

Head Office

40, Strand Road
Kolkata - 700 001, W.B.
Phone: +91 33 2243 3396/97
Fax: +91 33 2243 2395
Email: sales@oriplast.com

New Delhi Branch Office

Unit No. 1402, R. G. Trade Tower
B-7, Netaji Subhash Place,
Wazirpur District Centre
Pitampura, New Delhi - 110 034
Phone: +91 11 2735 2164/65
Fax: +91 11 4370 2640
Email: northsales@oriplast.com

Hyderabad Branch Office

Flat No. 6A, 6th Floor, Amurtha Estate
Dhruvtara Apartment, Somajiguda
Hyderabad - 500 082, Telangana
Phone: +91 40 6598 3033/
40 2716 4116/90002 96600
Email: hyderabad@oriplast.com

Guwahati

Jamini Bhawan, House No. - 59,
A.K Azad Road, Rehanari P.S. Paltanbazar,
Guwahati - 781008, Dist. - Kamrup - (M)
Phone: +91 9207080080
Email: sankar_oriplast@yahoo.co.in

Balasore Works

O. T. Road, P. O. & Dist.: Balasore
Odisha - 756 001
Phone: +91 6782 26 4551/53
Fax: +91 6782 26 2551
Email: works@oriplast.com

Bagnan Works

Khadinan, Bagnan,
Howrah - 711 303, W.B.
Phone: +91 96811 58608/96810 27489
Fax: +91 32 1426 6161
Email: contactus@paramppolymers.com

Raipur Works

Plot 67 to 71, 72 - Part, 73, 74, 80 to 89
Birkoni Industrial Area, Birkoni
Dist: Mahasamund
Chattisgarh - 493 445
Email: birkoni@oriplast.com

Bhubaneswar Branch Office

A1, 34/A, VIP Area,
IRC Village, Nayapalli
Bhubaneswar - 751 015, Odisha
Fax: +91 2551 1336
Email: bbsr@oriplast.com

Raipur Branch Office

Khushi Residency, Block - A
Flat No. 203, Mouza Telibandha
Labhandi, G. E. Road
Near Magneto Mall,
Raipur - 492 010, Chattisgarh
Phone: +91 79801 92901

Jaipur Branch Office

Plot No.: K-53
Flat No.: G-3 Kishan Nagar (Shyam Nagar)
Jaipur - 302 019, Rajasthan
Fax: +91 141 229 7111
Email: sales@adventec.in

C & F Agent, Cuttack

M/s. Aditya Logistic,
202/C, P. O.: Naya Bazar, P. S.: Chauliaganj,
Cuttack - 753 004, Odisha
Phone: +91 671 244 0419/320 2318
Email: cuttackdepot@oriplast.com

Behror Works

F-188 (K & L), RIICO Industrial Area, Phase II
Behror, Dist. - Alwar, Rajasthan - 301 701
Phone: +91 1494 22 0064/2396
Fax: +91 1494 22 2234
Email: contactus@adventec.in

Ori-Plast®
HEALTHY PIPES

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Ori-Plast®
HEALTHY PIPES

PE-RT

CATALOGUE

RESISTS HEAT.
REDEFINES
PIPING
SOLUTION.



FOR HOT AND COLD WATER
AS WELL AS INDUSTRIAL PIPE
APPLICATIONS

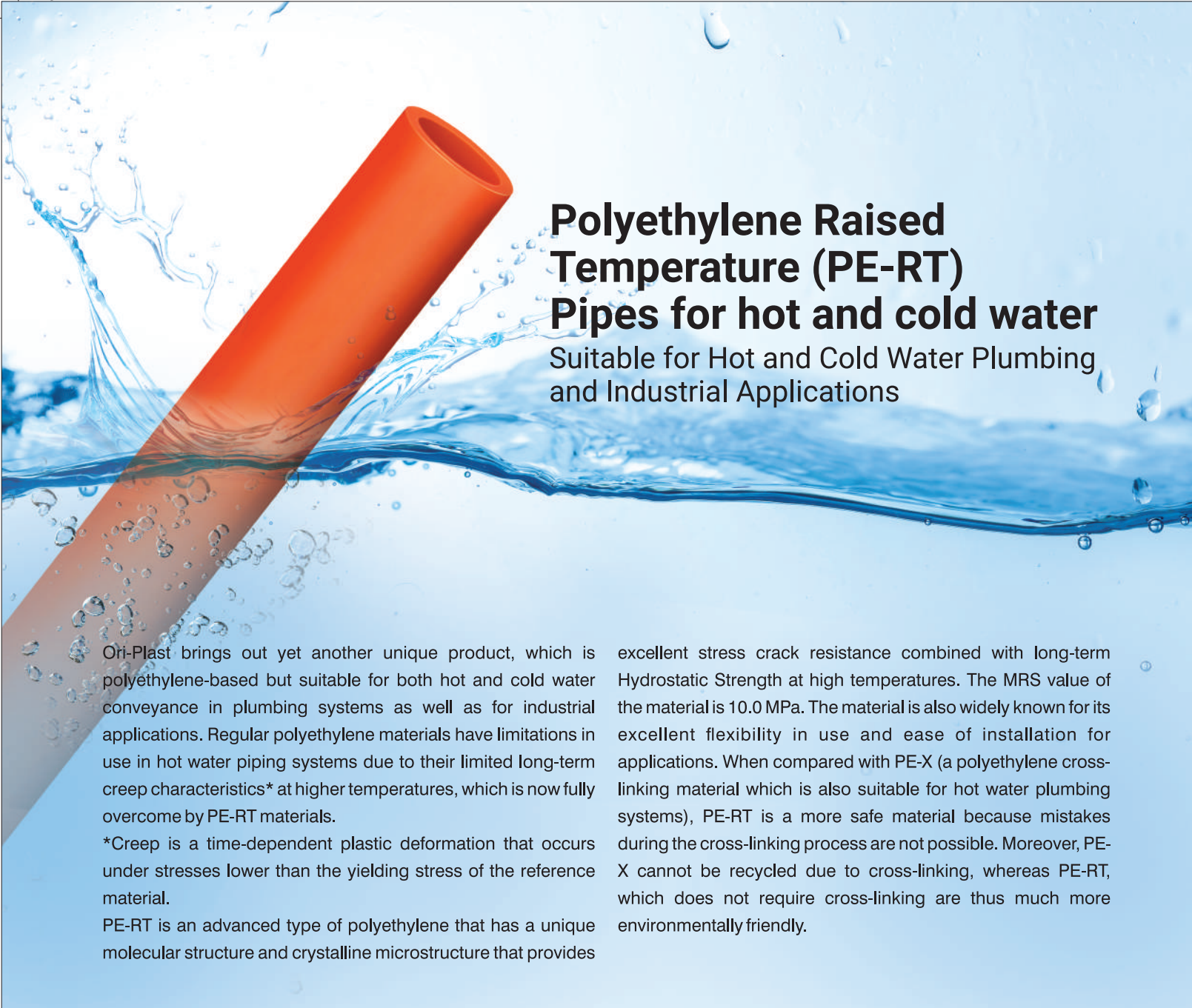
Heat resistant •
High stability and flexibility •
Lifetime warranty •



PIPES &
FITTINGS

NO LEAD
NO HEAVY
METALS





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

Suitable for Hot and Cold Water Plumbing and Industrial Applications

Orl-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 systems due to their limited long-term creep characteristics* at higher temperatures, which is now fully overcome by PE-RT materials.

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

PE-RT is an advanced type of polyethylene that has a unique molecular structure and crystalline microstructure that provides

excellent stress crack resistance combined with long-term Hydrostatic Strength at high temperatures. The MRS value of the material is 10.0 MPa. The material is also widely known for its excellent flexibility in use and ease of installation for applications. When compared with PE-X (a polyethylene cross-linking material which is also suitable for hot water plumbing systems), 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 does not require cross-linking are thus much more environmentally friendly.

Material Features



Fairly long-term hydrostatic strength without cross-linking



Fusible with all known welding methods



Very high-stress crack resistance



High Flexibility



Resistant to low temperatures (-40°C)



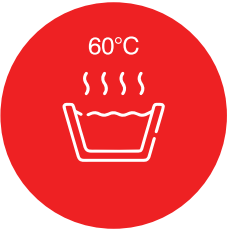
Good creep behaviour

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

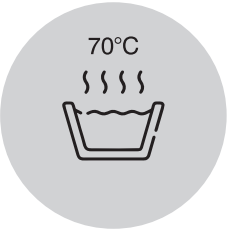
| Property | Method | Unit | Values |
|--|----------|---------------------|-------------|
| Density | ISO 1183 | gm/cc | 0.93 - 0.95 |
| Yield Stress at 23°C | ISO 527 | N/mm ² | 23.0 |
| Tensile Modulus | ISO 527 | N/mm ² | 850.0 |
| Charpy Notched Impact Strength at 23°C | ISO 868 | KJ/m ² | No failure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

Applications

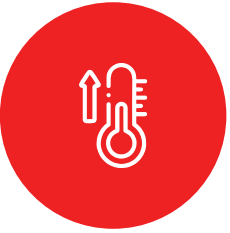
As per Table 1 of ISO 22391 (Part 1): 2009 specification PE-RT pipes are recommended for four different application classes as per the following details:



Class 1
For hot water supply at 60°C



Class 2
For hot water supply at 70°C



Class 4
Under floor heating and low-temperature radiators

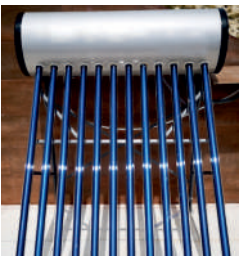


Class 5
High-temperature radiators

(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 the 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

- » Lightweight, 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 resistant 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 a 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 resistance thus remains incrustation free and under normal conditions, 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 | Considering 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 and 8 Bar and Class 5 for Working Pressure 4 Bar and 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 and 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. | | | | | | | | | | | |

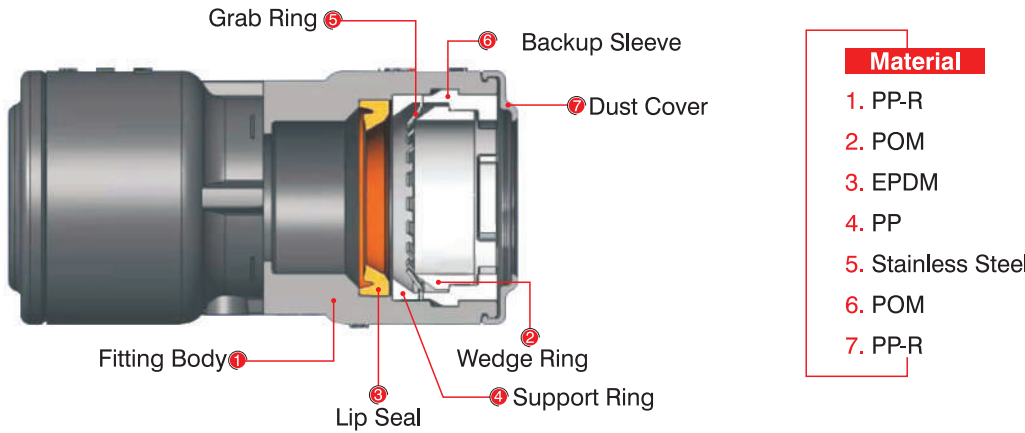
*Presently these two pipes are not within the scope of Ori-Plast's production



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, and 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 (18 BAR @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 |



How It Works

1. Push the pipe to the end. Check the mark on the pipe to ensure it reaches 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. Press it to fold the teeth and pull out 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 the pipe square with the pipe snipper, then chamfer the pipe end with the chamfer tool (A must-do).



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



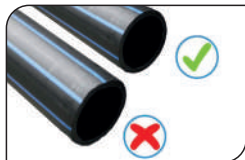
Push the pipe into the fittings until it reaches the mark.



Don't



Avoid using saws to cut the pipe. A pipe snipper is recommended.



Deburring, chamfering and sanding to rub out the sharp. Bur or scratch is a must.



To Uninstall



Take off the Dust Cover.



Cut pipe square

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

Benefits

- » Easy connections: PUSHON is heat-free without having to solder, crimping, clamps, unions, glues or special tools needed.
- » Full Flow: PUSHON has a compact size without reducing the inner bore to allow full flow, resulting in 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 and weather resistance.
- » Cost effective: PUSHON saves your time, labour and cost.
- » Outlet thread is patented: The thread of PUSHON has a combination of plastic and bronze to protect against leakage (Patent No. US 6186558B1).

PUSHON
FITTINGS



| | | | | |
|---|---|---|---|---|
| Straight Coupling | Female Coupling (Metal Thread) | 90° Male Elbow (Plastic Thread) | Reducing Coupling | Female Coupling (Plastic Thread) |
|  |  |  |  |  |
| Size (mm) 20 x 20 25 x 25 32 x 32 40 x 40 50 x 50 63 x 63 | Size (mm x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2" | Size (mm x Inch) 20 x 1/2" 25 x 1/2" 25 x 3/4" 32 x 1" 50 x 1/2" 63 x 2" | Size (mm) 25 x 20 32 x 20 32 x 25 50 x 32 63 x 50 | Size (mm x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2" |
| 90° Female Elbow (Metal Thread) | Male Coupling (Metal Thread) | 90° Elbow | 90° Female Elbow (Plastic Thread) | Male Coupling (Plastic Thread) |
|  |  |  |  |  |
| 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" | Size (mm x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2" | Size (mm) 20 x 20 25 x 25 32 x 32 50 x 50 63 x 63 | 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" | Size (mm x Inch) 20 x 1/2" 25 x 3/4" 32 x 1" 50 x 1 1/2" 63 x 2" |
| 90° Male Elbow (Metal Thread) | Equal Tee | Reducing Tee | Male Tee (Metal Thread) | Male Tee (Plastic Thread) |
|  |  |  |  |  |
| 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" | 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 | 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 | Size (mm x Inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25 | Size (mm x Inch x mm) 20 x 1/2" x 20 25 x 3/4" x 25 |
| Female Tee (Metal Thread) | Female Tee (Plastic Thread) | End Cap | Chamfer Tool | Release Key |
|  |  |  |  |  |
| 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 | 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 | Size (mm) 20, 25, 32, 50, 63 | Size (mm) 16 - 25 20 - 32 50 - 63 | Size (mm) 20, 25, 32, 50, 63 |