop edges ensure that the sealing elements are positioned correctly in the ribbed pipe. This means that the impermeability of 1.0 bar (water column of 10 m) is guaranteed when installing two sealing elements.

### 1.4.4 Sealing elements

The sealing elements ensure impermeability of the medium pipe and cable with the ribbed pipe or the core drilling. With the exception of DN 300, all the sealing elements are fitted with a hinged plastic compressible flange, which means that you can also retrofit them. The onion skin structure allows you to adapt the sealing area easily and flexibly. The sealing elements of the DN 150 are characterised by the patented yellow press-fit indicators that you can use multiple times. They are integrated into the external flange, which means that they make installation easy and safe, since they are pressed out of the flange as the compression increases. After this, use a torque wrench to tighten the bolts to 6 Nm.

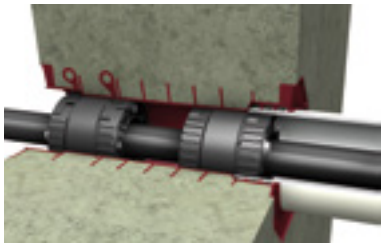
## 2.1 Ribbed pipe

The ribbed pipe is available in internal diameters of 100/150/200/300 with a standard overall length of 300 mm.

- Can be used in concrete walls, floor plates and ceilings
- Adjustment in the formwork or retrofitting in a recess are possible
- Impermeable to leachate and water under pressure at up to 1 bar (water column of 10 m)

### 2.1.1 Sealing blades

The sealing blades make possible optimum integration in concrete walls. The blades, which are at a slight angle, provide a great affinity with the concrete. In conjunction with correctly installed water-impermeable concrete, leakages of water under pressure can be safely prevented.



### 2.1.2 Shortening the ribbed pipe

As standard, the length of the ribbed pipe is designed for a wall thickness of 30 cm. For wall thicknesses of 25 cm and 20 cm, separation points are defined that make it possible to shorten the ribbed pipe without using cutting tools. The tear-off elements are fitted with two tabs that you can pull off around the circumference of the ribbed pipe using a carpenter's hammer, for example.

- Shortening without cutting tools
- Exact shortening to pre-defined overall lengths

### 2.1.3 Extending the ribbed pipe

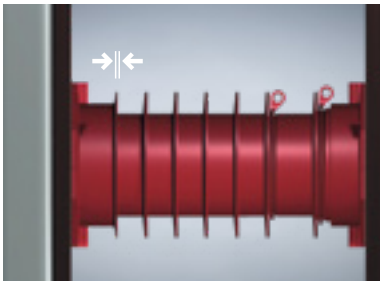
In the case of wall thicknesses greater than 30 cm, the extended ribbed pipe with an overall length of 600 mm is used. The polypropylene extension part that is welded tight to the ribbed pipe is cut to length on-site allowing an additional 5 mm for the spring element.

### 2.1.4 Wall flange and simple installation

The flanges are curved outwards. On the edges, they have a compression edge that is pressed onto the surface of the formwork when the ribbed pipe is braced. The anchor strips that are attached to the back of the flanges guarantee that they are held securely in the concrete. For easy installation, the wall flange has nail holes and axis markings. In the case of multiple arrangements, you can install the ribbed pipe flange to flange. When selecting concrete, pay attention to the quality and the maximum aggregate size to avoid honeycombing in these areas.

- Direct installation without formwork aids
- Optimum adaptation to uneven formwork
- Avoiding laitance in the ribbed pipe
- Multiple arrangements are possible:
  horizontally and vertically on a flange to flange basis

### 2.1.5 Spring element



The spring element in the form of a disc spring is a variable-length area of the ribbed pipe that is activated at bracing of the formwork walls.

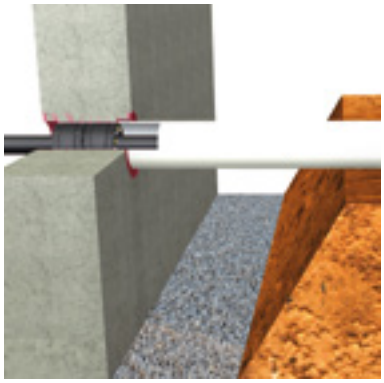
- Assimilation of formwork tolerances
- Optimum bracing in the formwork
- Safety from shifting when concreting
- Safety from floating when concreting

### 2.1.6 Positioning the sealing elements

The ribbed pipe has stop edges on the wall flanges. The stop edges ensure exact positioning of the sealing elements in the ribbed pipe. To do this, push the sealing elements into the ribbed pipe until the compressible flange is in contact with the stop edge on the wall flange.

## 2.1.7 Settlement protection

The excavation backfill is subject to natural settlement until the ground consolidates in its final position. Pipes, cables and leads cannot completely absorb these settlements, since their height is fixed in the area of the wall duct. As a result, these lines can be deformed, compressed and sheared. This means that the impermeability of the pipe ducting can be negatively affected.



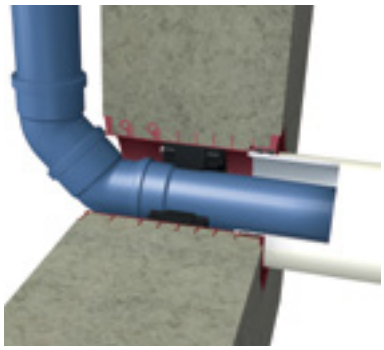
The settlement protection pipe prevents this:

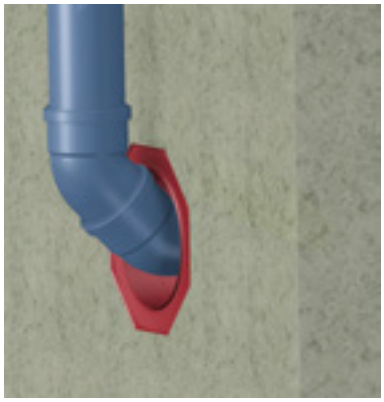
1. Insert the lip sealing ring of the plastic (PP or PVC) pipes into the beading integrated on the external wall flange
2. Cutting to length of the settlement protection pipe – measure the length of the pipe such that the working area of the building pit is bridged and at least 50 cm is in contact with the undisturbed ground
3. Push the medium pipe and cable through the settlement protection pipe and the ribbed pipe
4. Insert and bolt the sealing elements
5. Insert the settlement protection pipe all the way into the flange
6. Fill the excavation pit layer by layer with appropriate compression

The medium pipe and cable is located stress-free in the settlement protection pipe protected from deformation (ovalisation) caused by settlement and in this way plays an important part in providing permanently impermeable ducting.

## 2.1.8 Submersible pipe socket

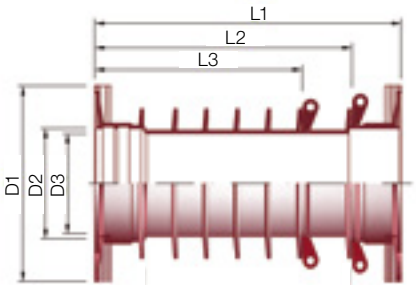
In general, the space that is available for rerouting the surface-mounted downpipe into the horizontal main is extremely tight. When routing the main through the basement wall, you have the option with the POLO-RDS evolution of fully inserting the pipe socket of the sewage pipe (up to DN/OD 200) into the ribbed pipe. This means that you can position the socket of the deflection elbow directly on the basement wall and integrate the downpipe in a space-saving way. In this installation situation, you should be aware that it is only possible to install one sealing element (see the illustration in point 4.1.7, Rerouting of downpipe, on page 28).

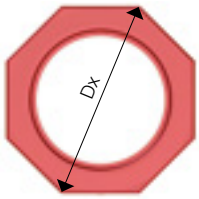




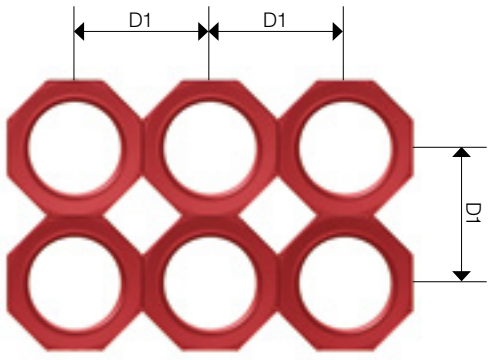
## 2.2 Technical data of ribbed pipe

| | |
|---|---|
| **Designation** | POLO-RDS evolution ribbed pipe |
| Material | Polypropylene |
| Dimensions | DN 100, DN 150, DN 200, DN 300 |
| Overall length | 300 mm, can be shortened using tear-off elements to 250 mm or 200 mm |
| Colour | Purple red, RAL 3004 |
| **Area of application** | Installation in concrete walls, floor plates and ceilings<br>External beading for linking of settlement protection<br>Multiple arrangement in flange to flange package |
| **Impermeability** | Impermeable to leachate and hydrostatic<br>water pressure of a water column of up to 10 m |
| **Temperature range** | –30 °C to +100 °C |
| **Installation temperature** | from 0 °C and above |




**Multiple arrangement of ribbed pipe**




Dimensions in mm

| Dimensions | A. no. | Overall length | L1 | L2 | L3 | D1 | D2 | D3 | Dx | Weight/kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **RDS ribbed pipe DN 100** | 01030 | 300 | 307 | 258 | 208 | 170 | 110 | 100 | 184 | 0.65 |
| **RDS ribbed pipe DN 150** | 01036 | 300 | 306 | 256 | 206 | 220 | 162 | 150 | 238 | 0.85 |
| **RDS ribbed pipe DN 200** | 01031 | 300 | 308 | 257 | 208 | 270 | 202 | 200 | 292 | 1.20 |
| **RDS ribbed pipe DN 300** | 01034 | 300 | 306 | 257 | 206 | 386 | 315 | 300 | 415 | 2.05 |

## 2.3 Sealing elements

Sealing elements ensure impermeability between the medium pipe(s) and cable(s) and the ribbed pipe or to the core drilling from leachate and from hydrostatic water pressure of up to 1 bar (a water column of 10 m) when two sealing elements are installed.

### 2.3.1 Means of functioning

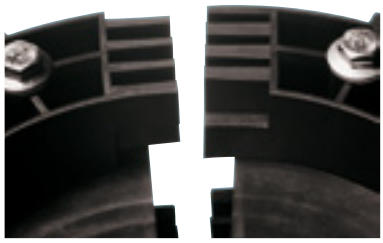
The plastic compressible flanges are pressed against one another by tightening the hexagon screws. The rubber seal that is between them is displaced to the side and seals outwards against the ribbed pipe or the core drilling and inwards against the ducted, smooth-walled, shape-retaining medium pipe. The screws are corrosion-resistant. The self-locking nuts are pressed into the rear compressible flanges.

Apart from this, dimension 150 sealing elements are fitted with patented yellow multi-use press-fit indicators in the external flange. They make installation much easier, since the indicators are pressed out of the flange in the case of appropriate compression. After this, you must use a torque wrench to tighten the bolts to 6 Nm.

The sealing elements are **not** suitable for absorbing longitudinal forces.

### 2.3.2 Hinged sealing element

All sealing elements of dimensions 100, 150 and 200 are of hinged design. The halves of the compressible flanges are fixed by means of an integrated latch that you can open by simply pulling them apart. This makes it possible to mount the sealing elements with cables that have already been ducted or with existing lines.



### 2.3.3 Press-fit indicators

Dimension 150 sealing elements are fitted with patented multi-use yellow press-fit indicators. They are integrated in the flange and make installation safe and easy due to the fact that they are visibly pressed out of the flange in the case of appropriate compression. After this, use a torque wrench to tighten the bolts to 6 Nm.
If you have to undo the sealing elements or disassemble them again, you can just push the press-fit indicators back into the flange. After this, tighten the screws again and repeat the procedure described before.

- Simpler, fast and safe installation
- Multi-use

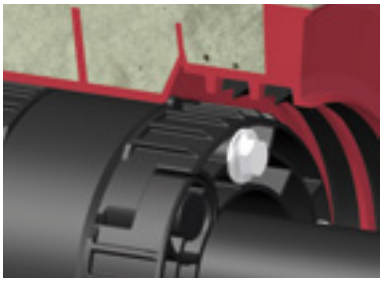
## 2.3.4 Onion skin structure

The onion skin structure allows you to cover a large sealing area with just one sealing element. This ensures the greatest possible level of flexibility on-site. You adjust the size of the opening to the medium pipe by folding back the sealing element and cutting or tearing off the corresponding onion-type seal.

- One sealing element for many dimensions
- Flexible, quick and easy to adapt

For detailed information about the sealing areas of sealing elements with onion skin structure, refer to point 2.4, Technical data of sealing elements, from page 16 onwards.

## 2.3.5 Stop lugs



The stop lugs on the external compressible flange ensure correct positioning of the sealing element in the ribbed pipe. You push the sealing elements all the way into the ribbed pipe. After this, tighten the bolts to 6 Nm. If you want to push the sealing elements in further, e.g. for installation in a core drilling, you can simply remove the stop lugs.

## 2.3.6 Core drilling

To retroactively duct pipes and cables in existing concrete walls, floor plates and ceilings, you have the option of using core drilling to make circular openings and, with the POLO-RDS evolution sealing element, to seal from leachate and water under pressure.

Generally, you must provide **two sealing elements** for sealing in core drillings.

Core drill bits with commercially available diameters of 100 mm, 150 mm, 200 mm or 300 mm are suitable for drilling the holes. The drilled hole must be smooth-walled. You must use suitable sealant to fill any possible uneven surfaces and fraying. If there is water under pressure, you must close the pores in the concrete surface using a suitable sealant.

Tolerance range of the drill diameter:

Dimensions in mm

| Sealing element | Tolerance range of core drilling |
|---|---|
| 2× DN 100 | 100–102 |
| 2× DN 150 | 150–152 |
| 2× DN 200 | 200–202 |
| 2× DN 300 | 300–302 |

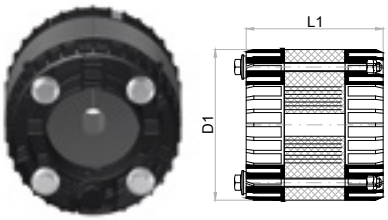
## 2.4 Technical data of sealing elements

### 2.4.1 DN 100 sealing elements

| | |
|---|---|
| **Designation** | POLO-RDS evolution sealing element |
| **Compressible flange** | |
| Design | split, hinged |
| Press-fit indicator | polypropylene |
| Threaded joint | stainless M6, A2 carriage bolts |
| Rubber seal | oil-resistant and gas-proof NBR |
| Colour | black |
| **Area of application** | All smooth-walled, shape-retaining medium pipes, cables and lines. Sealing elements are not suitable for absorbing longitudinal forces. |
| **Impermeability** | Impermeable to leachate and hydrostatic water pressure of 1 bar (water column of 10 m) |
| **Temperature range** | –30 °C to +100 °C |
| **Installation temperature** | from 0 °C and above |

**DN 100 sealing elements**

Dimensions in mm




| A. no. | DN/OD | Sealing area | L1 | D1 | kg/pc. |
|---|---|---|---|---|---|
| 01011 | 100 | 13–50 | 90 | 99 | 0.65 |
| 01014 | 100 | 52–58 | 90 | 99 | 0.50 |
| 01015 | 100 | 63 | 110 | 99 | 0.50 |
| 01010 | 100 | 8, 2 × 10, 12, 14, 16, 18 | 90 | 99 | 0.55 |
| 01020 | 100 | blank | 72 | 99 | 0.45 |

**Internal diameter of onion rings**

| Remove rings | A. no. 01011 sealing element 100 15–50 | | |
|---|---|---|---|
| | Ring internal ø | Medium pipe external ø | |
| 0 | 15 | 13–15 | |
| 1 | 20 | 16–20 | 3/8"–1/2" |
| 2 | 25 | 21–25 | 3/4" |
| 3 | 30 | 26–30 | |
| 4 | 35 | 31–35 | 1" |
| 5 | 40 | 36–40 | |
| 6 | 45 | 41–45 | |
| 7 | 50 | 46–50 | 6/4" |

### Number of sealing elements

| Sealing element | A. no. | Leachate | Water under pressure | Core drilling |
|---|---|---|---|---|
| DN 100 for DN/OD 13–50 | 01011 | 2* | 2 | 2 |
| DN 100 for DN/OD 52–58 | 01014 | 2* | 2 | 2 |
| DN 100 for DN/OD 63 | 01015 | 2* | 2 | 2 |
| DN 100 for DN/OD 8, 2 × 10, 12, 14, 16, 18 | 01010 | 1 | 2 | 2 |
| DN 100 blank sealing element | 01020 | 1 | 2 | 2 |

* for fixing the medium pipe and cable on an axially parallel basis

## 2.4.2 DN 150 sealing elements

**Designation** POLO-RDS evolution sealing element

**Compressible flange**

| | |
|---|---|
| Design | split, hinged |
| Material | Polyamide, fibre-glass-reinforced |
| Press-fit indicator | polypropylene, colour yellow |
| Threaded joint | stainless M6, A2 hexagon bolts |
| Rubber seal | oil-resistant and gas-proof NBR |
| Colour | black |

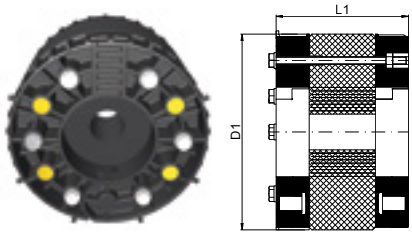
**Impermeability** Impermeable to leachate and hydrostatic water pressure of 1 bar (water column of 10 m) when installing two sealing elements

**Temperature range** –30 °C to +100 °C

**Installation temperature** from 0 °C and above

### DN 150 sealing elements

Dimensions in mm




| A. no. | DN/OD | Sealing area | L1 | D1 | kg/pc. |
|---|---|---|---|---|---|
| 01024 | 150 | 25–65 | 100 | 148 | 1.50 |
| 01025 | 150 | 70–90 | 100 | 148 | 1.20 |
| 01027 | 150 | blank | 110 | 148 | 1.50 |

Subject to technical alterations

# PRODUCT PERFORMANCE

### Internal diameter of onion rings

| Remove rings | A. no. 01024 sealing element 150 25–65 | | | A. no. 01025 sealing element 150 70–90 | | |
|---|---|---|---|---|---|---|
| | Ring internal ø | Medium pipe ø | | Ring internal ø | Medium pipe ø | |
| 0 | 27 | 25–27 | 3/4" | 72 | 70–72 | |
| 1 | 32 | 28–32 | 1" | 77 | 73–77 | 2 1/2" |
| 2 | 37 | 33–37 | | 82 | 78–82 | |
| 3 | 42 | 38–42 | 5/4" | 87 | 83–87 | |
| 4 | 47 | 43–47 | | 92 | 88–92 | 3" |
| 5 | 52 | 48–52 | 6/4" | | | |
| 6 | 57 | 53–57 | | | | |
| 7 | 62 | 58–62 | | | | |
| 8 | 67 | 63–67 | 2" | | | |

### Number of sealing elements

| Sealing element | A. no. | Leachate | Water under pressure | Core drilling |
|---|---|---|---|---|
| DN 150 for DN/OD 25–65 | 01024 | 2* | 2 | 2 |
| DN 150 for DN/OD 70–90 | 01025 | 2* | 2 | 2 |
| DN 150 blank sealing element | 01027 | 1 | 2 | 2 |

* for fixing the medium pipe and cable on an axially parallel basis

## 2.4.3 DN 150 5× 8–35 sealing element

**Designation** POLO-RDS evolution sealing element

**Compressible flange**

| | |
|---|---|
| Design | split, hinged |
| Material | powder-coated steel flange |
| Threaded joint | stainless M6, A2 hexagon bolts |
| Rubber seal | oil-resistant and gas-proof NBR |
| Colour | black |

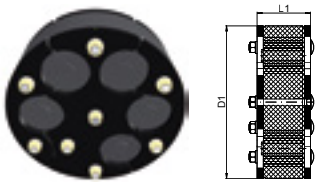
**Impermeability** Impermeable to leachate and hydrostatic water pressure of 1 bar (water column of 10 m) when installing two sealing elements.

**Temperature range** –30 °C to +100 °C

**Installation temperature** from 0 °C and above

### DN 150 5× 8–35 sealing element

Dimensions in mm




| A. no. | DN/OD | Sealing area | L1 | D1 | kg/pc. |
|---|---|---|---|---|---|
| 01023 | 150 | 5× 8–35 | 52 | 148 | 2.00 |

Subject to technical alterations

### Internal diameter of onion rings

| Remove rings | A. no. 01023 sealing element 150 5× 8–35 | | |
|---|---|---|---|
| | Ring internal ø | Medium pipe ø | |
| 0 | 10 | 8–10 | |
| 1 | 15 | 11–15 | |
| 2 | 20 | 16–20 | 3/8"–1/2" |
| 3 | 25 | 21–25 | 3/4" |
| 4 | 30 | 26–30 | |
| 5 | 35 | 31–35 | 1" |

### Number of sealing elements

| Sealing element | A. no. | Leachate | Water under pressure | Core drilling |
|---|---|---|---|---|
| DN 150 for 5× DN/OD 8–35 | 01023 | 1 | 2 | 2 |

## 2.4.4 DN 200 sealing elements

**Designation** POLO-RDS evolution sealing element

**Compressible flange**

| | |
|---|---|
| Design | split, hinged |
| Material | polyamide, fibre-glass-reinforced |
| Threaded joint | stainless M6, A2 hexagon bolts |
| Rubber seal | oil-resistant and gas-proof NBR |
| Colour | black |

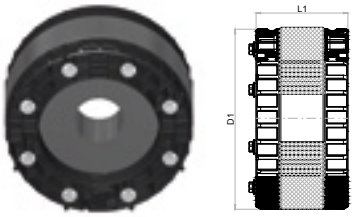
**Impermeability** Impermeable to leachate and hydrostatic water pressure of 1 bar (water column of 10 m) when installing two sealing elements.

**Temperature range** –30 °C to +100 °C

**Installation temperature** from 0 °C and above

### DN 200 sealing elements

Dimensions in mm




| A. no. | DN/OD | Sealing area | L1 | D1 | kg/pc. |
|---|---|---|---|---|---|
| 01012 | 200 | 50–125 | 100 | 199 | 2.60 |
| 01013 | 200 | 160 | 120 | 199 | 1.00 |
| 01021 | 200 | blank | 100 | 199 | 2.70 |

Subject to technical alterations

# PRODUCT PERFORMANCE

### Internal diameter of onion rings

| Remove rings | A. no. 01012 sealing element 200 50–125 | | |
|---|---|---|---|
| | Ring internal ø | Medium pipe ø | |
| 0 | 52 | 50–52 | 6/4" |
| 1 | 63 | 53–63 | 2" |
| 2 | 77 | 64–77 | 2 1/2" |
| 3 | 92 | 78–92 | 3" |
| 4 | 103 | 93–103 | |
| 5 | 114 | 104–114 | 3 1/2" |
| 6 | 125 | 115–125 | 4" |

### Number of sealing elements

| Sealing element | A. no. | Leachate | Water under pressure | Core drilling |
|---|---|---|---|---|
| DN 200 for DN/OD 50–125 | 01012 | 2* | 2 | 2 |
| DN 200 for DN/OD 50–125 | 01012 | 1 | 1** | 1** |
| DN 200 for DN/OD 160 | 01013 | 2* | 2 | 2 |
| DN 200 for DN/OD 160 | 01013 | 1 | 1** | 1** |
| DN 200 blank sealing element | 01021 | 1 | 2 | 2 |

* for fixing the medium pipe and cable on an axially parallel basis
** DN/OD 90/110/125/160 sewage pipe with slope up to 2 % m, impermeable up to 0.30 bar (water column of 3 m)

## 2.4.5 DN 300 sealing elements

**Designation** POLO-RDS evolution sealing element

**Compressible flange**

| | |
|---|---|
| Design | not split, not hinged |
| Material | polyamide, fibre-glass-reinforced |
| Threaded joint | stainless M6, A2 hexagon bolts |
| Rubber seal | oil-resistant and gas-proof NBR |
| Colour | black |

**Impermeability** Impermeable to leachate and hydrostatic water pressure of 1 bar (water column of 10 m) when installing two sealing elements.

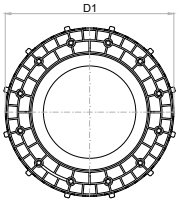
**Temperature range** –30 °C to +100 °C

**Installation temperature** from 0 °C and above

# PRODUCT PERFORMANCE

## DN 300 sealing elements

Dimensions in mm




| A. no. | DN/OD | Sealing area | L1 | D1 | kg/pc. |
|---|---|---|---|---|---|
| 01016 | 300 | 160 | 80 | 298 | 2.50 |
| 01017 | 300 | 200 | 80 | 298 | 2.00 |
| 01018 | 300 | 250 | 80 | 298 | 1.30 |
| 01022 | 300 | blank | 80 | 298 | 3.20 |

## Number of sealing elements

| Sealing element | A. no. | Leachate | Water under pressure | Core drilling |
|---|---|---|---|---|
| DN 300 for DN/OD 160 | 01016 | 2* | 2 | 2 |
| DN 300 for DN/OD 160 | 01016 | 1 | 1** | 1** |
| DN 300 for DN/OD 200 | 01017 | 2* | 2 | 2 |
| DN 300 for DN/OD 200 | 01017 | 1 | 1** | 1** |
| DN 300 for DN/OD 250 | 01018 | 2* | 2 | 2 |
| DN 300 for DN/OD 250 | 01018 | 1 | 1** | 1** |
| DN 300 blank sealing element | 01022 | 1 | 2 | 2 |

* for fixing the medium pipe and cable on an axially parallel basis
** DN/OD 160/200/250 sewage pipe with slope up to 2% m, impermeable up to 0.30 bar (water column of 3 m)

## 3.1 Programme overview

### POLO-RDS evolution DN 100 for 8–63 mm medium pipes and cables

**POLO-RDS evolution package DN 100 15-50 mm**
**Ribbed pipe of overall length 300 mm**
Pipe duct, complete, for 15–50 mm (1/2"–1 1/2") medium pipes and cables (PP ribbed pipe, DN 100 + 2× sealing elements 15–50 mm, hinged)

| Medium pipes and cables | A. no. |
|---|---|
| 15–50 mm | 01040 |

**POLO-RDS evolution ribbed pipe DN 100**
**Overall length 300 mm**
for 8–63 mm medium pipes and cables

| Medium pipes and cables | A. no. |
|---|---|
| 8–63 mm | 01030 |

**POLO-RDS evolution ribbed pipe DN 100**
**Overall length 600 mm**
for 8–63 mm medium pipes and cables
for wall thickness of 300–600 mm

| Medium pipes and cables | A. no. |
|---|---|
| 8–63 mm | 01070 |

**POLO-RDS evolution sealing element DN 100**
for 13–50 or 52–58 medium pipes and cables, hinged

| DN/OD 100 | |
|---|---|
| Medium pipes and cables | A. no. |
| 13–50 mm | 01011 |
| 52–58 mm | 01014 |

**POLO-RDS evolution sealing element DN 100**
for 63/2" medium pipe and cable, hinged

| Medium pipe and cable | A. no. |
|---|---|
| 63 mm/2" | 01015 |

**POLO-RDS evolution sealing element DN 100**
for multiple medium pipes and cables 8, 2 × 10, 12, 14, 16, 18 mm, hinged

| Medium pipes and cables | A. no. |
|---|---|
| 8, 2 × 10, 12, 14, 16, 18 mm | 01010 |

Subject to technical alterations

# OVERVIEW OF RANGE

**POLO-RDS evolution sealing element DN 100, blank**

| DN/OD | A. no. |
|---|---|
| 100 | 01020 |

## POLO-RDS evolution DN 150 for 8–90 mm medium pipes and cables

**POLO-RDS evolution package DN 150 25–65 mm**
**Ribbed pipe of overall length 300 mm**
Pipe duct, complete for 25–65 mm medium pipes and cables, with integrated press-fit indicators (PP ribbed pipe DN 150 + 2× 25–65 mm sealing elements, hinged)

| Medium pipes and cables | A. no. |
|---|---|
| 25–65 mm | 01046 |

**POLO-RDS evolution package DN 150 70–90 mm**
**Ribbed pipe of overall length 300 mm**
Pipe duct, complete for 70–90 mm medium pipes and cables, with integrated press-fit indicators (PP ribbed pipe DN 150 + 2× 70–90 mm sealing elements, hinged)

| Medium pipes and cables | A. no. |
|---|---|
| 70–90 mm | 01047 |

**POLO-RDS evolution ribbed pipe DN 150**
**Overall length 300 mm**
for 8–90 mm medium pipes and cables

| Medium pipes and cables | A. no. |
|---|---|
| 8–90 mm | 01036 |

**POLO-RDS evolution sealing element DN 150** for 25–65 mm medium pipes and cables, hinged with integrated press-fit indicators

| Medium pipes and cables | A. no. |
|---|---|
| 25–65 mm | 01024 |

**POLO-RDS evolution sealing element DN 150** for 70–90 mm medium pipes and cables, hinged with integrated press-fit indicators

| Medium pipes and cables | A. no. |
|---|---|
| 70–90 mm | 01025 |

Subject to technical alterations

# OVERVIEW OF RANGE

**POLO-RDS evolution sealing element DN 150**
for 5× 8–35 medium pipes and cables, hinged

| Medium pipes and cables | A. no. |
|---|---|
| 5× 8–35 | 01023 |

**POLO-RDS evolution sealing element DN 150, blank**
with integrated press-fit indicators

| DN/OD | A. no. |
|---|---|
| 150 | 01027 |

## POLO-RDS evolution DN 200 for 50–160 mm medium pipes and cables

**POLO-RDS evolution package DN 200 50–125 mm**
**Ribbed pipe of overall length 300 mm**
Pipe duct, complete for 50–125 mm medium pipes and cables
(PP ribbed pipe DN 200 + 2× 50–125 mm sealing elements, hinged)

| Medium pipes and cables | A. no. |
|---|---|
| 50–125 mm | 01041 |

**POLO-RDS evolution package DN 200 160 mm**
**Ribbed pipe of overall length 300 mm**
Pipe duct, complete for 160 mm medium pipe and cable
(PP ribbed pipe DN 200 + 1× 160 mm sealing element, hinged)

| Medium pipe and cable | A. no. |
|---|---|
| 160 mm | 01044 |

**POLO-RDS evolution ribbed pipe DN 200**
**Overall length 300 mm**
for 50–160 mm medium pipes and cables

| Medium pipes and cables | A. no. |
|---|---|
| 50–160 mm | 01031 |

**POLO-RDS evolution ribbed pipe DN 200**
**Overall length 600 mm**
for 50–160 mm medium pipes and cables
for wall thicknesses of 300–600 mm

| Medium pipes and cables | A. no. |
|---|---|
| 50–160 mm | 01073 |

Subject to technical alterations

# OVERVIEW OF RANGE

**POLO-RDS evolution sealing element DN 200**
for 50–125 mm medium pipes and cables, hinged

| Medium pipes and cables | A. no. |
|---|---|
| 50–125 mm | 01012 |

**POLO-RDS evolution sealing element DN 200**
element for 160 mm medium pipe and cable, hinged

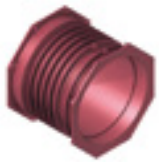
| Medium pipe and cable | A. no. |
|---|---|
| 160 mm | 01013 |

**POLO-RDS evolution sealing element DN 200, blank**

| DN/OD | A. no. |
|---|---|
| 200 | 01021 |

## POLO-RDS evolution DN 300 for 160–250 mm medium pipes and cables

**POLO-RDS evolution ribbed pipe DN 300**
**Overall length 300 mm**
for 160, 200 and 250 mm medium pipes and cables



| Medium pipes and cables | A. no. |
|---|---|
| 160, 200, 250 mm | 01034 |

**POLO-RDS evolution ribbed pipe DN 300**
**Overall length 600 mm**
for 160, 200 and 250 mm medium pipes and cables
for wall thicknesses of 300–600 mm

| Medium pipes and cables | A. no. |
|---|---|
| 160, 200, 250 mm | 01076 |

**POLO-RDS evolution sealing element DN 300**
for 160 mm medium pipe and cable, not split

| Medium pipe and cable | A. no. |
|---|---|
| 160 mm | 01016 |

Subject to technical alterations

# OVERVIEW OF RANGE

**POLO-RDS evolution sealing element DN 300**
for 200 mm medium pipe and cable, not split

| Medium pipe and cable | A. no. |
|---|---|
| 200 mm | 01017 |

**POLO-RDS evolution sealing element DN 300**
for 250 mm medium pipe and cable, not split

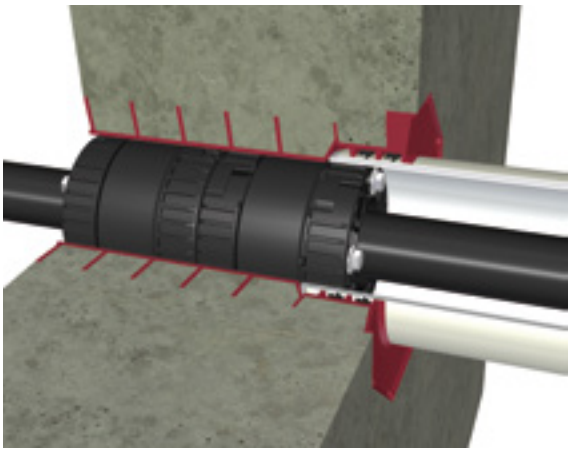
| Medium pipe and cable | A. no. |
|---|---|
| 250 mm | 01018 |

**POLO-RDS evolution sealing element DN 300, blank**

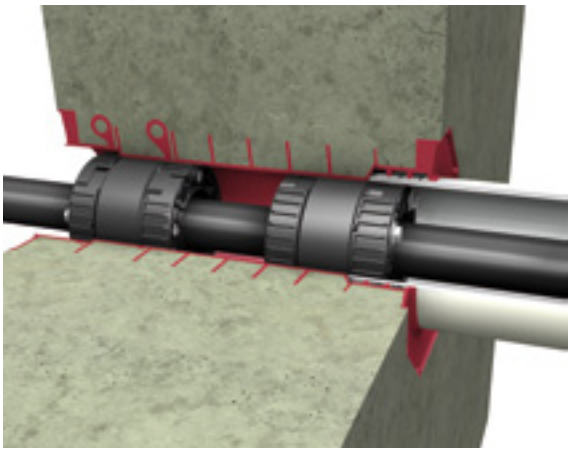
| DN/OD | A. no. |
|---|---|
| 300 | 01022 |

## 4.1 Installation examples

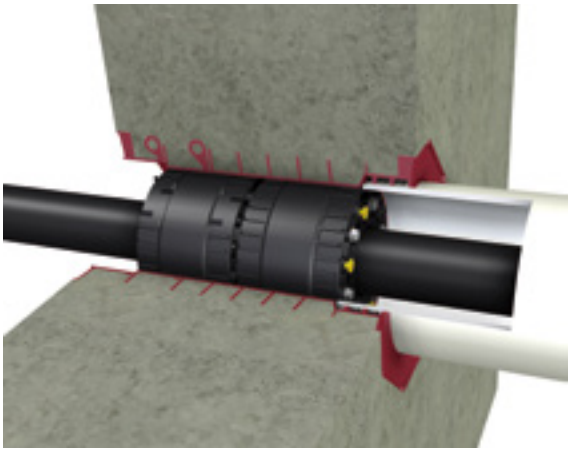
### 4.1.1 Wall thickness of 20 cm (25 cm)



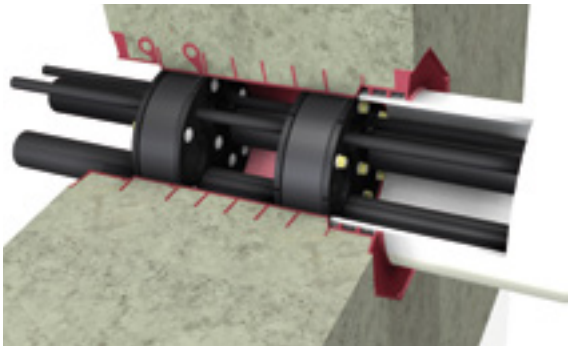
### 4.1.2 Wall thickness of 30 cm



### 4.1.3 Wall thickness of 30 cm, DN 150 with press-fit indicators

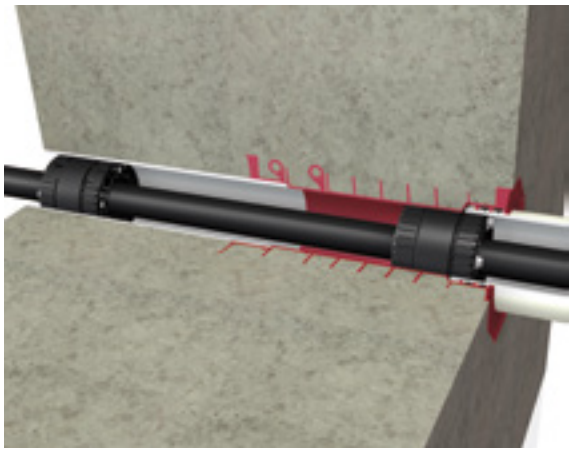


### 4.1.4 Wall thickness of 30 cm, DN 150 5× 8–35 mm

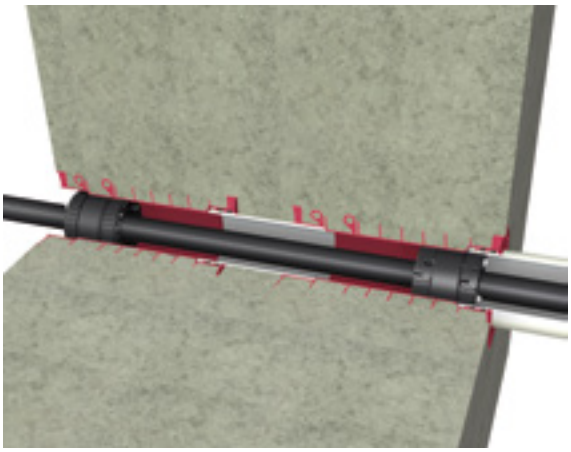


# INSTALLATION EXAMPLES

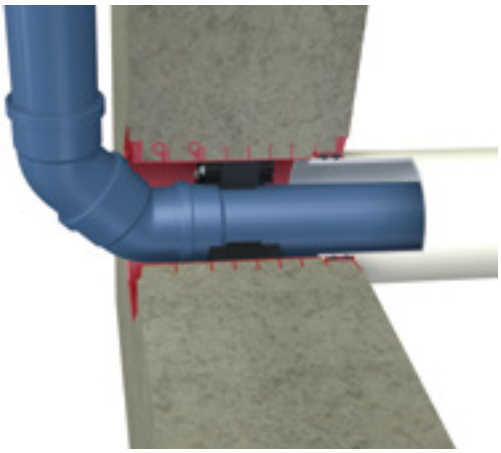
### 4.1.5 Wall thickness of > 30–60 cm

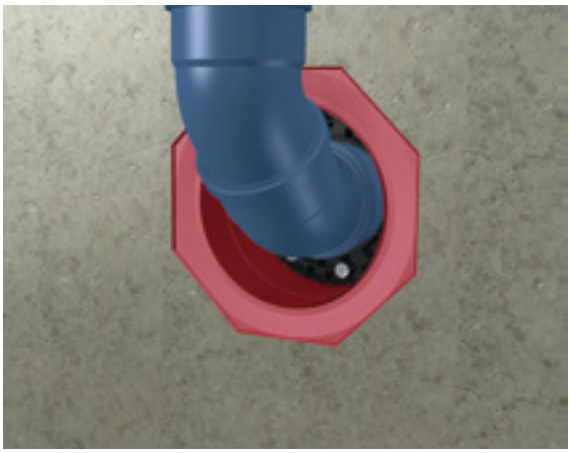


### 4.1.6 Wall thickness of > 60 cm



### 4.1.7 Rerouting of downpipe





# INSTALLATION EXAMPLES

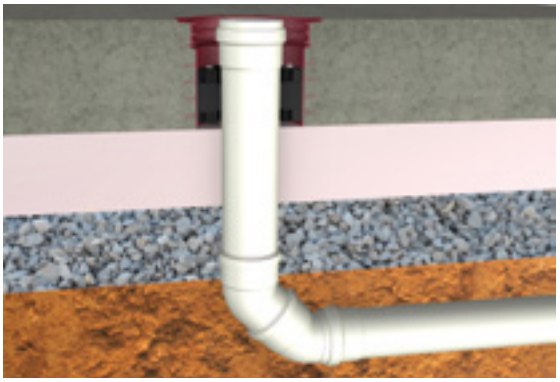
## 4.1.8 Installation in floor plate

The ribbed pipe is suitable for installation in the floor plate to duct the main on a groundwater- and gas-tight basis. When installed correctly, it is possible to seal the medium pipe and cable through the floor plate impermeable to **water under pressure and to gas** up to 0.30 bar (water column of 3 m) using only one sealing element.

If possible, we recommend using two sealing elements.

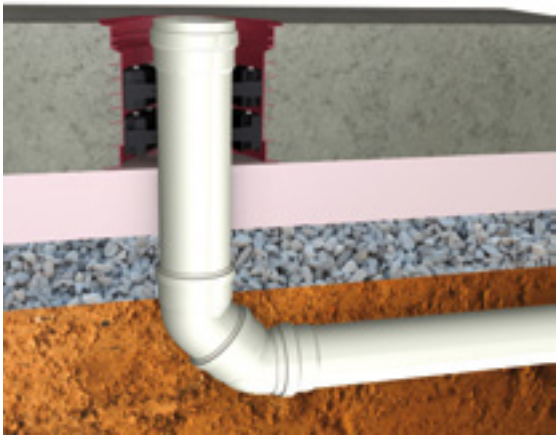
You must install and bolt the sealing element before carrying out concreting. Ideally, the downpipe is rerouted into the main by means of two 45 degree elbows.

### 4.1.8.1 20 cm floor plates, DN/OD 110 main, DN 200 ribbed pipe



### 4.1.8.2 30 cm floor plate, DN/OD 110 main, DN 200 ribbed pipe

### 4.1.8.3 30 cm floor plate, DN/OD 160 main, DN 300 ribbed pipe



## 4.2 Installation tools

### 4.2.1 Ribbed pipe

You can install the ribbed pipe by simply nailing it to the formwork.

It is possible to shorten the ribbed pipe for wall thicknesses of 20 cm and 25 cm using a carpenter's hammer, for example.

### 4.2.2 Sealing element

You remove the onion-type seal for the necessary medium pipe and cable diameter using a sharp knife or by simply tearing it off. Tighten the bolts using a 10 mm socket adapter, the short extension and a ratchet spanner with torque release.

## 5.1 Installation of ribbed pipe

### Description of normal application

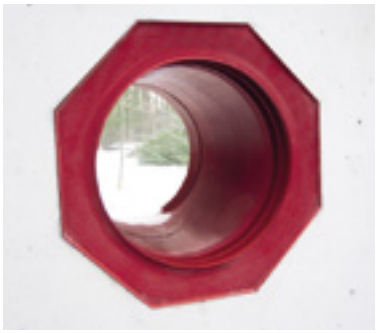
Mark the position of the pipe axis on the formwork wall.

On the wall flange, there are axis marks for positioning the ribbed pipe on the formwork.

Nail the ribbed pipe to the formwork wall.

Install the reinforcement.

Set up the second formwork wall and tighten the formwork anchor.



POLO-RDS evolution ribbed pipe concreted finish-concreted.

Shorten the ribbed pipe to a wall thickness of 20 cm or 25 cm by pulling off the tear-off elements.

With wall thicknesses of 30–60 cm, use the ribbed pipe with an overall length of 600 mm (A. no. 01070, 01073 or 01076).

## 5.2 Installation of DN 100 and DN 200 sealing elements with onion skin structure in ribbed pipe

Push the medium pipe and cable through the concreted-in ribbed pipe.

Fold back the sealing element and pull out the onion rings.

Cut the onion rings and tear them off.

Fold the sealing element over the medium pipe and cable and push it all the way into the ribbed pipe. As an alternative, you can install both sealing elements from the inside. To do this, pinch off the stop lugs on the first sealing element and push it into the ribbed pipe.

Tighten the screws in the diagonally opposite sequence in several passes. 6 Nm tightening torque.

## 5.3 Installation of DN 150 sealing elements with press-fit indicators and onion skin structure

Push the medium pipe and cable through the concreted-in ribbed pipe.

Fold back the sealing element. If required, pull out the onion rings, cut them and tear them off.

Fold the sealing element over the medium pipe and cable and push it all the way into the ribbed pipe. As an alternative to this, you can install both sealing elements from the inside. To do this, pinch off the stop lugs on the first sealing element and push it into the ribbed pipe. After this, proceed as described above.

Tighten the screws in the diagonally opposite sequence in several passes. Start with the screws on the separation mechanism.

Once all the yellow press-fit indicators have been pressed out …

… use a torque wrench to tighten the screws to 6 Nm.

## 5.4 Installation of multiple DN 150 5× 8–35 mm sealing element

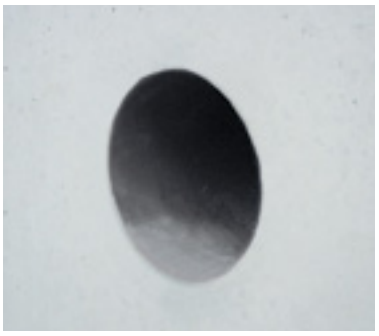
Push the medium pipes and cables through the concreted-in ribbed pipe.

Fold back the sealing element. If required, pull out the onion rings, cut them and tear them off.

Fold the sealing element over the medium pipes and cables and push it to the stop edge into the ribbed pipe. As an alternative to this, you can push in both sealing elements from the inside.

Tighten the screws in the diagonally opposite sequence in several passes. Start with the two screws in the middle. After this, use a torque wrench to tighten the screws to 6 Nm.

## 5.5 Installation of sealing elements in core drilling

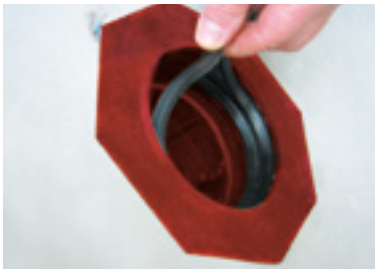


Drill core drillings with a diameter of 100 mm, 150 mm, 200 mm or 300 mm. Tolerance of –0/+2 mm. You may have to retreat the cut surface. In general, install **two sealing elements** per core drilling.

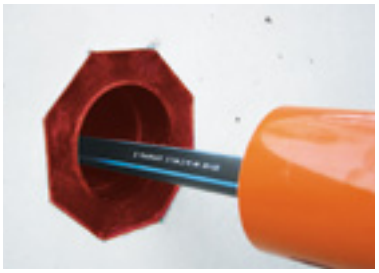
Install the sealing element as described above. For flush installation, nip off the stop lugs.

Tighten the screws in the diagonally opposite sequence in several passes with 6 Nm tightening torque.

## 5.6 Settlement protection



On the building side, insert lip sealing rings into the two beadings of the ribbed pipe.



Push the medium pipe and cable through the settlement protection pipe and the ribbed pipe.

Fold the sealing element over the medium pipe and cable and push it all the way into the ribbed pipe.

Tighten the screws in the diagonally opposite sequence in several passes with 6 Nm tightening torque.

Insert the settlement protection pipe into the ribbed pipe.

In the case of DN/OD 160 or 200 sewage pipes, use a DN/OD >/= 250 settlement protection pipe; in the case of 250 mm medium pipe and cable, provide a settlement protection pipe >/= DN/OD 315; establish supports in the area of the outer basement wall.

## 6.1 Text for tenders

POLO-RDS evolution pipe ducting system

### POLO-RDS evolution ribbed pipe

Ribbed pipe made of polypropylene for horizontal or vertical installation in walls, ceilings and floor plates. Nominal diameter DN 100/150/200/300, for flush formwork installation, standard length 300 mm or 600 mm (except for DN 150). Tear-off elements for quick and easy adaptation to wall thicknesses of 25 or 20 cm. Possibility of extending using plastic sewage pipes. Nail holes integrated in the external flange for installation on the formwork as well as a socket with two beadings for holding the settlement protection pipe. Spring element for assimilation of formwork tolerances. Stop edge for exact positioning of the sealing elements. Multiple flange-to-flange arrangement possible.

Minimum axis spacing of multiple arrangement: DN 100: 17 cm
DN 150: 22 cm
DN 200: 27 cm
DN 300: 38 cm

### POLO-RDS evolution sealing elements

Sealing elements with a compressible flange made of fibre-glass-reinforced polyamide
of dimensions 100/150/200/300 mm, hinged (except for DN 300)
In the case of DN 150, with press-fit indicators integrated in the flange
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)

Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 100–102 mm
DN 150: 150–152 mm
DN 200: 200–202 mm
DN 300: 300–302 mm

Installation according to manufacturer's guidelines

### POLO-RDS evolution pipe ducting system DN 100 15-50 mm package

Pipe duct, complete, consisting of 1 ribbed pipe and 2 sealing elements for 15–50 mm (1/2"–1 1/2") medium pipes and cables, manufactured by POLOPLAST, POLO-RDS evolution

### Polypropylene ribbed pipe

Impermeable to water under pressure up to 1 bar (water column of 10 m)
Suitable for holding medium pipes and cables from 8–250 mm
Overall length 300 mm, tear-off elements for adapting to wall thicknesses of 25 cm or 20 cm
Nominal diameter DN 100/150/200/300
Suitable for multiple flange-to-flange arrangement

# TEXT FOR TENDERS

### Polypropylene ribbed pipe of overall length 600 mm
Impermeable to water under pressure up to 1 bar (water column of 10 m)
Suitable for holding medium pipes and cables from 8–250 mm
Overall length 600 mm, nominal internal diameter DN 100/200/300
Suitable for multiple arrangement
Mounting length 300–600 mm, can be shortened
Suitable for multiple flange-to-flange arrangement

### DN 100 sealing element for 15–50 mm medium pipes and cables
Seal with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight with onion skin structure
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 100–102 mm

### DN 100 sealing element for 52–58 mm medium pipes and cables
Sealing element with compressible flanges made of glass fibre-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 100–102 mm

### DN 100 sealing element for 63 mm medium pipe and cable
Sealing element with compressible flanges made of glass fibre-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Multiple arrangement possible, since 8, 2 × 10, 12, 14, 16, 18 mm
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 100–102 mm

### DN 100 sealing element, multiple ducting for 8–18 mm medium pipes and cables
Sealing element with compressible flanges made of glass fibre-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Multiple arrangement possible, since 8, 2 × 10, 12, 14, 16, 18 mm
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 102 mm

### DN 100 blank sealing elements
Sealing element with compressible flanges made of glass fibre-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 102 mm

### DN 150 sealing element for 25–65 mm medium pipes and cables
Sealing element with compressible flanges made of fibre-glass-reinforced polyamide, hinged
With flange-integrated, yellow press-fit indicators
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 150: 150–152 mm

# TEXT FOR TENDERS

### DN 150 sealing element for 70–90 mm medium pipes and cables
Sealing element with compressible flanges made of glass fibre-reinforced polyamide, hinged
With press-fit indicators integrated in the flange
Rubber seal made of NBR material oil-resistant and gas-tight with onion skin structure
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 150: 152 mm

### DN 150 sealing element for 5× 8–35 mm diameter medium pipes and cables
Sealing element with powder-coated stainless steel compressible flange, hinged
Rubber seal made of NBR material oil-resistant and gas-tight with 5× onion skin structure
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 150: 152 mm

### DN 150 blank sealing element
Sealing element with compressible flanges made of fibre-glass-reinforced polyamide
With press-fit indicators integrated in the flange
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight to 1 bar or water column of 10 m
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 150: 152 mm

### DN 50 sealing element for 50–25 mm medium pipes and cables
Seal with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight with onion skin structure
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 200: 200–202 mm

### DN 200 sealing element for 160 mm medium pipe and cable
Sealing element with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight,
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for ducting of sewage pipes with slope of up to 2 % – impermeability up to 0.30 bar (water column of 3 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 200: 202 mm

### DN 200 blank sealing element
Sealing element with compressible flanges made of fibre-glass-reinforced polyamide
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 200: 202 mm

### DN 300 sealing element for 160 mm medium pipe and cable
Sealing element with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight, with onion skin structure
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for ducting of sewage pipes with slope of up to 2 % – impermeable up to 0.30 bar (water column of 3 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 300: 300–302 mm

# TEXT FOR TENDERS

### DN 300 sealing element for 200 mm medium pipe and cable

Sealing element with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for ducting of sewage pipes with slope of up to 2 % – impermeability up to 0.30 bar (water column of 3 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 300–302 mm

### DN 300 sealing element for 250 mm medium pipe and cable

Sealing element with compressible flanges made of fibre-glass-reinforced polyamide, hinged
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for ducting of sewage pipes with slope of up to 2 % – impermeability up to 0.30 bar (water column of 3 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 300–302 mm

### DN 300 blank sealing element

Sealing element with compressible flanges made of fibre-glass-reinforced polyamide
Rubber seal made of NBR material, oil-resistant and gas-tight
Pressure-tight up to 1 bar (water column of 10 m)
Suitable for installation in core drillings: Tolerance of drilled hole diameter: DN 100: 300–302 mm

# NOTES

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