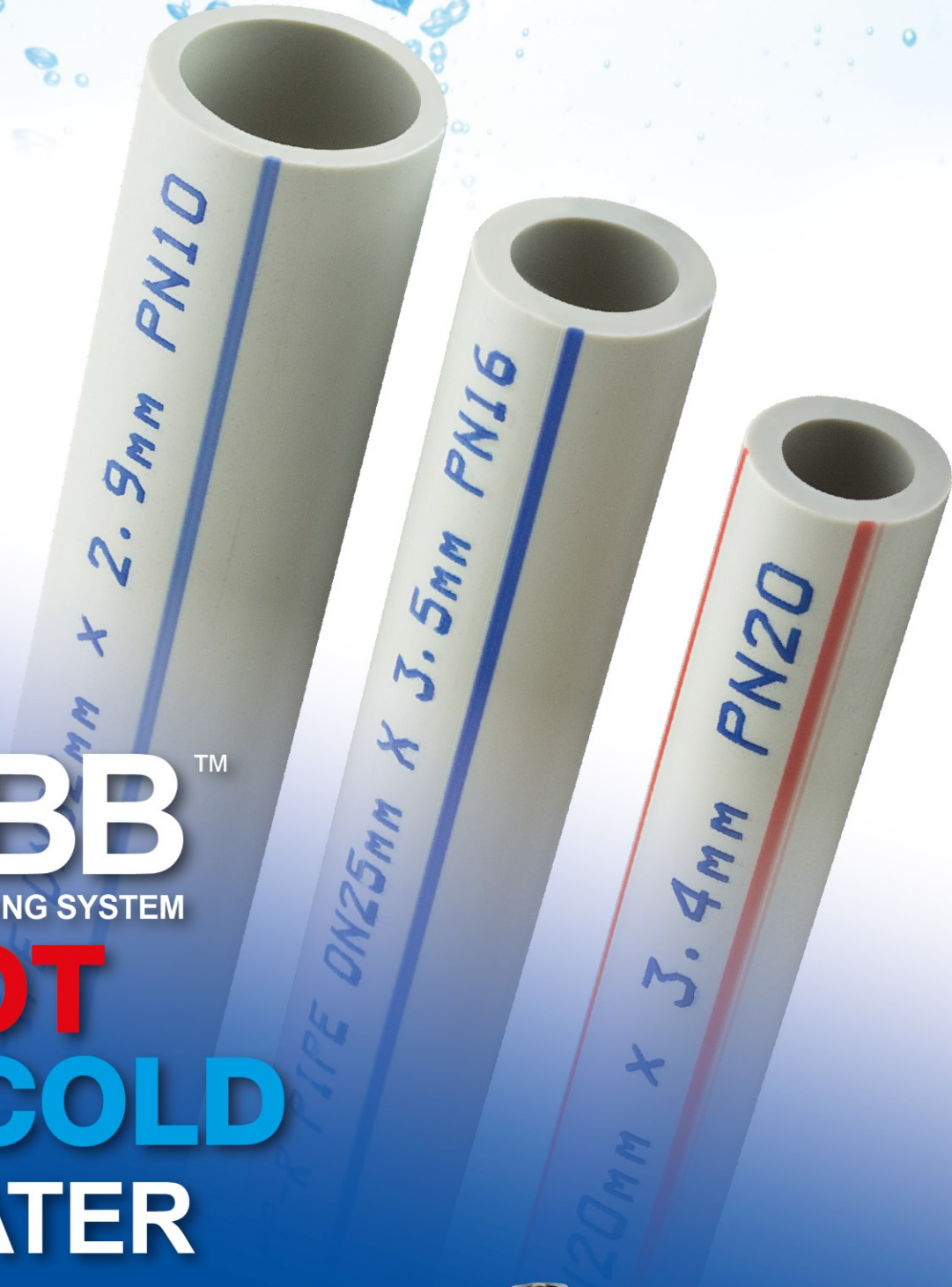


BBB™ THE PREFERRED BRAND
FOR PIPING

BINA PLASTIC
INDUSTRIES SDN BHD
(Co.No. 54840-T)



BBB™

PP-R PIPING SYSTEM

HOT
& **COLD**
WATER



BBB™ **PP-R PIPING SYSTEM**

With the rising demand for quality houses and buildings, good internal plumbing system is equally expected to play its role for the overall expectations of the owners. Hence the introduction of BBB PP-R pipes and fittings which offers continuous clean water, non-leakage, non-clogging and easy installation. Advantages of BBB PP-R pipes and fittings offers the following benefits:

Life Durations: Over 50 years in temperatures up to 90°C and operating pressure from 6 to 26 bars.

Hydraulic Pressure Resistance: BBB PP-R pipes show resistance under very high pressure (more than 100 bars)

Low Thermal Penetrability: BBB PP-R has very low thermal penetrability in hot and freezing water

Chemical Resistance: BBB PP-R shows high resistance to most chemicals and can be used in chemical laboratories

Mechanical Resistance: BBB PP-R pipes have very good resistance in mechanical strength making it hard to break or crack

Endurance in corrosion: BBB PP-R shows remarkable endurance to corrosion even in areas where the water is very hard. The materials remain constant

Low Friction: The texture of the material and it's smooth internal surface ensures minimum friction, thereby maintaining constant pressure and non-clogging.

Certificates: BBB PP-R are certified by SIRIM and SPAN under ISO standards EN ISO 15874

Types of pipes available **BBB PP-R PIPES**

**FOR
COLD WATER**



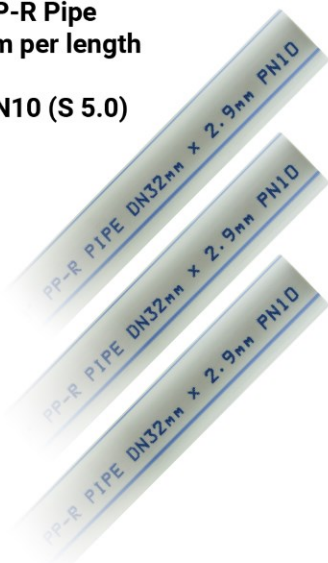
**FOR
HOT WATER**



PP-R Pipes Specification

PP-R Pipe 4m per length

PN10 (S 5.0)



| Outer Diameter (OD) (mm) | Min. Wall Thickness (mm) | Internal Diameter (ID) (mm) | Packing Per Bag (pc) |
|-----------------------------|-----------------------------|--------------------------------|-------------------------|
| 20 | 1.9 | 16.2 | 25 |
| 25 | 2.3 | 20.4 | 15 |
| 32 | 2.9 | 26.2 | 12 |
| 40 | 3.7 | 32.6 | 8 |
| 50 | 4.6 | 40.8 | 5 |
| 63 | 5.8 | 51.4 | 4 |
| 75 | 6.8 | 61.4 | 1 |
| 90 | 8.2 | 73.6 | 1 |
| 110 | 10.0 | 90.0 | 1 |

PP-R Pipe 4m per length

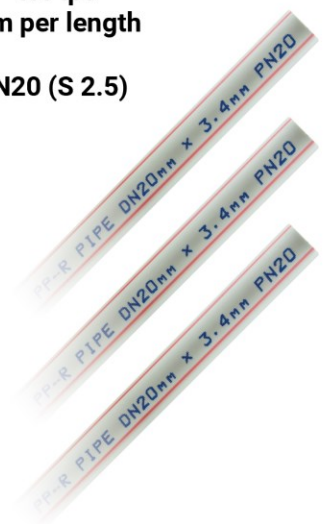
PN16 (S 3.2)



| Outer Diameter (OD) (mm) | Min. Wall Thickness (mm) | Internal Diameter (ID) (mm) | Packing Per Bag (pc) |
|-----------------------------|-----------------------------|--------------------------------|-------------------------|
| 20 | 2.8 | 14.4 | 25 |
| 25 | 3.5 | 18.0 | 15 |
| 32 | 4.4 | 23.2 | 12 |
| 40 | 5.5 | 29.0 | 8 |
| 50 | 6.9 | 36.2 | 5 |
| 63 | 8.6 | 45.8 | 4 |
| 75 | 10.3 | 54.4 | 1 |
| 90 | 12.3 | 65.4 | 1 |
| 110 | 15.1 | 79.8 | 1 |

PP-R Pipe 4m per length

PN20 (S 2.5)



| Outer Diameter (OD) (mm) | Min. Wall Thickness (mm) | Internal Diameter (ID) (mm) | Packing Per Bag (pc) |
|-----------------------------|-----------------------------|--------------------------------|-------------------------|
| 20 | 3.4 | 13.2 | 25 |
| 25 | 4.2 | 16.6 | 15 |
| 32 | 5.4 | 21.2 | 12 |
| 40 | 6.7 | 26.6 | 8 |
| 50 | 8.3 | 33.4 | 5 |
| 63 | 10.5 | 42.0 | 4 |
| 75 | 12.5 | 50.0 | 1 |
| 90 | 15.0 | 60.0 | 1 |
| 110 | 18.3 | 73.4 | 1 |

PP-R Fittings Specification

| SOCKET | Size (mm) | Packing |
|--------|-----------|---------|
| | 20 | 100 |
| 25 | 50 | |
| 32 | 50 | |
| 40 | 25 | |
| 50 | 10 | |
| 63 | 8 | |
| 75 | 8 | |
| 90 | 6 | |
| 110 | 2 | |



| ELBOW 45° | Size (mm) | Packing |
|-----------|-----------|---------|
| | 20 | 100 |
| 25 | 50 | |
| 32 | 50 | |
| 40 | 20 | |
| 50 | 10 | |
| 63 | 6 | |
| 75 | 4 | |
| 90 | 2 | |
| 110 | 2 | |



| ELBOW 90° | Size (mm) | Packing |
|-----------|-----------|---------|
| | 20 | 100 |
| 25 | 50 | |
| 32 | 25 | |
| 40 | 15 | |
| 50 | 10 | |
| 63 | 6 | |
| 75 | 4 | |
| 90 | 2 | |
| 110 | 1 | |



| EQUAL TEE | Size (mm) | Packing |
|-----------|-----------|---------|
| | 20 | 50 |
| 25 | 50 | |
| 32 | 25 | |
| 40 | 20 | |
| 50 | 8 | |
| 63 | 6 | |
| 75 | 2 | |
| 90 | 2 | |
| 110 | 1 | |



| REDUCING BUSH | Size (mm) | Packing |
|---------------|-----------|---------|
| | 25 x 20 | 100 |
| 32 x 20 | 100 | |
| 32 x 25 | 50 | |
| 40 x 20 | 50 | |
| 40 x 25 | 50 | |
| 40 x 32 | 50 | |
| 50 x 20 | 20 | |
| 50 x 25 | 20 | |
| 50 x 32 | 25 | |
| 50 x 40 | 25 | |
| 63 x 20 | 20 | |
| 63 x 25 | 20 | |
| 63 x 32 | 15 | |
| 63 x 40 | 20 | |
| 63 x 50 | 15 | |
| 75 x 63 | 8 | |
| 90 x 63 | 8 | |
| 90 x 75 | 8 | |
| 110 x 63 | 2 | |
| 110 x 75 | 2 | |
| 110 x 90 | 2 | |



| END CAP | Size (mm) | Packing |
|---------|-----------|---------|
| | 20 | 100 |
| 25 | 100 | |
| 32 | 50 | |
| 40 | 20 | |
| 50 | 25 | |
| 63 | 10 | |



| STOP VALVE | Size (mm) | Packing |
|------------|-----------|---------|
| | 20 | 10 |
| 25 | 10 | |
| 32 | 10 | |



PP-R Fittings Specification

REDUCING TEE



| Size (mm) | Packing |
|----------------|---------|
| 25 x 20 x 25 | 50 |
| 32 x 20 x 32 | 20 |
| 32 x 25 x 32 | 20 |
| 40 x 20 x 40 | 20 |
| 40 x 25 x 40 | 20 |
| 40 x 32 x 40 | 20 |
| 50 x 20 x 50 | 8 |
| 50 x 25 x 50 | 10 |
| 50 x 32 x 50 | 8 |
| 50 x 40 x 50 | 8 |
| 63 x 25 x 63 | 6 |
| 63 x 32 x 63 | 6 |
| 63 x 40 x 63 | 6 |
| 63 x 50 x 63 | 6 |
| 75 x 25 x 75 | 2 |
| 75 x 32 x 75 | 2 |
| 75 x 40 x 75 | 2 |
| 75 x 50 x 75 | 2 |
| 75 x 63 x 75 | 2 |
| 90 x 32 x 90 | 2 |
| 90 x 40 x 90 | 2 |
| 90 x 50 x 90 | 2 |
| 90 x 63 x 90 | 2 |
| 110 x 50 x 110 | 1 |
| 110 x 63 x 110 | 1 |

FIANGE ADAPTOR



| Size (mm) | Packing |
|-----------|---------|
| 40 | 25 |
| 50 | 20 |
| 63 | 10 |
| 75 | 6 |
| 90 | 8 |
| 110 | 4 |

THREADED FEMALE COUPLING



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 20 x (3/4) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 20 |
| 32 x (1) | 10 |
| 40 x (1 1/4) | 6 |
| 50 x (1 1/2) | 4 |
| 63 x (2) | 4 |

THREADED MALE COUPLING



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 20 x (3/4) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 10 |
| 32 x (1) | 10 |
| 40 x (1 1/4) | 6 |
| 50 x (1 1/2) | 4 |
| 63 x (2) | 4 |

THREADED FEMALE ELBOW 90°



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 20 x (3/4) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 10 |
| 32 x (1) | 10 |

THREADED MALE ELBOW 90°



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 20 x (3/4) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 10 |
| 32 x (1) | 10 |

THREADED FEMALE TEE



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 10 |
| 32 x (1) | 10 |

THREADED MALE TEE



| Size (mm x inch) | Packing |
|------------------|---------|
| 20 x (1/2) | 20 |
| 25 x (1/2) | 20 |
| 25 x (3/4) | 20 |
| 32 x (3/4) | 10 |
| 32 x (1) | 10 |

Raw Material

BBB PP-R pipes and fittings are manufactured using high quality Polypropylene Random Co-polymer resins. Its physical and chemical properties make it a versatile piping system in a wide range of applications in different industries.

Its advantages over other PP type 1 or 2 and other thermoplastic pipes in the potable water industries are its high impact strength and resistance to high temperatures.

Mechanical & Thermal Properties

Polypropylene Random Co-polymer (PP Type 3)

| Propety | | Test Method | Unit | Value |
|---|--------------|-----------------------|--------------------|----------------------|
| Viscosity Number J | | ISO 1628 T3 | cm ³ /g | 430 |
| Melt Flow Rate | MFR 190/5 | ISO 1133 Condition 18 | g/10 min | 0.5 |
| | MFR 230/2.16 | ISO 1133 Condition 12 | g/10 min | 0.3 |
| | MFR 230/5 | | g/10 min | 1.5 |
| Density at 23°C | | ISO 1183 | g/cm ³ | 0.898 |
| Crystalline Melting Temperature | | DIN 53736 B2 | °C | 150-154 |
| Tensile Stress At Yield | | ISO 527 | N/mm ² | 23 |
| Tensile Strength At Break | | Speed 50 mm/min | N/mm ² | 40 |
| Elongation at Break | | Test specimen 1B | % | >50 |
| Ball Indentation Hardness | | ISO 2039 T1 (132N) | N/mm ² | 43 |
| Flexural Stress at 3.5% | | DIN 53452 | N/mm ² | 20 |
| Outer Fiber Strain | | | | |
| Modulus or Elasticity, Tensile Test | | ISO 527 | N/mm ² | 700 |
| Shear Modulus | -10°C | ISO 537 Method A | N/mm ² | 1100 |
| | 0°C | | N/mm ² | 770 |
| | 10°C | | N/mm ² | 500 |
| | 20°C | | N/mm ² | 370 |
| | 30°C | | N/mm ² | 300 |
| | 40°C | | N/mm ² | 240 |
| | 50°C | | N/mm ² | 180 |
| | 60°C | | N/mm ² | 140 |
| Mechanical Strength Properties | | DIN 8078 | | no failure |
| Determined by Impact Strength at 0°C | | | | |
| Impact Strength | RT | ISO 179/1eU | kJ/m ² | no failure |
| (Charpy) | 0°C | | kJ/m ² | no failure |
| | -10°C | | kJ/m ² | no failure |
| Notched Impact Strength | RT | ISO 179/1eA | kJ/m ² | 20 |
| (Charpy) | 0°C | | kJ/m ² | 4 |
| | -20°C | | kJ/m ² | 3 |
| Coefficient of Linear Thermal Expansion | | VDE 0304 Part 1&4 | K ⁻¹ | 1.5x10 ⁻⁴ |
| Thermal Conductivity at 20°C | | DIN 52612 | W/mK | 0.24 |
| Specific Heat at 20°C | | Adiabatic Calorimeter | kJ/kg K | 2.0 |

ISO = International Organization for Standardization VDE = Verband Deutscher Elektrotechniker
The test specimens were made and the test methods selected in accordance with DIN 16774, Part 2.

Joining Methods



Step 1

Cut the pipe to required length using a cutter, mark the welding depth on the pipe, ensure that the indicator light on the welding tool signals that the tool is hot enough (260°C) for welding.



Step 2

Push the pipe and fitting into the welding adaptors, applying even strength at both ends. Do not twist or turn the pipe and fitting while pushing. Wait until heating time is reached.



Step 3

When the welding heating time is reached, remove both pipe and fittings together, again without twisting or turning while pulling out of the welding adaptor. Almost immediately, push both pipe and fitting together until the depth is reached. It is possible to adjust the joints for more than 5 degrees during this time. Joint is now completed.



Welding Machine Packing



**Welding Machine
20mm to 63mm**



**Welding Machine
75mm to 110mm**

Welding Depth, Heating, Welding and Cooling Time

The table below provides the necessary information for a good welding joint for various BBB pipe and fitting size.

| Pipe Diameter (mm) | Welding Depth (mm) | Heating Time (sec.) | Welding Time (sec.) | Cooling Time (min.) |
|--------------------|--------------------|---------------------|---------------------|---------------------|
| 20 | 14.0 | 5 | 4 | 2 |
| 25 | 15.0 | 7 | 4 | 2 |
| 32 | 16.5 | 8 | 6 | 4 |
| 40 | 18.0 | 12 | 6 | 4 |
| 50 | 20.0 | 18 | 6 | 4 |
| 63 | 24.0 | 24 | 8 | 6 |
| 75 | 26.0 | 30 | 8 | 8 |
| 90 | 29.0 | 40 | 8 | 8 |
| 110 | 32.5 | 50 | 10 | 8 |

Note: Heating time starts when both pipe and fitting are pushed into correct depth. Welding time begins when joints are connected. Cooling time is the time taken for the joint to be completely cured. Never reduce cooling time by pouring water or other means.



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