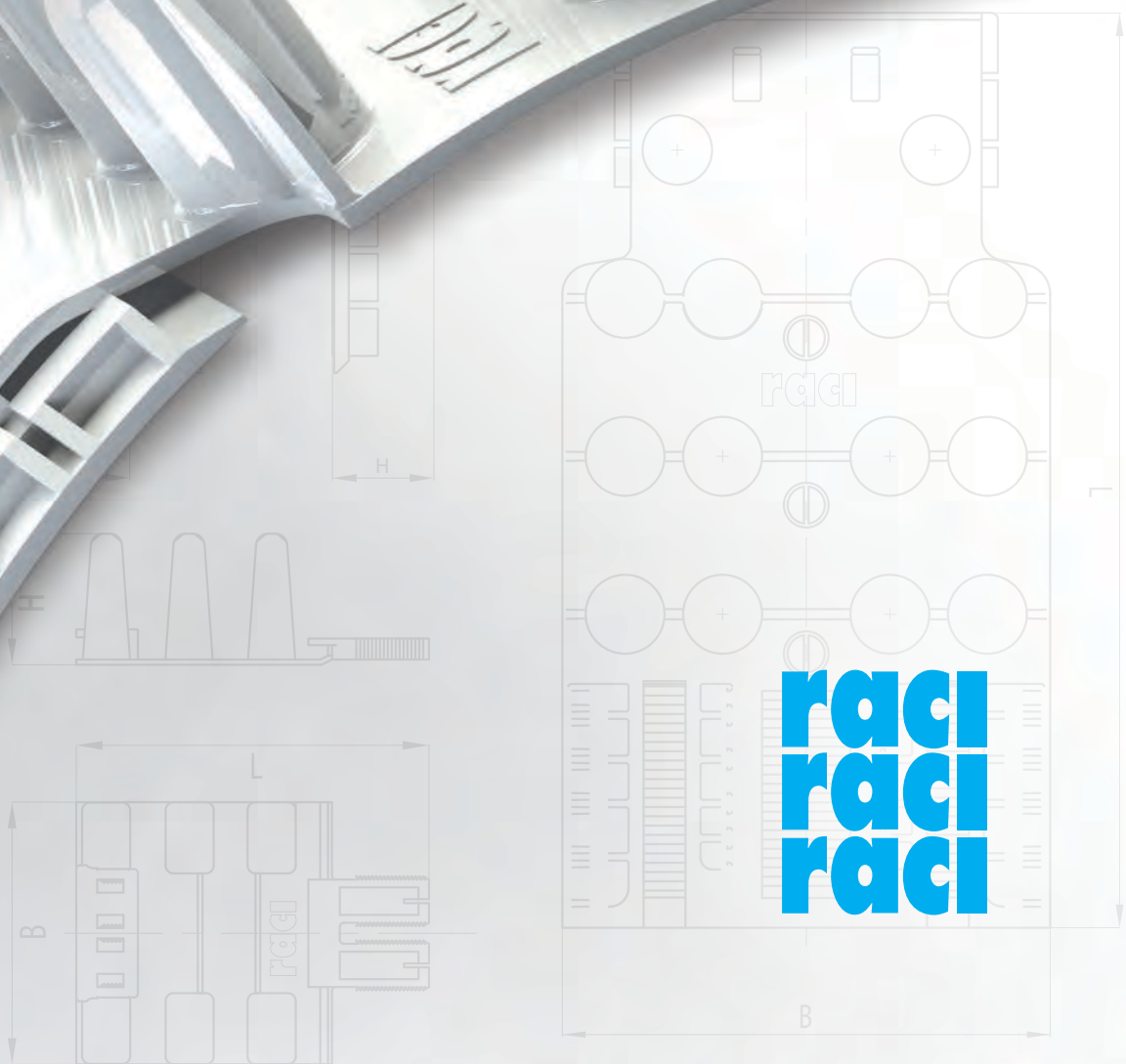
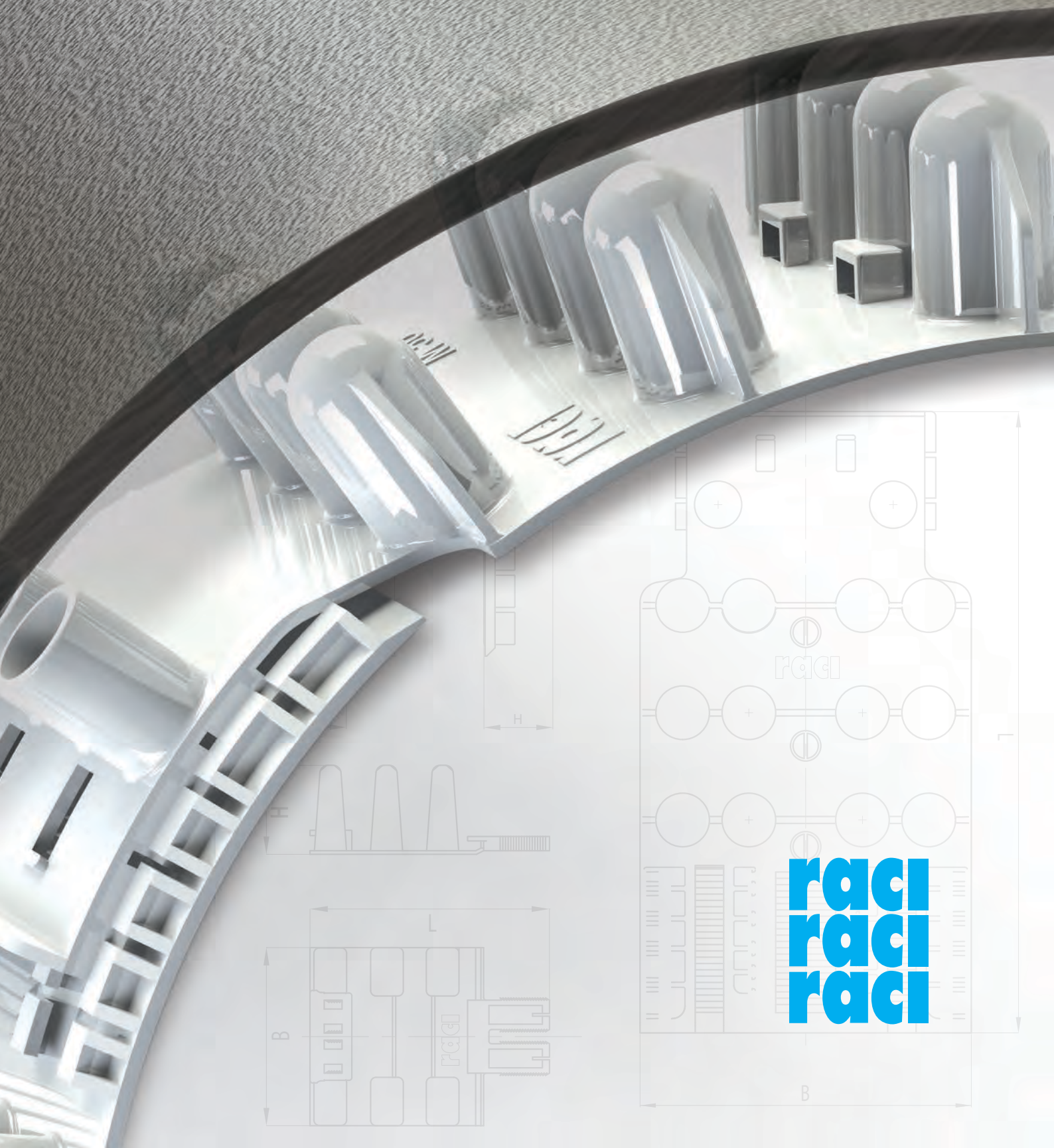


H D P E S P A C E R S

ACCESSORIES FOR NEW INSTALLATION AND PROTECTION OF PIPELINES



raci
raci
raci

OUR SPACERS

WHAT ARE THEY?

RACI has always supported the customer in the research and development of the best technical solutions, in order to best meet their specific needs. By collaborating with companies operating in the field, in 1975 the innovative system of our HDPE spacer collars has been designed and patented for crossing pipes within jacket pipes.

In fact, in many countries the crossings of pipelines located parallel to the roads or railway lines must be protected by casing pipe. RACI spacers allow, for example, to satisfy the requirements of EN 1594, for the construction of stretches of pipes/counter pipe in gas distribution pipelines.

The RACI spacer rings protect pipelines for drinking water, sewerage, gas and petrochemical fluids in a simple and effective way.



ADVANTAGES

- Electrical insulation between the pipeline and the casing pipe, for long-lasting protection against corrosion.
- Easy insertion of the main pipe, preventing damage to the protective coating.
- Excellent fixing on the main pipe to prevent horizontal sliding during insertion.
- Dielectric chemical-resistant material.
- Resistance to thermal shock and stress during insertion to ensure continuous and lasting support to the main pipe and its contents.



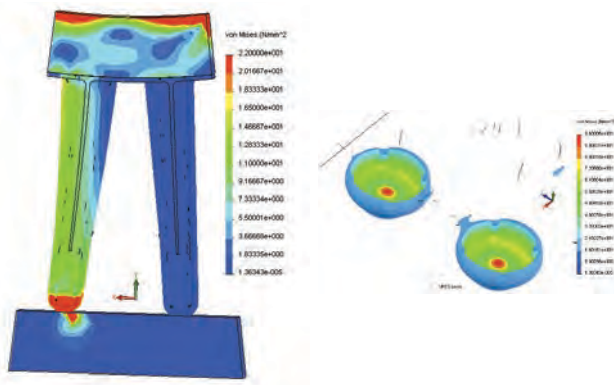
CHARACTERISTICS

- Entirely made of high density polyethylene (HDPE), no metal connection components are required.
- Modular rings composition system that allows the spacers to cover a wide range of pipe diameters, thereby minimizing the stocking quantities.
- Easily assembled, by inserting one element into the other.
- Low friction coefficient.
- Can be installed on steel, concrete, cast/ductile iron or plastic pipes.



(*) Usually a ring is composed by the same elements (e.g. **M**). For special measurements where it is not possible to reach the exact circumference of the pipe, a smaller element like a jolly is inserted (e.g. **N**) to allow a proper fitting of the ring around the pipe. As shown here in detail, the two different elements are considered a "family".

DESIGN AND QUALITY



The RACI spacers are the result of an in-depth structural, design and production analysis assisted by the solid modeling systems. So they represent the best compromise between mechanical resistance and used raw material.

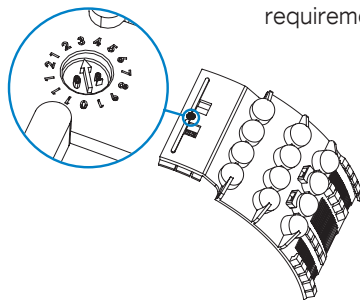
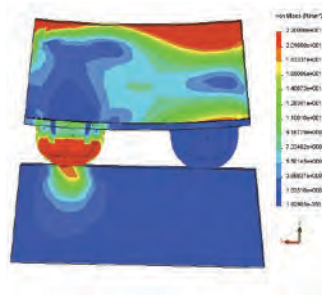
The RACI spacer collars are divided into eight families covering a wide range of diameters. All elements are designed according to their different applications.

They must therefore offer certain static and dynamic characteristics, as to ensure a successful pipeline insertion into the casing pipe.

Each family offers different heights so that the collar rings can overcome flanges, coupling joints, socket joints, or simply to obtain a better centering.

HEIGHTS ARE AVAILABLE FROM 15 TO 200 MM.

Special versions of spacer elements made of other polymers may also be produced in accordance with the mechanical and temperature resistance values required by customers (the variations of the raw material are linked to minimum order batches, due to production requirements).



Marking batch number to ensure an efficient control in terms of traceability.



QUALITY CONTROL

All RACI tests are carried out by our laboratory according to the standard UNI EN 527-2. For each production batch, 10 specimens are tested to check that the design characteristics are always satisfied.

Once the mechanical characteristics are verified, we start the production of the specific batch, by marking each element with the same batch number, in order to ensure its traceability.

During production, all elements undergo a dimensional control in accordance with the construction drawings and before packaging they are visually inspected to ensure that all elements reach our quality standards.



The RACI quality department also schedules the testing of some specimens for creep phenomenon, by simulating the application on a pipeline and by performing the ageing cycles in a climatic chamber for a duration of 15 days with temperature excursions from -20°C to +80°C.



HOW TO CHOOSE THE MODEL

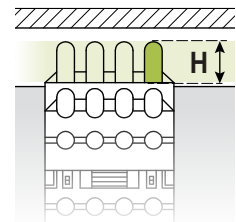
Summary overview for choosing the applicable model:

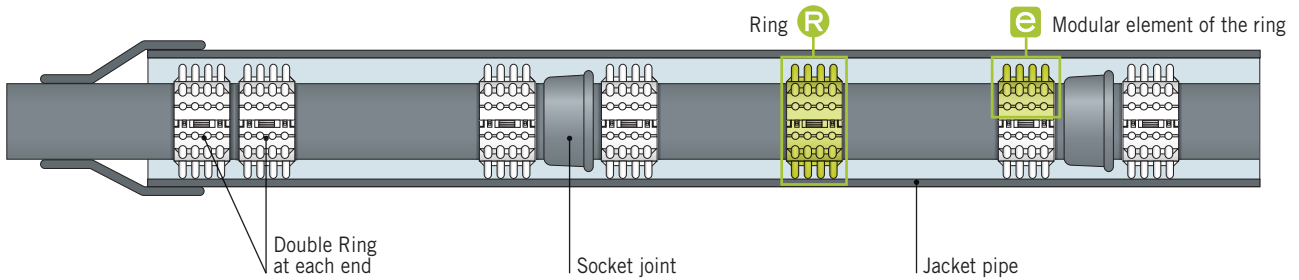
MAIN PIPE		COLLARS TYPE GROUPED INTO FAMILIES															
DN		C/D/I		S/T		A/B		F/G		M/N		P/Q		L		E/H	
mm	inch	H mm	H inch	H mm	H inch	H mm	H inch	H mm	H inch	H mm	H inch	H mm	H inch	H mm	H inch	H mm	H inch
		15	0,59	20	0,79	19	0,75	25	0,98	18	0,70	110	4,33	25	0,98		
						36	1,42	41	1,61	25	0,98			41	1,61	25	0,98
						50	1,97	60	2,36	36	1,42			50	1,97	41	1,61
								75*	2,95*	41**	1,61**	120	4,72	75	2,95	60	2,36
										50	1,97			100	3,94	75	2,95
										75	2,95			125	4,92	90	3,54
										90	3,54			150	5,91	110	4,33
														175	6,89	130	5,12
														200	7,87		
50	2"																
65	2" ½																
80	3"																
100	4"																
125	5"																
150	6"																
200	8"																
250	10"																
300	12"																
350	14"																
400	16"																
450	18"																
500	20"																
600	24"																
700	28"																
800	32"																
900	36"																
1000	40"																
1100	44"																
1200	48"																
1300	52"																
1400	56"																
1500	60"																
1600	64"																
1700	68"																
1800	72"																
1900	76"																
2000	80"																
2200	88"																
2400	96"																
2800	110"																

(*) Measure only available for Type **F** Elements

(**) Measure only available for Type **M** Elements

Families suitable for covering the pipe diameters (DN)

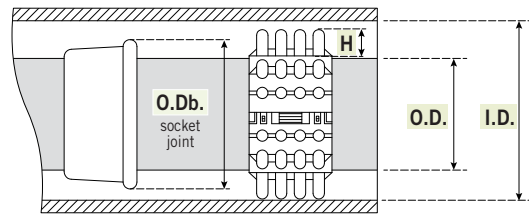




CHOICE OF ELEMENT HEIGHT (H)

Project data to be considered:

- Exact outside diameter of the main pipe including the protective coating **O.D.**
- Exact inner pipe diameter of casing pipe **I.D.**
- Exact outer diameter of the joint or flange **O.Db.**



The maximum height of the element to be adopted is given by the following comparison:

$$[\text{O.D. main pipe}] + [2 \times H \text{ element's height}] + [\text{tolerance } 12 \div 15 \text{mm}] < [\text{I.D. jacket pipe}]$$

Whenever the main pipe has socket or flanged joints, consider a second factor, so as to allow the element to exceed the height of the coupling:

$$[\text{O.D. main pipe}] + [2 \times H \text{ element's height}] > [\text{O.Db. socket pipe} + \text{tolerance min. 20mm}]$$

in this case the rings will be installed upstream and downstream of joint, at a distance not exceeding 30cm.



HEAVY DUTY APPLICATIONS

For longer crossings (>150 m) or very heavy pipes, it is possible to increase the frequency of the rings or to use special reinforced elements.

The reinforced elements are designed with increased sacrificial thickness. However, for heavy applications or non-standard applications, a more detailed analysis is required to consider the particular conditions of the construction site. In these cases, we recommend a consultation with RACI for the necessary technical support.

CALCULATION OF THE NUMBER OF ELEMENTS FOR A CROSSING

It is recommended to insert a double ring at the ends of the pipe to avoid problems during inserting operations and to duly distribute the overcharge.

The exact number of rings **R** is then derived from the following formula:

$$R_{\text{tot}} = L / I + 3$$

The total number of elements **e** for a crossing is:

$$e_{\text{tot}} = e \times R$$

- R_{tot}** rings necessary
- L** crossing length
- I** recommended spacing (see dedicated table of the selected element)
- e** elements to make a ring (See specific table of the selected element)

ASSEMBLY INSTRUCTIONS

1. Insert a spacer element in the next one, leaving the ends of the ring open, as shown in figure 1.
2. During this preliminary operation, the connection between the spacer elements must not exceed the value of two engaged teeth (enlarged detail).
3. Close the spacer ring by winding it around the pipe; complete the operation manually closing the two free ends. Start tightening the ring using the suitable clamp. Make sure that, for each connection between two contiguous elements, at least the third tooth in the socket is engaged.
4. Continue to tighten the ring around the pipe, carefully ensuring that the tightening between the elements is as homogeneous as possible. Do not use any extension as a lever on the wrench on the rack as this could damage the tool. The tool is designed to ensure a proper tightening using the designed ratchet.

For pipes with a very smooth outer surface (PVC-PE or similar), follow the indications on the next page.

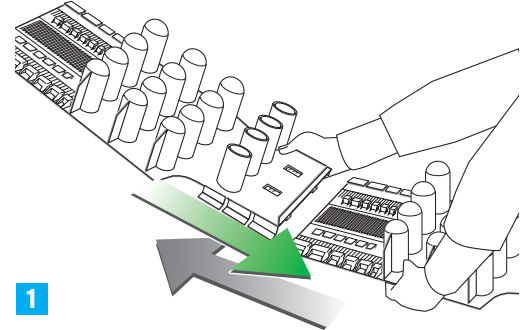
KEY TIPS

Before the insertion in the jacket pipe, use the suitable tool to check the tightness of the rings on the pipe because changes in temperature could cause expansions on the pipe or on the spacer ring's elements.

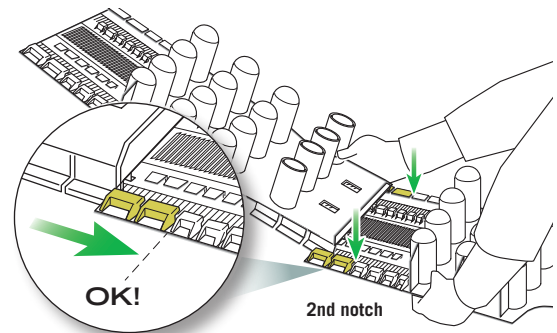
In the crossing phase, the ends of the pipe must be supported. Particularly for concrete jacket pipes, we suggest to use a lubricant especially for heavy duty applications.

Minimum storage temperature: -20°C

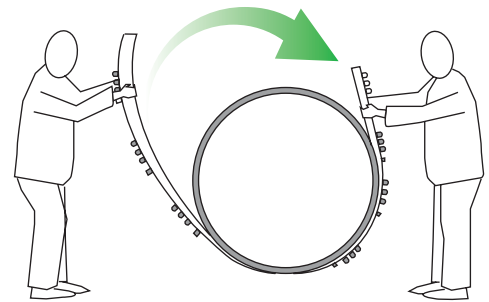
Minimum application temperature: where possible to bring the elements to a temperature of at least 5°C to allow the plastic material to return to the desired flexibility.



1



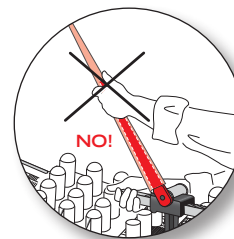
2



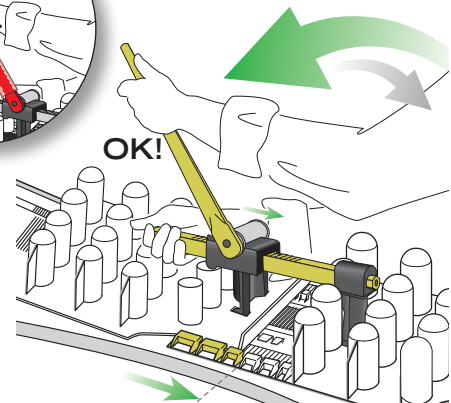
3



It is possible to change the lever to right or left handed mode.



NEVER use additional extensions to the normal lever supplied



4

SPECIAL APPLICATIONS

ANTI-SLIP TAPE

In case of plastic carrier pipe (PVC, PE and similar) or 3ply PE coated steel pipe, it is suggested to apply the tape on the contact area between the ring and the carrier pipe, in order to avoid any horizontal sliding of the rings on the carrier pipe during the inserting operations.

The table resumes the required quantity of tape for each insulating ring referred to the different pipe size.

HOW TO PROCEED WITH THE APPLICATION

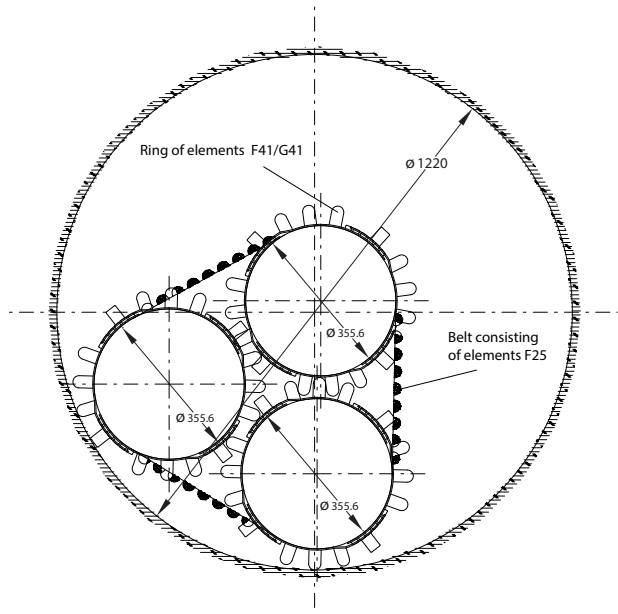
Apply the tape on the surface of the pipe where the insulating ring will be placed. In case some more layers are required to cover the entire width of the insulating ring, remove the protective film by wrapping it around the pipe for an overlap of 50%. It is recommended to remove the protective film (interleaving) from the last layer in contact with the insulating ring just before fixing the ring itself, so as to avoid a reduction in adhesion (caused by deposit of dust, debris, rain, etc.).

WATER WELL APPLICATION

RACI spacers can be easily and reliably used as centralizers in water wells rising columns in order to avoid the contact between the pipe and the casing and to have a better alignment of the submersible pump set.

APPLICATION ON CORRUGATED PIPES

Using suitable technical devices, RACI collars can also be used on pipes with an external corrugated surface. After submitting the design and dimensional data to RACI's technical department, the right solutions will be suggested to the installer.



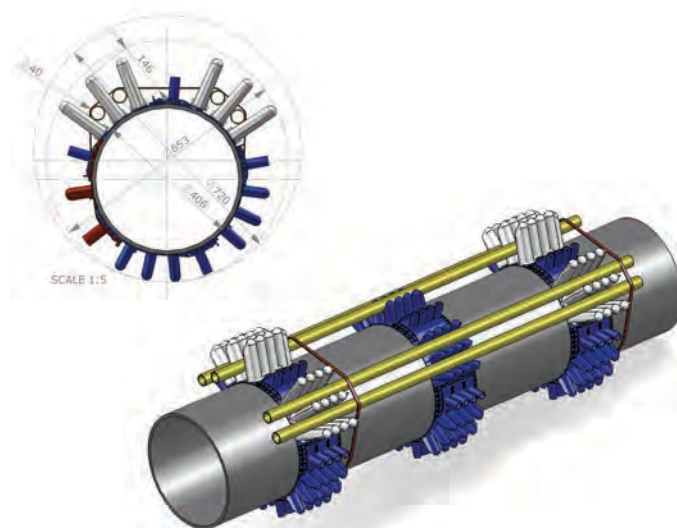
Example of belt consisting application.

H tape	DN pipe	QUANTITY SELF-AMALGAMATING TAPE					
		C-D-I / S-T / A-B		F-G		M-N / P-Q / L / E-H	
		m	ft	m	ft	m	ft
50 mm	2"	0,45	1,5	-	-	-	-
	4"	0,75	2,5	1,65	5,4	-	-
	6"	1,2	4	2,4	7,9	3,45	11,4
100 mm	8"	0,75	2,5	1,5	4,9	2,7	8,9
	10"			1,8	5,9	3,3	10,8
	12"			2,1	6,9	4,05	13,3
	16"			2,7	8,9	5,25	17,2
	20"			3,3	10,8	6,6	21,8
	24"					7,8	25,7
	30"					9,75	32,2
	32"					10,35	34,2
	36"					11,7	38,6
	40"					12,9	42,6
	42"					13,5	44,6
	48"					15,45	51
	52"					16,8	55,4
56"					18	59,4	

BELT APPLICATION

For crossings with multiple pipes for the conveyance of different services (for example, fluids and conduits), it is possible to use different series of rings: a series of rings for spacing the flow pipe and another series arranged as a belt to fix the additional services.

The experts of RACI's technical department can carry out a detailed analysis of the application and propose the best solution for the specific needs.



Example of crossing with multiple pipes.

PIPE END SEALS

Once the pipe is inserted inside the casing, two end seals must be provided for closing the crossing. The end seals belonging to our range of supply guarantee a clean and economical solution for sealing existing lines and new constructions. They allow simple and quick installation, the material used is highly resistant to ageing and offers excellent mechanical strength.

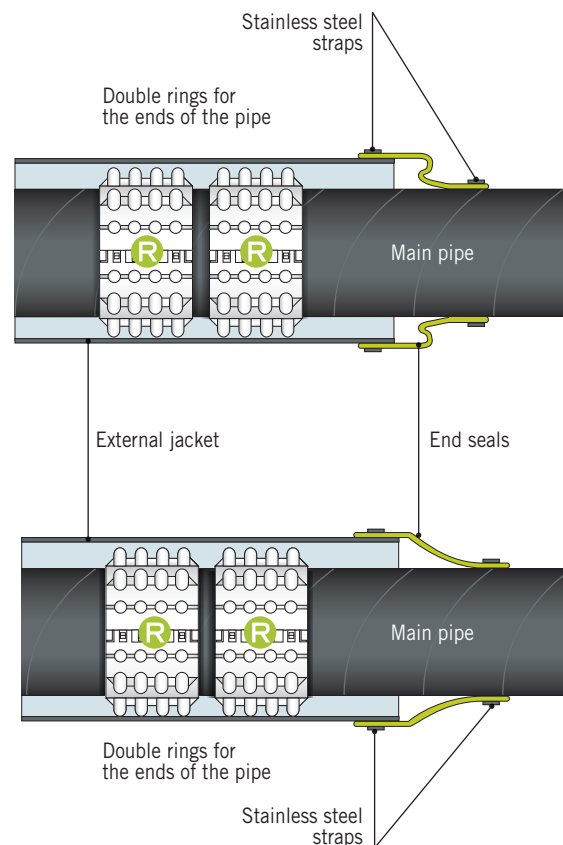
The end seals can be divided into two large macro categories, which in turn are sub-divided into 5 product types.

WAVE OR BELLOWS

- Z type Espansit wave end seal
- EKF type end seal

CONICAL

- C Espansit conical end seal
- STM type Espansit conical end seal with additional holes
- CSK type heat-shrinkable end seal



HDPE SPACERS TYPE S/T

MOD. 13100/S

PIPE DN 32-150
H. 20 mm



MOD. 13100/T

PIPE DN 32-150
H. 20 mm

Spacer for low diameter pipeline crossings.

CHARACTERISTICS

- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.

MATERIAL - HDPE

Yield strength*:
≥ 25 N/mm² (test according to UNI EN ISO 527-2)

Elongation at break*:
> 200% (test according to UNI EN ISO 527-2)

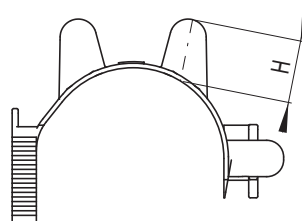
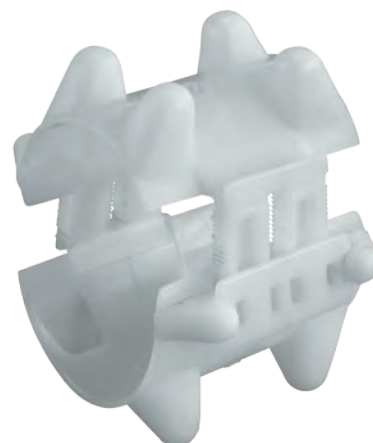
Hardness shore D:
64 - ASTM D 2240

Minimum working temperature:
- 20°C (for applications below 5°C contact Raci)

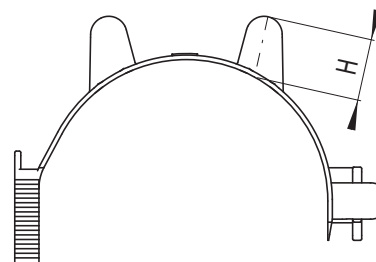
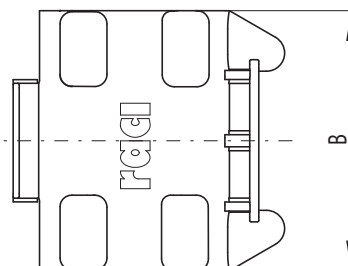
Minimum stocking temperature:
- 5°C (for applications below 5°C contact Raci)

Dielectric strength:
> 37 kV/mm - ASTM D 149/64

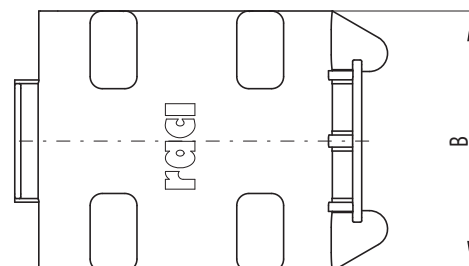
UVL stabilization:
Good



e S



e T



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
S	94 - 110	3,7 - 4,3	85	3,3	20	0,8	110
T	119 - 135	4,6 - 5,3			20	0,8	

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS* (pcs.)		RECOMMENDED SPACING BETWEEN INSULATORS (H element)			
Ø MIN	Ø MAX	Family		Gas		Water	
		S	T	mt	feet	mt	feet
59	68	2	-	2,0	6,6	2,0	6,6
69	75	1	1	2,0	6,6	2,0	6,6
76	84	-	2	2,0	6,6	2,0	6,6
88	102	3	-	2,0	6,6	2,0	6,6
103	107	2	1	2,0	6,6	1,5	4,9
108	114	1	2	2,0	6,6	1,5	4,9
115	120	-	3	2,0	6,6	1,5	4,9
121	132	4	-	1,5	4,9	1,5	4,9
133	140	3	1	1,5	4,9	1,5	4,9
141	146	2	2	1,5	4,9	1,5	4,9
147	152	1	3	1,5	4,9	1,5	4,9
153	168	-	4	1,5	4,9	1,5	4,9

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

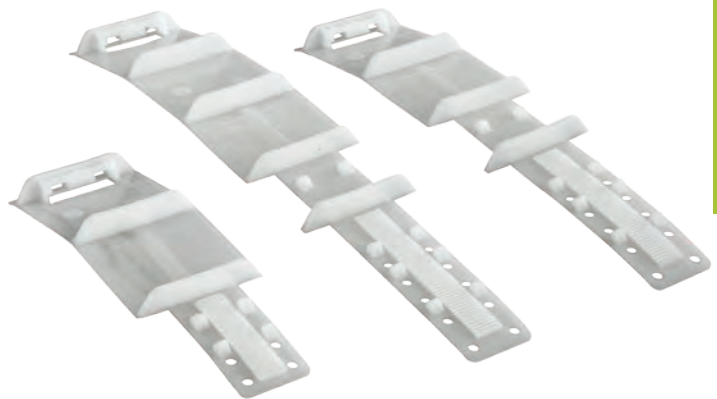
TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
S	20	100	40 x 30 x 35	3	4
T	20	80		3	4

Note: for logistic reasons, deliveries are for full carton boxes only.

HDPE SPACERS TYPE C/D/I

MOD. 13100/C	PIPE DN 40-200 H. 15 mm
MOD. 13100/D	PIPE DN 40-200 H. 15 mm
MOD. 13100/I	PIPE DN 40-200 H. 15 mm

Spacer for low diameter pipeline crossings.

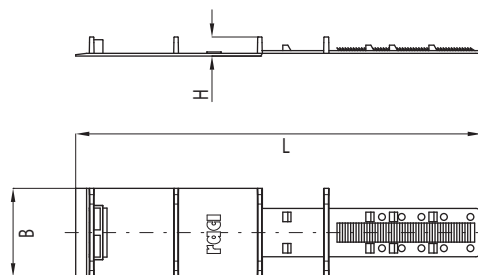


CHARACTERISTICS

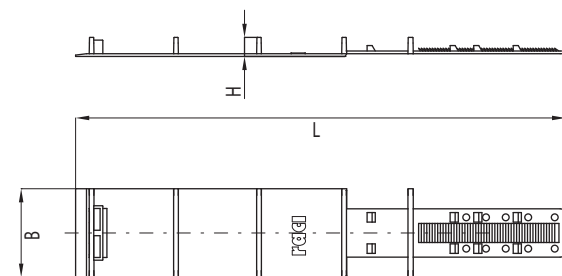
- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.

MATERIAL - HDPE

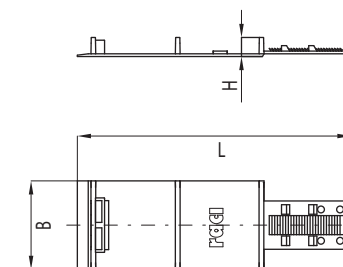
- Yield strength*:**
≥ 25 N/mm² (test according to UNI EN ISO 527-2)
- Elongation at break*:**
> 200% (test according to UNI EN ISO 527-2)
- Hardness shore D:**
64 - ASTM D 2240
- Minimum working temperature:**
- 20°C (for applications below 5°C contact Raci)
- Minimum stocking temperature:**
- 5°C (for applications below 5°C contact Raci)
- Dielectric strength:**
> 37 kV/mm - ASTM D 149/64
- UVL stabilization:**
Good



e C



e D



e I

(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
C	180 - 250	7 - 9,8	63	2,5	15	0,6	200
D	240 - 310	9,4 - 12					
I	130 - 160	5 - 6,3					

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS* (pcs.)			RECOMMENDED SPACING BETWEEN INSULATORS (H element)			
Ø MIN	Ø MAX	Family			Gas		Water	
		C	D	I	mt	feet	mt	feet
42	52	-	-	1	1,5	4,9	1,5	4,9
58	80	1	-	-	1,5	4,9	1,5	4,9
81	99	-	1	-	1,5	4,9	1,0	3,3
100	133	1	-	1	1,5	4,9	1,0	3,3
134	170	1	1	-	1,0	3,3	1,0	3,3
171	200	-	2	-	1,0	3,3	1,0	3,3

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
C	15	120	40 x 30 x 35	4	5
D	15	100		5	6
I	15	150		4	5

Note: for logistic reasons, deliveries are for full carton boxes only.

HDPE SPACERS TYPE A/B

MOD. 13100/A

PIPE DN 50-250
H. 19-36-50 mm



MOD. 13100/B

PIPE DN 50-250
H. 19-36-50 mm

Spacer for pipeline crossings.

CHARACTERISTICS

- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.

MATERIAL - HDPE

Yield strength*:
≥ 25 N/mm² (test according to UNI EN ISO 527-2)

Elongation at break*:
> 200% (test according to UNI EN ISO 527-2)

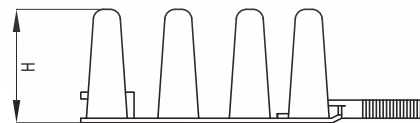
Hardness shore D:
64 - ASTM D 2240

Minimum working temperature:
- 20°C (for applications below 5°C contact Raci)

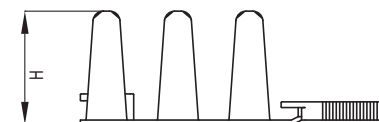
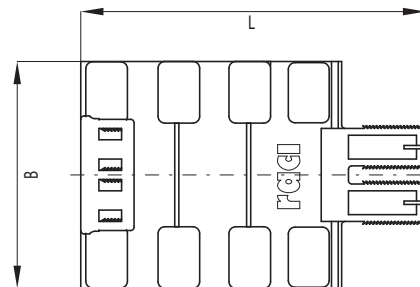
Minimum stocking temperature:
- 5°C (for applications below 5°C contact Raci)

Dielectric strength:
> 37 kV/mm - ASTM D 149/64

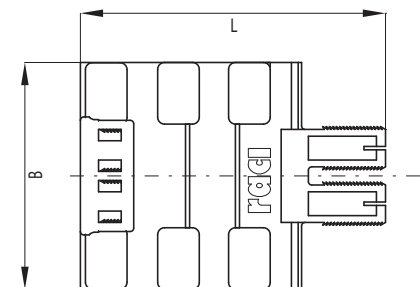
UVL stabilization:
Good



eA



eB



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
A	113 - 128	4,5 - 5	100	3,9	19 - 36 - 50	0,75 - 1,42 - 1,97	180
B	95 - 110	3,7 - 4,3					

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS* (pcs.)		RECOMMENDED SPACING BETWEEN INSULATORS (H element)			
Ø MIN	Ø MAX	Family		Gas		Water	
		A	B	mt	feet	mt	feet
55	64	-	2	2,0	6,6	2,0	6,6
60	70	1	1	2,0	6,6	2,0	6,6
68	77	2	-	2,0	6,6	2,0	6,6
85	98	-	3	2,0	6,6	2,0	6,6
90	106	1	2	2,0	6,6	1,5	4,9
98	116	3	-	2,0	6,6	1,5	4,9
118	132	-	4	2,0	6,6	1,5	4,9
125	140	1	3	2,0	6,6	1,5	4,9
140	158	4	-	1,5	4,9	1,5	4,9
158	180	2	3	1,5	4,9	1,5	4,9
178	200	5	-	1,5	4,9	1,5	4,9
200	240	-	7	1,5	4,9	1,5	4,9
215	242	6	-	1,5	4,9	1,5	4,9
239	272	6	1	1,5	4,9	1,0	3,3
245	281	7	-	1,5	4,9	1,0	3,3

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
A	19	140	40 x 30 x 35	6	7
	36	110		6	7
	50	80		5	6
B	19	160	40 x 30 x 35	5	6
	36	130		4	5
	50	90		4	5

Note: for logistic reasons, deliveries are for full carton boxes only.

HDPE SPACERS TYPE F/G

MOD. 13100/F

PIPE DN 100-500
H. 25-41-60-75 mm



MOD. 13100/G

PIPE DN 100-500
H. 25-41-60 mm

Spacer for pipeline crossings.

CHARACTERISTICS

- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.
- Heights 25 mm and 41 mm homologated according to SNAM RETE GAS specification (GASD A 09.01.06 and GASD C 09.06.00).
- Tightening by tool type C90 for height up to 75mm.

MATERIAL - HDPE

Yield strength*:
≥ 25 N/mm² (test according to UNI EN ISO 527-2)

Elongation at break*:
> 200% (test according to UNI EN ISO 527-2)

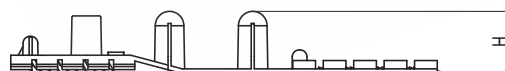
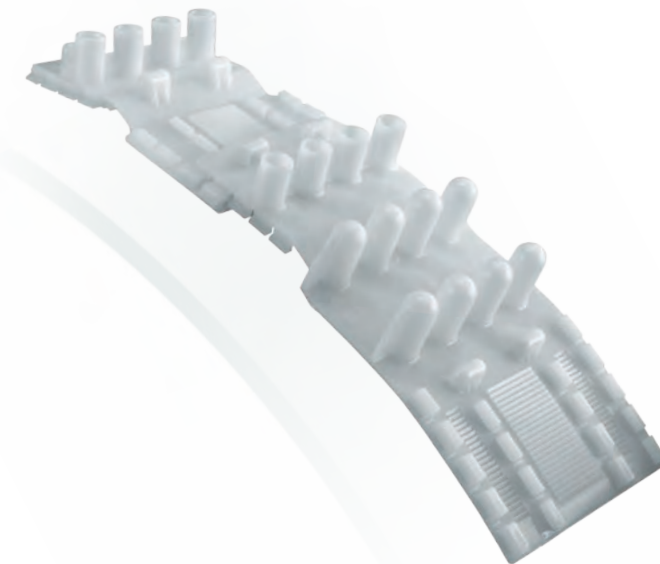
Hardness shore D:
64 - ASTM D 2240

Minimum working temperature:
- 20°C (for applications below 5°C contact Raci)

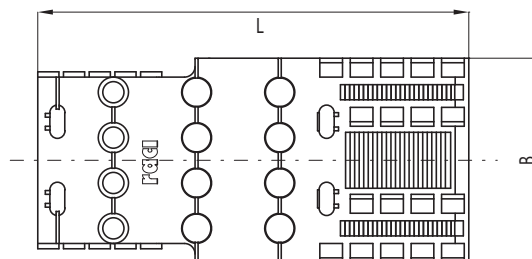
Minimum stocking temperature:
- 5°C (for applications below 5°C contact Raci)

Dielectric strength:
> 37 kV/mm - ASTM D 149/64

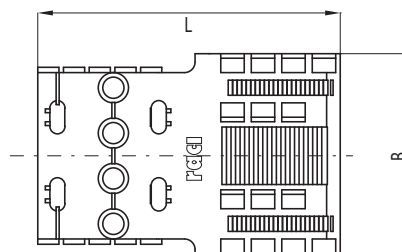
UVL stabilization:
Good



e F



e G



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
F	197 - 237	7,7 - 9,3	130	5,1	25 - 41 - 60 - 75	0,98 - 1,61 2,36 - 2,95	500
G	91 - 129	3,6 - 5			25 - 41 - 60	0,98 - 1,61 - 2,36	

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS* (pcs.)		RECOMMENDED SPACING BETWEEN INSULATORS (H element)			
Ø MIN	Ø MAX	Family		Gas		Water	
		F	G**	mt	feet	mt	feet
92	115	1	1	2,5	8,2	2,5	8,2
116	152	2	-	2,5	8,2	2,5	8,2
153	188	2	1	2,5	8,2	2,0	6,6
189	224	3	-	2,5	8,2	2,0	6,6
225	260	3	1	2,0	6,6	2,0	6,6
261	295	4	-	2,0	6,6	2,0	6,6
296	313	4	1	2,0	6,6	2,0	6,6
314	376	5	-	2,0	6,6	1,5	4,9
377	446	6	-	2,0	6,6	1,5	4,9
477	528	7	-	2,0	6,6	1,5	4,9

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

(**) The element G was designed as special pipe sizes for closing element in order to complete the circumferences on some pipe OD ranges. Therefore it is not possible to use more than 1 elements G in a ring.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
F	25	150	60 x 40 x 50	22	24
	41	100		17	19
	60	70		14	16
	75	60		15	17
G	25	50	40 x 30 x 25	4,5	5,5
	41	60		6	7
	60	40		4	5

Note: for logistic reasons, deliveries are for full carton boxes only.

TYPE M/N E P/Q

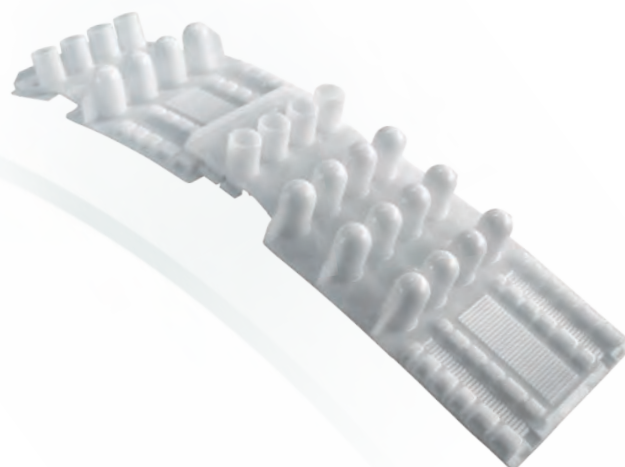
MOD. 13100/M | PIPE DN 150-1000
H. 18-25-36-41-50-75-90 mm

MOD. 13100/N | PIPE DN 150-1000
H. 18-25-36-50-75-90 mm

MOD. 13100/P | PIPE DN 150-750
H. 110-120 mm

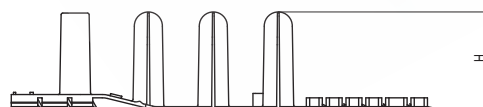
MOD. 13100/Q | PIPE DN 150-750
H. 110-120 mm

Spacer for pipeline crossings.

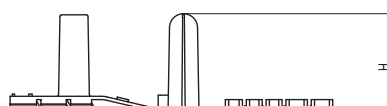
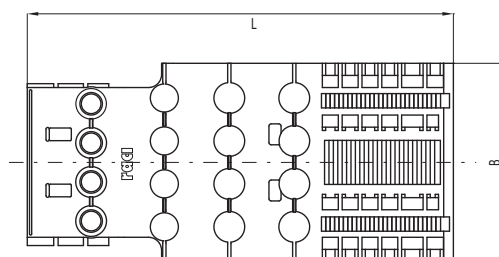


CHARACTERISTICS

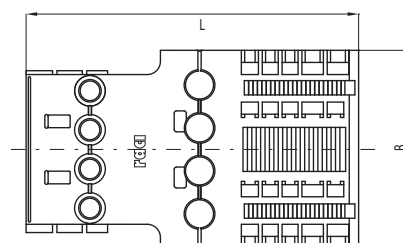
- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.
- Heights 25 mm and 41 mm homologated according to SNAM RETE GAS specification (GASD A 09.01.06 and GASD C 09.06.00).
- Tightening by tool type C90 for height up to 90 mm, tool type A200 for height from 110 a 120 mm.



e M/P



e N/Q



MATERIAL - HDPE

- Yield strength*:**
≥ 25 N/mm² (test according to UNI EN ISO 527-2)
- Elongation at break*:**
> 200% (test according to UNI EN ISO 527-2)
- Hardness shore D:**
64 - ASTM D 2240
- Minimum working temperature:**
- 20°C (for applications below 5°C contact Raci)
- Minimum stocking temperature:**
- 5°C (for applications below 5°C contact Raci)
- Dielectric strength:**
> 37 kV/mm - ASTM D 149/64
- UVL stabilization:**
Good



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
M	265 - 320	10,4 - 12,6	180	7,1	18 - 25 - 36 - 41 50 - 75 - 90	0,7-0,98-1,42-1,61 1,97-2,95-3,54	1000
N	185 - 240	7,3 - 9,4					
P	265 - 320	10,4 - 12,6					
Q	185 - 240	7,3 - 9,4			110 - 120	4,33 - 4,72	

The loading capacity values are estimated and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS* (pcs.)				RECOMMENDED SPACING BETWEEN INSULATORS (H element)			
Ø MIN	Ø MAX	Family		Family		Gas		Water	
		M	N**	P	Q**	mt	feet	mt	feet
143	168	1	1	1	1	2,5	8,2	2,5	8,2
169	201	2	-	2	-	2,5	8,2	2,5	8,2
202	227	1	2	1	2	2,5	8,2	2,5	8,2
228	252	2	1	2	1	2,5	8,2	2,0	6,6
253	286	3	-	3	-	2,5	8,2	2,0	6,6
287	311	2	2	2	2	2,0	6,6	2,0	6,6
312	337	3	1	3	1	2,0	6,6	2,0	6,6
338	395	4	-	4	-	2,0	6,6	2,0	6,6
396	421	4	1	4	1	2,0	6,6	2,0	6,6
422	505	5	-	5	-	2,0	6,6	2,0	6,6
506	590	6	-	6	-	2,0	6,6	1,5	4,9
591	674	7	-	7	-	2,0	6,6	1,5	4,9
675	759	8	-	8	-	1,5	4,9	1,5	4,9
760	915	9	-	n.a.	n.a.	1,5	4,9	1,0	3,3
850	1015	10	-	n.a.	n.a.	1,5	4,9	1,0	3,3

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

(**) The elements N and Q was designed as special pipe sizes for closing element in order to complete the circumferences on some pipe OD ranges. Therefore it is not possible to use more than 1 or 2 elements N or Q in a ring.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
M	18	100	60 x 40 x 50	27	29
	25	85		23	25
	36	60		20	22
	41	55		21	23
	50	40		16	18
	75	30		15	17
	90	25		15	17
N	18	100	60 x 40 x 50	20	22
	25	90		19	21
	36	70		16	18
	50	50		13	15
	75	35		11	13
	90	30		10	12
P	110	24	60 x 40 x 50	14	16
	120	20		13	15
Q	110	30	60 x 40 x 50	11	13
	120	26		10	12

Note: for logistic reasons, deliveries are for full carton boxes only.

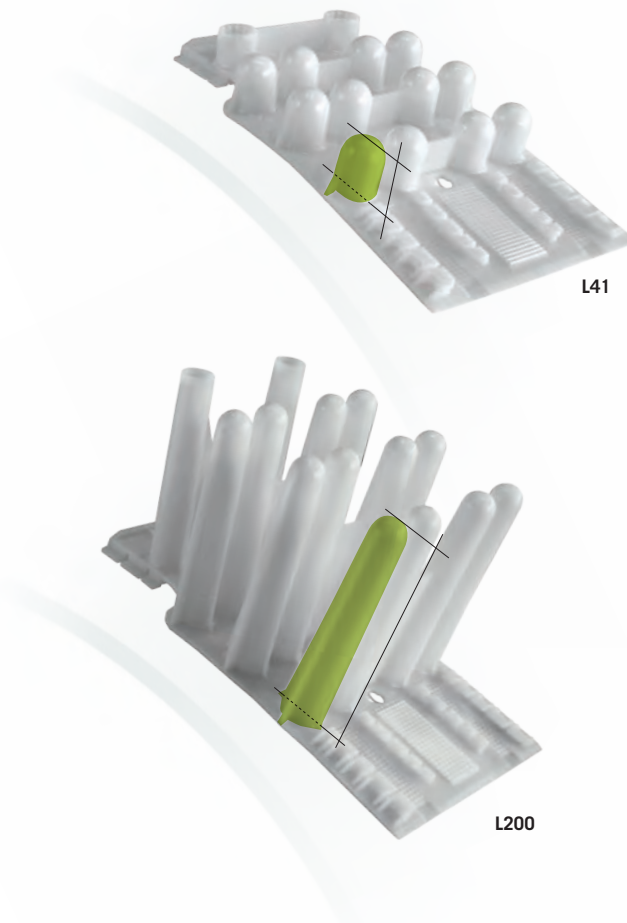
MOD. 13100/L | **PIPE DN 450-1600**
H. 25-41-50-75-100-125-150-175-200 mm



Collare distanziatore per condotte in tubi di protezione.

CHARACTERISTICS

- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- New design with special reinforcing ribs to guarantee high mechanical performances even with reduced thickness.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.
- Heights 25 mm and 41 mm homologated according to SNAM RETE GAS specification (GASD A 09.01.06 and GASD C 09.06.00).
- Tightening by tool type A75 for height up to 75 mm, tool type A200 for height from 100 up to 200mm.



MATERIAL - HDPE

Yield strength*:
≥ 25 N/mm² (test according to UNI EN ISO 527-2)

Elongation at break*:
> 200% (test according to UNI EN ISO 527-2)

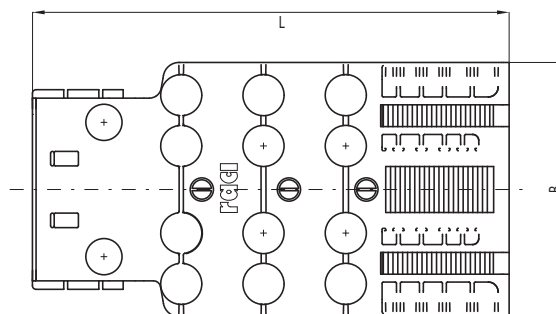
Hardness shore D:
64 - ASTM D 2240

Minimum working temperature:
- 20°C (for applications below 5°C contact Raci)

Minimum stocking temperature:
- 5°C (for applications below 5°C contact Raci)

Dielectric strength:
> 37 kV/mm - ASTM D 149/64

UVL stabilization:
Good



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
L25-L41-L50	280 - 325	11 - 12,8	210	8,3	25 - 41 - 50	0,98 - 1,61 - 1,97	3000
L75-L100					75 - 100	2,95 - 3,94	2500
L125					125	4,92	2000
L150-L175-L200					150 - 175 - 200	5,91 - 6,89 - 7,87	1500

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE Ø MAIN PIPE D.E.		SPACER ELEMENTS*	RECOMMENDED SPACING BETWEEN INSULATORS							
			H element ≤ 125 mm				H element ≥ 150 mm			
Ø MIN	Ø MAX	PCS.	Gas		Water		Gas		Water	
			mt	feet	mt	feet	mt	feet	mt	feet
450	510	5	2,5	8,2	2,5	8,2	2,5	8,2	2,5	8,2
540	610	6	2,5	8,2	2,5	8,2	2,5	8,2	2,5	8,2
625	715	7	2,5	8,2	2,5	8,2	2,5	8,2	2,5	8,2
715	805	8	2,5	8,2	2,5	8,2	2,5	8,2	2	6,6
805	895	9	2,5	8,2	2	6,6	2,5	8,2	1,5	4,9
895	985	10	2,5	8,2	2	6,6	2,5	8,2	1,2	3,9
985	1075	11	2,5	8,2	1,5	4,9	2,5	8,2	1,2	3,9
1075	1160	12	2	6,6	1	3,3	2	6,6	1	3,3
1160	1250	13	2	6,6	1	3,3	2	6,6	0,8	2,6
1250	1340	14	2	6,6	1	3,3	2	6,6	0,8	2,6
1340	1430	15	2	6,6	0,8	2,6	1,5	4,9	0,6	2
1430	1520	16	2	6,6	0,8	2,6	1,5	4,9	0,5	1,6
1520	1610	17	2	6,6	0,5	1,6	1,5	4,9	0,5	1,6
1610	1750	18	2	6,6	0,5	1,6	1,5	4,9	0,5	1,6

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
L	25	60	40 x 60 x 50	24	26
	41	42		20	22
	50	30		14,5	16,5
	75	22		15,4	17,4
	100	18		15	17
	125	14		12,6	14,6
	150	12		13	15
	175	10		12	14
	200	8		9,5	11,5

Note: for logistic reasons, deliveries are for full carton boxes only.

HDPE SPACERS TYPE E/H

MOD. 13100/E | PIPE DN 400-3000
H. 25-41-60-75-90-110-130 mm

MOD. 13100/H | PIPE DN 400-3000
H. 25-41-60-75-90-110-130 mm

Spacer for pipeline crossings.

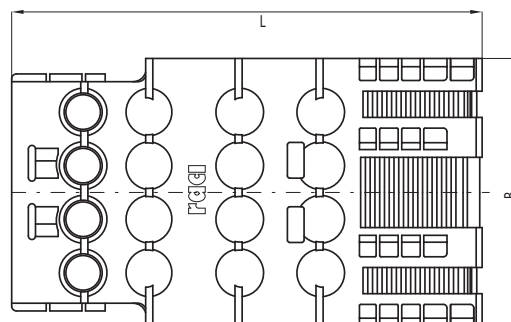


CHARACTERISTICS

- Modular system to assemble insulator rings, which allows spacers to be used on a wide pipe diameter range therefore reducing inventory costs.
- Spacers are quickly and easily assembled by manually fitting elements one into the other.
- The tooth insertion method allows on site adjustments to fit a wide range of pipe diameters.
- Spacers are manufactured entirely out of high density polyethylene (HDPE). No metal bolts or attachments are required.
- A low friction coefficient guarantees an easy insertion into the casing.
- Designed and tested to maintain continuous and long term support for the carrier pipe and its contents.
- Spacers provide a constant projection around the entire circumference of the carrier pipe.
- Spacers provide long term protection from corrosion.
- Spacers can be installed on steel-coated pipes, concrete pipes, ductile iron pipes or plastic pipes.
- Heights 25 mm and 41 mm homologated according to SNAM RETE GAS specification (GASD A 09.01.06 and GASD C 09.06.00).
- Available also in a special reinforced version for heavy duty applications (e.g. long crossings and/or big diameters).
- Tightening by tool type B75 for height up to 75 mm, tool type B130 for height from 90 up to 130 mm.



e E



MATERIAL - HDPE

Yield strength*:
≥ 25 N/mm² (test according to UNI EN ISO 527-2)

Elongation at break*:
> 200% (test according to UNI EN ISO 527-2)

Hardness shore D:
64 - ASTM D 2240

Minimum working temperature:
- 20°C (for applications below 5°C contact Raci)

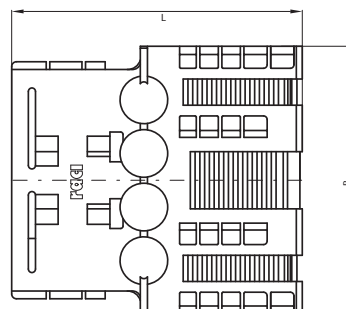
Minimum stocking temperature:
- 5°C (for applications below 5°C contact Raci)

Dielectric strength:
> 37 kV/mm - ASTM D 149/64

UVL stabilization:
Good



e H



(*) on test specimen with moulded material, realized and tested for every batch of production. Batch number is marked on each element recording nr/year of moulding.

TYPE	USEFUL LENGTH		WIDTH (B)		HEIGHT (H)		LOADING CAPACITY (kg)
	mm	inch	mm	inch	mm	inch	
E	280 - 335	11 - 13,2	225	8,8	25 - 41 - 60	0,98 - 1,61 - 2,36	5000
					75 - 90	2,95 - 3,54	4000
					110 - 130	4,33 - 5,12	3250
H	130 - 185	5,1 - 7,3	225	8,8	25 - 41 - 60	0,98 - 1,61 - 2,36	5000
					75 - 90	2,95 - 3,54	4000
					110 - 130	4,33 - 5,12	3250

The loading capacity values are esteemed and verified under static and ideal conditions.

OUTSIDE MAIN PIPE D.E.		SPACER ELEM.* (pcs.)		RECOMMENDED SPACING BETWEEN											
				H element ≤ 60 mm				≤75 H element ≤90mm				H element ≥ 110 mm			
Ø MIN	Ø MAX	Family		Gas		Water		Gas		Water		Gas		Water	
		E	H	mt	feet	mt	feet	mt	feet	mt	feet	mt	feet	mt	feet
421	465	4	1	3,5	11,5	3,3	10,8	3,3	10,8	2,8	9,2	2,5	8,2	2,0	6,6
466	530	5	-	3,5	11,5	3,3	10,8	3,3	10,8	2,8	9,2	2,5	8,2	2,0	6,6
531	630	6	-	3,3	10,8	3,3	10,8	2,8	9,2	2,8	9,2	2,0	6,6	2,0	6,6
631	730	7	-	3,3	10,8	3,3	10,8	2,8	9,2	2,8	9,2	2,0	6,6	2,0	6,6
731	830	8	-	3,3	10,8	3,0	9,8	2,8	9,2	2,5	8,2	2,0	6,6	1,8	5,9
820	910	9	-	3,3	10,8	3,0	9,8	2,8	9,2	2,5	8,2	2,0	6,6	1,8	5,9
910	1030	10	-	3,3	10,8	2,5	8,2	2,8	9,2	2,4	7,9	2,0	6,6	1,5	4,9
1031	1159	11	-	3,3	10,8	2,5	8,2	2,8	9,2	2,2	7,2	2,0	6,6	1,5	4,9
1160	1360	13	-	3,3	10,8	2,5	8,2	2,8	9,2	2,0	6,6	2,0	6,6	1,2	3,9
1361	1600	15	-	3,3	10,8	2,0	6,6	2,8	9,2	1,5	4,9	2,0	6,6	1,2	3,9
1601	1799	17	-	3,3	10,8	1,5	4,9	2,8	9,2	1,2	3,9	2,0	6,6	1,0	3,3
1800	2110	20	-	3,3	10,8	1,2	3,9	2,8	9,2	1,0	3,3	2,0	6,6	0,8	2,6
2111	2430	23	-	3,0	9,8	0,9	2,9	2,5	8,2	0,8	2,6	1,5	4,9	0,6	2
2431	2860	27	-	3,0	9,8	0,7	2,3	2,5	8,2	0,5	1,6	1,5	4,9	0,4	1,3
2861	3414	32	-	3,0	9,8	0,7	2,3	2,5	8,2	0,5	1,6	1,5	4,9	0,4	1,3

(*) number and type of elements to make one insulator ring around the entire circumference of the carrier pipe.

(**) The element H was designed as special pipe sizes for closing element in order to complete the circumferences on some pipe OD ranges. Therefore it is not possible to use more than 1 elements H in a ring.

TYPE	H (mm)	PIECES FOR CARTON BOX	CARTON DIMENSIONS (cm)	CARTONS WEIGHT (Kg)	
				Net	Gros
E	25	50	60 x 40 x 50	28	30
	41	26		18	20
	41 (R)*	26		20	22
	60	18		15	17
	75	14		14	16
	90	12		14	16
	110	10		13	15
	130	8		10	12
H	25	60	60 x 40 x 50	21	23
	41	58		22	24
	60	40		16	18
	75	30		13	15
	90	26		12	14
	110	22		10	12
	130	20		9	11

Note: for logistic reasons, deliveries are for full carton boxes only.

(*) R = Reinforced.

TOOL FOR SPACERS

MOD. 13204 (A75) | **H. MAX** 18-75 mm
MOD. 13205 (A200) | **H. MAX** 90-200 mm
 FOR COLLAR FAMILIES M / N / P / Q / L



MOD. 13206 (B75) | **H. MAX** 25-75 mm
MOD. 13207 (B130) | **H. MAX** 90-130 mm
 FOR COLLAR FAMILIES E / H

MOD. 13208 (C90) | **H. MAX** 18-90 mm
 FOR COLLAR FAMILIES M / N / F / G
 Combined gear and threaded rod spacers clamp tool.

CHARACTERISTICS

- Movable and fixed stainless steel jaw with high strength.
 - Threaded chrome rod with special nitrating treatment to increase the mechanical strength.
 - Operating by standard reversible ratchet key tool provided by safety lock device.
 - Simple and basic design with few elements.
 - Protection cap upon rotating gear to assure hand safety.
 - Reduced clamping torque thanks to the big dimensions of the gear.
 - New concept in handling: completely universal both referring hand hold and tightening direction.
- » For assembling collars, strictly adhere to the "ASSEMBLY INSTRUCTIONS" on page 13.5 or the multilingual instructions manual which comes as part of the supply.



MATERIALS

Main body (fixed and mobile jaw):
 Stainless steel X5CRNICUNB16-4 - AISI 630

Wheel pin:
 Hardened steel gear

Gear:
 Hardened steel 38 n d4

Self-lubricating bushing:
 Synthesized steel

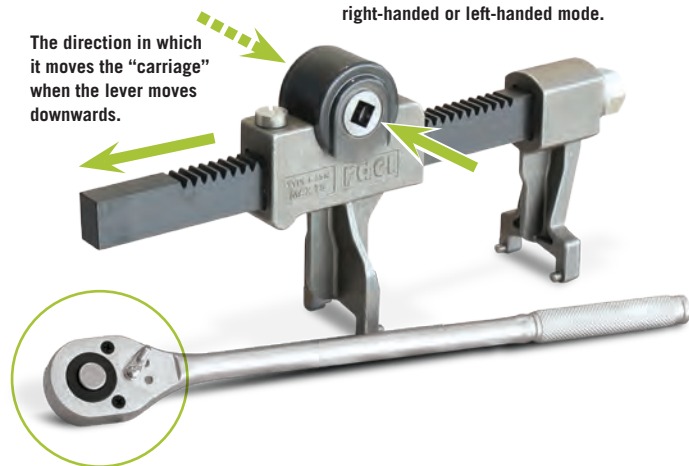
Protective cap:
 Polycarbonate

M12 buffer and nut:
 Stainless steel a2

Threaded rod:
 Galvanized hardened steel 40CRMNMO7 - AISI P20

The direction in which it moves the "carriage" when the lever moves downwards.

You can apply the lever in right-handed or left-handed mode.



POLYPROPYLENE CASE: 482 x 375 x 132 mm

MOD. TOOL	TOTAL WEIGHT (kg)
13204	5,6
13205	6,3
13206	6,1
13207	6,6
13208	5,4



SNAP TIGHTENING TOOL**MOD. 13201 (EEE5)** | **H. MAX 20 mm**FOR COLLAR FAMILIES **C / D / I / S / T**

Tightening tool for manually operated tightening.

**CHARACTERISTICS**

- Snap tightening tool.
- Self-locking and adjustable clamp, by screw adjustment.
- Basic design in a single element.
- To be used only for the small elements (C, D, I, S, T).

MATERIALS

body:
Steel plate

Spring:
Stainless steel

Jaws:
Vanadium Chrome steel



Applying a collar D.

PIPE END SEALS
ESPANSIT - TYPE Z

MOD. 13300

DN INT. PIPE 50-900 mm
DN EXT. PIPE 100-1050 mm



Bellows end seals for sealing the gap between the main pipe and the jacket pipe at the ends of crossing.

CHARACTERISTICS

- 10% tolerance on the outer diameter of the casing pipe and carrier pipe.
- Line obtained by moulding, the several waves allow high adaptability even for eccentric applications.
- Can be used only on new pipelines.
- Simple fastening with metal straps (included).

MATERIALS

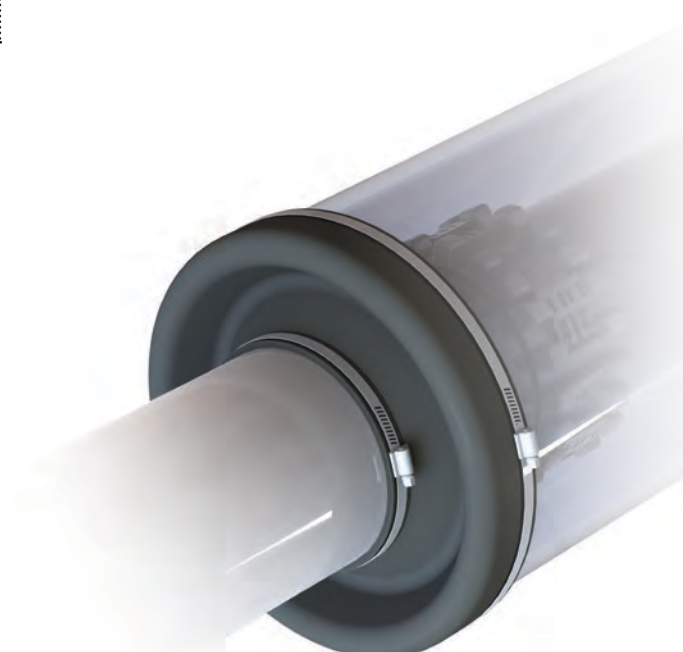
Rubber EPDM:
 Hardness 50 ± 5 Shore A (UNI 4916)

Colour:
 Black

Tensile strength:
 ~11,6 MPa (UNI 6065)

Elongation:
 ~ 640 % (UNI 6065)

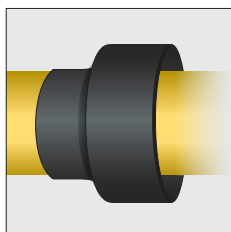
Straps:
 Stainless steel



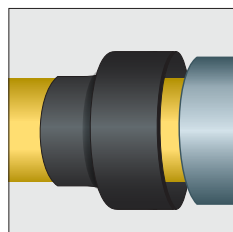
MAIN PIPE DN (mm)	CASING DN (mm)
from 50 to 900	from 100 to 1050



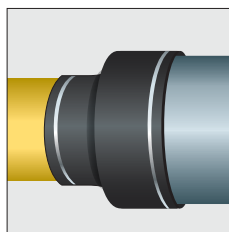
HOW TO APPLY THE TYPE Z ESPANSIT END SEAL



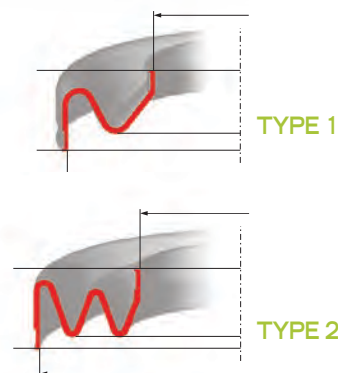
1. Insert the end seal on the main pipe before inserting the casing pipe or otherwise the final connection of the pipeline.



2. Insert the end seal on the jacket pipe.



3. Secure both pipes with the supplied straps.



Available with 1 or 2 waves.

EKF TYPE



MOD. 13500

DN INT. PIPE 0-150 mm

DN EXT. PIPE 100-600 mm

Multisize end seals for sealing the gap between the carrier pipe and the casing pipe at the ends of crossing.

CHARACTERISTICS

- Special frustum cone shape that allows the EKF end seal to be shortened according to the diameter of the main pipe.
- Suitable for a large number of carrier/casing pipe/end seal combinations.
- Can be used only on new pipelines.
- Cutting operations are made easier by the diametrical lines marked on the outer surface.
- Reduction in stock inventory due to the possibility of being applied on different diameters.
- Fastening on pipes with metal straps (included).

MATERIALS

Rubber EPDM:
Hardness 50 ± 5 Shore A (UNI 4916)

Thickness:
3-4 mm

Colour:
Black

Tensile strength:
~11,6 MPa (UNI 6065)

Elongation:
~ 640 % (UNI 6065)

Straps:
Stainless steel

MAIN PIPE DN (mm)

CASING DN (mm)

from 0 to 150

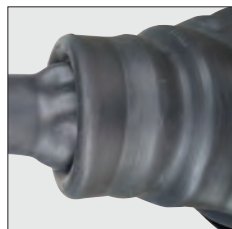
from 100 to 800



HOW TO APPLY MULTISIZE END SEALS



1. Spread the end seal out.



2. Place it on the crease to be cut.



3. Use a cutter on the crease.



4. Insert the end seal on the conduit pipe and then secure to the pipes with the supplied straps.

PIPE END SEALS
ESPANSIT - TYPE C

MOD. 13400 /KG

DN INT. PIPE 25-1300 mm
DN EXT. PIPE 37,5-3000 mm
 CLOSED VERSION



MOD. 13450 /KO

DN INT. PIPE 25-1300 mm
DN EXT. PIPE 37,5-3000 mm
 OPENED VERSION

Conical end seals for sealing the gap between the main pipe and the casing pipe at the ends of crossing.

CHARACTERISTICS

- Special frustum cone shape to compensate for the possible eccentric positions of the pipes.
- Fastening on pipes with metal straps (included).
- Available in an "open" version that is made up of a rubber sheet which can be wrapped around the pipeline, and then glued (using the included adhesive kit) on the flaps so as to form a closed end seal.
- "Open" version can also be used for lines that are already installed.

MATERIALS

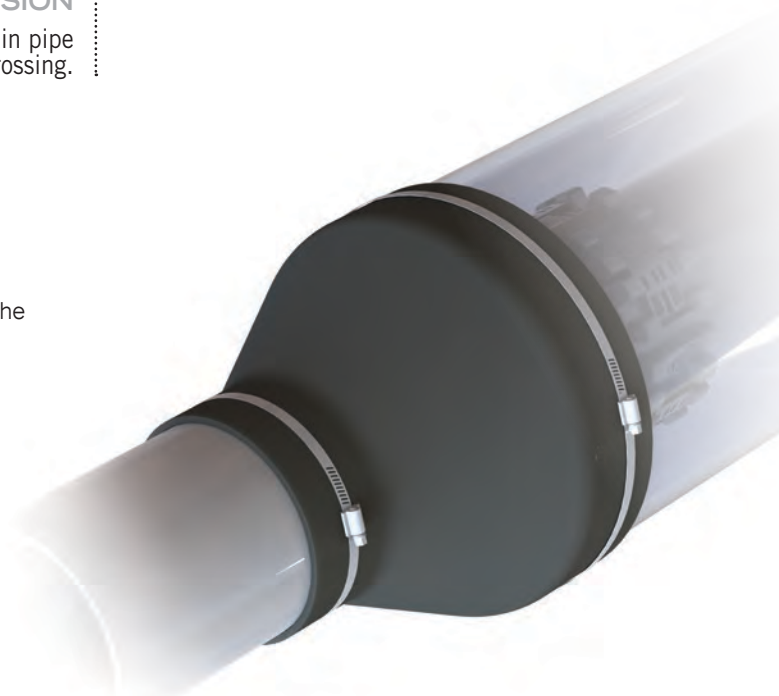
Rubber CR-SBR:
 hardness Shore A 65 ± 5 (UNI 4916)

Colour:
 Black

Tensile strength:
 ~6 MPa (UNI 6065)

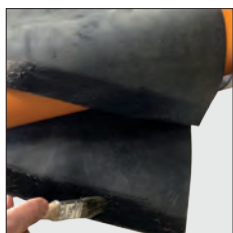
Elongation:
 ~200 % (UNI 6065)

Straps:
 Stainless steel



MAIN PIPE DN (mm)	CASING DN (mm)
from 25 to 1300	from 37,5 to 3000

HOW TO APPLY THE ESPANSIT OPEN VERSION END SEALS



1. Spread the glue on both sides that are to fit together, wrapping both around the pipes.



2. Ensure that the edges will adhere with sufficient strength.



3. Fix the pipes by the supplied straps.

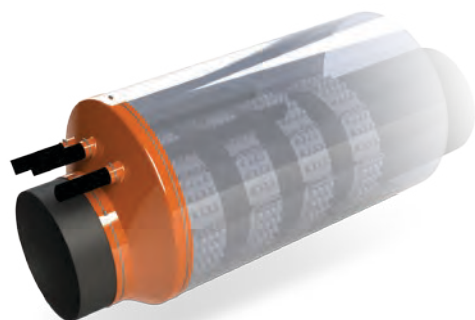
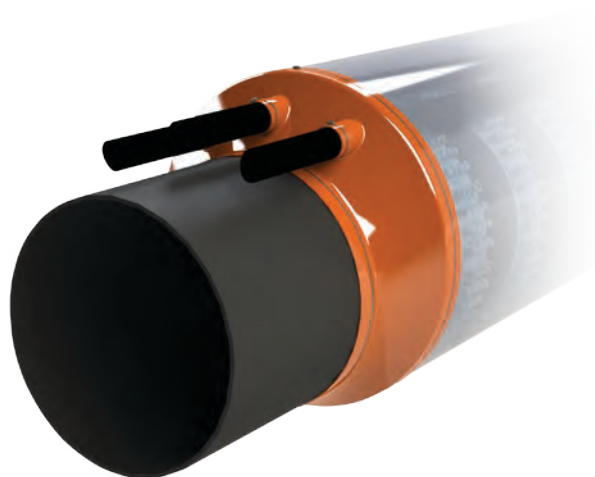
CLOSED VERSION

For this version it will be necessary to insert the end seal on the smaller pipe before installing it into the casing pipe. Finally, fix on both pipes using the supplied straps.

MULTI-HOLE TYPE STM

**MOD. 13550****DN INT. PIPE 50-1200 mm****DN EXT. PIPE 200-1600 mm**

Multihole end seals for sealing the cavity between the main pipe and the casing pipe at the ends of crossing.

**CHARACTERISTICS**

- Application in case of high eccentricity between the main pipe and the casing pipe.
- Available with several openings for the insertion of conduits in the same crossing.
- Dimensions and positions of the openings that can be customized prior to order (Fig.1: example schetch to be communicated when ordering).
- Available in a reinforced version (STMV) for application in case of high mechanical stress.
- Available in special version (STM-KMR) for low-pressure seal testing (i.e. water drainage pressure test), with the adhesive and additional extra-straps.
- Available in special material for classes of high fire resistance.
- Fixing on pipes by metal straps (included).

MATERIALS

PVC plastic:
Hardness 50 ± 5 Shore A

Thickness:
STM 6-8 mm / STMV 9-11mm

Colour:
Red

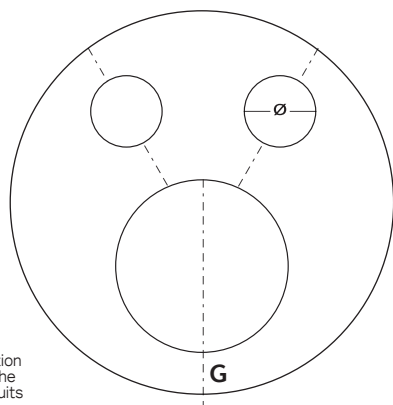
Fire resistance class:
B2 (DIN 53382/DN4102)

Tensile strength:
 ≥ 18 MPa

Elongation:
~ 360%

Straps:
Stainless steel

Fig. 1



O.D. jacket pipe

I.D. jacket pipe

H spacer

O.D. main pipe: position and size \varnothing of the additional conduits**HOW TO APPLY MULTIHOLE STM TYPE END SEALS**

For this version it will be necessary to insert the end seal on the main pipe before installing it into the casing pipe. Finally fix on the pipe by the supplied straps.

MAIN PIPE DN (mm)	CASING DN (mm)
from 50 to 1200	from 200 to 1600

PIPE END SEALS CSK TYPE

MOD. 13600

DN INT. PIPE 75-750 mm
DN EXT. PIPE 450-1200 mm



Heat shrinkable end seal for sealing the gap between the main pipe and the casing pipe at the ends of crossing.

CHARACTERISTICS

- It consists of an open band which must be wrapped around the pipe and welded with its own closure piece.
- The outer diameter of the casing pipe and the main pipe must be included into the range of shrinkage of the end sea, as to ensure a perfect sealing.
- The kit includes a PP holder to support the end seal once brought to its shrinkage.

MATERIALS

Crosslinked polyethylene:

Coated with an anti-corrosive layer

Colour:

Black

Operating temperature:

Max 65°C

Application/preheating temperature:

from - 20°C to + 50°C / Max 75°C

Thickness as supplied:

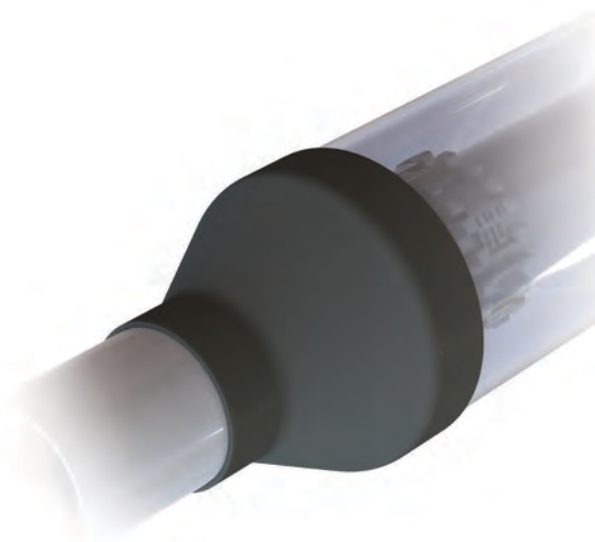
1,9 mm

Impact resistance:

15 Nm (DIN 30672)

Cathodic disbondment:

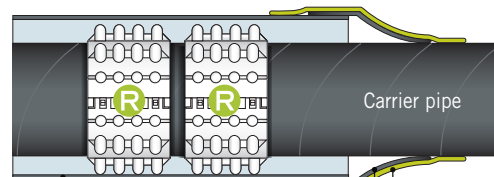
6 mm radius



H. (mm)	MAIN PIPE DN (mm)	CASING DN (mm)
650	from 75 to 400	from 125 to 750
900	from 450 to 750	from 800 to 1200

Other dimensions on request.

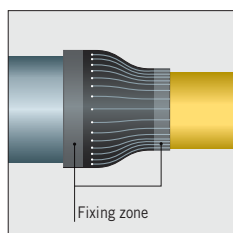
Double rings for the ends of the pipe



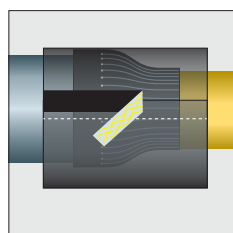
Jacket pipe

Heat shrinkable end seal
Plastic support

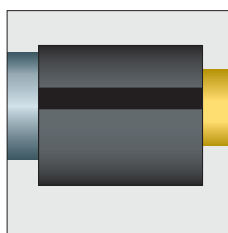
HOW TO APPLY CSK TYPE END SEALS



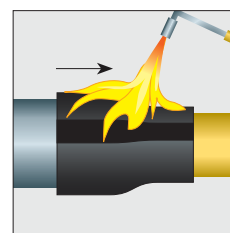
1. Wrap the jagged plastic support and secure it with adhesive tape, making it adhere correctly to the pipes.



2. Place the end seal above the support and close it with a preheated piece.



3. Adhere the piece uniformly so as to seal the sleeve.



4. Proceeding from the casing pipe to the main pipe, heat with the flame by performing the heat-shrinking.



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