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**INTEGRA**  
**GLIWICE**



**PRODUCT CATALOGUE**

**2024**

Typical pipe sizes used in construction: Gas, Water, Sewerage. (outside diameter and wall thickness)



DN		Steel pipes	Cast-Iron K9	PE 100			PE 80		PCV sewage pipes		PCV pressure pipes type 125 PN10 (SDR 26)	PRAGMA pipes	SPIRO pipes			Polyester pipes PN 10	Ceramic pipes	Concrete pipes
mm	inches			SDR 26	SDR 17	SDR 11	SDR 17,6	SDR 11	N (SDR41 S20)	S (SDR34 S16,7)			SN 2	SN 4	SN 8			
25	1	33,7 x 3,2			32 x 2,0	32 x 3,0	32 x 2,3	32 x 3,0										
32	1 1/4	42,4 x 3,2			40 x 2,4	40 x 3,7	40 x 2,3	40 x 3,7										
40	1 1/2	48,3 x 3,2			50 x 3,0	50 x 4,6	50 x 2,9	50 x 4,6										
50	2	60,3 x 3,6			63 x 2,5	63 x 3,8	63 x 5,8	63 x 3,6	63 x 5,8		63 x 2,5							
65	2 1/2	76,1 x 3,6			75 x 2,9	75 x 4,5	75 x 6,8	75 x 4,3	75 x 6,8									
80	3	88,9 x 4,0	98 x 6,0	90 x 3,5	90 x 5,4	90 x 8,2	90 x 5,2	90 x 8,2			90 x 3,5							
100	4	114,3 x 4,0	118 x 6,0	110 x 4,2	110 x 6,6	110 x 10,0	110 x 6,3	110 x 10,0		110 x 3,2	110 x 4,2	110 x 7,5				131 x 15,5		
125	5	139,7 x 4,0	144 x 6,0	125 x 4,8	125 x 7,4	125 x 11,8	125 x 7,1	125 x 11,8								159 x 17,0		
140	5 1/2			140 x 5,4	140 x 8,3	140 x 12,7	140 x 8,0	140 x 12,7										
150	6	168,3 x 4,5	170 x 6,0	160 x 6,2	160 x 9,5	160 x 14,6	160 x 9,1	160 x 14,6	160 x 4,0	160 x 4,7	160 x 6,2	160 x 11,0			168 x 4,0	186 x 18,0		
180	7			180 x 6,9	180 x 10,7	180 x 16,4	180 x 10,3	180 x 16,4										
		193,7 x 5,6		200 x 7,7	200 x 11,9	200 x 18,2	200 x 11,4	200 x 18,2	200 x 4,9	200 x 5,9		200 x 13,0						
200	8	219,1 x 6,3	222 x 6,3	225 x 8,6	225 x 13,4	225 x 20,5	225 x 12,8	225 x 20,5			225 x 8,6				220 x 5,8	242 x 21,0	276 x 38	
250	10	273,0 x 7,1	274 x 6,8	250 x 9,6	250 x 14,8	250 x 22,7	250 x 14,2	250 x 22,7	250 x 6,2	250 x 7,3		250 x 16,0			272 x 6,9	299 x 24,5		
280	11			280 x 10,7	280 x 16,6	280 x 25,4	280 x 16,0	280 x 25,4			280 x 10,8							
300	12	323,9 x 8,0	326 x 7,2	315 x 12,1	315 x 18,7	315 x 28,6	315 x 17,9	315 x 28,6	315 x 7,7	315 x 9,2	315 x 12,1	315 x 19,5			340 x 20,0	324 x 7,9	355 x 27,5	400 x 50
350	14	355,6 x 8,0	378 x 7,7	355 x 13,6	355 x 21,1	355 x 32,3	355 x 20,2	355 x 32,3							402 x 26,0	376 x 9,0	417 x 33,5	
400	16	406,4 x 8,8	429 x 8,1	400 x 15,3	400 x 23,7	400 x 36,4	400 x 22,8	400 x 36,4	400 x 9,8	400 x 11,7	400 x 15,3	400 x 26,0			452 x 26,0	427 x 10,1	486 x 43,0	510 x 55
450	18	457,0 x 10,0		450 x 17,2	450 x 26,7	450 x 41,0	450 x 25,6	450 x 41,0			450 x 17,3		492 x 21,0	504 x 27,0	508 x 29,0	478 x 10,9	548 x 49,0	
500	20	508,0 x 11,0	532 x 9,0	500 x 19,1	500 x 27,9	500 x 45,5	500 x 28,5	500 x 45,5	500 x 12,2	500 x 14,6	500 x 19,2	500 x 33,0	548 x 24,0	560 x 30,0	563 x 31,5	530 x 12,1	609 x 54,5	630 x 65
550	22			560 x 21,4	560 x 33,2	560 x 51,0	560 x 31,9	560 x 51,0										
600	24	610,0 x 11,0	635 x 9,9	630 x 24,1	630 x 37,4	630 x 57,3	630 x 35,8	630 x 57,3	630 x 15,4	630 x 18,4		630 x 42,0	655 x 27,5	665 x 32,5	678 x 39,0	616 x 13,8	721 x 60,5	750 x 75
700	28	711,0 x 11,0	738 x 10,8	710 x 27,2	710 x 42,1	710 x 64,6	710 x 40,2	710 x 64,6					766 x 33,0	781 x 40,5	792 x 46,0	718 x 15,6	831 x 65,5	
800	32	813,0 x 11,0	842 x 11,7	800 x 30,6	800 x 47,4		800 x 45,3						866 x 33,0	894 x 47,0	904 x 52,0	820 x 17,0	941 x 70,5	980 x 90
900	36	914,0 x 14,2	945 x 12,6	900 x 34,4	900 x 53,3		900 x 51,0						982 x 41,0	1007 x 53,5	1018 x 59,0	924 x 19,2		
1000	40	1016,0 x 14,2	1048 x 13,5	1000 x 38,2	1000 x 59,3		1000 x 56,6						1096 x 48,0	1121 x 60,5	1130 x 65,0	1026 x 21,2		1220 x 110
1100	44	1118,0 x 14,2	1152 x 14,4										1146 x 48,0	1171 x 60,5	1180 x 65,0	1099 x 23,0		
1200	48	1219,0 x 14,2	1255 x 15,3	1200 x 45,9									1310 x 55,0	1335 x 67,5	1356 x 78,0	1229 x 25,0		1460 x 130
1300	52	1320,0 x 16,0																
1400	56	1420,0 x 16,0	1462 x 17,1	1400 x 53,5									1536 x 68,0	1561 x 80,5	1582 x 91,0	1434 x 29,1		
1500	60	1520,0 x 16,0											1637 x 68,5	1687 x 93,5	1688 x 94,0	1499 x 30,6		

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## BENEFITS & ADVANTAGES of using easy feed casing spacers inside ducts/casings.

Simple installation of a new carrier pipes inside a new or old duct or split casing.

Quick positioning of the carrier pipe. Excellent insulation properties.

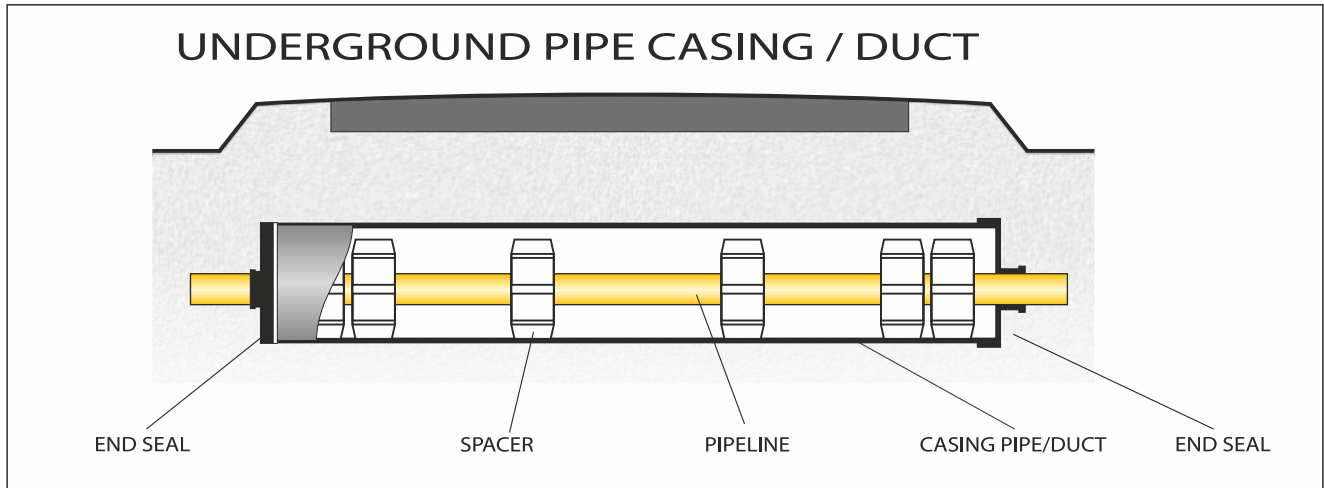
No interference with the cathodic protection plus protection of paint and insulation coatings.

Damage protection of the external surface.

Casing Spacers may be used for PE, PVC, Steel and other types of pipe, in a wide range of diameters.

Installation without specialized tools.

### CASING SPACERS GUIDE CALCULATOR



Size calculation guide.

The height of spacers can be calculated in the following way

$$(ID - OD) : 2 = \text{height}$$

**ID** = Inner Diameter of casing pipe,

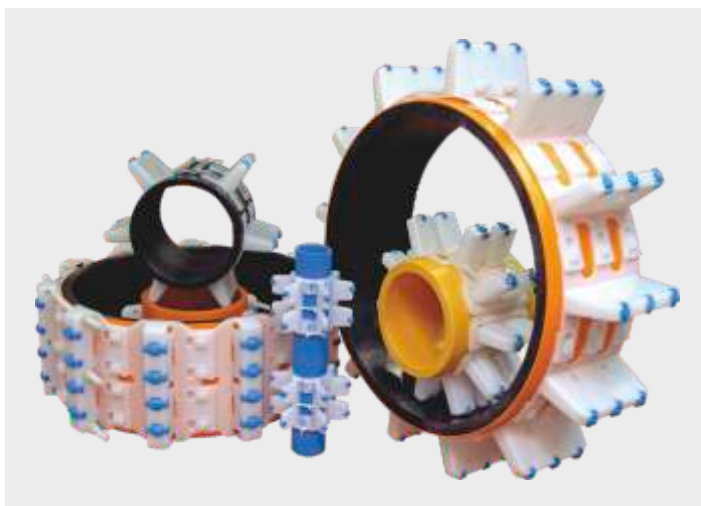
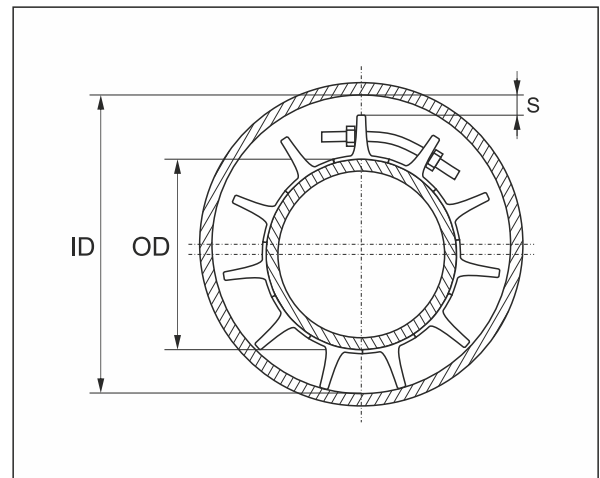
**OD** = Outer Diameter of carrier pipe  
+ possible insulation.

The total height of elements has to be lower than the calculated dimension  $S > 0$ .

The number of casing spacers needed is determined by the formula below:

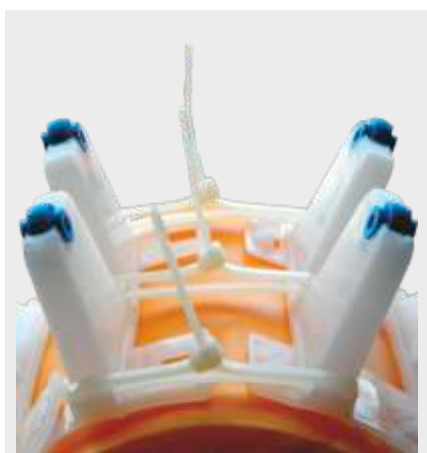
$$L \div 1.5 + 3 = \text{number of ring sets}$$

Where **L** equals the length of casing / duct in meters, we add 3 spacer ring sets to the total, so that the beginning and the end of the carrier pipe line is properly supported by two spacer ring sets.





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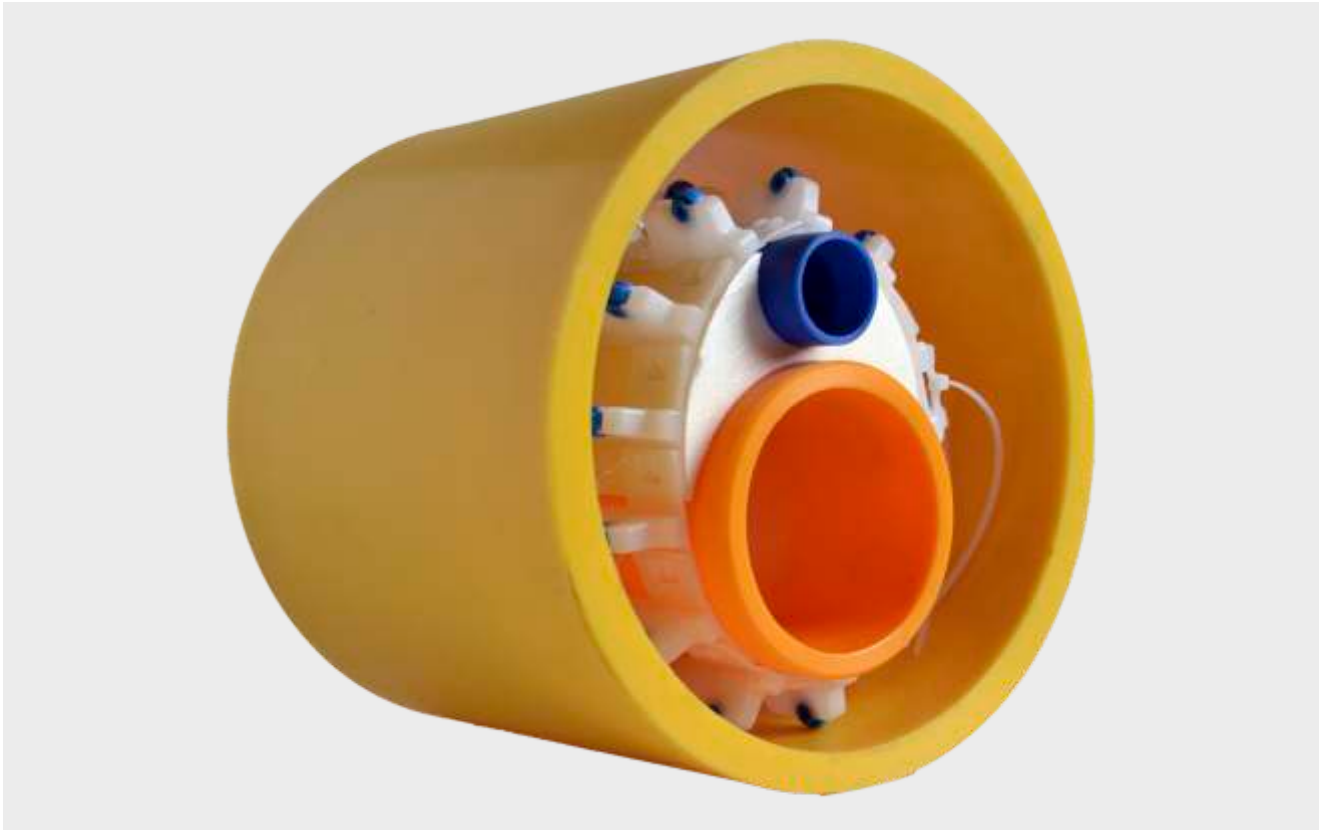


Type BR spacers are designed for small carrier pipes. Rollers reduce friction while feeding new pipes into new or old ducts / casings, allowing the pipe to move freely during installation. Connecting the spacer units together round the pipe is done by tough snap connectors on each of the units ensuring a strong and firm connection of each unit on the pipe. See the guide chart opposite for how many units per set are needed. After the spacer set rings are wrapped around the pipe use nylon straps to clamp them firmly to the pipe. Spacer ring sets are delivered with all required units and fixings for the OD and length of the pipe.

Pipe diameter range:	32 to 173 mm
Unit heights including rollers:	9, 15, 25, 35, 45 mm
Unit width:	100 mm
Unit material:	HDPE
Clamping straps:	Nylon
Working temperature:	-20°C to 60°C
Standard distance between spacer sets:	1.5 m
Maximum static load each set:	200 KG
Metal components:	None

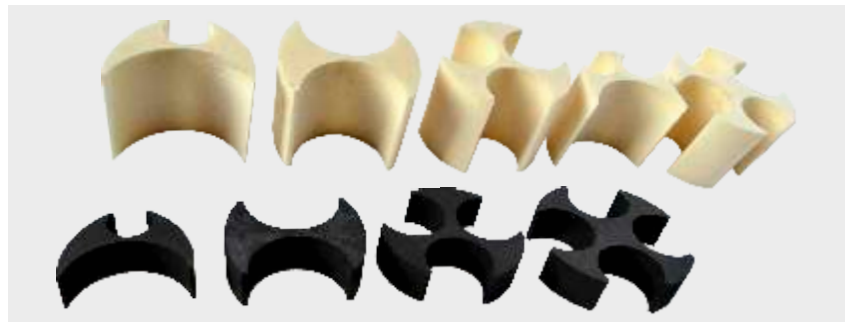
### Spacer selection guide chart

Outer diameter of the carrier pipe [mm]	Number of units per ring set
32 - 37	3
38 - 48	4
49 - 58	5
59 - 69	6
70 - 79	7
80 - 90	8
91 - 101	9
102 - 111	10
112 - 121	11
122 - 132	12
133 - 142	13
143 - 152	14
153 - 163	15
164 - 173	16



Type **BR** spacers are made of HDPE for Multi-pipe installations when a casing/duct contains more pipes of different sizes. The units are made up of **BR** spacers with separators from polystyrene or rubber inserts, which are used to separate the pipes and hold them firmly in place. The inserts are designed to ensure the correct distance between the pipes and to keep them in alignment.

The maximum diameter of the type **BR** spacers are determined by the size of the pipes and combination of pipes that are required.  
Maximum pipe diameter: 200 mm  
Materials used.  
Spacers: HDPE  
Inserts: Polystyrene or rubber



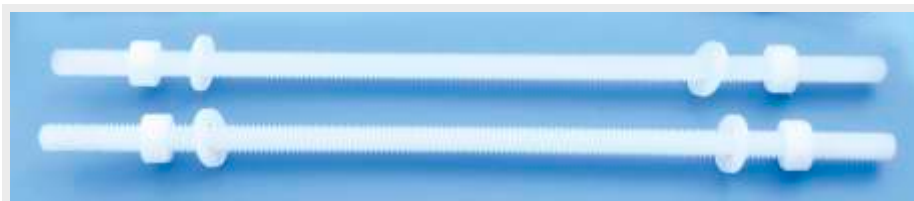
## PATENTED



Type L spacers are used for medium size diameter carrier pipes. Rollers reduce friction while feeding new pipes into new or old ducts /casings, allowing the new pipe to move freely during installation. Each spacer unit has 2 tough oblong holes which slot over the legs and click in place on the next unit and then wrap round the pipe, then 2 strong nylon threaded bars with washers and nuts clamp the ring set to the pipe, holding it firmly in place.

See the chart below for the number of units needed.

When clamping together the ends of the ring sets it may be necessary to cut / trim off the unused parts of the connector to make it fit better on the pipe. Spacer ring set are delivered with all required units and fixings for the OD and length of the pipe.



Pipe diameter range: 110 to 400 mm.  
 Unit heights including rollers: 24, 40, 60, 80 mm  
 Unit width: 125 mm  
 Standard space between ring sets: 1.5 m  
 Working temperature: -20°C to 60 °C

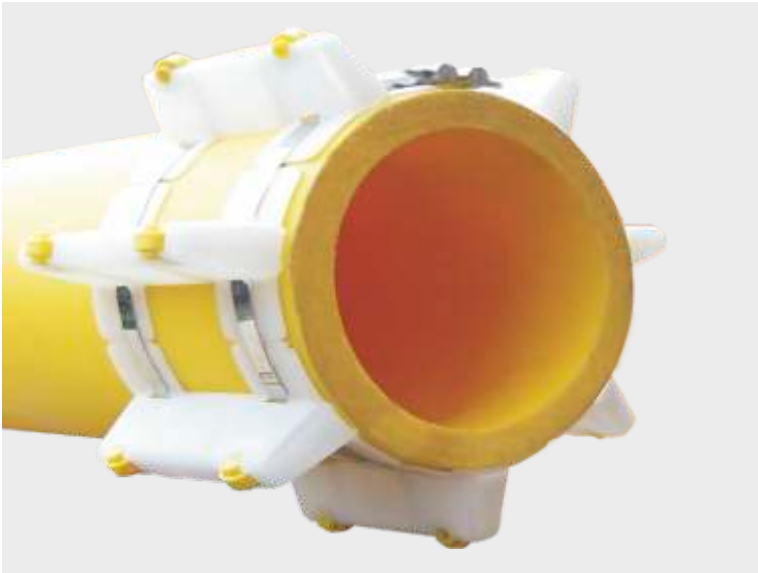
Unit material: HDPE  
 Clamping system: Threaded bars, nuts and washers: Nylon  
 Maximum static load each set: 300 KG  
 Metal parts: None

### Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set	Outer diameter of carrier pipe [mm]	Number of units per ring set
110 - 137	6	261 - 280	13
138 - 159	7	281 - 300	14
160 - 179	8	301 - 320	15
180 - 199	9	321 - 340	16
200 - 220	10	341 - 360	17
221 - 240	11	361 - 380	18
241 - 260	12	381 - 400	19



**PATENTED**

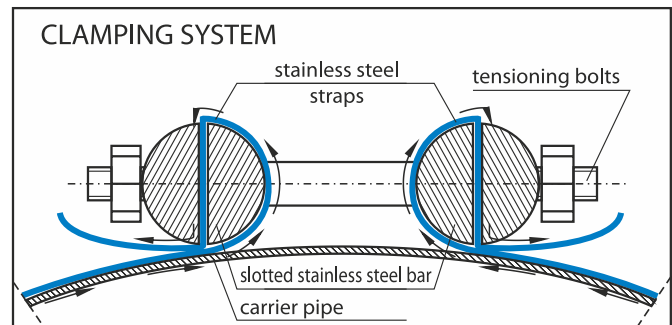


Type **R** spacers are used for medium to large diameter pipes. They are also designed to be used for very long carrier pipes, where it is very important to reduce friction when feeding a new pipe through new or old casings/ducts. The rollers help the new pipe to move easier during the installation. The fitting of the spacer is made easy as each unit butts up against the other. The units are clamped round the pipe by 2 stainless steel straps, which are threaded through the units and joined by 2 slotted bars with 2 bolts which clamp them firmly to the pipe.

When clamping together the straps it may be necessary to cut / trim off the unused parts so they lay flat on the carrier pipe. This ensures that the units grip firmly on to the surface.

Spacer ring sets are delivered with all required units and fixings for the OD and length of the pipe.

The easy to install clamping system is shown opposite.



Pipe diameter range: 160 to 420 mm  
 Unit heights incl. rollers: 28, 42, 58, 72, 88 mm  
 Unit width: 145 mm  
 Unit material: HDPE

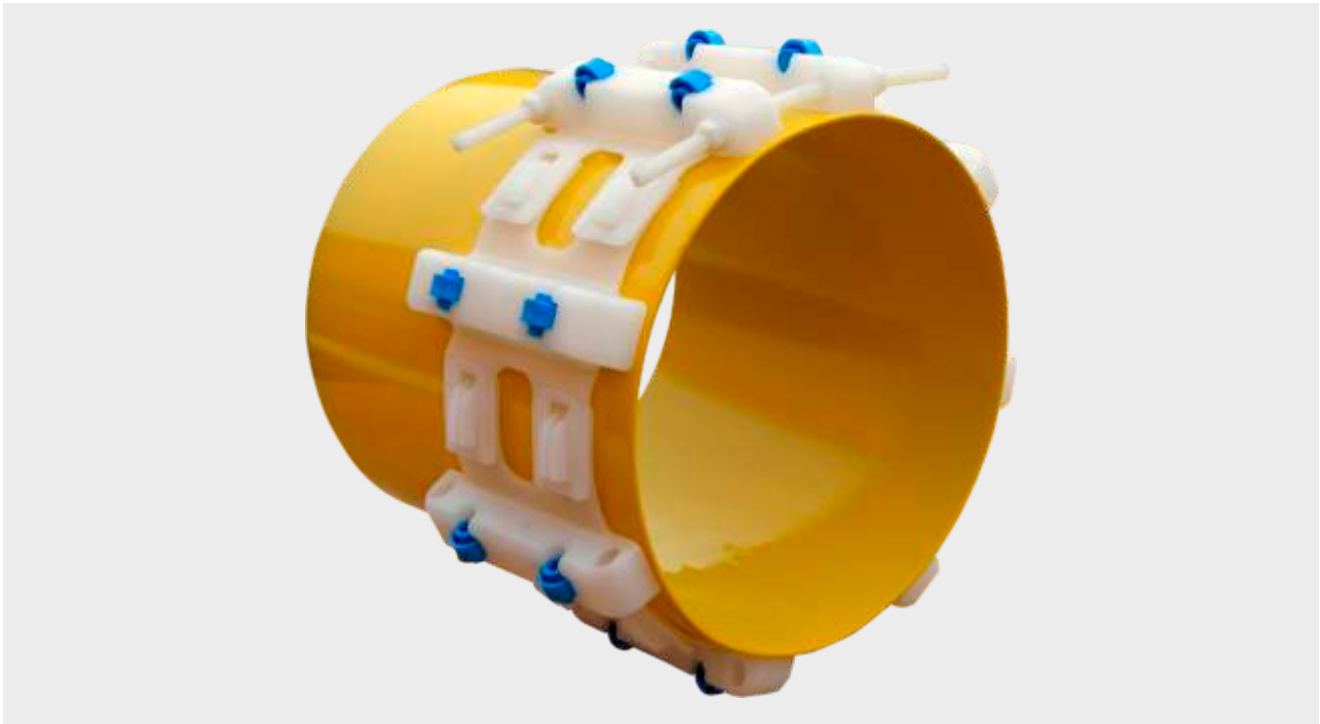
Clamping system.  
 Straps: Stainless Steel.  
 Clamp bars, bolts, nuts washers, standard: Galvanized steel  
 Spacial order: Stainless steel  
 Operating temperature: -20°C to 60°C  
 Standard space between spacer sets: 1.5 m  
 Maximum static load each set: 400 KG.

Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set
160 - 190	4
191 - 225	5
226 - 255	6
256 - 290	7
291 - 325	8
326 - 355	9
356 - 390	10
391 - 420	11



**PATENTED**



Type **TR** spacers are used for medium to large diameter pipes. They are also designed to be used for long carrier pipes, where it is very important to reduce friction when feeding a new pipe through new or old casings / ducts. The rollers help the new pipe to move easier during the installation. Fitting the spacer unit sets is made easy by a snap on system, which goes round the pipe and then 2 nylon threaded bars, nuts and washers hold them firmly on. Spacer ring sets are delivered with all required units and fixings for the OD and length of the pipe.



Spacer selection guide chart.

Outer diameter of the carrier pipe [mm]	Number of units per ring set
151 - 183	5
184 - 216	6
217 - 249	7
250 - 282	8
283 - 315	9
316 - 348	10
349 - 381	11
382 - 414	12

When clamping together the ends of the ring sets it may be necessary to cut / trim off the unused parts of the connector to make it fit better on the pipe.

Pipe diameter range:	151 to 414 mm
Unit height including rollers:	30; 50; 70; 90 mm
Unit width:	140 mm
Unit material:	HDPE
Clamping system:	
Threaded bars, nuts and washers:	Nylon
Operating temperature:	-20°C to 60°C
Standard distance between spacers set:	1.5 m
Maximum load:	700 KG

## PATENTED

Type **ZR DUO** spacers are intended for large diameter pipes, where it is very important to reduce friction in the casing/duct when feeding a new pipe through. The rollers on the unit help to move it easier during the installation. The fitting of the spacer units is made easy by a snap on system. The ring sets are held round the pipe by 2 steel threaded bars (ver. 1) or by 2 polyamide threaded bars, nuts and washers, which clamp them firmly on (ver.2). When clamping together the ends it may be necessary to cut/trim off the unused connector parts to make it fit better on the pipe. Spacer ring sets are delivered with all required units and fixings for the OD and length of the pipe.

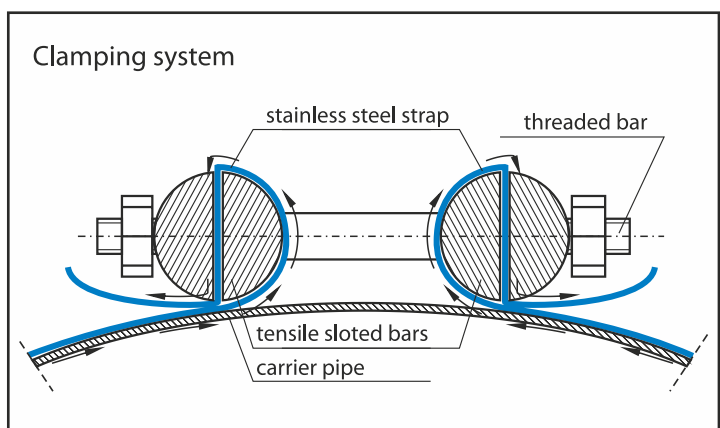
### Type ZR DUO version 1 casing spacers



### Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set
290 - 332	7
333 - 373	8
374 - 415	9
416 - 456	10
457 - 498	11
499 - 539	12
540 - 581	13
582 - 622	14
623 - 664	15
665 - 705	16
706 - 747	17
748 - 788	18
789 - 820	19

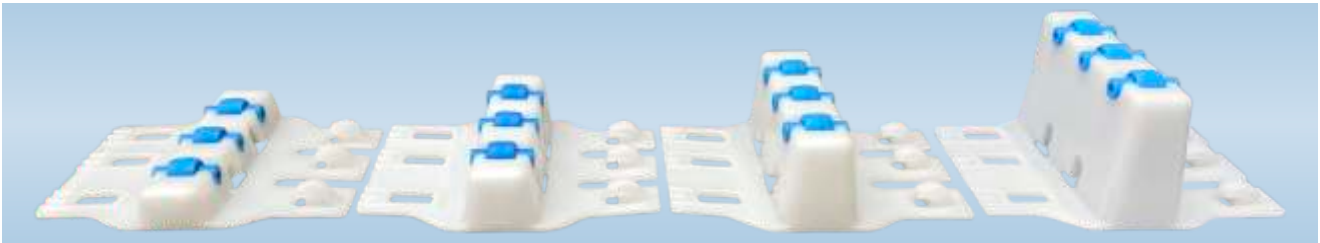
Diameter range: from 290 to 820 mm.  
 Total height of the spacer: 35; 60; 90; 130 mm.  
 Rollers protrude above the support element by 6 mm.  
 Element width: 170 mm.  
 Material: HDPE, steel.  
 Operating temperature: from -20 to +60°C.  
 Distance between spacers: 1.5 m  
 (0.15 m from the beginning and end of the duct).  
 Max. static load on the circuit: 1800 kG.



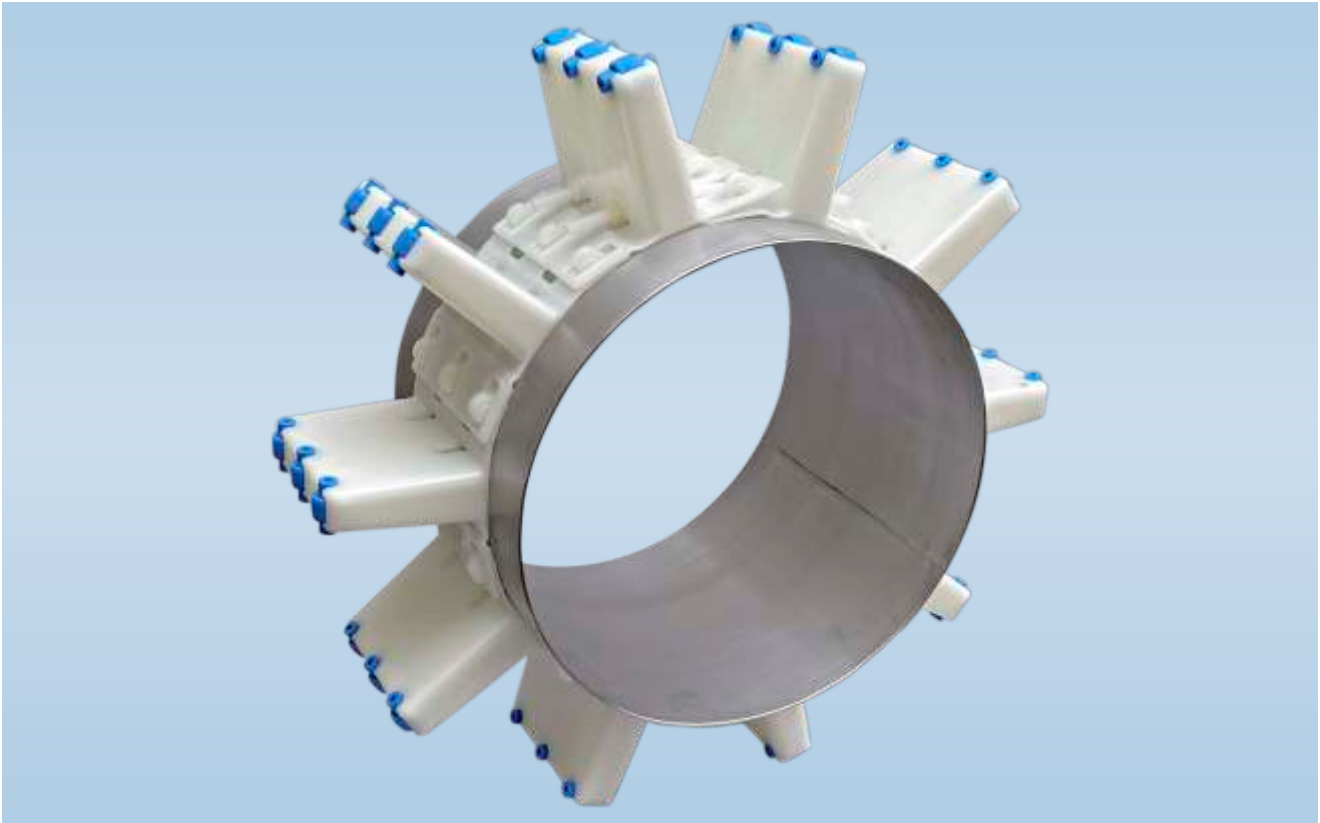




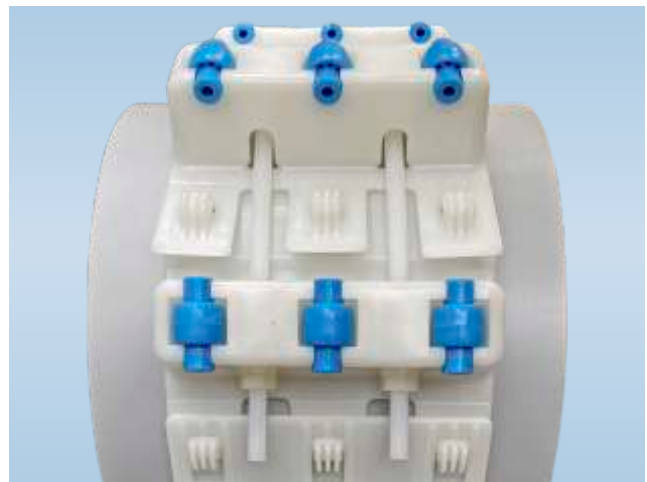
**PATENTED**



**Type ZR DUO version 2 casing spacers**



Diameter range: from 266 to 807 mm.  
 Total height of the spacers: 35; 60; 90; 130 mm.  
 Rollers protrude above the support element by 6 mm.  
 Element width: 170 mm.  
 Material: HDPE, polyamide clamping device.  
 For diameters up to 558 mm, M10 bars are used;  
 for diameters above 559 mm, M12 bars are used.  
 Operating temperature: from -20 to +60°C.  
 Distance between spacers: 1.5 m  
 (0.15 m from the beginning and end of the duct).  
 Max. static load on the circuit: 1800 kG.  
 The standard length of threaded polyamide bar is 330 mm.



**Spacer selection guide chart.**

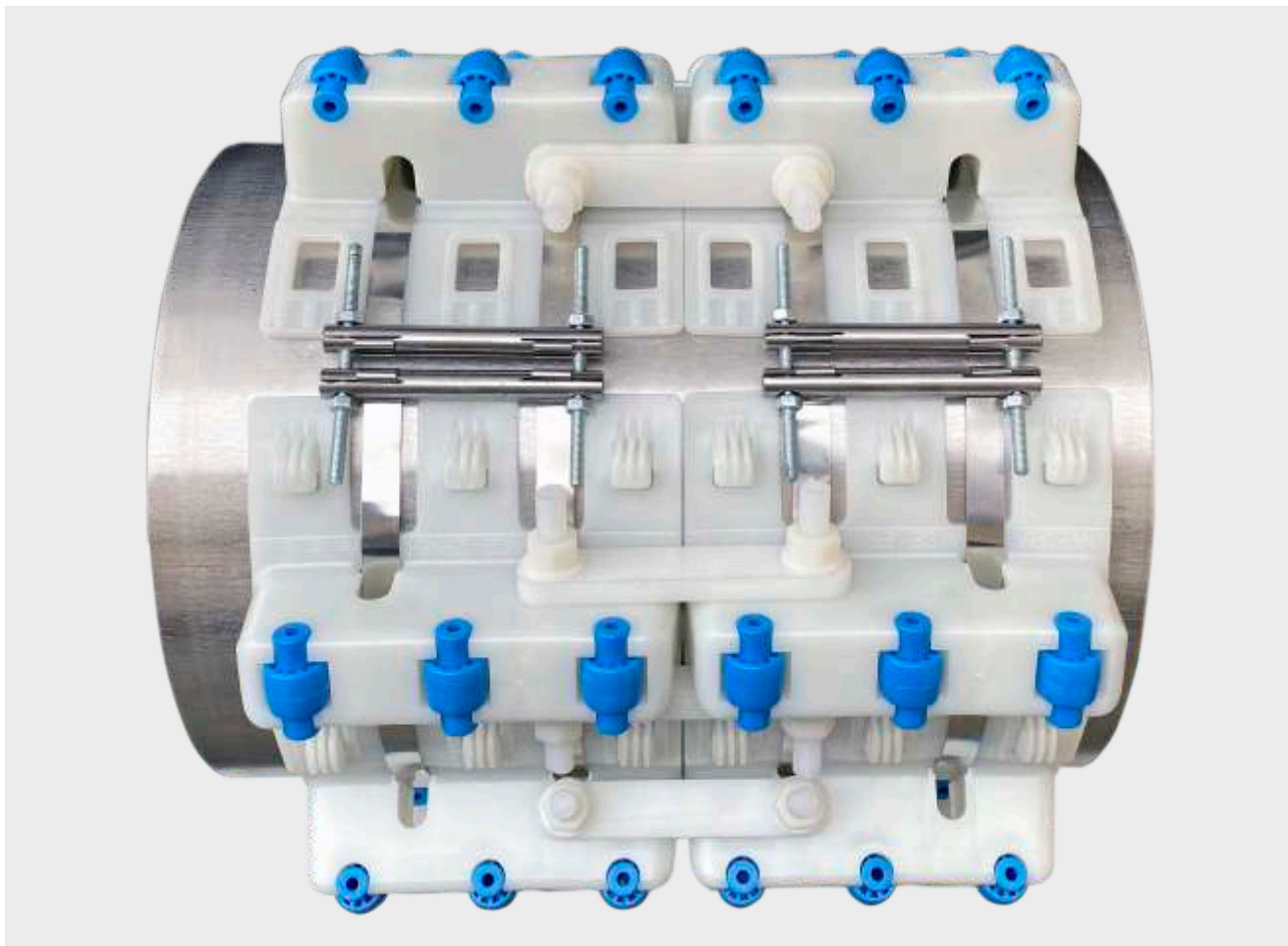
Outer diameter of carrier pipe [mm]	Number of units per ring set	Threaded bar
266 - 309	7	M10
310 - 350	8	M10
351 - 392	9	M10
393 - 433	10	M10
434 - 475	11	M10
476 - 516	12	M10
517 - 558	13	M10

Outer diameter of carrier pipe [mm]	Number of units per ring set	Threaded bar
559 - 599	14	M12
600 - 641	15	M12
642 - 683	16	M12
684 - 724	17	M12
725 - 766	18	M12
767 - 807	19	M12
-	-	-

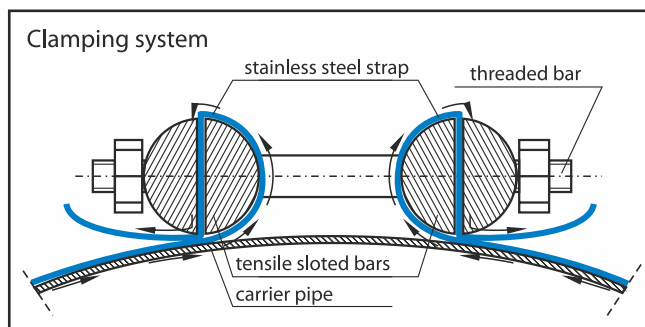
## PATENTED

The join system type ZR DUO casing spacers (versions 1 and 2) is used wherever heavy pipeline sections need to be applied (up to DN 800 diameter), and the conditions for constructing the passage are very difficult, for example, due to the significant length of the casing pipe. The dual version consists of two spacers circuits connected with plastic connectors. The rigid connection of the elements significantly improves the overall strength of the system against shear forces generated during pulling pipes through the passage. Additionally, it causes the circuits to self-lock, preventing them from sliding and rotating relative to each other. It also increases the resistance to static loads of the entire system (up to 3600 kG).

### The join system type ZR DUO casing spacers version 1.



Diameter range: from 290 to 820 mm.  
 Total height of the unit: 35; 60; 90; 130 mm.  
 Rollers protrude above the supporting element by 6 mm.  
 Set width: 340 mm.  
 Material: HDPE, steel.  
 Operating temperature: from -20 to +60°C.  
 Distance between spacers: 1.5 m.  
 Max. static load of the set: 3600 kG.



#### Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set	Outer diameter of carrier pipe [mm]	Number of units per ring set
290 - 332	7	582 - 622	14
333 - 373	8	623 - 664	15
374 - 415	9	665 - 705	16
416 - 456	10	706 - 747	17
457 - 498	11	748 - 788	18
499 - 539	12	789 - 820	19
540 - 581	13	-	-

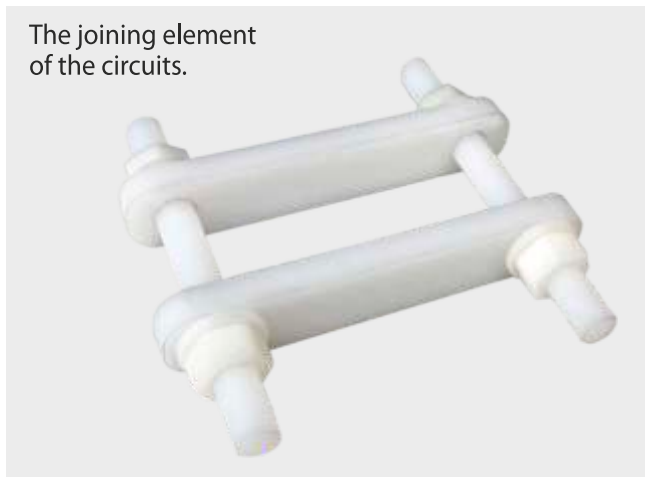
**PATENTED**

## The join system type ZR DUO casing spacers version 2.



Diameter range: from 266 to 807 mm.  
 Total height of the unit: 35; 60; 90; 130 mm.  
 Rollers protrude above the supporting element by 6 mm.  
 Set width: 340 mm.  
 Material: HDPE, polyamide threaded bar.  
 For diameters up to 553 mm, M10 threaded bar are used, above diameter 554 mm, M12 threaded bar are used.  
 Operating temperature: from -20 to +60°C.  
 Distance between spacers: 1.5 m  
 Max. static load of the circuit: 3600 kG.  
 The standard length of threaded polyamide threaded bar is 330 mm.

The joining element of the circuits.



### Spacer selection guide chart.

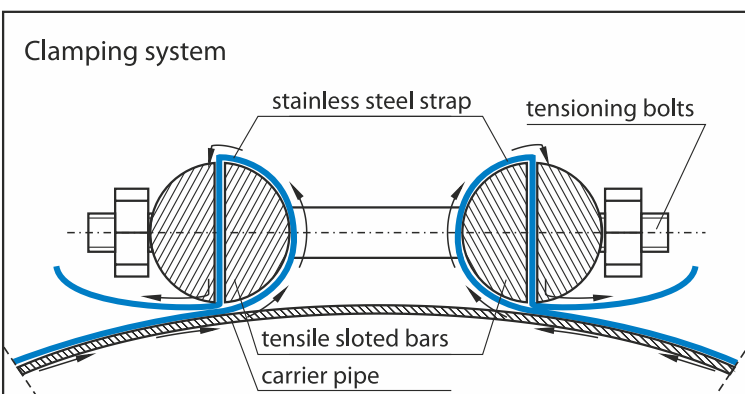
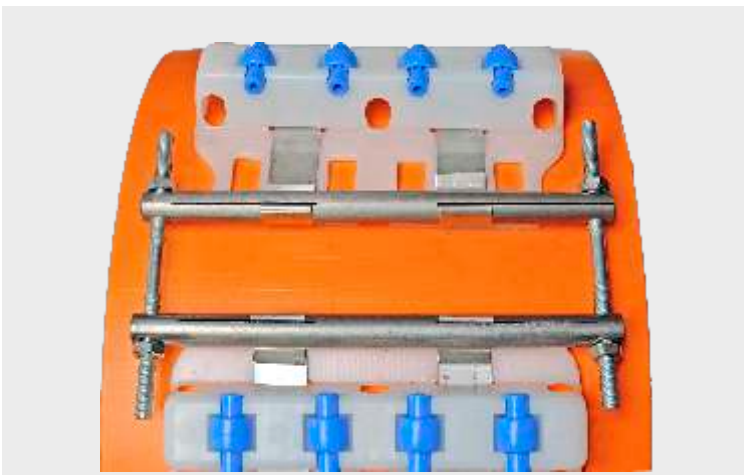
Outer diameter of carrier pipe [mm]	Number of units per ring set	Threaded bar
266 - 309	7	M10
310 - 350	8	M10
351 - 392	9	M10
393 - 433	10	M10
434 - 475	11	M10
476 - 516	12	M10
517 - 558	13	M10

Outer diameter of carrier pipe [mm]	Number of units per ring set	Threaded bar
559 - 599	14	M12
600 - 641	15	M12
642 - 683	16	M12
684 - 724	17	M12
725 - 766	18	M12
767 - 807	19	M12
-	-	-



## PATENTED

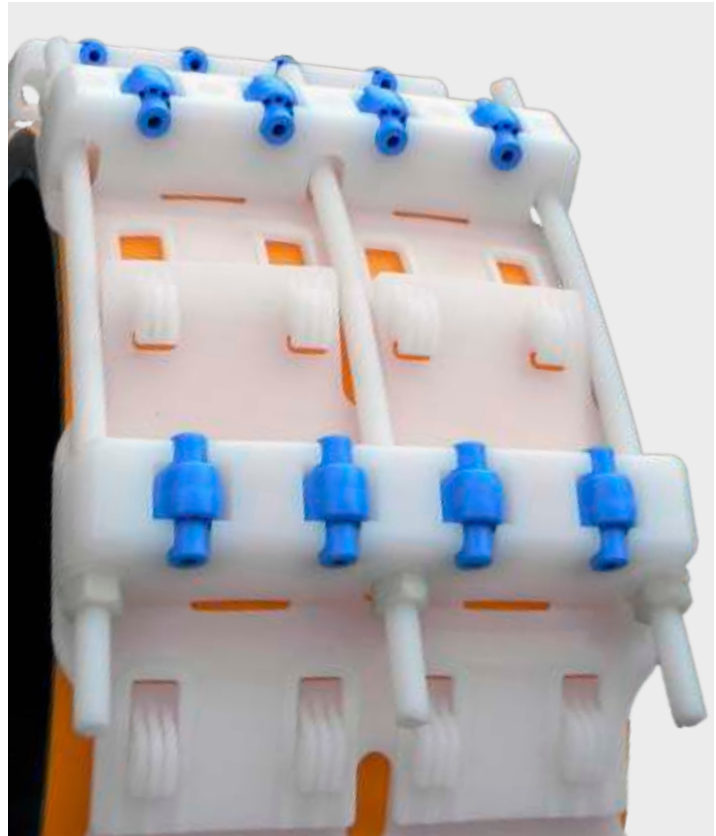
**SM DUO V1** is designed for extra large diameter pipes from 500 mm. Each unit has 4 rollers for high capacity loads. This is very important to reduce friction in the casing/duct when feeding a new pipe through. The rollers help to move the carrier pipe easier during the installation. Fitting the spacer units is made easy by a very strong snap on system. The ring sets are held round the pipe by 2 stainless steel straps, which are fed through units. Then a special steel clamping system with 2 slotted bars and 2 threaded steel rods with nuts and washers clamp the units firmly to the pipe. Call our technical team for larger sizes. When clamping together the ends of the ring sets it may be necessary to cut/trim off the unused parts of the connectors to make it lay flat on the pipe. Spacer ring sets are delivered with all required units and fixings for the OD and length of the pipe.



Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set
DN 500	9
DN 550	10
DN 600	11
DN 650 (630)	12
DN 700	13
DN 800	15
DN 900	17
DN 1000	19
DN 1100	21
DN 1200	23
DN 1300	25
DN 1400	27
DN 1500	29

When assembling the clamping mechanism together, thread the stainless steel straps round and through the slots as showed on the diagram.



Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set	Threaded bar
500-525	10	M12
526-575	11	M12
576-625	12	M12
626-675	13	M12
676-725	14	M12
726-775	15	M12
776-825	16	M12
826-875	17	M12
876-925	18	M12
926-975	19	M12
976-1025	20	M12
1026-1075	21	M14
1076-1125	22	M14
1126-1175	23	M14
1176-1225	24	M14
1226-1275	25	M14
1276-1325	26	M14
1326-1375	27	M14
1376-1425	28	M14
1426-1475	29	M14
1476-1525	30	M14

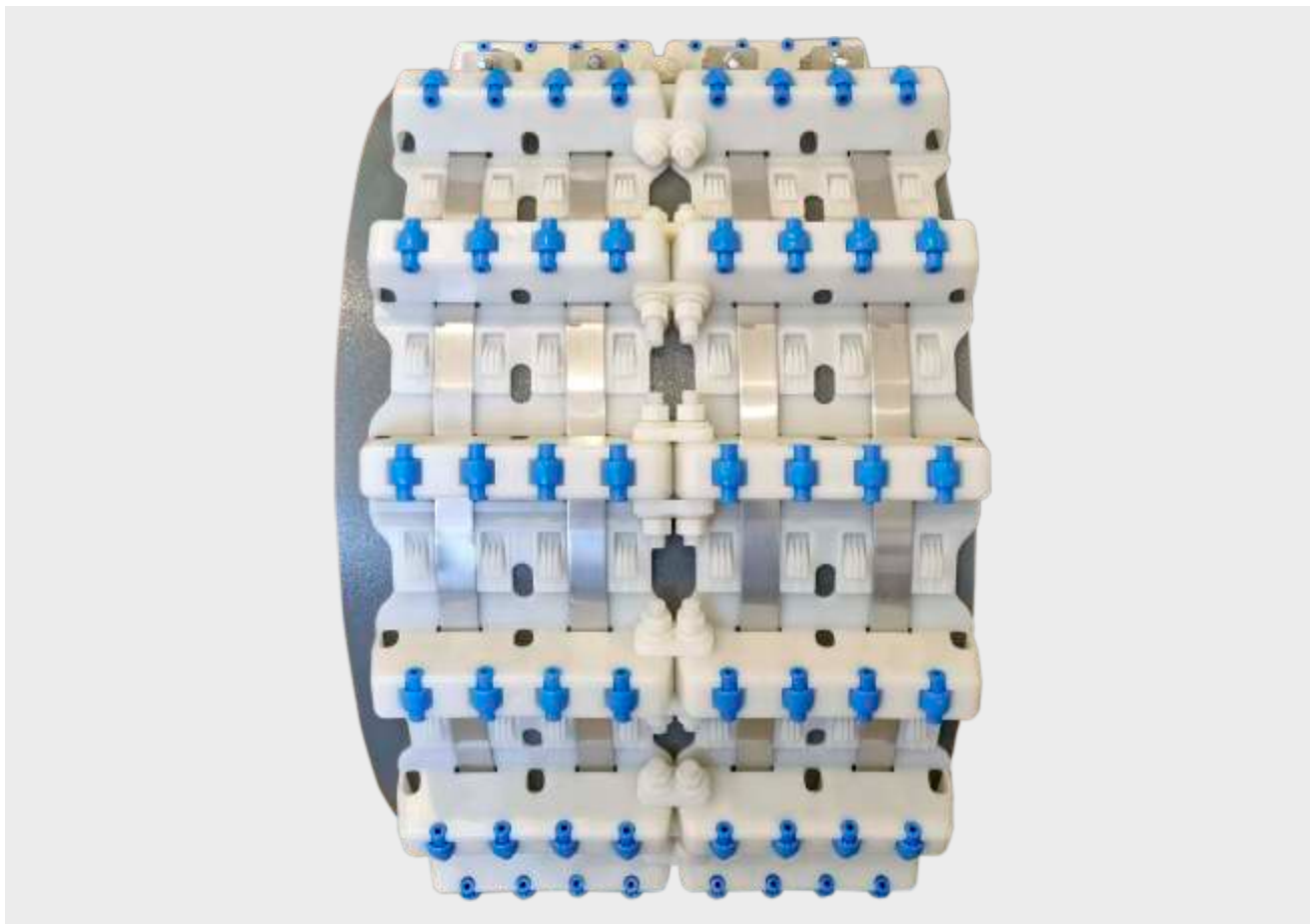
Diameter range: from 500 mm.  
 Unit height with rollers: 32, 50, 70, 100, 160, 210 mm  
 Unit width: 240 mm  
 Unit material: HDPE  
 Clamping system:  
 Threaded bars, nuts and washers: Nylon  
 Operating temperature: -20° to 60°C  
 Standard space between set: 1.5m  
 Maximum static load per set: 3200 KG

Assemble the spacer units by snapping them together and putting them round the pipe. Then put the nuts and washers on one end of the 3 threaded bars. Now thread them through the 2 end units and put the other nuts and washers on. Finally tighten them firmly on the pipe.

## PATENTED

The join system type **SM DUO** casing spacers (versions 1 and 2) is used wherever heavy pipeline sections need to be applied (from diameter 471 mm), and the conditions for constructing the passage are very difficult, for example, due to the significant length of the casing pipe. The dual version consists of two spacers circuits connected with connectors made of either plastic or steel. The rigid connection of the elements significantly increases the overall strength of the system against shear forces generated during pulling pipes through the passage. Additionally, it causes the circuits to self-lock, preventing them from sliding and rotating relative to each other. It also increases the resistance to static loads of the entire system up to 6400 kG.

### The join system type **SM DUO** casing spacers version 1.



Spacer selection guide chart.

Outer diameter of carrier pipe [mm]	Number of units per ring set	Outer diameter of carrier pipe [mm]	Number of units per ring set
471 - 520	9	1021 - 1070	20
521 - 570	10	1071 - 1120	21
571 - 620	11	1121 - 1170	22
621 - 670	12	1171 - 1220	23
671 - 720	13	1221 - 1270	24
721 - 770	14	1271 - 1320	25
771 - 820	15	1321 - 1370	26
821 - 870	16	1371 - 1420	27
871 - 920	17	1421 - 1470	28
921 - 970	18	1471 - 1520	29
971 - 1020	19	-	-

Diameter range: from 471 to 2220 mm.  
 Total height of the unit: 32; 50; 70; 100; 160; 210 mm.  
 Set width: 472 mm.  
 Material: HDPE, steel.

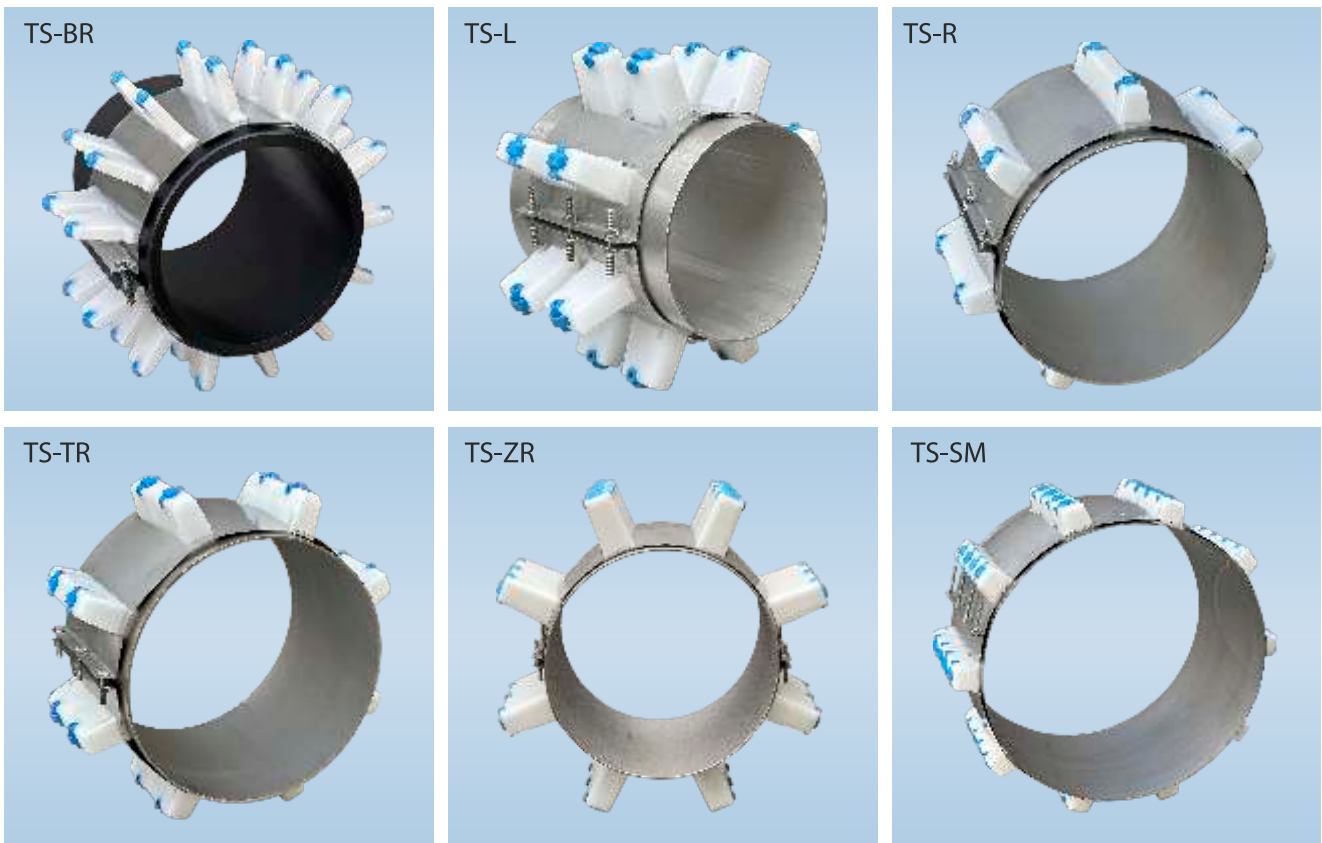
Operating temperature: from -20 to +60°C.  
 Distance between sleeves: 1 - 2 m.  
 Max. static load of the circuit: 6400 kG.



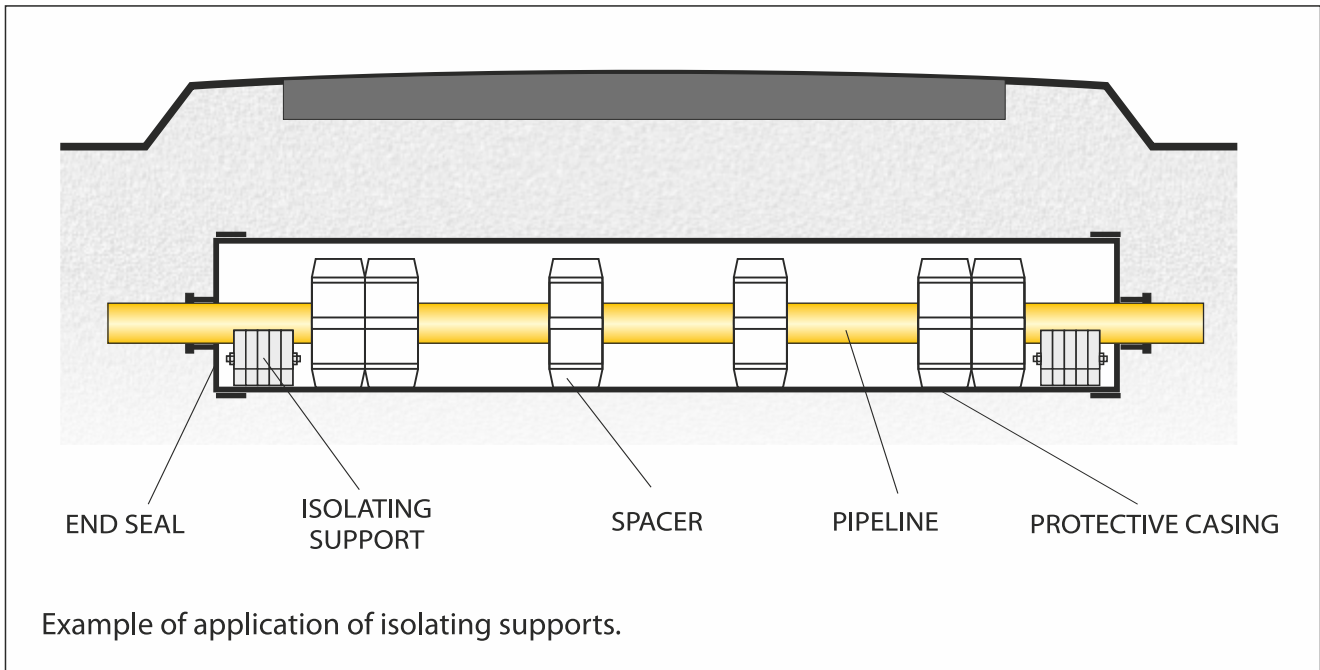




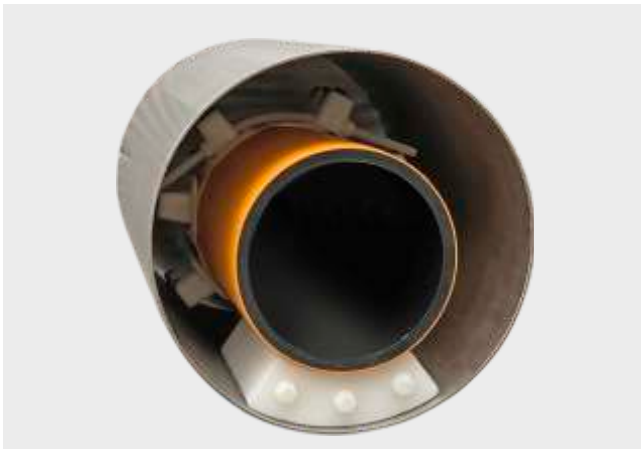
This is a casing spacers fixing system designed for all types of pipes and intended for making construction of longer ducts (over 100 m). It utilizes a wide stainless steel tape mounted on the pipe. The tape has a series of openings into which plastic sliding elements are inserted. The system allows for the use of any type of casing spacers from our production range and of any height. Additionally, it enables the creation of double casing spacers, for example, for pipes of significant weight.



In special cases, it are possible to use spacers of different heights on a single ring set (minimum number of elements are 8).



They are most commonly made of HD polyethylene or other synthetic material depending on environmental and strength requirements. They protect the spacers from the effects of uneven settlement of the pipeline relative to the casing pipe. Such support distributes the pressure and improves the performance of the spacers in the duct. The shape is adapted to the outer diameter of the conduit pipe (including insulation) and the inner diameter of the casing pipe. The length of the support

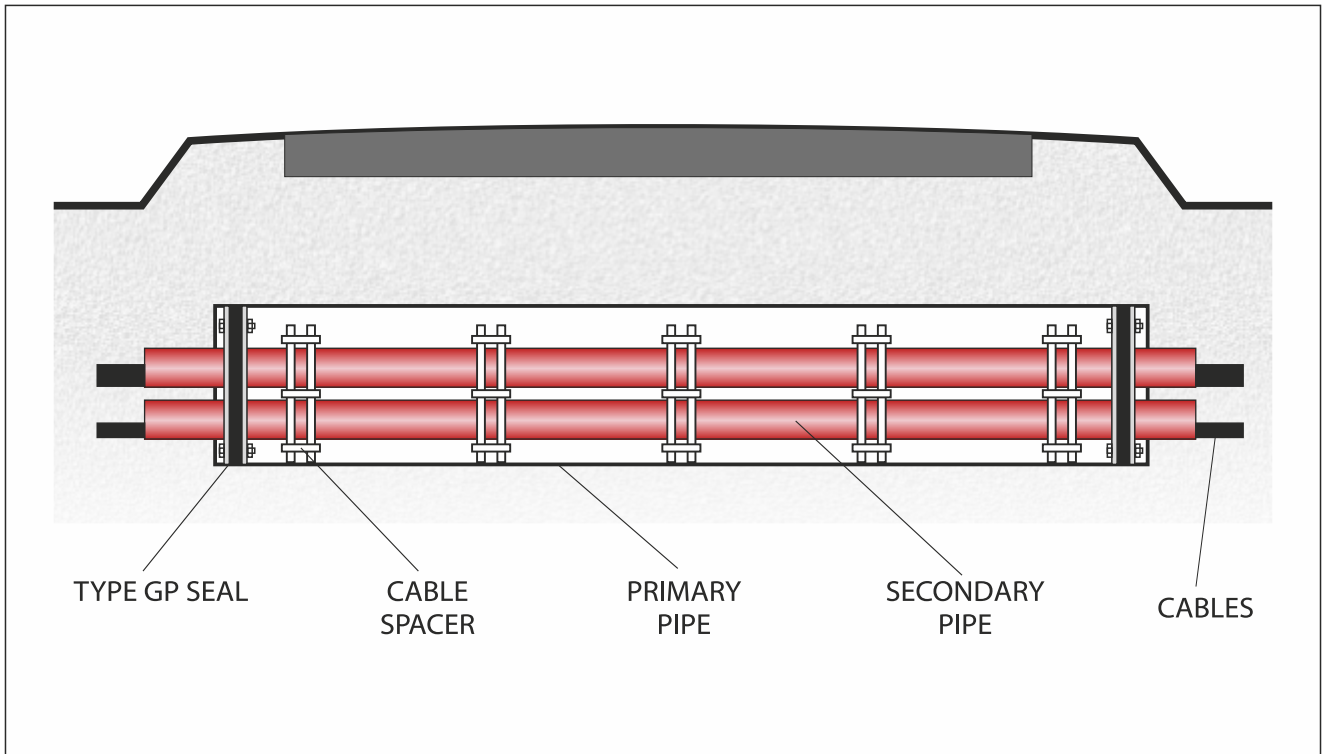


is determined by the transmitted weight and the height corresponds to the height of the spacers, with a wrap angle of approximately 75 degrees or according to the project. They can be used with pipes made of different types of materials.

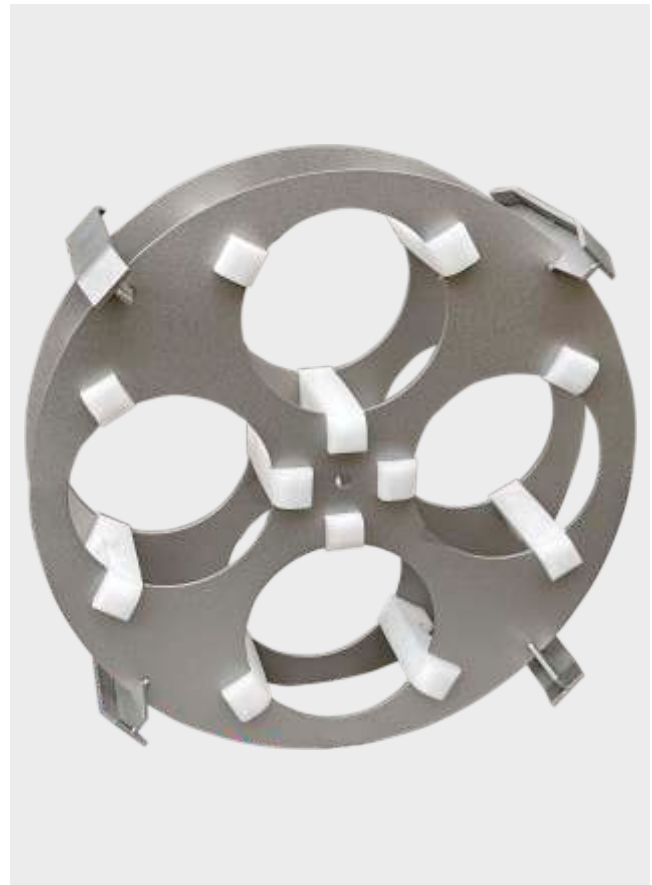
- Diameter range from 50 to 1200 mm.
- Total length of support up to 1000 mm.
- Height up to 220 mm.
- Operating temperature up to 60°C (for HD PE).
- Max. pressure up to 12 kG/cm<sup>2</sup> (for HD PE).



**PATENTED**



The spacers of this type are designed to protect all kinds of cables routed through ducts. The cables are placed in plastic pipes (secondary pipe), on which spacers are mounted. Then, the whole set is introduced into the protective pipe (primary pipe). The spacers enable the routing of individual cables as well as cable bundles. The system allows for easy cable replacement in case of failure. Materials used: HDPE or steel.



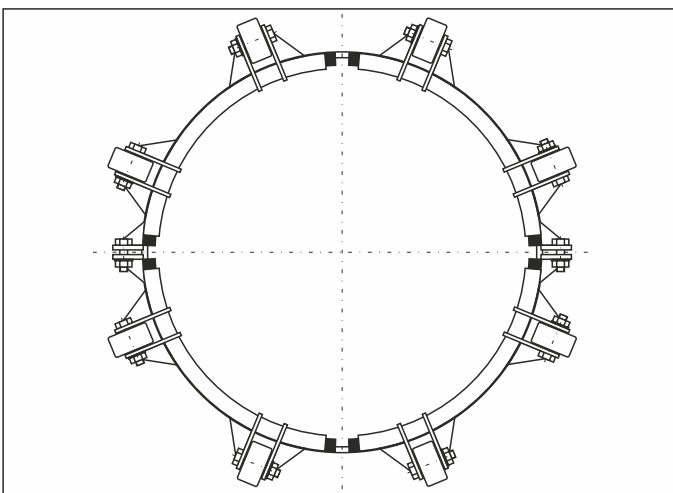




**PATENTED**

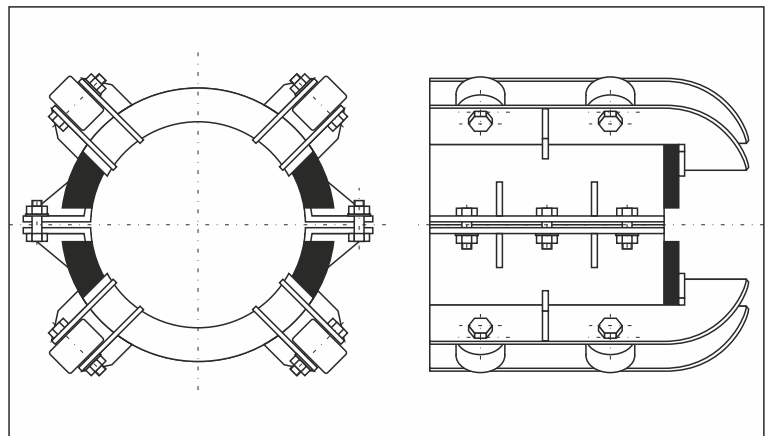


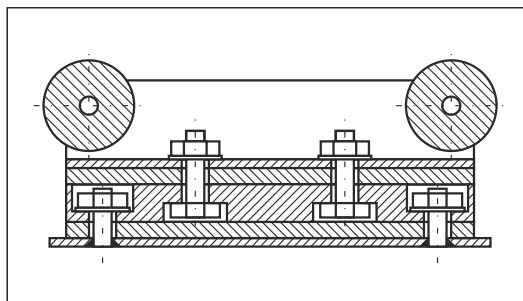
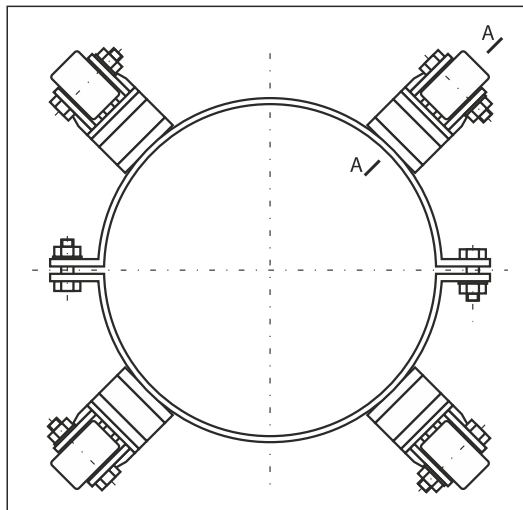
Due to many problems when feeding carrier pipes through small or large casings/ducts over long distances, we have designed a very special lead spacer. The spacer protects the casing/duct, carrier pipe and spacers from damage while installing a new carrier pipe. It carries the weight and reduces friction which improves and makes the installation smoother. The Lead spacer frame is made from steel with steel wheels and a large rubber pressure ring which protects the end of the pipe from damage and is clamped to the pipe firmly. Each spacer is made especially to suit the installation. The Lead spacer is slightly bigger which protects the normal spacers and guides it through and over any unexpected bumps and round bends.



As standard, the lead spacer has curved ends to deal with bends and has appropriate size wheels depending on the diameter of the carrier pipe. If there are cables and small pipes to be fitted they can be placed between the spacer legs and also clamped to the lead spacer.

After installation of the pipe in the duct, the lead spacer must be removed. One of the most important aspect and advantage is that it can be used many times on the same size pipe.





Spacers of this type, despite being made of metal, electrically insulate the conduit pipe from the protective one. They feature a special three-layer plastic liner ensuring resistance to electrical puncture.

They are produced in two versions:

- 1 - with steel wheels,
- 2 - with sliding elements made of plastic.

Materials used: stainless steel or galvanized steel, polyethylene PE1000.

Diameter range: DN 100 - DN 500

Height: 80 - 220 mm.

**PS** roller spacers are designed for use on large and heavy pipelines. They are made of steel flat bar with a thickness adapted to the size and weight of the pipeline. A very significant point is that the spacers can be made for any height and situation, (minimum height 40 mm).

**Special order only.**



The sliding elements are made of hard polyethylene and bolted to the steel legs. This solution has a high shearing force resistance which can occur during pushing the pipeline through the duct / casing. This type of spacer can be used to strengthen and support other types of spacer systems, placing them between the solid polyethylene spacers for instance, every 3rd or 4th ring set.

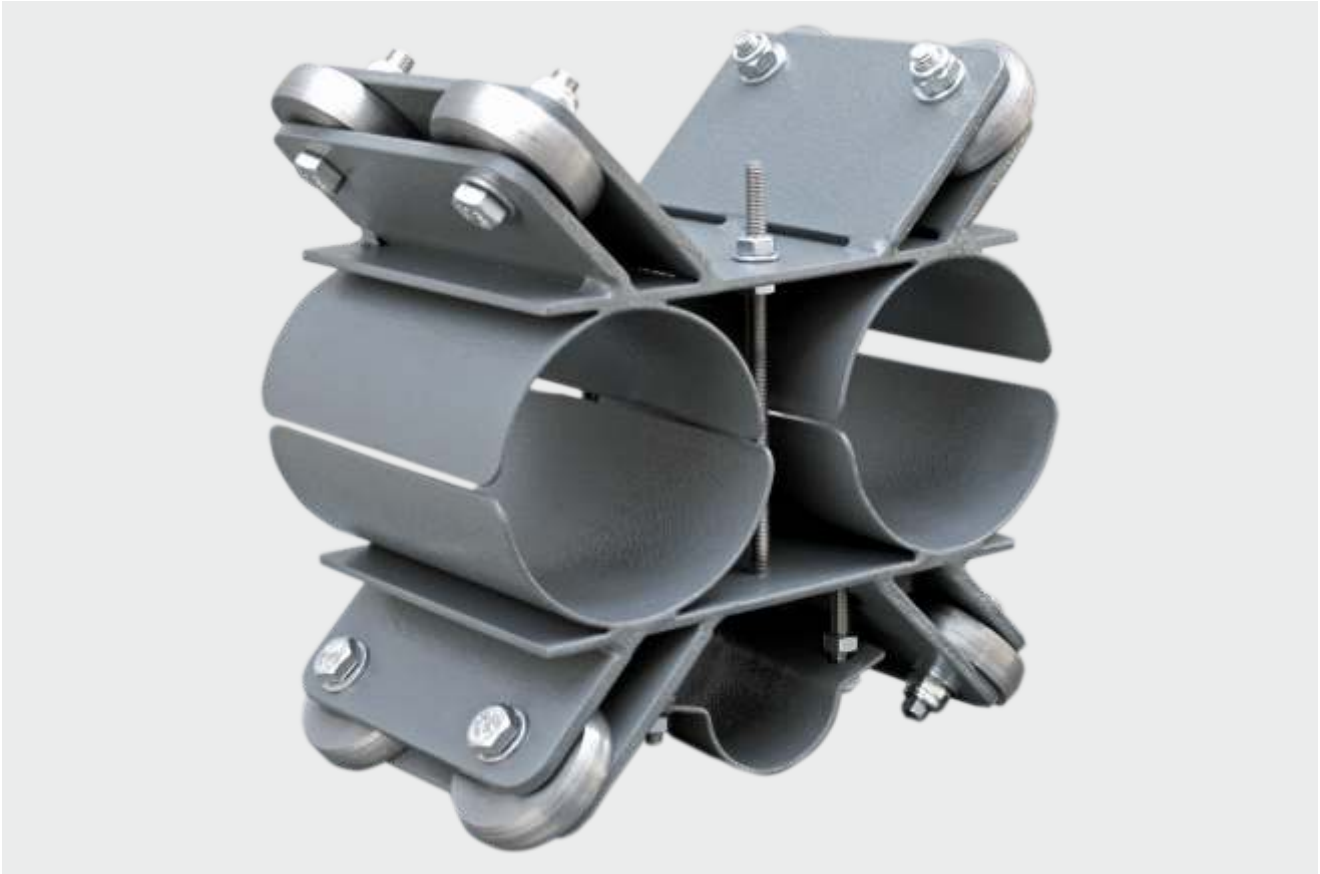
**WARNING!** These spacer skids are not a dielectric. They do not isolate electrically the carrier pipes from the casing / duct.

**Special order only.**

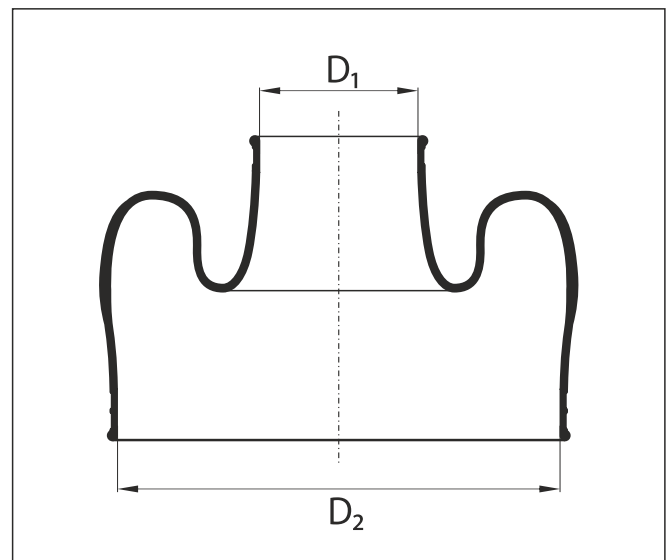


These steel roller spacers are used when several types of pipes are laid in one casing pipe. The use of these gives a more precise way to locate pipes in the casings/ducts and maintains the separation of pipelines. They take into account the number, diameter and arrangement of pipes / cables. The structure is made up from steel by support plates, pipe clamps and wheels depending on the sizes required.

**Special order only.**



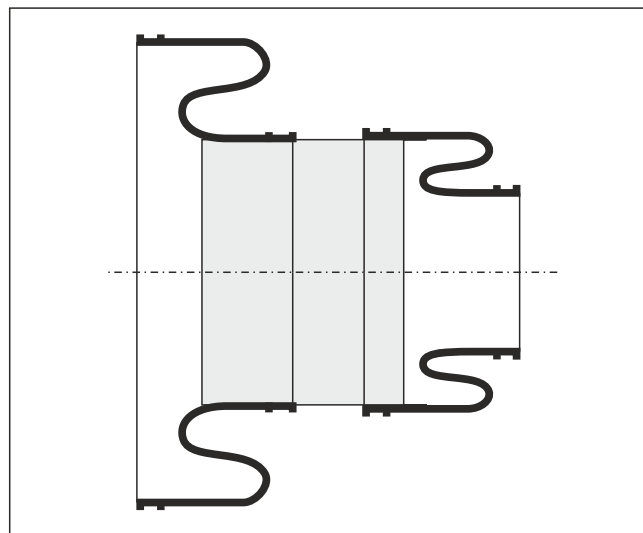
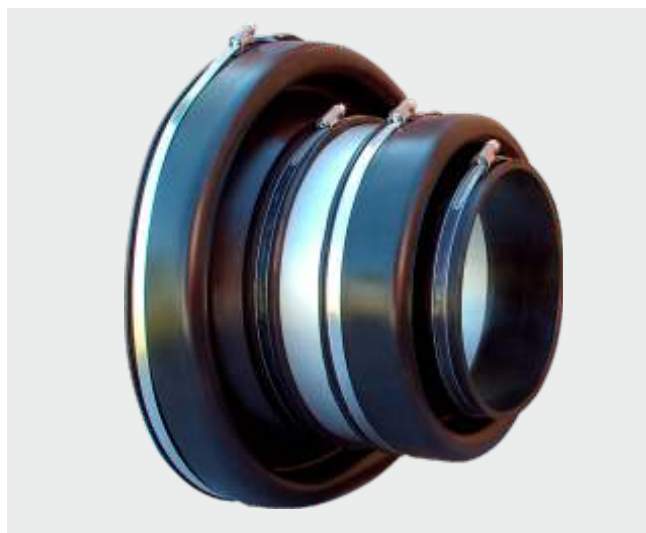
The seals are used in many different areas, such as district heating systems, gas, water and sewerage networks. The end seals protect the space between the carrier pipe and casing from filling up with unwanted materials which may damage the carrier pipe. They are highly durable and also compensate for thermal changes in the pipes.



Technical data:  
Materials: EPDM rubber and stainless steel jubilee clips.  
Operating temperature: -30°C to 100°C.

Pipe DN x DN	Range of use [mm]	
	D <sub>1</sub>	D <sub>2</sub>
20 x 50	24 - 29	57 - 69
25 x 50	30 - 35	57 - 69
25 x 80	30 - 35	85 - 100
25 x 100	30 - 35	101 - 120
25 x 150	30 - 35	141 - 174
32 x 80	36 - 44	85 - 100
32 x 100	36 - 44	101 - 120
32 x 150	36 - 44	141 - 174
40 x 100	45 - 56	101 - 120
40 x 125	45 - 56	121 - 140
40 x 150	45 - 56	141 - 174
50 x 100	57 - 69	101 - 120
50 x 125	57 - 69	121 - 140
50 x 150	57 - 69	141 - 174
65 x 125	70 - 84	121 - 140
65 x 150	70 - 84	141 - 174
65 x 200	70 - 84	210 - 239
80 x 150	85 - 100	141 - 174
80 x 180	85 - 100	175 - 209
80 x 200	85 - 100	210 - 239
80 x 240	85 - 100	240 - 269
80 x 250	85 - 100	270 - 299
100 x 150	101 - 120	141 - 174
100 x 180	101 - 120	175 - 209
100 x 200	101 - 120	210 - 239
100 x 240	101 - 120	240 - 269
100 x 250	101 - 120	270 - 299
100 x 300	101 - 120	300 - 349
125 x 180	121 - 140	175 - 209
125 x 200	121 - 140	210 - 239
125 x 240	121 - 140	240 - 269

Pipe DN x DN	Range of use [mm]	
	D <sub>1</sub>	D <sub>2</sub>
125 x 250	121 - 140	270 - 299
150 x 200	141 - 174	210 - 239
150 x 240	141 - 174	240 - 269
150 x 250	141 - 174	270 - 299
150 x 300	141 - 174	300 - 349
150 x 400	141 - 174	390 - 439
180 x 250	175 - 209	270 - 299
180 x 300	175 - 209	300 - 349
180 x 350	175 - 209	350 - 389
200 x 250	210 - 239	270 - 299
200 x 300	210 - 239	300 - 349
200 x 350	210 - 239	350 - 389
200 x 400	210 - 239	390 - 439
240 x 300	240 - 269	300 - 349
240 x 350	240 - 269	350 - 389
240 x 400	240 - 269	390 - 439
250 x 300	270 - 299	300 - 349
250 x 350	270 - 299	350 - 389
250 x 400	270 - 299	390 - 439
250 x 450	270 - 299	440 - 489
250 x 500	270 - 299	490 - 544
300 x 400	300 - 349	390 - 439
300 x 450	300 - 349	440 - 489
300 x 500	300 - 349	490 - 544
350 x 450	350 - 389	440 - 489
350 x 500	350 - 389	490 - 544
400 x 500	390 - 439	490 - 544
400 x 600	390 - 439	584 - 646
450 x 600	440 - 489	584 - 646
500 x 600	490 - 544	584 - 646



The reducer seal unit is used whenever there is a large pipe with a smaller than usual pipe installed that has to be sealed. This is done by two end seals and a short steel sleeve connecting the two seals together as illustrated above.





In addition to EDPM rubber, we also supply end seals made from other types of materials.  
 Operating temperatures:  
 Silicon: -55°C to 230°C  
 NBR: -20°C to 90°C  
 NBR rubber is resistant to any petroleum based compounds.  
 Special order only.



The Type **U** end seals are designed for large diameter pipes and for non-standard pipe sizes. The seals are made of EPDM rubber in a cone format.

The sleeve is clamped on to the casing pipe firmly by a stainless steel strap, as seen in diagram 1. The smaller clamping strap must be loose so you can push it into the carrier pipe, then tighten the small clamping strap firmly on to the carrier pipe, as seen in diagram 2.

**It is important that the seal is pushed inside the casing /duct.**

1. The first stage of assembly



2. The final positioning of the end seal



### Size guide chart.

The outer diameter of the carrier pipe (min.) [mm]	The outer diameter of the casing pipe (max.) [mm]	The outer diameter of the carrier pipe (min.) [mm]	The outer diameter of the casing pipe (max.) [mm]
200	360	700	1260
300	540	800	1440
400	720	900	1620
500	900	1000	1800
600	1080	1100	1980

## TYPE **G-S-G** AND **G-S-W** GASKETS

Type **G-S** steel re-enforced gaskets are used on flanged pipes in city and district, gas, water and sewer systems and networks.



They can be used for steel and PE pipeline joints. Due to the quality of the materials used, the shape and durability is improved giving a longer life to the gasket and a better connection to the flanged link. The cost of maintenance of the pipelines is reduced by installing **G-S-G** and **G-S-W** gaskets. Construction design and sizes enable quick and easy gasket installation between the flanges.

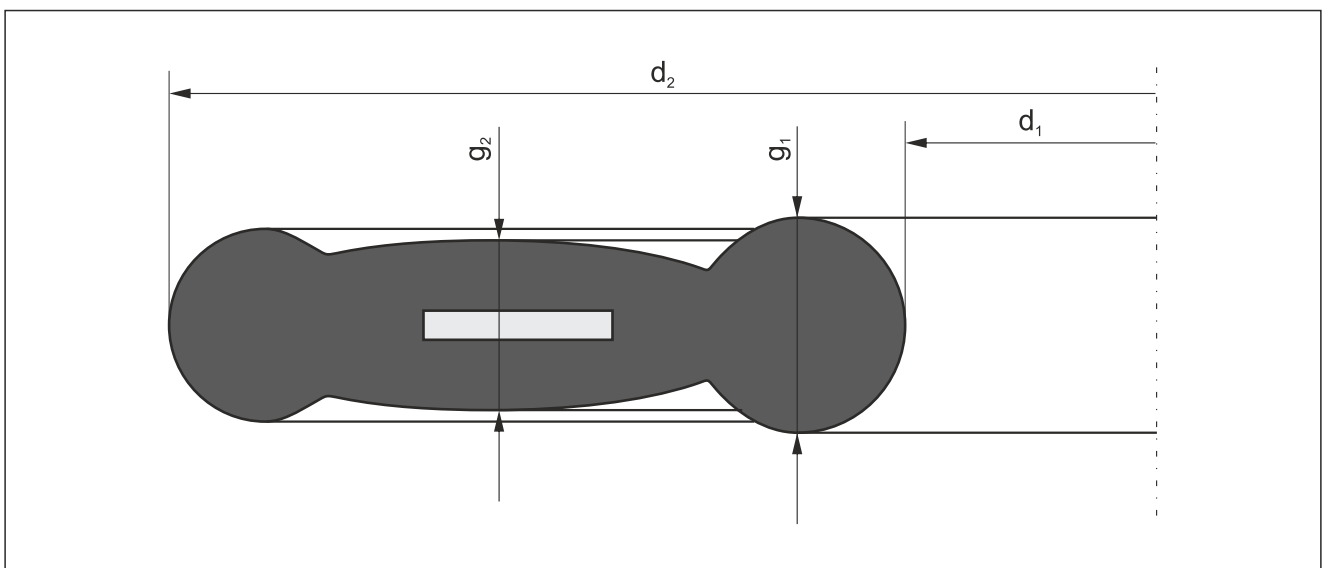
Type **G-S** gasket basic features:

The vulcanized steel ring prevents any shape changes.

Optimal shape guarantees a perfect tightness with less tension on the bolts.

Shape and size ensures the gasket centers between flanges.

The stiffness of the gasket allows a quick and easy installation between flanges.





DN	d1 [mm]	d2 [mm]	g <sub>1</sub> [mm]	g <sub>2</sub> [mm]	Pressure [bar]	DN	d1 [mm]	d2 [mm]	g <sub>1</sub> [mm]	g <sub>2</sub> [mm]	Pressure [bar]
20	27	61	4	3	10 - 40	350	368	457	9	7	25
25	34	71	4	3	10 - 40	400	420	489	9	7	10
32	43	82	4	3	10 - 40	400	420	495	9	7	16
40	49	92	4	3	10 - 40	400	420	514	9	7	25
50	61	107	5	4	10 - 40	400	420	546	9	7	40
65	77	127	5	4	10 - 40	450	470	539	9	7	10
80	89	142	5	4	10 - 40	450	470	555	9	7	16
100	115	162	6	5	10 - 16	500	520	594	9	7	10
125	141	192	6	5	10 - 16	500	520	617	9	7	16
150	169	218	7	6	10 - 16	500	520	624	9	7	25
200	220	273	7	6	10 - 16	600	620	695	9	7	10
250	273	328	7	6	10	600	620	734	10	7	16
250	273	329	7	6	16	600	620	731	10	7	25
300	324	378	7	6	10	700	720	810	10	7	10
300	324	384	7	6	16	800	820	917	10	7	10
300	324	400	7	6	25	1000	1025	1124	11	8	10
350	368	438	9	7	10	1200	1225	1342	11	8	10 - 16
350	368	444	9	7	16						

Other dimensions available upon request.

**The gaskets have quality certificates for the materials used and G-S-W seals additionally have certification allowing for use in drinking water installations.**

Designations of the elastomers used, their application and operating temperature.

Gasket type	Rubber type	Application	Operating temperature °C		
			continuous operation	1 hour	1 minute
<b>G-S-G</b>	NBR Nitrile rubber Shore hardness (A) 70 ± 5	Gas, gasoline, oils, greases, compressed air	-30 ÷ +125	-35 ÷ +130	-40 ÷ +135
<b>G-S-S</b>	EPDM ethylene-propylene rubber Shore hardness (A) 70 ± 5	municipal waste water, diluted acids and bases, alcohols, compressed air	-30 ÷ +100	-35 ÷ +130	-40 ÷ +160
<b>G-S-W</b>	Certified EPDM-KTW ethylene-propylene rubber Shore hardness (A) 70+/-5	Drinking water	-30 ÷ +100	-35 ÷ +130	-40 ÷ +160



Type **GZ** Connectors are designed to join ends of sewage pipes of the same diameter. The connector consists of an EPDM sleeve (NBR and silicon on request) and four stainless steel straps and one center band. The smaller outer straps are responsible for gripping the two pipes firmly, while the wide center band ensures the pipes have a level connection and prevents blockages of the pipeline. This extremely reliable and strong method of gripping the pipes in a rubber sleeve allows the use of GZ connectors on sewage pipes made of PCV, PE, concrete and cast iron pipes. They can also be used to connect sewage pipes made of other materials. This is a non-pressurized connection.





GZ 450 to 2250 sewer pipe connectors L=400 mm.

Suitable for pressures up to 0.5 bar.

Operating temperature depends on the material used:

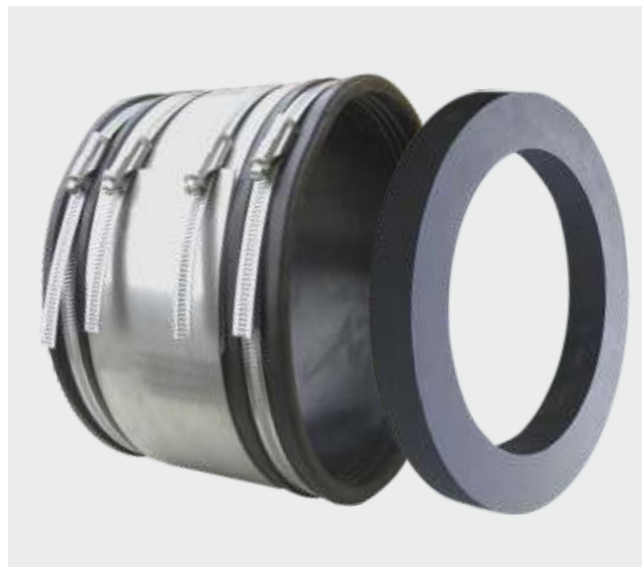
EPDM -30°C to +100°C, NBR -35°C to +125°C

Specification size guide chart.

Type	Diameter range [mm]	Connector length [mm]	Working pressure [bar]	Type	Diameter range [mm]	Connector length [mm]	Working pressure [bar]
GZ 110	100 - 110	100	0.5	GZ 330	316 - 340	200	0.5
GZ 120	111 - 125	120	0.5	GZ 360	341 - 365	200	0.5
GZ 140	126 - 145	120	0.5	GZ 380	366 - 395	200	0.5
GZ 160	146 - 165	150	0.5	GZ 450*	396 - 480	250 or 400	0.25
GZ 180	166 - 185	150	0.5	GZ 500*	481 - 720	250 or 400	0.25
GZ 200	186 - 200	150	0.5	GZ 750*	721 - 960	250 or 400	0.25
GZ 220	201 - 220	180	0.5	GZ 1000*	961 - 1200	250 or 400	0.25
GZ 240	221 - 235	180	0.5	GZ 1250*	1201 - 1440	400	0.25
GZ 250	236 - 245	180	0.5	GZ 1500*	1441 - 1680	400	0.25
GZ 260	246 - 265	180	0.5	GZ 1750*	1681 - 1920	400	0.25
GZ 280	266 - 290	200	0.5	GZ 2000*	1921 - 2160	400	0.25
GZ 310	291 - 315	200	0.5	GZ 2250*	2161 - 2400	400	0.25

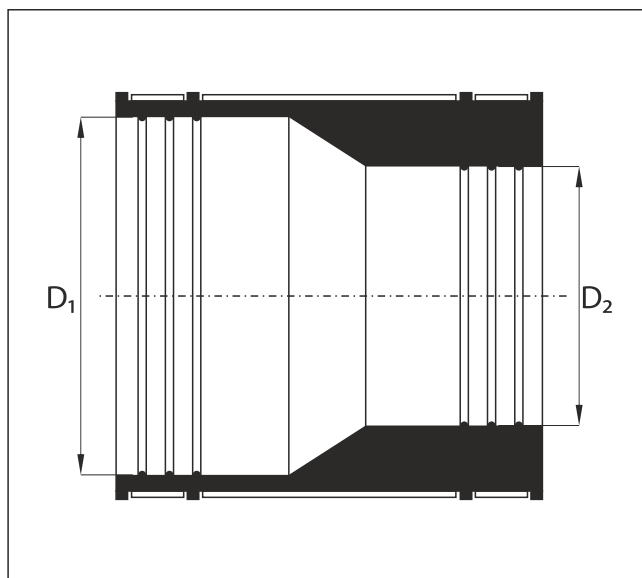
\* - special order only.

Type **GZ** reduction connectors are designed to join ends of pipes with different diameters, where the pipe sizes differ by 8 mm either way.



The reduction element is a thick rubber ring that fits in between smaller pipe and the GZ connector. EPDM sleeves are produced as a standard, NBR as a special order. GZ connectors contain four stainless steel straps and one center band. The smaller outer straps are responsible for gripping the two pipes firmly, while the wide center band ensures the pipes have a level connection and prevents blockages of the pipeline. This extremely reliable and strong method of gripping the pipes in a rubber sleeve allows the use of **GZ** connectors on sewage and drainage pipes made of PCV, PE, concrete and cast iron pipes. They can also be used to connect pipes made of other materials. This is a non-pressurized connection.

## MOUDLED REDUCTION CONNECTOR



We stock standard dimensions of the most used reduction units for sewage pipe sizes from GZ:

Specification size guide chart.

Type	Actual diameter range [mm]	Dimensions $D_1$ range [mm]	Dimensions $D_2$ range [mm]	Length of Reducter [mm]
GZ 110/90	110 / 90	100 - 110	88 - 92	100
GZ 220/200	220 / 200	201 - 220	198 - 202	180
GZ 240/200	240 / 200	221 - 235	198 - 202	180
GZ 260/200	260 / 200	246 - 265	198 - 202	180
GZ 280/242	280 / 242	266 - 290	240 - 244	200



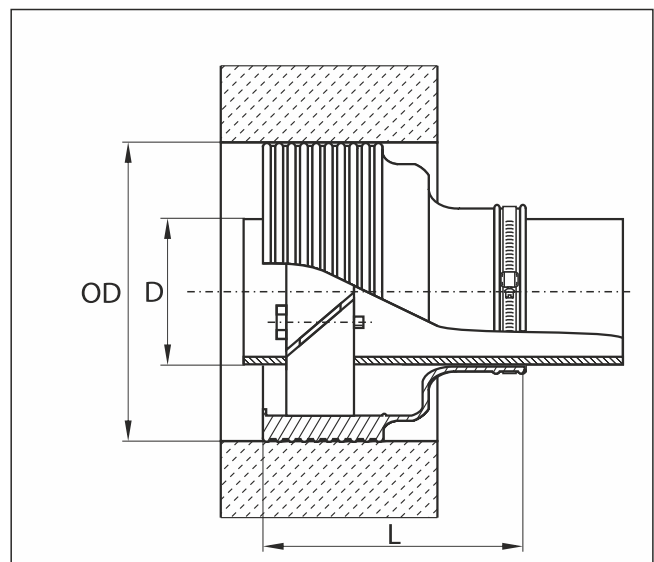
It is a non-pressure seal for entering a pipeline into a concrete enclosure, especially for sewer and drainage systems access points. It protects from groundwater migration as well as from spilling sewage outside the sewer network. This seal allows angular movement of the pipeline up to 12 degrees in all directions plus linear movements up to 25 mm.



Materials:  
EPDM Rubber, stainless steel expanding ring and jubilee clip.

Specification size guide chart.

DN	D [mm]	OD [mm]	L [mm]
80	78 - 96	≈ 160	120
100	108 - 118	≈ 200	120
150	155 - 170	≈ 250	120
200	200 - 225	≈ 300	120
250	250 - 280	≈ 350	120
300	310 - 330	≈ 400	120





## PATENTED

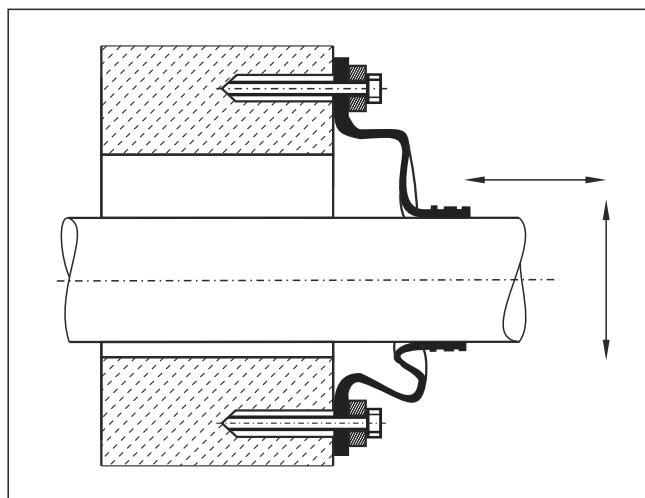
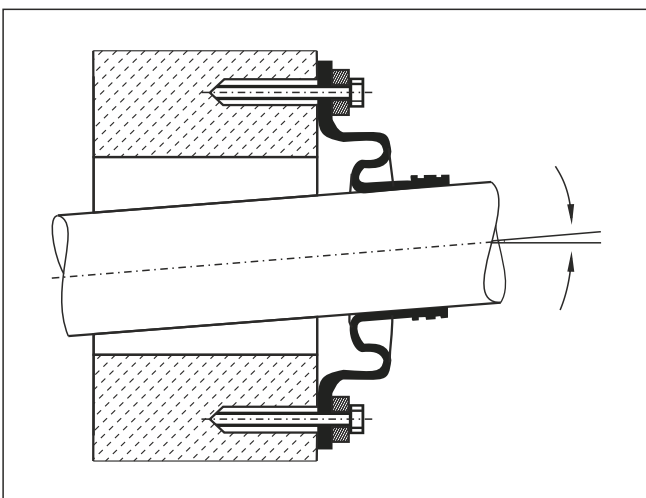
Type **WGC** seals are designed for non-pressure installations that are water and gas proof. Their main application is for heating distribution, gas, water and sewage supply networks. This kind of seal allows pipes to move relative to the structure without the seal leaking at the joints.



### Advantages:

It enables the movement of pipes in ducts in any direction without the seal leaking, e.g. movement due to temperature changes which may happen with insulated heat distribution pipelines. In places where subsidence may happen between a building and a new pipeline which has been put in a building or a new build.

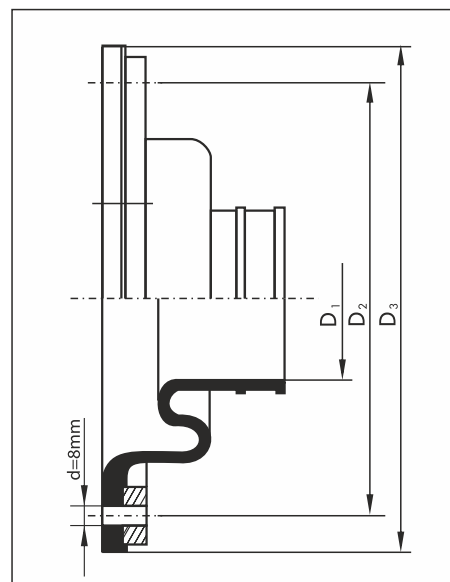
There is no need to use a protective sleeve or drill an opening with high precision. An easy installation, service-free, corrosion resistant. The pipe can be placed at a maximum of 12 degrees at any angle.



Materials used: EPDM rubber, ( NBR to order only )  
Stainless steel 304 or 316 clamping ring, jubilee clip, and fixing bolts with plastic rawl plugs.

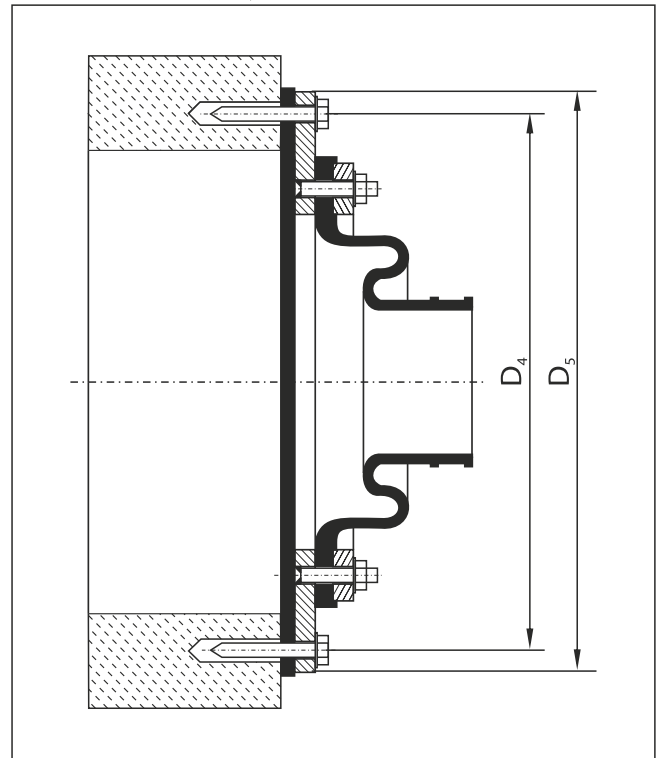
Specification size guide chart.

DN	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	D <sub>3</sub> [mm]	Range of use [mm]	Max. diameter of the opening [mm]
25	30	126	150	32 - 35	65
32	38	135	159	40 - 44	70
40	46	142	167	48 - 52	80
50	57	150	180	60 - 65	90
65	72	167	193	75 - 78	110
80	84	184	209	88 - 94	120
100	104	220	251	108 - 116	150
125	121	237	270	125 - 140	170
150	155	275	307	158 - 172	200
200	196	328	360	200 - 225	250
250	248	410	440	250 - 280	320

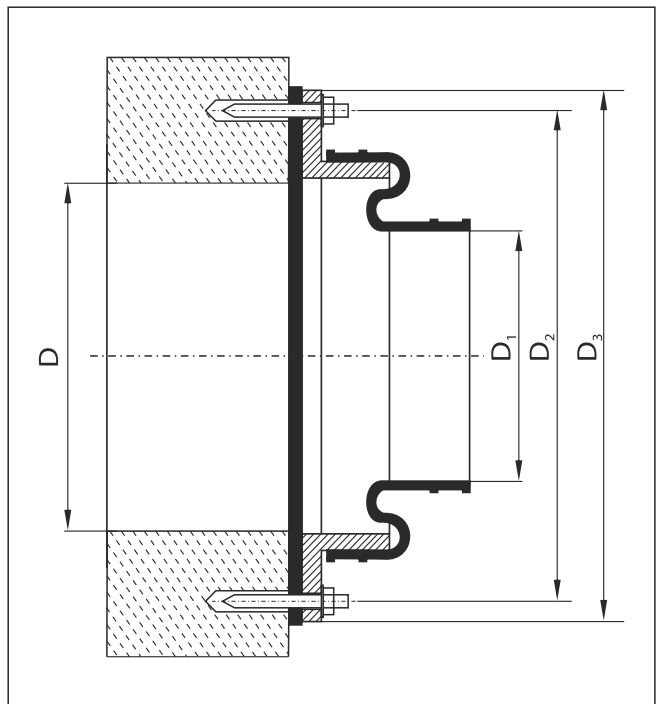


## TYPE WGC EXTERIOR WALL SURFACE PIPE SEALS

When there is an opening much larger than the pipe this type of seal reduces the hole with a steel plate to suit a smaller standard seal and still keeps the integrity of the seal.



## TYPE TN EXTERIOR WALL PIPE SEALS



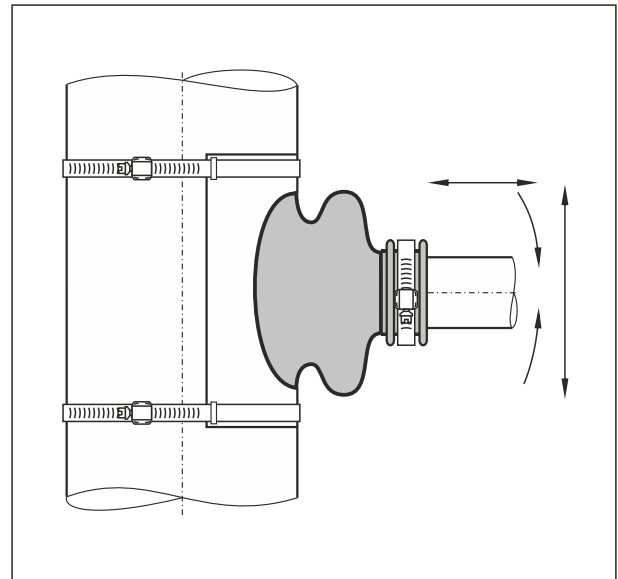
Guide chart

DN / the opening	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	D <sub>3</sub> [mm]	Maximum diameter of the opening D [mm]
300 / opening 375	315	470	500	375
300 / opening 400	315	495	525	400
300 / opening 425	315	520	550	425
300 / opening 450	315	545	575	450

Type **RTR** seals are designed for non-pressure entrance of a pipe into all kinds of tanks, wells, manholes, pipes that have round cross-section. The system fits and seals tightly to the pipe or tank diameters.



Type **A** bracket attachment.



The seal allows angles up to 12 degrees and linear movement of 25 mm of the attached pipe.



Type **B** bracket for fitting to concrete.

Specification size guide chart.

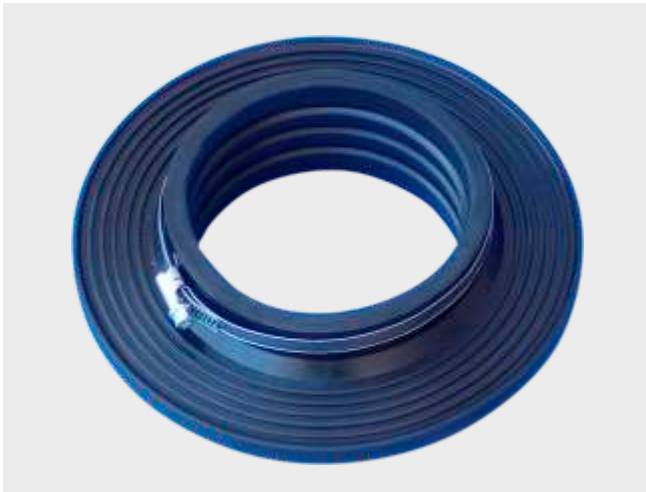
DN	Diameter of pipeline [mm]	Outer dimension of flange [mm]
25	32 - 35	135 x 135
32	40 - 44	135 x 135
40	48 - 52	150 x 150
50	60 - 65	170 x 170
65	75 - 78	180 x 180
80	88 - 94	195 x 195
100	108 - 116	220 x 220
125	125 - 140	230 x 230
150	158 - 172	275 x 275
200	200 - 225	335 x 335

Materials:  
EPDM rubber and stainless steel



Type **B** square frame fittings can be used on concrete roofs.

Puddle flanges are designed to seal pipelines and pipes set in concrete going into and through walls of buildings, like tanks, swimming pools, foundations, partition walls, floors and ceilings etc.



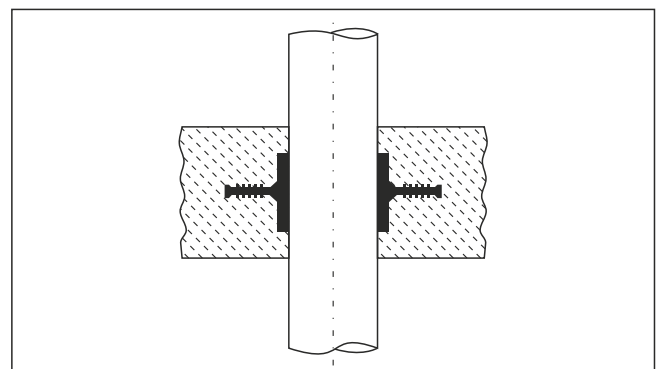
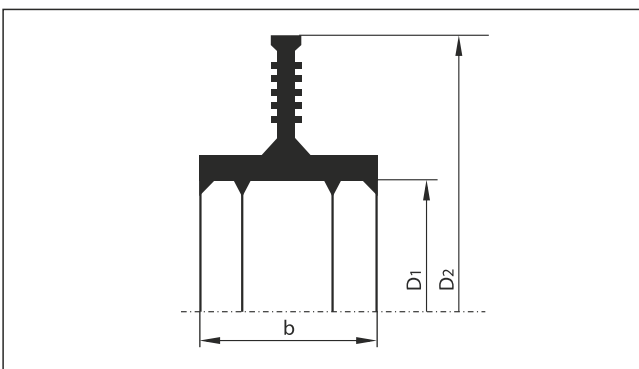
**Advantages:**

- Prevention of water and gas penetration through the point of entry.
- Easy installation and suitability for all kinds of pipes.
- Especially suitable for entry into a foundation wall or floor, horizontal or vertical.

**Technical data:**

Materials: EPDM rubber, stainless steel jubilee clips.  
 Maximum operating pressure: 2.5 bar.

The rubber puddle flange is installed by sliding it on to the pipe and placing it where the pipe will go through the planned concrete wall between the shuttering and tightening it with the jubilee clips. After that you can pour the concrete, care should be taken not to pour the concrete directly on the rubber flange. This kind of seal is permanent and cannot be removed. EPDM puddle flanges are not suitable for existing walls.



Specification size guide chart.

DN	d [mm]	D1 [mm]	D2 [mm]	b [mm]
25	32	29	127	60
32	40	38	136	60
40	50	48	146	60
50	63	60	158	60
65	75	71	169	60
80	90	84	182	60
100	110	105	203	60
125	125	120	218	60
125	140	120	218	60
150	160	154	252	60
180	200	195	293	60
200	225	215	315	60
250	250	245	343	60

DN	d [mm]	D1 [mm]	D2 [mm]	b [mm]
250	280	245	343	60
300	315	310	408	60
350	355	352	435	75
400	400	395	480	75
450	450	442	530	75
500	500	480	580	75
550	560	547	640	75
600	630	613	710	75
700	710	690	790	75
800	800	775	880	75
900	900	870	980	75
1000	1000	965	1080	75
1200	1200	1155	1280	75



Type **LU** sealing chains are a simple but very effective way of sealing the space between carrier pipes and ducts/casing pipes or holes drilled through concrete walls in buildings.



The sealing chain is made of elements that interlock with each other making a perfect seal. When fitted and put round the pipe and pushed into the hole and tightened by the bolts, they expand evenly round between the pipe and the hole making a perfect seal.



Sealing chains are used for sealing pipes in the walls of concrete tanks, foundations, swimming pools, pump houses and many other situations, such as cathodic protection of the pipes, noise reduction and for clean rooms. Protection against liquids, fumes, smoke and gases.

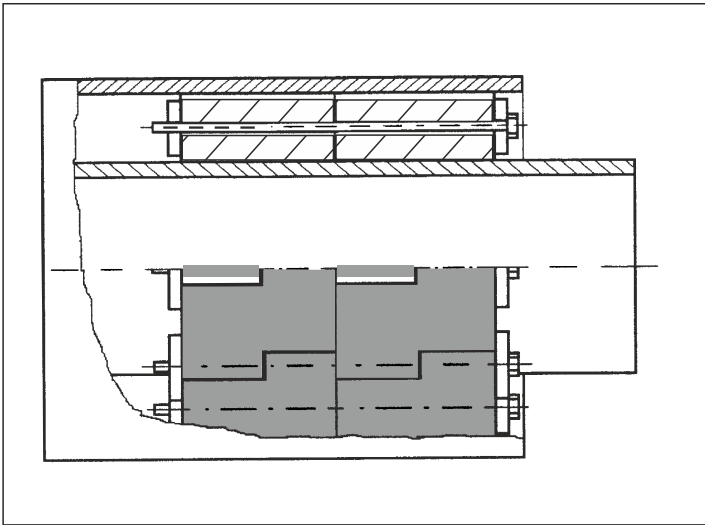


36 Sewer pipes 600 mm diameter

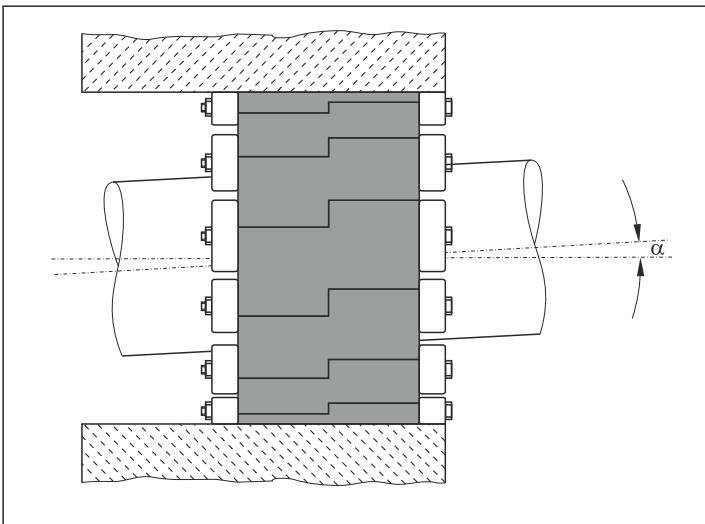


Water pipelines 250 mm diameter

Type **LU** sealing chains can be used to seal pipe diameters from 40 mm to extremely large diameters. You can seal steel, cast iron, plastic and concrete pipes. **LU** sealing chains can handle pressures up to 2.5 bars. We recommend using a double sealing chain called **2 LU** for pressures up to 5 bars.



This type of seal uses 2 sets of **LU** called **2 LU** with double length bolts and stainless steel plates.



To provide a 100% seal, the maximum angle ( $\alpha$ ) allowed cannot exceed 1.25 degrees. See the diagram.

## Installation guide:



Place the sealing chain round the pipe and connect both ends.



Slide the chain inside the opening till it is flush with the surface.



Tighten the bolts evenly till firm round the carrier pipe.

Sealing chains work perfect with casing pipes and openings made in a concrete wall. The hole should be as smooth as possible to get a perfect seal.

## Choosing a sealing chain example:

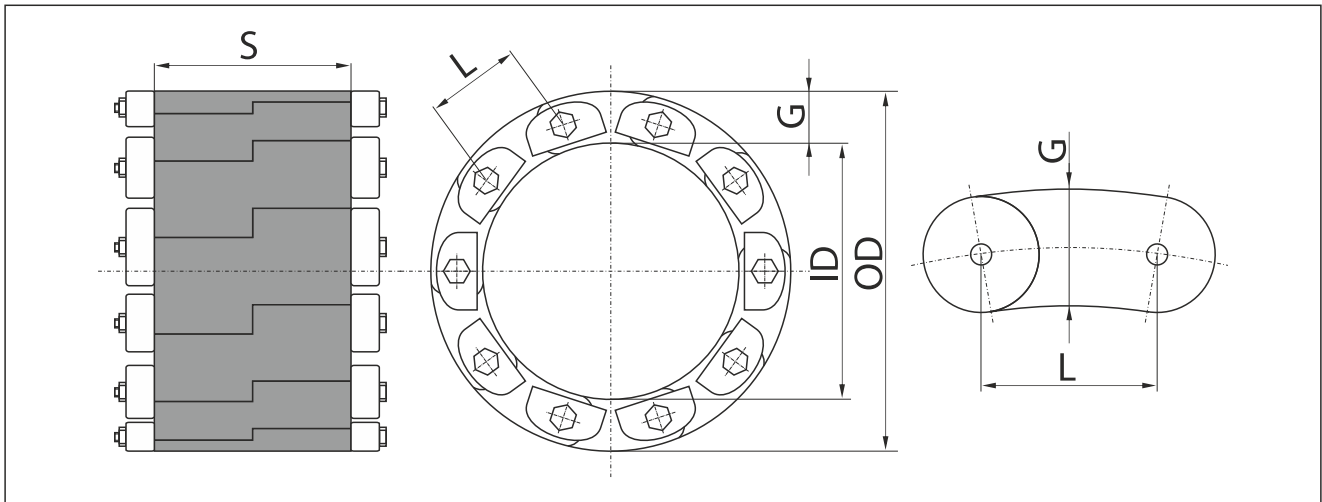
1. Inner diameter of casing pipe: OD = 400 mm  
 Outer diameter of carrier pipe with any possible insulation: ID = 315 mm  
 Size of the gap to be sealed: Gap = 85 mm
2. Based on the size to be sealed a certain model of the sealing chain is to be selected from the chart below (column 2). For Gap = 85 mm Type **LU6** should be used.

3. Overall length of sealing chain needed:  

$$\frac{(400 + 315)}{2} \times 3.14 = 1122.55 \text{ mm.}$$

4. Defining the number of links:  
 $1122.55 \div 68 = 16.508 \text{ pcs.}$   
 where 68 mm is the length of link from the table - column 3 for chain **LU6**.

5. The number of links should be expressed in round numbers. That is why in point 4. 16.508 has to be a round number. For example decimal values less than 0.49 must be rounded down while more than 0.5 rounded up. In the case above the number of links will be 17.



## Specification guide chart.

1	2	3	4	5	6
Type	Gap size to seal, the difference between hole diameter and pipe diameter.	L length of link [mm]	G thickness of link [mm]	S width of link [mm]	Bolt size
LU-1	26 - 33	30	13	44	M5 x 60 mm
LU-2	32 - 41	35	16	44	M5 x 60 mm
LU-3	40 - 51	40	20	63	M8 x 90 mm
LU-4	50 - 63	48	25	72	M8 x 110 mm
LU-5	62 - 77	56	31	88	M10 x 140 mm
LU-6	76 - 93	68	38	88	M10 x 140 mm
LU-7	92 - 113	82	46	90	M10 x 150 mm
LU-8	112 - 133	99	56	98	M12 x 170 mm
LU-9	132 - 157	104	66	98	M12 x 170 mm
LU-10	156 - 181	104	78	106	M12 x 190 mm
LU-11	180 - 206	114	90	110	M12 x 190 mm

## Maximum torque values for bolts.

Sealing chain	LU-1	LU-2	LU-3	LU-4	LU-5	LU-6	LU-7	LU-8	LU-9	LU-10	LU-11
Maximum torque - Nm	10	10	20	20	30	30	30	50	50	50	50

## Optimizing of sealing chain selection:

In the range of diameters up to DN 100 we recommend to make the opening according to the following formula: **Opening diameter = Outer pipe diameter x 1.4 to 1.6.**

In the range of diameters up to DN 400 we recommend to make the opening according to the following formula: **Opening diameter = Outer pipe diameter x 1.25 to 1.4.**

Above diameter DN 400 we suggest to make the opening according to the following formula: **Opening diameter = Outer pipe diameter + 100 to 200 mm.**

### CAUTION:

Sealing chains cannot carry the weight of the carrier pipe and its contents.

## Installation tips:

1. The size and the number of links must be chosen correctly, the minimum amount of links - 6.
2. Axis of carrier pipe must coincide with axis of the casing pipe or opening.
3. Wrap the chain round the pipe and join both ends with the bolts supplied.
4. Move the chain on the pipe so all of it is in the casing pipe or opening.
5. Tighten the bolts evenly on the ring, one turn at a time to the correct torque.

### CAUTION:

Do not use pneumatic or electric nut runners.

## Types and materials:

When ordering the chain, apart from giving number of links, it is necessary to add the letter to define the material.

Symbol	Elastomer	Pressure plate	Bolts
"A2" EPDM bis	EPDM	plastic	A2
"A4" EPDM bis	EPDM	plastic	A4
"Z" EPDM bis	EPDM	plastic	galvanized steel
"A4" KTW bis	EPDM-KTW	plastic	A4
"A2" NBR bis	NBR	plastic	A2
"A4" NBR bis	NBR	plastic	A4
"A2" SILIKON (milled)	SILIKON	stainless steel 1.4307	A2
"A4" SILIKON (milled)	SILIKON	stainless steel 1.4404	A4
"A2" EPDM (milled)	EPDM	stainless steel 1.4307	A2
"A4" EPDM (milled)	EPDM	stainless steel 1.4404	A4
"A4" KTW (milled)	EPDM-KTW	stainless steel 1.4404	A4
"A2" NBR (milled)	NBR	stainless steel 1.4307	A2
"A4" NBR (milled)	NBR	stainless steel 1.4404	A4



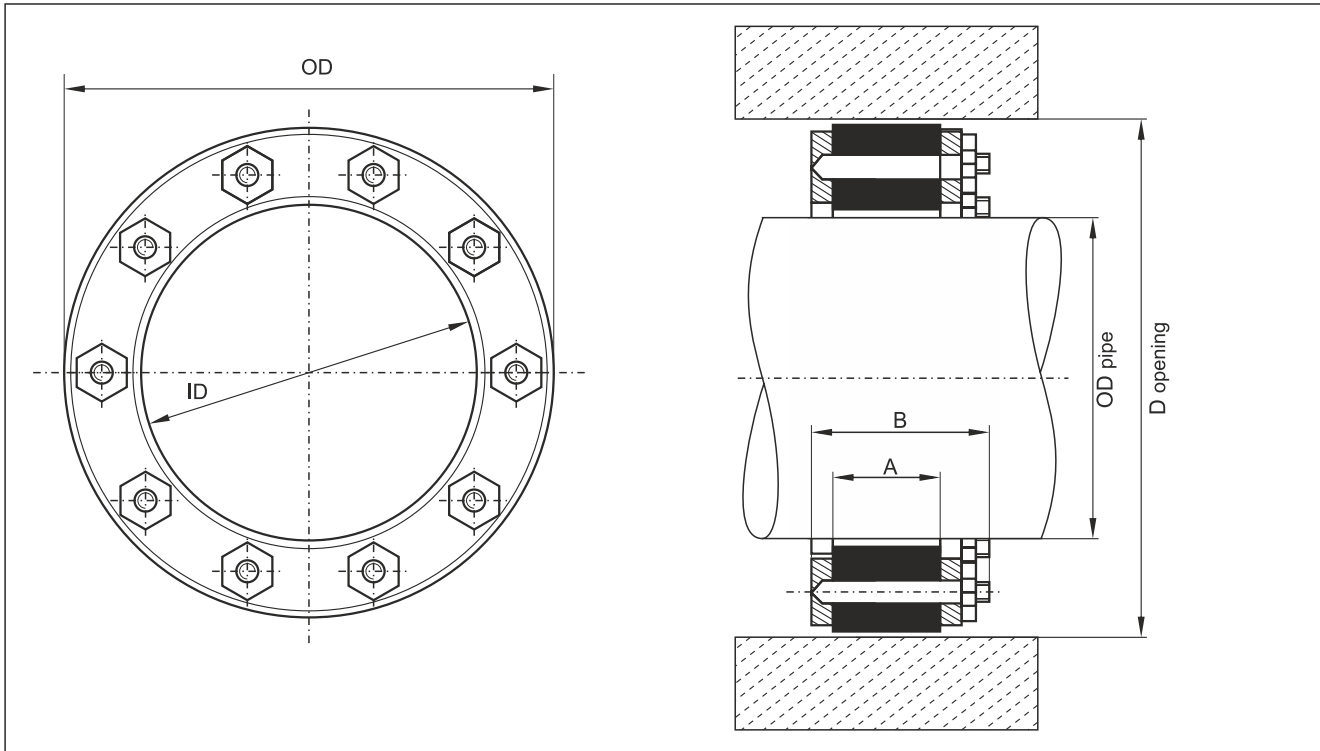
Type **GP** sealing systems are designed for non-pressured or pressured entries through concrete walls/ducts for pipes and cables passing through all kinds construction partitions, concrete tanks, ducts and structures. The seals are made of rubber and 2 stainless steel rings which clamp them together. After tightening with the bolts, nuts and washers the rubber expands, sealing the opening and holding them firmly in place. This kind of seal can be used for pipes made of steel, cast iron, PVC, PE and cables.



#### Advantages:

- The seals are custom-made to order, "bespoke".
- They ensure tightness from 1.0 to 5.0 bar, depending on the type of seal.
- They protect against the migration of liquids, gases, and smoke.
- They dampen noise and vibrations of pipelines.
- They allow sealing passages with a large difference in diameters: opening and pipeline.
- They allow sealing non-axial and multi-conduit passages.

To maintain tightness, the maximum angular deviation of the pipeline axis from the opening axis cannot exceed 2°.



**Technical data:**

$D_{\text{opening}}$  – diameter of the opening in the building partition  
 $OD_{\text{pipe}}$  – outer diameter of the pipeline.  
 $OD$  – outer diameter.

$ID$  – inner diameter.  
 $A$  – thickness of rubber.  
 $B$  – total dimension (around 70 mm).

Range of opening diameters [mm]	Minimum difference between the diameter of the opening and the diameter of the pipe [mm]
up to 100	25
101 - 150	30
151 - 200	40
201 - 500	50
501 - 800	70
801 - 1000	80
over 1000	Subject to agreement

**CAUTION:** Do not use pneumatic or electric nut runners.

**Materials:**

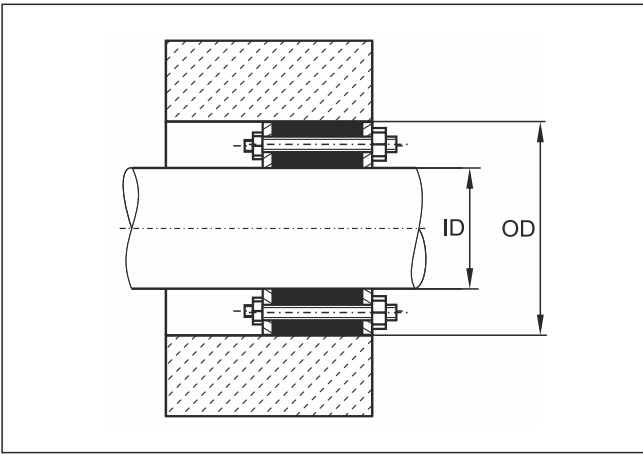
EPDM elastomers, EPDM-KTW, NBR or silicone,  
 Compression rings and bolts - stainless steel (1.4307 or 1.4404).  
 Operating temperature: from -30°C to +100°C (for EPDM elastomer).

Bolt size	S [cm <sup>2</sup> ]
M 5	9
M 6	16
M 8	25
M 10	36

Best conditions for compressing the rubber with the pressure plates is based on the size of bolts. For EPDM rubber 50° Shore [A].

**Maximum torque values for bolts.**

Bolt size	M5	M6	M8	M10
Max torque [Nm]	10	15	20	30



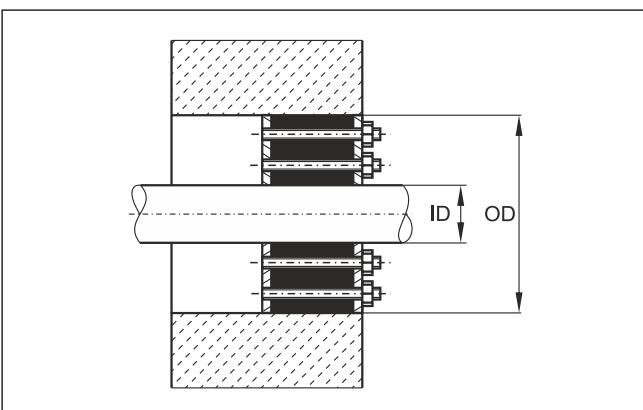
It is the most used solution.

Applications:

**GP-SR** seals are designed for sealing carrier pipes or electric cables through an opening.

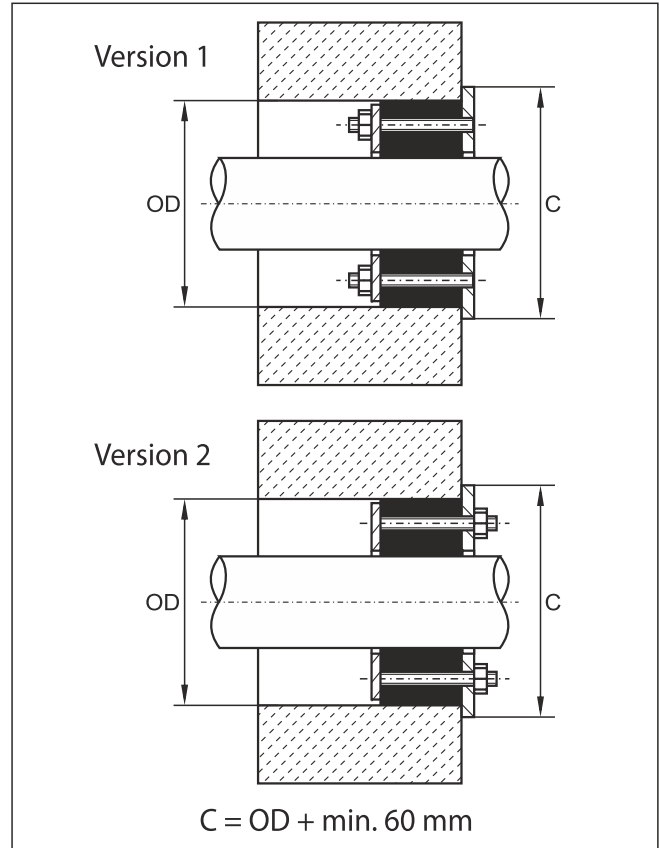
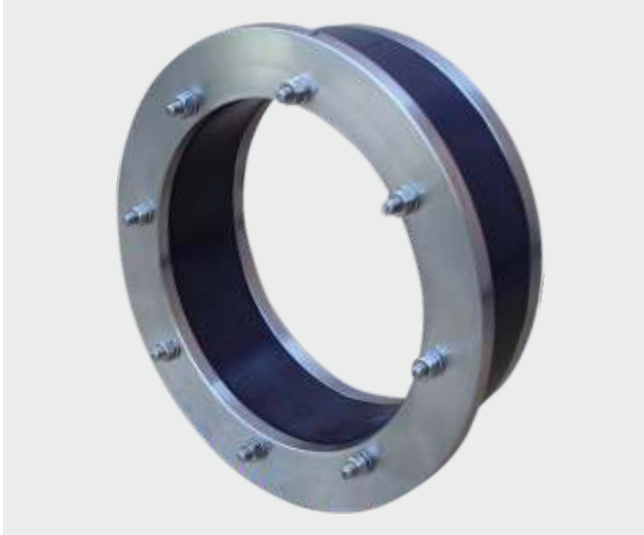
They also work well with protective sleeves and openings made directly in the wall.

Pressure rings and rubber can be split when needed to be installed on an existing pipeline.

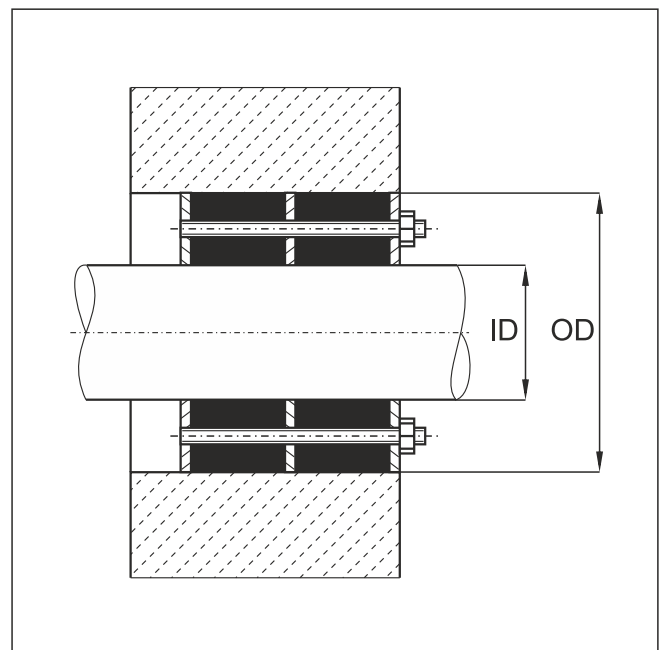
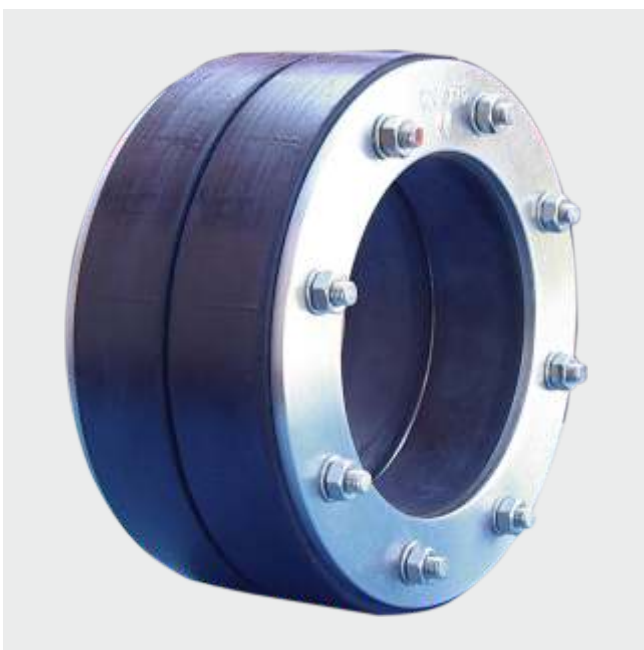


Type **GP-SD** seals are used when there is a large difference between the carrier pipe size and the opening diameter. Double or even triple rings of bolts are used to properly compress the rubber creating a very good seal in the wall/duct.

Pressure plates and rubber can be split to be installed on existing pipes.

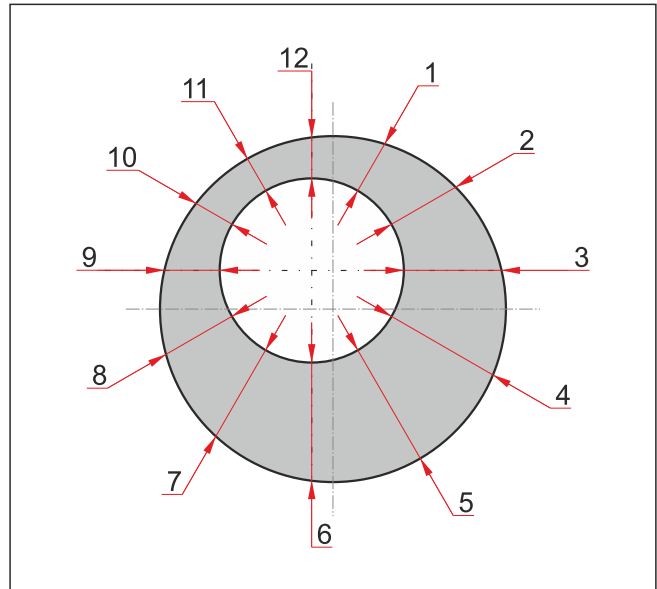
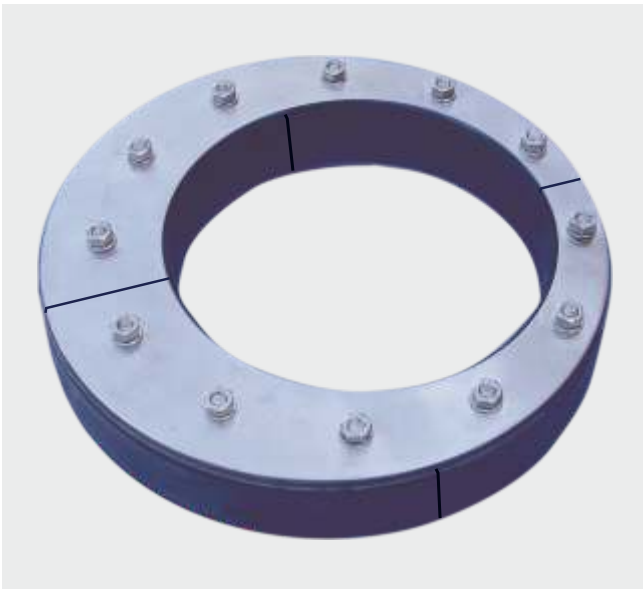


Type **GP-LR** compression seal has a larger plate on one side and smaller on the other. It is used in tanks where the volume of liquid changes rapidly. The large plate is mounted always on the inside of the tank. This kind of larger plate can be also used on other types of seals.



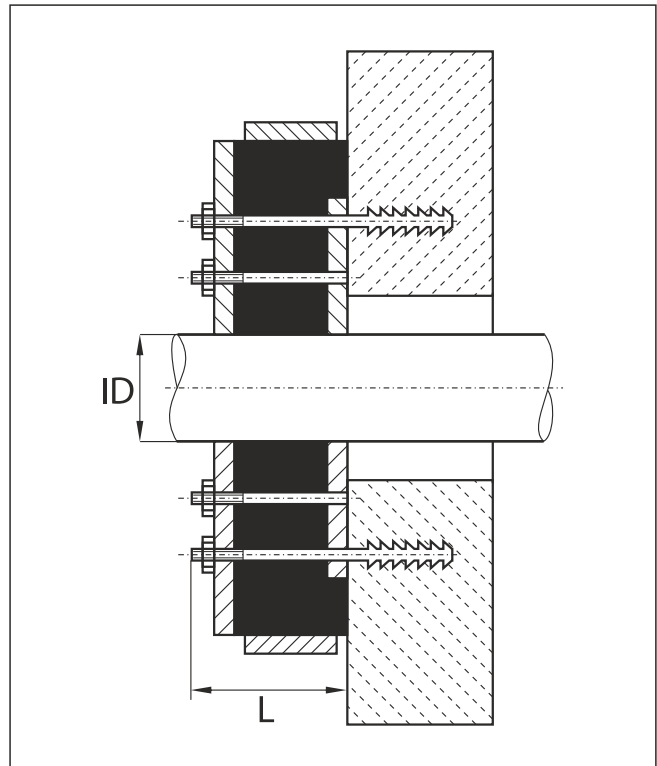
Type **GP-DL** seals were created for higher pressures up to 5 bar. This are made up from two **GP-SR** seals. Pressure plates and the rubber can be split, so the seal can be installed on an existing pipe.





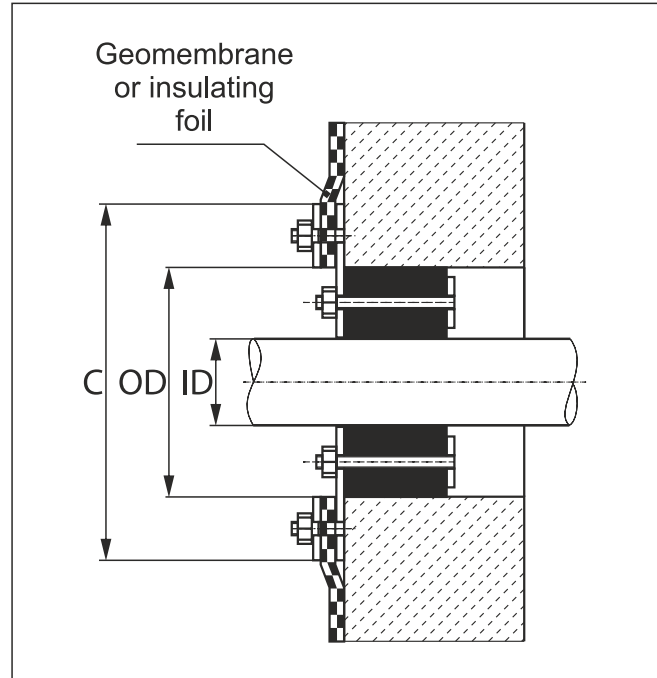
Type **GP-UM** is an off centered compression seal. They are used when the carrier pipe is not centered in the duct/casing. It is necessary to make an exact measurements from twelve positions (see the picture above).  
This type of compression seal can be split or in one piece.

**PATENTED**

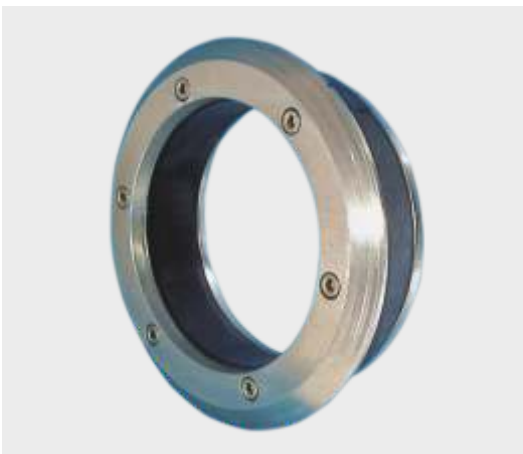
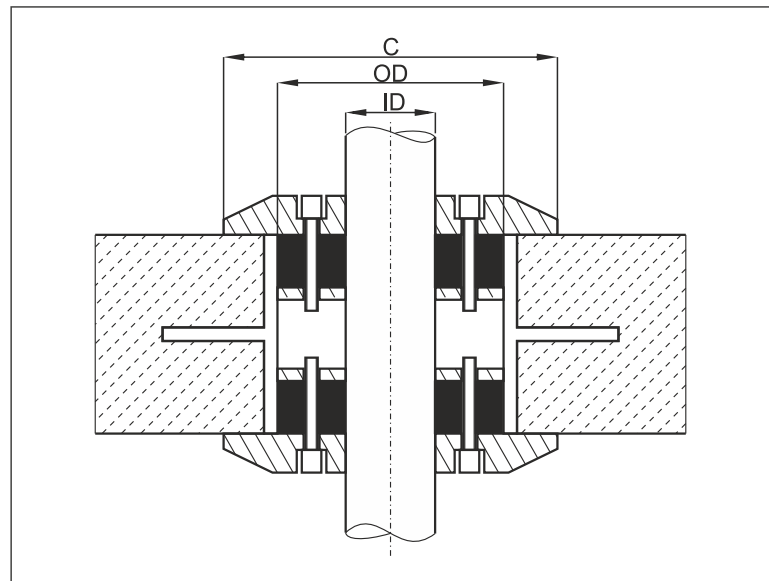


Type **GP-B** seals are designed for existing pipelines. They are bolted to the wall and where there is no possibility to place a seal between the pipe and opening. It can be used only on flat walls.

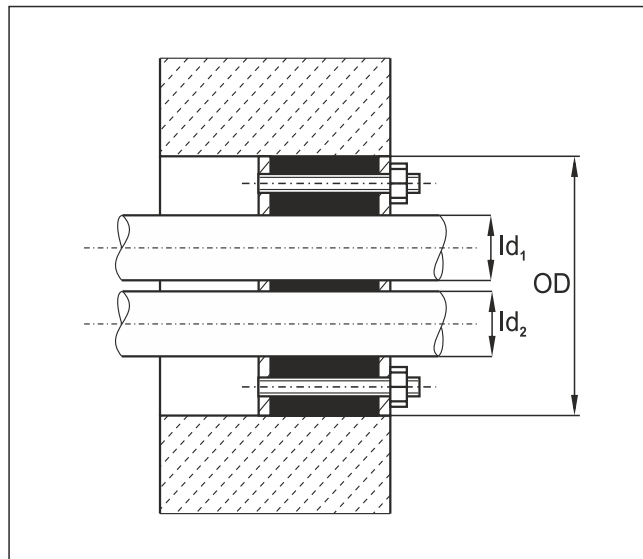
Specification:  
Unit thickness 60mm.  
Pressure plates and rubber are split.  
Used for all types of pipelines and cables.



Type **GP-F** compression seals are used with Geo or water proof membranes or other types of insulation, for example to cover bumps. Standard size:  $C = OD + 100 \text{ mm}$ .  
Special order only.



Type **GP-SP** seals are for openings to seal pipes or cables going through floors and ceilings. They are used for casing pipes concreted in the ceiling or directly into the opening. This type of seal protects against liquids, smoke and gas penetration. Pressure plates and rubber can be split for existing pipe and cables.



Type **GP-W** seals are for sealing multi-pipe installations.  
It is important to give the OD of the seal and the number of the holes with diameter.

Remember:  
It is important to calculate the surface of the holes, they cannot exceed 30% of the whole seal.



This seal is non-metallic.  
Compression disks are made of a plastic and the seal is from EPDM or NBR rubber. Bolts, nuts and washers are made of nylon. They are intended to seal cables and pipes in walls and ducts and insulate them from electrical contact. Pressure is up to 1 bar.  
Operating temperature depends on materials used.



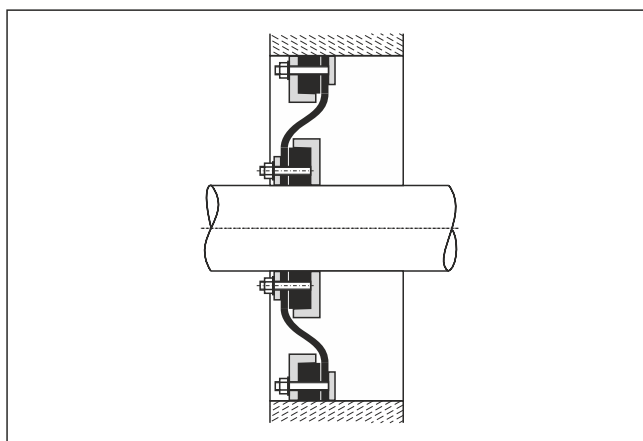
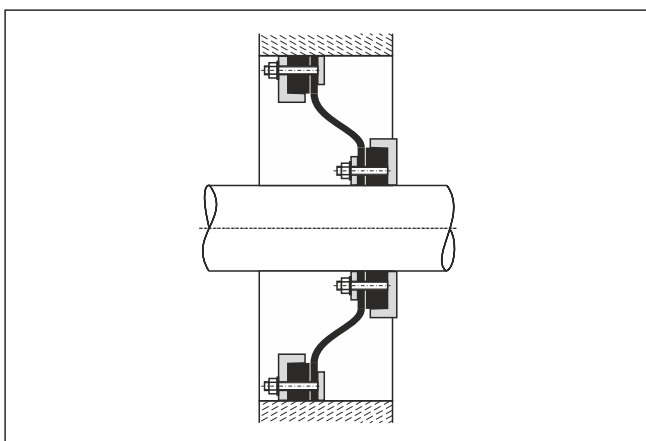
These seals are for cables or pipes in concrete walls or ducts.  
Pressure plates and rubber are always split.

Remember:  
It is important to calculate the surface of the holes, they cannot exceed 30% of the whole seal.

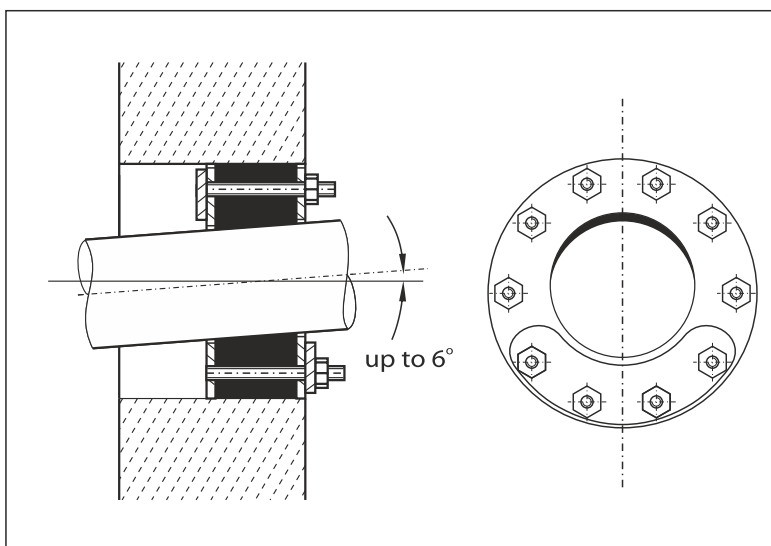


This type is used to seal power cables in square or rectangular openings in walls.  
Special order only.

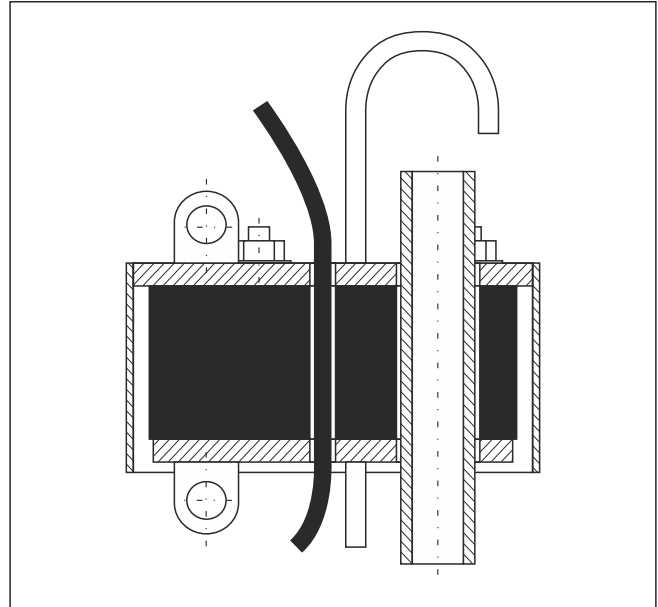




Type **GP-AM** seals consist of two **GP-SR** seals plus a rubber membrane between them. Tight passage construction allows axis movement of the pipeline preserving full seal tightness up to 1 bar. Range of movement depends on the difference in diameters of the opening and the pipeline. Maximum value is +/- 50 mm. To use this type of seal the opening has to be bigger at least 150 - 300 mm than the outer diameter of the pipeline. Maximum pipe size is DN 500. This kind of seal cannot be made in a split version. Special order only.



Type **GP-K** seal is designed to seal pipeline transitions passing through building partitions at an angle different from right angle. The maximum deviation cannot exceed 6°.



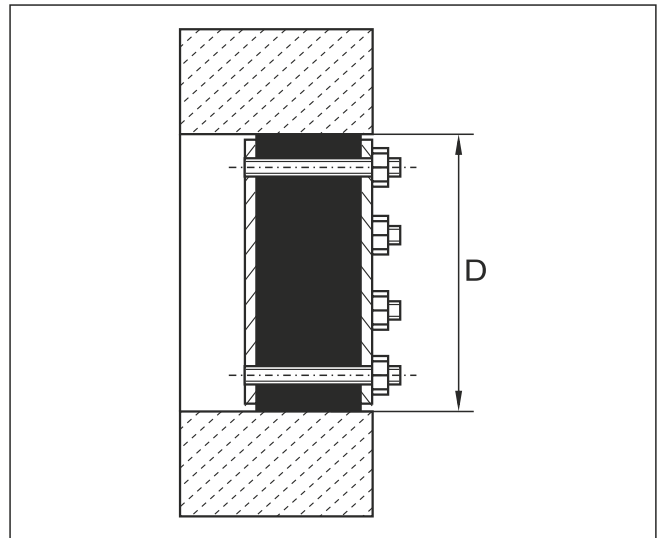
Type **GP-AJ** is a sealing head for drilled water wells. It is used to close drain pipes. It has separate openings for carrier pipe, pump power cable and vent. In the lower part there is a hook to hang the pump.

Materials: Stainless steel, EPDM rubber.

Special order only.



Version 1, diameters up to 200 mm



Version 2, diameters over 200 mm

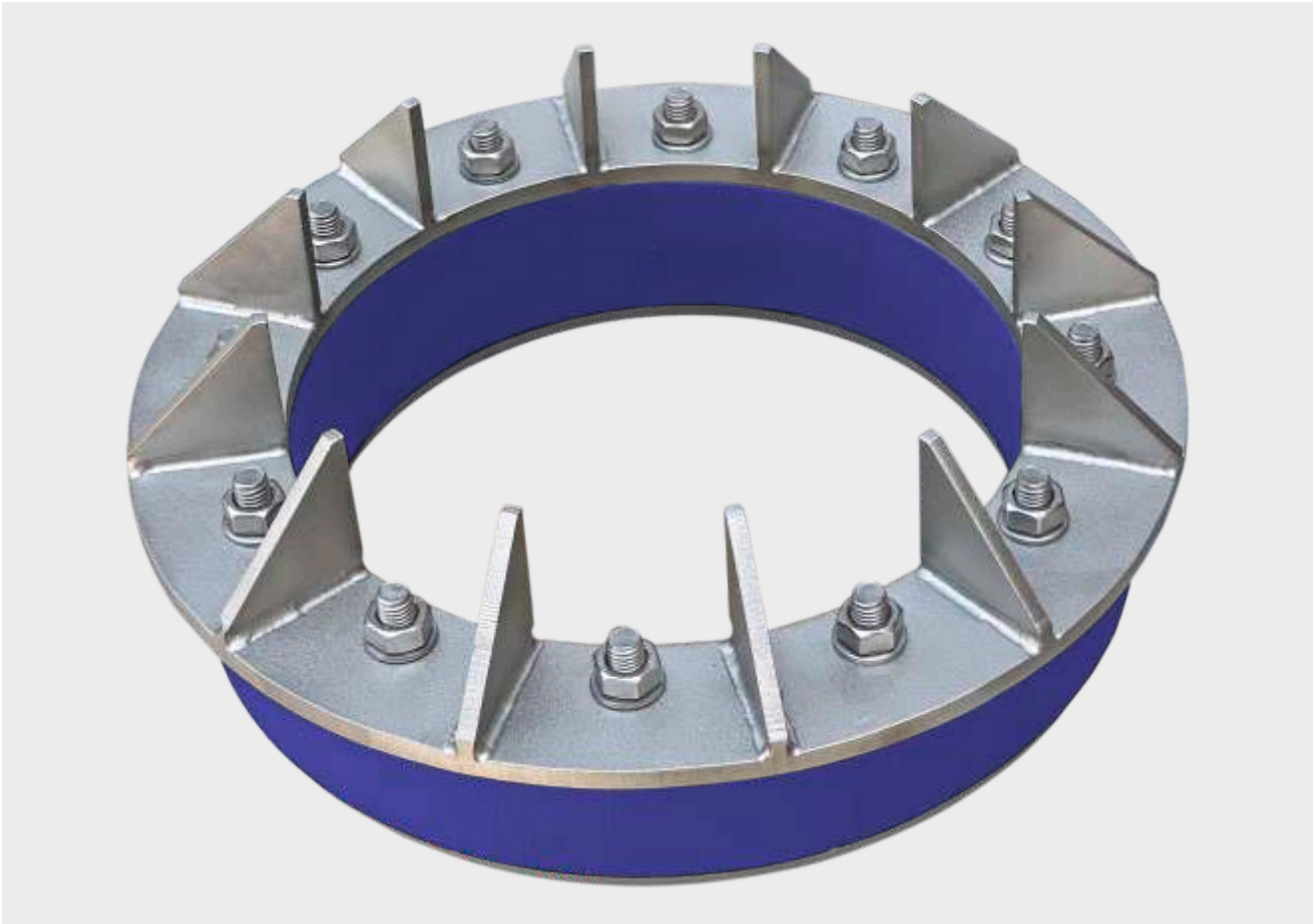
These types of seals are used for plugging holes after removing redundant pipes and making access entries in walls, tanks and foundations. Plus adding a drainage plug.

The materials guarantee a permanent seal.

Maximum operating pressure 1 bar.

Special order only.

**PATENTED**

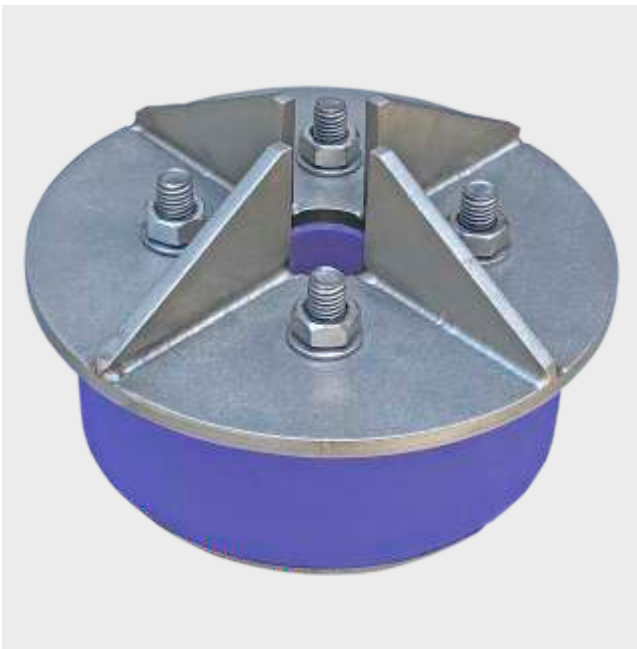


The explosion-proof seal type **GP-EX** is designed for areas where potentially hazardous gases, liquids or dust explosions may occur. They have an enlarged and reinforced outer compression ring (the outer diameter is larger by approximately 40-50 mm than the diameter of the opening), which protects the silicone sealing ring from the effects of shock waves. These seals can be used in both walls and ceilings.

Materials used:

Metal parts: stainless steel 1.4307 or 1.4404,

Elastomer: silicone, approximately 40 mm thick.



Split version

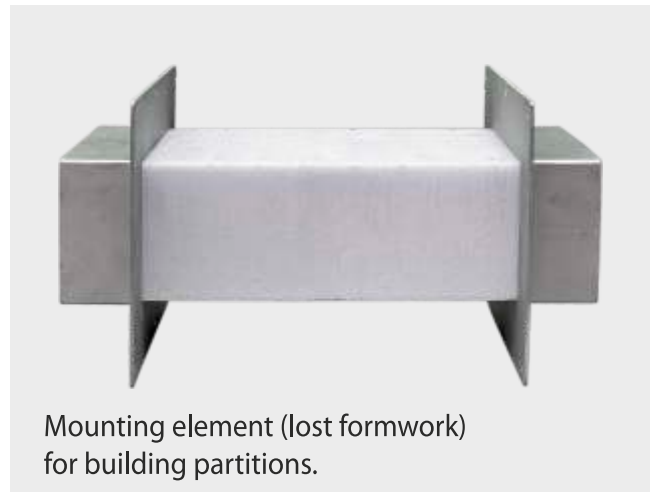
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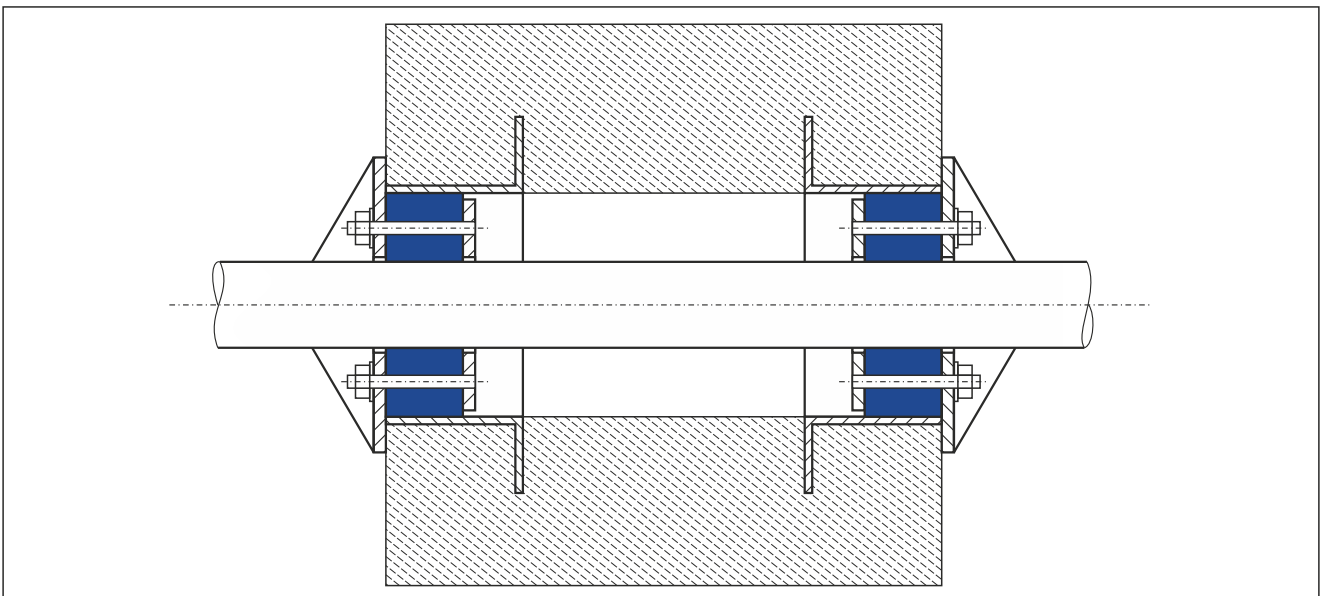
Rectangular version



Rectangular version  
split version

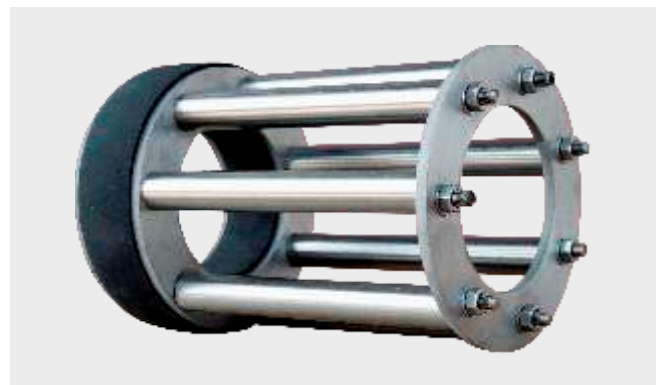


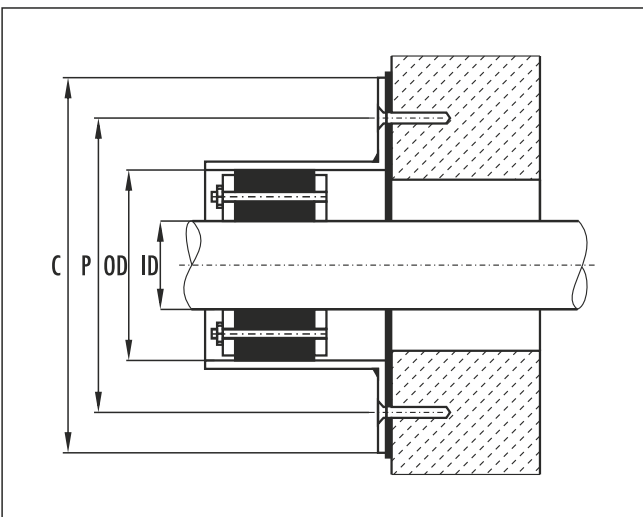
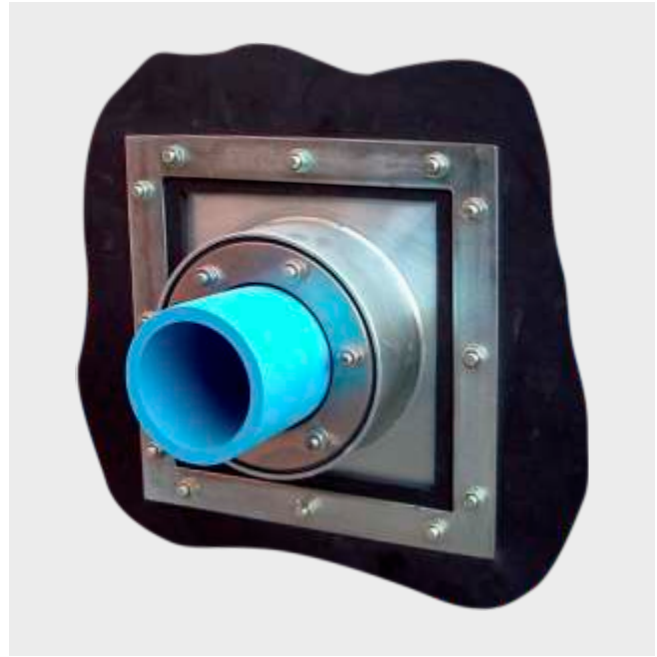
Mounting element (lost formwork)  
for building partitions.





These are examples of the types of **GP** seals which are produced for special projects and the individual requirements of clients. Special order only.





These types of seals can be bolted on to walls with anchor bolts or screwed using rawl plugs, depending on the thickness and type of wall, on buildings, foundations, tanks, floors and ceilings. This type of seal is used when there is no possibility to place a seal directly in the wall. These types of seals can be fitted on round tanks or concrete walls and foundations with insulation. In some cases there is an existing pipe so they can be split, depending on the pressure. Special order only.

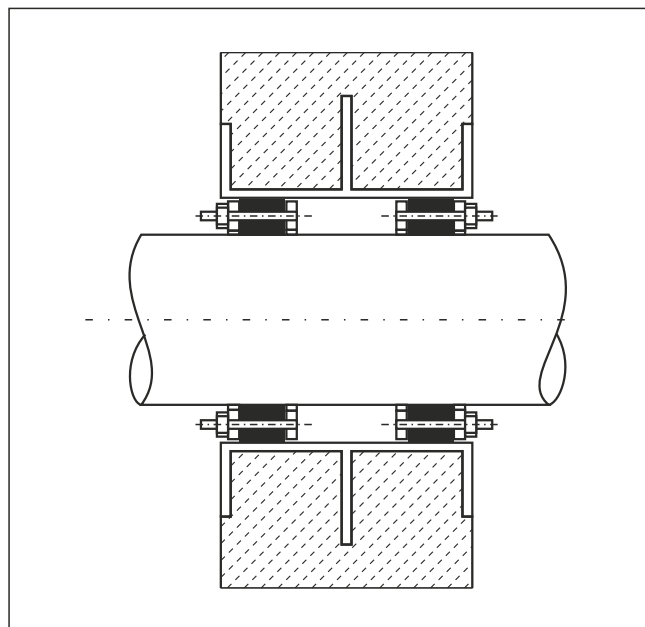
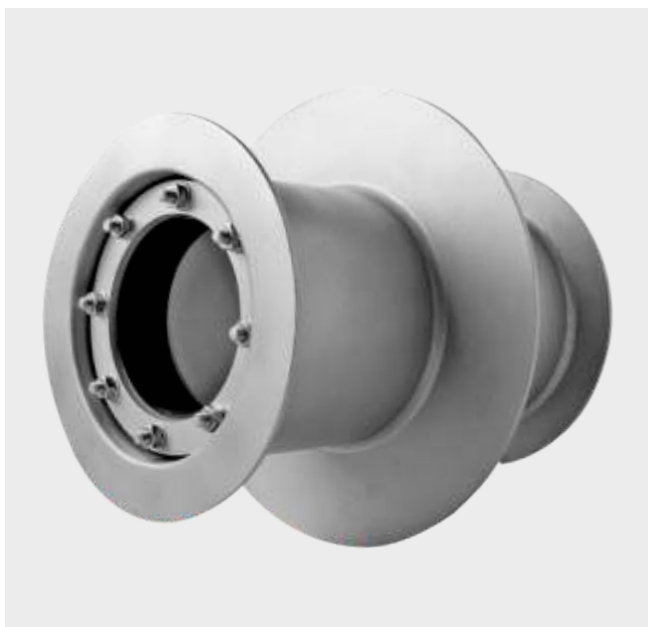
It is a wall sleeve with a flat steel face on each side and a central collar to hold it firmly in place in concrete walls, foundations or concrete tanks. A double seal is used to make tight passages for a pipeline going through. It consists of a steel sleeve and 2 seals type GP-SR system.

Technical data:

Sleeve: Galvanized steel, Stainless steel 304L (1.4307) 316L (1.4404).

Rubber: EPDM or NBR.

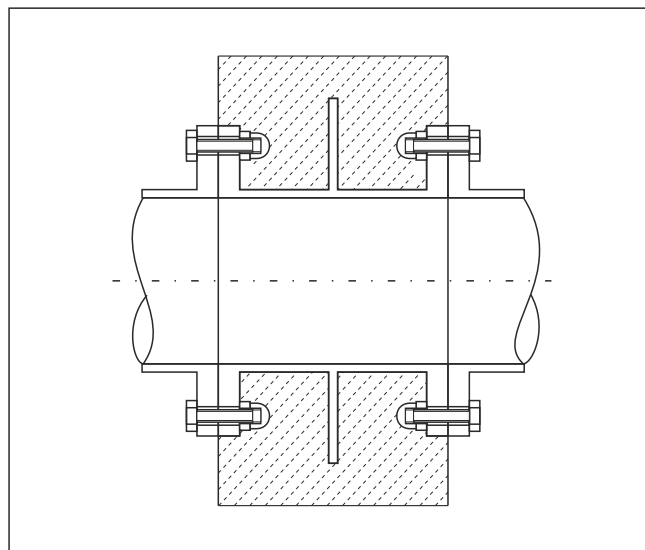
Can be used for pipes up to DN 1000. Special order only.



Type **EL** Wall sleeves are used to eliminate the horizontal movement of pipelines. These units can be used in concrete walls or tanks for intake or outlet.

Can be used for pipes up to DN 1000.

Materials: Galvanized or stainless steel 304L or 316L (1.4307; 1.4404).



During installation pay special attention to the supporting wall and that the pipeline is perpendicular to resistant surfaces. Special order only.

### CAUTION!

Forces carried by the pipeline on the supporting construction need to be given in the building calculations.



Steel casing sleeves are used to make a clean entry into walls, foundations, floors and ceilings made of concrete, so pipes and cables can pass through and be sealed.



Type I



Type II



Special made



Type III

Diameter range:

From 50 mm up to 2000 mm, steel wall thickness from 2 to 8 mm for CB steel galvanized, stainless steel, from 2 to 8 mm, maximum length stock pipe 6 m rolled 2 m.

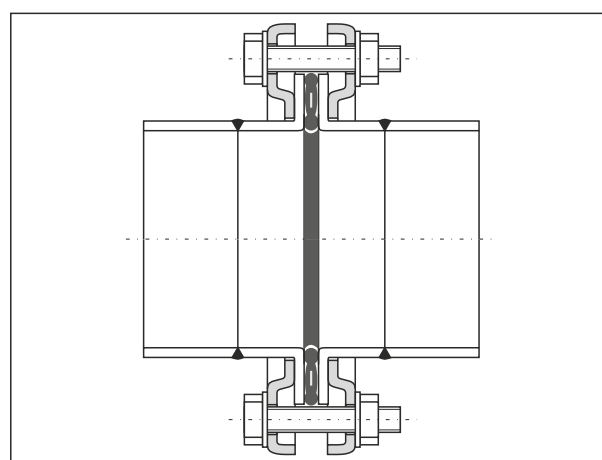
Materials: Carbon steel, Stainless steel 304L, 316L.

All sleeves special order only.





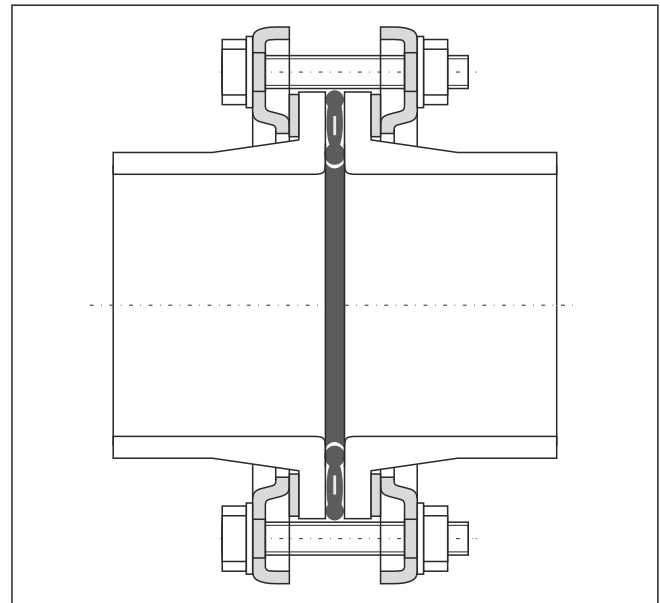
The profile compressed flange is designed for low-pressure stub end pipes and is made of stainless steel to a maximum of PN10 pressure. They are used for water, air and gas pipeline ends. Their purpose is to reduce weight and are much easier to install than the heavy and expensive solid flanges. They are manufactured in a range of diameters from DN 32 to DN 300 and are made in accordance with ISO 7005 BSi-EN 1092-1 2007 norms. They are made of stainless steel 1.4307, 1.4404 other grades are available such as 1.4571; 1.4541 on special order.



Specification size guide chart.

DN	Outer diameter of the pipe	Outer diameter of the flange	Inner diameter of the flange	Drilled pitch diameter	Flange thickness	Number of holes	Hole diameter
32	40; 41; 42.3; 43	140	47	100	3	4	18
40	44.5; 48.3	150	53	110	4	4	18
50	50; 52; 54	165	59	125	4	4	18
50	57	165	62	125	4	4	18
50	60.3	165	65	125	4	4	18
65	70; 73	185	78	145	4	4 or 8	18
65	76.1	185	81	145	4	4 or 8	18
80	80; 83; 84	200	89	160	4	8	18
80	88.9	200	94	160	4	8	18
100	104; 106; 108	220	113	180	4	8	18
100	114.3	220	119	180	4	8	18
125	129; 133	250	137	210	4	8	18
125	139.7	250	145	210	4	8	18
150	154; 156	285	161	240	5	8	22
150	159	285	164	240	5	8	22
150	168.3	285	173	240	5	8	22
200	204; 206; 208	340	213	295	5	8	22
200	219.1	340	224	295	5	8	22
250	254; 256	395	261	350	6	12	22
250	273	395	279	350	6	12	22
300	304; 306; 308	445	314	400	6	12	22
300	323.9	445	329	400	6	12	22

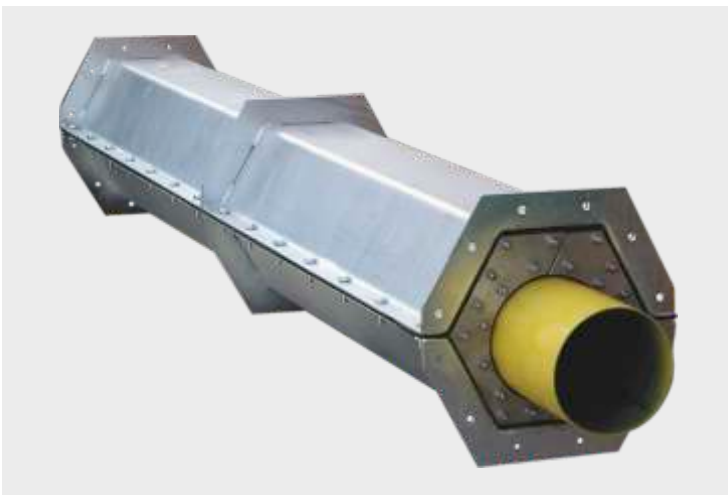
**PATENTED**



Specification size guide chart.

DN	Pipe outer diameter	Flange outer diameter	Pressure ring diameter	Drilled pitch diameter	Flange thickness	Number of holes	Hole diameter
32	40	140	43/70	100	3	4	18
40	50	150	53/78	110	4	4	18
50	63	165	80/102	125	4	4	18
65	75	185	88/125	145	4	4 or 8	18
80	90	200	110/138	160	4	8	18
100	110	220	131/158	180	4	8	18
100	125	220	141/158	180	4	8	18
125	140	250	156/164	210	4	8	18
150	160	285	182/214	240	5	8	22
150	180	285	202/214	240	5	8	22
200	200	340	229/270	295	5	8	22
200	225	340	243/270	295	5	8	22
250	250	395	270/314	350	6	12	22
250	280	395	300/314	350	6	12	22
300	315	445	343/374	400	6	12	22

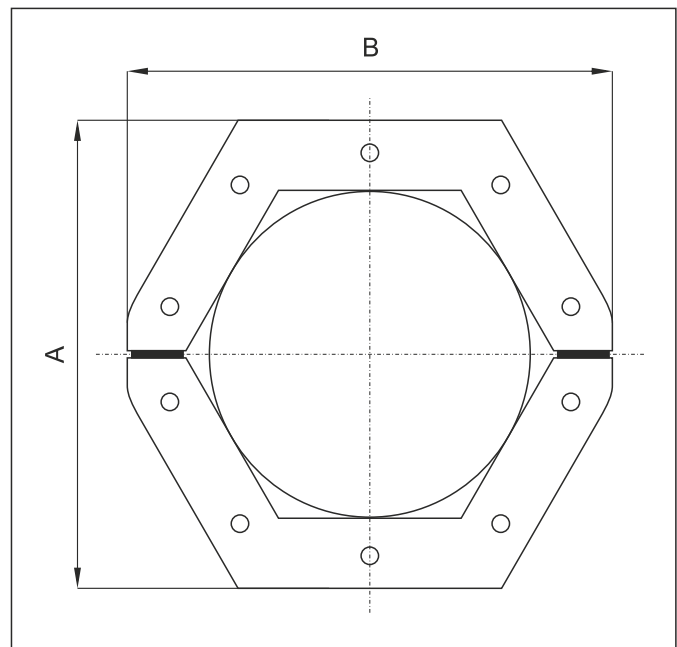
**PATENTED**



Split casing pipe with support ribs.

Split elbow.

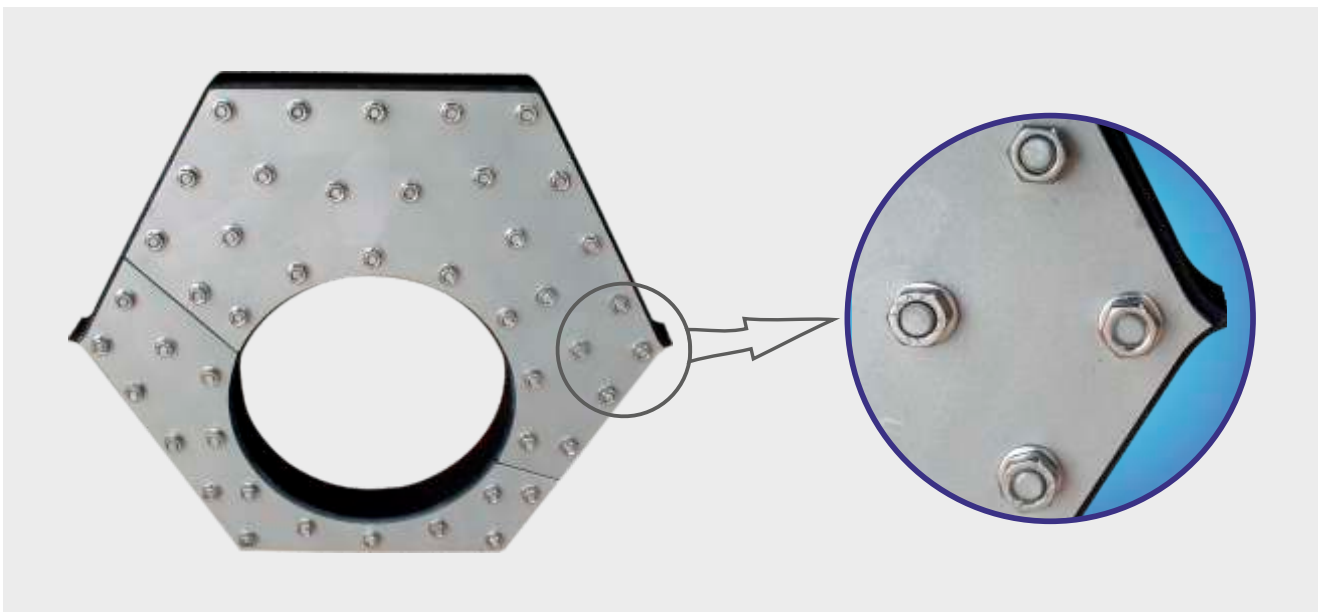
Intended to make a duct/casing round existing pipelines so other cables or pipes can be laid. Technical approval allows the use of Integra split casing pipes as a duct/protection for existing pipelines under the roads. Split pipes are made from galvanized carbon steel according to the requirements and categories (EN ISO 12944-2:2001) or from stainless steel of different types. Made in lengths 2 m (DN 800 and bigger maximum length 1 m). Individual pieces are connected with special collar connections. It is necessary to use spacers. With split casings we recommend to use 2 spacers per 2 metre section due to the joints. The distance between spacers is calculated by the weight of the pipe, contents and ground conditions. Special order only.



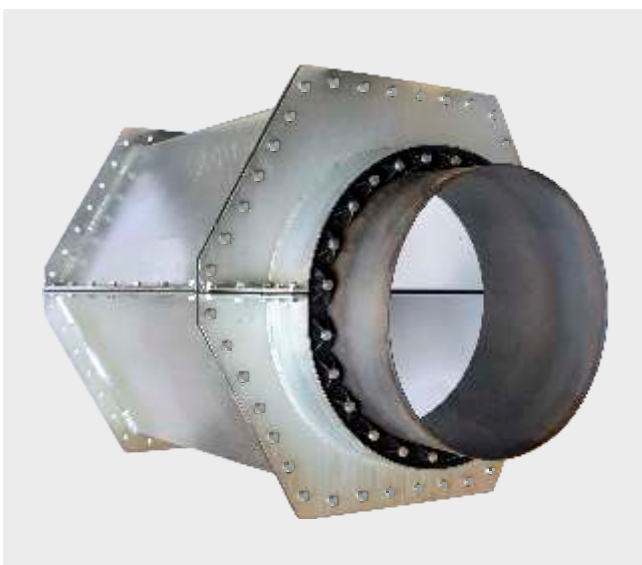
Specification guide chart.

Indicative nominal diameter [mm]	Wall Thickness stainless steel [mm]	Wall Thickness galvanized steel [mm]	A [mm]	B [mm]	Indicative nominal diameter [mm]	Wall Thickness stainless steel [mm]	Wall Thickness galvanized steel [mm]	A [mm]	B [mm]
125	3.0	4.0	215	215	400	3.0	4.0	515	540
150	3.0	4.0	245	250	500	4.0	6.0	620	660
200	3.0	4.0	305	320	600	5.0	6.0	735	780
250	3.0	4.0	365	380	800	5.0	8.0	940	1020
300	3.0	4.0	420	440	1000	6.0	8.0	1200	1300
350	3.0	4.0	470	490	1200	6.0	8.0	1380	1500

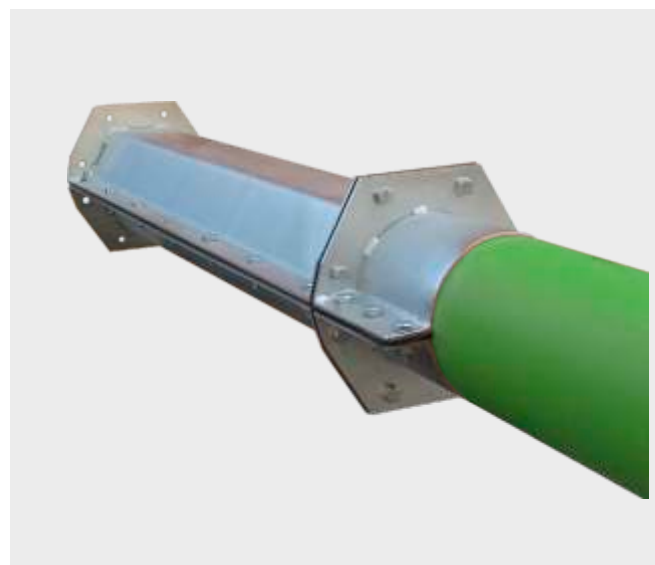
Other sizes available on request. All pipes special order only.



Ends of the pipe are sealed with the use of a hexagonal GP disk compression seals.



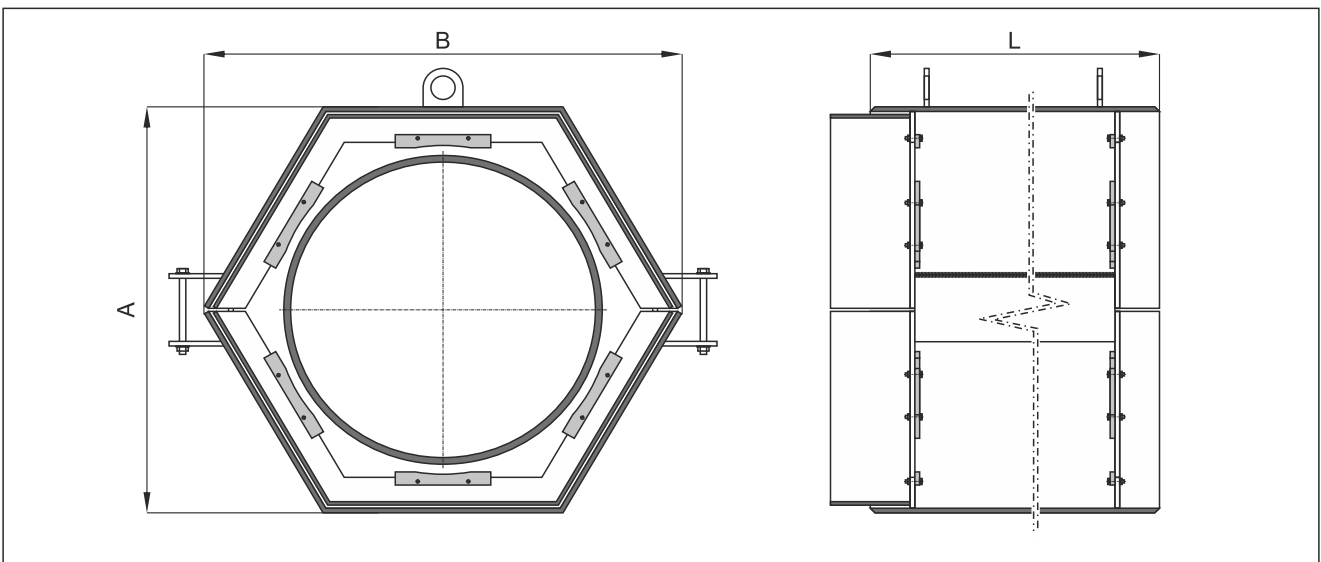
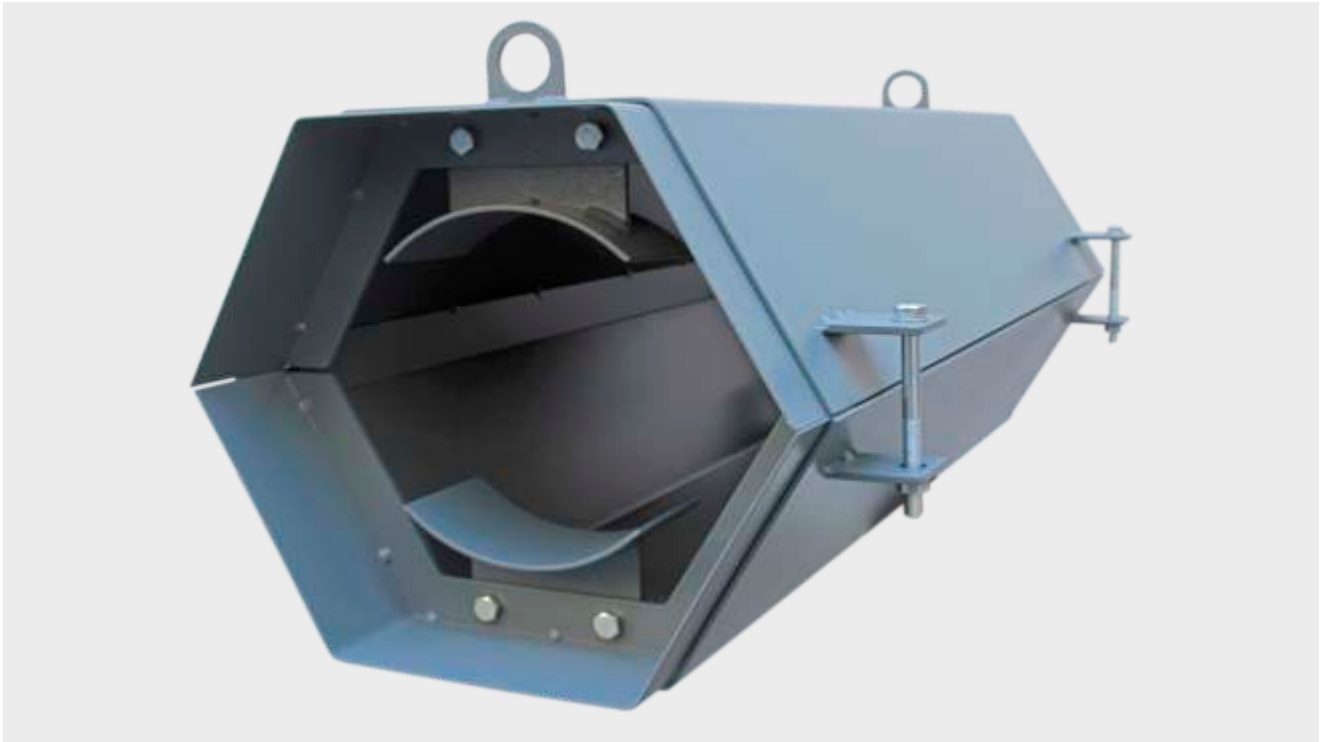
To seal the ends of a casing pipe we must use the link seals for sizes bigger than DN 800 and above.



It is possible to extend the existing casing with integra casing pipe.



**PATENTED**



The hexagonal welded casing pipe is designed to create protection for exposed steel carrier pipes. They are manufactured in a standard 2000 mm length, they can be made to smaller lengths to suit the situation. Each section comes with steel spacers at each end, 4 clamps to hold the section in place for welding, plus lugs for unloading and installation. After installation the lugs and welding clamps should be cut off. The pipe is not protected by the factory with any anti-corrosive coating. Available in carbon steel, for special order stainless steel and other. Special order only.

Chart of sizes for split casings.

Average size [mm]	Wall Thickness [mm]	A [mm]	B [mm]	L [m]	Average size [mm]	Wall Thickness [mm]	A [mm]	B [mm]	L [m]
125	4.0	140	160	2.0	400	4.0	410	480	2.0
150	4.0	170	190	2.0	500	6.0	520	600	2.0
200	4.0	230	260	2.0	600	6.0	620	710	2.0
250	4.0	280	320	2.0	800	8.0	820	940	1.0
300	4.0	330	370	2.0	1000	8.0	1050	1190	1.0
350	4.0	360	410	2.0	1200	8.0	1220	1410	1.0

These items are intended as a temporary closing off of sewage pipes and other low pressure installations up to 0.25 bars. They are a simple construction and easy to install. They can be used with PE, steel, cast iron and concrete pipes installations. The plug is placed inside the pipeline and screwed tight until the rubber expands and fills the space tightly. The plug can come with a valve or have a valve fitted to release the pressure or monitor and control the pressure in the pipe. All items are made to order only.



Up to DN 500.



Special made.



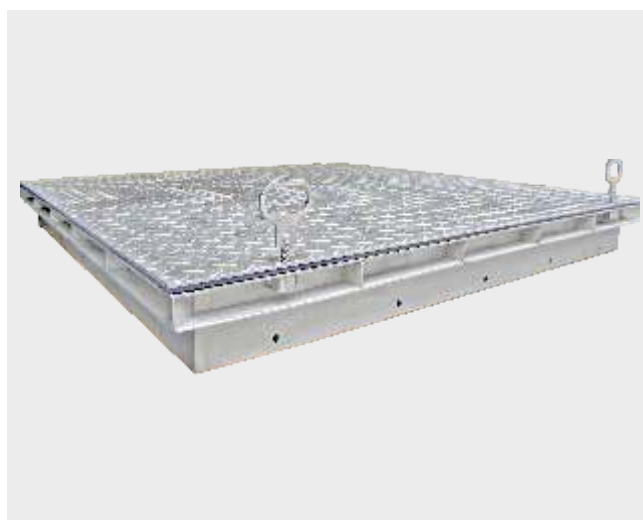
For large diameters.

## LOW PRESSURE INSPECTION HATCH TYPE WR-K

Hatches of this type are installed in the upper part of the tank and are used to inspect and change elements installed in the tank. We offer a wide range of hatches made to order according to requirements. The hatch can be installed with additional safety measures such as a grid that prevents accidents like tools and personnel falling into the tank or building.



Insulated hatches.



Application:

Water tanks.

Installation chambers.

Water and sewage pump rooms.

Technical data:

Material: stainless steel, styrofoam thermal insulation, seal of the cover EPDM or NBR rubber

Hatches with a special lock or a padlock. Covers are protected with a lever or gas spring against accidental closing. Special order only.



## LARGE INSPECTION HATCHES



On demand  
stainless steel gas springs.



## HIGH PRESSURE INSPECTION HATCHES FOR TANKS TYPE WR-S

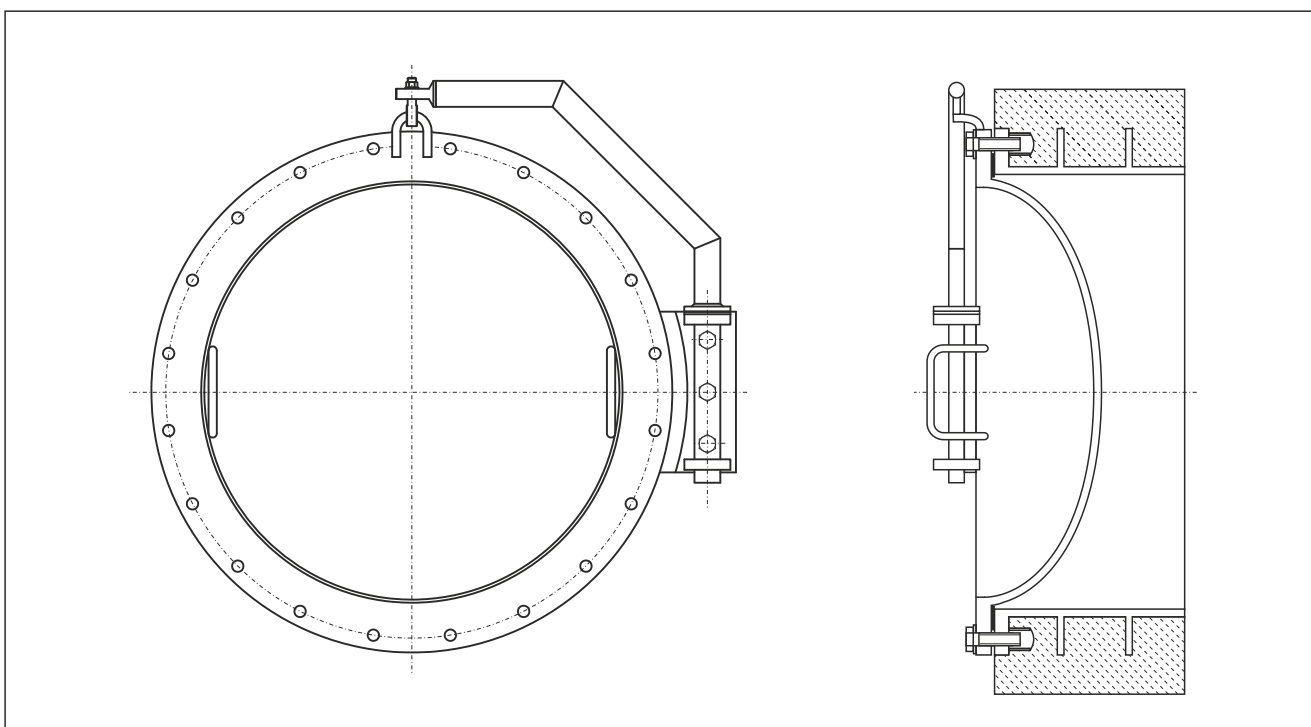
Inspection hatches are installed to walls of concrete tanks and are used for control, conservation and repairs of the equipment inside the tank. They are most often used to close separated fermentation chambers in sewage treatment plants. When used in concrete tanks they can be installed only during pouring of the concrete.

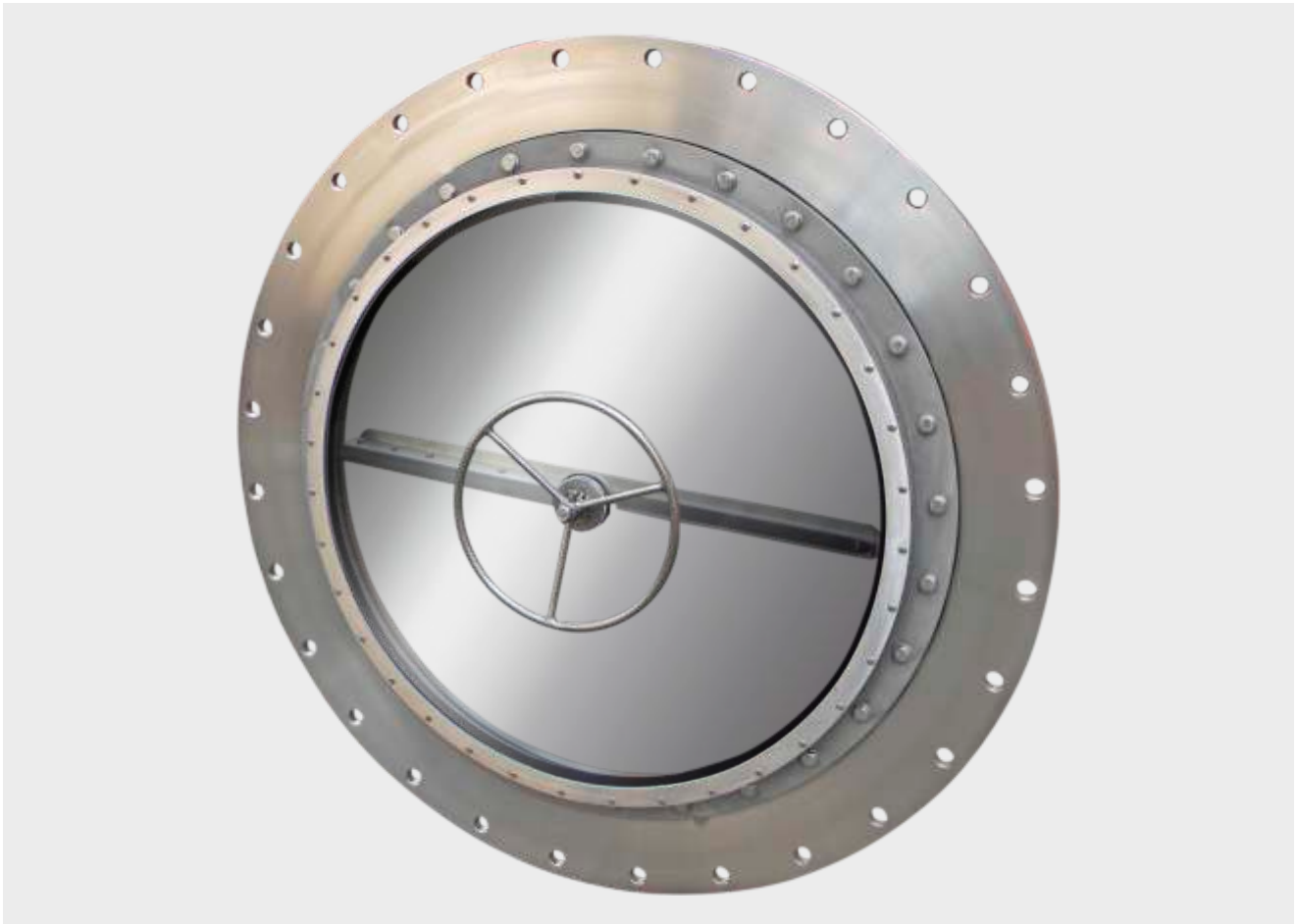
Materials:

Stainless steel 304L (1.4307) or 316L (1.4404), EPDM, NBR rubber seal.

Operating pressure up to 10 bars

Size of the hatch up to 1200 mm.





Hatches with tempered laminated glass panel up to 0.5 bars.



For special orders.

## TYPE **AR** SUPPORTS WITH ADJUSTABLE HEIGHT

**PATENTED**



Type **AR** supports are used to support all kinds of pipelines in a large range of diameters. A simple box construction ensures high durability while limiting the weight of the support itself. Distances between supports can be up to 9 meters, in special circumstances up to 12 meters. Height of the support cannot be higher than 1.0 meter.

Due to the regulation ability of the height you are able to create a fall in the pipe, which stops any stagnation occurring. Standard height regulation is +/- 75mm. Supports can be placed on all kinds of foundations or pedestals.

Construction of the clamp allows for thermal pipes. Special order only.

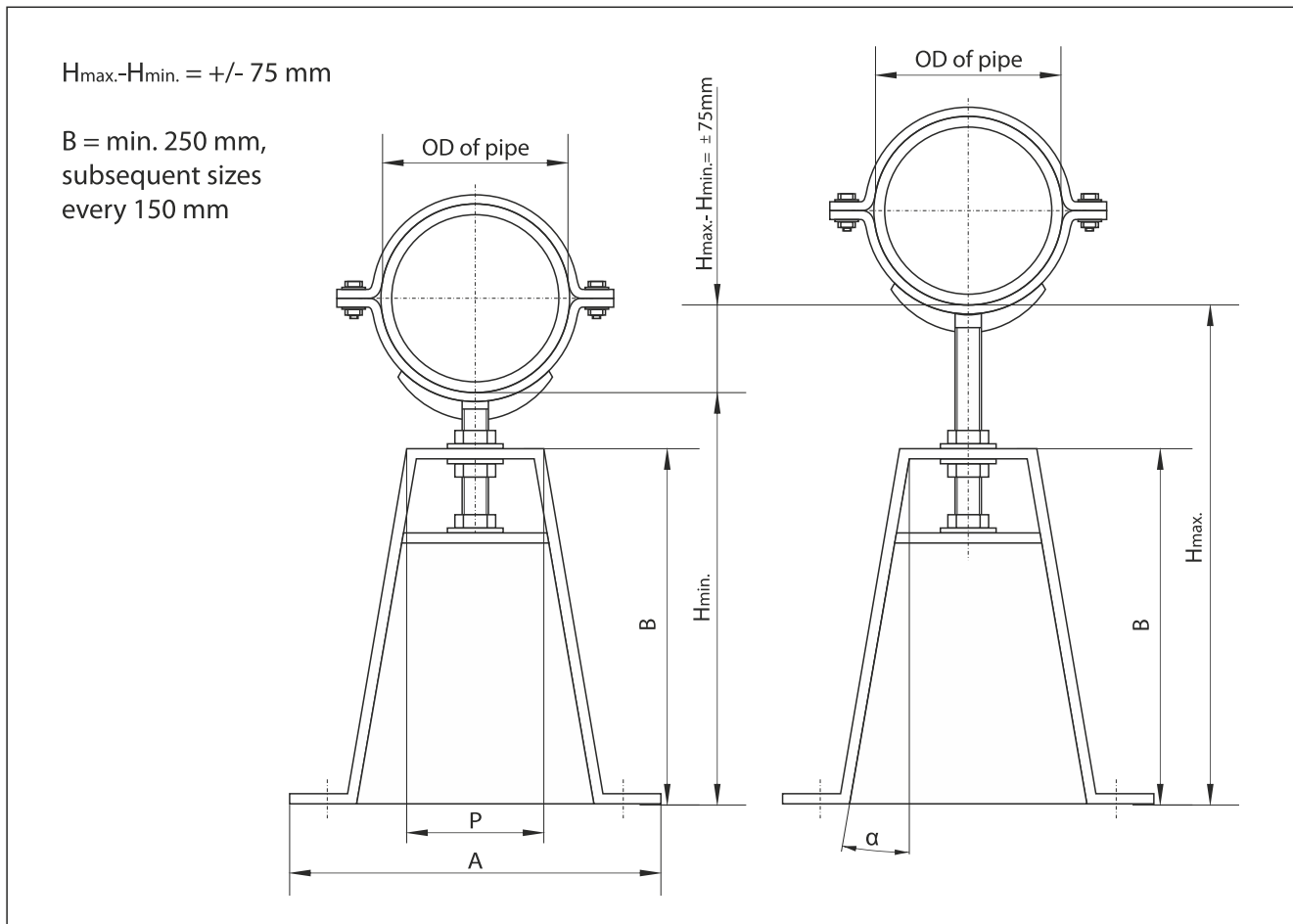


AR-LO

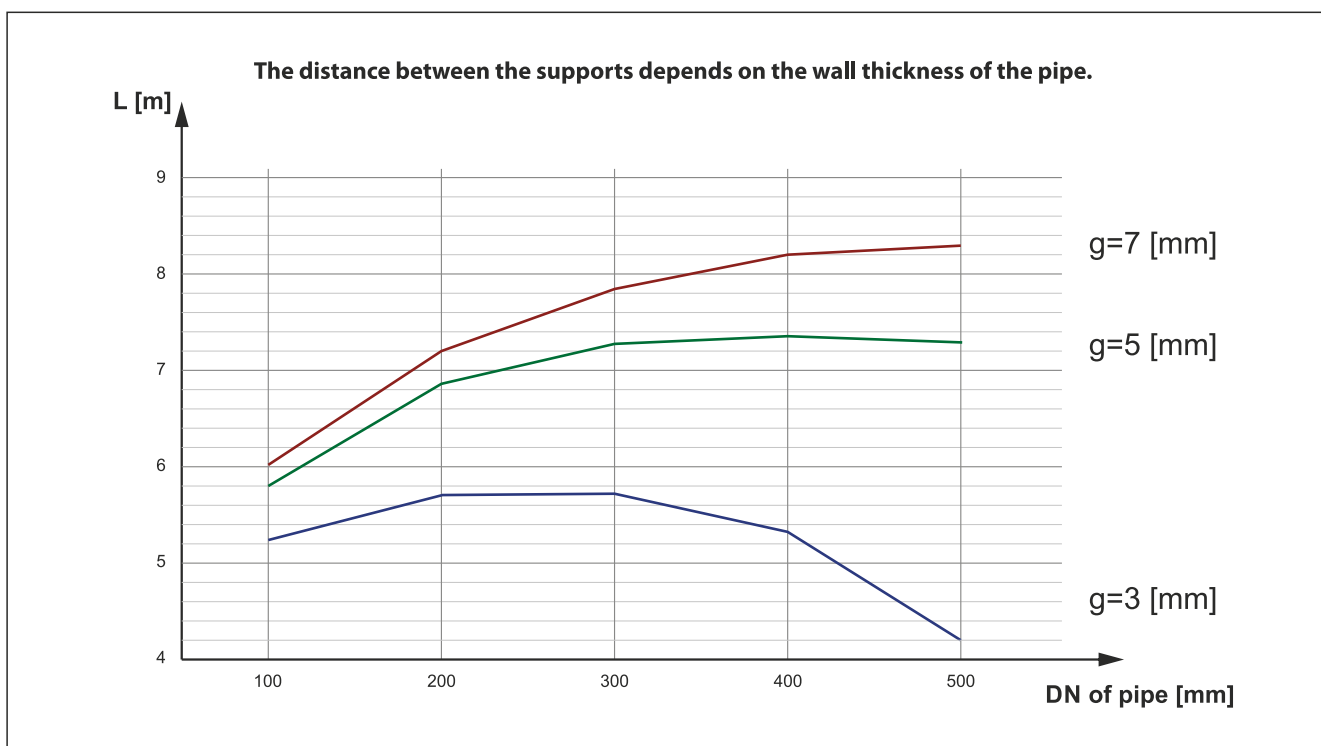


AR-K

The supports can carry single and multiple pipelines and work with a combination of three types of supports: floor, wall and suspended types. The clamp can be covered with polyethylene or rubber and can be used on thermal and any other type of installations. Supports are made from all types of steel. Special order only.



## Supports for low parameter steel pipelines.







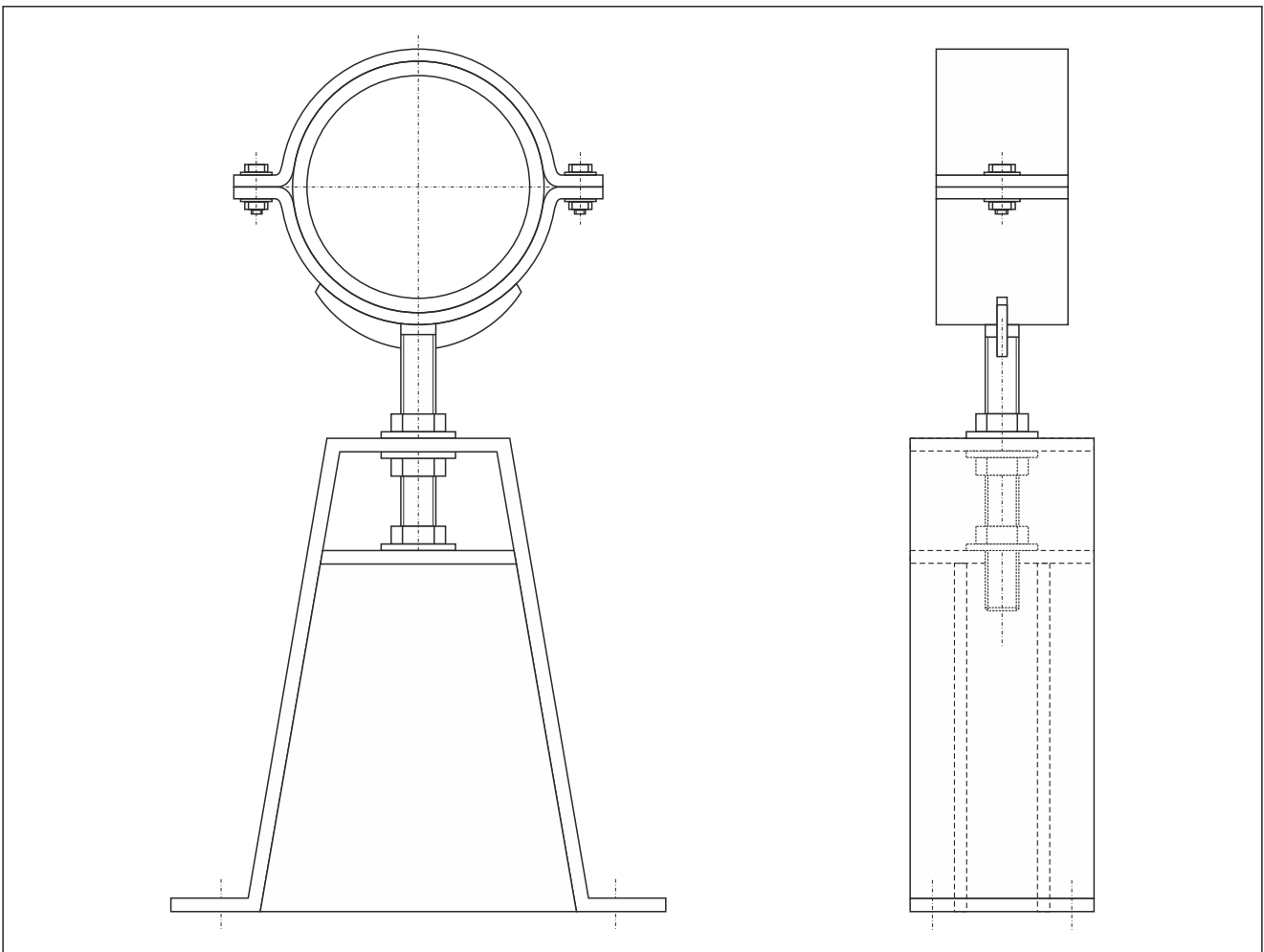
Supports can be used for pipe diameters between 100 and 350 mm. Height can be regulated by the threaded bar and locking nuts. Support is suitable for small extensions of the pipeline. Installation with anchor bolts in the base or sunk into concrete.

They are manufactured to individual requirements.

Sizes from DN 100 to DN 350.

Special order only.

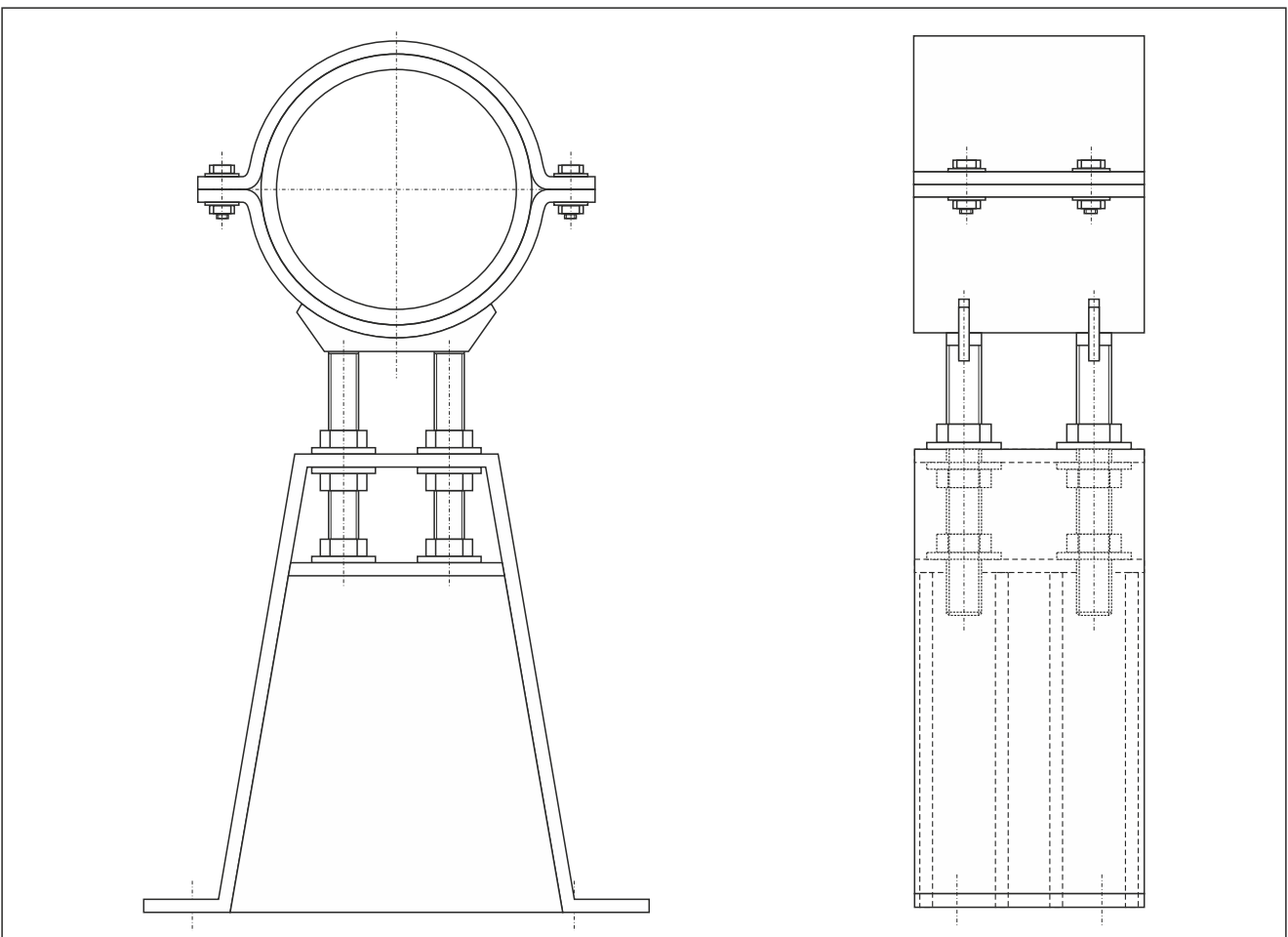
DN	Steel thickness [mm]	Threaded bar	Lifting capacity [kG]	Max. axial force [kG]	Max. lateral force [kG]
100	3	M20	2000	400	300
150	3	M20	2000	400	300
200	3	M24	2000	500	400
250	3	M24	2500	500	400
300	3	M30	2500	600	500
350	3	M30	2500	600	500

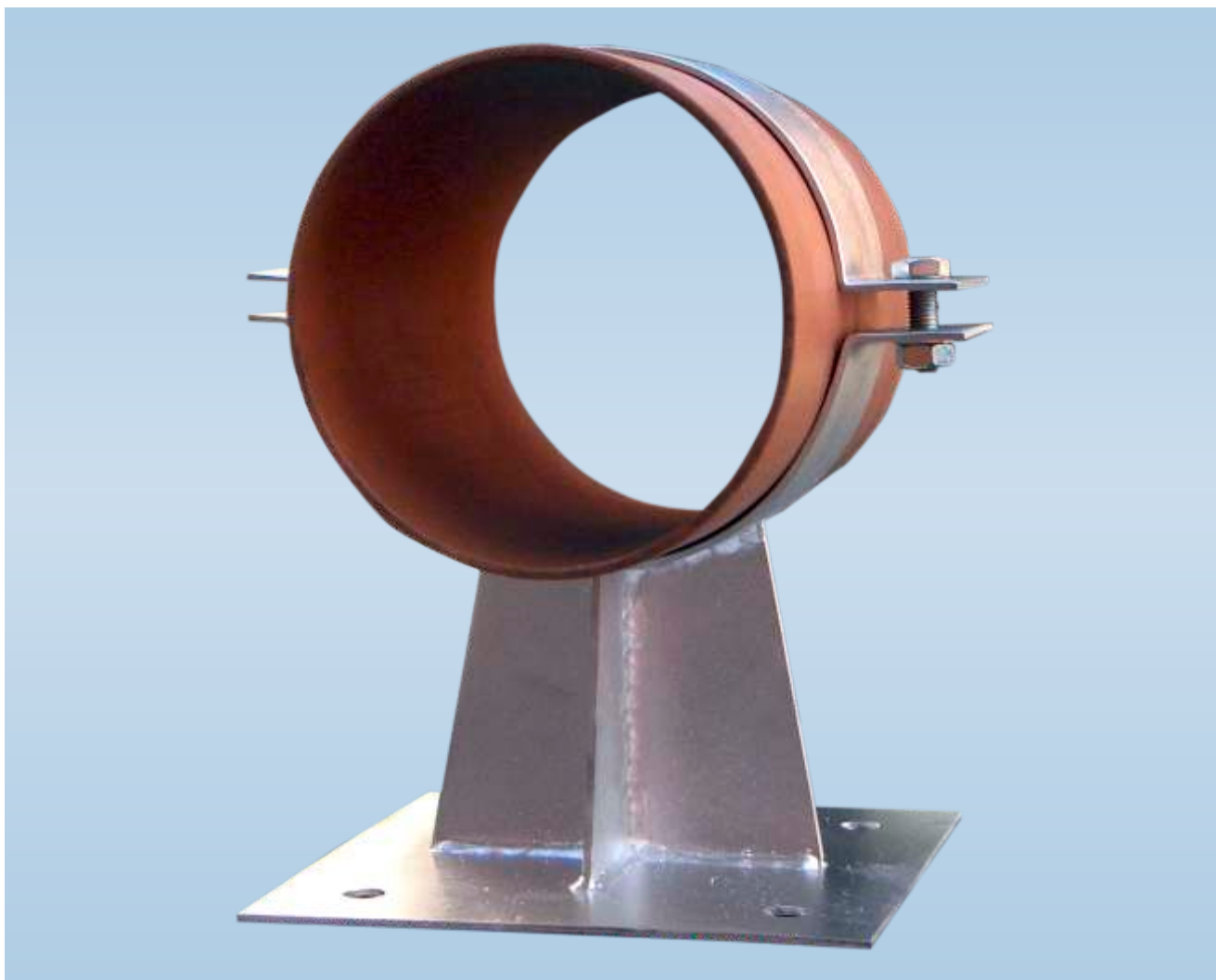




Support can be used for diameters from DN400 to DN1000.  
 Regulation of 75 mm is done by 4 threaded bars. This support is suitable when the weight and sideways force is high.  
 Installation with anchor bolts to a concrete base, foundation or floor.  
 They are manufactured to individual requirements.

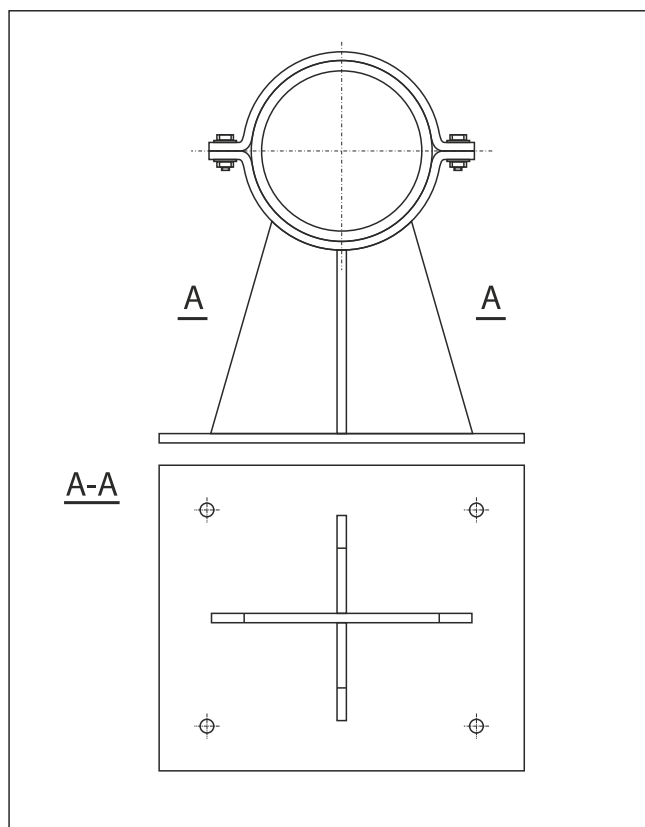
DN	Steel thickness [mm]	Threaded bar	Lifting capacity [kG]	Max. axial force [kG]	Max. lateral force [kG]
400	3	4xM24	5000	1600	1400
500	4	4xM30	6000	2000	1600
600	4	4xM30	6000	2100	1700
800	4	4xM36	7500	2200	1800
1000	5	4xM36	8000	2600	2000





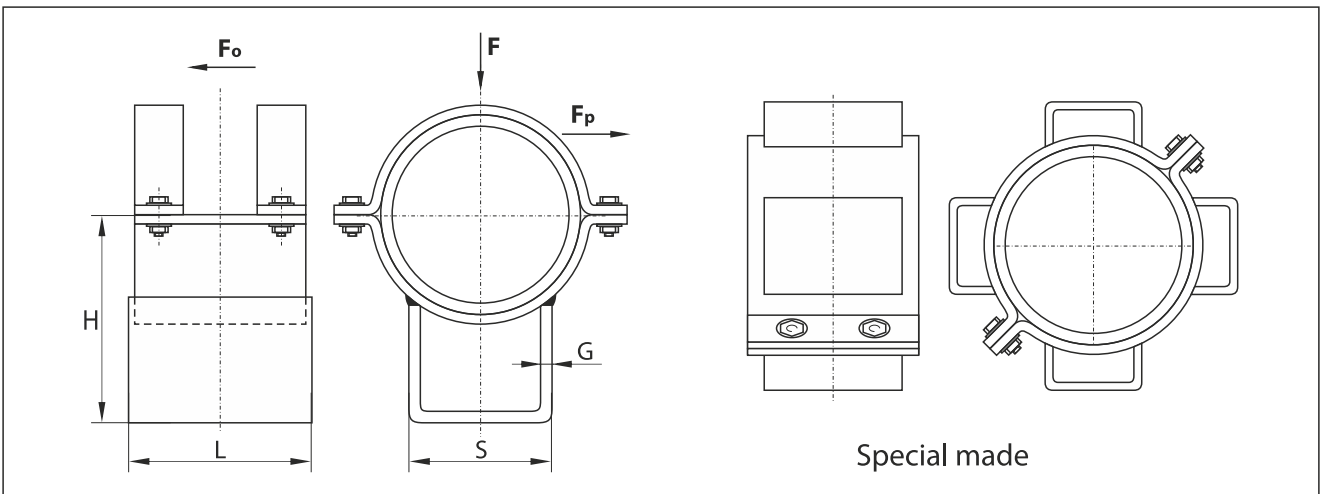
Support can be used for diameters DN 100 - DN 500, also suitable for sideways force of the pipes. The support can be strengthened by adding extra ribs where necessary. Made to order only.

DN	Steel thickness [mm]	Carrying capacity [kG]	Max. axial force [kG]	Max. lateral force [kG]
100	2	1500	900	1300
150	2	2000	1000	1500
200	3	2500	1200	1800
250	3	2700	1400	2000
300	3	2800	1600	2200
400	5	3500	2400	3100
500	5	4500	3200	4000





Moving supports are widely used in industry, everywhere in pipelines where large forces appear. Most commonly used in installations for LNG, LPG, cold water etc. To insulate pipes from the supports you can use a double coating of hard polyurethane and sometimes even wooden cladding. Supports usually have two straps but can be made with up to 4 depending on the forces involved, they can be supported by special ribs. Steel elements on the surface usually have a polyethylene or teflon coating on the insides. Special order only. Sliding base for moving supports is additional cost.

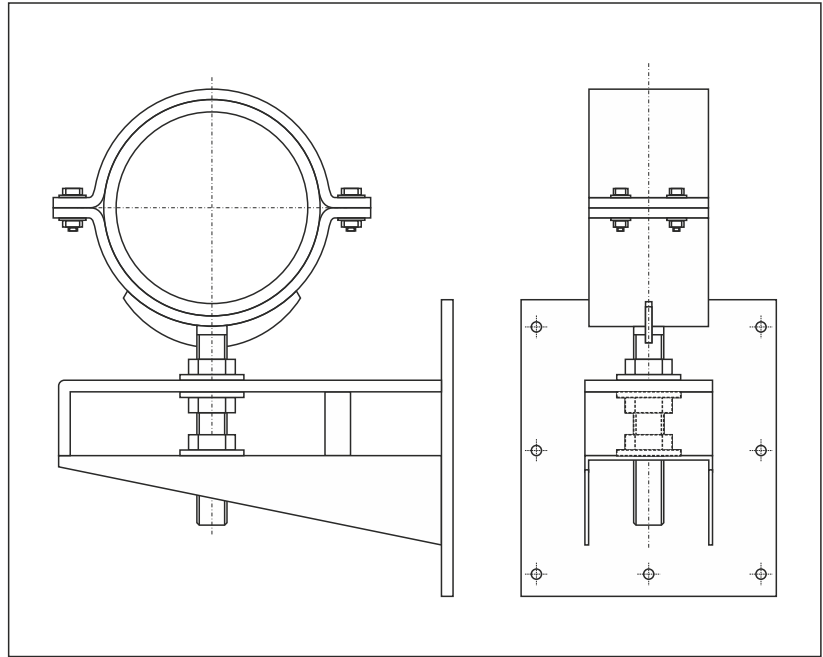


DN	L [mm]	S [mm]	G [mm]	F [kG]	F <sub>o</sub> [kG]	F <sub>p</sub> [kG]
50	120	40	2.5	500	350	250
80	120	60	2.5	680	400	300
100	160	70	3.0	880	600	400
125	160	80	3.0	1000	700	500
150	200	100	3.0	1200	800	600
200	200	140	4.0	1500	900	800
250	280	200	4.0	3500	1800	1500
300	300	250	4.0	4000	2000	1800
350	320	300	5.0	4200	2400	2200
400	340	350	5.0	4400	2700	2400
500	380	400	6.0	4800	3000	2500
600	400	500	6.0	5000	3300	2700

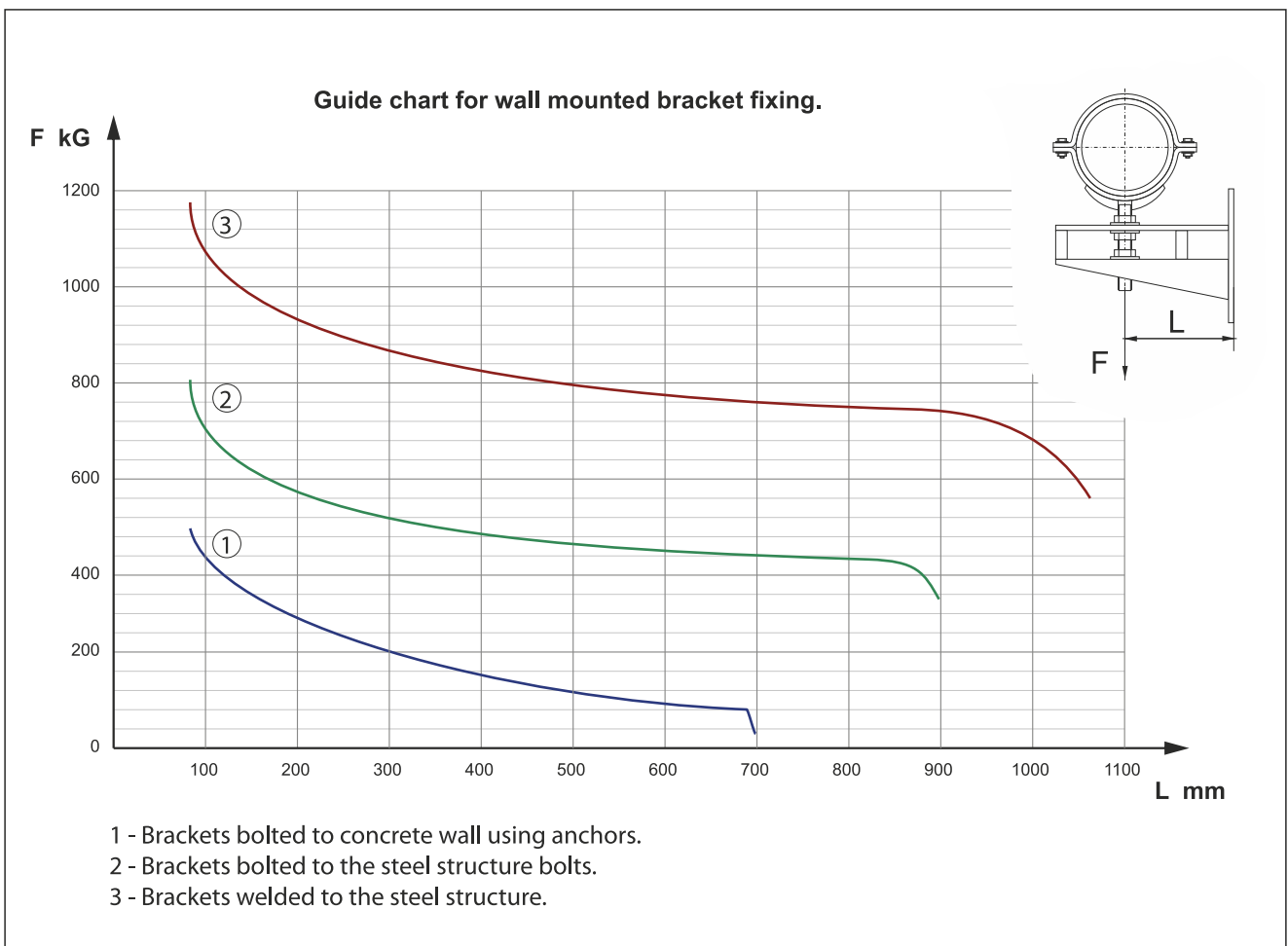


TYPE **KR** WALL BRACKETS WITH HEIGHT REGULATION.

**PATENTED**



This type of brackets are intended for pipes mounted on walls in buildings, inside or outside. They can be attached to concrete or steel by bolts or welded.



The brackets are suitable for horizontal pipes. They can be adjusted for proper positioning of pipes. You can also group them to create pipe and cables sets.

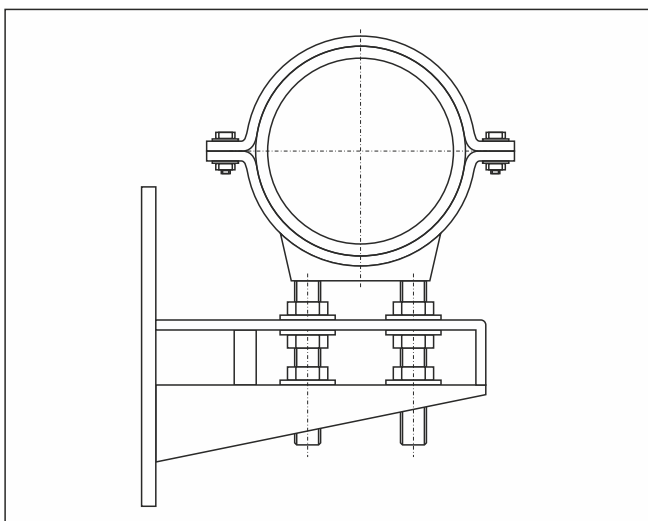
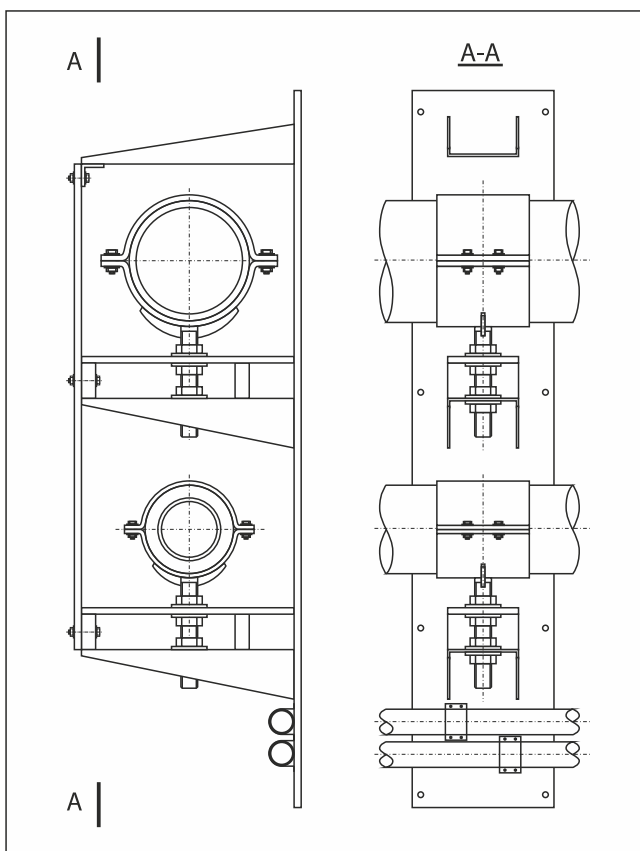
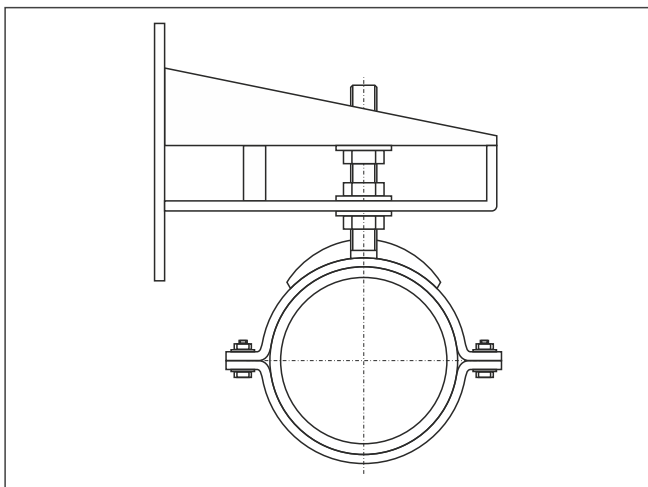


Type **KR-L** is intended for single pipes along wall in or outside buildings.

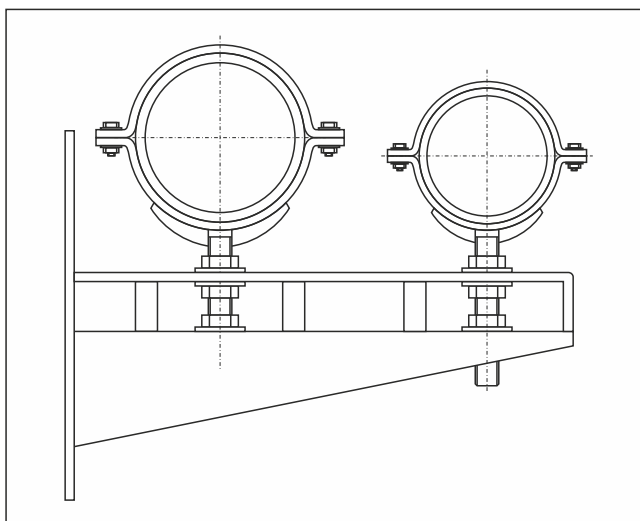
Diameter range: DN 50 to DN 250.

DN	Steel thickness [mm]	Threaded bar	Carrying capacity [kG]	Max. axial force [kG]	Max. lateral force [kG]
50	3	M12	500	100	70
80	3	M12	500	100	70
100	3	M16	800	150	90
150	3	M16	800	150	90
200	4	M20	1000	200	110
250	4	M20	1000	200	110

These brackets can be easily used to hang or sit pipes on.

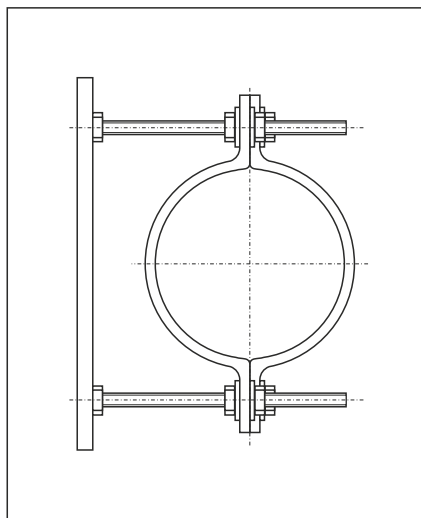


For large sideway forces two adjustment threaded bars can be used.



Sets of brackets for holding different types of pipes, power cables and ventilation pipes.

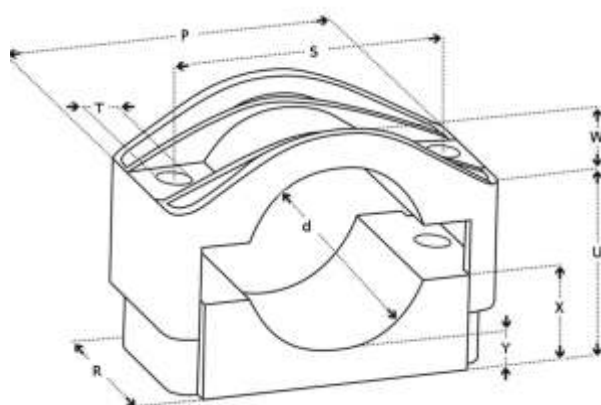
## BRACKETS FOR VERTICAL PIPELINES.



Brackets with regulation for uneven wall surfaces or fixed. For pipe diameters sizes up to DN 250. Regulation is done with 4 or 6 threaded bars depending on the weight carried and regulating distance required. Installation can be done with anchors or chemical bolts or rawl plugs with hexagon headed coach screws. They can be welded or bolted to metal constructions



DN	Steel thickness [mm]	Threaded bar	Carrying capacity [kG]	Max. axial force [kG]	Max. lateral force [kG]
50	3	4 x M12	400	400	200
80	3	4 x M12	400	400	200
100	3	4 x M16	600	600	300
150	3	4 x M16	600	600	300
200	4	6 x M20	800	800	600
250	4	6 x M20	800	800	600



UK type clips are designed for the attachment of power cables and pipelines with diameters from 15 to 100 mm. They come in five sizes. They can be mounted on both walls and ceilings at a spacing of 1 to 2 m.

The clips are made of premium quality glass fiber reinforced polyamide. This material is characterized by excellent electrical insulating properties and resistance to stretching and abrasion.

In addition, It has a low coefficient of friction and a consistent shape at both reduced and increased temperatures.

Type	Diameter range	P	R	S	T	U	W	X	Y
UK 15-26	15-26	77	45	50	10	26-42	4	17	8
UK 26-38	26-38	92	60	60	12	33-49	7	18	7
UK 36-52	36-52	105	60	75	12	39-55	15	23	8
UK 50-75	50-75	126	60	95	12	46-71	22	30	9
UK 75-100	75-100	200	80	150	15	70-95	32	45	10

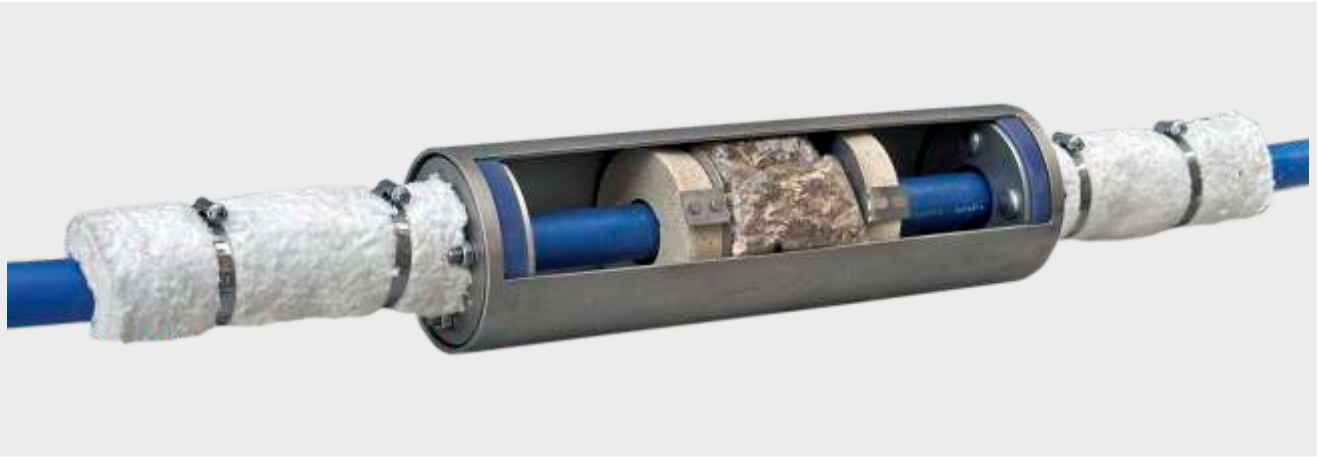
These clips are manufactured according to EN PN 61914:2016-06 standard.

Average operating temperature ranges from -25 to 60°C, and it also has a so-called "self-extinguishing" effect.

**PLEASE NOTE:** Due to the variety of mounting locations, mounting screws are not included with the clips. Correct installation is straightforward and is the responsibility of the installation contractor.





**PATENTED**

These are professional fireproof seals designed to prevent the spread of fire along pipes (flammable and non-flammable), cables, or fiber optics passing through building partitions.

The maximum operating temperature is 1300°C, making them suitable for both cellulose and hydrocarbon fires. Additionally, they protect rooms from the infiltration of water, gas or smoke. Due to their symmetrical design, the seals work in both directions.

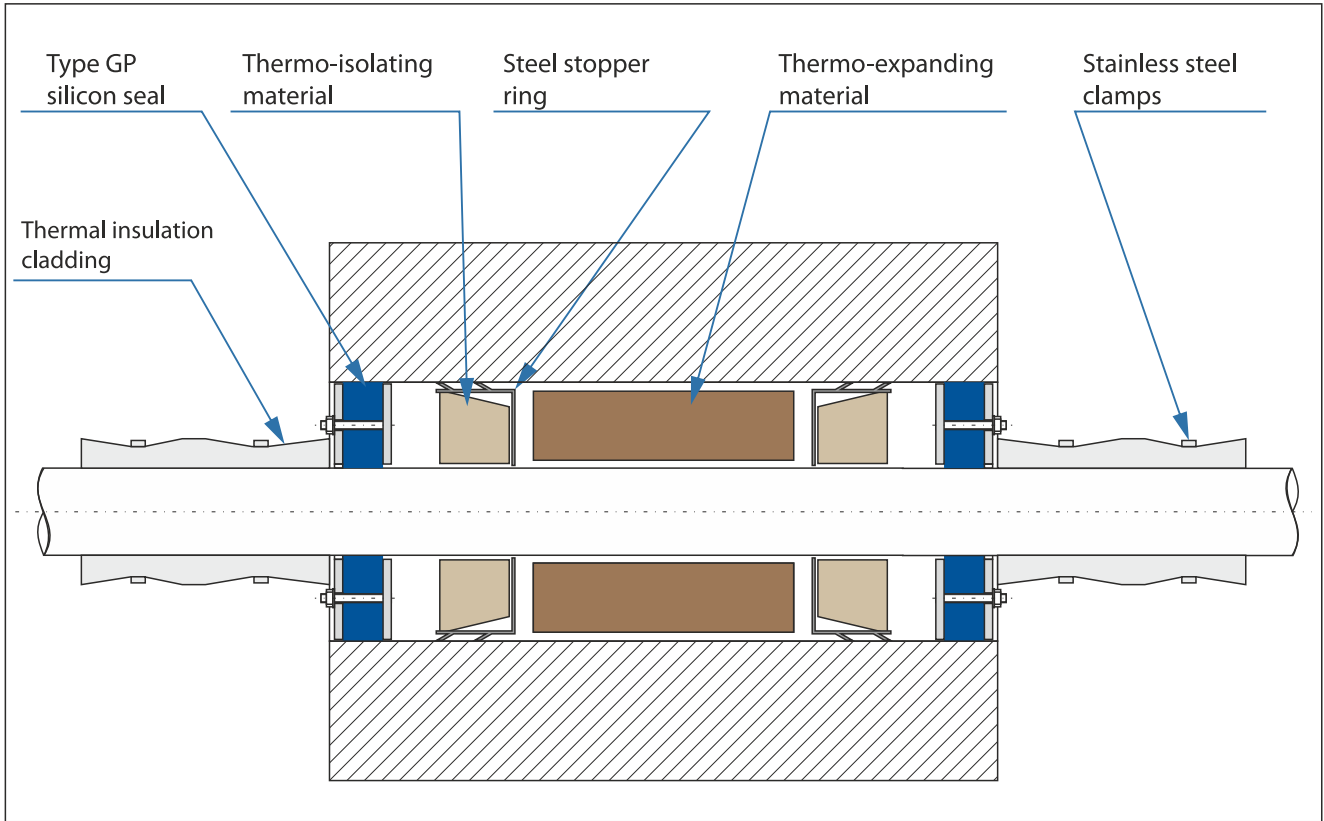
They consist of several protective zones - the primary (central) zone is a non-flammable swelling material that expands its volume many times under high temperatures, filling all free spaces through which fire could pass.

External seals of the GP type made of silicone ensure water, gas or smoke tightness, with a standard thickness of 20mm. The system can operate in both horizontal (FPF-H) and vertical (FPF-V) versions - with a minimum wall or ceiling thickness of 20 cm.

For the circular version, the maximum hole diameter is 250 mm (maximum dimensions for the rectangular version 300x 150 mm).

Up to 5 pipes or cables can pass through one seal. The fireproof passage is installed directly in a hole made in a concrete building partition.

Additionally, to prevent heat flow along pipes or cables on both sides of the seal for up to 0.5 m, thermal insulation is applied in the form of a lining made of reinforced glass fiber, mineral wool, or several layers of tape made of ceramic fabric.



Components of an **FPF** type seal.



Thermo-expanding material with a decomposition temperature of no less than 1300°C. Packaged in approximately 100 g containers.



Thermal insulation cladding.



Stainless steel clamps.

Standard version.

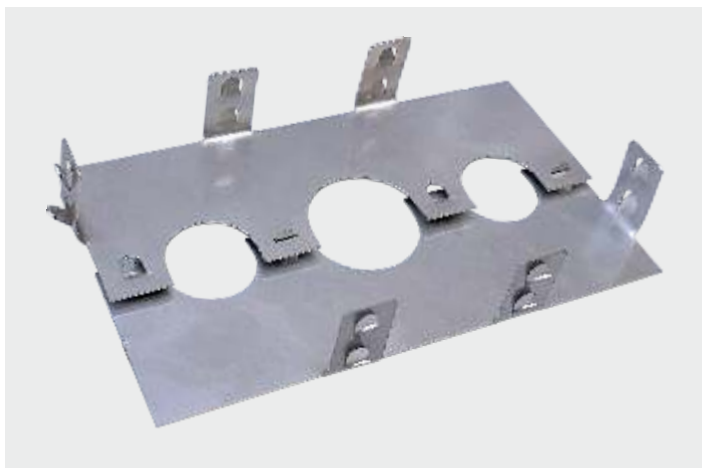


Split version.





Rectangular version.



Undivided version



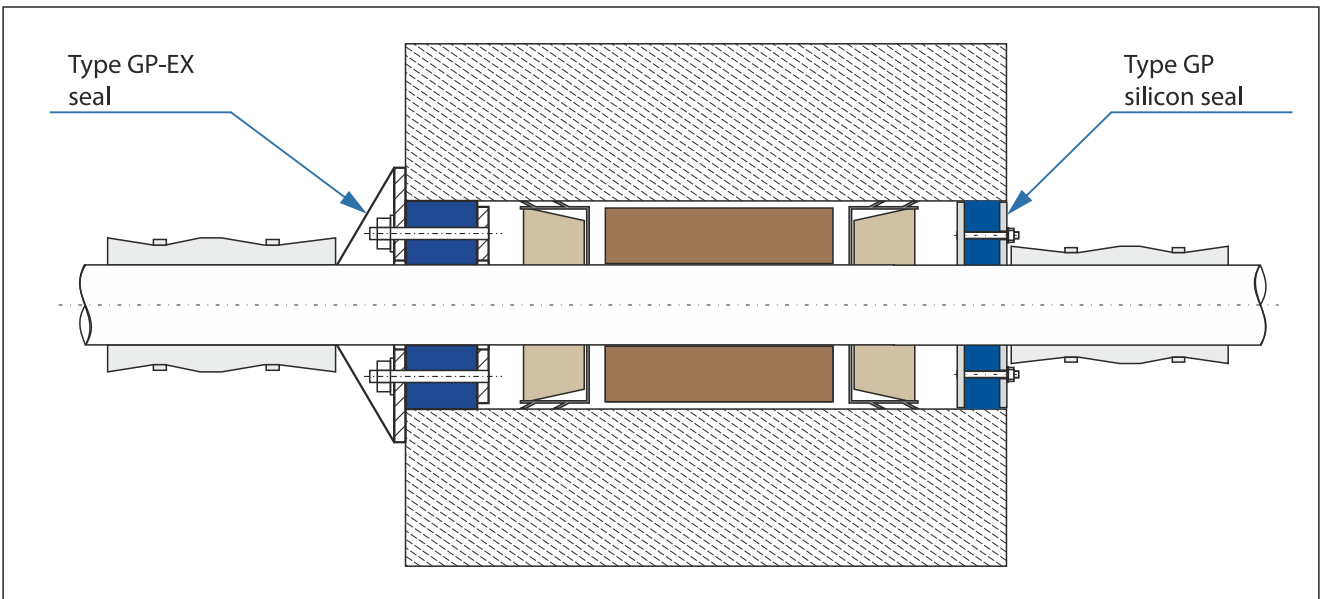


**PATENTED**

The type **FPF** fireproof seal can be used in conjunction with the type **GP-EX** explosion-proof passage. The resulting passage will be resistant to both explosion and fire.



Type **GP-EX** seal, round split version.



Type GP-EX seal, rectangular split version.



Mounting element (lost formwork) for building partitions.