Marks awarded to the programmes of the Water Supply and Heating Division:

Coesklima Superk®

Italy Germany Russia Ukraine Spain France

REFERENCE STANDARDS

UNI 10954-1	Metal-plastic multilayer piping systems for hot and cold water

Coestherm®

Italy Germany Germany Austria Spain Australia Croatia

Ukraine Russia Poland Sweden France Portugal – LNEC

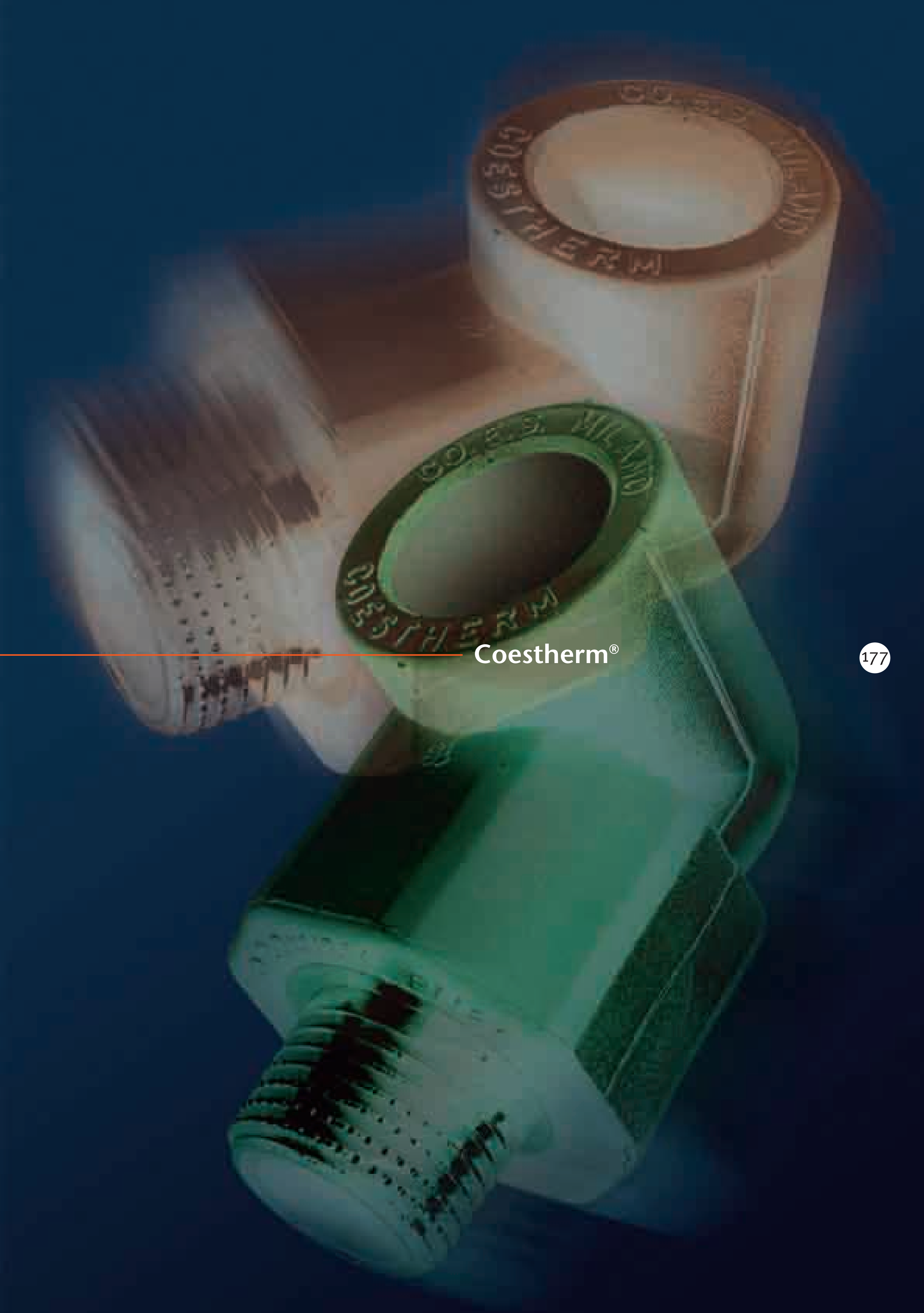
REFERENCE STANDARDS

DIN 8077	P.P. pipes - Dimensions
DIN 8078	P.P. pipes - Quality regulations - Tests
DIN 16962	Connections and fittings for P.P. pipes under vacuum - Dimensions
UNI EN ISO 15874	Plastic pipe systems (PP polypropylene) for installations with hot and cold water
DVS 2207	Welding thermoplastic materials using a heating element
DVS 2208	Machinery and devices for welding thermoplastic materials
DIN 2999	Threading for pipes and fittings. Cylindrical internal and conical external threading - Dimensions
ISO 228	Threading of pipes for coupling on the thread without seal – Design, Dimensions and Tolerances
UNI 9182	Cold and hot water supply and distribution systems – Design, testing and management criteria

Updated certifications are available for downloading in the Website www.coes.it

Water Supply and Heating

HVAC



Coestherm®

Coestherm®

Coestherm®

Coestherm® is a programme of pipes and fittings in random PP, from diam. 16 mm to diam. 125 mm, for transporting fluids in the following fields of use:

- **Adduction** of hot and cold water in sanitary, heating and air conditioning systems.
- **Transport** of chemicals and alimentary liquids in industrial applications
- **Irrigation** systems for greenhouses and gardens
- **Compressed** air systems

Random PP is a high-performance plastic material. It resists cracking, even under pressure, corrosion and chemicals. In addition, its molecular composition guarantees acoustic insulation and immunity to ground currents.

The Coestherm® programme is non-toxic and perfectly suitable for transporting drinking water and alimentary liquids (Italian Ministerial Decree dated 6.04.04 nr. 174, ex-circular 102).

Coestherm® pipes are produced conforming to the DIN 8077 standard; the fittings conform to DIN 16962 and take into account a minimum operating period of 50 years at pressures up to 10 bar with temperature of 60 °C for PN 20.

- LOW HEAD LEAKS AND HIGH THERMAL STABILITY
- PERFECTLY WELDABLE
- THE RAW MATERIAL IS NON-POLLUTING AND RECYCLABLE

PHYSICAL CHARACTERISTICS

CHARACTERISTICS	METHODS	UNITS	VALUES
SPECIFIC WEIGHT	ISO/R 1183	g/cm^3	0,895
FLUIDITY INDEX AT 190°C - WITH 5 KG	ISO 1133	g/10 min	0,4
FLUIDITY INDEX AT 230°C - WITH 2,16 KG	ISO 1133	g/10 min	0,3
MELTING POINT	polarisation microscope	°C	140-150

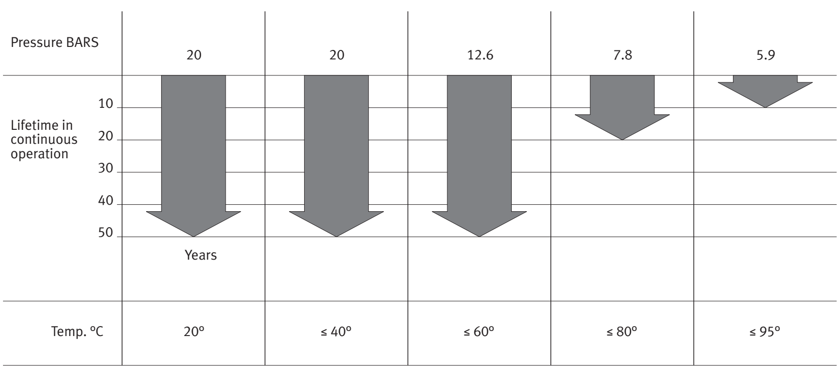
THERMAL CHARACTERISTICS

CHARACTERISTICS	METHODS	UNITS	VALUES
THERMAL CONDUCTIVITY AT 20°C	DIN 52612	W/m·K	0,24
SPECIFIC HEAT AT 20°C	adiabatic calorimeter	KJ/Kg·K	2,0
LINEAR THERMAL EXPANSION COEFFICENT	VDE 0304	K^{-1}	1,5×10^{-4}

MECHANICAL CHARACTERISTICS

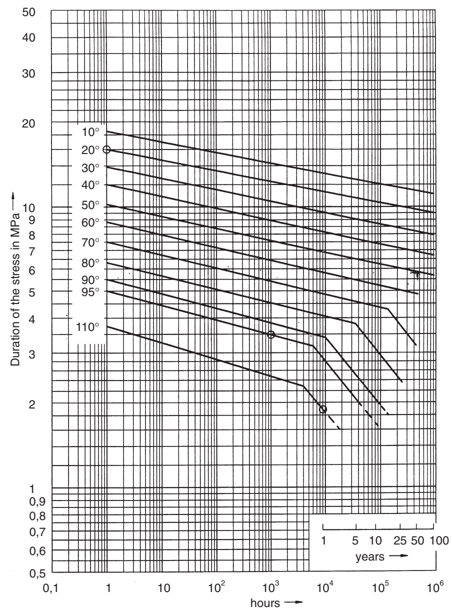
CHARACTERISTICS	METHODS	UNITS	VALUES
YIELD STRENGTH	ISO/R527	N/mm^2	21
BREAKING LOAD	DIN 53455	N/mm^2	40
ULTIMATE ELONGATION	DIN 53455	%	800
COEFFICIENT OF ELASTICITY	ISO 178	N/mm^2	800
HARDNESS TEST	ISO 2039	N/mm^2	40
RESILIENCE WITH TEST (CHARPY) ON UNCUT SPECIMEN			
AT 0°C	ISO 179	KJ/m^2	it does not break
AT –10°C		KJ/m^2	it does not break
RESILIENCE WITH TEST (CHARPY) ON UNCUT SPECIMEN			
A 0°C	ISO 179	KJ/m^2	7
A –10°C		KJ/m^2	3
IMPACT RESISTANCE AT 0°C	DIN 8078		it does not break

DIAGRAM OF LIFETIME IN CONTINUOUS OPERATION AT DIFFERENT TEMPERATURES AND PRESSURES (PN 20)



REGRESSION CURVES

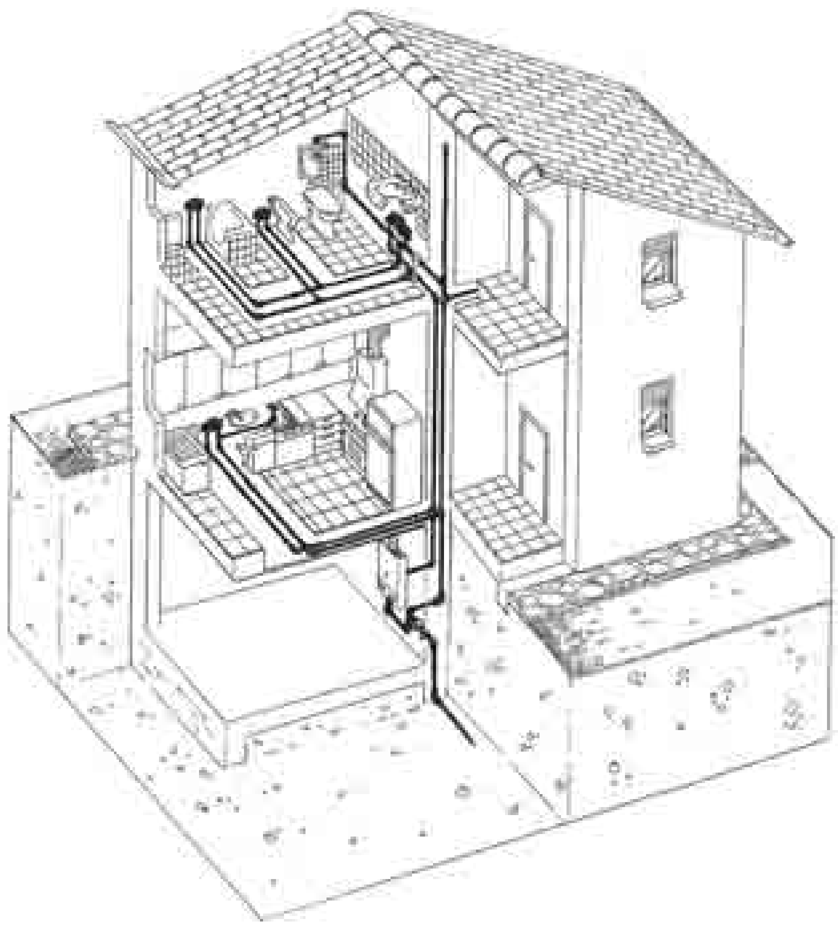
Coestherm® PP Random has the feature of resisting cracking under stress as the following regression curves demonstrate:



CHARACTERISTICS AND SYSTEM PROPERTIES

Coestherm® was designed to transport hot and cold water under pressure for the following fields of use:

- **Hydro-sanitary systems**
- **Systems for transporting alimentary liquids**



CONNECTION TECHNIQUES

The Coestherm® connection technique is based on two systems: welding and mechanical screwing

Welding technique:
Polyfusion
Electric sleeve
Star joints
Stabi pipe

Screwing techniques:
Threading

WELDING BY MULTI CASTING

Coestherm® is welded with a system called **“socket”**. In this way the pipes and fittings are joined together by overlapping.
The two ends of the pipes and of the socket of the fittings are heated with a heating element with bushing and spindle.
The optimum welding temperature for Coestherm® is 260°C (±5).
Fig. 1 shows the welding process sequence.

HEATING ELEMENT

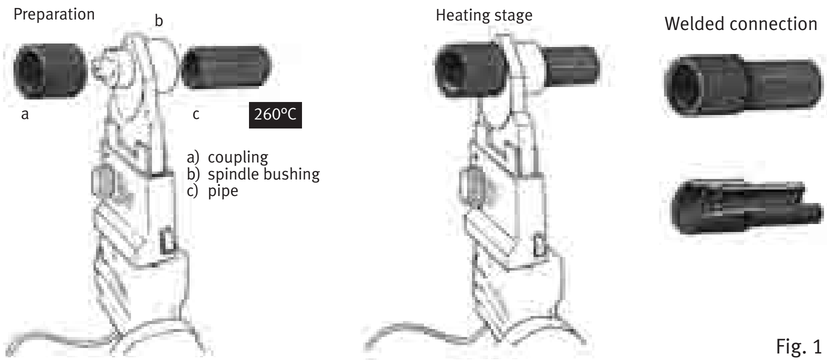


Fig. 1

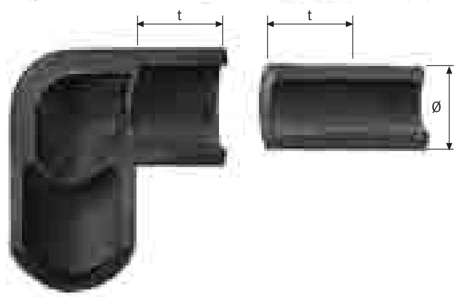


Fig. 2

PREPARATION FOR WELDING

Cut the pipe perpendicular and round off the sharp edges of the section. Thoroughly clean the end of the pipe and the socket of the fitting with alcohol and absorbent paper.
Mark the depth of the socket on the pipe (as shown in *Fig. 22*).

NOTE: Make sure that the temperature of the heating element has reached 260°C (±5).

INDICATIVE VALUES FOR SOCKET WELDING WITH HEATING ELEMENT AND A TEMPERATURE OF 20°C

Pipe Ø	heating sec s	max. interval sec s	cooling min
20	7	4	2
25	7	4	2
32	8	6	4
40	12	6	4
50	18	6	4
63	24	8	6
75	30	8	6
90	40	8	8
110	50	10	8

TABLE OF SOCKET DEPTHS FOR PP-R FITTINGS

pipe Ø	socket depth = t (mm)
20	14,5
25	16
32	18
40	20,5
50	23,5
63	27,5
75	31
90	35,5
110	41,5

MAKING THE WELDING

During this operation, pipe and fitting are held motionless, preventing them from turning. The pipe is quickly inserted axially into the bushing (up to the marking line on the socket), whereas the fitting is pushed all the way on the spindle. During this operation, pipe and fitting are held motionless without letting them turn. The surfaces to be joined are heated according to the table (*Fig. 23*). After the heating time has passed, the pieces are extracted from the heating element and immediately joined axially without turning them. You have to pay attention to the right coupling depth. The pipe must be inserted up to the previously marked point, meaning up to the bottom of the socket. It is advisable to continue keeping the two parts fixed for a certain period of time (equivalent to approximately the heating time). The welded connection can be subjected to mechanical stress only after the cooling time has passed. The bushing and spindle have to be thoroughly cleaned after each welding operation.

INSTRUCTIONS FOR WELDING BY MULTI CASTING

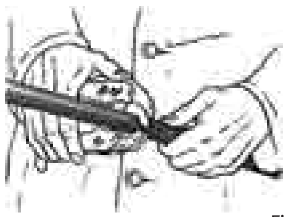


Fig. 1

Cut the pipe perpendicularly, using shears or the pipe cutter (*Fig. 1*).

Fig. 2

Clean the end of the pipe and the socket of the fitting with alcohol and absorbent paper.
Mark the depth of the fitting's insertion on the pipe (*Fig. 2*). Consult the depth table for calculating the depth of the socket of the fittings with respect to the Ø.

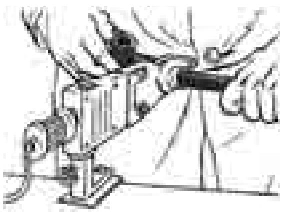


Fig. 3

Heat the pipe and fitting at the same time (as indicated in *figure 3*).

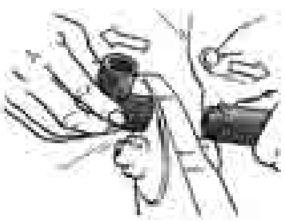


Fig. 4

After the heating time has passed (*Fig. 4*), detach the pipe and fitting from the heating element at the same time.

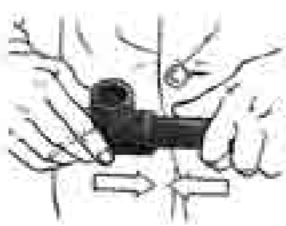


Fig. 5

Join the pipe and fitting without turning them within the allowable time (*Fig. 5*).

WELDING WITH ELECTRIC COUPLING

The electric coupling works according to a very simple principle. A properly sized heating element that can be connected to the coupling welding machine with plug pins is inserted inside the coupling body using a special, exclusive Coes technology.
All you have to do is connect the plug pins to the coupling welder, press "Start" and the current that flows through the electric coupling will develop such a quantity of heat as to make the multi casting between fitting and pipe optimum.
The Coestherm® electric coupling has a stop ring that can be disassembled. This solution lets us have a precise retainer when coupling the pipe, and is extremely useful for repairs. In fact, the coupling can freely slide over the pipe when the stop ring is removed.

INSTRUCTIONS FOR WELDING WITH ELECTRIC COUPLING

To get proper welding with the electric coupling, cut the pipe suitable and perpendicular to the axis (*Fig. 1*).

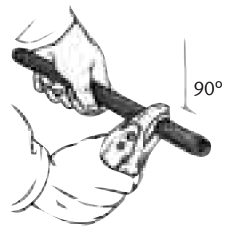


Fig. 1

Scrape the surface of the pipe with a scraper to remove impurities.
Clean the pipe and coupling with alcohol or a proprietary detergent (*Fig. 2*).


Fig. 2

Insert the pipe observing the coupling depth.
For this purpose mark the pipes with the special pencil so as to get exact centring of the coupling and prevent any unthreading (*Fig. 3*).

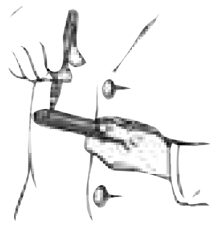


Fig. 3

During welding and consequent cooling stage, prevent all possible external stresses for a minimum time of 4 minutes (*Fig. 4*).

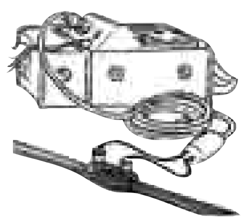


Fig. 4

Wait at least 2 hours (from the most recent welding) before putting the system under vacuum (*Fig. 5*).

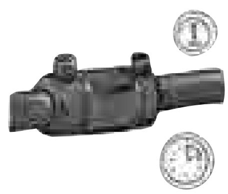


Fig. 5

COUPLING BY THREADING

All of the metal inserts inserted into Coestherm® are made of OT 58 brass and the threading is made in conformity with the ISO 228 and DIN 2999 standards.

INSTRUCTIONS FOR WELDING COESTHERM® SADDLE JOINTS

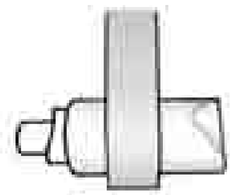


Fig. 1

Abide by the following instructions when welding the saddle joints of diameter 20, 25 and 32 (manual welding).
Place the special matrixes on the multi caster (*Fig. 1*).

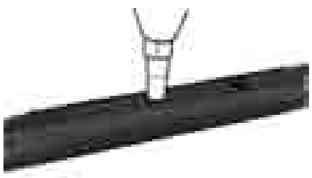


Fig. 2

Mount the cutter of the desired diameter on a drill and drill the pipe in the pre-established point (*Fig. 2*).

Fig. 3

Insert the matrix with white pin (*Fig. 1*) into the previously made hole and at the same time set the saddle joint in the hollow matrix. Move the saddle joint away from the matrix at the end of the heating stage and at the same time remove the multi caster from the pipe (*Fig. 3*).

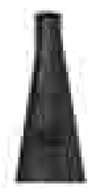


Fig. 4

Set and centre the saddle joint a few seconds later, and keep it pressed down for about 30 sec. so that it creates an even 1.5-mm bead (*Fig. 4*).

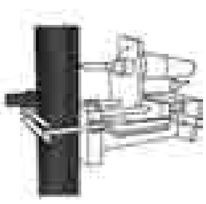


Fig. 5

It is advisable you use special equipment for the saddle joints of diameter 40, 50, 63 and 75 so as to ensure the correct thrust force (*Fig. 5*). The same equipment can also be used for welding diameters 20, 25 and 32.

INSTRUCTIONS FOR WELDING STABIPIPE PIPES

Before you do any welding on the Stabipipe pipe, you have to eliminate the layer of aluminium using the special cutter (*Fig. 1*).
Depending on the type of welding, the pipe must be milled with two different depths.

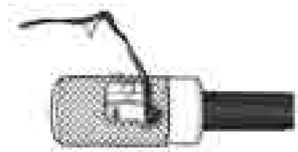


Fig. 1

The cutters supplied by Coes are fitted for socket welding. For welding the electric couplings, you have to remove the setscrews (*Fig. 2*).

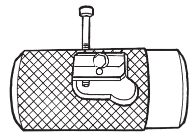


Fig. 2

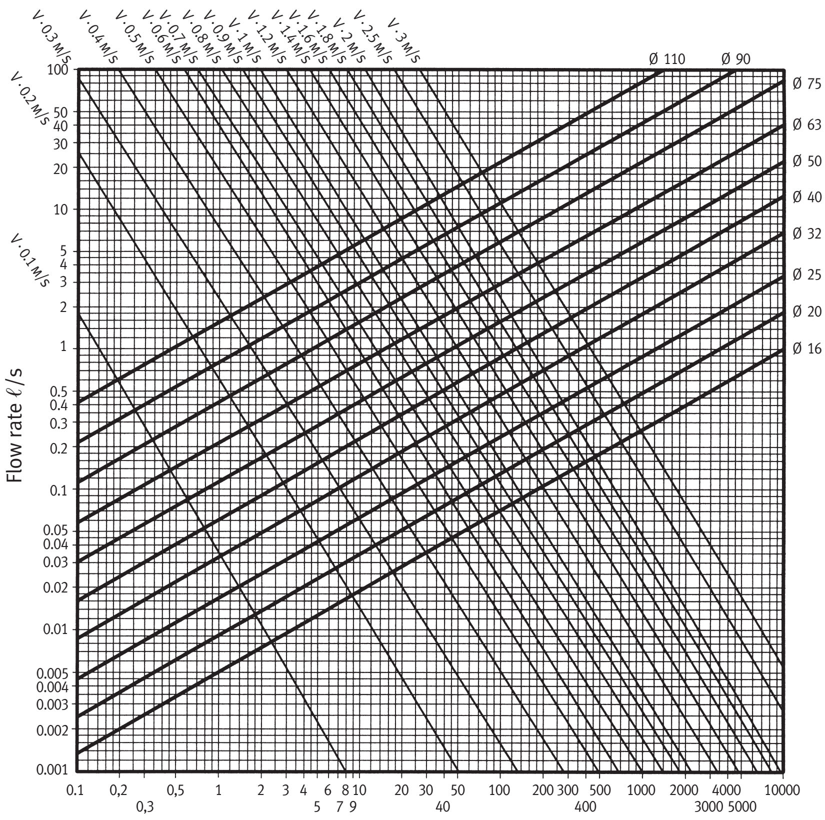
Socket welding: milling depth depending on the diameter (*Fig. 3*).

Fig. 3

Welding with electric coupling milling depth equivalent to half of the length of the electric coupling (*Fig. 4*).

Fig. 4

DIAGRAM OF COESTHERM® PIPE FLOW RESISTANCE



System design and execution

Follow the standards in force in the countries of application.
The UNI 9182 standard is valid in Italy.

Flow resistance

The flow resistance values for straight Coestherm® pipes can be obtained from the diagram.

Flow resistances in Coestherm® fittings

The data in the table that follows can be used for the individual resistance of the fittings, bearing in mind that they are approximate values.
The resistance of the connections must be determined as a whole. You can add 3-5% to the total flow resistance as an indicative value.

Ø EXT. FITTING	16 20 25	32 40	50 63	≥ 63
type of fitting	resistance coefficient			
	1,5	1,0	0,6	0,5
	2,0	1,7	1,1	0,8
		0,3		
		1,5		
	inlet	0,5		
	effect	1,0		

Insulation

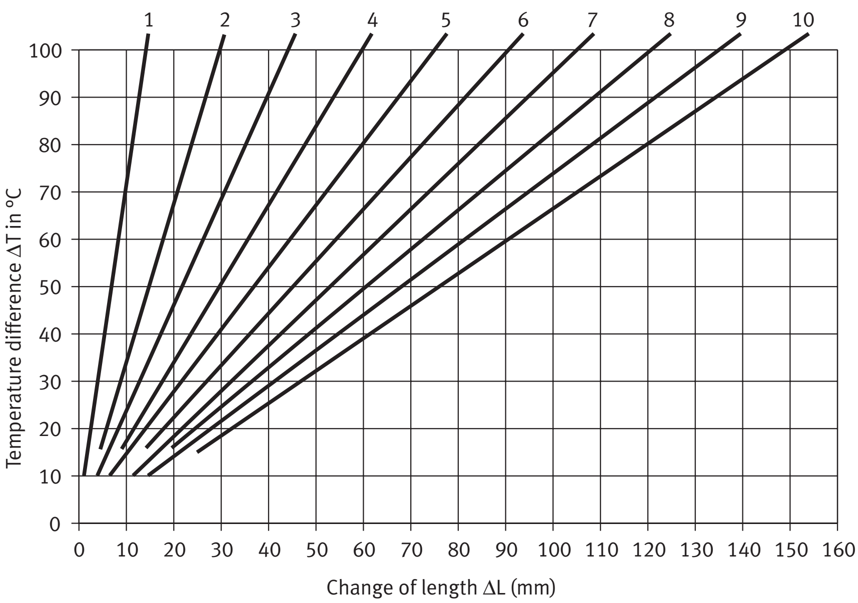
In using PP-R pipes for building hot water, heating and air conditioning systems, refer to the standards in force in order to determine the value of the insulating layer, if any.

Change of length of the PP-R pipes due to the action of the heat (thermal stress)

If exposed to a change of temperature, the PP-R pipes are subject to relatively high thermal expansion.
Longitudinal thermal expansion of these pipes is about 11 times greater than in steel pipes.
This phenomenon must necessarily be taken into consideration during installation, but all the possibilities regarding positioning – or rather, the layout of the pipes – must be examined during the design stage in order to compensate the thermal expansion phenomena that may arise.
The changes of length of pipes up to 10 can be found in the following diagram.
The linear thermal expansion coefficient for Coestherm® pipes is:

$$\varepsilon t = 1.5 \cdot 10^{-4}\ (K^{-1})$$

DIAGRAM OF COESTHERM® PIPE CHANGE OF LENGTH



Expansion comparison
PP-R/STABIPIPE

PPR 10 m Δt 50 = ΔL 75 mm
STABIPIPE 10 m Δt 50
= ΔL 17.5 mm

The linear thermal expansion coefficient for Coestherm® STABIPIPE pipes is:

$$\varepsilon t = 0.35 \cdot 10^{-4}\ (K^{-1})$$

Aside from the diameter and thickness, the change of length of a pipe is calculated according to the following formula:

$$\Delta L = L \times \Delta t \cdot \varepsilon t \qquad (mm)$$

ΔL = linear thermal expansion (mm)
εt = longitudinal expansion coefficient mm/m °ΔC
L = pipe length (m)
Δt = temperature difference (°C)

Calculation of the change of length (ΔL)is obtained depending on the design temperature. The method of calculation is clarified in the following example.
Example for a pipe 8 cm long, with a design temperature of + 16°C.

1. minimum pipe wall temperature = + 9°C (e.g. cold water pipe)
   difference Δt = 16°C – 9°C = 7°C
2. maximum pipe wall temperature = + 70°C (e.g. cold water pipe)
   difference Δt = 70°C – 16°C = 54°C

In case 1: contraction of the pipe = 8m × 7°C × 0.15 = 8.4 mm
In case 2: expansion of the pipe = 8m × 54°C × 0.15 = 64.8 mm

In the majority of cases the change of length can be compensated with a change of pipe direction (*Fig. 1* and *2*).

EXPANSION COMPENSATION BY CHANGE OF DIRECTION

You have to make sure that the pipe can move freely in an axial direction, and in this case if compensation by change of direction is not possible, you have to install expansion curves. Generally speaking, axial compensators are not suitable for the purpose and moreover, they are not economic. You have to calculate the length of the flexible arm of the pipe by using the formula that follows in order to achieve compensation:

$Ls = K \cdot \sqrt{d \cdot \Delta L}$ (mm)

where: Ls = length of the arm (mm)
d = external diameter of the pipe (mm)
ΔL = change of length (mm)
K = constant depending on the material used (for PP = 20).

The compensation systems depending on the linear expansion are illustrated in the diagrams of *Fig. 1*, *2* and *3*.

PF = fixed point

PS = sliding point

L = length

ΔL = Change of length

Ls = length of the arm starting from the fixed point

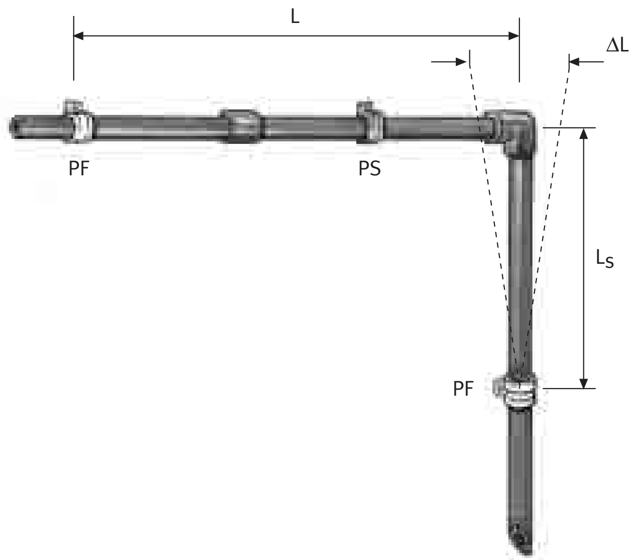


Fig. 1

Having defined the stretch of pipe L, we calculate ΔL with the formula:

$$\Delta L = L \cdot \Delta t \cdot \varepsilon t$$

from which we get the length of the flexible arm and the position where the bracket is to be installed for the fixed point with the formula:

$$Ls = K \sqrt{d \cdot \Delta L}$$

PF = fixed point

PS = sliding point

ΔL1 = changes of length

Ls = length of the arm starting from the fixed point

Ls1 = length of the arm starting from the sliding point

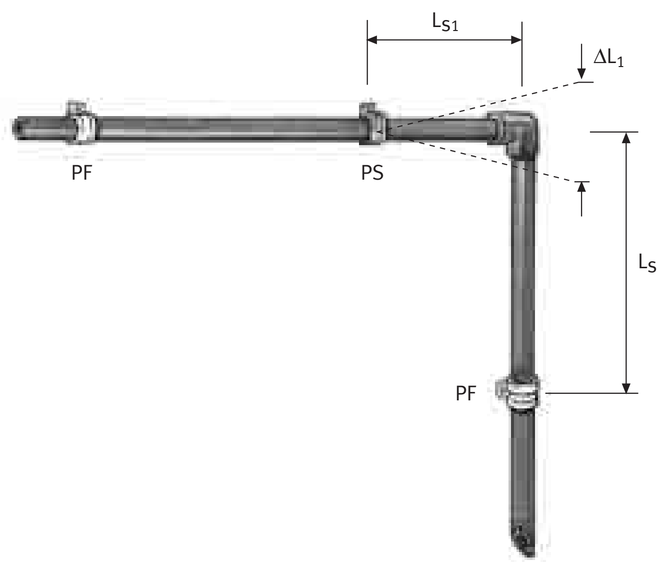


Fig. 2

In *Fig. 2*, having defined the stretch of pipe L_s, we calculate ΔL_1 with the formula:

$$\Delta L_1 = Ls \cdot \Delta t \cdot \varepsilon t$$

from which we get the length of the flexible arm with the formula:

$$Ls_1 = K \sqrt{d \cdot \Delta L_1}$$

We determine the position of the sliding point (PS) bracket depending on the expansion of the flexible arm Ls_1.

EXPANSION COMPENSATION BY EXPANSION CURVES (Ω)

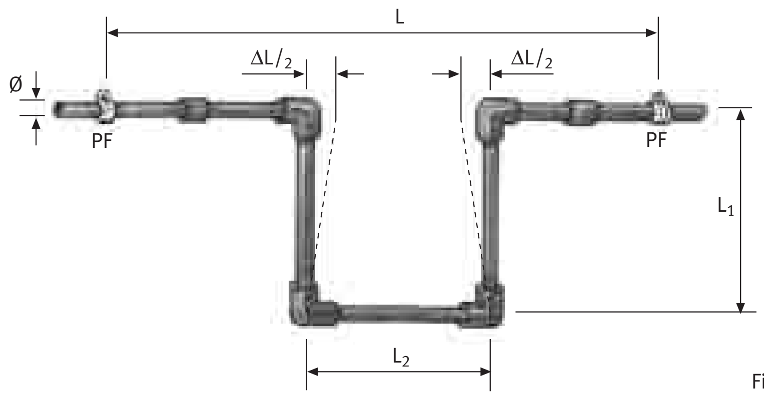


Fig. 3

PF = fixed point

L = length

ΔL = changes of length

Ø = external pipe diameter

Ls = length of the arm ($2L_1+L_2$)

Having defined the stretch of pipe L, we calculate ΔL with the formula:

$$\Delta L = L \cdot \Delta t \cdot \varepsilon t$$

from which we get the length of the flexible arm with the formula:

$$Ls = K \sqrt{d \cdot \Delta L}$$

that depicts the sum of the stretches of pipe of the expansion curve (Ω), so:

$$Ls = 2L_1 + L_2$$

The value of L_2 is always equal to $1/2\ L_1$.

For pipes exposed to thermal stress that are installed into chase, you have to bear in mind the possible mechanical stresses transmitted by the pipe to the structure.

Fixed point and sliding point

The type and frequency of the pipe fastenings are determined by the construction type of system and by the expansions, if any.

The fixed points must divide the pipe into stretches in which contraction or expansion is possible, however without ever releasing the expansion on the inserts or fittings. The guide of these stretches is made using sliding point bands. The distance between bands, i.e. the distance between the support points, primarily depends on the working conditions and on the weight of the pipe (passing fluid included).

In practice, the distances between the supports shown in the following table (*Fig. 4*) have proven valid.

Note: Fastening of the pipe must take into account the expansions and relative axial thrusts.

DISTANCE BETWEEN THE SUPPORTS IN cm AT STANDARD TEMPERATURE:

Ø mm	20°C	30°C	40°C	50°C	60°C	70°C	80°C
16	75	70	70	65	65	60	55
20	80	75	70	70	65	60	60
25	85	85	85	80	75	75	70
32	100	95	90	85	80	75	70
40	110	110	105	100	95	90	85
50	125	120	115	110	105	100	90
63	140	135	130	125	120	115	105
75	150	150	140	140	125	115	105
90	165	160	150	150	140	125	115
110	190	180	170	170	160	140	130

Fig. 4

Curvature

It is possible to make the curves by using hot air blowers (industrial dryers); the radius of the curves must be ≥ 8 times the pipe diameter.
Use of flame is absolutely not recommended.

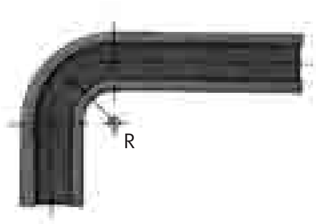
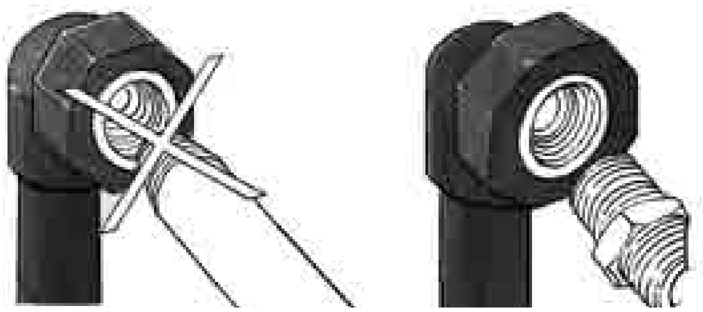


DIAGRAM OF THE RADIUSES OF CURVATURE

Ø pipes	cold curvature (R = 8xd)
20	160
25	200
32	256
40	320
50	400
63	500

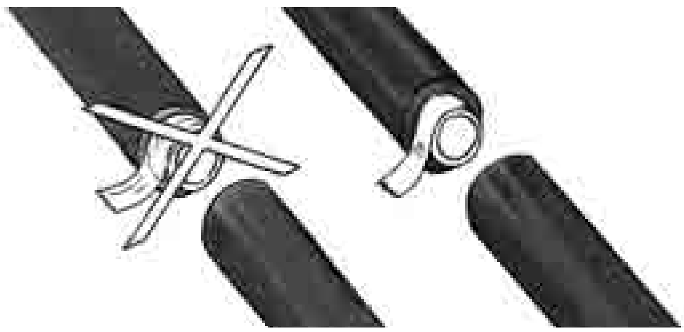
Connection by threading

It is advisable you make connections only with fittings having the same identical type of threading (see DIN 2999). Moreover, do not use fittings having unsuitable conical threading connected with "female" PP-R fittings having cylindrical threading.



Hydraulic seal

Use Teflon or similar material for the seal with other metal fittings, however without lavish use.

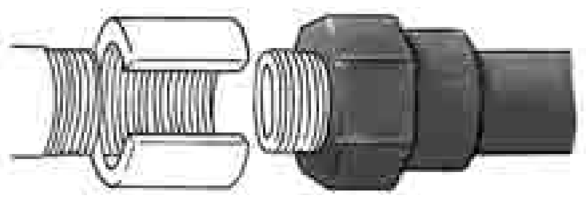


Thermal treatment of the threads and knurl

The inserts with female thread of the Coestherm® line are subjected to a thermal treatment process to detension them so as to get an optimum hardness value equivalent to "100 Brinell", a value that gives the insert remarkable mechanical features.
The special configuration of the outer surface of the insert (knurl) permits optimum cohesion between the insert made of OT 58 and the PP-R, also ensuring considerable resistance to the phenomenon of torsion between the two materials.

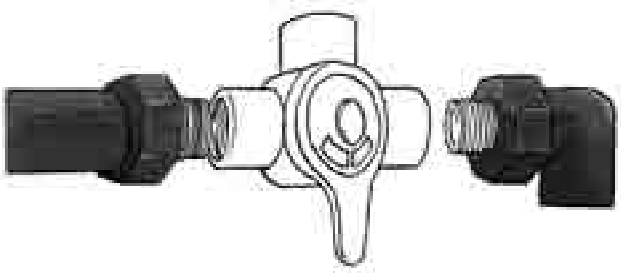
Connection between the PP-R fitting and iron pipe

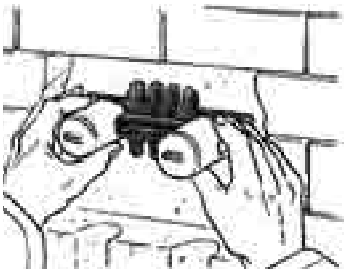
In the case of connection with an existing galvanized iron pipe, be sure to connect the PP-R pipe using a fitting with a male thread, interposing an iron coupling.
It is absolutely unadvisable to connect it with a fitting having a "female" thread.



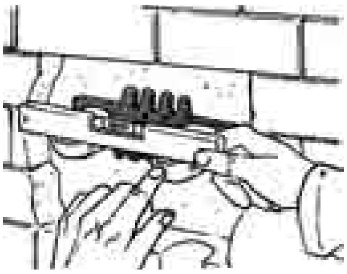
Connection between the PP-R fitting and built-in unit

Use the "male" fittings for connection between a built-in tap body and PP-R pipe, avoiding use of fittings with "female" thread and nipples with conical thread.



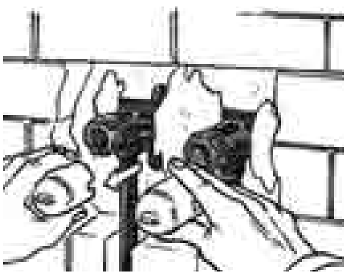


Position the bracket complete with polystyrene in the wall excavation at the envisaged heights or in the position indicated by the installer.

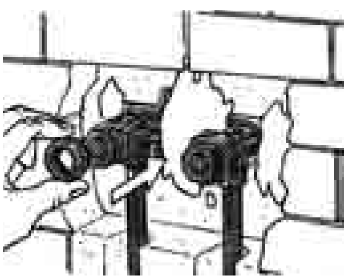


The surface plates of the bracket (transversal and longitudinal) must be perfectly calibrated. For this purpose use a water level and the specially provided support appendices provided on the polystyrene mould as points of reference.

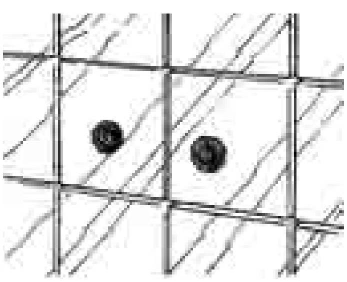
The installation depth must be about 56 mm from the finished surface (complete with covering). The exact reference is given by the reduction shown on the polystyrene. Secure the bracket (with mortar) in the centre part and on the sides beside the two polystyrene cylinders while being careful to not obstruct the vertical passages (above and below).



Remove the polystyrene protection only when you insert the octagonal fittings. Prevent foreign bodies from getting into the seats.
A perfect housing of the fittings in the seats is essential for good installation.



Insert the fittings as shown in the figure. Then lock them with the relevant octagonal ring nut, making its rounded part coincide with the cylindrical part of the fitting.



When the job is completed, the finished surface will coincide with the external faces of the two fittings. The threaded parts will face the established centre distance and be aligned for fixing the fittings.

Hole Repair

In the case you make a hole in a PP-R pipe, it is possible to repair it by using the special tool to be mounted on the multi caster and the special hole repair patch (*Fig. 1*).

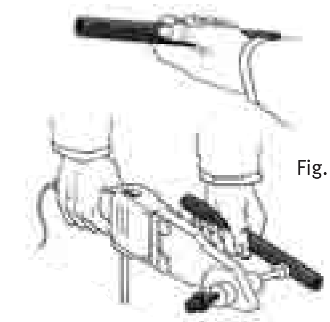


Fig. 1

Changing the insert

Should the female Ø 1/2" insert accidentally break, it is not necessary to remove the fitting – breaking tiles and masonry – but it is possible to avoid all of this by using the special repair KIT and replacing only the threaded ring nut (*Fig. 2*).

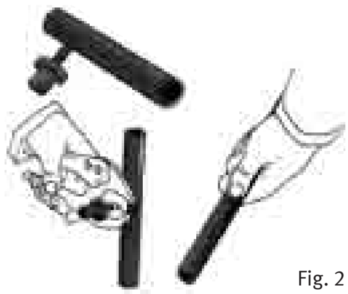
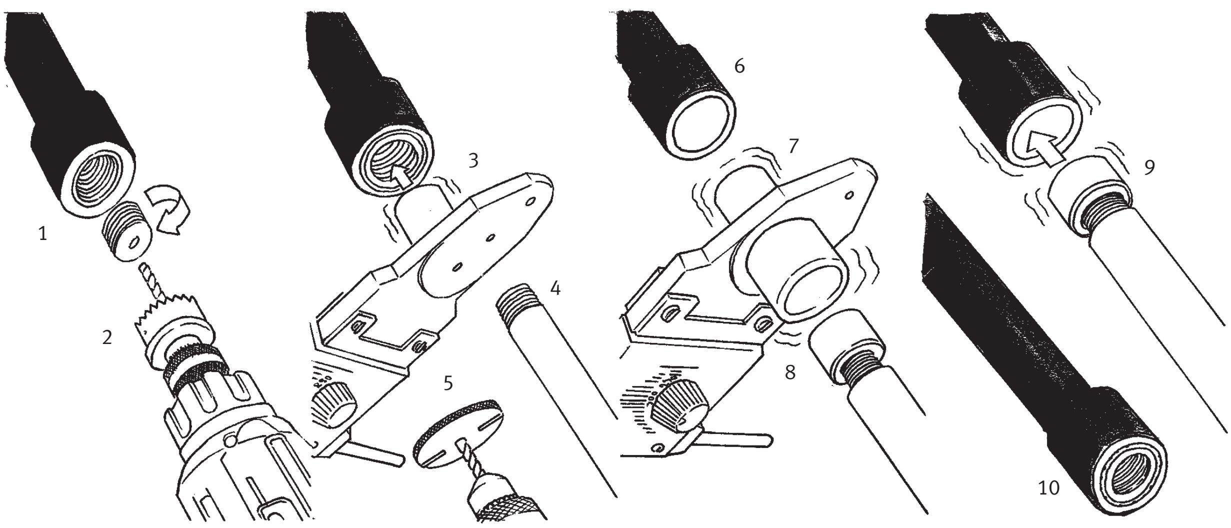


Fig. 2

Using the bracket

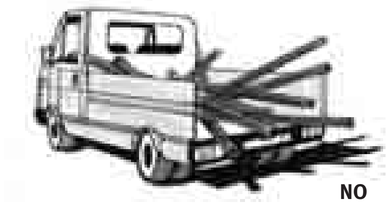
In order to make execution of PP-R systems simpler and more effective, Coes has designed and patented the bracket for fixed point for securing threaded terminals.

1. Screw on the bored 1/2" pawl (1) on the insert to be replaced.
2. Mark the depth of the insert, 18 mm, with chalk on the hole saw (2) and cut, pivoting in the hole.
3. Set the extended matrix (3) on the insert for heating.
4. To make extraction of the pawl to be replaced easier, use a 1/2" bar of pipe threaded on one side (4).
5. Plane the bottom of the fitting with the mill (5), holding the drill forcefully until the four protuberances on the bottom have reached a thickness of about 0.5-1 mm
6. Thoroughly clean the surfaces to be welded with alcohol.
7. Heat the fitting with the extended male matrix.
8. Screw the new insert (8) on a 1/2" bar of pipe and heat it with the female matrix D 32 for about 7/8 seconds.
9. Weld while pushing the insert down to the bottom of the fitting.
10. Before connecting to the thread, the welding must be completely cold.

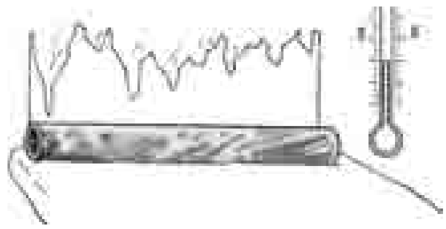


Note: CO.E.S. S.p.A. declines all responsibility for damages caused by non-observance of all the operations described above and/or by welding done with unsuitable equipment.

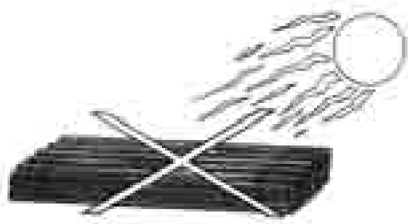
Loading – Installation
Be careful in moving pipes and never install damaged pipes or fittings.



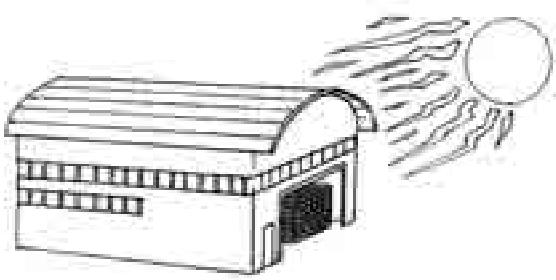
Low temperatures
With temperatures close to 0°C, Coestherm® tends to become fragile, so additional cautiousness is advisable in all machining stages (as previously described, pay attention when cutting the bars).
It is a good rule of thumb to always empty the pipes when it is believed that water may freeze in order to prevent breaking phenomena.



Exposure to UV rays
Although it is adequately stabilised, Coestherm® suffers from UV rays. It is therefore recommended that you do not install PP-R pipes directly exposed to sunlight without adequate protection.



Storage
The height of the stack of pipes, as a rule, must not exceed 1.5 m.



PN 10 pipe for cold water

CODE	d	L	di	s	S
TA20C4	20	4000	16,2	1,9	5
TA25C4	25	4000	20,4	2,3	5
TA32C4	32	4000	26	3,0	5
TA40C4	40	4000	32,6	3,7	5
TA50C4	50	4000	40,8	4,6	5
TA63C4	63	4000	51,4	5,8	5
TA75C4	75	4000	61,2	6,9	5
TA90C4	90	4000	73,6	8,2	5
TA11C4	110	4000	90	10	5

PN16 pipe

CODE	d	L	di	s	S
TA32D4	32	4000	19,2	4,4	3,2
TA75D4	75	4000	54,5	10,3	3,2
TA90D4	90	4000	65,4	12,3	3,2
TA11D4	110	4000	79,8	15,1	3,2
TA12D4	125	4000	90,8	17,1	3,2

PN20 pipe

CODE	d	L	di	s	S
TA1604	16	4000	10,6	2,7	2,5
TA160L ●	16	–	10,6	2,7	2,5
TA200L ●	20	–	13,2	3,4	2,5
TA2004	20	4000	13,2	3,4	2,5
TA2504	25	4000	16,6	4,2	2,5
TA3204	32	4000	21,2	5,4	2,5
TA4004	40	4000	26,6	6,7	2,5
TA5004	50	4000	33,2	8,4	2,5
TA6304	63	4000	42	10,5	2,5
TA7504	75	4000	50	12,5	2,5
TA9004	90	4000	60	15	2,5
TA1104	110	4000	73,2	18,4	2,5

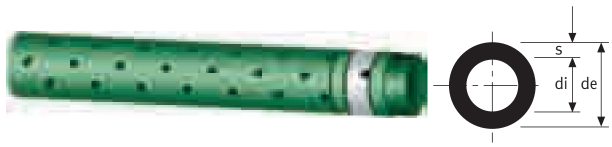
● On order only. Rolls of 200 m.

PN25 pipe

CODE	d	L	di	s	S
TA20B4	20	4000	11,8	4,1	2
TA25B4	25	4000	14,8	5,1	2
TA32B4	32	4000	19,0	6,5	2

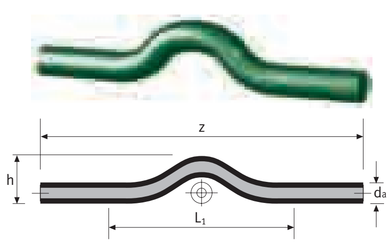
Stabipipe PN20 pipe

(pressure pipe with aluminium)



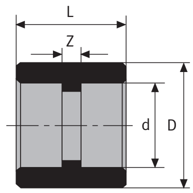
CODE	d	L	di	s
TA201AL	20	4000	14,4	2,8
TA251AL	25	4000	18,0	3,5
TA321AL	32	4000	23,2	4,4
TA401AL	40	4000	29,0	5,5
TA501AL	50	4000	36,2	6,9
TA631AL	63	4000	45,8	8,6
TA751AL	75	4000	54,4	10,3
TA901AL	90	4000	65,4	12,3
TA111AL	110	4000	79,8	15,1

Overrun curve

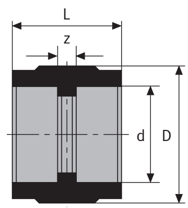


CODE	d	z	L1	h
SO2000	20	354	190	49,4
SO2500	25	357	210	55
SO3200	32	357	210	64

Coupling

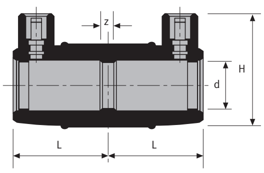



CODE	d	D	z	L
MA1600	16	24	4	30
MA2000	20	30	4	33
MA2500	25	36	4	36
MA3200	32	43	4	44
MA4000	40	57	5	47

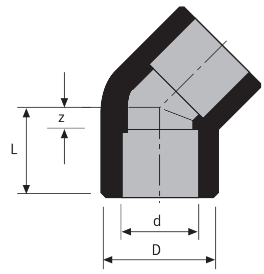
CODE	d	D	z	L
MA5000	50	70	6	56
MA6300	63	88	12	70
MA7500	75	105	15	83
MA9000	90	126	22	100
MA1100	110	154	32	122
MA1200	125	166	11	90

Electric coupling

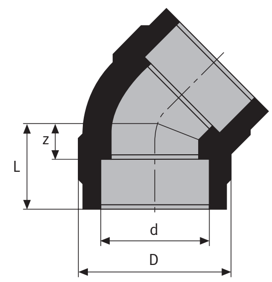



CODE	d	z	L	H
ML2000	20	2	36	42,7
ML2500	25	2	39	49,7
ML3200	32	2	43	58,7
ML4000	40	2	49	77,2
ML5000	50	2	55	88,2
ML6300	63	2	63	103,5

45° elbow

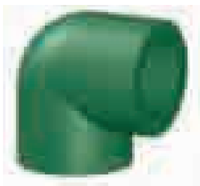



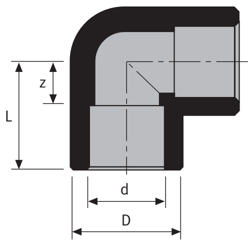
CODE	d	D	z	L
G42000	20	30	6	20,5
G42500	25	36	6	23
G43200	32	43	8	28
G44000	40	57	9	31

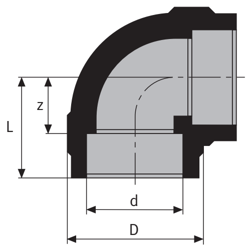
CODE	d	D	z	L
G45000	50	70	15	40
G46300	63	88	21	50
G47500	75	105	25	58
G49000	90	166	20	56
G41100	110	166	23	63
G41200	125	166	37	77

90° elbow



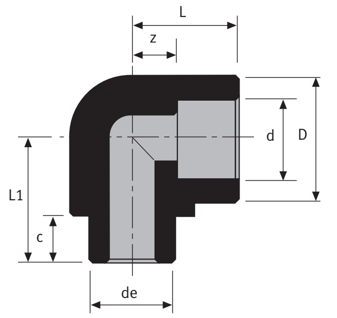


CODE	d	D	z	L
G91600	16	24	9	22
G92000	20	30	12,5	27
G92500	25	36	15	31
G93200	32	43	18	38
G94000	40	57	22	43



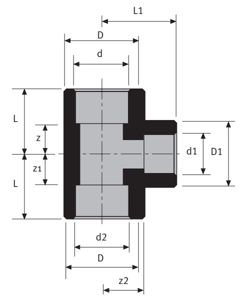
CODE	d	D	z	L
G95000	50	70	28	53,5
G96300	63	88	36	65,5
G97500	75	105	43,5	76,5
G99000	90	126	52,5	90,5
G91100	110	154	64,5	108,5
G91200	125	166	71	122

Male/female 90° elbow

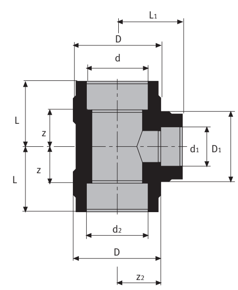


CODE	d	D	z	L	de	c	L1
G9MF20	20	30	12,5	27	20	15,5	33,5
G9MF25	25	38	15	31	25	17	40

Union tee

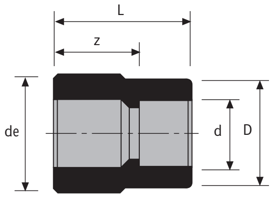


CODE	d	d1	d2	D	D1	L	L1	z	z1	z2
RT1600	16	16	16	24	–	22	–	9	–	–
RT2000	20	20	20	30	–	27	–	12,5	–	–
RT2500	25	25	25	36	–	31	–	15	–	–
RT22020	25	20	20	36	30	32	29,5	15	16	15
RT2520	25	20	25	36	30	31	29,5	15	15	15
RT22520	25	25	20	36	36	32	32	14	16	14
RT32020	32	20	20	43	43	38,5	38	18	22,5	18
RT32025	32	20	25	43	43	38,5	38	18	20,5	18
RT3220	32	20	32	43	30	38,5	34	18	14	19
RT32520	32	25	20	43	43	38,5	38	18	22,5	18
RT32525	32	25	25	43	43	38,5	38	18	20,5	18
RT3225	32	25	32	43	33,5	38	34	18	18	18
RT33220	32	32	20	43	43	38,5	38	18	20,5	18
RT33225	32	32	25	43	43	38,5	38	18	20,5	18
RT3200	32	32	32	43	–	38	–	18	–	–
RT4025	40	25	40	57	36	43	38	22	22	22
RT4032	40	32	40	57	44	43	40	22	22	22
RT4000	40	40	40	57	–	43	–	22	–	–

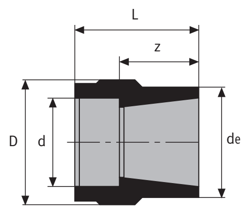


CODE	d	d1	d2	D	D1	L	L1	z	z2
RT5032	50	32	50	70	56	53,5	53,5	28,5	34,5
RT5040	50	40	50	70	56	53,5	53,5	28,5	31,5
RT5000	50	50	50	70	–	53,5	–	28,5	–
RT6325	63	25	63	88	70	65,5	65,5	36,5	48,5
RT6332	63	32	63	88	70	65,5	65,5	36,5	45,5
RT6340	63	40	63	88	70	65,5	65,5	36,5	43,5
RT6350	63	50	63	88	70	65,5	65,5	36,5	40,5
RT6300	63	63	63	88	–	65,5	–	36,5	–
RT7550	75	50	75	105	88	76,5	76,5	43,5	51,6
RT7563	75	63	75	105	88	76,5	76,5	43,5	47,5
RT7500	75	75	75	105	–	76,6	–	43,6	–
RT9063	90	63	90	126	105	90,5	90,5	52,5	61,5
RT9075	90	75	90	126	105	90,5	90,5	52,5	57,5
RT9000	90	90	90	126	–	90,5	–	52,5	–
RT1175	110	75	110	154	126	108,5	108,5	64,5	75,5
RT1190	110	90	110	154	126	108,5	108,5	64,5	70,5
RT1100	110	110	110	154	–	108,5	–	64,5	–
RT1275	125	75	125	166	100	–	–	–	–
RT1290	125	90	125	166	120	–	–	–	–
RT1211	125	110	125	166	146	124	124	84	83
RT1200	125	125	125	166	–	123	–	80	–

Reduction

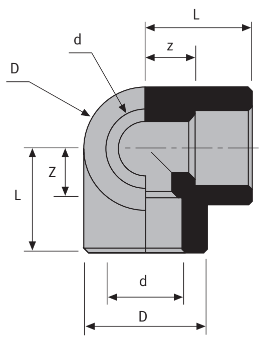



CODE	de	d	D	Z	L
RD2016	20	16	24	19	32
RD2520	25	20	30	20,5	35
RD3220	32	20	30	25,5	40
RD3225	32	25	36	24	40
RD4025	40	25	36	29	45
RD4032	40	32	44	27	45

CODE	de	d	D	z	L
RD5032	50	32	50	41	60
RD5040	50	40	56	38	60
RD6325	63	25	64	54	70
RD6332	63	32	64	51	70
RD6340	63	40	63	48	70
RD6350	63	50	70	45	70
RD7550	75	50	75	60	85
RD7563	75	63	88	56	85
RD9063	90	63	90	71	100
RD9075	90	75	105	67	100
RD1175	110	75	105	87	120
RD1190	110	90	126	82	120
RD1211	125	110	166	125	110

Three-way elbow

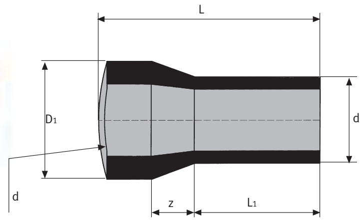



CODE	d	D	z	L
G920V3	20	30	12,5	27

90° bend large radius, f/f

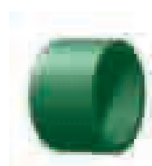
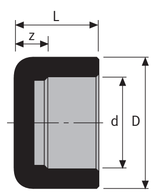

CODE	D	D	H	R
G9R200	20	30	65	56
G9R250	25	35	66	56
G9R320	32	42	70	56

Saddle joint

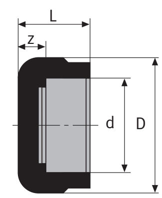



CODE	d	z	D_1	d	L_1	L
SD2032	20	12,5	29	32	36	64
SD2040	20	12,5	29	40	36	64
SD2050	20	12,5	29	50	36	64
SD2063	20	12,5	29	63	36	64
SD2075	20	12,5	29	75	36	64
SD2090	20	12,5	29	90	36	64
SD2011	20	12,5	29	110	36	64
SD2540	25	12,5	36,5	40	36	65
SD2550	25	12,5	36,5	50	36	65
SD2563	25	12,5	36,5	63	36	65
SD2575	25	12,5	36,5	75	36	65
SD2590	25	12,5	36,5	90	36	65
SD2511	25	12,5	36,5	110	36	65
SD3250	32	12,5	44,5	50	36	65
SD3263	32	12,5	44,5	63	36	65
SD3275	32	12,5	44,5	75	36	65
SD3290	32	12,5	44,5	90	36	65
SD3211	32	12,5	44,5	110	36	65
SD4063	40	12,5	56	63	36	65
SD4075	40	12,5	56	75	36	65
SD4090	40	12,5	56	90	36	65
SD4011	40	12,5	56	110	36	65
SD5075	50	12,5	68	75	36	65
SD5090	50	12,5	68	90	36	65
SD5011	50	12,5	68	110	36	65
SD6390	63	12,5	81	90	36	65
SD6311	63	12,5	81	110	36	65
SD7511	75	12,5	96	110	82	124

End cap

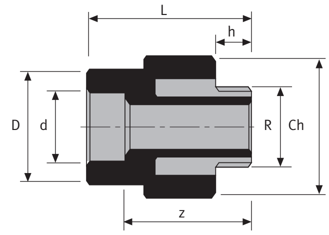



CODE	d	D	Z	L
TC1600	16	24	7	20
TC2000	20	30	9	23,5
TC2500	25	36	9	25
TC3200	32	44	11	29
TC4000	40	57	14	35

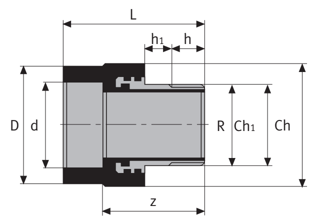



CODE	d	D	Z	L
TC5000	50	70	16	41
TC6300	63	88	18	46,6
TC7500	75	105	20	53
TC9000	90	126	23	61
TC1100	110	154	27	71

Male threaded joint

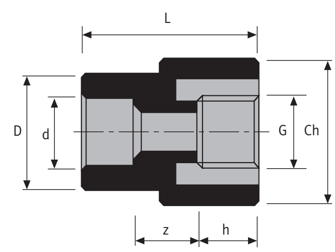


CODE	d	D	z	L	h	R	Ch
MA16M1	16	35	43	56	14,7	1/2”	-
MA20M1	20	30	48,2	62,7	14,7	1/2”	37
MA20M2	20	30	49,5	64	16	3/4”	44
MA25M1	25	36	46,7	62,7	14,7	1/2”	44
MA25M2	25	36	48	64	16	3/4”	44
MA32M2	32	44	44	64	16	3/4”	44

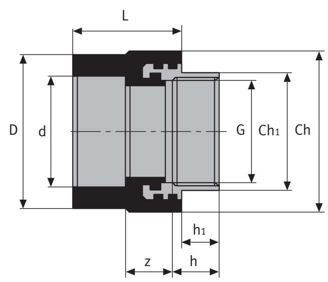


CODE	d	D	z	L	h	h1	R	Ch	Ch1
MA32M3	32	44	54,5	74,5	17,5	10	1”	56	39
MA40M4	40	54	68	90	22	15	1 1/4”	73	44
MA50M5	50	67	64	89	20	13	1 1/2”	78	48
MA63M6	63	86	75	104	24	20	2”	88	60
MA75M7	75	97	92	125	30	25	2 1/2”	110	78

Female threaded joint

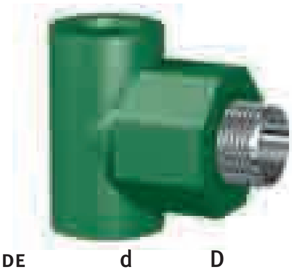


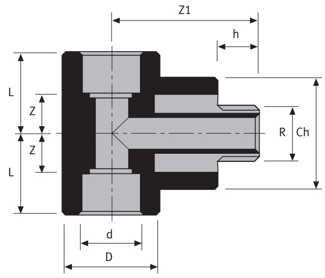
CODE	d	D	z	L	h	G	Ch
MA16F1	16	35	15	41	13,2	1/2”	-
MA20F1	20	30	20,3	48	13,2	1/2”	37
MA20F2	20	30	19	48	14,5	3/4”	44
MA25F1	25	36	18,8	48	13,2	1/2”	44
MA25F2	25	36	17,5	48	14,5	3/4”	44
MA32F2	32	44	13,5	48	14,5	3/4”	44



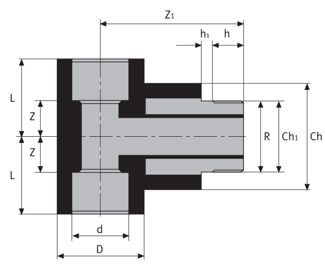
CODE	d	D	z	L	h	h1	G	Ch	Ch1
MA32F3	32	44	13,5	57	20	10	1”	56	39
MA40F4	40	54	23	68	24	15	1 1/4”	73	48
MA50F5	50	68	19	71	24	15	1 1/2”	78	54
MA63F6	63	86	22	80	24	20	2”	88	66
MA75F7	75	97	32	95	30	25	2 1/2”	110	85

Male threaded union tee



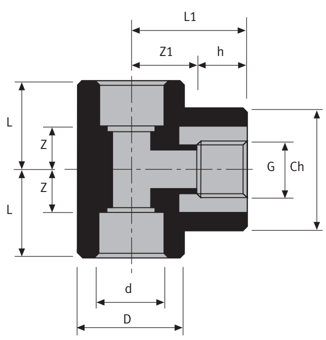


CODE	d	D	z	L	R	Ch	z1	h
RT16M1	16	24	9	22	1/2”	-	46,7	14,7
RT20M1	20	30	12,5	27	1/2”	37	49,7	14,7
RT25M1	25	36	15	31	1/2”	44	55,7	14,7
RT25M2	25	36	15	31	3/4”	44	57	16
RT32M1	32	44	18	38	1/2”	44	57,7	14,7
RT32M2	32	44	18	38	3/4”	44	59	16

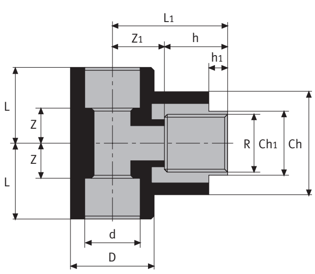


CODE	d	D	z	L	R	Ch	z1	h	h1	Ch1
RT32M3	32	44	18	38	1”	56	70,5	17,5	10	39

Female threaded union tee

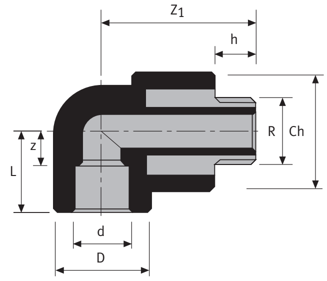


CODE	d	D	z	L	G	Ch	z1	L1	h
RT16F1	16	24	9	22	1/2”	-	18,8	32	13,2
RT20F1	20	30	12,5	27	1/2”	37	21,8	35	13,2
RT25F1	25	36	15	31	1/2”	44	27,8	41	13,2
RT25F2	25	36	15	31	3/4”	44	26,5	41	14,5
RT32F1	32	44	18	38	1/2”	44	28,5	43	13,2
RT32F2	32	44	18	38	3/4”	44	28,5	43	14,5

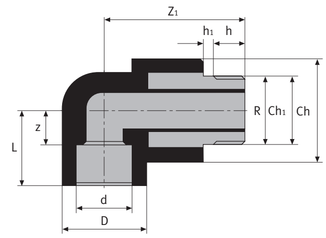


CODE	d	D	z	L	G	Ch	z1	L1	h	h1	Ch1
RT32F3	32	44	18	38	1”	56	33	45	20	10	39

Male threaded 90° elbow

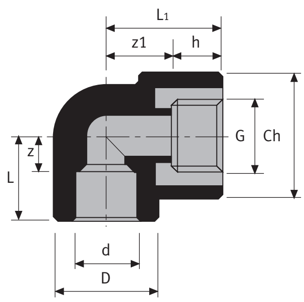


CODE	d	D	z	L	R	Ch	z1	h
G916M1	16	24	9	22	1/2”	-	38,7	14,7
G920M1	20	30	12,5	27	1/2”	37	49,7	14,7
G925M1	25	36	15	31	1/2”	44	55,7	14,7
G925M2	25	36	15	31	3/4”	44	57	16
G932M1	32	44	18	36	1/2”	44	57,7	14,7
G932M2	32	44	18	38	3/4”	44	59	16

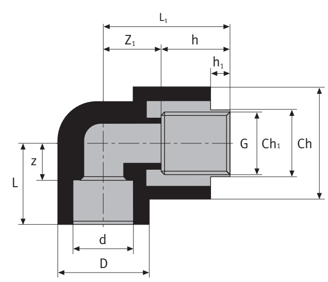


CODE	d	D	z	L	R	Ch	z1	h	h1	Ch1
G932M3	32	44	18	38	1”	56	70,5	17,5	10	39

Female threaded 90° elbow

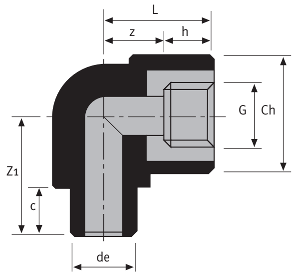


CODE	d	D	z	L	G	Ch	z1	L1	h
G916F1	16	24	9	22	1/2”	-	18,8	32	13,2
G920F1	20	30	12,5	27	1/2”	37	21,8	35	13,2
G925F1	25	36	15	31	1/2”	44	27,8	41	13,2
G925F2	25	36	15	31	3/4”	44	26,5	41	14,5
G932F1	32	44	18	38	1/2”	44	28,5	43	14,5
G932F2	32	44	18	38	3/4”	44	28,5	43	14,5



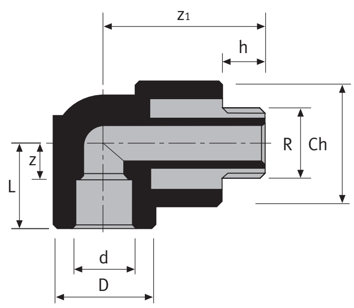
CODE	d	D	z	L	G	Ch	z1	L1	h	h1	Ch1
G932F3	32	44	18	38	1”	56	33	53	20	10	39

Female threaded 90° elbow with male tang



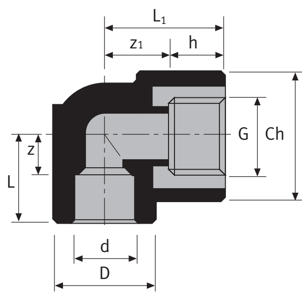
CODE	d	z	L	h	G	Ch	z1	c
G920FX	20	21,8	35	13,2	1/2”	37	38,5	15,5

Male threaded 90° elbow with double bracket



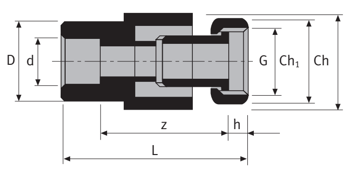
CODE	d	D	z	L	R	Ch	z1	h
GS20M1	20	30	12,5	27	1/2”	37	49,7	14,7

Female threaded 90° elbow with double bracket



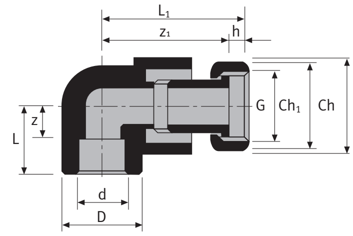
CODE	d	D	z	L	G	Ch	z1	L1	h
GS20F1	20	30	12,5	27	1/2”	37	21,8	35	13,2

Straight union to be welded



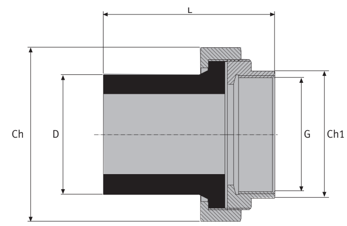
CODE	d	D	z	L	h	G	Ch	Ch1
BD20F2	20	30	46	68	7,5	3/4”	37	29
BD25F3	25	36	48	73	9	1”	44	37
BD32F4	32	44	60	90	10	1 1/4”	56	46
BD40F5	40	54	70	98	12	1 1/2”	73	53
BD50F6	50	68	73	107	14	2”	78	64
BD63F7	63	86	78	112	14	2 1/2”	88	80

90° union to be welded



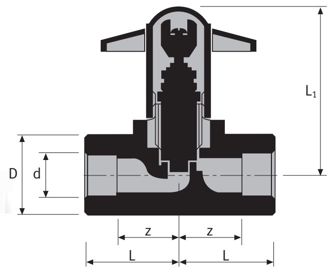
CODE	d	D	z	L	h	G	z1	L1	Ch	Ch1
BC20F2	20	30	12,5	27	7,5	3/4”	49	56,5	37	29
BC25F3	25	36	15	31	9	1”	56	65	44	37
BC32F4	32	44	18	38	10	1 1/4”	70	80	56	46

Pipe union fitting



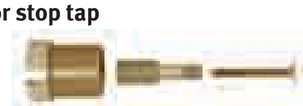
CODE	D	L	G	Ch	Ch1
RB75M7	75	110	2 1/2”	117	82
RB90M8	90	120	3”	130	95
RB11M9	110	145	4”	155	122

Stop tap

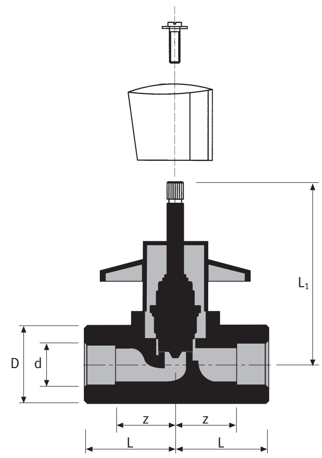
CODE	d	D	Z	L	L1
RC2000	20	36	28,5	43	70
RC2500	25	36	27	43	70

Accessories for stop tap



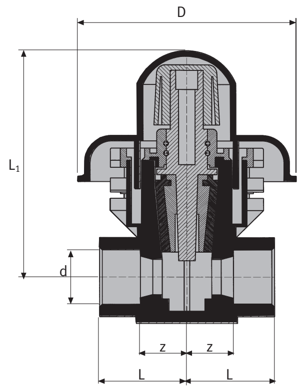
CODE	NAME
C26606060	①

Stop tap with handle

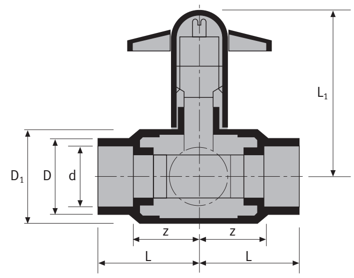
CODE	d	D	z	L	L1
RC2010	20	36	28,5	43	100
RC2510	25	36	27	43	100

Checkable valve with gate closure

CODE	d	D	z	L	L1
VI2000	20	80	16	85	32
VI2500	25	80	15	85	32
VI3200	32	80	14	85	36

Ball valve

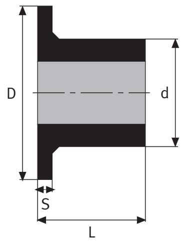
CODE	d	D	DN	z	L	D1	L1
VS2000	20	33	15	28,5	43	42	80
VS2500	25	33	15	27	43	42	80
VS3200	32	40	20	34,5	52,5	50	80

Accessories for ball valve

CODE	NAME
C26606061	①

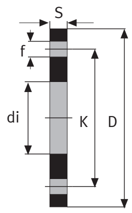
① Extension set

Neck for flanges PN20



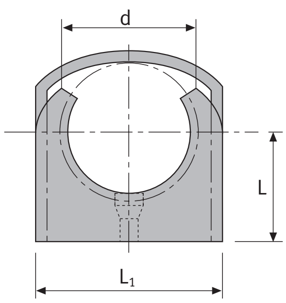
CODE	d	D	L	S
CT7520	75	113	76	10
CT9020	90	128	91	12
CT1120	110	148	110	14
CT1220	125	162	–	–

Steel flange UNI 2278/67



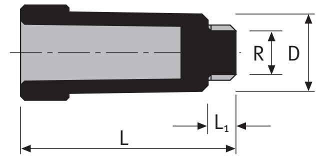
CODE	DN	di	K	D	S	f	NO. HOLES
FL7500	65	86	145	185	18	18	4
FL9000	80	98	160	200	20	18	8
FL1100	100	120	180	220	22	18	8
FL1200	125	150	180	220	20	18	8

Pipe clamps



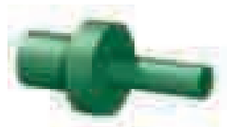
CODE	d	L	L1
BL1600	16	22	27
BL2000	20	25	32
BL2500	25	26	41
BL3200	32	30	49
BL4000	40	35	56
BL5000	50	40	67
BL6300	63	50	83
BL7500	75	60	125
BL9000	90	70	142
BL1100	110	80	160
BL1200	125	–	–

Male threaded plug for system test



CODE	R	D	L1	L
TP1200	1/2”	33	10	87
TP3400	3/4”	40	14	91

Repair plug

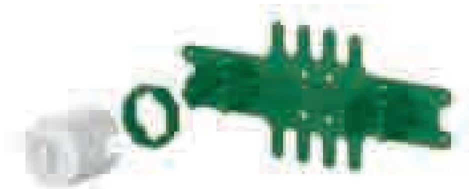


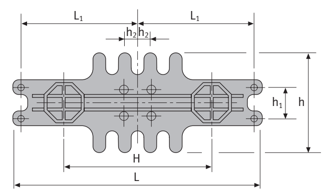
CODE	Ø	Ø
TR1107	7/11	11

Spare inserts

CODE	Ø
IR1200	32 x 1/2” F

Fixed point positioning bracket complete with polystyrene protective plug





CODE	H	L	h	h1	L1	h2
SP0100	100	205	110	35	95	30
SP0155	155	260	110	35	122	30
SP0200	200	305	110	35	145	30

Note: for the spare parts see our price list