

Ori-Plast[®]
LIFE LINES... NOT JUST PIPE LINES

PE-RT

Pipes and fittings
for hot & cold water

PUSHON

The pushfit fittings for water pipe

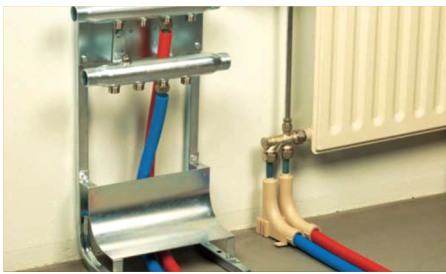
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Polyethylene Raised Temperature (PE-RT) Pipes for hot & cold water

Suitable for Hot and Cold Water Plumbing and Industrial Applications

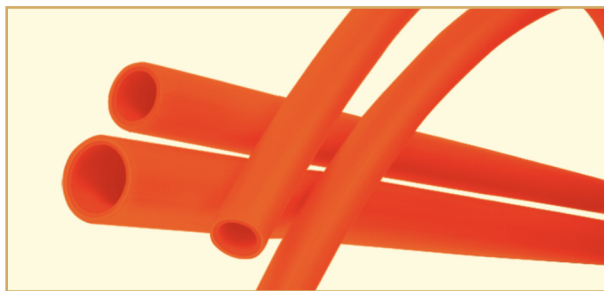
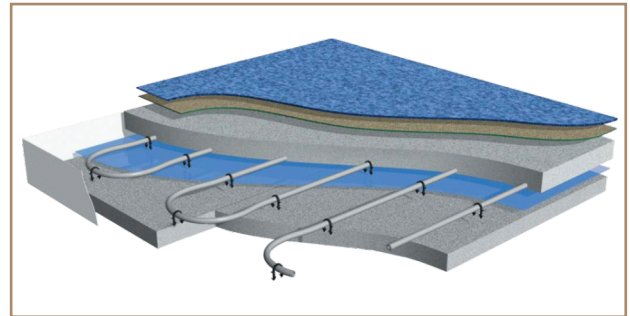
Ori-Plast®



Ori-Plast brings out yet another unique product which is polyethylene based but suitable for both hot and cold water conveyance in plumbing systems as well as for industrial applications. Regular polyethylene materials have limitations in use in hot water piping system due to its limited long-term creep characteristics* at higher temperatures which is now fully overcome by PE-RT materials.

* Creep is a time dependent plastic deformation which occurs under stresses lower than the yielding stress of the reference material.

PE-RT is an advanced type of polyethylene which has unique molecular structure and crystalline microstructure that provides excellent stress crack resistance combined with long-term Hydrostatic Strength at high temperature. The MRS value of the material is 10.0 MPa. The material is also widely known for its excellent flexibility in uses and ease of installation for applications. When compared with PE-X (a polyethylene cross linking material which is also suitable for hot water plumbing system), PE-RT is a more safe material because mistakes during the cross linking process are not possible. Moreover PE-X cannot be recycled due to cross-linking, whereas PE-RT which do not require cross linking are thus much more environment friendly.



MATERIAL FEATURES:

- ▶ Fairly long-term hydrostatic strength without cross linking
- ▶ Fusible with all know welding methods
- ▶ Very high stress crack resistance
- ▶ High Flexibility
- ▶ Resistant to low temperatures (-40°C)
- ▶ Good creep behaviour

For some of the important material properties, please refer to the table below.

| Property | Method | Unit | Values |
|--|----------|-----------------------|------------|
| Density | ISO 1183 | gm/cc | 0.93-0.95 |
| Yeild Stress at 23°C | ISO 527 | N / mm ² | 23.0 |
| Tensile Modulus | ISO 527 | N / mm ² | 850.0 |
| Charpy Notched Impact Strength at 23°C | ISO 868 | kJ / m ² | No failure |
| Thermal Expansion Coefficient | | mm / m ⁵ K | 0.17 |
| Heat Conductivity at 23°C | | W / mK | 0.40 |

APPLICATIONS :

As per Table 1 of ISO 22391 (Part 1) : 2009 specification PE-RT pipes are recommended for four different application classes as per following details :

- Application Class 1: For hot water supply at 60°C
- Application Class 2: For hot water supply at 70°C
- Application Class 4: Under floor heating and low temperature radiators
- Application Class 5: High temperature radiators

(Application Class 3 for low temperature under floor heating is covered under ISO 10508 but does not apply to ISO 22391)

The table also provides details of service conditions including the maximum design temperature (T_{max}) for above applications. The other areas where the PE-RT pipes can be used are:

- Solar heater piping systems
- Air conditioning systems
- Industrial applications
- Plumbing applications



ADVANTAGES:

- Light weight, delivery in coiled bundles and thus easy to transport and install
- Excellent flexibility makes it convenient to use by coiling and bending, thus reducing the consumption of pipe fittings and the ultimate installation cost.
- Pipes are stress crack resistance and thus when the pipe is bent, the stress in the bent part loose quickly
- Quick laying even over large surfaces
- Simple installation even when below freezing temperature
- Low brittle rupture temperature and thus have wide operating temperature range (from -20°C to 95°C). When PP-R becomes brittle under 0°C or so, PE-RT is still ductile under -40°C.
- Low frictional loss and thus can transport 30% more fluid than metal pipes of identical diameter
- Good chemical corrosion resistant, thus remains incrustation free life long and under normal condition the pipe can be used safely for 50 years

WALL THICKNESS CHART

| Dimensions of Polyethylene of Raised Temperature (PE-RT) Pipes for Dimension Class A | | | | | | | | | | | | | | | |
|--|---|--|---------------------|----------------|-----------|---------------------|------------|-----------|---------------------|------------|-----------|---------------------|------------|-----------|------|
| As per Table 3 of ISO 22391-2:2009 | | | | | | | | | | | | | | | |
| All dimensions are in mm | | | | | | | | | | | | | | | |
| Nominal Size DN /OD | Nominal Outside Diameter | Mean OD (d_{em}) | | Pipe Series | | | | | | | | | | | |
| | | | | S 5 | | | S 4 | | | S 3.2 | | | S 2.5 | | |
| | | | | Wall Thickness | | | | | | | | | | | |
| d_n | min | max | e_{min} and e_n | S_{calc} | e_{max} | e_{min} and e_n | S_{calc} | e_{max} | e_{min} and e_n | S_{calc} | e_{max} | e_{min} and e_n | S_{calc} | e_{max} | |
| 12* | 12 | 12.0 | 12.3 | 1.3 | 4.1 | 1.6 | 1.4 | 3.8 | 1.7 | 1.7 | 3.0 | 2.0 | 2.0 | 2.5 | 2.3 |
| 16* | 16 | 16.0 | 16.3 | 1.5 | 4.8 | 1.8 | 1.8 | 3.9 | 2.1 | 2.2 | 3.1 | 2.6 | 2.7 | 2.5 | 3.1 |
| 20 | 20 | 20.0 | 20.3 | 1.9 | 4.8 | 2.2 | 2.3 | 3.8 | 2.7 | 2.8 | 3.1 | 3.2 | 3.4 | 2.4 | 3.9 |
| 25 | 25 | 25.0 | 25.3 | 2.3 | 4.9 | 2.7 | 2.8 | 4.0 | 3.2 | 3.5 | 3.1 | 4.0 | 4.2 | 2.5 | 4.8 |
| 32 | 32 | 32.0 | 32.3 | 2.9 | 5.0 | 3.3 | 3.6 | 3.9 | 4.1 | 4.4 | 3.1 | 5.0 | 5.4 | 2.5 | 6.1 |
| 40 | 40 | 40.0 | 40.4 | 3.7 | 4.9 | 4.2 | 4.5 | 3.9 | 5.1 | 5.5 | 3.1 | 6.2 | 6.7 | 2.5 | 7.5 |
| 50 | 50 | 50.0 | 50.5 | 4.6 | 4.9 | 5.2 | 5.6 | 4.0 | 6.3 | 6.9 | 3.1 | 7.7 | 8.3 | 2.5 | 9.3 |
| 63 | 63 | 63.0 | 63.6 | 5.8 | 4.9 | 6.5 | 7.1 | 3.9 | 8.0 | 8.6 | 3.2 | 9.6 | 10.5 | 2.5 | 11.7 |
| 75 | 75 | 75.0 | 75.7 | 6.8 | 5.0 | 7.6 | 8.4 | 4.0 | 9.4 | 10.3 | 3.1 | 11.5 | 12.5 | 2.5 | 13.9 |
| 90 | 90 | 90.0 | 90.9 | 8.2 | 5.0 | 9.2 | 10.1 | 4.0 | 11.3 | 12.3 | 3.2 | 13.7 | 15.0 | 2.5 | 16.6 |
| 110 | 110 | 110.0 | 111 | 10.0 | 5.0 | 11.1 | 12.3 | 4.0 | 13.7 | 15.1 | 3.1 | 16.8 | 18.3 | 2.5 | 20.2 |
| Note | Cosidering the note given in point A.4 of ISO 22391 (Part 2) : 2009 and reproduced under Calculated Pipe Value given earlier. We can Conclude | | | | | | | | | | | | | | |
| | Pipe Series S 5 | is suitable for Application Classes 1,2 & 4 for Working Pressure of 4 Bar and 6 Bar and Application Class 5 for Working Pressure of 4 bar only. | | | | | | | | | | | | | |
| | Pipe Series S 4 | is suitable for Application Class 1,2 & 4 for Working Pressure of 4 Bar, 6 Bar & 8 Bar and Class 5 for Working Pressure 4 bar & 6 bar. | | | | | | | | | | | | | |
| | Pipe Series S 3.2 | is suitable for Application Class 1,2 & 4 for Working Pressure of 4 Bar, 6 Bar, 8 Bar and 10 Bar and Class 5 for working Pressures of 4 bar, 6 bar & 8 bar | | | | | | | | | | | | | |
| | Pipe Series S 2.5 | is suitable for all the four Application Class and all the recommended Working Pressure of 4 Bar, 6 Bar, 8 Bar and 10 Bar | | | | | | | | | | | | | |

*Presently these two pipes are not within the scope of Ori-Plast's production

PUSHON

the pushfit fittings for water pipe

TECHNICAL SPECIFICATION : ISO 14236:2000

Ori-Plast®

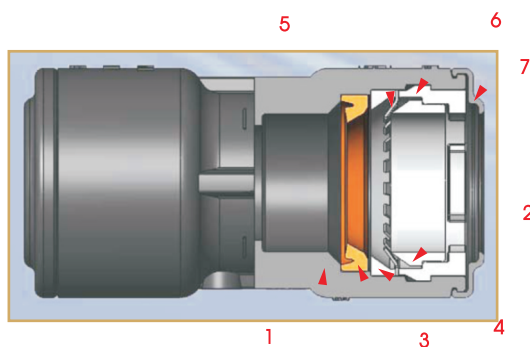
TECHNICAL SPECIFICATION : ISO 14236:2000

Mechanical joint fittings for use with polyethylene pressure pipes in water supply systems, compatible with thermoplastic pipes for water supply application with pipe O.D according to ISO 4427, ISO 161, DIN 8074, DIN 8077

PROPERTIES

TEST METHODS

| | |
|---|------------------------------------|
| Maximum Working Pressure | 16 Bar (Hydrostatic pressure test) |
| Resistance to Internal Pressure (25 BAR @ 20°C) | ISO 12092 |
| Leak-tightness under Internal Pressure (18BAR @ 20°C) | ISO 3503 |
| Resistance to Pull-Out | ISO 3501 |
| Leak-tightness under Internal Vacuum | ISO 3459 |
| Long term pressure test for Leak-tightness of assemble joints | ISO 1167 |



| No. | Part Name | Material |
|-----|---------------|-----------------|
| 1 | Fitting Body | PP-R |
| 2 | Wedge Ring | POM |
| 3 | Lip Seal | EPDM |
| 4 | Support Ring | PP |
| 5 | Grab Ring | Stainless Steel |
| 6 | Backup Sleeve | POM |
| 7 | Dust Cover | PP-R |

HOW IT WORKS

1. Push the pipe to the end. check the mark on the pipe to ensure it reach to the end stop
2. The grab ring's teeth. grab on the pipe surface firmly. the teeth are in opposite direction of the flow. In case of water hammer or tensile stress the teeth will grip the pipe more firmly to prevent pull out.
3. To uninstall, insert the release key into the hole and press it to fold the teeth and pullout the pipe. In case of large fittings press the key and twist the pipe to pull out
4. Dust cover protects the fitting holes from sediment



JOINTING OF THE PUSHON FITTINGS

DO



Cut pipe square by the pipe snipper, then chamfer the pipe end with the chamfer tool. A must do



Mark the pipe by measuring at the pipe depth line on the fittings.



Push the pipe into the fittings until it reaches the mark.

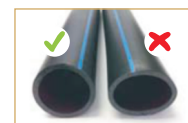
DONT



Avoid using saws to cut the pipe, pipe snipper is recommended



Deburring, chamfering, sanding to rub out the sharp, bur or scratch is a must



TO UNINSTALL



Take off the Dust Cover.



Snap the release key on the pipe and align the pins with the holes around the backup sleeve.

Cut pipe square

BENEFITS

- Easy connections: PUSHON is heat free without having to solder, crimping, clamps, unions, glues or special tools needed
- Full Flow: PUSHON has compact size without reducing inner bore to allow full flow resulting low working pressure
- Reusable: PUSHON fittings can be easily removed so that they can be used again when required.
- O-ring is made of superior quality synthetic rubber "EPDM" that has high water & weather resistant
- Cost effective: PUSHON save your time, labor and cost
- Outlet thread is patented: The thread of PUSHON have a combination of plastic and bronze to protect leakage (Patent No. US 6186558B1)

PUSHON FITTINGS

| | | | | |
|--|--|---|---|--|
| <p>STRAIGHT COUPLING</p>  | <p>FEMALE COUPLING (Metal Thread)</p>  | <p>90° MALE ELBOW (Plastic Thread)</p>  | <p>REDUCING COUPLING</p>  | <p>FEMALE COUPLING (Plastic Thread)</p>  |
| <p>Size (mm) 20 x 20 25 x 25 32 x 32 40 x 40 50 x 50 63 x 63</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm) 25 x 20 32 x 20 32 x 25 50 x 32 63 x 50</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> |
| <p>90° FEMALE ELBOW (Metal Thread)</p>  | <p>MALE COUPLING (Metal Thread)</p>  | <p>90° ELBOW</p>  | <p>90° Female Elbow (Plastic Thread)</p>  | <p>Male Coupling (Plastic Thread)</p>  |
| <p>Size (mm. x Inch) 20 x 1/2" 25 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm) 20 x 20 25 x 25 32 x 32 50 x 50 63 x 63</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm. x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> |
| <p>90° MALE ELBOW (Metal thread)</p>  | <p>EQUAL TEE</p>  | <p>REDUCING TEE</p>  | <p>MALE TEE (Metal Thread)</p>  | <p>MALE TEE (Plastic Thread)</p>  |
| <p>Size (mm. x Inch) 20 x 1/2" 25 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2"</p> | <p>Size (mm) 20 x 20 x 20 25 x 25 x 25 32 x 32 x 32 50 x 50 x 50 63 x 63 x 63</p> | <p>Size (mm) 20 x 20 x 25 32 x 20 x 32 32 x 25 x 32 50 x 32 x 50 63 x 50 x 63</p> | <p>Size (mm. x inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25</p> | <p>Size (mm. x inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25</p> |
| <p>FEMALE TEE (Metal Thread)</p>  | <p>FEMALE TEE (Plastic Thread)</p>  | <p>END CAP</p>  | <p>CHAMFER TOOL</p>  | <p>TAPPING SADDLE (Galvanized Bolt / Nut)</p>  |
| <p>Size (mm. x inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25 32 x 1 x 32 50 x 1 1/2" x 50 63 x 2" x 63</p> | <p>Size (mm. x inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25 32 x 1 x 32 50 x 1 1/2" x 50 63 x 2" x 63</p> | <p>Size (mm) 20 , 25, 32, 50, 63</p> | <p>Size (mm) 16 - 25 20 - 32 50 - 63</p> | <p>Size (mm) 40 x 20 50 x 20 50 x 25 63 x 20 63 x 25 63 x 32</p> |
| <p>FEMALE TAPPING SADDLE (Metal Thread)</p>  | <p>FEMALE TAPPING SADDLE (Plastic Thread)</p>  | <p>MALE BALL VALVE</p>  | <p>RELEASE KEY</p>  | |
| <p>Size (mm x inch) 32 x 1/2" 40 x 1/2" 40 x 3/4" 50 x 1/2" 50 x 3/4" 50 x 1" 63 x 1/2" 63 x 3/4" 63 x 1"</p> | <p>Size (mm x inch) 32 x 1/2" 40 x 1/2" 40 x 3/4" 50 x 1/2" 50 x 3/4" 50 x 1" 63 x 1/2" 63 x 3/4" 63 x 1"</p> | <p>Size (mm) 20 , 25, 32</p> | <p>Size (mm) 20, 25, 32, 50, 63</p> | |

Ori-Plast[®]

LIFE LINES... NOT JUST PIPE LINES

ISO 9001 : 2000 COMPANY

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