

PEARL PLASTIC INDUSTRY

BRAND: PPI (PPR-C & PVC SYSTEMS)

PPR-C PIPES & FITTINGS TECHNICAL INSTALLATION GUIDE

Standard Operating Procedures for Socket Fusion Welding & Plumbing Systems

Manufacturer:	Pearl Plastic Industry (PPI)
Material Type:	Polypropylene Random Copolymer (Type 3)
Pressure Ratings:	PN16 (Cold Water) / PN20 (Hot Water)
Applicable Norms:	DIN 8077 / 8078 / 16962 & ISO 15874
Official Distributor:	UTCS.PK (Universal Trading & Construction)
Head Office / Mill:	Samundri Road, Faisalabad, Pakistan
Technical Hotline:	041-2568056 / 0300-0471963
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1. INTRODUCTION & MATERIAL PROPERTIES

Pearl Plastic Industry (PPI) manufactures premium-grade Polypropylene Random Copolymer (PPR-C Type 3) piping and fittings engineered specifically for pressurized hot and cold sanitary water networks, commercial plumbing, heating installations, and chemical transport lines.

Key Engineering Advantages of PPI PPR-C Systems:

- **Zero Corrosion & Scaling:** Smooth inner surface prevents calcification, lime build-up, and diameter reduction.
- **Hygienic & Potable Water Certified:** Non-toxic, tasteless, odorless, and completely free of heavy metals (Lead/Cadmium).
- **Monolithic Welded Joints:** Homogeneous socket fusion ensures joints are as strong as the pipe itself—eliminating leakage risks.
- **Low Thermal Conductivity (0.24 W/mK):** Significantly reduces heat dissipation in hot water networks and prevents sweat/condensation on cold lines.
- **50+ Years Working Lifespan:** Designed to withstand continuous operation under high temperature (up to 70°C/95°C peak) and pressures up to 20 bar.

2. REQUIRED WELDING TOOLS & SETUP

Tool Name	Specification / Parameter	Function & Proper Use
Socket Fusion Machine	Thermostatic regulation at 260°C (±10°C)	Melts pipe exterior and fitting interior simultaneously for molecular bonding.
Teflon Heating Dies	Sizes: 20mm, 25mm, 32mm, 40mm, 50mm, 63mm+	High-grade PTFE coating. Must be kept clean and scratch-free.
Pipe Shears / Cutter	Sharp ratchet blade mechanism	Ensures clean, 90° perpendicular cut without ovalization or cracking.
Depth Gauge / Marker	Permanent fine-tip felt marker & ruler	Marks exact welding penetration depth onto the pipe exterior.
Cleaning Cloths	Lint-free cloth with Isopropyl Alcohol	Removes dust, grease, and moisture from the joint faces prior to heating.

Tool Setup Note: Always allow the fusion welding machine to preheat until the green ready-light turns on (approx. 5–10 minutes). Verify temperature reaches **260°C** before commencing any fusion jointing.

3. STANDARD FUSION WELDING PROCEDURE (STEP-BY-STEP)

1 Perpendicular Cutting (90° Angle)

Cut the pipe strictly perpendicular to the pipe axis using sharp PPRC pipe shears. Do not use a hacksaw. Ensure the cut edge is clean, square, and free of burrs or swarf.

2 Surface Cleaning & Depth Marking

Clean both the pipe end and fitting interior with a dry, clean lint-free cloth. Using a depth gauge and marker, mark the specified **Welding Insertion Depth** onto the pipe end (see Table 1).

3 Simultaneous Heating (Socket Fusion)

Push the pipe and fitting simultaneously into the preheated Teflon dies (260°C). Push straight without turning or twisting until the pipe reaches the marked depth. Start timing immediately once fully seated.

4 Jointing & Alignment (Do NOT Rotate)

After the specified heating time, remove both components smoothly from the dies. Immediately push the pipe straight into the fitting up to the marked depth. **Never twist or rotate during joining!** Minor axial alignment must occur within 4 seconds.

5 Holding & Cooling Phase

Hold the joint firmly without moving for the required "Hold Time". Allow the joint to cool naturally to ambient temperature. A uniform double fusion bead must form around the joint circumference.

4. TABLE 1: TECHNICAL WELDING PARAMETERS REFERENCE

Pipe OD (mm)	Welding Depth (mm)	Heating Time (Seconds at 260°C)	Max. Adjusting Time (Seconds)	Cooling Period (Minutes)
20 mm (1/2")	14.0 mm	5 Seconds	4 Seconds	2 Minutes
25 mm (3/4")	15.0 mm	7 Seconds	4 Seconds	2 Minutes
32 mm (1")	16.5 mm	8 Seconds	6 Seconds	4 Minutes
40 mm (1.1/4")	18.0 mm	12 Seconds	6 Seconds	4 Minutes
50 mm (1.1/2")	20.0 mm	18 Seconds	6 Seconds	4 Minutes
63 mm (2")	24.0 mm	24 Seconds	8 Seconds	6 Minutes

Pipe OD (mm)	Welding Depth (mm)	Heating Time (Seconds at 260°C)	Max. Adjusting Time (Seconds)	Cooling Period (Minutes)
75 mm (2.1/2")	26.0 mm	30 Seconds	8 Seconds	6 Minutes
90 mm (3")	29.0 mm	40 Seconds	10 Seconds	8 Minutes
110 mm (4")	32.5 mm	50 Seconds	10 Seconds	8 Minutes

CRITICAL WARNING: Cold weather condition (below 5°C): Heating time must be increased by approx. 30–50% to achieve adequate plasticization. Never quench heated joints with cold water.

5. SUPPORT CLAMPING SPACING GUIDELINES

Pipe Diameter	Horizontal Support (Cold 20°C)	Horizontal Support (Hot 60°C)	Vertical Riser Spacing
20 mm	65 cm	50 cm	100 cm
25 mm	75 cm	60 cm	120 cm
32 mm	90 cm	75 cm	140 cm
40 mm	105 cm	90 cm	160 cm
50 mm	125 cm	105 cm	180 cm
63 mm	140 cm	120 cm	200 cm

6. THREADED TRANSITION FITTINGS GUIDELINES

- PPI Female & Male Threaded Fittings feature heavy-duty, dezincification-resistant brass inserts.
- Always seal metallic threads with **PTFE Teflon tape**. Do not use hemp or paste that may damage plastic threads.
- Do not over-torque threaded connections. Hand-tighten plus 1.5 to 2 turns with a suitable wrench is sufficient.

7. HYDROSTATIC PRESSURE TESTING STANDARD (DIN 1988)

- A Preparation & Air Bleeding:** Fill network with filtered potable water starting from lowest point. Open all vent cocks at high points until all air is fully evacuated.
- B Initial Pressure Test (15 Bar):** Pressurize the system to **1.5 times the operating pressure (minimum 15 Bar)**. Maintain for 30 minutes, repressurizing if elastic pipe expansion causes slight drop.
- C Final Inspection & Acceptance:** Inspect all fusion and threaded joints for any signs of weeping or moisture. Pressure drop must not exceed 0.2 bar after 2 hours.

8. SUMMARY: CRUCIAL DO'S & DON'TS

? DO's: • Verify heating plate is at 260°C. • Mark welding depth on every pipe cut. • Push straight into dies and fittings. • Allow natural cooling before pressure test. • Protect pipes from UV during storage.	? DON'Ts: • Never twist or rotate during welding. • Never exceed specified heating times. • Never cool joints with cold water. • Never use open flame or gas torch. • Never overtighten brass threaded inserts.
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PEARL PLASTIC INDUSTRY

Excellence in Polypropylene Piping Systems & Fittings

Manufacturer & Technical Support

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Official Webstore:	https://utcs.pk
Product Range:	PPRC Pipes PN16/PN20, Sockets, Elbows, Tees, Unions, Gate Valves, Over Cross & Transition Fittings

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