

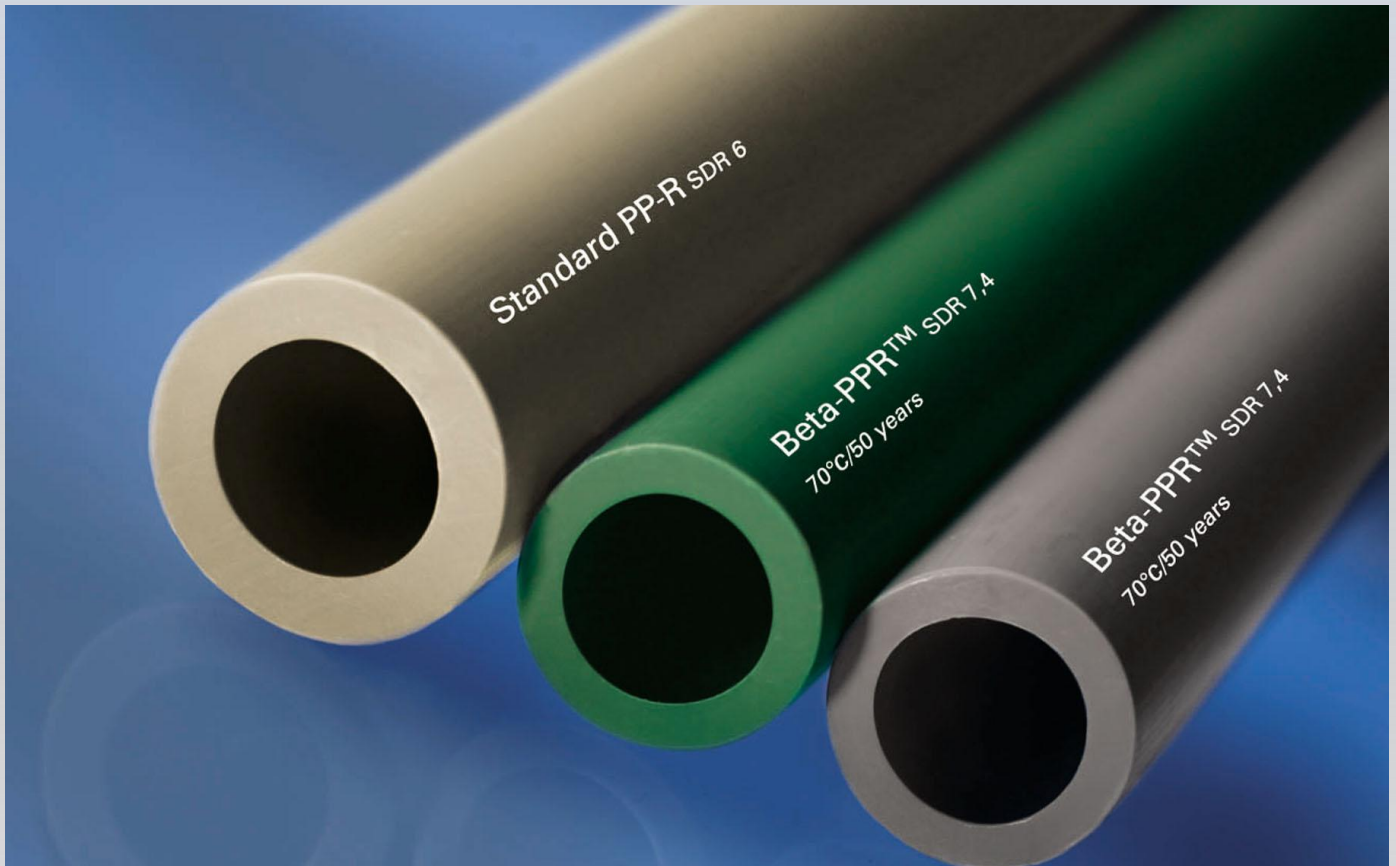


GFD PIPES
Good For Distribution

PPR/ PPR-CT (Beta-PPR) Pipes

PPR-AL-PPR Pipes

PPR Fittings



Shandong GFD Building Material Co.,Ltd.

GPPIG International Development Co.,Ltd.

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Company introduction

GFD is a professional choice for global plumbing system market. The brand means “ Good Fitting Designer ” The purpose of our business is providing the most cost performance plumbing products to our agents globally. Shandong GFD Building material Co.,Ltd. as the factory of GPPIG (GFD Plastic Pipe Industry Group UK) in China, is composed of 3 Divisions.

1.Brass Fittings Division: The main products cover compression and press fittings for multilayer pipe system and PEX fitting, Screw fitting, Ball valves and Manifolds.We also produce fittings according to customers’ drawing,with high accuracy and designated materials.

2.Plastic Pipe Division: The main products cover multilayer (PEX-AL-PEX) pipes, PEX/PERT floor heating pipes, PAP5 pipes and fittings, PPR pipes and Fittings.HDPE pipes and Fittings (Max OD 1600mm). UPVC pipes and fittings.

3.Mining Pipe Division: The main products covers Ultra-high Molecular Belt Supporting Roller, HDPE Roller, HDPE pipe for mining, Steel mesh Skeleton PE pipe, RTP(Reinforced Thermoplastic Pipe) etc.
The factory have passed ISO9001, ISO14001, OHSAS18001.NSF, UPC, WRAS, Water Mark,and other certificates is applying on our agents requirement.
GFD following the spirit “ Professional makes Perfect ” is never stop efforts to improve products quality at low cost.
Welcome foresight business partners cooperate with us.



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GFD pipe systems offers high quality pipes and fittings manufactured from Polypropylene Random Copolymers (PP-R) and advanced PP-RCT which exhibits a modified crystalline structure yielding higher technical performances. These recyclable, environmentally friendly, physiologically and microbiologically safe materials, have a proven suitability for the manufacture of cold, warm and heating water pipe systems.

From the raw material to the final product, GFD pipe systems are subjected torigorous ISO certified quality management procedures. Raw materials are exclusively procured from approved suppliers. Pipes and fittings are manufactured using technologically advanced computer controlled production lines. All items produced are tested to ensure dimensional, physical and chemical compliance with DIN, ISO, EN and DVGW applicable standards.

GFD pipes are supplied with all needed joining and connection elements from 16 mm to 160 mm external diameter.

POLYPROPYLENE (PP-R) MATERIAL FEATURES

High heat and extraction stability. Near zero moisture absorption.
Excellent electrical insulation characteristics. Corrosion, chemicals and bacteria resistant.

Service life of min 50 years for design temperatures ranging from 0 °C to 70 °C with tolerance for short term peak temperatures of 100 °C.

Higher flow rate due to smooth pipe inner surface.
Joints created by heat fusion featuring mechanical properties superior to the pipe itself. Elimination of water hammer commonly caused by hard metal systems resulting in silent operation.

Energy saving thermal insulation properties.

Good creep resistance maintaining pressure performance over long service lifetimes. Optimum cost to benefit ratio.

APPLICATION FIELDS

Potable and domestic hot and cold water systems
Domestic heating systems
Swimming pools Water treatment
Compressed air lines
Chemical liquid transportation Pressurized irrigation networks

SERVICE LIFE AND WORKING PRESSURE

Domestic cold water at 20 °C, working pressure up to 20 Bar: 50 yrs
Domestic warm water at 70 °C, working pressure up to 10 Bar: 50 yrs
Domestic heating water at 70 °C, working pressure up to 3 Bar: 50 yrs
Domestic heating water at 70 °C, with 90 days at 85 °C, working pressure up to 3.2 Bar: 35 yrs

PRODUCT STANDARDS

GFD pipe systems conforms to the following standards:

DIN EN ISO 15874: Plastics piping systems for hot and cold water installations -Polypropylene (PP)

DIN EN ISO 1043-1: Plastics – Symbols and abbreviated terms part 1: Basic polymers and their special characteristics

DIN 8077: Polypropylene pipes - Dimensions

DIN 8078: Polypropylene pipes - General quality requirements and testing

DVGW: German Technical and Scientific Association for Gas and Water-working sheets

Raw Material :Beta-PPR™ RA7050-GN

Description

Beta-PPR™ RA7050-GN is a PP-RCT(1), a Polypropylene-Random-Copolymer with an enhanced Crystalline structure brought about by a special -nucleation and with an improved Temperature resistance. Proof of the excellent performance characteristics of Beta-PPR™ RA7050-GN is, for example, a categorised required strength (CRS) of 5 MPa at 70 °C and 50 years (according to ISO 12162) in comparison to a value of 3.21 MPa for standard PP-R.

The colour of Beta-PPR™ RA7050-GN is green similar to RAL 6024.

Applications

In general Beta-PPR™ RA7050-GN is intended to be used in applications for plumbing and heating, such as in-house hot and cold water pipes and fittings, floor and wall heating systems and radiator connections.

Physical Properties**

		Typical Value*	Unit	Test Method
Density		905	kg/m ³	ISO 1183
Melt Flow Rate	(230°C/2.16 kg)	0.3	g/10 min	ISO 1133
Tensile Stress at Yield	(50 mm/min)	25	MPa	ISO 527-2
Tensile Strain at Yield	(50 mm/min)	10	%	ISO 527-2
Modulus of Elasticity in Tension	(1 mm/min)	900	MPa	ISO527
Charpy Impact Strength, notched	(+23°C)	40	kJ/m ²	ISO 179/1eA
Charpy Impact Strength, notched	(0°C)	4	kJ/m ²	ISO 179/1eA
Charpy Impact Strength, notched	(-20°C)	2	kJ/m ²	ISO 179/1eA
Mean Linear Thermal Coefficient of Expansion from 0°C to 70°C		1.5	*10 ⁻⁴ K ⁻¹	DIN 53752
Thermal Conductivity		0.24	WK ⁻¹ m ⁻¹	DIN 52612 Part 1
Surface Resistance		> 10 ¹²	Ohm	DIN 53482/VDE 0303 Part 2

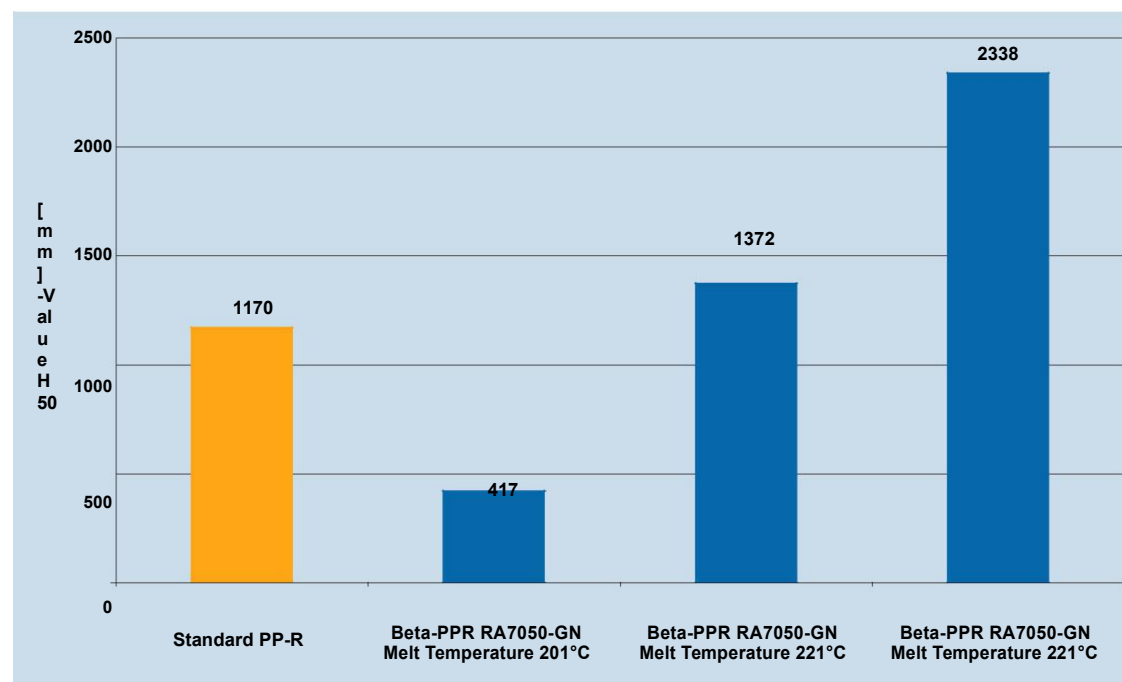


Diagram 1: Impact performance of pipes 25 x 3,5 mm measured at 0°C according to the EN 1411

Benefits of Beta-PPR RA7050

- Beta-PPR offers higher hydraulic capacity with same outer diameter
- PP-RCT pipe systems allow use of a higher percentage of smaller pipes in actual installations (percentage depends upon specific design)
- The Dendrit design program incorporates Beta-PPR and optimises the pipe sizes in any design
- Cost efficient system due to beneficial dimensioning
- Easier installation
- Existing extrusion and injection moulding equipment can be utilised without major changes

The innovative characteristics of Beta-PPR RA7050

- Improved design strength: 5.0 MPa at 70°C/50 years, which is >50 % higher than old PP-R at 3.2 MPa (refer to figure 1)
- Dimensioning with the DVGW (German association of companies for the gas and water industry) W544 design basis (70 ° C/50 years and Sf = 1.5) allows SDR 7.4 (S 3.2) instead of SDR 6 (S 2.5) pipes
- Higher hydraulic capacity or higher pressure can be utilised
- Excellent oxidation resistance due to state-of-the-art additive package
- Produced on multiple reactor technology
- PP-RCT is a new material class in German standards DIN8077/DIN8078 and Austrian ÖNORM B 5174
- Beta-PPR is weldable with known PP welding procedures

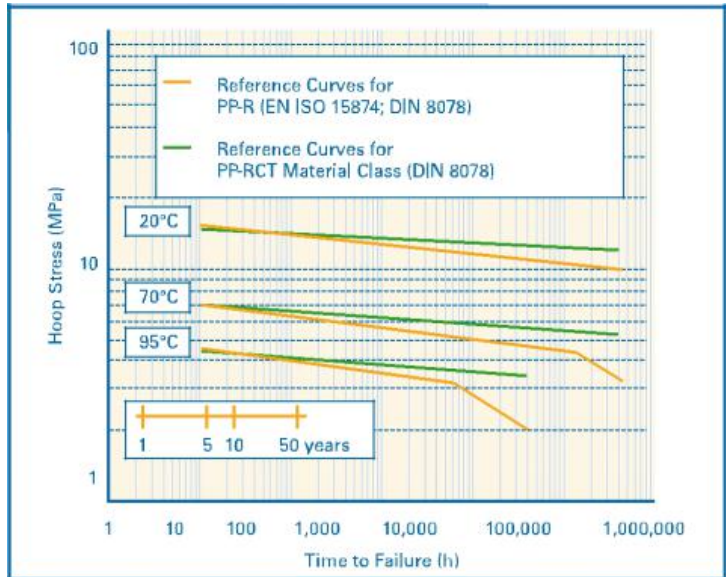


Figure 1: Pressure performance of PP-RCT versus today's PP-R reference curves

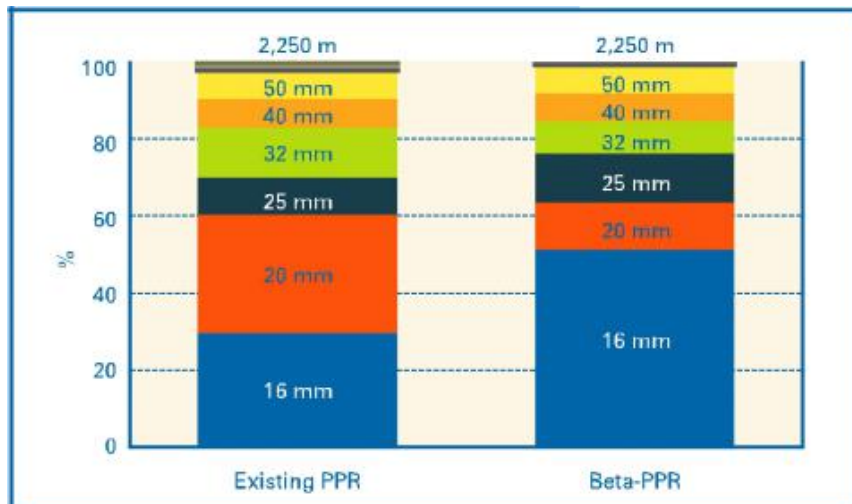
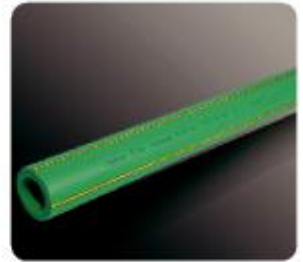


Figure 2: Percentage (metre basis) of pipes at each pipe size for a domestic hot and cold water distribution system calculated with Dendrit program for a model house

	Beta-PPR RA7050	Beta-PPR RA7050-GN
Colour	Steel grey	Green
Ral colour code	7042	6024
CRS at 70°C/50 years	5.0 MPa	5.0 MPa
MFR (230/2.16)	0.3 g/10 min	0.3 g/10 min
Modulus of Elasticity	900 MPa	900 MPa

BETA PP - RCT PIPE

The GFD Beta PP-RCT pipe system is manufactured using a new generation of material developed through a special “Beta-nucleation” technology, namely PP-RCT. This new material class, characterized by its modified crystal-line structure and enhanced temperature resistance, exhibits technical performances superior to all other thermoplastic material alternatives (PP-R, PE, PEX).



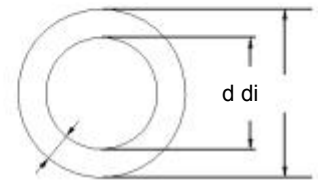
Material: Beta-PPR™ (PP-RCT)

Standard: DIN EN ISO 1043-1/15874, DIN 8077/8078

Color: Green/Grey

Pipe Series:

Series	S5	S4	S3.2	S2.5	S2
PN(MPa)	1.25	1.6	2.0	2.5	3.2



DN: 20,25,32,40,50,63,75,90,110,125,140,160

Length supplied: 4m straight lengths/3.9m/5.8m/6m

Pipe Series and Specification (mm)			Pipe Series			
	Average Outside Diameter		S5	S4	S3.2	s2.5
Dn	Dem. min.	Dem. max.	Nominal Wall Thickness e			
20	20.0	20.3	2.0	2.3	2.8	3.4
25	25.0	25.3	2.3	2.8	3.5	4.2
32	32.0	32.3	2.9	3.6	4.4	5.4
40	40.0	40.4	3.7	4.5	5.5	6.7
50	50.0	50.5	4.6	5.6	6.9	8.3
63	63.0	63.6	5.8	7.1	8.6	10.5
75	75.0	75.7	6.8	8.4	10.3	12.5
90	90.0	90.9	8.2	10.1	12.3	15.0
110	110.0	110.0	10.0	12.3	15.1	18.3
125	125.0	126.2	11.4	14.0	17.1	20.8
140	140.0	141.3	12.7	15.7	19.2	23.3
160	160.0	161.5	14.6	17.9	21.9	26.6

Advantages:

Excellent thermal pressure and stress resistance allowing larger bore size and increased flow for the same external pipe diameter.

Cost effectiveness stemming from the larger percentage of smaller pipe sizes in actual installations.

50% improvement in long term strength resulting in a service life of 50 years at 70° C for a pressure of 5MPa as compared to 3.2MPa for standard PP-R.

Improved hydro-static pressure resistance allows operation at higher stresses for elevated temperatures.

SDR7.4(S3.2) design basis allowed instead of SDR6 (S2.5) as per the DVGW-W544 (German association of companies for the gas and water industry-working sheets).

No limitation on water pH values necessary due to excellent resistance to oxidation.

Recommended for hot water applications (class 2 pipes) and high temperature radiators (class 5 pipes)

BETA PP - RCT PIPE SDR7 . 4/S3 . 2 (PN20) - Class 2 & Class 5

Pipe		Dimension	Wall Thickness	Internal Diameter	Water Content	Weight
Size (mm)	Packing Unit	d (mm)	s (mm)	d _i (mm)	(l/m)	(kg/m)
20	112	20	2.8	14.1	0.163	0.149
25	112	25	3.5	18.0	0.254	0.228
32	64	32	4.4	23.0	0.415	0.375
40	36	40	5.6	28.8	0.651	0.575
50	36	50	6.9	36.2	1.029	0.862
63	16	63	8.7	45.6	1.633	1.379
75	16	75	10.3	54.4		
90	4	90	12.3	65.4		
110	4	110	15.1	79.8		
125	4	125	17.1	90.8		
140	4	140	19.2	101.6		
160	4	160	21.9	116.2		

PP - R PIPE SYSTEM

Material: PPR RA130E

Standards: DIN 8077/8078, DIN EN ISO15874

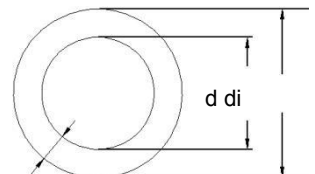
Color: Green/Grey/White

Pipe Series:

Series	S5	S4	S3.2	S2.5	S2
PN(MPa)	1	1.25	1.6	2.0	2.5

DN: 20,25,32,40,50,63,75,90,110,125,140,160

Length supplied: 4m straight lengths/3.9m/5.8m/6



PP - R PIPE SYSTEM SDR6/S2 . 5 - PN20

Pipe		Dimension	Wall Thickness	Internal Diameter	Water Content	Weight
Size (mm)	Packing Unit	d (mm)	s (mm)	d _i (mm)	(l/m)	(kg/m)
20	112	20	3.4	13.2	0.137	0.172
25	112	25	4.2	16.6	0.216	0.226
32	64	32	5.4	21.2	0.353	0.434
40	36	40	6.7	26.6	0.556	0.671
50	36	50	8.3	33.2	0.866	1.050
63	16	63	10.5	42.0	1.385	1.650

PP - R/AL -PPR STABLE ALUMINUM PIPE SYSTEM

Structure: Five overlapping layers of metal and plastic; inside and outside layers of PP-R tightly bonded with PP-based adhesive to the mid aluminum layer. PPR-AL-PPR/PERT/PE

Standards: DIN 8077/8078, DIN EN ISO 15874, DVGW W542

Color: Green / white

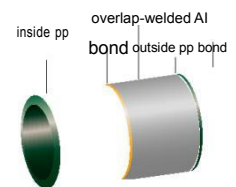
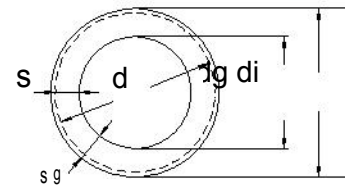
Length supplied: 4m straight lengths

Advantages:-

75% decrease in the linear expansion coefficient as compared to non composite pipes.

High impact resistance, detectable in embedded applications and better mechanical stability due to the presence of the aluminum layer.

Good heat preservation due to low heat conduction coefficient (0.45W/L.M). 20% improvement in flow rate due to reduced pipe thickness.



Pipe		Dimension	Wall Thickness	Internal Diameter	External Diameter	Thickness to Al.	Water Content	Weight
Size (mm)	Packing Unit	d (mm)	s (mm)	d _i (mm)	d _g (mm)	s _g (mm)	(l/m)	(kg/m)
20	80	20	2.8	14.4	21.9	3.7	0.163	0.216
25	60	25	3.5	18.0	27.0	4.5	0.254	0.296
32	40	32	4.4	23.2	34.1	5.5	0.415	0.471
40	20	40	5.6	28.8	42.2	6.7	0.651	0.739
50	16	50	6.9	36.2	52.3	8.0	1.029	1.025
63	12	63	8.7	45.6	65.4	9.9	1.632	1.610

N.B: PP-RCT/AL Stable Aluminum Pipes are available upon request.



PP-R & PP-RCT FITTINGS AND ACCESSORIES



Socket	
GFD100	
D20	D40
D25	D50
D32	D63



Reducing Tee	
GFD310	
D20/25/20	D50/20/50
D25/20/20	D50/25/50
D25/20/25	D50/32/50
D32/20/32	D50/40/50
D32/25/32	D63/25/63
D40/20/40	D63/32/63
D40/25/40	D63/40/63
D40/32/40	D63/50/63



Reducer	
GFD110	
D25/20	D50/20
D32/20	D50/25
D32/25	D50/32
D40/20	D50/40
D40/25 D63/40	
D40/32	D63/50



End Cap	
GFD500	
D20	D40
D25	D50
D32	D63



Elbow 90°	
GFD200	
D20	D40
D25	D50
D32	D63



End Cap (with thread)	
GFD500A	
	1/2
	3/4



Elbow 45°	
GFD220	
D20	D40
D25	D50
D32	D63



Cross Pipe	
GFD003	
	D20
	D25
	D32



Tee	
GFD300	
D20	D40
D25	D50
D32	D63



Male Thread Connector	
GFD101	
D20*1/2	D32*1
D25*1/2	D40*11/4
D25*3/4	D50*11/2
D32*3/4	D63*2

PP-R & PP-RCT FITTINGS AND ACCESSORIES



Female Thread Connector
 GFD102

D20*1/2	D40*1 1/4
D25*1/2	D50*1 1/2
D25*3/4	D63*2
D32*1	



Double Union Ball Valve
 GFD9020

D20	D40
D25	D50
D32	D63



Male Thread Elbow
 GFD201

D20*1/2
D25*1/2
D25*3/4
D32*1



Union (Plastic/Plastic)
 GFD103-3

D20	D32
D25	D40



Female Thread Elbow
 GFD202

D20*1/2
D25*1/2
D25*3/4
D32*1



Electrical Peeler
 GFD9018

D20	D40
D25	D50
D32	D63



Female Thread Tee
 GFD302

D20*1/2*20
D25*1/2*25
D25*3/4*25
D32*1*32



Cutter
 GFD9017

D20 - 32
D20 - 75



Concealed Stop Valve (chrome coated)9012-A1

D20
D25
D32



Welding Machine
 GFD800

D20-32
D20-63
D75-110



Stop Valve
 GFD9012-B

D20	D40
D25	D50
D32	D63



Welding Machine Mould
 GFD802

D20	D40
D25	D50
D32	D63

PP-R Fusion Welding Process

process called fusion welding. The process is very simple and results in inseparable water tight joints. It is carried out using an electric fusion welding machine that simultaneously heats the internal surface of the fitting and the external surface of the pipe which are then joined together to form inseparable water tight joints.

The following sections demonstrate the basic procedure for fusion welding process for plain and composite PPR pipes.

Welding Plain and PPR / FG / PPR Faser pipes:

The following steps describe the steps of the welding process:

1. Prepare the welding machine by fitting it with the welding dies of the diameters to be welded. Connect the plug to the 220 V power supply socket and wait until the machine reaches the working temperature (260°C).
2. Cut the pipe at right angles to the pipe axis using suitable pipe cutter.
3. Remove any burrs or cutting chips by deburring the cutting area.
4. Mark the welding depth on the pipe using a suitable marker.
5. Without turning insert the end of the pipe into the heating sleeve up to the marked welding depth and at the same time slide without turning the fitting into the other side of the heating tool up to the stop.
6. Leave the pipe and fitting on the heating tool until the heating time is elapsed.
7. At the end of the heating time, remove the pipe and fitting from the heating tool and push them immediately into each other up to the mark indicating the welding depth. At this stage the depth mark will be covered by the welding bead. During this process, do not rotate the pipe and fitting relative to each other.
8. Allow the joint to cool fully before using.



Handling and Storage of PPR Pipe and Fittings

PPR pipes and fittings should be handled with care considering the resilience of these pipes and fittings. Transportation, storage and handling should be done taking into consideration the below directions and precautions.

Handling

- Take all reasonable care when handling PPR, particularly in very cold conditions when the impact strength of the material is reduced.
- Do not throw or drop pipes, or drag them along hard surfaces.
- Do not scratch pipes against hard surfaces or drag them along the ground.
- In case of mechanical handling, use protective slings and padded supports. Metal chains and hooks should not make direct contact with the pipe.

Storage

- PPR Pipes & fittings should be stored in covered areas away from direct sun light.
- To avoid deformation over time, pipes should be stacked on a flat base or on a level ground with maximum stack height of 1.5m.
- Provide side support at 1m centers.
- Store all materials in well-ventilated, shady conditions in covered stores.
- Avoid direct exposure to sunlight for long periods.
- keep pipes in their nylon packing and fittings in their original packaging until required for use
- Ideally, stacks should contain one diameter pipe size only. Where this is not possible, stack largest diameter pipes at base of stack.
- Do not place heavy items on top of the pipes.
- Pipes should be kept clean as much as possible, as this may save cleaning time while preparing pipes for welding.
- While stores at site or during temporary storage outdoor, PPR Pipes and fittings should be covered with proper sheet for protection from UV.





GFD PIPES

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