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## Pipeline Accessories

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# PSI Plastic Insulators System **DSI**



**ruhrgas**



**TALW-Bauteilprüfung**

Prüflabor zertifiziert nach

DIN EN ISO 9001

**Werkstoffprüfung**

**Versuche an DSI- Kunststoffgleitkufen GKO 125 gs, 125 gl, 36 gs, 36 gl**

Zug und Einzelstegdruckversuche

Druckversuche mit Segmenten

Druckversuche mit geschlossenem Ring

**1.Bericht**



Verteiler:

TALW Archiv

TALW H.Engbert

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**Untersuchungsbericht W 26/01**


Dieser Bericht umfasst 24 Seiten

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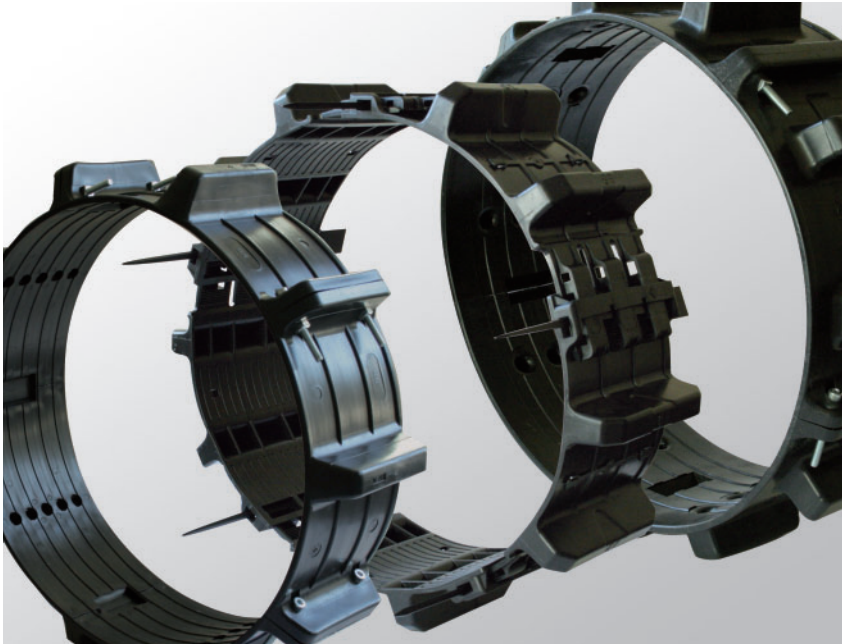
Datum : 03.04.2002

geprüft/freigegeben:

Datum:

*15.04.2002* 

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Polypropylen insulators are universally applicable in the installation of pipelines when the carrier pipe runs inside a casing.

**Plastic insulators provide various advantages:**

- easy installation of the carrier pipe since the plastic material reduces the friction coefficient to a minimum
- minimised friction prevents damage to the protective coating and insulation of the pipes
- a wide range of skid heights ensures concentricity of the carrier pipe in the casing if required
- excellent insulating properties of the plastic material ensures: all requirement of cathodic protection are met.

Plastic insulators are suitable for all pipe diameters from 25 mm upwards and many skid heights are available to suit specific requirements.

## Technical Data

### Material

Polypropylene have a good friction coefficient due to steel wax like surface. The sliding friction coefficient is approx. 0.2 as for steel has a coefficient of approx. 0.5. Therefore the abrasion is reduced to a minimum.

The material is strong and yet flexible and is therefore resistant to stress cracking.

Flexibility of the body, stability of the skid form and excellent dielectric insulation are some of the good characteristics of this material.

### Installation

Plastic insulator rings are normally installed with the following spacing between the rings:

- pipe dia up to 300 mm at a spacing of 2.5 m
- pipe dia 400 – 600 mm at a spacing of 2.0 m
- pipe dia > 600 mm at a spacing of 1.5 m

In particular cases, the ring distance may be modified after having examined the installation situation.

### Load capacity:

Typ	max. static capacity per ring
PA/PE 0.75 – PA/PE 1.5	85 kg
PA/PE 2.0 – PA/PE 3.0	100 kg
PA/PE 4.0	200 kg
PA/PE 6.0 – PA/PE 12.0	250 kg
AZ/AC 1 / AZ/AC 2	200 kg
GKO-mK	250 kg
MA	650 kg
RGV	1,000 kg
GKO-gl	4,000 kg
GKO-gs	14,200 kg

**The weight load data apply to a skid height of up to 75 mm. For skid heights above 75 mm, these values have to be multiplied with the factor 0.75.**

All values are calculated for standard pipes. To determine the correct distance for your individual application many other facts have to be taken into consideration such as wall thickness of the carrier pipe, fluid to be transported... If you need any assistance please contact us.

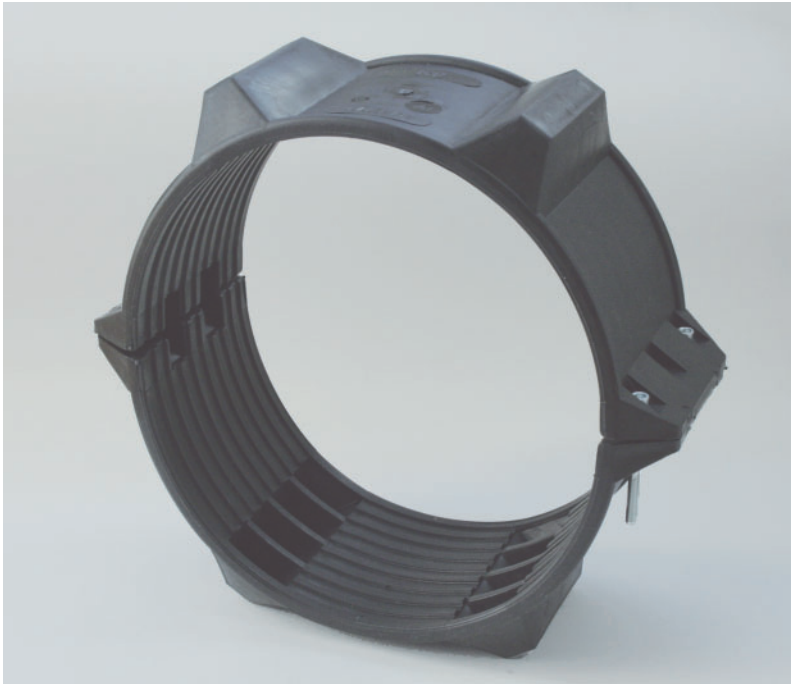
If you cannot determine the type according to our tables, please specify:

- the O.D. of the carrier pipe (inclusive coating) in mm
- the I.D. of the casing in mm

# General Information



Pipe O.D. from 25 mm to 336 mm



Type PA/PE insulator rings are available for a pipe O.D. from 25 to 336 mm. They consist of **two halfshell-segments**. The nuts and bolts required for assembly are included.

The type code indicates the carrier pipe O.D. in inch and the skid height in mm (e.g. PA/PE 4-38 = carrier pipe 4", skid height 38 mm).

The skid height is calculated from the difference in diameter of the carrier pipe and the casing. It is important to consider the actual dimensions, including coatings, rather than the nominal sizes.

- Example:
- PE- coated carrier pipe ND 100
  - O.D. (117.9 x 5.2 mm)
  - Steel casing ND 200 (219.1 x 6.3)
  - I.D. 206.5 mm minus Carrier pipe O.D. 117.9 mm = 88.6
  - $88,6 : 2 = 44.3$  mm skid height
  - Suitable type: PA/PE 4-38

After determining the skid height, the next lower height is selected from the table (e.g. 44.3 mm, ideal skid height = 38 mm).

The segments can be assembled with the corrosion protected steel bolts DIN 912 and nuts DIN 562 included.

Up to type PA/PE 4 the insulator rings have 4 skids; from type PA/PE 6 up to 6 skids are provided. The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



# How to find the right type



Nom. width mm   Inch	Pipe O.D. in mm		Type PA/PE	Skid height mm incl. basic element	Width mm	Number of Segments	Number of skids	Bolts DIN 912 number/size	Art. no.
	min.	max.							
20   0.75	25.0	32.0	PA/PE 0.75-12.5	12.5	80	2	4	4 M 4 x 30	3-001-02400
			PA/PE 0.75-21	21.0					3-001-01001
			PA/PE 0.75-25	25.0					3-001-01002
			PA/PE 0.75-36	36.0					3-001-01003
25   1.0	32.0	40.0	PA/PE 1-13	13.0	80	2	4	4 M 4 x 30	3-001-01004
			PA/PE 1-19	19.0					3-001-01005
			PA/PE 1-25	25.0					3-001-01006
			PA/PE 1-34	34.0					3-001-01007
32   1.25	42.0	48.3	PA/PE 1.25-11	11.0	80	2	4	4 M 4 x 30	3-001-01008
			PA/PE 1.25-17.6	17.6					3-001-01009
			PA/PE 1.25-29	29.0					3-001-01010
			PA/PE 1.25-40	40.0					3-001-01011
40   1.5	48.0	54.0	PA/PE 1.5-11	11.0	80	2	4	4 M 4 x 30	3-001-01069
			PA/PE 1.5-14.5	14.5					3-001-01012
			PA/PE 1.5-26.0	26.0					3-001-01013
			PA/PE 1.5-36	36.0					3-001-01014
			PA/PE 1.5-48	48.0					3-001-01015
			PA/PE 1.5-70	70.0					3-001-01039
50   2.0	60.0	67.0 <sup>1)</sup>	PA/PE 2-16	16.0	100	2	4	4 M 6 x 40	3-001-01016
			PA/PE 2-25	25.0					3-001-01017
			PA/PE 2-36	36.0					3-001-01018
			PA/PE 2-48	48.0					3-001-01019
			PA/PE 2-55	55.0					3-001-01085
			PA/PE 2-70	70.0					3-001-01086
			PA/PE 2-90	90.0					3-001-01087
			PA/PE 2-110	110.0					3-001-01088
			65   2.5	76.1					82.5 <sup>2)</sup>
PA/PE 2.5-25	25.0	3-001-01021							
PA/PE 2.5-36	36.0	3-001-01022							
PA/PE 2.5-48	48.0	3-001-01023							
PA/PE 2.5-55	55.0	3-001-01095							
PA/PE 2.5-70	70.0	3-001-01096							
PA/PE 2.5-90	90.0	3-001-01097							
PA/PE 2.5-105	105.0	3-001-01098							
80   3.0	88.9	96.0 <sup>3)</sup>			PA/PE 3-16	16.0	100	2	
			PA/PE 3-25	25.0	3-001-01025				
			PA/PE 3-36	36.0	3-001-01026				
			PA/PE 3-48	48.0	3-001-01027				
			PA/PE 3-55	55.0	3-001-01100				
			PA/PE 3-70	70.0	3-001-01101				
			PA/PE 3-90	90.0	3-001-01102				
100   4.0	106.6	120.0 <sup>4)</sup>	PA/PE 4-16	16.0	130	2	4	4 M 6 x 55	3-001-01028
			PA/PE 4-25	25.0					3-001-01029
			PA/PE 4-38	38.0					3-001-01030
			PA/PE 4-55	55.0					3-001-01031
			PA/PE 4-75	75.0					3-001-01032
			PA/PE 4-90	90.0					3-001-01033
125	See list for AZ/AC Ø 125 mm Type AZ/AC 1								



# How to find the right type

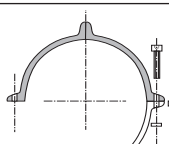


Nom. width mm/inch	Pipe O.D. in mm		Type PA/PE	Skid height mm incl. basic element	Width mm	Number of Segments	Number of skids	Bolts DIN 912 number/size	Art. no.
	min.	max.							
150 6	160.0	178.0	PA/PE 6-16	16.0	130	2	6	4 M 6 x 70	3-001-01036
			PA/PE 6-25	25.0					3-001-01037
			PA/PE 6-36	36.0					3-001-01038
			PA/PE 6-55	55.0					3-001-01040
			PA/PE 6-75*	75.0					3-001-01041
			PA/PE 6-90*	90.0					3-001-01042
200	193.7	210.0	PA/PE 7-16	16.0	175	2	6	4 M 6 x 70	3-001-01110
			PA/PE 7-25	25.0					3-001-01111
			PA/PE 7-36	36.0					3-001-01112
			PA/PE 7-55	55.0					3-001-01113
			PA/PE 7-75	75.0					3-001-01114
			PA/PE 7-90	90.0					3-001-01115
			PA/PE 7-110	110.0					3-001-01116
200 8	221.0	239.0	PA/PE 8-16	16.0	130	2	6	4 M 6 x 70	3-001-01043
			PA/PE 8-25	25.0					3-001-01044
			PA/PE 8-36	36.0					3-001-01045
			PA/PE 8-55*	55.0					3-001-01046
			PA/PE 8-75*	75.0					3-001-01047
			PA/PE 8-90*	90.0					3-001-01048
250	244.5	260.0	PA/PE 9-16	16.0	175	2	6	4 M 6 x 70	3-001-01120
			PA/PE 9-25	25.0					3-001-01121
			PA/PE 9-36	36.0					3-001-01122
			PA/PE 9-55	55.0					3-001-01123
			PA/PE 9-75	75.0					3-001-01124
			PA/PE 9-90	90.0					3-001-01125
			PA/PE 9-110	110.0					3-001-01126
250 10	276.0	295.0	PA/PE 10-16	16.0	130	2	6	4 M 6 x 70	3-001-01049
			PA/PE 10-25	25.0					3-001-01050
			PA/PE 10-36	36.0					3-001-01051
			PA/PE 10-55*	55.0					3-001-01052
			PA/PE 10-75*	75.0					3-001-01053
			PA/PE 10-90*	90.0					3-001-01054
315	298.5	315.0	PA/PE 11-16	16.0	175	2	6	4 M 6 x 70	3-001-01130
			PA/PE 11-25	25.0					3-001-01131
			PA/PE 11-36	36.0					3-001-01132
			PA/PE 11-55	55.0					3-001-01133
			PA/PE 11-75	75.0					3-001-01134
			PA/PE 11-90	90.0					3-001-01135
			PA/PE 11-110	110.0					3-001-01136
300 12	326.0	336.0	PA/PE 12-18	18.0	130	2	6	4 M 6 x 70	3-001-01055
			PA/PE 12-25	25.0					3-001-01056
			PA/PE 12-36	36.0					3-001-01057
			PA/PE 12-55*	55.0					3-001-01058
			PA/PE 12-75*	75.0					3-001-01059
			PA/PE 12-90*	90.0					3-001-01060

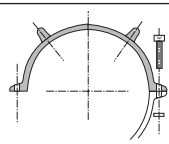
<sup>1)</sup> up to Pipe O.D. 75.0 mm with 4 Bolts M 6 x 55    <sup>3)</sup> up to Pipe O.D. 101.6 mm with 4 Bolts M 6 x 55  
<sup>2)</sup> up to Pipe O.D. 88.9 mm with 4 Bolts M 6 x 55    <sup>4)</sup> up to Pipe O.D. 127.0 mm with 4 Bolts M 6 x 70

Shear-secure-tape against slipping of spacers see next page

\* Plug in skid




Sectional drawing  
PA/PE 0.75 to PA/PE 4,  
ring with 4 skids total



Sectional drawing  
PA/PE 6 to PA/PE 12,  
ring with 6 skids total

## Accessories

	<b>Shear-Secure-Tape</b>
	<b>Art.No. 4-002-S20088</b> = width 50 mm, length 15 m
	<b>Art.No. 4-002-S20089</b> = width 100 mm, length 15 m

**Material:** PE-Tape with butyl rubber mixture

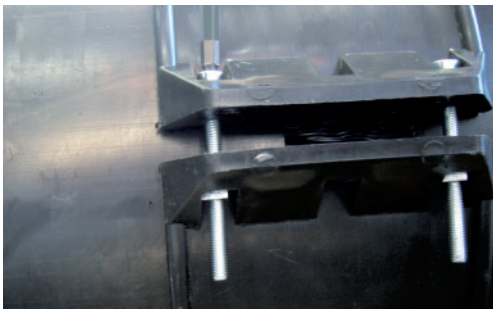


**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-**tape** to guarantee an optimum security **against slipping**.



# Installation Instruction



An insulator ring always consists of two halves fitting the indicated pipe size. Four nuts and bolts per insulator ring are necessary.

Wrap smooth pipe surfaces (e.g. PE, PVC, PE coated steel/cast iron or vitrified clay) in the pipe/insulator contact area with shear-secure-tape to guarantee utmost safety against slipping.

Place the two halves around the pipe and join them with bolts. Then tighten the bolts evenly in order to get even distances between the insulator elements.

The square nuts have to be aligned in a way to fit in the corresponding recesses of the insulator segment.

Tighten the bolts so that the insulator ring is firmly attached to the pipe. It is not absolutely necessary to tighten the bolts completely.

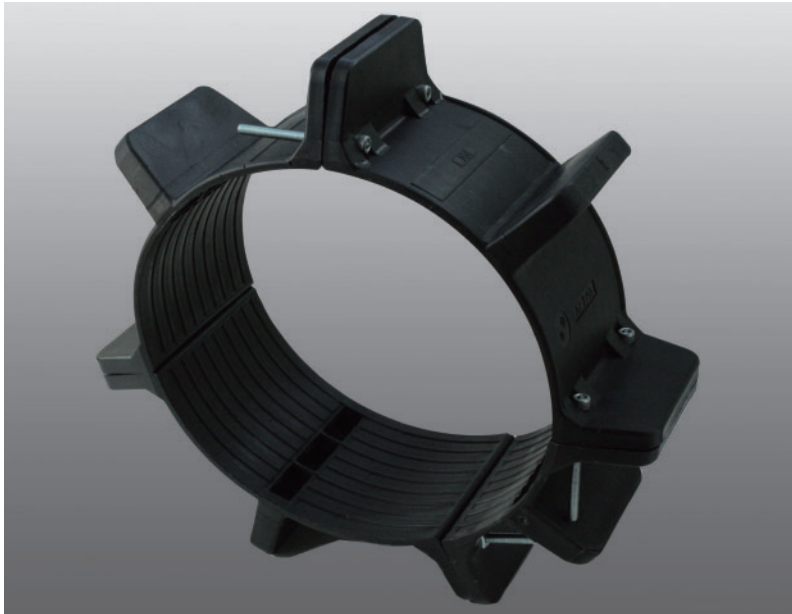
**Max. torques:**

**Insulator type PA/PE 0.75 - PA/PE 1.5 = 0.7 Nm**

**Insulator type PA/PE 2 - PA/PE 12 = 3 Nm**

## General Information

Pipe O.D. from 98 mm to 385 mm



AZ/AC insulator rings are used for a pipe O.D. from 98 to 385 mm and consist of several segments. The number of segments depends on the carrier pipe's O.D.. The nuts and bolts required for assembly are included.

The universal applicability of type AZ/AC provides two special advantages:

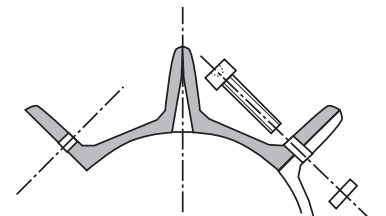
- variable ring diameter, which is especially important for thick-walled pipes whose O.D. substantially deviates from the nominal size (e.g. AZ/AC pressure pipe ND 16, vitrified clay pipes);
- only two segment sizes are required to assemble ND 100 to ND 350 insulator rings - a decisive edge in stock-keeping.

The skid height is calculated from the difference in diameter of the carrier pipe and the casing. It is important to consider the actual dimensions, including coatings, rather than the nominal sizes.

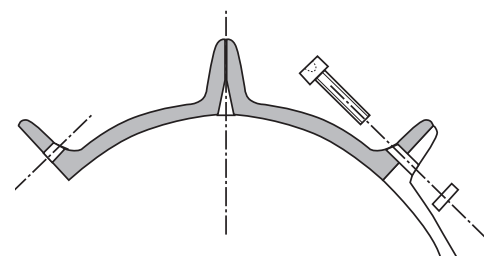
For an example calculation refer to type PA/PE.

The segment can be assembled with the corrosion protected steel bolts DIN 912 and nuts DIN 562 included.

The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



Sectional drawing of AZ/AC 1 segment

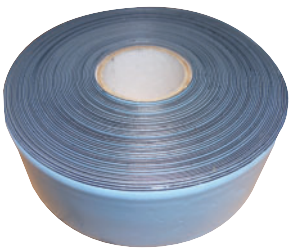


Sectional drawing of AZ/AC 2 segment

# How to find the right type

Type	Skid height	Width	Number of bolts per segment	Article no.
AZ/AC-1	16	130	2 M6 x 70	3-002-00085
AZ/AC-1	25	130	2 M6 x 70	3-002-00086
AZ/AC-1	36	130	2 M6 x 70	3-002-00087
AZ/AC-1	55	130	2 M6 x 70	3-002-00088
AZ/AC-1	75	130	2 M6 x 70	3-002-00089
AZ/AC-1	90	130	2 M6 x 70	3-002-00083
AZ/AC-1	110	130	2 M6 x 70	3-002-00097
AZ/AC-2	16	130	2 M6 x 70	3-002-00090
AZ/AC-2	25	130	2 M6 x 70	3-002-00091
AZ/AC-2	36	130	2 M6 x 70	3-002-00092
AZ/AC-2	55	130	2 M6 x 70	3-002-00093
AZ/AC-2	75	130	2 M6 x 70	3-002-00094
AZ/AC-2	90	130	2 M6 x 70	3-002-00095
AZ/AC-2	110	130	2 M6 x 70	3-002-00096
Shear-secure-tape, 15 m/roll, 50 mm width				4-002-S20088

Outer Ø of carrier pipe in mm		Number of segments per ring		Bolts number/size
min.	max.	AZ/AC 1	AZ/AC 2	
98	130	3		6 M 6x70
130	172	4		8 M 6x70
173	202	5		10 M 6x70
203	230		3	6 M 6x70
234	268	1	3	8 M 6x70
269	310		4	8 M 6x70
302	350	1	4	10 M 6x70
350	385		5	10 M 6x70



Shear-Secure-Tape
<b>Art.No. 4-002-S20088</b> = width 50 mm, length 15 m
<b>Art.No. 4-002-S20089</b> = width 100 mm, length 15 m

**Material:** PE-Tape with butyl rubber mixture

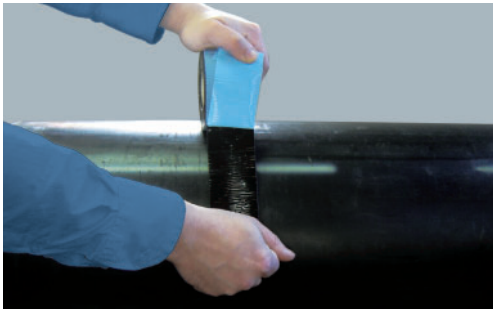


**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security **against slipping**.

# PSI Plastic Insulator Segments Type AZ/AC System **DSI**

## Installation Instruction



Get insulator elements and bolts ready according to the selection table (see reverse).  
Join the elements in a insulator band and tighten the nuts just a few turns on the bolts.

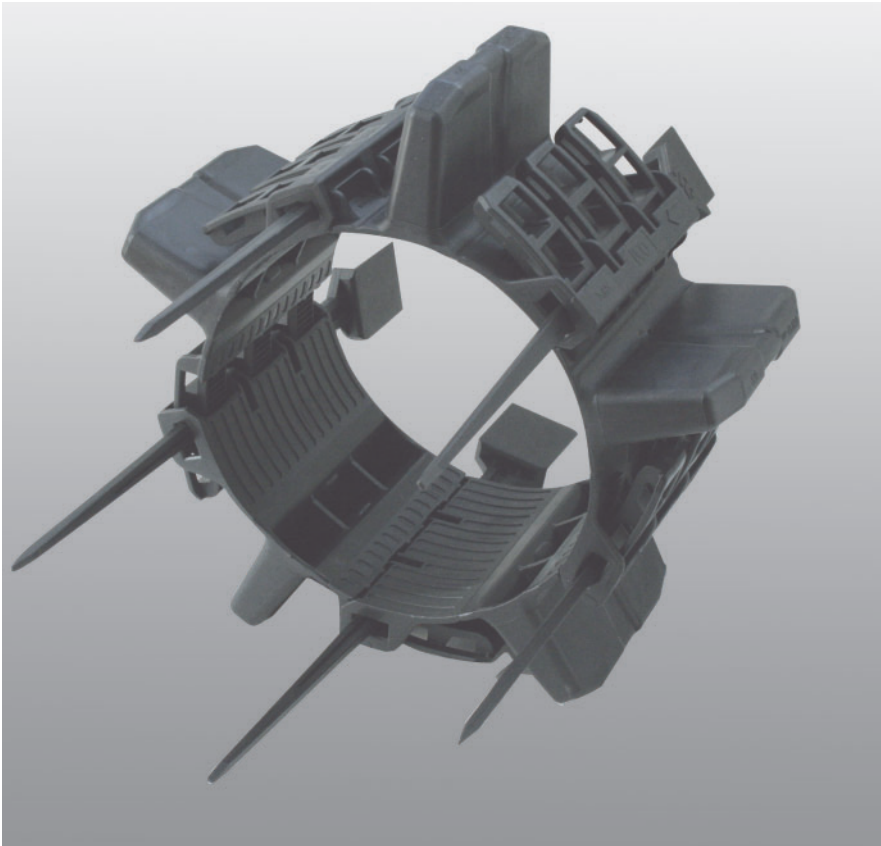
Wrap smooth pipe surfaces (e.g. PE, PVC, PE coated steel/cast iron or vitrified clay) in the pipe/ insulator contact area with shear-secure-tape to guarantee utmost safety against slipping.

Place pre-assembled elements around the carrier pipe and close the final segments.

Then tighten the bolts evenly in order to get even distances between the insulator elements.

The square nuts have to be aligned in a way to fit in the corresponding recesses of the insulator segment.

Tighten the bolts with a torque of no more than 3 Nm so that the insulator ring is firmly attached to the pipe. It is not absolutely necessary to tighten the bolts completely.



GKO-mk are the latest PSI Insulator generation. Due to the bolt less wedge system the installation can be achieved quick and easy. The flexible design ensures suitability for all pipe diameters > 150 mm.

If required an additional support for cable ducts can be installed on the segment.

- **Flexible construction**
- **Non-metallic connection for simple and fast installation**
- **Connection technology by wedge system**

PSI shear-secure-tapes can be used to improve adhesion on smooth surfaces or to balance tolerances.

Subject to technical changes.



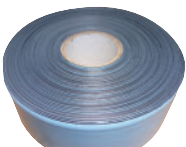
# How to find the right type



Type	Skid height	Width	Article no.
GKO mk	25	130	3-002-04101
GKO mk	36	130	3-002-04102
GKO mk	50	130	3-002-04103
GKO mk	65	130	3-002-04104
GKO mk	75	130	3-002-04105
GKO mk	90	130	3-002-04106
GKO mk	110	130	3-002-04107
GKO mk	125	130	3-002-04108
Shear-secure-tape, 15 m/roll, 50 mm width			4-002-S20088

Outer Ø of carrier pipe in mm		Number of segments per ring
min.	max.	
150	180	4
181	230	5
231	280	6
281*	330*	7
331*	380*	8
381*	430*	9

\* carrier pipe O.D. exceeding 281 mm only appropriate for plastic tubes

	Shear-Secure-Tape
	<b>Art.No. 4-002-S20088</b> = width 50 mm, length 15 m
	<b>Art.No. 4-002-S20089</b> = width 100 mm, length 15 m

**Material:** PE-Tape with butyl rubber mixture



**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security against slipping.



# Installation Instruction



Put out **spacer elements** and wedges according to **selection table**.

**Connect elements** as a spacer band (for position of the wedges per spacer element see selection table on the backside), put the mounting link with grid into the entry of next element, be aware of **parallelism**. **Push wedges** into the lateral fixing slot until **top can be seen** on the other side of the spacer. Mind the **direction of the arrows**.

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-**tape** to guarantee an optimum security **against slipping**.

**Put** pre-mounted **elements around** the medium pipe and close last joint. Shift the spacer ring **together by hand**.

Shift spacer elements **together with a screw clamp** as far that one or more **wedges can be put in the next fixing slot**.

Drive in all wedges with **hammer strokes parallel** to the pipe. The **wedges don't have to be in fully**.

When mounting more spacer rings please be aware that the **skids** of the single mounted rings **align together**.

We expressly exclude any other use of the material. The PSI guarantee is restricted to faulty material. The suitability of the product for a special purpose must be tested by the user on his own responsibility.



# Installation Instruction

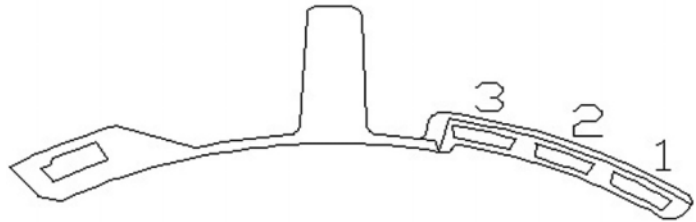


Pipe ND			Pipe O.D. in mm		number per segment	Position of wedges in connecting section		
PE	Steel	GGG	up	to	GKO mk	1	2	3
DN 150			160	164	4	0	2	2
DN 150			180	183	4	1	2	1
	DN 150		174	176	4	0	4	0
		DN 150	170	175	4	1	1	2
DN 200			200	204	5	0	2	3
DN 200			225	230	5	1	4	0
DN 200			250	255	6	0	4	2
	DN 200		224	227	5	1	3	1
		DN 200	222	226	5	1	3	1
DN 250			280	285	6	3	2	1
	DN 250		279	283	6	3	2	1
		DN 250	274	278	6	3	1	2
DN 300			315	318	7	1	5	1
DN 350			355	358	8	0	8	0
DN 400			400	405	9	0	9	0

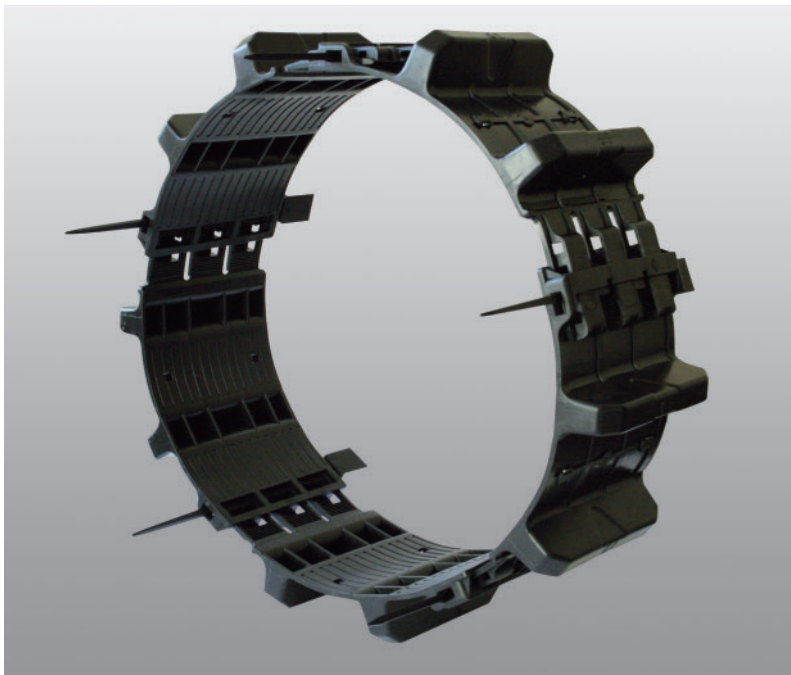
The recommended position of the wedges are experienced and can differ acc. to outside temperature.

**GKO mounting example:**

For a pipe OD 200 mm, use 5 elements per ring. Put 2 wedge in position 2 and 3 wedges in position 3.



## General Information



GKO gs and GKO gl are the latest PSI Insulator generation. Due to the bolt less wedge system and half segments GKO the installation can be achieved easily and quickly.

Owing to various diameter ranges and type GKO gh half segments, continuous use for an outer diameter exceeding 400 mm is possible.

If required an additional support for cable ducts can be with cable binders fixed on the segment.

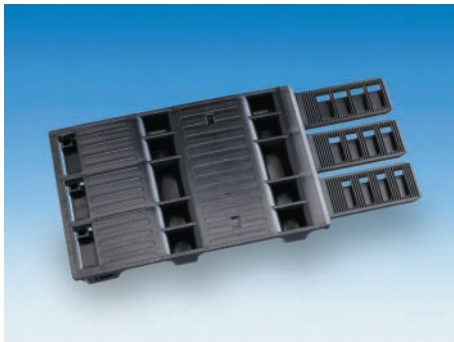
- **Flexible construction**
- **Non-metallic connection for simple and fast installation**
- **Connection technology by wedge system**

PSI shear-secure-tapes can be used to improve adhesion on smooth surfaces or to balance tolerances.

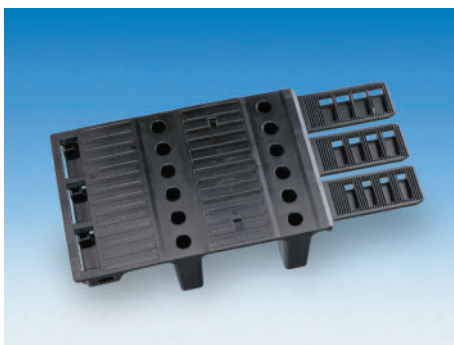
Subject to technical changes.



# How to find the right type



GKO-gl



GKO-gs

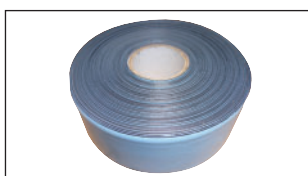


GKO-gh

Type	Skid height	Width	Article no.
GKO gl	36	225	3-002-02200
GKO gl	50	225	3-002-02201
GKO gl	65	225	3-002-02202
GKO gl	75	225	3-002-02203
GKO gl	90	225	3-002-02204
GKO gl	110	225	3-002-02205
GKO gl	125	225	3-002-02206
GKO gs	36	225	3-003-03207
GKO gs	50	225	3-003-03208
GKO gs	65	225	3-003-03209
GKO gs	75	225	3-003-03210
GKO gs	90	225	3-003-03211
GKO gs	110	225	3-003-03212
GKO gs	125	225	3-003-03213
GKO gh	36	225	3-003-03200
GKO gh	50	225	3-003-03201
GKO gh	65	225	3-003-03202
GKO gh	75	225	3-003-03203
GKO gh	90	225	3-003-03204
GKO gh	110	225	3-003-03205
GKO gh	125	225	3-003-03206

Shear-Secure-Tape against slipping see below

Outer Ø of carrier pipe in mm		Number of segments per ring	
min.	max.	GKO gl/gs	GKO gh
400	440	3	1
441	490	4	
491	540	4	1
541	625	5	
626	659	5	1
660	749	6	
750	854	7	
855	959	8	
960	1067	9	
1068	1199	10	
1200	1330	11	
1331	1440	12	
1441	1540	13	
1541	1660	14	
1661	1800	15	
1801	1910	16	
1911	2042	17	
2043	2150	18	
2151	2270	19	
2271	2400	20	
2401	2500	21	



Shear-Secure-Tape
<b>Art.No. 4-002-S20088</b> = width 50 mm, length 15 m
<b>Art.No. 4-002-S20089</b> = width 100 mm, length 15 m

Material: PE-Tape with butyl rubber mixture

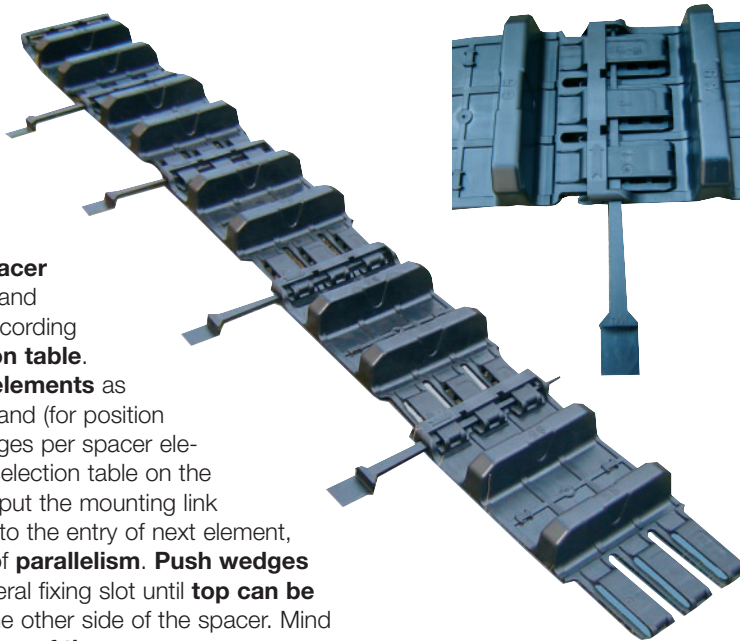


**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security **against slipping**.



# PSI Plastic Insulator Type GKO-gl and GKO-gs System **DSI** Installation Instruction



Put out **spacer elements** and wedges according to **selection table**.

**Connect elements** as a spacer band (for position of the wedges per spacer element see selection table on the backside), put the mounting link with grid into the entry of next element, be aware of **parallelism**. **Push wedges** into the lateral fixing slot until **top can be seen** on the other side of the spacer. Mind the **direction of the arrows**.

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-**tape** to guarantee an optimum security **against slipping**.

**Put** pre-mounted **elements around** the medium pipe and close last joint. Shift the spacer ring **together by hand**.

Shift spacer elements **together with a screw clamp** as far that one or more **wedges can be put in the next fixing slot**.

Drive in all wedges with **hammer strokes parallel** to the pipe. The **wedges don't have to be in fully**.

#### **Attention:**

The **lashes** of the smaller pipe diameters (ND400 – 600) **have to be slightly bent downwards** for an easier insertion.

When mounting more spacer rings please be aware that the **skids** of the single mounted rings **align together**.

We expressly exclude any other use of the material. The PSI guarantee is restricted to faulty material. The suitability of the product for a special purpose must be tested by the user on his own responsibility.



# Installation Instruction

Pipe ND			Pipe O.D. in mm		number of elements per ring		Position of wedges in connecting section			
PE	Steel	GGG	up	to	GKO	GKO half seg.	1	2	3	4
ND 400			397	402	3	1			3	1
	ND 400		406	411	3	1		1	3	
		ND 400	429	439	3	1	1	3		
ND 450			448	452	4				3	1
			456	462	4			1	3	
ND 500			498	504	4	1			2	3
	ND 500		508	513	4	1			4	1
		ND 500	532	542	4	1		3	2	
			538	542	5					5
			559	564	5				4	1
	ND 600		610	615	5		2	3		
ND 600			630	635	5	1			6	
		ND 600	635	645	5	1		1	5	
			660	665	6				3	3
	ND 700		711	716	6			5	1	
		ND 700	738	748	6		4	2		
			762	767	7				2	5
ND 800			796	802	7				7	
	ND 800		813	819	7			3	4	
		ND 800	842	852	7		1	6		
			864	870	8				1	7
	ND 900		914	920	8			1	7	
		ND 900	945	955	8			6	2	
	ND 1000		1016	1022	9				7	2
		ND 1000	1048	1058	9			4	5	
			1057	1063	9			6	3	
			1118	1125	10				6	4
	ND 1200		1219	1226	11				6	5
			1321	1328	11		1	10		
	ND 1400		1422	1430	12			9	3	
			1524	1532	13			7	6	
	ND 1600		1626	1634	14			5	9	
			1727	1736	15			3	12	
	ND 1800		1829	1838	16			1	15	
			1930	1939	17				16	1
	ND 2000		2032	2041	17			16	1	
			2134	2144	18			14	4	
	ND 2200		2235	2245	19			12	7	
			2337	2347	20			10	10	
	ND 2400		2438	2448	21			8	13	

The recommended position of the wedges are experienced and can differ according to outside temperature.

**GKO mounting example:**

For a pipe O.D. 429 mm, use 3 full and 1 half element per ring. Put 1 wedge in position 1 and 3 wedges in position 2.





## General Information



Pipe O.D. from 402 mm up



Starting with a pipe O.D. of 402 mm, MA insulator rings consisting of two segment sizes (MA and MA2) and various skid heights are used to suit the respective pipe O.D.

The special advantage of these insulators is their universal applicability. The following rule is used to determine the composition of suitable insulator rings:

- for every 100 mm of pipe O.D. = 1 MA segment
- for every 50 mm of pipe O.D. = 1 MA 2 segment

Example: Carrier pipe O.D. 559 = 5 MA segments + 1 MA 2 segment.

The segment's skid height is calculated from the difference in diameter of the carrier pipe and the casing.

For an example calculation refer to type PA/PE.

The nuts and bolts required for assembly are included.

The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.

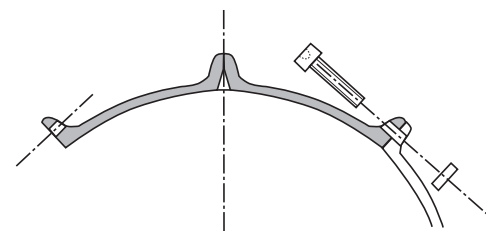


# How to find the right type

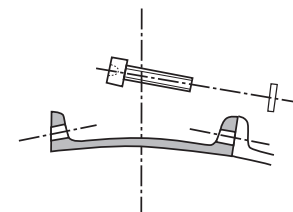


Type	Skid height mm	Width mm	Number of skids	Number of bolts per segment	Art. no.
MA 25	25	160	3	2 M 8 x 70	3-002-00050
MA 36	36	160	3	2 M 8 x 70	3-002-00051
MA 50	50	160	3	2 M 8 x 70	3-002-00053
MA 65	65	160	3	2 M 8 x 70	3-002-00064
MA 75	75	160	3	2 M 8 x 70	3-002-00054
MA 2/25	25	160	2	2 M 8 x 70	3-002-00055
MA 2/36	36	160	2	2 M 8 x 70	3-002-00056
MA 2/50	50	160	2	2 M 8 x 70	3-002-00057
MA 2/65	65	160	2	2 M 8 x 70	3-002-00063
MA 2/75	75	160	2	2 M 8 x 70	3-002-00058
MA 2 = half segment					
Shear-Secure-Tape against slipping see below					

Nominal diameter		Outer Ø of carrier pipe in mm		Number of segments per ring		Bolts number/size
ND	inch	min.	max.	MA 1	MA 2	
400	16	402	435	4		8 M 8x70
450	18	450	494	4	1	10 M 8x70
500	20	500	544	5		10 M 8x70
550	22	548	599	5	1	12 M 8x70
600	24	600	653	6		12 M 8x70
650	26	654	699	6	1	14 M 8x70
700	28	700	749	7		14 M 8x70
750	30	750	799	7	1	16 M 8x70
800	32	800	849	8		16 M 8x70
850	34	850	899	8	1	18 M 8x70
900	36	900	949	9		18 M 8x70
950	38	950	994	9	1	20 M 8x70
1000	40	995	1044	10		20 M 8x70
1050	42	1045	1097	10	1	22 M 8x70
1100	44	1098	1149	11		22 M 8x70
1150	46	1150	1199	11	1	24 M 8x70
1200	48	1200	1306	12		24 M 8x70

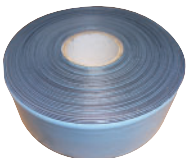


Sectional drawing of MA segment



Sectional drawing of MA 2 segment

For larger nominal diameter on request.

	Shear-Secure-Tape
	Art.No. 4-002-S20088 = width 50 mm, length 15 m
	Art.No. 4-002-S20089 = width 100 mm, length 15 m

Material: PE-Tape with butyl rubber mixture



**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security against slipping.

## General Information



For heavy pipes from pipe O.D. 500 mm up



RGV insulator rings are used from a pipe O.D. of 500 mm. They differ from MA types in having two **reinforced load-carrying centre solid skids** per segment. The fastening skids (36 mm high) are for connection only. To obtain the required pipe O.D., RGV segments are combined with RGV 2 segments.

Special advantages of these insulator rings are their high static load-carrying capacity and their versatility. The following rule is used to determine the composition of suitable insulator rings:

- for every 100 mm of pipe O.D. = 1 RGV segment
- for every 50 mm of pipe O.D. = 1 RGV 2 segment

Example:

Carrier pipe O.D. 559 = 5 RGV segments RGV + 1 RGV 2 segment

The segment's skid height is calculated from the difference in diameter of the carrier pipe and the casing.

For an example calculation refer to type PA/PE.

The nuts and bolts required for assembly are included.

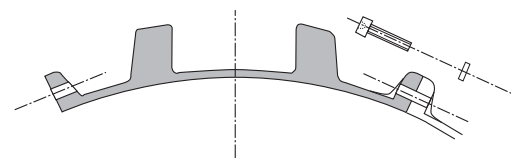
The following table gives the technical details on available sizes, skid heights of the various types and carrier pipe diameters.



# How to find the right type

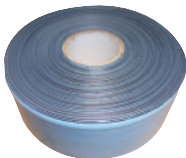
Type	Skid height mm	Width mm	Number of bolts	Art. no.
RGV	50	210	2 M 8x70	3-002-00074
RGV	75	210	2 M 8x70	3-002-00075
RGV	90	210	2 M 8x70	3-002-00076
RGV	125	210	2 M 8x70	3-002-00073
RGV half	50	210	2 M 8x70	3-002-00274
RGV half	75	210	2 M 8x70	3-002-00275
RGV half	90	210	2 M 8x70	3-002-00276
RGV half	125	210	2 M 8x70	3-002-00273
Shear-Secure-Tape against slipping see below				

Nominal diameter		Pipe O.D. in mm		Number of segments		Bolts number/size
DN	Zoll	min.	max.	RGV	RGV half	
500	20	500	535	5		10 M 8 x 70
550	22	547	595	5	1	12 M 8 x 70
600	24	596	645	6		12 M 8 x 70
650	26	646	699	6	1	14 M 8 x 70
700	28	700	750	7		14 M 8 x 70
750	30	751	799	7	1	16 M 8 x 70
800	32	800	850	8		16 M 8 x 70
850	34	851	899	8	1	18 M 8 x 70
900	36	900	950	9		18 M 8 x 70
950	38	951	999	9	1	20 M 8 x 70
1000	40	1000	1075	10		20 M 8 x 70
1100	44	1090	1180	11		22 M 8 x 70
1200	48	1190	1290	12		24 M 8 x 70
1300	52	1291	1390	13		26 M 8 x 70
1400	56	1391	1490	14		28 M 8 x 70
1500	60	1491	1590	15		30 M 8 x 70
1600	64	1591	1690	16		32 M 8 x 70
1700	68	1691	1790	17		34 M 8 x 70
1800	72	1791	1890	18		36 M 8 x 70
1900	76	1891	1990	19		38 M 8 x 70
2000	80	1991	2100	20		40 M 8 x 70



Sectional drawing of RGV segment

For larger nominal diameter on request.

	Shear-Secure-Tape	
	Art.No. 4-002-S20088 = width 50 mm, length 15 m	
	Art.No. 4-002-S20089 = width 100 mm, length 15 m	

Material: PE-Tape with butyl rubber mixture

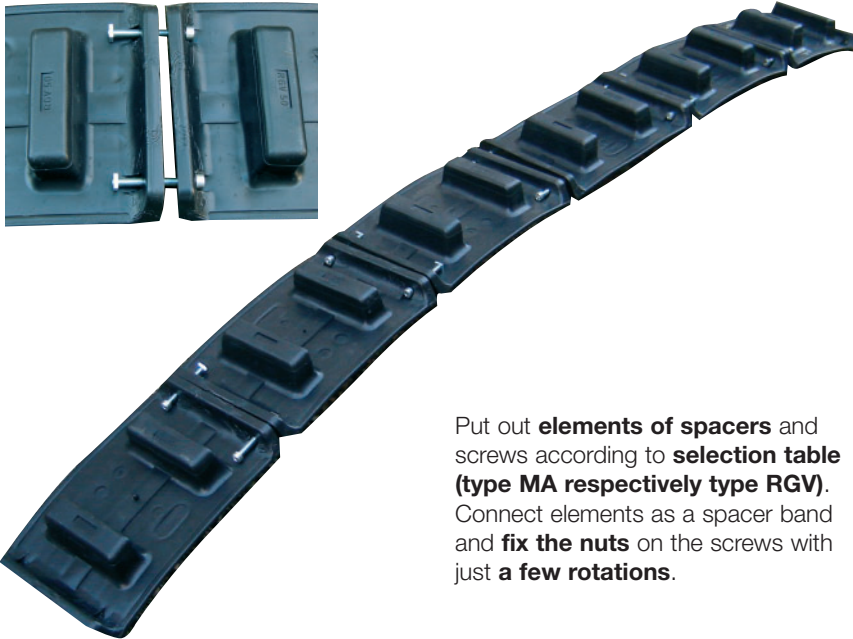


**Application:**

On smooth pipe surface which are in contact with the spacers (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-tape to guarantee an optimum security **against slipping**.

# PSI Plastic Insulators Type MA and Type RGV System **DSI**

## Installation Instructions



Put out **elements of spacers** and screws according to **selection table (type MA respectively type RGV)**. Connect elements as a spacer band and **fix the nuts** on the screws with just **a few rotations**.

On smooth pipe surfaces (e.g. PE, PVC, steel/cast on PE-coated or stoneware) wrap a shear-secure-**tape** to guarantee an optimum security against **slipping**.

Put pre-mounted elements around the medium pipe and close last joint.

Draw the **screws equally** tight to receive equal pitches between the spacer elements.

Square **nuts have to fit into the designed cavity** of the spacer segment.

Tighten screws with a **torque moment of max. 8 Nm** to fix the spacer ring irremovable on the pipe. Screws don't have to be necessarily completely contracted.



Outer diameter of the medium pipe in mm	Number of segments per ring	
	from	up
500 - 535	5	
547 - 595	5	1
596 - 645	6	
646 - 699	6	1
700 - 750	7	
751 - 799	7	1
800 - 850	8	
851 - 899	8	1
900 - 950	9	
951 - 999	9	1
1000 - 1075	10	
1090 - 1180	11	
1190 - 1290	12	
1291 - 1390	13	
1391 - 1490	14	
1491 - 1590	15	
1591 - 1690	16	
1691 - 1790	17	
1791 - 1890	18	
1891 - 1990	19	
1991 - 2100	20	

Outer diameter of the medium pipe in mm	Number of segments per ring	
	from	up
402 - 435	4	
450 - 494	4	1
500 - 544	5	
548 - 599	5	1
600 - 653	6	
654 - 699	6	1
700 - 749	7	
750 - 799	7	1
800 - 849	8	
850 - 899	8	1
900 - 949	9	
950 - 994	9	1
995 - 1044	10	
1045 - 1097	10	1
1098 - 1149	11	
1150 - 1199	11	1
1200 - 1249	12	

PSI-warranty is limited on the substitute of faulty material. The suitability of the product has to be tested for the special use by the user self dependent.