



## PRODUCTS CATALOGUE

SPACERS (SLIDING), END SEALS  
AND SEALING OF INSTALLATION PASSAGES,  
CLAMP CONNECTORS FOR PE PIPES

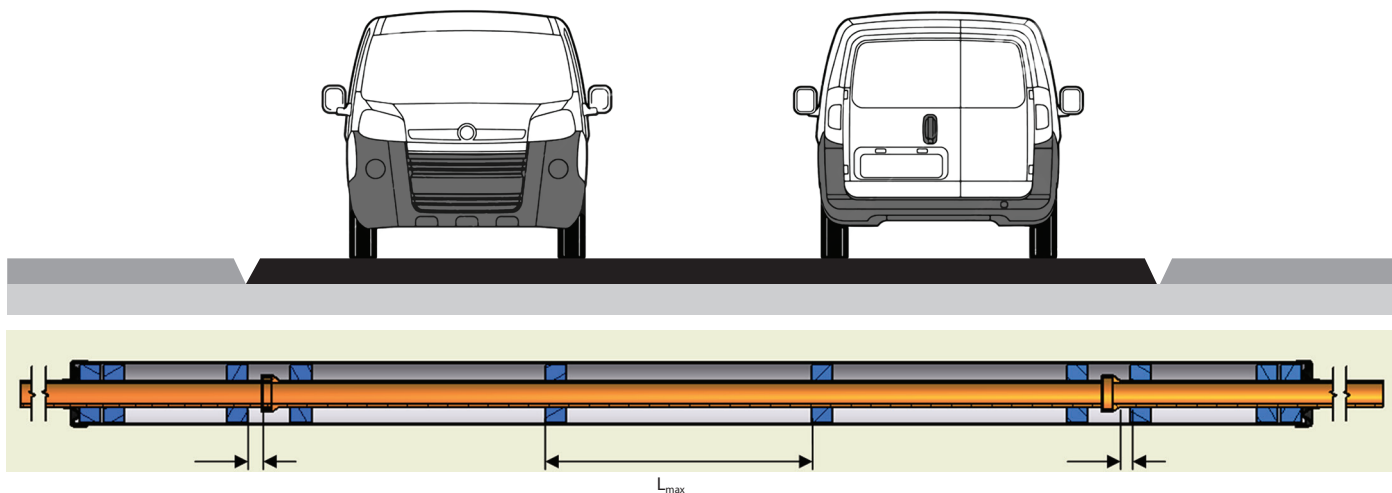
ver. 1/2018



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Picture 1. Road crossing

AKWEDUKT casing spacers are used for inserting carrier pipes into casings.

Our products are made of high-quality heavy duty material (PEHD, PEMD, PELD, POM). We offer different spacer systems which address a wide range of pipe sizes and weights and are designed to meet the needs of pipeline design and construction businesses.

Our end seals are an easy, time-saving and safe method of sealing casing ends. AKWEDUKT casing spacer and end seal system is the perfect solution for pipeline intersections, road crossings etc. It provides maximum protection in areas where a pipeline passes under or is buried beneath an obstruction.

Certificates and approvals:

- Technical Recommendation ITB RT ITB-1174/2015 issued by the Construction Technology Institute ("Instytut Techniki Budowlanej") in Warsaw.
- National Technical Assessment ITB-KOT-2018/0433 Edition 1
- Technical Approval ITB AT-15-8516 / 2016
- Hygienic certificate No HK/W/0881/01/2015 issued by the National Institute of Public Health - State Institute of Hygiene in Warsaw (applies to PE pipe fittings)
- „BC” spacer system: Utility Model Protection Certificate No 64539 issued by the Patent Office of the Republic of Poland
- „a-NTplus” and „A-NT” “spacers systems: application for the EU Community utility model No RCD 2669382
- „B-NT” spacer systems: application for the EU Community utility model No RCD2695734
- „C” spacer systems: application for the EU Community utility model No RCD2690883
- „C” spacer system: Patent application No P-408226, Patent Office of the Republic of Poland (WIPO ST 10/C PL 408226)
- End seals: Utility Model Protection Certificate No 64538

## We offer the following spacer systems...

- |                  |                  |
|------------------|------------------|
| 1. „a - 60”      | 8. „A - NT”      |
| 2. „a - 120”     | 9. „BA”          |
| 3. „a - NT”      | 10. „BC”         |
| 4. „a - NT plus” | 11. „B - NT”     |
| 5. „a - NT RED”  | 12. „B - NT RED” |
| 6. „A”           | 13. „CA”         |
| 7. „A + P”       | 14. „C”          |

**We deliver our spacers as ready-to-install spacer rings/belts.  
Only the “A” system spacers are designed to be assembled by the end user.**

AKWEDUKT pipeline spacer systems are divided into 3 groups – MINI, MIDI, MAXI, depending on the load carrying capacities.

### MINI

- „a-60” – for carrier pipes between  $\varnothing$  20 and  $\varnothing$  150, maximum static load per spacer ring up to 120 kg
- „a-120” – for carrier pipes between  $\varnothing$  100 and  $\varnothing$  300, maximum static load per spacer ring up to 250 kg
- „a-NT” – for carrier pipes between  $\varnothing$  80 and  $\varnothing$  350, maximum static load per spacer ring up to 300 kg
- „a-NT plus” – for carrier pipes between  $\varnothing$  80 and  $\varnothing$  350, maximum static load per spacer ring up to 250 kg for  $h \leq 40$  mm, and maximum static load per spacer ring up to 200 kg for  $h > 40$  mm
- „A” – for carrier pipes between  $\varnothing$  80 and  $\varnothing$  300, maximum static load per spacer ring up to 200 kg (for on-site assembly by the end user)
- „A+P” – it is an extension of the a system, „A”, for carrier pipes between  $\varnothing$  150 and  $\varnothing$  300, maximum static load per spacer ring up to 200 kg

### MIDI

- „A-NT” – for carrier pipes between  $\varnothing$  100 and  $\varnothing$  500, maximum static load per spacer ring up to 500 kg.
- „BA” – for carrier pipes between  $\varnothing > 350$ , maximum static load per spacer ring up to 1000 kg

### MAXI

- „BC” – for carrier pipes between  $\varnothing > 400$ , maximum static load per spacer ring up to 1500 kg for  $h > 80$  mm, and maximum static load per spacer ring up to 1800 kg for  $h \leq 80$  mm
- „B-NT” – for carrier pipes between  $\varnothing > 350$ , maximum static load per spacer ring up to 1500 kg
- „CA” – for carrier pipes between  $\varnothing > 500$ , maximum static load per spacer ring up to 2500 kg
- „C” – for carrier pipes between  $\varnothing > 500$ , maximum static load per spacer ring up to 2500 kg

### SPECIAL APPLICATIONS

- „a-NT RED” – for carrier pipes between  $\varnothing$  150 and  $\varnothing$  500, maximum static load per spacer ring up to 800 kg
- „B-NT RED” – for carrier pipes between  $\varnothing > 350$ , maximum static load per spacer ring up to 2000 kg
- Steel Spacers

### CHOOSING A SPACER

1) Minimum spacer height „ $h_{min}$ ”: the distance between the carrier pipe OD or carrier pipe bell/flange and the casing should be between 5 and 15 mm.

$$H_{min} = OD + (10 \text{ mm} \div 30 \text{ mm}) \text{ [mm]}$$

2) Maximum spacer height „ $h_{max}$ ”: the clearance between casing and spacer ring should be at least 20 mm.

$$H_{max} = \frac{ID - OD}{2} - \min. 20 \text{ mm [mm]}$$

The greater the clearance, the easier the insertion of the carrier pipe.

### We recommend:

- installing two rings of spacers next to each other at the end as well as at the front of the casing.
- for bell mouth pipes we recommend installing one ring of spacers directly behind the bell and one ring directly before the bell.

### Distance between spacer rings

- The maximum distance between spacer rings depends on the maximum load per ring and the medium in the carrier pipe. We usually recommend a distance of 0,8 to 2,0 m.

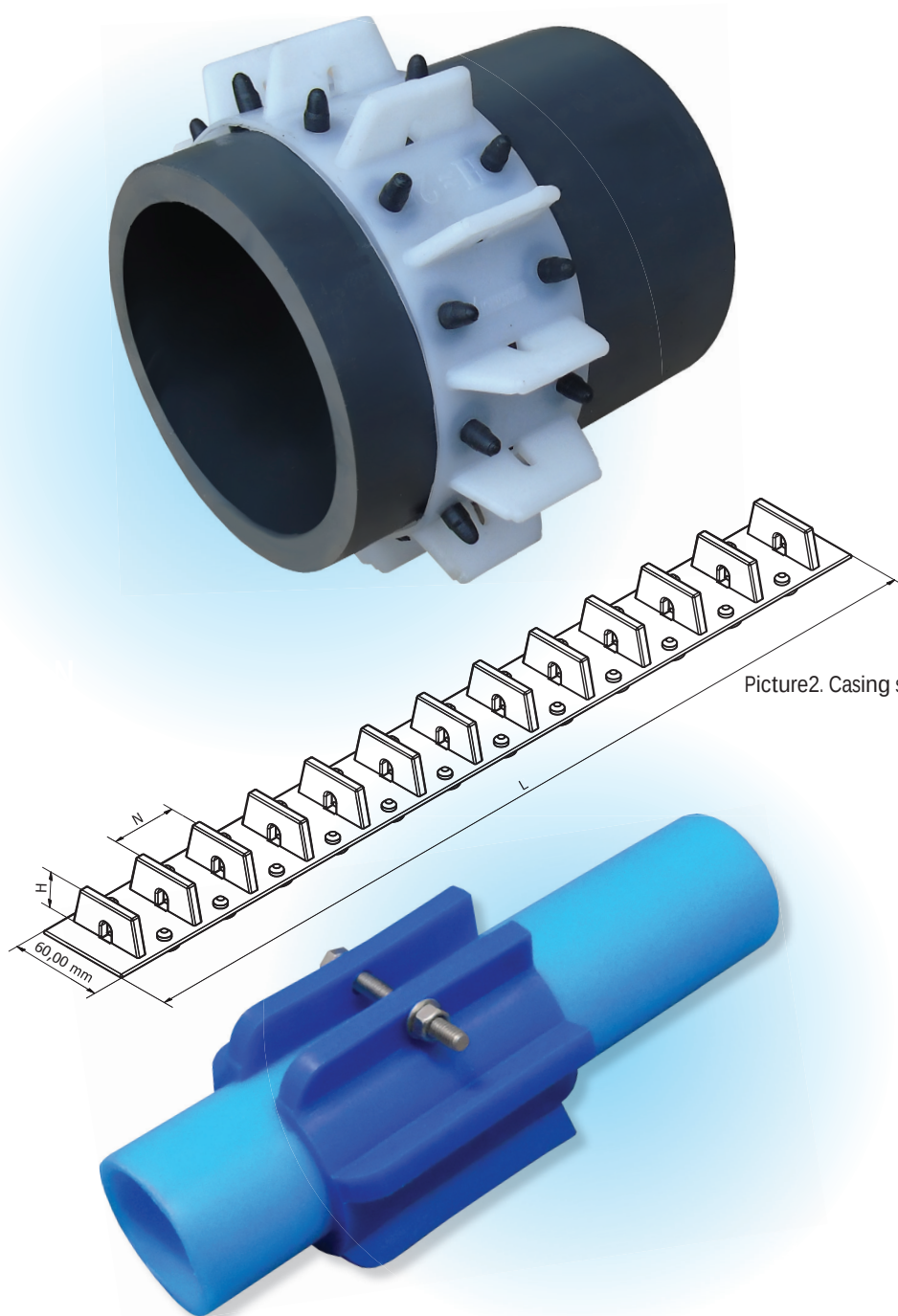
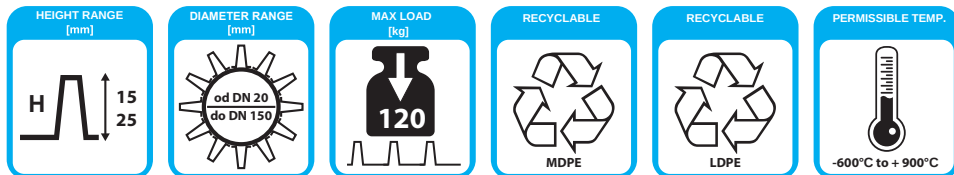
The pipe manufacturer or the pipeline designer may recommend a different distance.

Most important aspects of calculating the distance between spacers are safety and proper function of the pipeline.



## TYPE „a-60 ”

**ASSEMBLY:** „a-60” spacers can be manufactured as a single-element or multi-element version. Fasten the spacers around the pipe using stainless steel or zinc-coated screws or plastic elements. A multi-element spacer can be obtained by heat sealing single-elements.



Picture2. Casing spacers type „a-60 ”

### „a-60” spacer selection chart

| NO. | Diameter range DZ [mm] | Number of spacers per one ring |
|-----|------------------------|--------------------------------|
| 1   | ø 35÷46                | 4                              |
| 2   | ø 47÷59                | 5                              |
| 3   | ø 60÷70                | 6                              |
| 4   | ø 71÷81                | 7                              |
| 5   | ø 82÷94                | 8                              |
| 6   | ø 95÷105               | 9                              |
| 7   | ø 106÷116              | 10                             |
| 8   | ø 117÷129              | 11                             |
| 9   | ø 130÷141              | 12                             |
| 10  | ø 142÷152              | 13                             |
| 11  | ø 153÷163              | 14                             |

Spacers for further diameter ranges available on request.

### Selection table for single-element spacers type „a-60” - „clip”

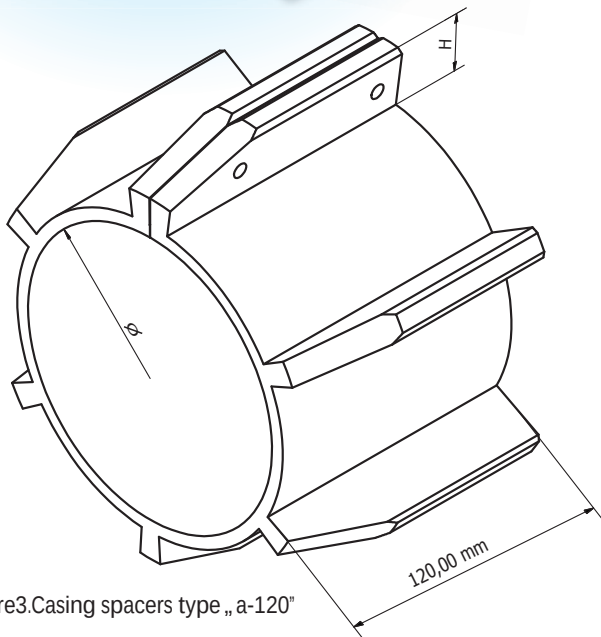
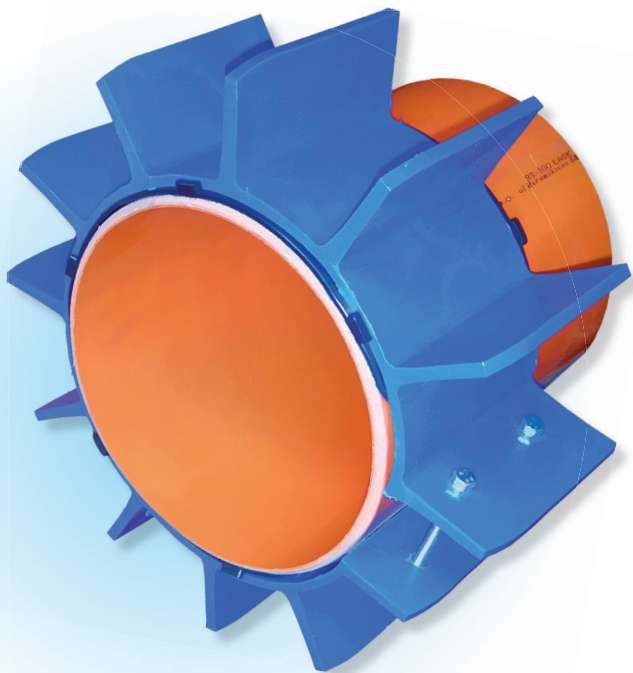
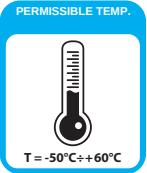
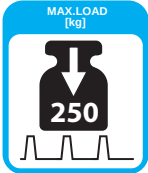
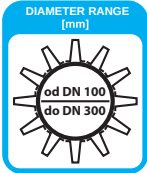
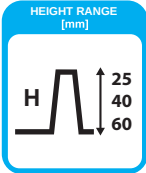
| NO. | Diameter range DZ[mm] | Number of spacers per one ring |
|-----|-----------------------|--------------------------------|
| 1   | ø 25÷30               | 1clip                          |
| 2   | ø 31÷36               | 1clip                          |
| 3   | ø 37÷46               | 1clip                          |
| 4   | ø 47÷58               | 1clip                          |
| 5   | ø 59÷69               | 1clip                          |

Height from H=16mm to H=33mm, N=36mm



TYPE „a-120 ”

**ASSEMBLY:** „a-120”spacers can be manufactured as a single-element or multi-element version. Fasten the spacers around the pipe using stainless steel or zinc-coated screws or plastic elements. A multi-element spacer can be obtained by heat sealing single-elements or joining them using screws.

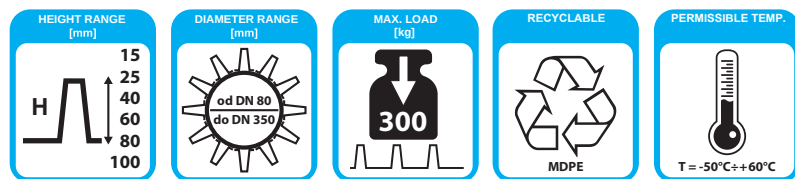


Picture3.Casing spacers type „a-120”

| „a-120”spacer selection chart                             |                        |                                |
|-----------------------------------------------------------|------------------------|--------------------------------|
| NO.                                                       | Diameter range DZ [mm] | Number of spacers per one ring |
| 1                                                         | ø 105÷121              | 7                              |
| 2                                                         | ø 122÷139              | 8                              |
| 3                                                         | ø 140÷155              | 9                              |
| 4                                                         | ø 156÷172              | 10                             |
| 5                                                         | ø 173÷188              | 11                             |
| 6                                                         | ø 189÷205              | 12                             |
| 7                                                         | ø 206÷222              | 13                             |
| 8                                                         | ø 223÷240              | 14                             |
| 9                                                         | ø 241÷256              | 15                             |
| 10                                                        | ø 257÷273              | 16                             |
| 11                                                        | ø 274÷291              | 17                             |
| 12                                                        | ø 292÷309              | 18                             |
| 13                                                        | ø 310÷325              | 19                             |
| 14                                                        | ø 326÷342              | 20                             |
| 15                                                        | ø 343÷360              | 21                             |
| Spacers for further diameter ranges available on request. |                        |                                |

## TYPE „a-NT”

**ASSEMBLY:** assembling the spacers of a-NT system consists in tightening the ring on the pipe by means of fasteners (steel or plastic). The multi-element version is made by connecting several basic elements.

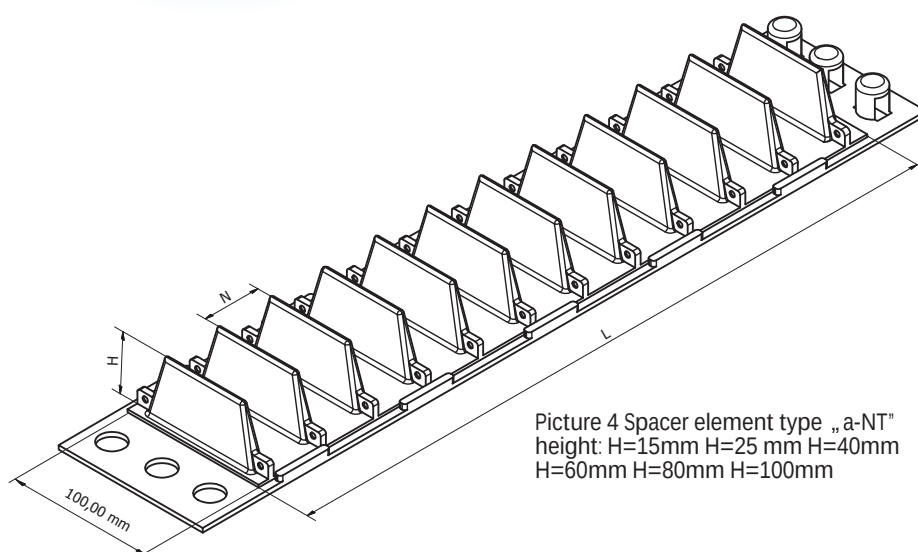
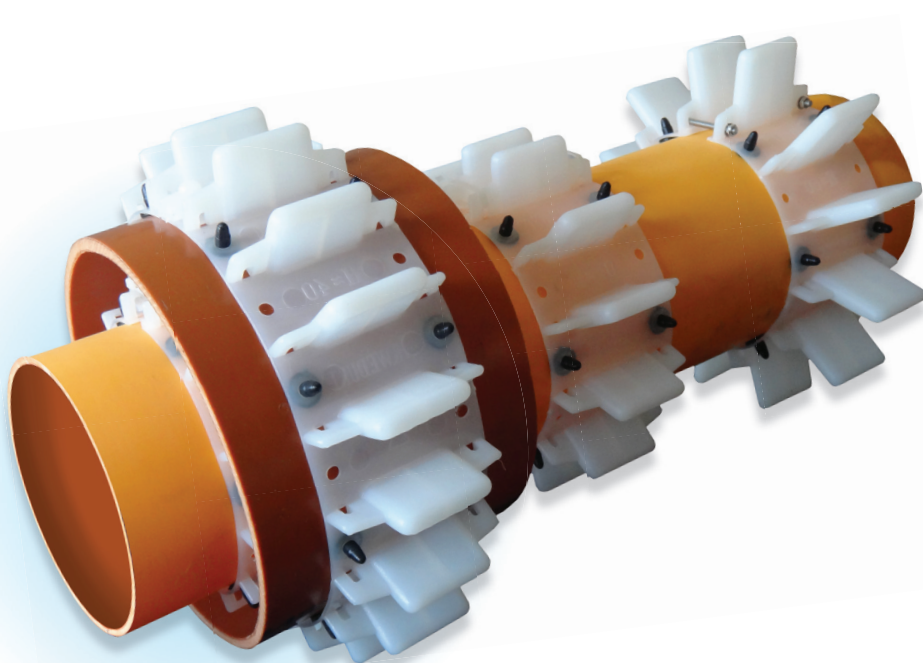


„a-NT” spacer selection chart

| NO. | Diameter range DZ [mm] | Number of spacers per one ring |
|-----|------------------------|--------------------------------|
| 1   | ø 89÷101               | 7                              |
| 2   | ø 102÷116              | 8                              |
| 3   | ø 117÷130              | 9                              |
| 4   | ø 131÷144              | 10                             |
| 5   | ø 145÷158              | 11                             |
| 6   | ø 159÷172              | 12                             |
| 7   | ø 173÷185              | 13                             |
| 8   | ø 186÷198              | 14                             |
| 9   | ø 199÷214              | 15                             |
| 10  | ø 215÷228              | 16                             |
| 11  | ø 229÷242              | 17                             |
| 12  | ø 243÷255              | 18                             |
| 13  | ø 256÷270              | 19                             |
| 14  | ø 271÷284              | 20                             |
| 15  | ø 285÷298              | 21                             |
| 16  | ø 299÷312              | 22                             |
| 17  | ø 313÷326              | 23                             |
| 18  | ø 327÷340              | 24                             |
| 19  | ø 341÷354              | 25                             |
| 20  | ø 355÷368              | 26                             |
| 21  | ø 369÷383              | 27                             |
| 22  | ø 383÷396              | 28                             |
| 23  | ø 397÷410              | 29                             |
| 24  | ø 411÷424              | 30                             |
| 25  | ø 425÷438              | 31                             |
| 26  | ø 439÷452              | 32                             |

N=44mm

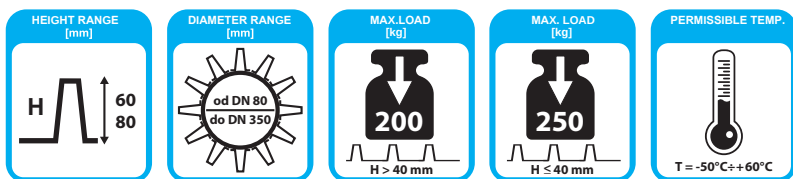
Spacers for further diameter ranges available on request.



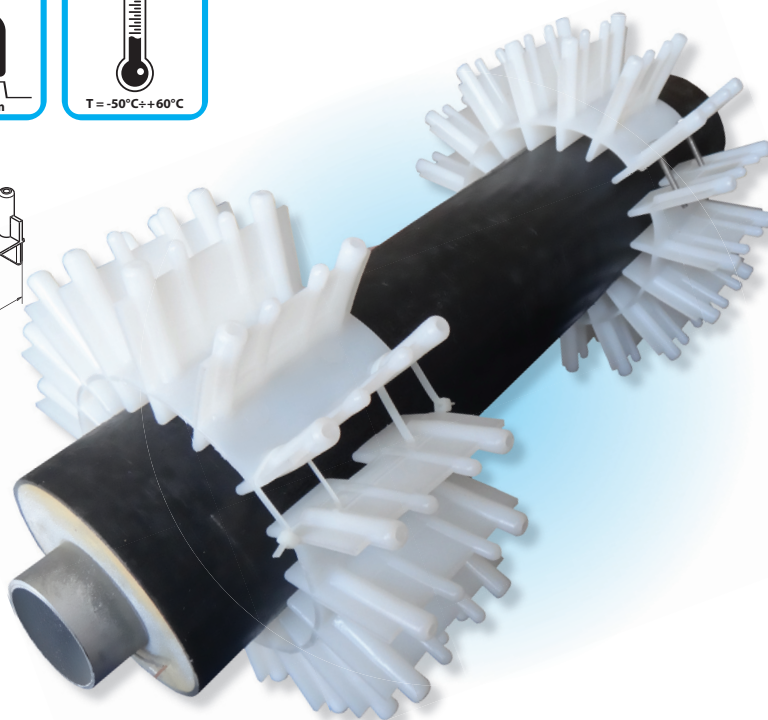
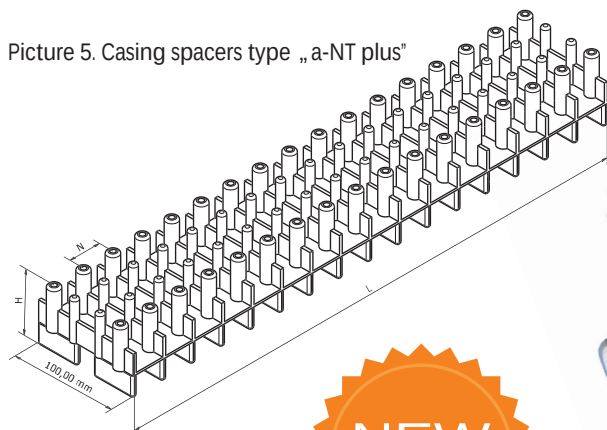
Picture 4 Spacer element type „a-NT”  
height: H=15mm H=25 mm H=40mm  
H=60mm H=80mm H=100mm

## TYPE „a-NT plus ”

**ASSEMBLY:** fasten the ring around the pipe using steel or plastic joining elements. The multi-element spacers can be joined by welding or heat sealing.



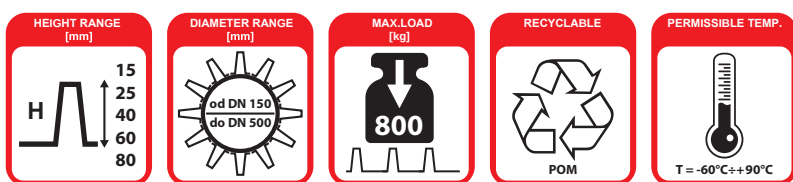
Picture 5. Casing spacers type „a-NT plus”



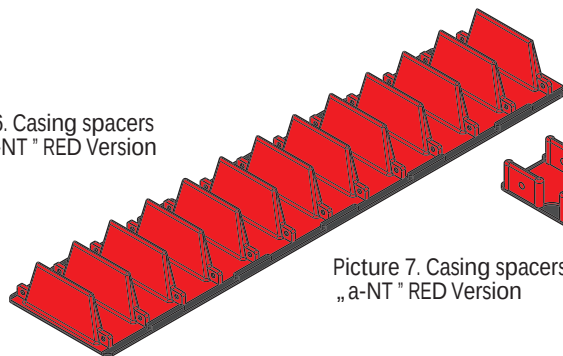
Spacers made on an individual request.

## TYPE „a-NT RED ”

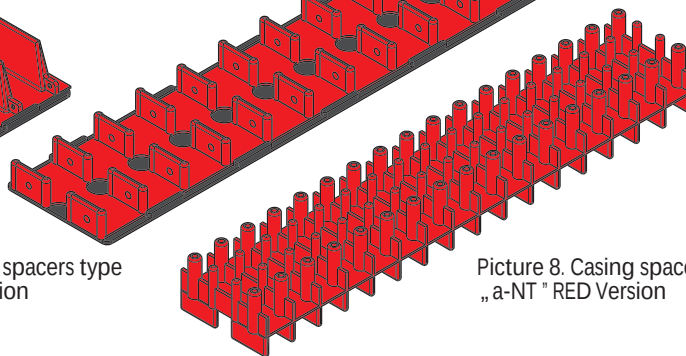
**ASSEMBLY:** fasten the ring around the pipe using steel or plastic joining elements. Permissible operating temperature from -60°C to +90°C



Picture 6. Casing spacers type „a-NT ” RED Version



Picture 7. Casing spacers type „a-NT ” RED Version



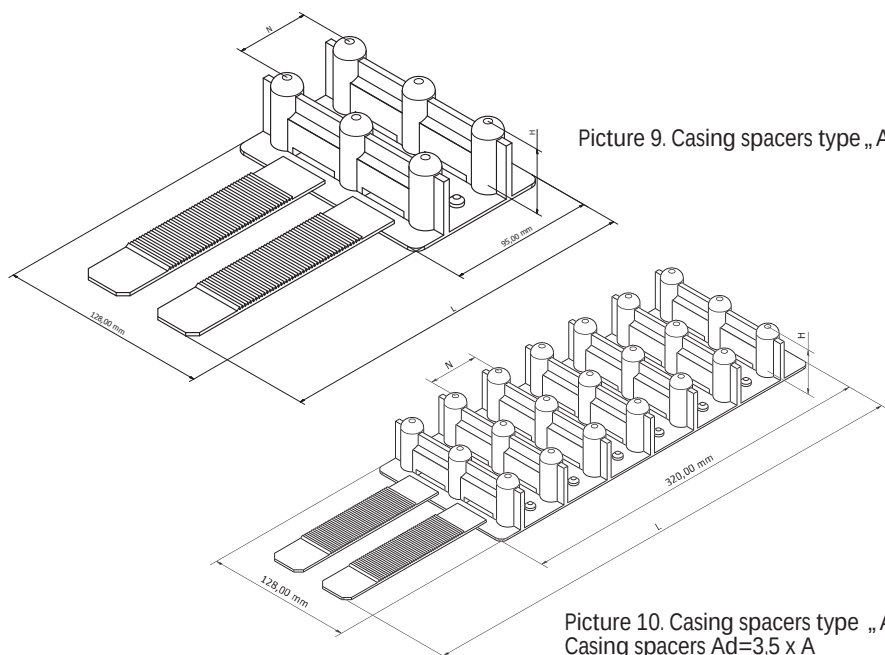
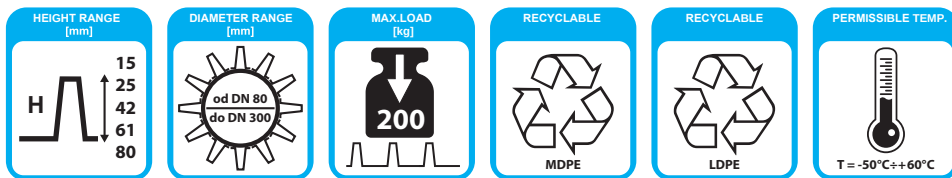
Picture 8. Casing spacers type „a-NT ” RED Version

Spacers made on an individual request.



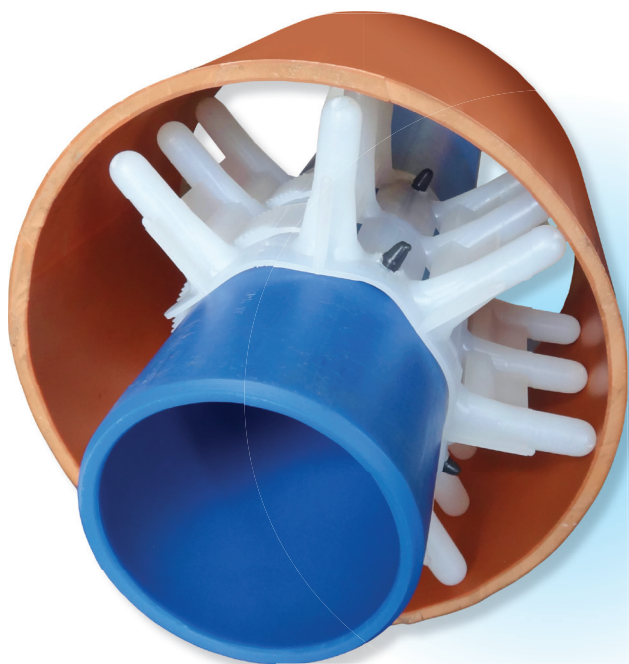
## TYPE „A ”

**ASSEMBLY:** no special tools are needed. Insert the button-strap into the slot of the next element and tighten the elements using pliers or a hex key.



Picture 9. Casing spacers type „A ”

Picture 10. Casing spacers type „Ad ”  
Casing spacers Ad=3,5 x A



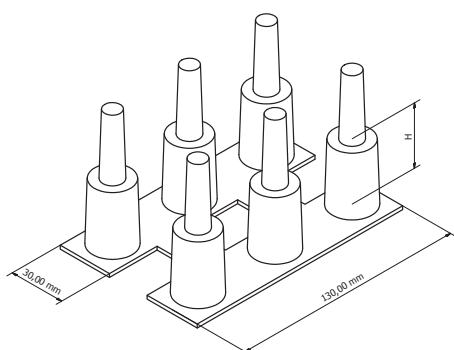
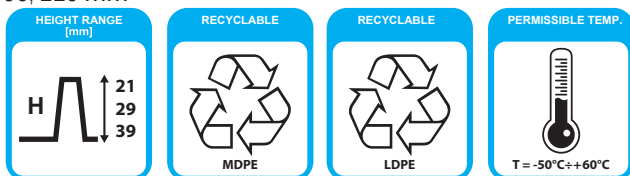
„A”spacer selection chart

| NO.                                                       | Diameter range DZ [mm] | Number of spacers per one ring |
|-----------------------------------------------------------|------------------------|--------------------------------|
| 1                                                         | ø 90 ÷ 105             | 6                              |
| 2                                                         | ø 106 ÷ 122            | 7                              |
| 3                                                         | ø 123 ÷ 135            | 8                              |
| 4                                                         | ø 136 ÷ 151            | 9                              |
| 5                                                         | ø 152 ÷ 165            | 10                             |
| 6                                                         | ø 166 ÷ 181            | 11                             |
| 7                                                         | ø 182 ÷ 196            | 12                             |
| 8                                                         | ø 197 ÷ 211            | 13                             |
| 9                                                         | ø 212 ÷ 226            | 14                             |
| 10                                                        | ø 227 ÷ 241            | 15                             |
| 11                                                        | ø 242 ÷ 256            | 16                             |
| 12                                                        | ø 257 ÷ 271            | 17                             |
| 13                                                        | ø 272 ÷ 286            | 18                             |
| 14                                                        | ø 287 ÷ 302            | 19                             |
| 15                                                        | ø 303 ÷ 317            | 20                             |
| 16                                                        | ø 318 ÷ 332            | 21                             |
| 17                                                        | ø 333 ÷ 347            | 22                             |
| 18                                                        | ø 348 ÷ 363            | 23                             |
| 19                                                        | ø 364 ÷ 378            | 24                             |
| 20                                                        | ø 379 ÷ 393            | 25                             |
| 21                                                        | ø 394 ÷ 410            | 26                             |
| N=46mm                                                    |                        |                                |
| Spacers for further diameter ranges available on request. |                        |                                |

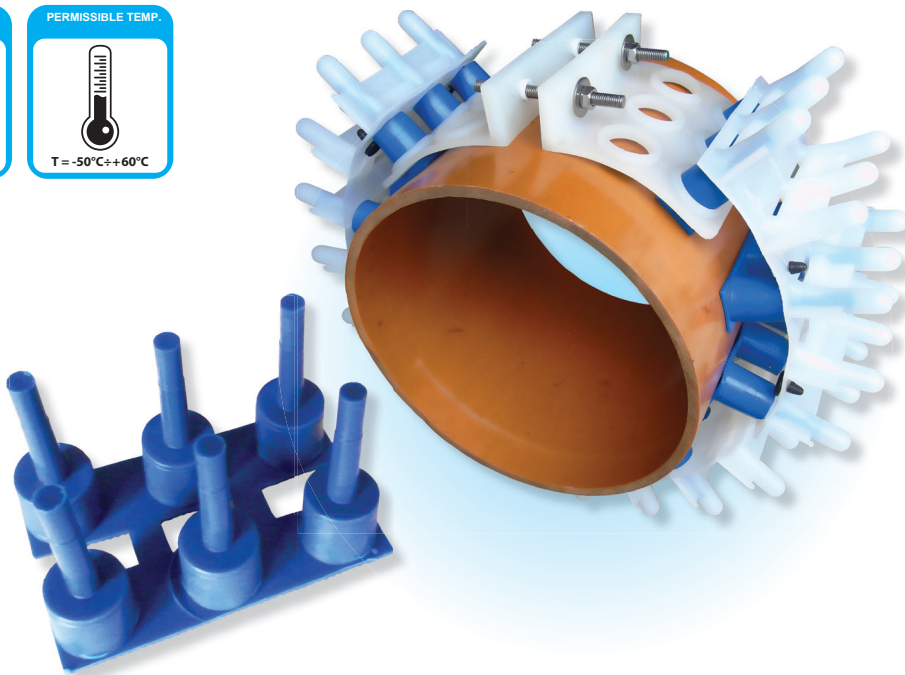
## TYPE „A+P ”

**ADDITIONAL INFORMATION:** this is an extended version of the A type spacers with an extension element. The extension is made of a LDPE and MDPE mix.

**ASSEMBLY:** Insert the button-strap into the slot of the next element, insert the extension, install the closing element at the end of the ring and tighten the screws. To prevent the spacers from changing their position on the pipe, place spacer pads between the spacer and the carrier pipe. Within the A+P system the possible spacer height is 46, 54, 63, 64, 71, 81, 82, 90, 110 mm



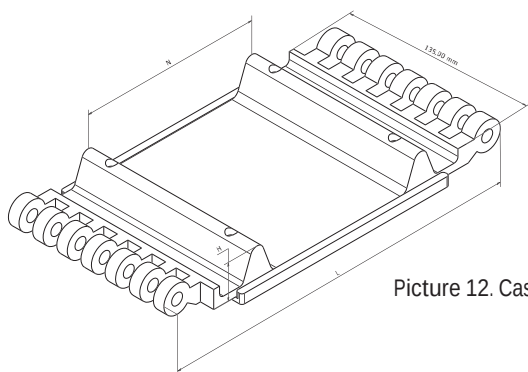
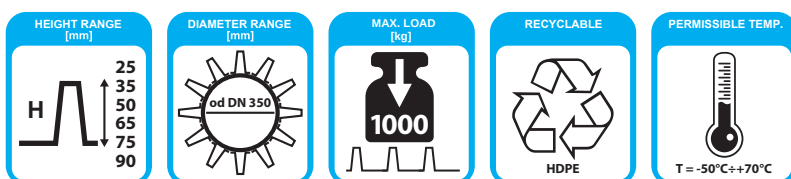
Picture 11. Extension P for system „A”



The spacers are delivered in ready-made rings or for self-assembly.

## TYPE „BA ”

**ASSEMBLY:** join the basic elements and the closing elements using plastic (POM or PC) bolts. Make a ring and fasten it around the carrier pipe using steel or plastic joining elements. To make the insertion of the carrier pipe into the casing easier, steel balls can be added on top of the spacers.



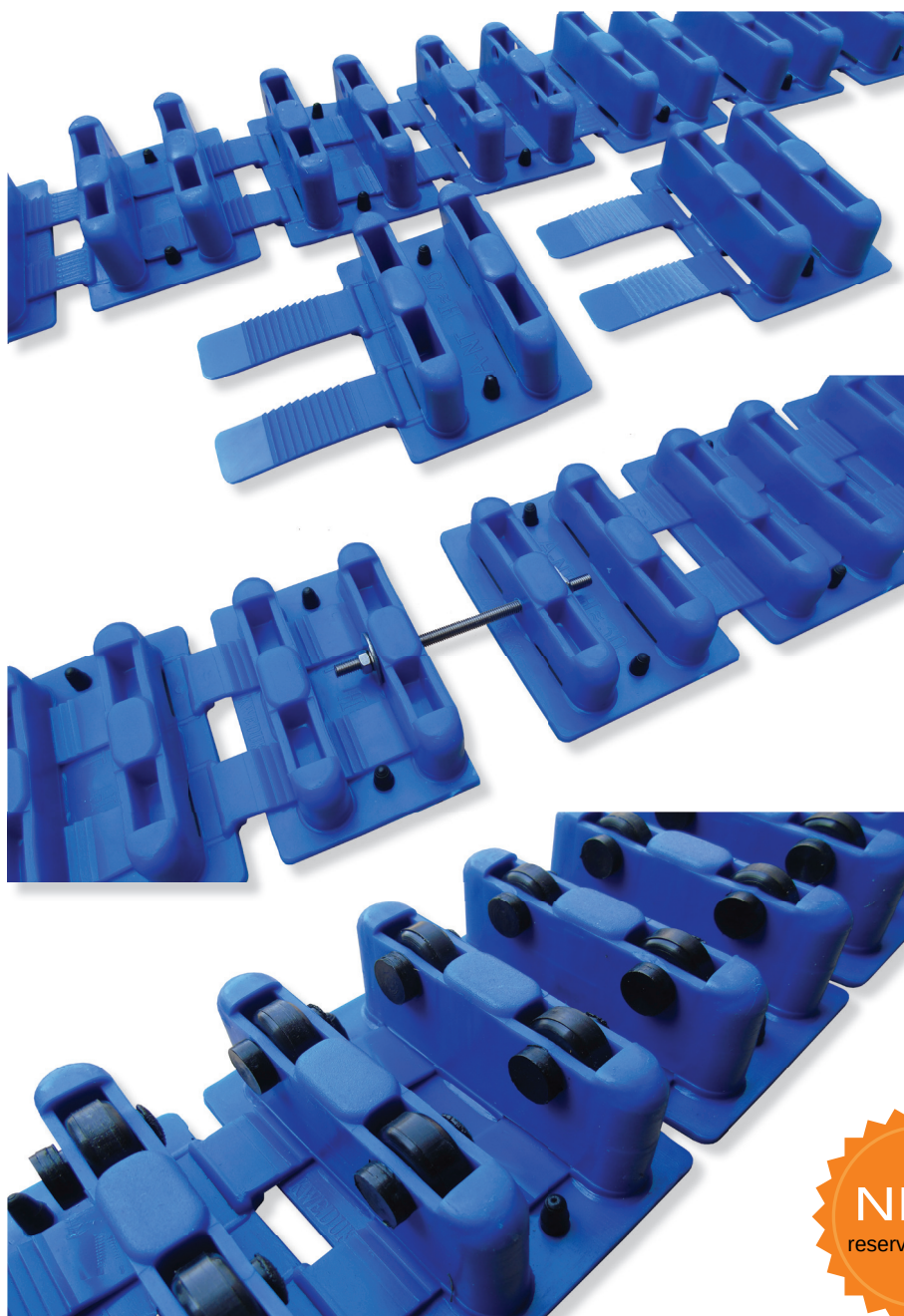
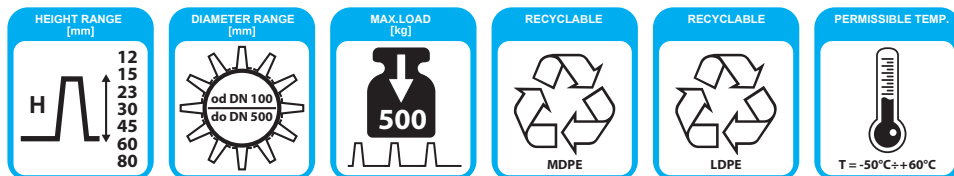
Picture 12. Casing spacers type „BA ”

| „BA”spacer selection chart                                |                        |
|-----------------------------------------------------------|------------------------|
| NO.                                                       | Diameter range DZ [mm] |
| 1                                                         | ø 326 ÷ 395            |
| 2                                                         | ø 396 ÷ 495            |
| 3                                                         | ø 496 ÷ 590            |
| 4                                                         | ø 591 ÷ 685            |
| 5                                                         | ø 686 ÷ 780            |
| 6                                                         | ø 781 ÷ 842            |
| Spacers for further diameter ranges available on request. |                        |

Spacers made on an individual request.

## TYPE „A-NT”

**ASSEMBLY:** insert the shorter part of the strap into the slot of the next element to make a ring. Fasten the ring around the pipe using pliers. It is possible to use extensions or rolling elements.



„A-NT” spacer selection chart

| NO. | Diameter rang DZ [mm] | Number of spacers per one ring |
|-----|-----------------------|--------------------------------|
| 1   | ø 94÷109              | 6                              |
| 2   | ø 110÷ 124            | 7                              |
| 3   | ø 125÷140             | 8                              |
| 4   | ø 141÷158             | 9                              |
| 5   | ø 159÷186             | 10                             |
| 6   | ø 187÷217             | 12                             |
| 7   | ø 218÷248             | 14                             |
| 8   | ø 249÷284             | 16                             |
| 9   | ø 285÷315             | 18                             |
| 10  | ø 316÷350             | 20                             |
| 11  | ø 351÷375             | 22                             |
| 12  | ø 376÷405             | 24                             |
| 13  | ø 406÷437             | 26                             |
| 14  | ø 438÷469             | 28                             |
| 15  | ø 470÷505             | 30                             |
| 16  | ø 506÷540             | 32                             |
| 17  | ø 541÷569             | 34                             |
| 18  | ø 570÷599             | 36                             |
| 19  | ø 600÷629             | 38                             |
| 20  | ø 630÷660             | 40                             |

Spacers for further diameter ranges available on request.

**NEW**  
reserved design

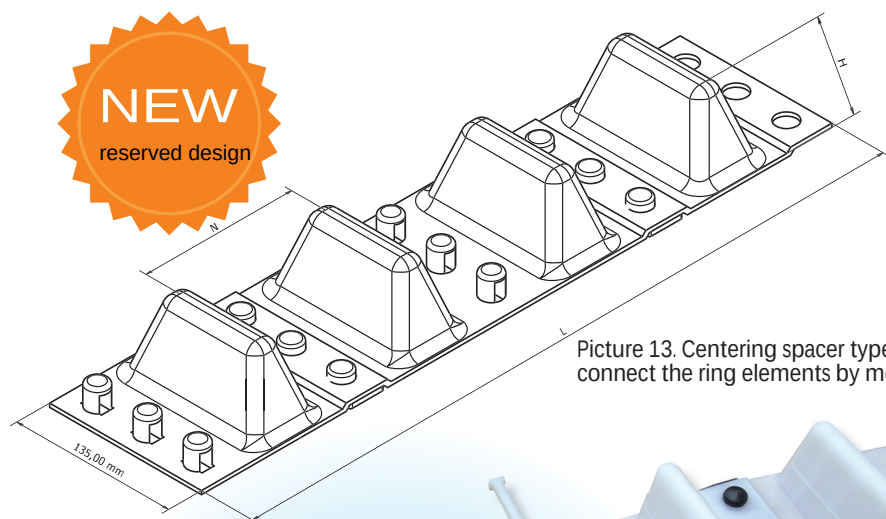
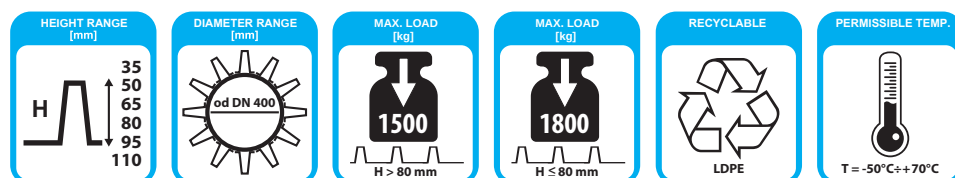


## TYPE „BC”

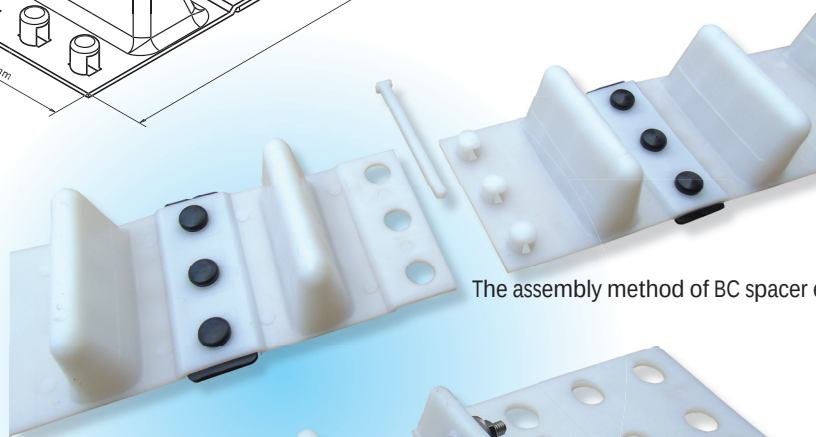
**ASSEMBLY:** join the basic elements and the closing elements using plastic (POM or PC) bolts. Make a ring and fasten it around the carrier pipe using steel or metal screws. Alternatively you can insert the button strap into the slot of the next piece using a draw bolt which can be removed after assembly.

You can adjust the spacer belt length to carrier pipe circumference by:

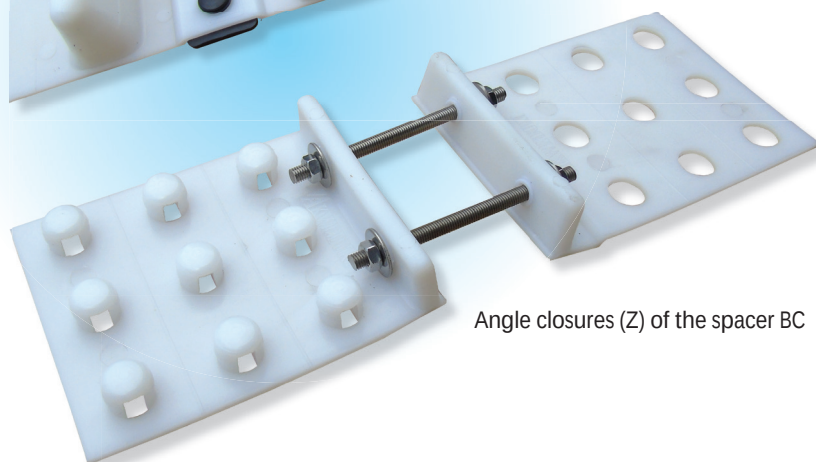
- removing one or two segments from basic elements
- shortening the closing elements
- adjusting the length of the screws used or the length of the button strap



Picture 13. Centering spacer type "BC" to connect the ring elements by means of pins.



The assembly method of BC spacer elements.



Angle closures (Z) of the spacer BC

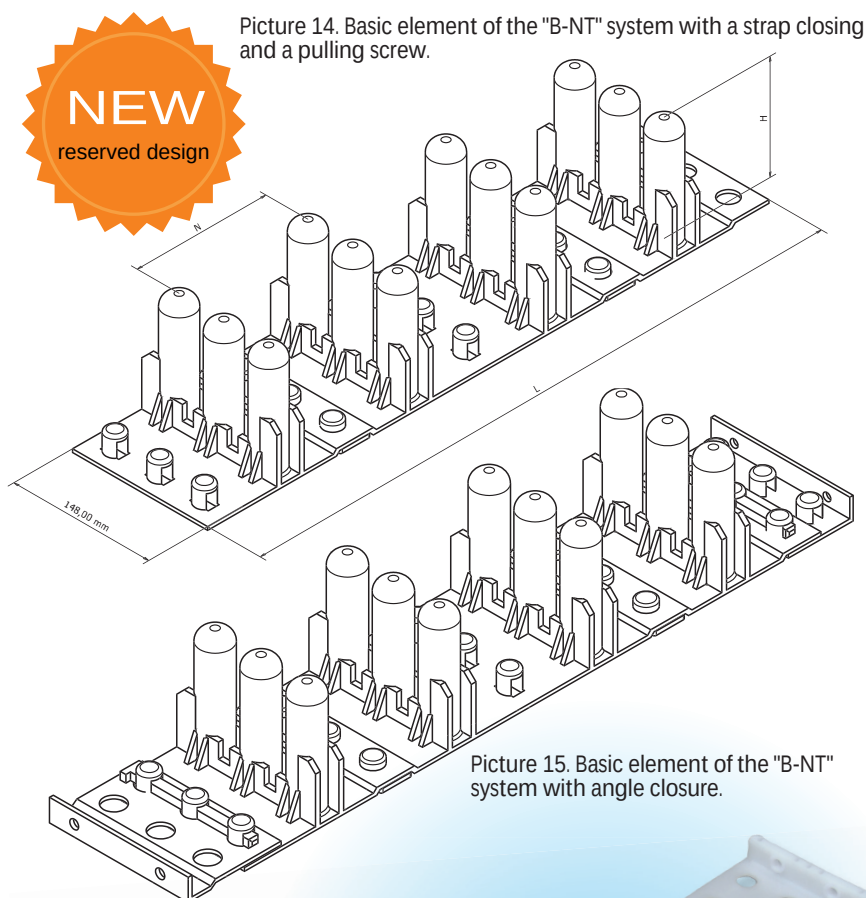
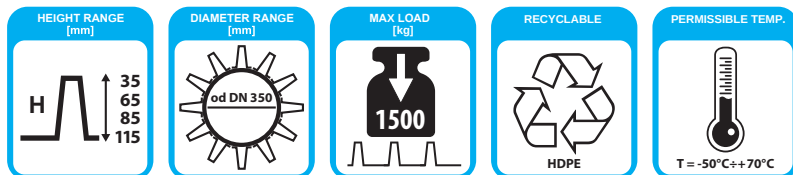
| „BC” spacer selection chart                               |                       |                                |
|-----------------------------------------------------------|-----------------------|--------------------------------|
| NO.                                                       | Diameter range DZ[mm] | Number of spacers per one ring |
| 1                                                         | ø 225÷285             | 4P + Z                         |
| 2                                                         | ø 309÷352             | 6P + Z                         |
| 3                                                         | ø 353÷397             | 7P + Z                         |
| 4                                                         | ø 398÷443             | 8P + Z                         |
| 5                                                         | ø 444÷487             | 9P + Z                         |
| 6                                                         | ø 488÷532             | 10P + Z                        |
| 7                                                         | ø 533÷577             | 11P + Z                        |
| 8                                                         | ø 578÷624             | 12P + Z                        |
| 9                                                         | ø 625÷668             | 13P + Z                        |
| 10                                                        | ø 669÷713             | 14P + Z                        |
| 11                                                        | ø 714÷757             | 15P + Z                        |
| 12                                                        | ø 758÷803             | 16P + Z                        |
| 13                                                        | ø 804÷848             | 17P + Z                        |
| 14                                                        | ø 849÷893             | 18P + Z                        |
| 15                                                        | ø 894÷937             | 19P + Z                        |
| 16                                                        | ø 938÷983             | 20P + Z                        |
| 17                                                        | ø 984÷1028            | 21P + Z                        |
| 18                                                        | ø 1029÷1072           | 22P + Z                        |
| 19                                                        | ø 1073÷1117           | 23P + Z                        |
| 20                                                        | ø 1118÷1163           | 24P + Z                        |
| 21                                                        | ø 1164÷1208           | 25P + Z                        |
| 22                                                        | ø 1209÷1252           | 26P + Z                        |
| 23                                                        | ø 1253÷1297           | 27P + Z                        |
| 24                                                        | ø 1298÷1343           | 28P + Z                        |
| 25                                                        | ø 1344÷1388           | 29P + Z                        |
| 26                                                        | ø 1389÷1432           | 30P + Z                        |
| 27                                                        | ø 1433÷1477           | 31P + Z                        |
| 27                                                        | ø 1478÷1520           | 32P + Z                        |
| Spacers for further diameter ranges available on request. |                       |                                |

Z = closure

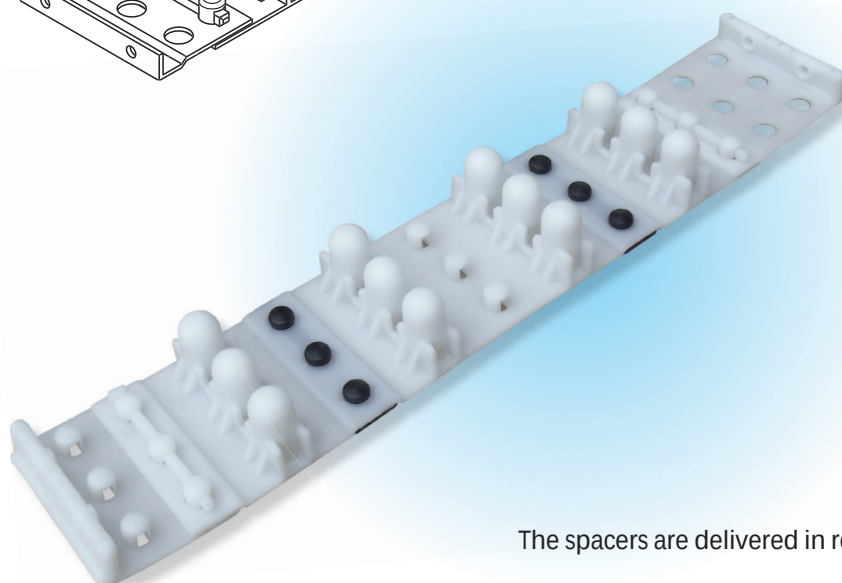
The spacers are delivered in ready-made rings or for self-assembly.

## TYPE „B-NT”

**ASSEMBLY:** join the basic and the closing elements. Fasten the ring around the carrier pipe by placing B-NT system joints on the first and last element of the ring and tightening the joining screws. Alternatively you can insert the button strap into the slot of the next piece using a draw bolt which can be removed after assembly.



Picture 15. Basic element of the "B-NT" system with angle closure.



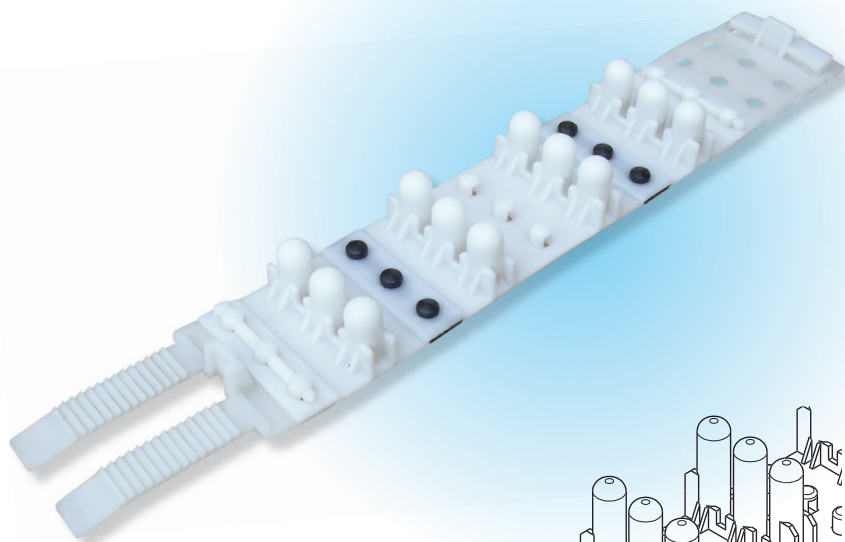
„B-NT” spacer selection chart, screw joining

| NO.                                                      | Diameter range DZ [mm] | Number of spacers per one ring |
|----------------------------------------------------------|------------------------|--------------------------------|
| 1                                                        | ø 285÷315              | 7 + Z                          |
| 2                                                        | ø 330÷374              | 8 + Z                          |
| 3                                                        | ø 375÷419              | 9 + Z                          |
| 4                                                        | ø 420÷464              | 10 + Z                         |
| 5                                                        | ø 465÷500              | 11 + Z                         |
| 6                                                        | ø 510÷554              | 12 + Z                         |
| 7                                                        | ø 555÷598              | 13 + Z                         |
| 8                                                        | ø 599÷642              | 14 + Z                         |
| 9                                                        | ø 643÷687              | 15 + Z                         |
| 10                                                       | ø 688÷732              | 16 + Z                         |
| 11                                                       | ø 733÷777              | 17 + Z                         |
| 12                                                       | ø 778÷822              | 18 + Z                         |
| 13                                                       | ø 823÷866              | 19 + Z                         |
| 14                                                       | ø 867÷910              | 20 + Z                         |
| 15                                                       | ø 911÷955              | 21 + Z                         |
| 16                                                       | ø 956÷999              | 22 + Z                         |
| 17                                                       | ø 1000÷1044            | 23 + Z                         |
| 18                                                       | ø 1045÷1088            | 24                             |
| 19                                                       | ø 1089÷1133            | 25 + Z                         |
| 20                                                       | ø 1134÷1178            | 26 + Z                         |
| 21                                                       | ø 1179÷1222            | 27 + Z                         |
| 22                                                       | ø 1223÷1267            | 28 + Z                         |
| 23                                                       | ø 1268÷1310            | 29 + Z                         |
| 24                                                       | ø 1311÷1356            | 30 + Z                         |
| 25                                                       | ø 1357÷1400            | 31 + Z                         |
| 26                                                       | ø 1401÷1445            | 32 + Z                         |
| 27                                                       | ø 1446÷1490            | 33 + Z                         |
| 28                                                       | ø 1491÷1534            | 34 + Z                         |
| 29                                                       | ø 1535÷1579            | 35 + Z                         |
| 30                                                       | ø 1580÷1624            | 36 + Z                         |
| Spacers for further diameter ranges available on request |                        |                                |

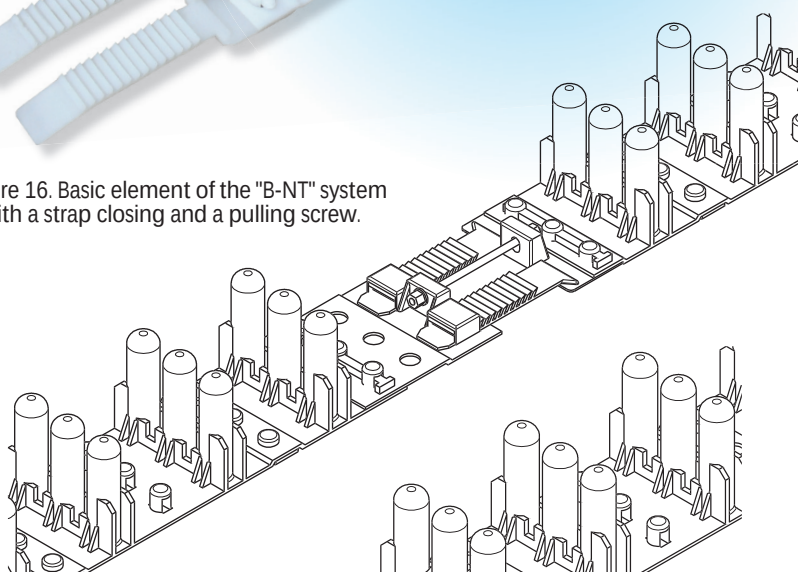
Z = closure

The spacers are delivered in ready-made rings or for self-assembly. .

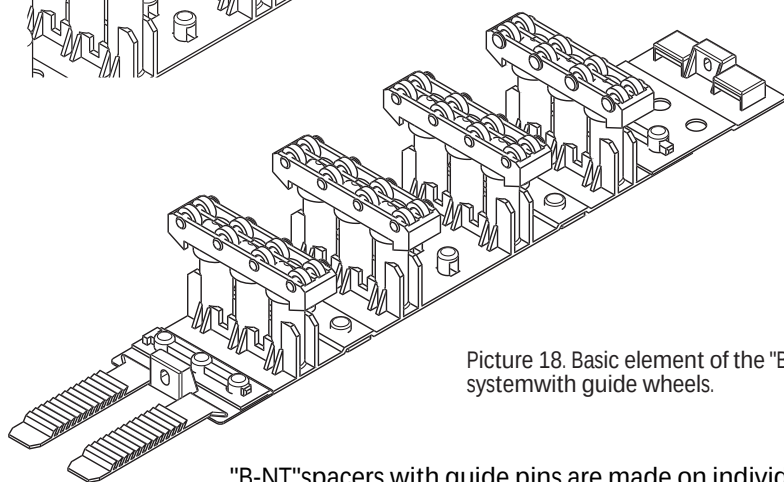
## TYPE „B-NT”



Picture 16. Basic element of the "B-NT" system with a strap closing and a pulling screw.



Picture 17. The method of connecting the basic elements of the "B-NT" system by means of intermediate cubes.



Picture 18. Basic element of the "B-NT" system with guide wheels.

"B-NT" spacers with guide pins are made on individual request.

„B-NT" spacer selection chart, button strap version

| NO. | Diameter range DZ [mm]       | Number of spacers per one ring |
|-----|------------------------------|--------------------------------|
| 1   | $\varnothing \leq 400$       | 7 + Z                          |
| 2   | $\varnothing 401 \div 445$   | 8 + Z                          |
| 3   | $\varnothing 446 \div 490$   | 9 + Z                          |
| 4   | $\varnothing 491 \div 534$   | 10 + Z                         |
| 5   | $\varnothing 535 \div 579$   | 11 + Z                         |
| 6   | $\varnothing 580 \div 624$   | 12 + Z                         |
| 7   | $\varnothing 625 \div 667$   | 13 + Z                         |
| 8   | $\varnothing 668 \div 712$   | 14 + Z                         |
| 9   | $\varnothing 713 \div 757$   | 15 + Z                         |
| 10  | $\varnothing 758 \div 802$   | 16 + Z                         |
| 11  | $\varnothing 803 \div 846$   | 17 + Z                         |
| 12  | $\varnothing 847 \div 891$   | 18 + Z                         |
| 13  | $\varnothing 892 \div 936$   | 19 + Z                         |
| 14  | $\varnothing 937 \div 980$   | 20 + Z                         |
| 15  | $\varnothing 981 \div 1025$  | 21 + Z                         |
| 16  | $\varnothing 1026 \div 1069$ | 22 + Z                         |
| 17  | $\varnothing 1070 \div 1114$ | 23 + Z                         |
| 18  | $\varnothing 1115 \div 1159$ | 24 + Z                         |
| 19  | $\varnothing 1160 \div 1204$ | 25 + Z                         |
| 20  | $\varnothing 1205 \div 1248$ | 26 + Z                         |
| 21  | $\varnothing 1249 \div 1290$ | 27 + Z                         |
| 22  | $\varnothing 1291 \div 1335$ | 28 + Z                         |
| 23  | $\varnothing 1336 \div 1381$ | 29 + Z                         |
| 24  | $\varnothing 1382 \div 1425$ | 30 + Z                         |
| 25  | $\varnothing 1426 \div 1469$ | 31 + Z                         |
| 26  | $\varnothing 1470 \div 1514$ | 32 + Z                         |
| 27  | $\varnothing 1515 \div 1559$ | 33 + Z                         |
| 28  | $\varnothing 1560 \div 1604$ | 34 + Z                         |
| 29  | $\varnothing 1605 \div 1649$ | 35 + Z                         |
| 30  | $\varnothing 1650 \div 1699$ | 36 + Z                         |

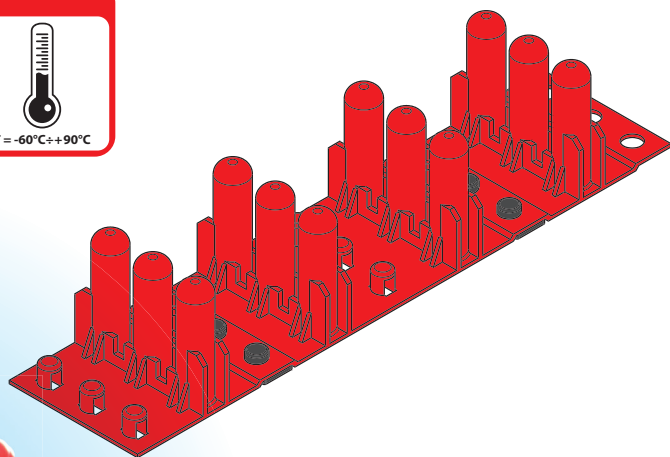
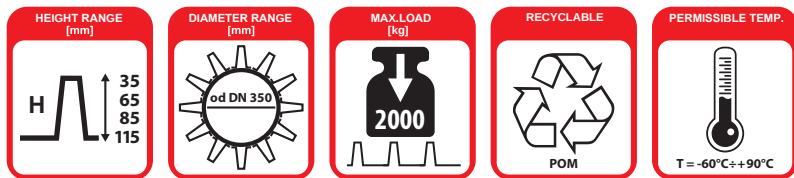
Spacers for further diameter ranges available on request.

Z = closure



## TYPE „B-NT RED ”

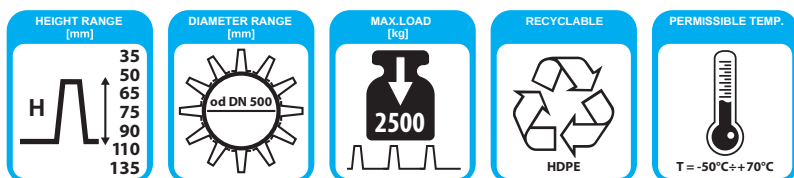
**ASSEMBLY:** join the basic and the closing elements. Fasten the ring around the carrier pipe by placing special B-NT system joints on the first and last element of the ring and tightening the joining screws. Alternatively you can insert the button strap into the slot of the next piece using a draw bolt which can be removed after assembly.



Picture 19. „B-NT ” basic element, RED Version

## TYPE „CA ”

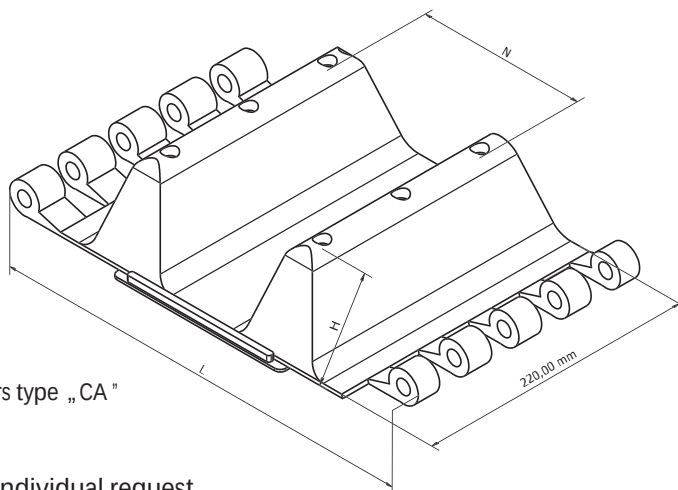
**ASSEMBLY:** join the basic elements and the closing elements using plastic (POM or PC) bolts. Make a ring and fasten it around the carrier pipe using steel or plastic joining elements. To make the insertion of the carrier pipe into the casing easier, steel balls can be added on top of the spacers.



„CA”spacer selection chart

| NO. | Diameter range DZ [mm] |
|-----|------------------------|
| 1   | ø 843 ÷ 950            |
| 2   | ø 951 ÷ 1050           |
| 3   | ø 1051 ÷ 1150          |
| 4   | ø 1151 ÷ 1250          |
| 5   | ø 1251 ÷ 1350          |

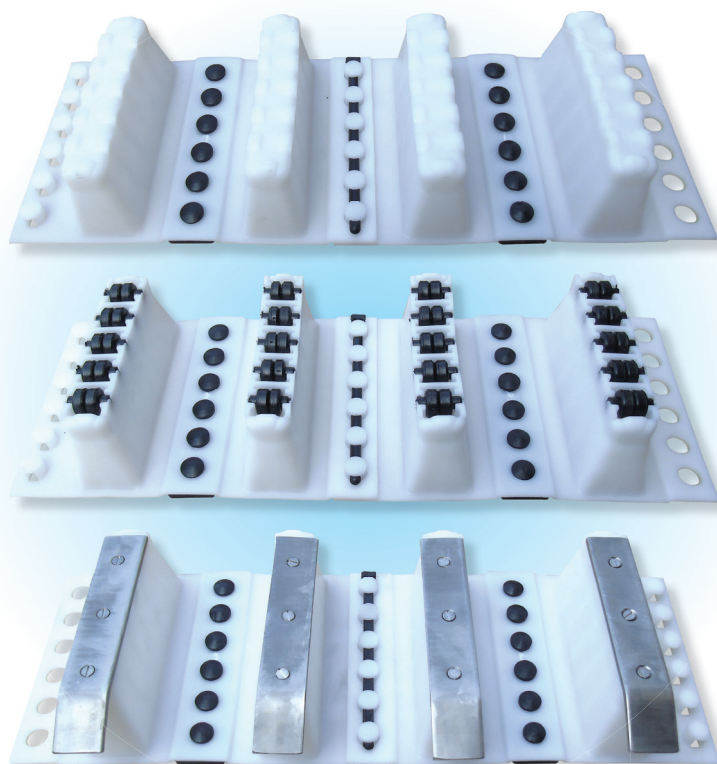
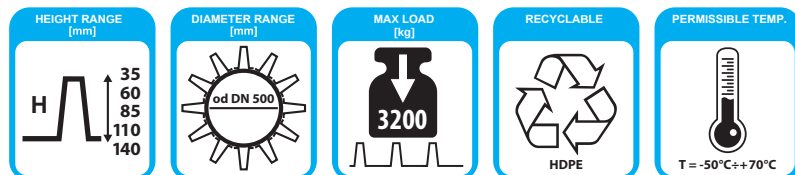
Spacers for further diameter ranges available on request.



Picture 20. Casing spacers type „CA ”

## TYPE „C ”

**ASSEMBLY:** join the basic elements and the closing elements using plastic (POM or PC) bolts. Make a ring and fasten it around the carrier pipe using steel or plastic joining elements. To make the insertion of the carrier pipe into the casing easier, steel balls or extensions with rolling elements can be added on top of the spacers.

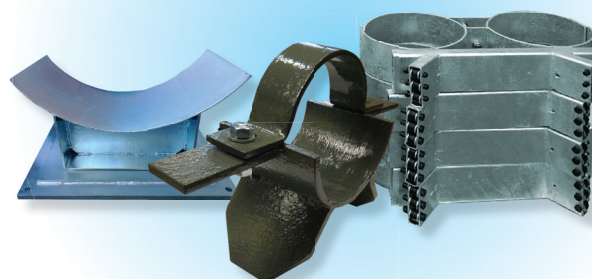


| „C” spacer selection chart                                |                        |                                |
|-----------------------------------------------------------|------------------------|--------------------------------|
| NO.                                                       | Diameter range DZ [mm] | Number of spacers per one ring |
| 1                                                         | ø 516 ÷ 561            | 6P + Z                         |
| 2                                                         | ø 562 ÷ 608            | 7P + Z                         |
| 3                                                         | ø 609 ÷ 655            | 8P + Z                         |
| 4                                                         | ø 656 ÷ 702            | 9P + Z                         |
| 5                                                         | ø 703 ÷ 749            | 10P + Z                        |
| 6                                                         | ø 750 ÷ 796            | 11P + Z                        |
| 7                                                         | ø 797 ÷ 842            | 12P + Z                        |
| 8                                                         | ø 843 ÷ 890            | 13P + Z                        |
| 9                                                         | ø 891 ÷ 937            | 14P + Z                        |
| 10                                                        | ø 938 ÷ 984            | 15P + Z                        |
| 11                                                        | ø 985 ÷ 1031           | 16P + Z                        |
| 12                                                        | ø 1032 ÷ 1078          | 17P + Z                        |
| 13                                                        | ø 1079 ÷ 1124          | 18P + Z                        |
| 14                                                        | ø 1125 ÷ 1172          | 19P + Z                        |
| 15                                                        | ø 1173 ÷ 1218          | 20P + Z                        |
| 16                                                        | ø 1219 ÷ 1266          | 21P + Z                        |
| 17                                                        | ø 1267 ÷ 1313          | 22P + Z                        |
| 18                                                        | ø 1314 ÷ 1360          | 23P + Z                        |
| 19                                                        | ø 1361 ÷ 1407          | 24P + Z                        |
| 20                                                        | ø 1408 ÷ 1454          | 25P + Z                        |
| 21                                                        | ø 1455 ÷ 1501          | 26P + Z                        |
| 22                                                        | ø 1502 ÷ 1548          | 27P + Z                        |
| 23                                                        | ø 1549 ÷ 1595          | 28P + Z                        |
| 24                                                        | ø 1596 ÷ 1642          | 29P + Z                        |
| 25                                                        | ø 1643 ÷ 1689          | 30P + Z                        |
| 26                                                        | ø 1690 ÷ 1736          | 31P + Z                        |
| 27                                                        | ø 1737 ÷ 1783          | 32P + Z                        |
| Spacers for further diameter ranges available on request. |                        |                                |
| Z = closure                                               |                        |                                |

## SPECIAL APPLICATION SPACERS „Akwedukt”

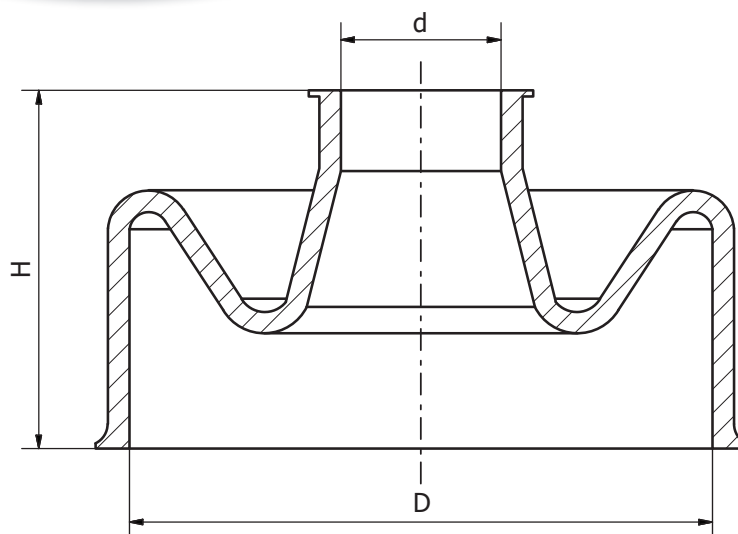
- STEEL SPACERS
- GUIDE CARRIAGES FOR CARRIER PIPE INSERTION
- CASING SPACERS FOR MULTI-PIPE CASINGS

AVAILABLE ON REQUEST FOR SPECIFIC PROJECT NEEDS



## N-type end seals

N-type end seals are designed for sealing of installations routed in casings or through construction partitions. They are used in non-pressure conditions (up to 2 meters of water column height) and protect against migration of water, mud and gas along the pipeline. The assembly consists in fitting an end seal on the casing, displacing the carrier pipe. The tightness is achieved by tightening the stainless steel bands





## N-type end seals

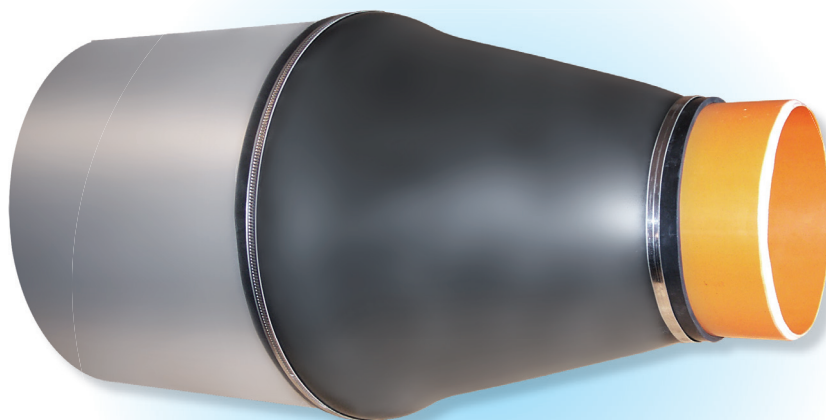
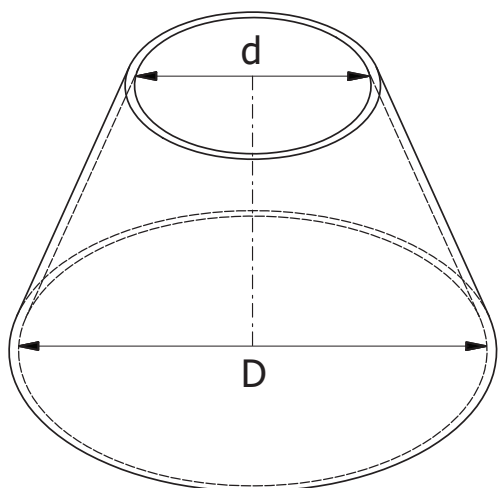
End seals selection chart

| NO. | D/d              | D   | d       | H   | NO. | D/d              | D   | d       | H   |
|-----|------------------|-----|---------|-----|-----|------------------|-----|---------|-----|
|     | [mm]             |     |         |     |     | [mm]             |     |         |     |
| 1   | 50/20            | 50  | 20      | 50  | 40  | 200 / 160        | 218 | 160     | 100 |
| 2   | 50/25            | 50  | 25      | 50  | 41  | 200 / 160 / 90   | 218 | 160/90  | 100 |
| 3   | 63/25            | 60  | 25      | 50  | 42  | 200 / 160 / 110  | 218 | 160/110 | 100 |
| 4   | 63/32            | 60  | 32      | 60  | 43  | 200 / 160 / 125  | 218 | 160/125 | 100 |
| 5   | 80 / 25          | 86  | 25      | 60  | 44  | 250X / 160       | 250 | 160     | 70  |
| 6   | 80 / 32          | 86  | 32      | 60  | 45  | 250X / 160 / 110 | 250 | 160/110 | 95  |
| 7   | 80 / 40          | 86  | 40      | 60  | 46  | 250X / 160 / 125 | 250 | 160/125 | 95  |
| 8   | 100 / 25         | 110 | 25      | 60  | 47  | 250X / 160 / 140 | 250 | 160/140 | 95  |
| 9   | 100 / 32         | 110 | 32      | 60  | 48  | 250 / 100        | 270 | 110     | 75  |
| 10  | 100 / 40         | 110 | 40      | 60  | 49  | 250 / 125        | 270 | 125     | z75 |
| 11  | 100 / 50         | 110 | 50      | 60  | 50  | 250 / 150        | 270 | 160     | 75  |
| 12  | 100 / 63         | 110 | 60      | 60  | 51  | 250 / 160        | 270 | 160     | 75  |
| 13  | 100 / 63 / 50    | 110 | 60/50   | 95  | 52  | 250 / 200        | 270 | 218     | 75  |
| 14  | 125 / 63 / 40    | 125 | 60/40   | 83  | 53  | 250 / 150 / 125  | 270 | 160/125 | 100 |
| 15  | 125 / 63 / 50    | 125 | 60/50   | 83  | 54  | 250 / 160 / 110  | 270 | 160/125 | 100 |
| 16  | 125 / 63         | 125 | 63      | 52  | 55  | 300 / 200        | 322 | 218     | 70  |
| 17  | 140 / 90         | 140 | 90      | 74  | 56  | 300 / 200 / 80   | 322 | 218/90  | 100 |
| 18  | 140 / 90 / 50    | 140 | 90/50   | 98  | 57  | 300 / 200 / 100  | 322 | 218/110 | 100 |
| 19  | 140 / 90 / 63    | 140 | 90/63   | 101 | 58  | 300 / 200 / 150  | 322 | 218/160 | 100 |
| 20  | 140 / 90 / 75    | 140 | 90/75   | 102 | 59  | 300 / 200 / 180  | 322 | 218/180 | 100 |
| 21  | 150 / 100        | 160 | 110     | 60  | 60  | 300 / 200 / 200X | 322 | 218/200 | 100 |
| 22  | 150 / 110 / 32   | 160 | 110/32  | 88  | 61  | 350 / 150        | 345 | 160     | 95  |
| 23  | 150 / 110 / 40   | 160 | 110/40  | 88  | 62  | 350 / 200        | 345 | 218     | 95  |
| 24  | 150 / 110 / 50   | 160 | 110/50  | 88  | 63  | 350 / 250        | 345 | 270     | 95  |
| 25  | 150 / 110 / 63   | 160 | 110/60  | 88  | 64  | 400 / 150        | 408 | 160     | 90  |
| 26  | 150 / 110 / 75   | 160 | 110/75  | 89  | 65  | 400 / 200X       | 408 | 200     | 90  |
| 27  | 150 / 110 / 90   | 160 | 110/90  | 88  | 66  | 400 / 200        | 408 | 218     | 90  |
| 28  | 180 / 110        | 180 | 110     | 93  | 67  | 400 / 250X       | 408 | 250     | 90  |
| 29  | 180 / 110 / 90   | 180 | 110/90  | 93  | 68  | 400 / 300        | 408 | 318     | 90  |
| 30  | 200X / 125       | 200 | 125     | 80  | 69  | 400 / 250        | 408 | 270     | 90  |
| 31  | 200X / 125 / 75  | 200 | 125/75  | 100 | 70  | 450 / 200X       | 445 | 200     | 85  |
| 32  | 200X / 125 / 90  | 200 | 125/90  | 100 | 71  | 450 / 225        | 445 | 218     | 85  |
| 33  | 200X / 125 / 110 | 200 | 125/110 | 100 | 72  | 450 / 250        | 445 | 270     | 85  |
| 34  | 200 / 150 / 75   | 218 | 160/75  | 100 | 73  | 450 / 300        | 445 | 318     | 85  |
| 35  | 200 / 150 / 90   | 218 | 160/90  | 100 | 74  | 500 / 250X       | 508 | 250     | 108 |
| 36  | 200 / 150 / 100  | 218 | 160/110 | 100 | 75  | 500 / 250        | 508 | 270     | 108 |
| 37  | 200 / 150 / 125  | 218 | 160/125 | 100 | 76  | 500 / 300        | 508 | 318     | 108 |
| 38  | 200 / 150        | 218 | 160     | 80  | 77  | 500 / 350        | 508 | 380     | 108 |
| 39  | 200X / 160       | 200 | 160     | 100 | 78  | 500 / 400        | 508 | 408     | 108 |

End seals for further diameter ranges available on request.

## End seals type CU and CU-L

CU and CU-L type end seals are designed for sealing installations routed in casings or construction partitions. They are used in non-pressure conditions (up to 2 meters of water column height) and protect against migration of water, mud and gas along the pipeline. The assembly consists in fitting an end seal on the casing, displacing the carrier pipe. The tightness is achieved by tightening the stainless steel bands.



CU end seals selection chart

| NO. | Type | D / d [mm] |
|-----|------|------------|
| 1   | CU   | 350 / 250  |
| 2   | CU   | 450 / 300  |
| 3   | CU   | 500/350    |
| 4   | CU   | 600 / 400  |
| 5   | CU   | 600 / 450  |
| 6   | CU   | 750 / 500  |
| 7   | CU   | 750 / 550  |
| 8   | CU   | 900 / 600  |
| 9   | CU   | 900 / 650  |
| 10  | CU   | 1050 / 700 |
| 11  | CU   | 1000 / 740 |
| 12  | CU   | 1200/800   |
| 13  | CU   | 1140/850   |
| 14  | CU   | 1350/900   |
| 15  | CU   | 1250/930   |
| 16  | CU   | 1400/1000  |
| 17  | CU   | 1500/1100  |
| 18  | CU   | 1600/1200  |

Further diameter ranges available on request

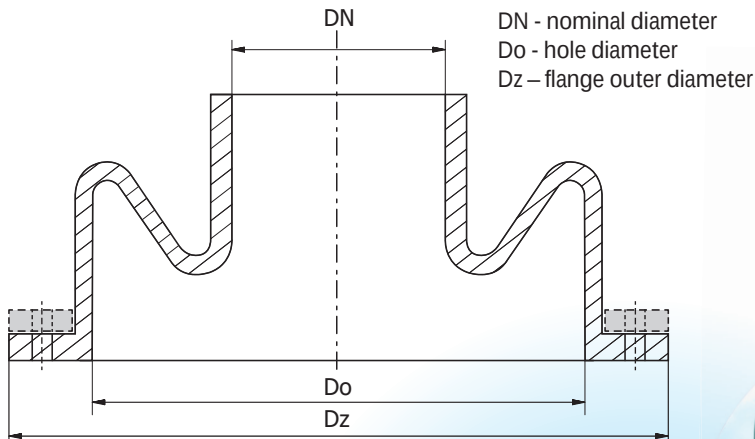
CU-L end seals selection chart

| NO. | Type | D / d [mm] |
|-----|------|------------|
| 1   | CU-L | 275/175    |
| 2   | CU-L | 360/260    |
| 3   | CU-L | 450/325    |
| 4   | CU-L | 545/385    |
| 5   | CU-L | 635/450    |
| 6   | CU-L | 725/515    |
| 7   | CU-L | 815/580    |
| 8   | CU-L | 910/645    |
| 9   | CU-L | 1000/710   |
| 10  | CU-L | 1090/770   |
| 11  | CU-L | 1180/835   |
| 12  | CU-L | 1270/900   |
| 13  | CU-L | 1360/965   |
| 14  | CU-L | 1450/1030  |
| 15  | CU-L | 1540/1100  |
| 16  | CU-L | 1630/1160  |
| 17  | CU-L | 1720/1225  |
| 18  | CU-L | 1810/1290  |
| 19  | CU-L | 1900/1400  |
| 20  | CU-L | 1990/1470  |
| 21  | CU-L | 2080/1540  |
| 22  | CU-L | 2200/1610  |

Further diameter ranges available on request.

## KUMA-1 Flanged end seal (SINGLE-PIPE)

The KUMA-1 and KUMA-n type flanged end seals are designed for sealing installation passages through building partitions (single or multi-pipe passages). They are used in non-pressure conditions (up to 2 meters of water column height) and protect against migration of water, mud and gas along the pipeline. The tightness between the seal and the pipe(s) is ensured by clamping a stainless steel (or steel-plastic) band. The tightness between the seal flange and partition is obtained by tightening the seal with a steel or plastic flange using screws (expansion pins). The flanges can be one-piece or segmented.



On request, the seals can be equipped with plastic flanges (one-piece or segmented).



Steel pressure flange, size 6mm

Selection chart of KUMA-1 single-pipe flanged end seals.

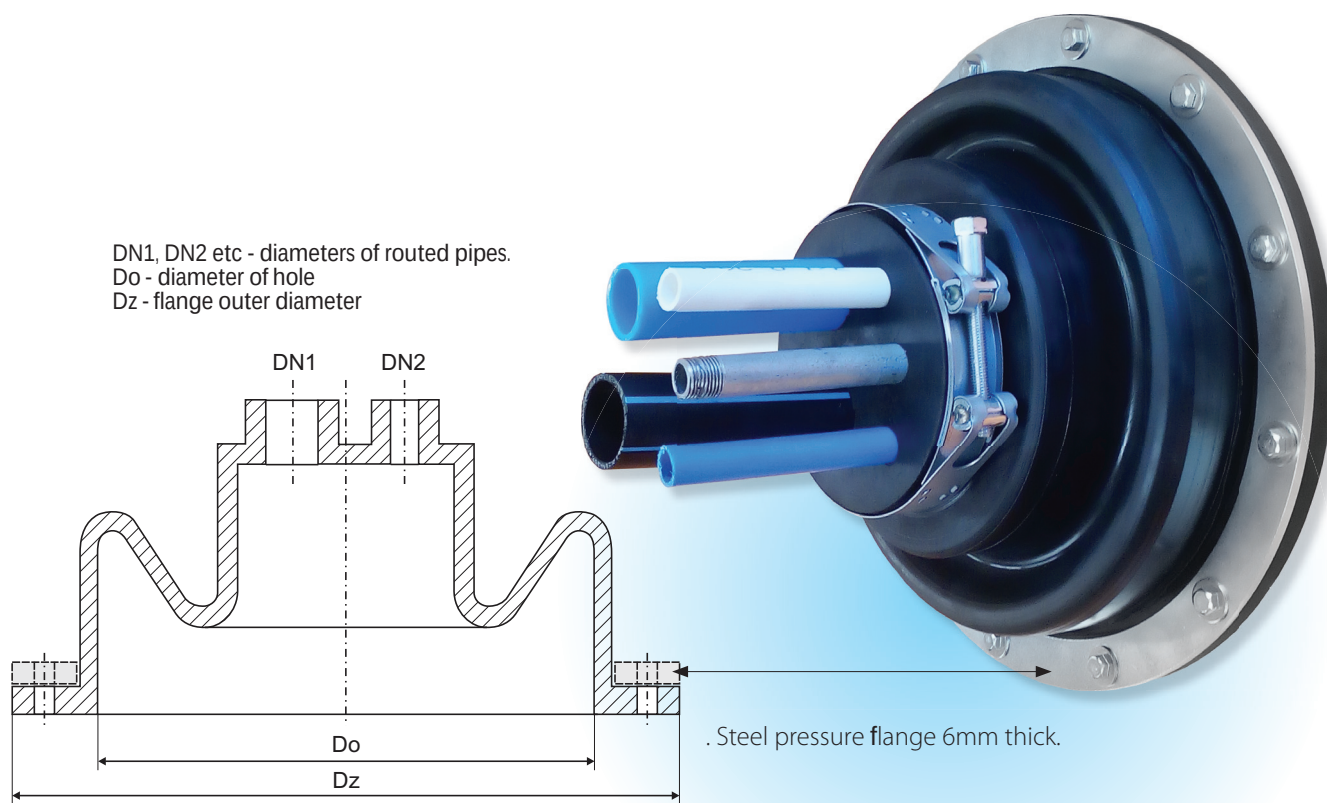
| Diameter of sealed pipe DN [mm]<br>Maximum    | 20 ÷ 28 | 29 ÷ 35 | 38 ÷ 44 | 48 ÷ 55 | 60 ÷ 68 | 70 ÷ 78 | 85 ÷ 95 | 85 ÷ 95 | 105 ÷ 115 | 105 ÷ 115 | 120 ÷ 135 | 155 ÷ 170 | 155 ÷ 170 | 175 ÷ 190 | 190 ÷ 210 | 190 ÷ 210 | 215 ÷ 230 | 245 ÷ 260 | 265 ÷ 280 | 310 ÷ 330 | 390 ÷ 410 |
|-----------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Diameter of the hole in the partition Do [mm] | 50      | 60      | 110     | 110     | 110     | 155     | 155     | 220     | 155       | 220       | 220       | 220       | 322       | 270       | 270       | 322       | 322       | 350       | 350       | 400       | 500       |
| Outer diameter of flange Dz [mm]              | 110     | 120     | 180     | 180     | 180     | 245     | 245     | 300     | 245       | 300       | 300       | 300       | 408       | 350       | 350       | 408       | 408       | 445       | 445       | 508       | 600       |
| Screw diameter O [mm]                         | 6       | 6       | 6       | 6       | 6       | 8       | 8       | 8       | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         | 8         |
| Number of screw [psc.]                        | 4       | 4       | 6       | 6       | 6       | 6       | 8       | 6       | 6         | 8         | 8         | 8         | 12        | 12        | 12        | 12        | 12        | 12        | 12        | 16        | 16        |

Further diameter ranges available on request



## KUMA-N Flanged end seal (MULTI-PIPE)

Application parameters are the same as for KUMA-1.



On request, the seals can be equipped with plastic flanges (one-piece or segmented).

Selection chart of KUMA-n multi-pipe flanged end seals.

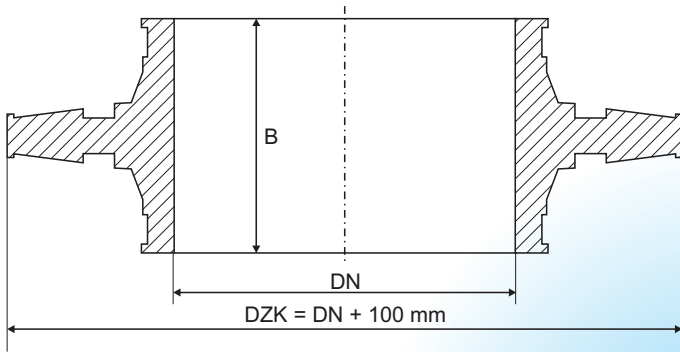
| DN                                                                  | 25    | 32    | 40    | 50    | 63     | 75     | 80     | 80     | 100    | 100    | 125    | 150    | 150    | 180    | 200     | 200     | 225     | 250<br>X | 250     | 300     | 400     |
|---------------------------------------------------------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|----------|---------|---------|---------|
| $\Sigma F(DN)$<br>[F(DN1)<br>+F(DN2)<br>+...]<br>[mm <sup>2</sup> ] | 0-120 | 0-270 | 0-450 | 0-720 | 0-1120 | 0-1540 | 0-2270 | 0-2270 | 0-3400 | 0-3400 | 0-4500 | 0-7500 | 0-7500 | 0-9600 | 0-11300 | 0-11300 | 0-14500 | 0-18800  | 0-22000 | 0-30000 | 0-48000 |
| Do (max)<br>[mm]                                                    | 50    | 60    | 110   | 110   | 110    | 155    | 155    | 220    | 155    | 220    | 220    | 220    | 322    | 270    | 270     | 322     | 320     | 350      | 350     | 400     | 500     |
| Dz<br>[mm]                                                          | 110   | 120   | 180   | 180   | 180    | 245    | 245    | 300    | 245    | 300    | 300    | 300    | 408    | 350    | 350     | 408     | 408     | 445      | 445     | 508     | 600     |
| Screw diameter<br>Ø[mm]                                             | 6     | 6     | 6     | 6     | 6      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8       | 8       | 8       | 8        | 8       | 8       | 8       |
| Number<br>of screw [psc]                                            | 4     | 4     | 6     | 6     | 6      | 6      | 8      | 6      | 6      | 8      | 8      | 8      | 12     | 12     | 12      | 12      | 12      | 12       | 12      | 16      | 16      |

Further diameter ranges available on request

$\Sigma F(DN)$  – sum of cross-sections of the pipes [mm<sup>2</sup>]  
Do (max) – maximum diameter of the hole in the partition  
Dz – flange outer diameter

## Sealing flange KU-TYPE

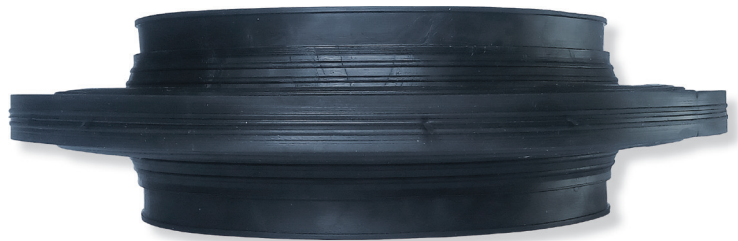
Sealing flange KU-type are intended for making tight install passages through building partitions. After tightening the flange(s) on pipe with bands from stainless steel, whole is placed (concreted) in building partition at the construction stage. Flanges type KU is also used for making transition sleeves. Working pressure is 0,3 MPa. Minimum thickness of concrete cover on KU flange is 30mm. The flanges are made from high-quality elastomers. By using KU flanges and properly matched to thickness of baffle, it is an easy way to obtaining transition sleeves for construction needs.



Selection chart of sealing flange KU-type

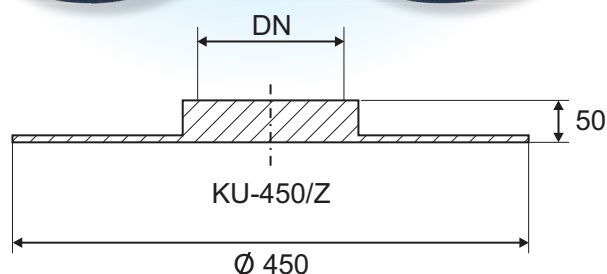
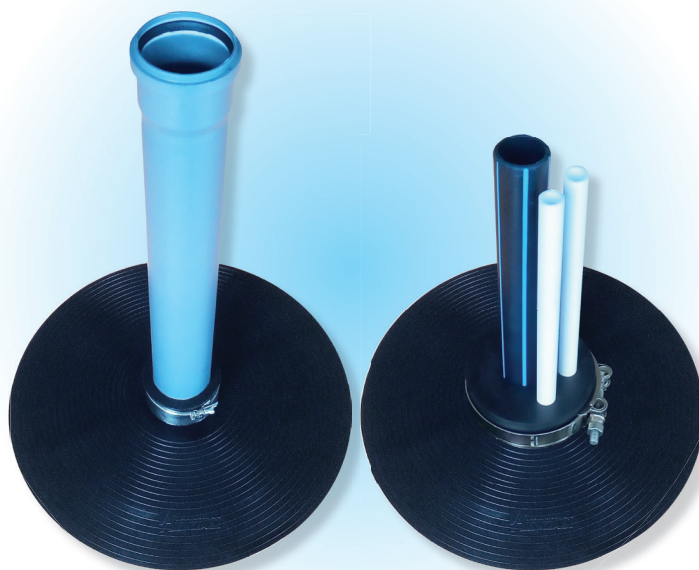
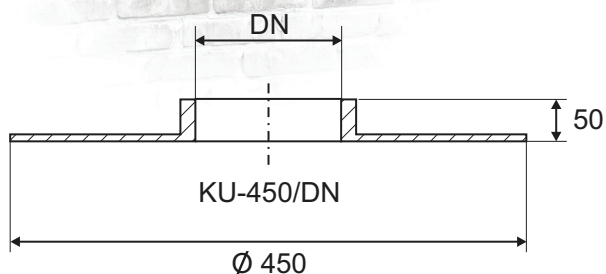
| NO. | Diameter of the carrier pipe [mm] | Application range [mm] | Flange outer diameter [mm] | Seal width [mm] |
|-----|-----------------------------------|------------------------|----------------------------|-----------------|
| 1   | 25                                | 20-28                  | 125                        | 70              |
| 2   | 32                                | 29-35                  | 130                        | 70              |
| 3   | 40                                | 39-44                  | 140                        | 70              |
| 4   | 50                                | 49-55                  | 150                        | 70              |
| 5   | 63                                | 60-68                  | 160                        | 70              |
| 6   | 75                                | 73-80                  | 175                        | 70              |
| 7   | 90                                | 88-97                  | 190                        | 70              |
| 8   | 100                               | 104-108                | 200                        | 70              |
| 9   | 110                               | 110-118                | 200                        | 70              |
| 10  | 125                               | 125-133                | 225                        | 70              |
| 11  | 140                               | 140-145                | 240                        | 70              |
| 12  | 160                               | 159-168                | 260                        | 70              |
| 13  | 180                               | 175-185                | 280                        | 70              |
| 14  | 200                               | 195-205                | 300                        | 70              |
| 15  | 225                               | 215-230                | 325                        | 70              |
| 16  | 250                               | 245-260                | 350                        | 70              |
| 17  | 280                               | 270-285                | 380                        | 70              |
| 18  | 315                               | 310-330                | 415                        | 70              |
| 19  | 350                               | 350-360                | 450                        | 70              |
| 20  | 400                               | 390-410                | 500                        | 70              |

Further diameter ranges available on request



## KU-PO flanged surface-hole seal

KU-PO Flanged surface-hole seals are designed for sealing installation passages through building partitions (single or multi-pipe passages). They are used in non-pressure conditions (up to 2 meters of water column height) and protect against migration of water, mud and gas along the pipeline. They are made of high quality elastomers. The tightness between the seal and the pipe(s) is ensured by tightening the stainless steel band. The tightness between the flexible flange and the building partition is achieved by gluing the bottom part of the flange to the partition with waterproof construction adhesives and on the upper part of the flange water resistant insulation is made. The main application of KU-PO type flanges is the protection of tightness of pipe passages through partitions with and without insulation. When using KU-PO for passage of pipes through roofs or ceilings, the flexible flange should be placed between the layers of waterproof insulation.



Selection chart of KU-PO flanged surface

| TYPE          | Flange diameter [mm] | Pipe diameter DN [mm]                                        |
|---------------|----------------------|--------------------------------------------------------------|
| KU-PO 450/Z   | 450                  | Z – hole blinded for the performance of multi-pipe passages. |
| KU-PO 450/080 | 450                  | 80                                                           |
| KU-PO 450/100 | 450                  | 100                                                          |
| KU-PO 450/150 | 450                  | 150                                                          |
| KU-PO 450/200 | 450                  | 200                                                          |

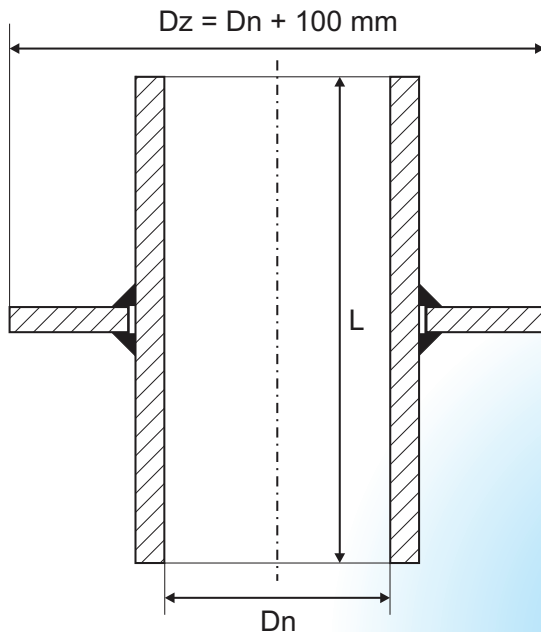
Further diameter ranges available on request

It is possible to make multi-pipe passages based on the customer's drawing.

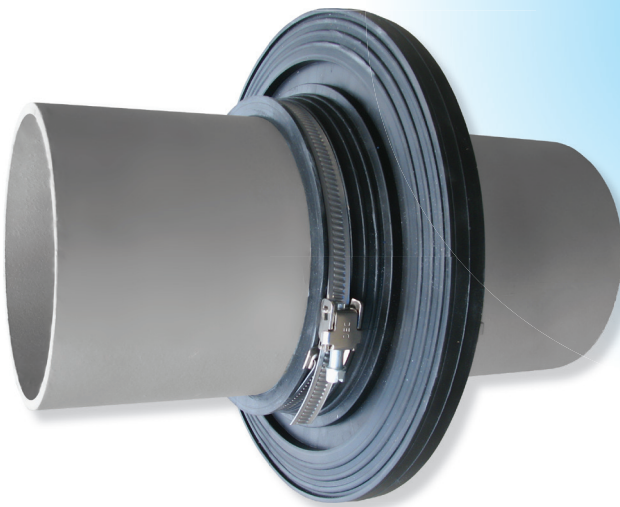
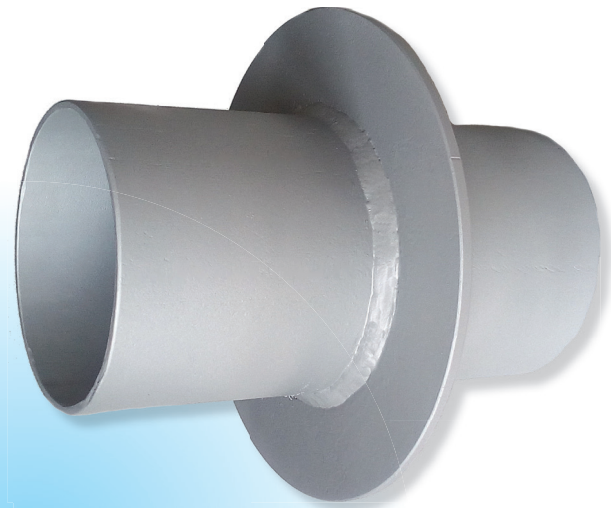


## Transition sleeves

TP type bushings are designed for tight passages through building partitions. They are used in non-pressure conditions (up to 2 meters of water column height) as well as in pressure conditions up to 30m of water column (in the case of TP sleeves with mounted KU flanges) and protect against migration of water, mud and gas along the pipeline. Permanently installed in the partition, they protect against the migration of water along the sleeve and are used to place a seal in them to ensure tightness between the sleeve and the pipe.



Steel sleeve with a steel flange



Steel sleeve with a KU flange



Plastic sleeve with a KU flange

| Dz [mm]  | Dn [mm]           |
|----------|-------------------|
| ≤100     | Dz+50mm           |
| 100 -400 | Dz.+( 50 -100 mm) |
| >400     | Dz.+(100÷200 mm)  |

Minimum internal dimensions of the sleeve (Dn) depending on the pipe outer diameter (Dz)

## Clamp connectors AWJ

### Band with a metal ring.

| NR KAT.   | d x G     |
|-----------|-----------|
| OPA 32 01 | 32 x 1/2" |
| OPA 32 02 | 32 x 3/4" |
| OPA 40 01 | 40 x 1/2" |
| OPA 40 02 | 40 x 3/4" |
| OPA 40 03 | 40 x 1"   |
| OPA 50 01 | 50 x 1/2" |
| OPA 50 02 | 50 x 3/4" |
| OPA 50 03 | 50 x 1"   |
| OPA 63 01 | 63 x 1/2" |
| OPA 63 02 | 63 x 3/4" |
| OPA 63 03 | 63 x 1"   |
| OPA 63 04 | 63 x 5/4" |



### Straight connector

| NR KAT. | d x d   |
|---------|---------|
| ZPE 20  | 20 x 20 |
| ZPE 25  | 25 x 25 |
| ZPE 32  | 32 x 32 |
| ZPE 40  | 40 x 40 |
| ZPE 50  | 50 x 50 |
| ZPE 63  | 63 x 63 |
| ZPE 75  | 75 x 75 |
| ZPE 90  | 90 x 90 |



### Plug PE

| NR KAT. | d  |
|---------|----|
| KOR 20  | 20 |
| KOR 25  | 25 |
| KOR 32  | 32 |
| KOR 40  | 40 |
| KOR 50  | 50 |
| KOR 63  | 63 |
| KOR 75  | 75 |
| KOR 90  | 90 |



### Straight reduction connector.

| NR KAT.   | d x d   |
|-----------|---------|
| ZPR 25 20 | 25 x 20 |
| ZPR 32 25 | 32 x 25 |
| ZPR 40 25 | 40 x 25 |
| ZPR 40 32 | 40 x 32 |
| ZPR 50 32 | 50 x 32 |
| ZPR 50 40 | 50 x 40 |
| ZPR 63 32 | 63 x 32 |
| ZPR 63 40 | 63 x 40 |
| ZPR 63 50 | 63 x 50 |



### Straight connector with internal thread.

| NR KAT.   | d x G     |
|-----------|-----------|
| ZPW 20 01 | 20 x 1/2" |
| ZPW 20 02 | 20 x 3/4" |
| ZPW 25 01 | 25 x 1/2" |
| ZPW 25 02 | 25 x 3/4" |
| ZPW 25 03 | 25 x 1"   |
| ZPW 32 02 | 32 x 3/4" |
| ZPW 32 03 | 32 x 1"   |
| ZPW 32 04 | 32 x 5/4" |
| ZPW 40 03 | 40 x 1"   |
| ZPW 40 04 | 40 x 5/4" |
| ZPW 40 05 | 40 x 6/4" |
| ZPW 50 04 | 50 x 5/4" |
| ZPW 50 05 | 50 x 6/4" |
| ZPW 50 06 | 50 x 2"   |
| ZPW 63 05 | 63 x 6/4" |
| ZPW 63 06 | 63 x 2"   |



### Straight connector with external thread.

| NR KAT.   | d x G       |
|-----------|-------------|
| ZPZ 20 01 | 20 x 1/2"   |
| ZPZ 20 02 | 20 x 3/4"   |
| ZPZ 25 01 | 25 x 1/2"   |
| ZPZ 25 02 | 25 x 3/4"   |
| ZPZ 25 03 | 25 x 1"     |
| ZPZ 32 02 | 32 x 3/4"   |
| ZPZ 32 03 | 32 x 1"     |
| ZPZ 32 04 | 32 x 5/4"   |
| ZPZ 40 02 | 40 x 3/4"   |
| ZPZ 40 03 | 40 x 1"     |
| ZPZ 40 04 | 40 x 5/4"   |
| ZPZ 40 05 | 40 x 6/4"   |
| ZPZ 40 06 | 40 x 2"     |
| ZPZ 50 04 | 50 x 5/4"   |
| ZPZ 50 05 | 50 x 6/4"   |
| ZPZ 50 06 | 50 x 2"     |
| ZPZ 63 04 | 63 x 5/4"   |
| ZPZ 63 05 | 63 x 6/4"   |
| ZPZ 63 06 | 63 x 2"     |
| ZPZ 63 07 | 63 x 2 1/2" |
| ZPZ 75 07 | 75 x 2 1/2" |
| ZPZ 90 08 | 90 x 3"     |



### Reducer

| NR KAT.   | d x G     |
|-----------|-----------|
| WRW 50 01 | 50 x 1/2" |
| WRW 50 02 | 50 x 3/4" |
| WRW 50 03 | 50 x 1"   |
| WRW 63 01 | 63 x 1/2" |
| WRW 63 02 | 63 x 3/4" |
| WRW 63 03 | 63 x 1"   |



## Clamp connectors AWJ

### Elbow with internal thread

| NR KAT.   | d x G     |
|-----------|-----------|
| KPW 20 01 | 20 x 1/2" |
| KPW 20 02 | 20 x 3/4" |
| KPW 25 01 | 25 x 1/2" |
| KPW 25 02 | 25 x 3/4" |
| KPW 25 03 | 25 x 1"   |
| KPW 32 02 | 32 x 3/4" |
| KPW 32 03 | 32 x 1"   |
| KPW 40 03 | 40 x 1"   |
| KPW 40 04 | 40 x 5/4" |
| KPW 40 05 | 40 x 6/4" |
| KPW 50 05 | 50 x 6/4" |
| KPW 63 06 | 63 x 2"   |



### Elbow PE-PE

| NR KAT. | d x d   |
|---------|---------|
| KPE 20  | 20 x 20 |
| KPE 25  | 25 x 25 |
| KPE 32  | 32 x 32 |
| KPE 40  | 40 x 40 |
| KPE 50  | 50 x 50 |
| KPE 63  | 63 x 63 |
| KPE 75  | 75 x 75 |
| KPE 90  | 90 x 90 |



### Elbow PE-STALwith external thread.

| NR KAT.   | d x G       |
|-----------|-------------|
| KPZ 20 01 | 20 x 1/2"   |
| KPZ 20 02 | 20 x 3/4"   |
| KPZ 25 01 | 25 x 1/2"   |
| KPZ 25 02 | 25 x 3/4"   |
| KPZ 25 03 | 25 x 1"     |
| KPZ 32 02 | 32 x 3/4"   |
| KPZ 32 03 | 32 x 1"     |
| KPZ 32 04 | 32 x 5/4"   |
| KPZ 40 03 | 40 x 1"     |
| KPZ 40 04 | 40 x 5/4"   |
| KPZ 40 05 | 40 x 6/4"   |
| KPZ 50 05 | 50 x 6/4"   |
| KPZ 50 06 | 50 x 2"     |
| KPZ 63 06 | 63 x 2"     |
| KPZ 75 07 | 75 x 2 1/2" |
| KPZ 90 08 | 90 x 3"     |



### T-piece PE-PE-PE

| NR KAT. | d x d x d    |
|---------|--------------|
| TPE 20  | 20 x 20 x 20 |
| TPE 25  | 25 x 25 x 25 |
| TPE 32  | 32 x 32 x 32 |
| TPE 40  | 40 x 40 x 40 |
| TPE 50  | 50 x 50 x 50 |
| TPE 63  | 63 x 63 x 63 |
| TPE 75  | 75 x 75 x 75 |
| TPE 90  | 90 x 90 x 90 |



### T-piece with internal thread.

| NR KAT.   | d x G x d      |
|-----------|----------------|
| TPW 20 01 | 20 x 1/2" x 20 |
| TPW 25 01 | 25 x 1/2" x 25 |
| TPW 25 02 | 25 x 3/4" x 25 |
| TPW 25 03 | 25 x 1" x 25   |
| TPW 32 02 | 32 x 3/4" x 32 |
| TPW 32 03 | 32 x 1" x 32   |
| TPW 40 03 | 40 x 1" x 40   |
| TPW 40 04 | 40 x 5/4" x 40 |
| TPW 50 05 | 50 x 6/4" x 50 |
| TPW 63 06 | 63 x 2" x 63   |



### T-piece PE-STALwith external thread.

| NR KAT.   | d x G x d        |
|-----------|------------------|
| TPZ 20 01 | 20 x 1/2" x 20   |
| TPZ 25 02 | 25 x 3/4" x 25   |
| TPZ 25 03 | 25 x 1" x 25     |
| TPZ 32 02 | 32 x 3/4" x 32   |
| TPZ 32 03 | 32 x 1" x 32     |
| TPZ 32 04 | 32 x 5/4" x 32   |
| TPZ 40 03 | 40 x 1" x 40     |
| TPZ 40 04 | 40 x 5/4" x 40   |
| TPZ 40 05 | 40 x 6/4" x 40   |
| TPZ 50 05 | 50 x 6/4" x 50   |
| TPZ 50 06 | 50 x 2" x 50     |
| TPZ 63 06 | 63 x 2" x 63     |
| TPZ 75 07 | 75 x 2 1/2" x 75 |



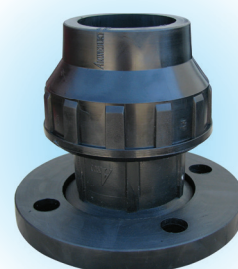
### Reducing tee-piece.

| NR KAT.   | d x d x d    |
|-----------|--------------|
| TRE 25 20 | 25 x 20 x 25 |
| TRE 32 20 | 32 x 20 x 32 |
| TRE 32 25 | 32 x 25 x 32 |
| TRE 40 20 | 40 x 20 x 40 |
| TRE 40 25 | 40 x 25 x 40 |
| TRE 40 32 | 40 x 32 x 40 |
| TRE 50 25 | 50 x 25 x 50 |
| TRE 50 32 | 50 x 32 x 50 |
| TRE 50 40 | 50 x 40 x 50 |
| TRE 63 32 | 63 x 32 x 63 |
| TRE 63 40 | 63 x 40 x 63 |
| TRE 63 50 | 63 x 50 x 63 |



### Straight connector with flange

| NR KAT.   | d x D   |
|-----------|---------|
| ZPK 63 50 | 63 x 50 |





## Dimensions of typical pipes used in the construction of gas pipelines, water pipes and sewage systems

|                       |                                       | Polyethylene pipes PE100 |                     |                     | Polyethylene pipes PE80 |                   | PVC sewage pipes    |                        |
|-----------------------|---------------------------------------|--------------------------|---------------------|---------------------|-------------------------|-------------------|---------------------|------------------------|
| Steel pipes           | Cast iron pressure pipes (spheroidal) | SDR 26                   | SDR 17              | SDR 11              | SDR 17,6                | SDR 11            | klasa N (SDR41 S20) | klasa S (SDR 34 S16,7) |
| dn 25 (33,7 x 3,2)    |                                       |                          | dn 25 (32x2,0)      | dn 25 (32x3,0)      | dn 25 (32x2,3)          | dn 25 (32x3,0)    |                     |                        |
| dn 32 (42,4 x 3,2)    |                                       |                          | dn 32 (40x2,4)      | dn 32 (40x3,7)      | dn 32 (40x2,3)          | dn 32 (40x3,7)    |                     |                        |
| dn 40 (48,3 x 3,2)    |                                       |                          | dn 40 (50x3,0)      | dn 40 (50x4,6)      | dn 40 (50x2,9)          | dn 40 (50x4,6)    |                     |                        |
| dn 50 (60,3 x 3,6)    |                                       | dn 50 (63x2,5)           | dn 50 (63x3,8)      | dn 50 (63x5,8)      | dn 50 (63x3,6)          | dn 50 (63x5,8)    |                     |                        |
| dn 65 (76,1 x 3,6)    |                                       | dn 65 (75x2,9)           | dn 65 (75x4,5)      | dn 65 (75x6,8)      | dn 65 (75x4,3)          | dn 65 (75x6,8)    |                     |                        |
| dn 80 (88,9 x 4,0)    | dn 80 (98x6,0)                        | dn 80 (90x3,5)           | dn 80 (90x5,4)      | dn 80 (90x8,2)      | dn 80 (90x5,2)          | dn 80 (90x8,2)    |                     |                        |
| dn 100 (114,3x4,0)    | dn 100 (118x6,0)                      | dn 100 (110x4,2)         | dn 100 (110x6,6)    | dn 100 (110x10,0)   | dn 100 (110x6,3)        | dn 100 (110x10,0) |                     | dn 100 (110x3,2)       |
| dn 125 (139,7x4,0)    | dn 125 (144x6,0)                      | dn 125 (125x4,8)         | dn 125 (125x7,4)    | dn 125 (125x11,8)   | dn 125 (125x7,1)        | dn 125 (125x11,8) |                     |                        |
| dn 150 (168,3x4,5)    | dn 150 (170x6,0)                      | dn 150 (160x6,2)         | dn 150 (160x14,6)   | dn 150 (160x14,6)   | dn 150 (160x9,1)        | dn 150 (160x14,6) | dn 150 (160x4,0)    | dn 150 (160x4,7)       |
| dn 200 (219,1x6,3)    | dn 200 (222x6,3)                      | dn 200 (225x8,6)         | dn 200 (225x20,5)   | dn 200 (225x20,5)   | dn 200 (225x20,5)       | dn 200 (225x20,5) |                     | dn 200 (200x5,9)       |
| dn 250 (273,0x7,1)    | dn 250 (274x6,8)                      | dn 250 (250x9,6)         | dn 250 (250x14,8)   | dn 250 (250x22,7)   | dn 250 (250x14,2)       | dn 250 (250x22,7) | dn 250 (250x6,2)    | dn 250 (250x7,3)       |
|                       |                                       | dn 280 (280x10,7)        | dn 280 (280x16,6)   | dn 280 (280x25,4)   | dn 280 (280x16,0)       | dn 280 (280x25,4) |                     |                        |
| dn 300 (323,9x8,0)    | dn 300 (326x7,2)                      | dn 300 (315x12,1)        | dn 300 (315x18,7)   | dn 300 (315x28,6)   | dn 300 (315x17,9)       | dn 300 (315x28,6) | dn 300 (315x7,7)    | dn 300 (315x9,2)       |
| dn 350 (355,6x8,0)    | dn 350 (378x7,7)                      | dn 350 (355x13,6)        | dn 350 (355x21,1)   | dn 350 (355x32,3)   | dn 350 (355x20,2)       | dn 350 (355x32,3) |                     |                        |
| dn 400 (406,4x8,8)    | dn 400 (429x8,1)                      | dn 400 (400x15,3)        | dn 400 (400x23,7)   | dn 400 (400x36,4)   | dn 400 (400x22,8)       | dn 400 (400x36,4) | dn 400 (400x9,8)    | dn 400 (400x11,7)      |
| dn 450 (457,0x10,0)   |                                       | dn 450 (450x17,2)        | dn 450 (450x26,7)   | dn 450 (450x41,0)   | dn 450 (450x25,6)       | dn 450 (450x41,0) |                     |                        |
| dn 500 (508,0x11,0)   | dn 500 (532x9,0)                      | dn 500 (500x19,1)        | dn 500 (500x27,9)   | dn 500 (500x45,5)   | dn 500 (500x28,5)       | dn 500 (500x45,5) | dn 500 (500x12,2)   | dn 500 (500x14,6)      |
|                       |                                       | dn 550 (560x21,4)        | dn 550 (560x33,2)   | dn 550 (560x51,0)   | dn 550 (560x31,9)       | dn 550 (560x51,0) |                     |                        |
| dn 600 (610,0x11,0)   | dn 600 (635x9,9)                      | dn 600 (630x24,1)        | dn 600 (630x37,4)   | dn 600 (630x57,3)   | dn 600 (630x35,8)       | dn 600 (630x57,3) | dn 600 (630x15,4)   | dn 600 (630x18,4)      |
| dn 700 (711,0x11,0)   | dn 700 (738x10,6)                     | dn 700 (710x27,2)        | dn 700 (710x42,1)   | dn 700 (710x64,6)   | dn 700 (710x40,2)       | dn 700 (710x64,6) |                     |                        |
| dn 800 (813,0x11,0)   | dn 800 (842x11,7)                     | dn 800 (800x30,6)        | dn 800 (800x47,4)   | dn 800 (800x47,4)   | dn 800 (800x45,3)       |                   |                     |                        |
| dn 900 (914,0x14,2)   | dn 900 (945x12,6)                     | dn 900 (900x34,4)        | dn 900 (900x53,3)   | dn 900 (900x53,3)   | dn 900 (900x51,0)       |                   |                     |                        |
| dn 1000 (1016,0x14,2) | dn 1000 (1048x13,5)                   | dn 1000 (1000x38,2)      | dn 1000 (1000x59,3) | dn 1000 (1000x59,3) | dn 1000 (1000x56,6)     |                   |                     |                        |
| dn 1100 (1118,0x14,2) | dn 1100 (1152x14,4)                   |                          |                     |                     |                         |                   |                     |                        |
| dn 1200 (1219,0x14,2) | dn 1200 (1255x15,3)                   | dn 1200 (1200x45,9)      |                     |                     |                         |                   |                     |                        |
| dn 1300 (1320,0x16,0) |                                       |                          |                     |                     |                         |                   |                     |                        |
| dn 1400 (1420,0x16,0) | dn 1400 (1462x17,1)                   | dn 1400 (1400x53,5)      |                     |                     |                         |                   |                     |                        |
| dn 1500 (1520,0x16,0) |                                       |                          |                     |                     |                         |                   |                     |                        |

## Dimensions of typical pipes used in the construction of gas pipelines, water pipes and sewage systems

|                                          |                   | Pipes SPIRO         |                     |                     |                            |                   |                    |                     |
|------------------------------------------|-------------------|---------------------|---------------------|---------------------|----------------------------|-------------------|--------------------|---------------------|
| PVC pressure pipes type 125 PN10 (SDR26) | Pragma pipes      | SN2                 | SN4                 | SN8                 | Polyester pipes PN10 (GRP) | Stoneware pipes   | Concrete pipes     | Pre-insulated pipes |
|                                          |                   |                     |                     |                     |                            |                   |                    | dn 25 (Dz=90mm)     |
|                                          |                   |                     |                     |                     |                            |                   |                    | dn 32 (Dz=110mm)    |
|                                          |                   |                     |                     |                     |                            |                   |                    | dn 40 (Dz=110mm)    |
| dn 50 (63x2,5)                           |                   |                     |                     |                     |                            |                   |                    | dn 50 (Dz=125mm)    |
|                                          |                   |                     |                     |                     |                            |                   |                    | dn 63 (Dz=140mm)    |
| dn 80 (90x3,5)                           |                   |                     |                     |                     |                            |                   |                    | dn 80 (Dz=160mm)    |
| dn 100 (110x4,2)                         |                   |                     |                     |                     |                            | dn 100 (131x15,5) |                    | dn 100 (Dz=200mm)   |
|                                          |                   |                     |                     |                     |                            | dn 125 (159x17,0) |                    | dn 125 (Dz=225mm)   |
| dn 150 (160x6,2)                         | dn 150 (160x10,5) |                     |                     |                     | dn 150 (168x4,0)           | dn 150 (186x18,0) |                    | dn 150 (Dz=250mm)   |
| dn 200 (225x8,6)                         |                   |                     |                     |                     | dn 200 (220x5,8)           | dn 200 (242x21,0) | dn 200 (276x38)    | dn 200 (Dz=315mm)   |
|                                          | dn 250 (250x16,0) |                     |                     |                     | dn 250 (272x6,9)           | dn 250 (299x24,5) |                    | dn 250 (Dz=400mm)   |
| dn 280 (280x10,8)                        |                   |                     |                     |                     |                            |                   |                    |                     |
| dn 300 (315x12,1)                        | dn 300 (315x19,5) |                     |                     | dn 300 (340x20,0)   | dn 300 (324x7,9)           | dn 300 (355x27,5) | dn 300 (400x50)    | dn 300 (Dz=450mm)   |
|                                          |                   |                     |                     | dn 350 (402x26,0)   | dn 350 (376x9,0)           | dn 350 (417x33,5) |                    | dn 350 (Dz=500mm)   |
| dn 400 (400x15,3)                        | dn 400 (400x26,0) |                     |                     | dn 400 (452x26,0)   | dn 400 (427x10,1)          | dn 400 (486x43,0) | dn 400 (510x55)    | dn 400 (Dz=520mm)   |
| dn 450 (450x17,3)                        |                   | dn 450 (492x21,0)   | dn 450 (504x27,0)   | dn 450 (508x29,0)   | dn 450 (478x10,9)          | dn 450 (548x49,0) |                    |                     |
| dn 500 (500x19,2)                        | dn 500 (500x32,5) | dn 500 (548x24,0)   | dn 500 (560x30,0)   | dn 500 (563x31,5)   | dn 500 (530x12,1)          | dn 500 (609x54,5) | dn 500 (630x65)    | dn 500 (Dz=630mm)   |
|                                          |                   |                     |                     |                     |                            |                   |                    |                     |
|                                          | dn 600 (630x41,0) | dn 600 (655x27,5)   | dn 600 (665x32,5)   | dn 600 (678x39,0)   | dn 600 (616x13,8)          | dn 600 (721x60,5) | dn 600 (750x75)    | dn 600 (Dz=780mm)   |
|                                          |                   | dn 700 (766x33,0)   | dn 700 (781x40,5)   | dn 700 (792x46,0)   | dn 700 (718x15,6)          | dn 700 (831x65,5) |                    | dn 700 (Dz=900mm)   |
|                                          |                   | dn 800 (866x33,0)   | dn 800 (894x47,0)   | dn 800 (904x52,0)   | dn 800 (820x17,0)          | dn 800 (941x70,5) | dn 800 (980x90)    | dn 800 (z=1000mm)   |
|                                          |                   | dn 900 (982x41,0)   | dn 900 (1007x53,5)  | dn 900 (1018x59,0)  | dn 900 (924x19,2)          |                   |                    | dn 900 Dz=1100mm    |
|                                          |                   | dn 1000 (1096x48,0) | dn 1000 (1121x60,5) | dn 1000 (1130x65,0) | dn 1000 (1026x21,2)        |                   | dn 1000 (1220x110) | dn 1000 Dz=1200mm   |
|                                          |                   | dn1100 (1146x48,0)  | dn1100 (1171x60,5)  | dn1100 (1180x65,0)  | dn 1100 (1099x23,0)        |                   |                    | dn 1100 Dz=1300mm   |
|                                          |                   | dn 1200 (1310x55,0) | dn 1200 (1335x67,5) | dn 1200 (1356x78,0) | dn 1200 (1229x25,0)        |                   | dn 1200 (1460x130) |                     |
|                                          |                   |                     |                     |                     | dn 1300 (1331,5X24,8)      |                   |                    |                     |
|                                          |                   | dn 1400 (1536x68,0) | dn 1400 (1561x80,5) | dn 1400 (1582x91,0) | dn 1400 (1434x29,1)        |                   |                    |                     |
|                                          |                   | dn 1500 (1637x68,5) | dn 1500 (1687x93,5) | dn 1500 (1688x94,0) | dn 1500 (1499x30,6)        |                   |                    |                     |

## APROBATA TECHNICZNA ITB AT-15-8516/2016

Na podstawie rozporządzenia Ministra Infrastruktury z dnia 8 listopada 2004 r. w sprawie aprobat technicznych oraz jednostek organizacyjnych upoważnionych do ich wydawania (tekst jednolity, Dz. U. z 2014 r., poz. 1040), w wyniku podlegającego aprobowaniu dokonanego w Instytucie Techniki Budowlanej w Warszawie, na wniosek firmy:

**AKWEDUKT Marek Pawlak**  
ul. Władysława Syrokomli 5  
94-308 Łódź

świadczą się przydatność do stosowania w budownictwie wyrobów pod nazwą:

**Łączniki zaciskowe i opaski przyłączeniowe  
AKWEDUKT z polipropylenu (PP)  
do rur polietylenowych**

w zakresie i na zasadach określonych w Załączniku, który stanowi integralną część niniejszej Aprobaty Technicznej ITB.

Termin ważności:  
21 listopada 2021 r.

Załącznik:  
Postanowienia ogólne i techniczne



**DYREKTOR**  
Instytut Techniki Budowlanej  
*dr inż. Marcin M. Kruk*

Warszawa, 21 listopada 2016 r.

Aprobata Techniczna ITB AT-15-8516/2016 jest nowelizacją Aprobaty Technicznej ITB AT-15-8516/2010. Dokument Aprobata Technicznej ITB AT-15-8516/2016 zawiera 18 stron. Tekst tego dokumentu można kopiować tylko w całości. Publikowanie lub rozpowszechnianie w częściowej formie bez zgody Instytutu Techniki Budowlanej jest niedozwolone. Wynagrodzenie za udzielenie z Instytutem Techniki Budowlanej.

## KRAJOWA OCENA TECHNICZNA ITB-KOT-2017/0219 wydanie 1

Niniejsza Krajowa Ocena Techniczna została wydana zgodnie z Rozporządzeniem Ministra Infrastruktury i Budownictwa z dnia 17 listopada 2016 r. w sprawie krajowych ocen technicznych (Dz. U. z 2016 r., poz. 1968) przez Instytut Techniki Budowlanej w Warszawie, na wniosek firmy:

**AKWEDUKT - MAREK PAWLAK**  
ul. Władysława Syrokomli 5, 94-308 Łódź

Krajowa Ocena Techniczna ITB-KOT-2017/0219 wydanie 1 stanowi pozytywną ocenę właściwości użytkowych poniższych wyrobów budowlanych do zamierzonego zastosowania:

**Płozy dystansowe systemu AKWEDUKT**

Data ważności Krajowej Oceny Technicznej:  
29 września 2022 r.



**p.o. DYREKTORA**  
Instytutu Techniki Budowlanej  
*dr inż. Robert Gerylo*

Warszawa, 29 września 2017 r.

Dokument Krajowej Oceny Technicznej ITB-KOT-2017/0219 wydanie 1 zawiera 32 strony, w tym 3 załączniki. Tekst tego dokumentu można kopiować tylko w całości. Publikowanie lub rozpowszechnianie w częściowej formie bez zgody Instytutu Techniki Budowlanej jest niedozwolone. Wynagrodzenie za udzielenie z Instytutem Techniki Budowlanej.

## KRAJOWA OCENA TECHNICZNA ITB-KOT-2018/0433 wydanie 1

Niniejsza Krajowa Ocena Techniczna została wydana zgodnie z Rozporządzeniem Ministra Infrastruktury i Budownictwa z dnia 17 listopada 2016 r. w sprawie krajowych ocen technicznych (Dz. U. z 2016 r., poz. 1968) przez Instytut Techniki Budowlanej w Warszawie, na wniosek firmy:

**AKWEDUKT - MAREK PAWLAK**  
ul. Władysława Syrokomli 5, 94-308 Łódź

Krajowa Ocena Techniczna ITB-KOT-2018/0433 wydanie 1 stanowi pozytywną ocenę właściwości użytkowych poniższych wyrobów budowlanych do zamierzonego zastosowania:

**Uszczelnienia przepustów instalacyjnych systemu  
AKWEDUKT**

Data ważności Krajowej Oceny Technicznej:  
27 marca 2023 r.



**DYREKTOR**  
Instytutu Techniki Budowlanej  
*dr inż. Robert Gerylo*

Warszawa, 27 marca 2018 r.

Dokument Krajowej Oceny Technicznej ITB-KOT-2018/0433 wydanie 1 zawiera 18 stron, w tym 2 załączniki. Tekst tego dokumentu można kopiować tylko w całości. Publikowanie lub rozpowszechnianie w częściowej formie bez zgody Instytutu Techniki Budowlanej jest niedozwolone. Wynagrodzenie za udzielenie z Instytutem Techniki Budowlanej.