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Chairman Message

Roxy For Modern Water Systems

Roxy Plast factories for modern water systems, a member of Momen group for investments, were established in 2005 due to the tremendous development in the pipe and fittings industry To cover the needs of national and international markets.

Our main products include UPVC, HDPE, PP and PPR-C (pipes & fittings) in all types, colors, and different standards (ASTM, DIN, BS,EN, ISO, IQS, AND EGYPTIAN) depending on the client's needs.
Our head office is located in Heliopolis, Cairo, Egypt, and our factories are located in Obour city and 10th of Ramadan City.

A team of quality assurance specialists in laboratory affairs carry out continuous monitoring processes on the plastic pipes and all the other related parts of the system, such as the fittings and the related accessories.

We also have a developed quality assurance system that uses a series of developed devices that allow us to ensure that the production process is up to the international standards and special requirements contracted with our customers.

There is a series of experiments conducted on our plant's production process that include chemical, physical and mechanical properties.

Adding to that, there is a full range of specialists in the field of plastic pipe installation who are fully prepared to provide our customers with technical advice.

Now **Roxy** Plast is considered as one of the largest companies that produces and processes pipes and its accessories in the Egyptian market as well as the Arab world and Africa.

Our products are accredited in different regions, such as: Egypt, Africa, the Arab world and Europe.
Not only are our distribution channels in Africa and the MENA region, but we have also Opened new markets in the last two years in north asia and south America a

Chairman

Why Roxy ?

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Circle Of Trust For Every Client

Pipes Factory

Roxy for Modern water systems (pipe systems) is an Egyptian company under the umbrella of the holding company Momen group, which has been established in 1989. Investing in several fields, one of its investments is water systems manufacturing.

Our mission is to establish a circle of trust for every client by providing the best quality, service and price.

We apply the latest German technological innovations in our manufacturing process in addition to the usage of the best European and American materials such as Borealis, boroug, basell, shintech and Topilene.

A proud Egyptian product with German technology.
Massive production capacity that enables us to deliver in a very short time period with the best quality and competing price.

We work on a stock basis, not by order production so we can maintain fast delivery.
Our products are accredited by most of the big consultancy firms, and are frequently tested in the big Egyptian and German labs.

We have a well-trained quality assurance department that assures that our products meet the standards. Adding to that, Roxy Plast gives a warranty on all our systems for 50 years.
We manufacture our products according to the DIN, ASTM, EN, ISO, IQS, BS and ES standards.

Features & Advantages of ROXY PPR System

Roxy For Modern Water Systems

Features of Roxy Plast PPR Pipes and Fittings

Poly propylene is a thermoplastic addition polymer made from the combination of propylene monomers. It's used in variety of applications to include packaging for consumer products, plastic parts for various industries including the automotive industry.

Advantages

The reliability and durability of the pipeline system directly depends on the quality and properties of the basic substance. The invention of poly propylene random copolymer (PPR) was the result of the unique research, which make it the best selection for pressurized water and heating systems. Long life.

Deposits and corrosion don`t build up on the surface, having direct contact with water. The internal pipe size does not reduce over time, Preserving the purity of water.

The **Roxy** Plast PPR material is absolutely non-toxic and chemical resistant (inert), and therefore does not affect the quality of the pipeline water, and absolutely has no rust release. Widespread use of polypropylene pipelines, Resistance to changing conditions.

Roxy Plast PPR endures high pressure and temperature drops. Due to the elasticity of the material, an important advantage of polypropylene pipes is as follows: water in the polypropylene pipes may freeze without destroying them.

If water freezes in the polypropylene pipes and fittings, they are not destroyed, but only slightly increase in size and come back to the previous size after thawing.
Roxy Plast PPR pipeline water supply system can withstand a certain amount of freezing / thawing. Basic normative document on polypropylene indicates that it is possible to do. Low heat loss.

Roxy Plast PPR systems are economical-to-operate, and their heat conductivity is much lower as compared with the metal pipes (heat economy up to 35%). Noise & vibration damping capacity Roxy Plast PPR systems maintain noise suppression much better as compared to the metal pipelines.

Convenient & fast installation. Installation of **Roxy** Plast PPR pipes and fittings requires minimal skills, time and effort. Fusion welding method allows to ensure a long- life tight joint for only a few seconds.

Low cost, good value for money factor is achieved due to the low cost of raw materials and technological ease of installation. Furthermore, the durability of polypropylene plumbing compares favourably with metal plumbing (about 5 times).

Features & Advantages
of ROXY PPR System

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Circle Of Trust For Every Client

Roxy Roxy Plast PPR pipes are light and easily moved and transported; therefore the handling charges are reduced. They are easy to install, and safe for the health (no risk to get an injury), so that the total cost of the installation is lower than when you use pipes and fittings made of other materials (carbon steel, cooper, PVC and etc.).

1. **Roxy** Plast PPR, used for the pipes and fittings manufacture, is tested to elevated temperatures and chemicals. It is durable and more stable than other materials, which are used in this field.

2. The absence of rust, corrosion, decomposition, decay, dirt, bacteria and calcareous deposits in the pipes and fittings prevents the internal pipe size reduction, and thus, their capacity is not reduced over time.

3. Then since polypropylene is not a corrosive material, there is no electrochemical or abrasive reaction or wear. Plastic pipes can be easily attached to the fittings, they are widely used for different purposes; their installation requires minimal time and effort.

4. **Roxy** Plast PP-R exhibits high stability to a wide range of organic and inorganic compounds. Due to smooth inner surface it is not subject to the action of timescale, thereby, the internal pipe size remains constant.

Why Roxy Plast PPR system:

Chemical Resistance
Diluted bases and acids don't react readily with polypropylene, which makes it a good choice for containers of such liquids, such as cleaning agents and more.

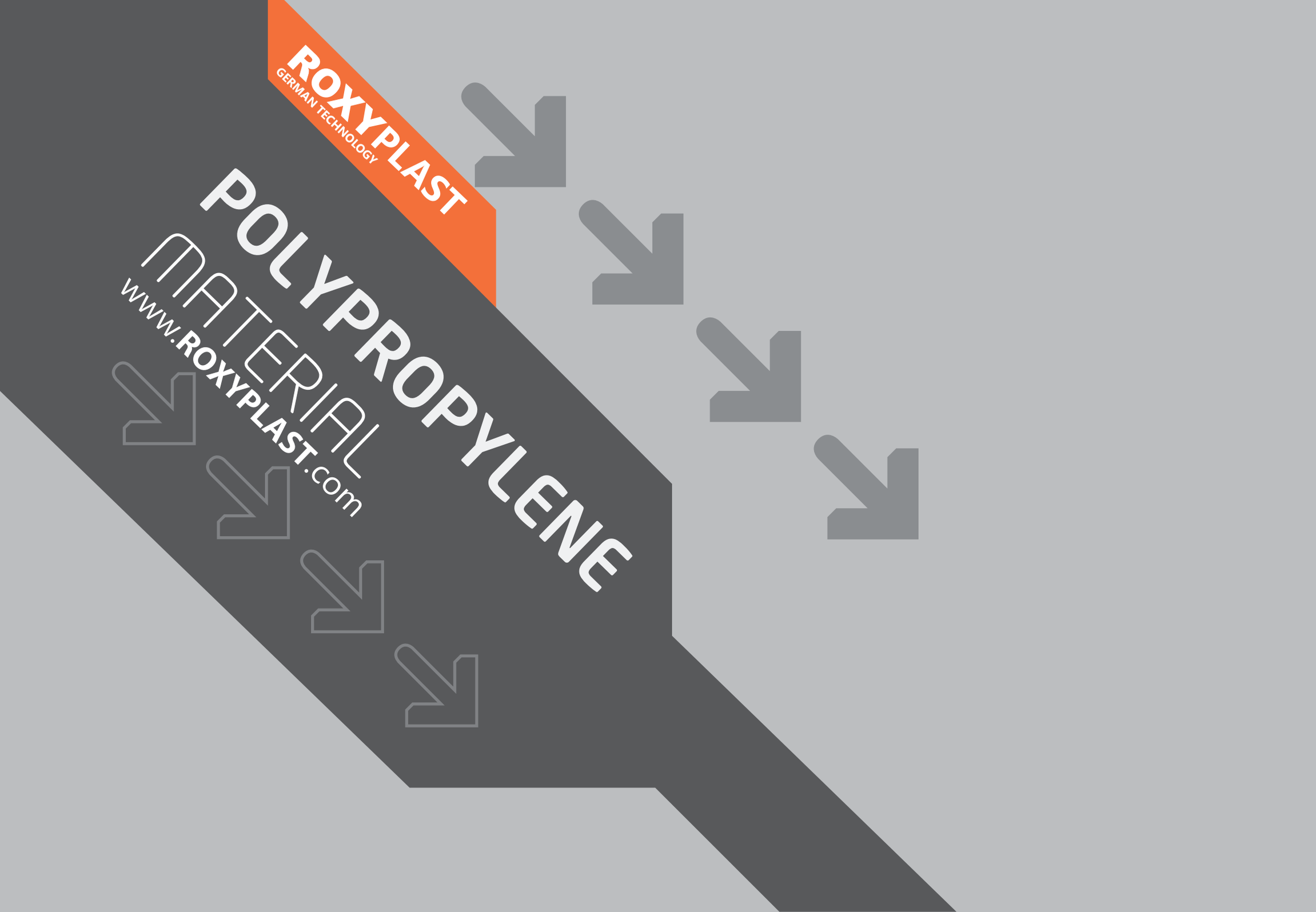
Elasticity and toughness
Polypropylene will act with elasticity over a certain rang of deflection (like all materials),but it will also Exerts plastic deformation early in the deformation process, so it is generally considered a tough material, so it is not Elastic.

Resistance to stress and pressure
Polypropylene retains its shape after a lot of torsion, bending, and flexing

Insulation
Polypropylene has a very high resistance to electricity and is very useful for electronic components.

Transmissivity
Although Polypropylene can be made transparent

CONCLUSION
Roxy Plast PPR (is the most competitive material for our conditions as compared to copper, steel and other polymeric materials. Besides, its random copolymer family is the most suitable for cold and hot water supply systems (drinking water, heating, process pipelines, etc.).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GERMAN TECHNOLOGY
POLYPROPYLENE
MATERIAL
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POLYPROPYLENE MATERIAL

Polypropylene systems have been successfully applied to a wide variety of applications.

Polypropylene is used in double containment systems, chemical piping, and pure water systems.

It is chemically resistant to many strong and weak acids, In addition to being one of the few materials that is recommended for strong bases such as Sodium Hydroxide.

It is not ideal for strong oxidizing acids, aromatics, and chlorinated hydrocarbons.

Polypropylene has an extended operating range up to a maximum temperature of 200° F ~ 90° C

Polypropylene is a fairly ductile material at ambient temperatures and it demonstrates good impact strength.

Copolymer polypropylene is a blend of (6%) ethylene and (94%) propylene Copolymer resins generally exhibit better mechanical strength and offer higher safety factors into a system design. moreover, copolymer PP shows a greater purity level when tested in a static leak test, making it the ideal material for pure water systems.

TECHNICAL DATA SHEET

Topilene® R200P

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Polypropylene Random Copolymer

For PP R Pipes and Fittings(Pressure Pipes Systems)

Product Description

***Topilene*® R200P** is a specially designed polypropylene random copolymer (PP -R, natural colored) that features excellent long -term hydrostatic pressure resistance and heat stability. It is suitable for hot & cold water supply pipes and fittings as well as radiator connecting pipes. It is the outcome of HYOSUNG's integrated polymerization and crystallization technology with advanced PP manufacturing process technique.

Characteristics

Typical Application Hot & cold water supply pipes and fittings / Radiator connecting pipes

Features Excellent long -term hydrostatic pressure resistance and heat stability (PPR 125, MRS 12.5 MPa, CRS 3.3 MPa) / Excellent stiffness and impact strength balance / Chemical stability / Environment -friendly / Enhanced processability

Compliance The pipes produced with ***Topilene*® R200P** complies with the hydrostatic pressure requirements according to DIN 8078 and ISO/DIS 15874. It complies with the requirements of NSF/ANSI 14, FDA 21 CFR 177.1520 and (EU) No 10/2011 for food contact. This product corresponds to the DVGW W270/KTW guidelines and GB/T17219 -1998 for drinking water system.

Typical Properties

Resin Properties	Method	Value	Unit
Melt Index(230℃, 2.16kg)	ASTM D1238	**0.25**	g/10min
Density	ASTM D792	**0.90**	g/㎤
Tensile Strength at Yield	ASTM D638	**270**	kg/㎠
Flexural Modulus	ASTM D790	**9,000**	kg/㎠
Notched Izod Impact Strength(23℃ / -10℃)	ASTM D256	**N.B / 5.0**	kg·cm/cm
Rockwell Hardness	ASTM D785	**75**	R-Scale
Heat Deflection Temperature	ASTM D648	**90**	℃
Vicat Softening Point	ASTM D1525	**130**	℃
Mean Coefficient of Linear Thermal Expansion(0℃ -80℃)	Dilatometer	**$1.5*10^{-4}$**	K^{-1}

The values listed above are typical values for reference purpose only and shall not be construed as specifications.

Storage and Handling

This product should be stored in dry condition at temperature below 40°C and protected from UV -light. When condensation is visible or can be expe cted, pre -drying is recommended. (Drying condition: 80~100℃/2~4hours at air circulated condition)

HYOSUNG PP/DH Performance Unit

TECHNICAL DATA SHEET

Topilene® R200P

Polypropylene Random Copolymer

For PP-R Pipes and Fittings(Pressure Pipes Systems)

Process Guidelines

The actual extrusion conditions will depend on the type of equipment and the SDR of pipes produced. The below conditions may be used as guidelines for this material.

Cylinder feeding zone	160-180℃
Cylinder melting zone	180-210℃
Cylinder mixing zone	180-220℃
Head	180-220℃
Die	180-220℃
Melt temperature	200-220℃
Cooling temperature	20-30℃

Disclaimer

HYOSUNG PP/DH Performance Unit

Borouge

PRODUCT DATA SHEET

POLYPROPYLENE

Borstar® RA140E

POLYPROPYLENE RANDOM COPOLYMER FOR PRESSURE PIPE SYSTEMS

DESCRIPTION

Borstar® RA140E is a BNT Nucleated high molecular weight, low melt flow rate polypropylene random copolymer (PP-R) natural colored.

APPLICATIONS

Borstar® RA140E together with the appropriate additive packageis recommended for the production of PP-R pipes and fittings used in: Heating, Plumbing, Domestic water, Relining, and Industrial applications

SPECIFICATIONS

Borstar® RA140E is intended to fulfill the following standards and regulations, providing the appropriate industrial manufacturing standard procedures are used and a continuous quality system is implemented: DIN 8078, DIN 8077 and EN ISO 15874.

SPECIAL FEATURES

Borstar® RA140E is a natural grade used for production of pipes and fittings. The material is in pellet form and includes selected additive package which ensure:

- Enhanced process ability
- Economical pipe production
- Excellent product consistency
- High temperature resistance
- Low incidence on taste and odour
- Good impact strength

The pipe systems will show high durability, no corrosion, good weldability, homogeneous joints, low tendency to incrustations and fast and easy installation.

PHYSICAL PROPERTIES

Property	Typical Value	Test Method
Density	905kg/m³	ISO 1183
Melt Flow Rate (°230C/2.16 kg)	0.30g/10min	ISO 1133
Flexural Modulus (2mm/min)	850MPa	ISO 178
Tensile Modulus (1mm/min)	800MPa	ISO 527
Tensile Strain at Yield (50mm/min)	13.5%	ISO 527-2
Tensile Stress at Yield (50 mm/min)	25MPa	ISO 527-2
Thermal Conductivity	0.24W/(m K)	DIN 52612
Coefficient of Thermal Expansion (°0C/70 °C)	10^1.8E-4/K	DIN 53752
Charpy Impact Strength, notched (23°C)	60 kJ/m²	ISO 1791/eA
Charpy Impact Strength, notched (0°C)	6.0kJ/m²	ISO 1791/eA
Charpy Impact Strength, unotched (23°C)	No break	ISO 1791/eU
Charpy Impact Strength, unotched (0°C)	No break	ISO 1791/eU

*Data should not be used for specification work

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PROCESSING CONDITIONS

The actual conditions will depend on the type of the equipment used and the diameter and wall thickness of the pipes produced.

Following parameters should be used as guidelines for extrusion:

Cylinder	180-210°C
Head	210-220C
Die	210-220C
Melt temperature	200-220°C

Following parameters should be used as guidelines IM Machines:

Holding Pressure	200-500bar
Mould Temperature	10-40C
Melt temperature	200-220°C
Injection Speed	As high as possible

Specific recommendations for processing conditions can be determined only when the application and type of equipment are known. Please contact your local Borouge representative for such particulars.

STORAGE

Borstar ® RA140E should be stored in dry conditions at temperature bellow 50C and protected from UV-light. Improper storage can initiate degradation, which results in odour generation and colour changes and can have negative effects on physical properties of this product.
More information on storage can be found in Safety Information Sheet (SIS) for this product.

SAFETY

The product is not classified as a hazardous preparation.

Please see our Safety Information Sheet (SIS) for details on various aspects of safety, recovery and disposal of the product, for more information contact your Borouge representative.

RECYCLING

The product is suitable for recycling using modern methods of shredding and cleaning. In-house production waste should be kept clean to facilitate direct recycling.

RELATED DOCUMENTS

The following related documents are available on request, and represent various aspects on the usability, safety, recovery and disposal of the product.

Safety Information Sheet
Statement on chemicals, regulations and standards
Statement on compliance to regulations for drinking water pipes

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DISCLAIMER

The product(s) mentioned herein are not intended to be used for medical, pharmaceutical or healthcare applications and we do not support their use for such applications. To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability whatsoever for the accuracy and completeness of such information. Borouge makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose . It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products. No liability can be accepted in respect of the use of Borouge products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

Jan 2018

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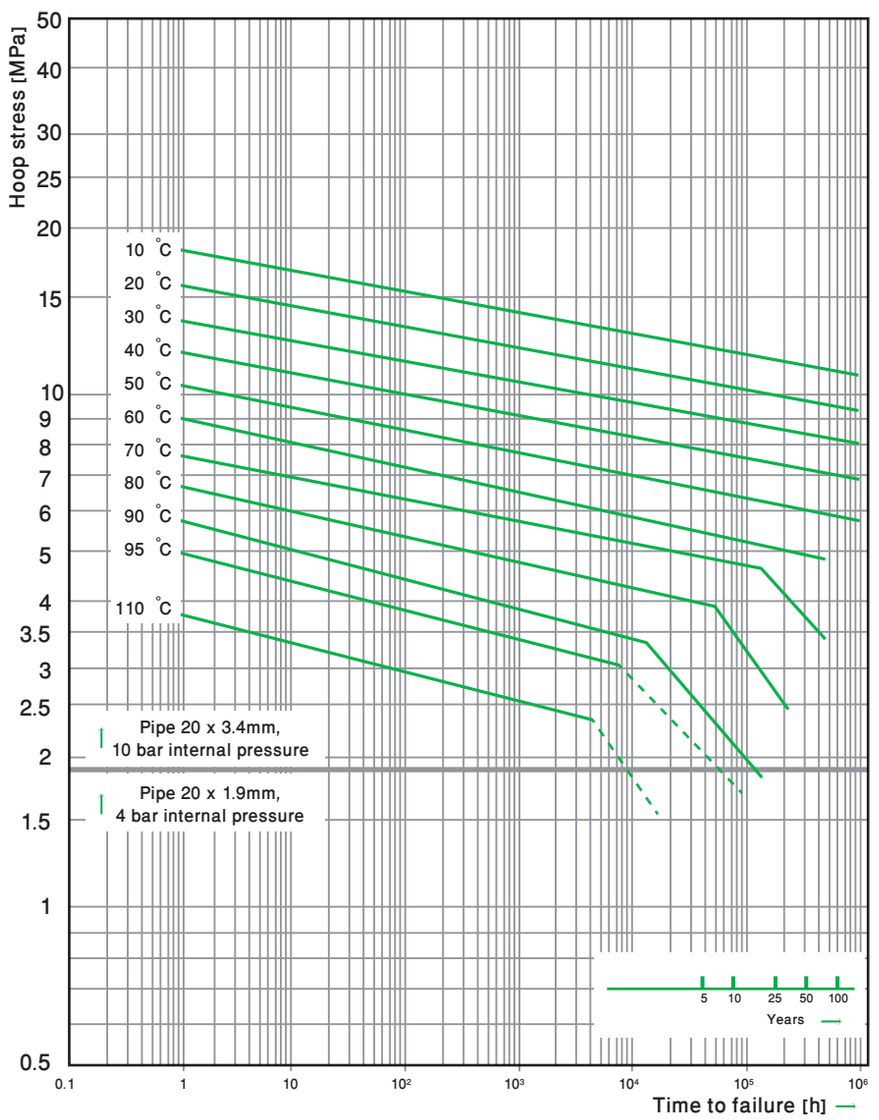
POLYPROPYLENE PHYSICAL **PROPERTIES**

Typical value	Test Method	Main Value	Unit
PHYSICAL PROPERTIES			
Density 23° c	ISO 11 83	0.895	g / cm2
Vicat softening Temperature (0.98 n)	ISO 306	130	c°
RHEOLOGY			
Melt Mass Flow Rate MFR (230° C/2.16 KG)	ISO 1133	0.3	g/10 min
MECHANICAL PROPERTIES			
Tensile modules (1mm/min)	ISO 527 – 1.2	900	MPA
Tensile stress yield (50mm/min)	ISO 527 – 1.2	27	MPA
Tensile strain yield (50 mm / min)	ISO 527 – 1.2	13	%
Charpy impact strength At 23 ° c	ISO 179/1eu	N.B	KJ/M2
Charpy impact strength At – 20 ° c	ISO 179/1eu	30	KJ/M2
Charpy impact strength Notched at 23 ° c	ISO 179/1eu	38	KJ/M2
Charpy impact strength Notched at - 20 ° c	ISO 179/1eu	2	KJ/M2
THERMAL PROPERTIES			
Heat deflection (temperature 0.45 mpa "HTD/b")	ISO 75 – 1.2	88	° c
Mean coefficient of linear (Thermal Expansion 0:110° c)	Din 53752	1.5×10^{-4}	K^{-1}
Thermal conductivity	Din 52612 - 1	0.23	$K^{-1}\ m^{-1}$
ELECTRICAL PROPERTIES			
Surface resistance	Din 53482	$>10^{13}$	Ohm. cm

BEHAVIOR OF **PPR PIPE**

According to DIN 8078, the service life of PP-R pipe depends on the time the internal hoop stress is subjected to a specific temperature. Hoop stress is given as follows:



$$\delta = \frac{p \times (d-s)}{20 \times s}$$

Where
δ= Hoop Stress (N/mm^2 or MPa)
P = Internal Pressure (Bar)
d = Outer Diameters of Pipe (mm)
S = Wall Thickness of Pipe (mm)

Permissible Operating Pressure

Projected Service Life
The following table provides more detailed information with regards to the permissible pressure at various temperatures.

These values are derived from the Hoop Stress Chart and formula. Under normal working pressures and conditions, the average service life of suitable PP-R pipes are at least 50 years.

Example
A PN 10, cold water pipe, transporting water at a temperature of 30 °C can last for more than 50 years under normal conditions with an operating pressure of 13.1 Bars or 190 P.S.I.

A PN 20, hot water pipe, transporting water at a temperature of 70 °C can last for more than 50 years under normal conditions with an operating pressure of 10.2 Bars or 148 P.S.I.

SDR "Standard Dimention Ratio" = Diameter/Wall Thickness Ratio [d/e] **s**=Pipes series
Index from ISO 4065) < /p>

Table 1.1 permissible Working Pressure
(For Potable Water)

(Bars)/1.25 Safety factor		Roxy Standard Pipe SDR 11- S5	Roxy Standard Pipe SDR 7.4 - S3.2	Roxy Standard Pipe SDR 6- S2.5	Roxy Standard Pipe SDR 5- S2
		Nominal pressure class			
Years of service	temperature	PN10	PN16	PN20	PN25
1 Year	10 ◦C	21.1	33.4	42.0	52.9
	20 ◦C	18.1	28.6	63.0	45.3
	30 ◦C	15.3	24.3	30.6	38.5
	40 ◦C	12.9	20.5	25.8	32.5
	50 ◦C	11.0	17.5	22.0	27.7
	60 ◦C	9.3	14.7	18.5	23.3
	70 ◦C	7.3	12.4	15.6	19.6
	80 ◦C	6.5	10.4	13.1	16.4
	95 ◦C	4.6	7.3	9.2	11.6
5 Year	10 ◦C	20.0	31.6	39.8	50.1
	20 ◦C	16.9	26.8	33.8	42.2
	30 ◦C	14.4	22.8	28.7	36.1
	40 ◦C	12.1	19.2	24.2	30.5
	50 ◦C	10.2	16.2	20.4	25.7
	60 ◦C	8.6	13.7	17.2	21.7
	70 ◦C	7.2	11.4	14.3	18.0
	80 ◦C	5.7	9.1	11.5	14.4
	95 ◦C	3.0	4.8	6.1	7.6

BEHAVIOR OF **PPR PIPE**

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...Continued

(Bars)/1.25 Safety factor		Roxy Standard Pipe SDR 11- S5	Roxy Standard Pipe SDR 7.4 - S3.2	Roxy Standard Pipe SDR 6- S2.5	Roxy Standard Pipe SDR 5- S2
		Nominal pressure class			
Years of service	temperature	PN10	PN16	PN20	PN25
10 Years	10 ◦C	19.3	30.6	38.5	48.5
	20 ◦C	16.4	26.1	32.5	41.3
	30 ◦C	13.9	22.0	27.5	34.9
	40 ◦C	11.8	18.7	23.6	29.7
	50 ◦C	9.9	15.5	19.7	24.9
	60 ◦C	8.3	13.2	16.6	20.8
	70 ◦C	7.0	11.1	14.0	17.6
	80 ◦C	4.8	7.6	9.6	12.0
	95 ◦C	2.6	4.0	5.1	6.4
25 Years	10 ◦C	18.7	29.6	37.3	46.9
	20 ◦C	16.0	25.3	31.8	40.1
	30 ◦C	13.4	21.3	26.8	33.7
	40 ◦C	11.3	18.0	22.6	28.5
	50 ◦C	9.6	15.2	19.1	24.1
	60 ◦C	8.0	12.6	15.9	20.0
	70 ◦C	6.1	9.6	12.1	15.2
	80 ◦C	3.8	6.1	7.6	9.6
50 Years	10 ◦C	18.2	28.8	36.3	45.7
	20 ◦C	15.5	24.5	30.9	38.9
	30 ◦C	13.1	20.7	26.1	32.9
	40 ◦C	11.0	17.5	22.0	27.7
	50 ◦C	9.3	14.7	18.5	23.3
	60 ◦C	7.7	12.1	15.3	19.2
	70 ◦C	5.1	8.1	10.2	12.8
	80 ◦C	N/A	N/A	N/A	N/A
100 Years	10 ◦C	17.7	28.1	35.4	44.5
	20 ◦C	15.0	23.8	29.3	37.5
	30 ◦C	12.8	20.2	25.5	32.1
	40 ◦C	21.3	16.9	21.3	26.9
	50 ◦C	8.9	14.2	17.8	22.5
	60 ◦C	N/A	N/A	N/A	N/A
	70 ◦C	N/A	N/A	N/A	N/A
	80 ◦C	N/A	N/A	N/A	N/A

Table 1.2 Permissible Working Pressure

(For Hot Water & Heating Installations)...Continued

(Bars)/1.25 Safety factor		Roxy Standard Pipe SDR 11- S5	Roxy Standard Pipe SDR 7.4 - S3.2	Roxy Standard Pipe SDR 6- S2.5	Roxy Standard Pipe SDR 5- S2
		Nominal pressure class			
Years of service	temperature	PN10	PN16	PN20	PN25
Constant service temperature 70 ◦C incl.30 days per year at...	57 ◦C	5	11.33	14.27	17.07
		10	10.95	13.79	15.20
		25	9.32	11.74	15.00
		45	8.08	10.18	14.40
	80 ◦C	5	10.72	13.50	13.88
		10	10.16	12.80	13.06
		25	8.84	11.14	11.72
		42.5	7.77	9.79	10.17
		5	9.85	12.42	13.32
		37.3	9.42	11.87	12.22
		25	8.05	10.14	11.06
		37.5	7.29	9.18	9.88
		5	9.04	11.39	11.74
	90 ◦C	10	8.69	10.94	12.12
		25	7.03	8.86	9.91
		35	6.48	8.16	8.86
		5	11.20	14.11	15.90
	75 ◦C	10	10.77	13.57	14.50
		25	9.19	11.58	13.70
		45	7.97	10.05	12.80
Constant service temperature 70 ◦C incl.60 days per year at...		5	10.41	13.12	15.80
	80 ◦C	10	9.96	12.54	15.40
		25	8.38	10.56	13.20
		40	7.47	9.41	11.60
		5	9.55	12.03	15.78
	85 ◦C	10	9.14	11.52	15.30
		25	7.31	9.22	13.30
		35	6.73	8.48	11.20
		5	8.76	11.04	14.90
	90 ◦C	10	7.75	9.76	12.90
		25	6.20	7.81	10.48
		30	5.92	7.46	8.45

BEHAVIOR OF **PPR PIPE**

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...Continued

(Bars)/1.25 Safety factor		Roxy Standard Pipe SDR 11- S5	Roxy Standard Pipe SDR 7.4 - S3.2	Roxy Standard Pipe SDR 6- S2.5	Roxy Standard Pipe SDR 5- S2
		Nominal pressure class			
Years of service	temperature	PN10	PN16	PN20	PN25
Constant service temperature 70 ◦C incl. days per year at...	75 ◦C	5	11.12	14.02	14.73
		10	10.62	13.38	13.80
		25	8.99	11.33	12.40
		45	7.80	9.82	11.20
	80 ◦C	5	10.23	12.90	16.10
		10	9.80	12.35	15.50
		25	7.97	10.05	12.71
		37.5	7.21	9.09	11.52
	85 ◦C	5	9.37	11.81	15.15
		10	8.51	10.72	14.20
		25	6.81	8.58	12.16
		37.5	6.37	8.03	11.40
	90 ◦C	5	8.41	10.59	11.30
		10	7.11	8.96	10.45
		25	5.69	7.17	9.22

BEHAVIOR PP-R PIPE

Hygiene & Health Concerns

PP-R Pipes are manufactured with health concerns in mind. The connection of pipes does not require any additives such as cement solvent, fluxes or solder. To ensure the safety of people who come in contact with or consume the potable water, the following are strictly adhered to: DIN 1988 Part 2 Drinking Water Supply Systems Materials Components Appliances Design and Installation.

Sound Insulation

Compared to metallic pipes, PP-R pipes do not need further insulation to decrease the decibel level when water flows at relatively high speeds. The reason is simple. Metals transmit noises quicker and louder than plastics. Hence, whistling noises that result from the water hammer effect are non-existent.

Advantages of Using PP-R Pipes & Fittings

In comparison to either one of the conventional piping systems (metal or plastic), the PP-R pipe has the following advantages that make it the system of the new millennium:

- It is safe for human health
- It is resistant to rust and corrosion
- Rupture-free
- It has high resistance to acids and chlorides
- High-pressure tolerance and rating
- Speed and ease of fusion technology
- Extensive reduction in money, time and labor.
- No scaling
- Noise-free at high flow rates
- Light-weight

CHEMICAL **TABLES**

Hostile Environment	Concentration	Chemical resistance		
		20˚C	60˚C	100˚C
1,2 diamlnethanol	TP	Rs	Rs	--
2 - n itrotoluene	TP	Rs	TR	--
I - ICL/HMO_3	%75 / %25	NR	NR	NR
adipinic acid	TP	Rs	Rs	--
nitric gas	all	Rs	Rs	--
nitric acid	%10	Rs	TR	NR
nitric acid	%10 - 50	TR	NR	NR
nitric acid	> %50	NR	NR	NR
battery acid	V	Rs	Rs	--
acrylonitrile	TP	Rs	TR	--
allyl alcohol	96%	Rs	Rs	--
deluted	AS	Rs	Rs	--
aldehy de	AS	Rs	Rs	--
amber acid	TP	Rs	Rs	Rs
amyl alcohol	AS	Rs	Rs	--
ammonia acid	TP	Rs	Rs	--
ammonia gas	TP	Rs	Rs	--
ammonia liquid	TP	Rs	--	--
acetic acid anhydride	TP	Rs	CR	--
aniline	TP	Rs	CR	--
anone	TP	CR	NR	NR
anone (cyclohexanone)	V	Rs	Rs	Rs
antifreeze	TP	CR	--	--
acetaldehyde	TP	Rs	Rs	--
acetalphenone	TP	CR	--	--
amyl acetate	AS	Rs	Rs	butyl
ammonium acetate	TP	CR	NR	NR
a cetate	AS	Rs	Rs	Rs
sodium acetate	TP	Rs	Rs	--
acetone	35%	Rs	Rs	--
natrium benzoate	TP	R	NR	NR
benzol	AS	Rs	Rs	Rs
sodium bicarbonate	AS	Rs	Rs	--
potassium bisulphate	HD	Rs	Rs	--
potassium dichromate	AS	Rs	Rs	--
butanediol	TP	Rs	Rs	--
butantriol (1,2,4)	TP	Rs	Rs	--
butylene, liquid	TP	CR	--	--
butylene glycol	TP	Rs	--	--
butylene glycol	10%	Rs	CR	butyl
alcohol	TP	Rs	CR	CR

CHEMICAL **TABLES**

Roxy For Modern Water Systems

Hostile Environment	Concentration	Chemical resistance		
		20˚C	60˚C	100˚C
natrium benzoate	%35	Rs	Rs	--
benzol	TP	R	NR	NR
sodium bicarbonate	AS	Rs	Rs	Rs
potassium bisulphate	AS	Rs	Rs	--
potassium bisulphite	HD	Rs	--	--
potassium dichromate	AS	Rs	Rs	--
butanediol	TP	Rs	Rs	--
butantriol (1, 2 ,4)	TP	Rs	Rs	--
butylene, liquid	TP	CR	--	--
butylene glycol	TP	Rs	--	--
butylene glycol	%10	Rs	CR	butyl
alcohol	TP	Rs	CR	CR
butylene phenol	AS	Rs	--	--
butylene phenol	TP	HC	--	--
butine (2) diol (1 ,4)	TP	Rs	--	--
liquid paraffin	TP	Rs	CR	--
fixing agent vat	V	Rs	Rs	--
wines	V	Rs	Rs	--
vinyl acetate	TP	Rs	YC	--
tartaric acid	%10	Rs	Rs	--
wine vinegar	V	Rs	Rs	Rs
distilled water	V	Rs	Rs	Rs
air	TP	Rs	Rs	Rs
wax	V	Rs	CR	--
hexane	TP	Rs	CR	--
hexane triol (1,2,6)	TP	Rs	Rs	--
heptane	TP	Rs	CR	HC
hydrazine hydrate	TP	Rs	--	--
natrium hydrate	%60	Rs	Rs	Rs
potassium hydrogen carbonate	AS	Rs	Rs	--
barium hydroxide	AS	Rs	Rs	Rs
potassium hydroxide	%50	Rs	Rs	Rs
aniline hydrochloride	AS	Rs	Rs	--
hydrochloride	AS	Rs	Rs	Rs
hydrochloride	TP	Rs	CR	-
calcium hypocloride	HD	Rs	--	--
sodium hypocloride	%20	NR	NR	NR
sodium hypochlorite	%10	Rs	--	--
sodium hypochlorite	%20	CR	CR	NR
hydroxiacetic acid	%30	Rs	CR	--
glycerin	TP	Rs	Rs	RS
glucose	%20	Rs	Rs	RS
town gas	V	Rs	--	--
diaminethanol	TP	Rs	--	--
tar oil	H	Rs	NR	NR
dextrin	HD	Rs	Rs	--
dihexyl fatalat	TR	Rs	CR	--
diglycolic acid	AP	Rs	Rs	--
diesel oil	V	Rs	CR	--
di -iso-octyl fatalat	TP	Rs	CR	--
di-iso-propyl ether	TP	CR	NR	--
dimethyl amine	%100	Rs	--	--

CHEMICAL **TABLES**

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Hostile Environment	Concentration	Chemical resistance		
		20˚C	60˚C	100˚C
dimethylformamide	TP	Rs	Rs	--
di-n-butyl ether	TP	CR	--	--
di-n -onyl fatalat	TP	Rs	CR	--
dioane,	TP	CR	CR	--
sulfur dioxide	all	Rs	Rs	--
sulfur dioxide, gas	TP	Rs	Rs	--
sulfur dioxide, fluid	all	Rs	Rs	--
carbon dioxide,gas	all	Rs	Rs	--
carbon dioxide,fluid	all	Rs	Rs	--
dioctyl fatalat	TP	Rs	CR	--
dichloroben zene	TP	CR	--	--
dichloracetic acid	TP	CR	--	--
dichloracetic acid	50%	Rs	Rs	--
dichlorethylene (1, 1-1 , 2)	TP	YC	--	--
diethyl amine	TP	Rs	--	--
diethyl ether	TP	Rs	CR	--
leaven	all	Rs	--	--
gelatin	HD	Rs	Rs	RS
fatty acids >C4	TP	Rs	CR	--
potassium iodide	AS	Rs	Rs	--
carbolineum	V	Rs	--	--
ammonium carbonate	GL	Rs	Rs	--
potassium carbonate	GL	Rs	Rs	--
calcium carbonate	GL	Rs	Rs	Rs
sodium carbonate	50%	Rs	Rs	CR
carbonimonoxide	all	Rs	Rs	--
carbonsulphide	TP	HC	HC	HC
caustic soda	60%	Rs	Rs	Rs
alum	TP	Rs	Rs	--
oxygen	TP	Rs	--	--
fatty acid	20%	Rs	--	--
acid acetanhydride	40%	Rs	Rs	--
coconut oil	TP	Rs	--	--
coconut fat spirit	TP	Rs	YC	--
cognac	V	Rs	Rs	--
starch solution	all	Rs	Rs	--
starch syrup	all	Rs	Rs	--
cresol	90%	Rs	Rs	--
cresol	>90%	Rs	--	--
silicotfluorine acid	32%	Rs	Rs	--
fluorosilicic acid	32%	Rs	Rs	--
silicic acid	all	Rs	Rs	--
xylol, xylene	TP	CR	NR	NR
corn oil	TP	Rs	CR	--
citric acid	LD	Rs	Rs	Rs
molasses	V	Rs	Rs	Rs

FOLLOWED STANDARD

According to:

DIN 8077 Polypropylene Pipes and Dimensions
DIN 8078 Polypropylene Pipes, General Quality Requirements and Testing
DIN 16962 Pipe Joints and Elements for Polypropylene Pressure Pipes
DIN 1988 PART 2 Drinking Water Supply Systems, Material Components, Appliance Design and Installation

BS 6700 Design Installation, Testing and Maintenance of Services Supplying Water for Domestic Use within Buildings and their Curtilages
DVS 2207 Welding of Thermoplastic
DVS 2208 Welding Machines and Devices for Thermoplastic
ES 3703 PART 1 2002 Polypropylene Pipe dimensions and Testing

What are DIN Standards

Deutsches Institut für Normung (DIN) is a German institute for standardization. It is a technical and scientific association recognized by the German government as the National Standards body representing German interests at International and European levels.

DIN provides a forum where representatives from the manufacturing industries, consumer organizations, commerce, trades, and service industries, science and technical inspectorates as well as the Government can gather to discuss and define their specific standardization requirements and to record their results as German standards.

What does **PN** stand for, and what does it mean to be **PN**-10, **PN**-16 or **PN**-20?

PN stands for Nominal Pressure. It is a numerical designation used for referencing purposes related to mechanical characteristics of the components of a piping system.

A PN-25 Pipe means that the pipe can withstand pressure up to 25 Bars.

Why are fittings categorized under PN- 25 types?

Fittings can withstand any temperature above 95°C and pressure up to 25 kg/cm^2. Hence, they are categorized under PN-25.

FOLLOWED STANDARD

How are pipes categorized as **PN**-10, **PN**-12, **PN**-16, **PN**-20 & **PN**-25?

It is done by matching them with the SDR (Standard Dimension Ratio) conventional pipes.
A PPR – C Pipe with a wall thickness of OD / SDR is matched as the equivalent of a PPR – C Pipe for a SDR Pipe.

PN -10 is regarded as the equivalent of a SDR 11 because the PN 10 Pipe of 20 mm OD has an approximate thickness of 20/11=1.8.
PN-10 160 mm has an approximate thickness of 160/11 = 14.55 Likewise, SDR 9 is matched with PN – 12, SDR 7.4 with PN – 16, SDR 6 with PN – 20 and SDR 5 as PN – 25.

How are the PP-R pipes & fittings joined together?

The process of jointing the PP-R pipes and fittings is very simple and results in inseparable water joints.
It is carried out by using a simple welding machine that melts the internal surface of the fittings and the external surface of the pipe at 270°C to the point of melting. Since the pipes and fittings are produced from the same material, the connection is homogeneous.

Can the pipe's alignment be adjusted after the welding process?

Any alignment up to 5 degrees relative to the axis of the pipe can be adjusted immediately after jointing.

How are the sizes of the pipes and fittings measured?

A pipe's size is obtained by measuring its Outer Diameter (OD) in millimeters (mm).
As for the PP-R fittings, they are obtained by measuring Inner Diameter (ID) also in millimeters (mm).
And the metal threaded fittings are measured in inches (").

How can stressing of the pipe be avoided?

Possible linear thermal expansion and contraction needs to be taken care of during designing and installing. Stressing of the pipes can be avoided by providing flexible length and proper supporting.

Why is the joining of pipes without using sockets not recommended?

This is because such joining results in blockage or reduction in the inner diameter at the joining point. Hence, it is recommended to avoid it as it can affect the functioning of the entire system.

Is joining the pipes & fittings using the glue recommended?

It is not recommended because glue cannot stop the pipes from leaking. It resembles a termite attack and requires frequent maintenance, thus affecting the pipe's hygiene and shelf-life.

Which method of pressure testing is recommended?

Before any pipes are filled or cemented in concealed application, they are to be hydrostatically tested for any pressure loss or leakage. Start by closing all ends of the pipe with end caps and pipe plugs. Then proceed with loading water and pressure in the closed pipes up to 25 Bar pressure in PN – 16, PN – 20 and PN – 25 pipes, and up to 15 bar pressure for PN – 10 and PN – 12 at room temperature.

The pressure should be maintained for at least 8 hours to check for any drop in pressure and repeated to dismiss the minute chance of any leakage. In the event of any considerable pressure drop, the particular area of leakage has to be identified and redone.

ROXYPLAST
GERMAN TECHNOLOGY

THE MOUNTING PROCEDURE

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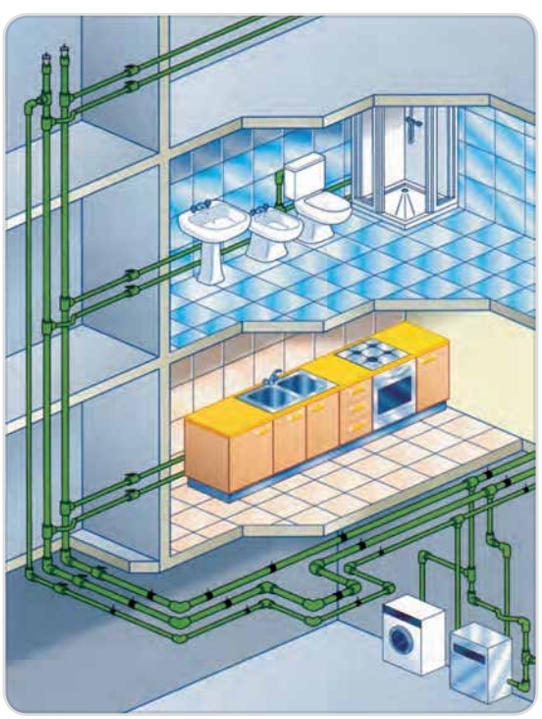
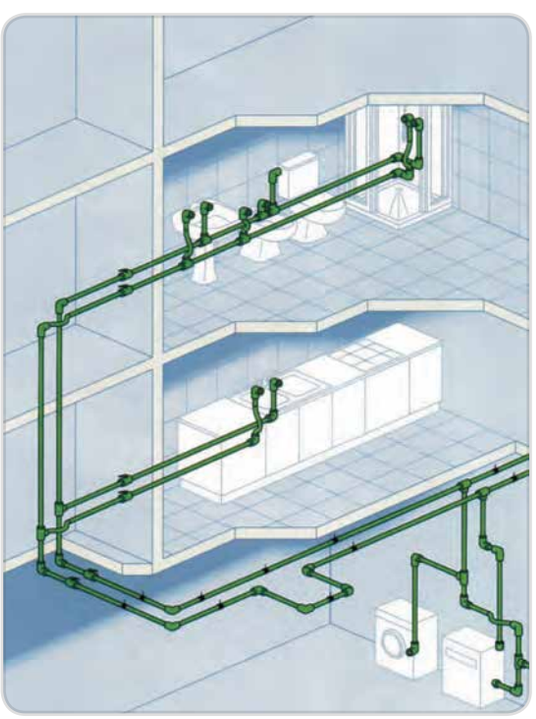
THE MOUNTING PROCEDURE

PP-R PIPES & FITTINGS APPLICATION AREAS

- Potable (or drinking) water
- Hot & cold water in residential apartments, public housing, commercial shopping centers, office buildings, hospitals, schools, hotels & resorts, etc.
- Industrial factories dealing with chemicals
- Irrigation
- HVAC (Heating, Ventilating and Air Conditioning)
- Food processing
- Laboratories and chemical sewerage
- Boilers as well as radiator connections and networks
- Risers for water delivery, ventilation and pressure relief





HOW TO **CONNECT**

You can use a hacksaw or any other sharp instrument to cut the pipe segments. However, it is more preferable to apply special scissors and cutters. For different pipe diameters, special types of tools are developed.

The dissection should be made at a right angle strictly, especially for pipes with a diameter of 40 mm or more.

If contortion of the pipe occurs, then this means that your instrument is not sharp enough. Then you should clear burrs off the sheared edges by usinga cutter or a knife.

HOW TO **CONNECT**..

Roxy For Modern Water Systems

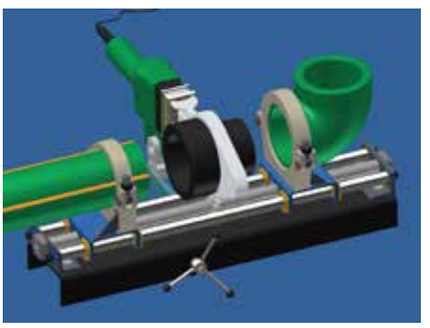
It is also advisable to scrape off the edge's outer layer at the jointing places of the pipes with big diameters.

Damaged and cracked pipes cannot to be used. Moreover, if the pipe and the fitting can be joined easily when not heated, they should also not be used. The common rule for jointing is that the inner diameter of the unheated part of the faucet should be just a little smaller than the outer diameter of the pipe.

The same rule also applies to the welding adaptors. They should not be fixed easily with the welded parts in a cool state.

In the process of welding the adaptor, the welded component should be closely connected.

The parts that do not meet the requirements cannot be used! Welding parts should be cleaned in the joint area from any kind of dirt and degreased with the help of a specific cleaner.



Mark the welding depth according to the table below:

Outer Diameter (mm)	Welding Depth (mm)	Heating Time (sec) In/ Out	Welding Time (sec)	Cooling Time (sec)
20	14	5/8	4	2
25	16	7/11	4	2
32	18	8/12	6	4
40	20	12/18	6	4
50	23	18/27	6	4
63	27	24/36	8	6
75	30	30/45	8	8
90	33	40/60	8	8
110	37	50/75	10	10
125				
140				
160				

IFix the welding dies of the proper diameters, the bushing and the draw bar, on the welding machine. When switched to the power supply socket, the machine warms up to the essential working temperature (260 °C) automatically.

You can settle the heat regulator on the desired temperature if necessary.

Put the pipe into the heating bushing and the spigot part on the draw bar.

This process should be done smoothly.

Radial rotation is prohibited and the pipe axis line should not deviate from the bushing axis line by more than 5 degrees.

For welding pipes with diameters more than 40 mm and lengths more than 2 meters, a specific welding device is applied with centration to gain coaxially of the jointing.

After the stipulated heating time, remove the welded parts and join them immediately.

Push the pipe into the fitting up to the end of the welded area. Do not turn the jointing and keep the coaxially of the parts.

Note: a pipe pushed too deep into the fitting can trample and reduce the inner section.

Overheating may result in the pipe diameter becoming too narrow and the fitting diameter increasing.

It is recommended to keep the parts fixed strongly during welding time. Do not align the parts together or use cold water during cooling time. After cooling, the jointing may be used under moderate mechanical stress.

The piping system may be filled with water within 1 hour after welding.

Jointing may have the axial deviation of the pipe and fitting below 5°.

There should not be any cracks, folds or other damages caused by overheating on the fitting part.

There should be an even all-around bead of welded plastic material around the joint.

Polypropylene pipes welding should be held at ambient temperature, 23 °C or higher.

Consider also the cool down of the surface of the welding machine.

It is best to use heat light signal to make sure that the welding surface temperature has reached between 255-265 °C, Welding dies and welding machines should be kept clean.

Remove the left over material with the help of a rough napkin and avoid the damaging of the Teflon surface of welding dies.

HOW TO **CONNECT**..

Roxy For Modern Water Systems

Connection technique using heated-tool socket welding

When the pipe and the fitting are welded, their plastic materials fuse together to from a homogeneous, firmly bonded whole. Special tools are used to heat up pipe and fitting, which are then just joined together. This connection is lastingly leak proof.

System components

Fittings
the PP-R-metal connection of the **ROXY** fitting excels by its leakproofness and resistance to torsion.
This connection withstands decades of operational loads without any difficulty.
Thanks to the specific geometry of their inserts, which are made of high-grade brass, the moulded parts meet the highest safety standards and guarantee safe laying.

The metal threads of the **ROXY** brass components meet the requirements of the din EN 10226 standard and are manufactured from high-quality brass.
Moreover, the material complies with the current version of the recommendations (as at 2014) of the federal Environment Agency on “Materials suitable from a drinking water hygiene point of view”.

This guarantees that the limit values of the “Deutsche Trinkwasser-verordnung (TrinkwV 2001)” (German Drinking Water Ordinance)are reliably observed. All **ROXY** fittings are compatible with all **ROXY** pipes (refer to page 8 and following).

Pipes and Fittings
all pipes and fittings of the **ROXY** installation system are made of PP-R, with only high-quality raw materials being used. This raw material is equipped with high-grade stabilizers. The stabilizer package protects the polymer from oxidation, which may occur, for example, following long-term exposure to high temperatures > 70 C and high pressure.

HANDLING AND STORAGE

Prevent PPR pipes and fittings from impacts and mechanical shocks. During transportation, the packs of pipes should be stored flat on a firm leveled ground, Protect them from any sharp metal angles and edges of the transport platform.

Pipes should be stored on shelves or other firm surfaces. The height of the bundle of pipes should not exceed 1 meter and at least 1 meter away from any heating body.

Loading on and off of polypropylene pipes should be held at ambient temperatures (at least -10 ° C). If special support handles are used, pipes can be transported at temperature below - 20°C.

The delivered pipes and fittings should be kept in place for about 2 hours at a temperature above zero, Polypropylene pipes and fittings are to be stored inside, sheltered from ultraviolet radiation with a minimum temperature of 5°C.

They should be kept in their boxes until they ready for use. Do not store them with solvents, oil, paints and like substances.

CHANGE IN PPR PIPE LENGTH

LINEAR THERMAL EXPANSION AND COMPENSATION METHODS

Polypropylene pipes have a higher thermal expansion rate and greater flexibility than metals. This fact should be taken into consideration when designing water supplying systems; especially if pipes in hot water supplying and heating systems are not reinforced with metal layers. The linear expansion of PPR pipes is calculated according to the following formula:

$$\Delta L = \varepsilon . L . \Delta T$$

Where:

ΔL — the change in length of pipe, (mm)

ε — the coefficient of linear expansion;

L — the original length of pipe, (m)

ΔT — Temperature difference, (°C).

For non-reinforced pipes, the coefficient of thermal expansion is 0.15 mm / m , while for reinforced pipes, the coefficient is 0.03 mm / m .

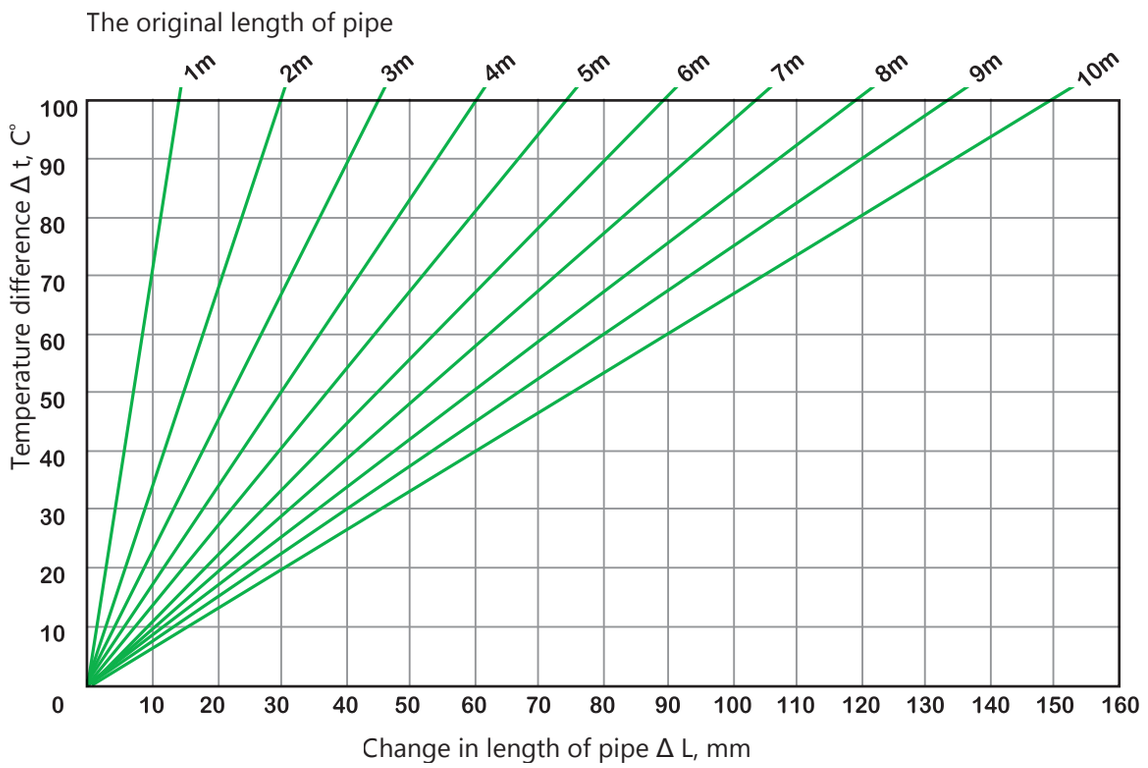
For example, on the segment of a non-reinforced pipeline of 6.5 m length, the probable temperature varies from 20 °C to 75 °C. Therefore, the length variation will be 0.15 mm .

0.15 • 6.5 • 55 °C = 54 mm,

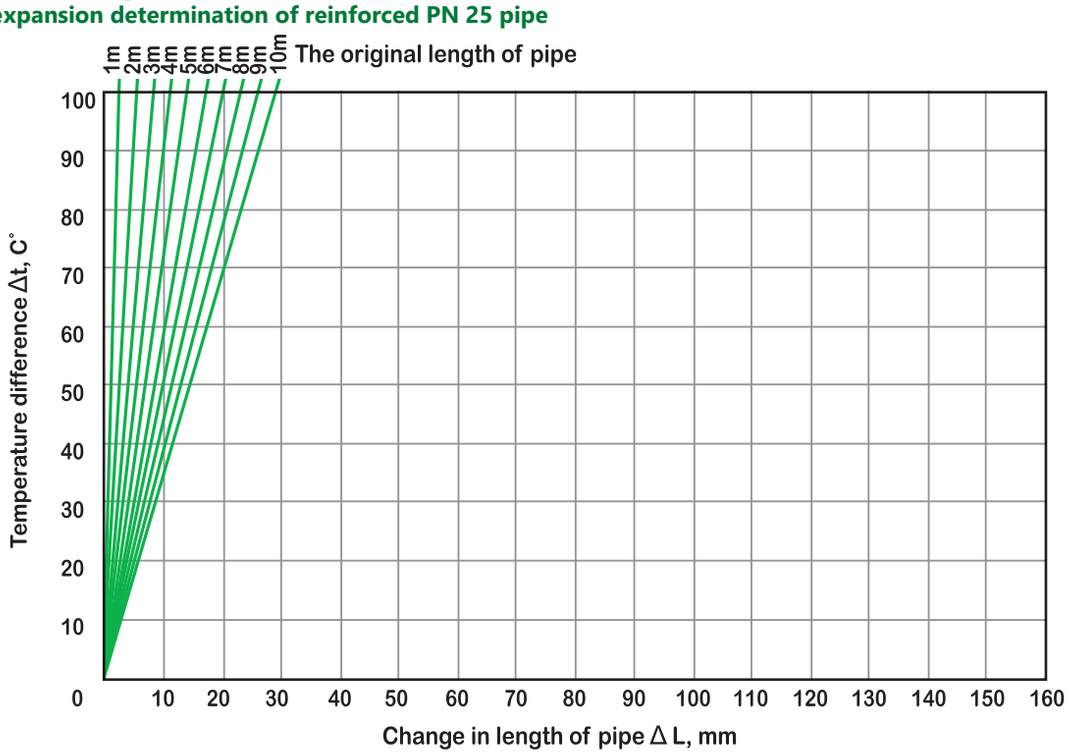
The amount of pipe thermal expansion may also be determined by the monograms (see Pictures 1 and 2). Thermal expansion of water supplying systems can be accommodated in the pipe bends. In case the thermal compensation is not sufficient, square expansion compensators are equipped (see Pictures 3 and 4).

CHANGE IN PPR PIPE LENGTH

Pic 1: Monogram for thermal expansion determination of PN 10, PN20 pipes.



Pic 2: Monogram for thermal expansion determination of reinforced PN 25 pipe



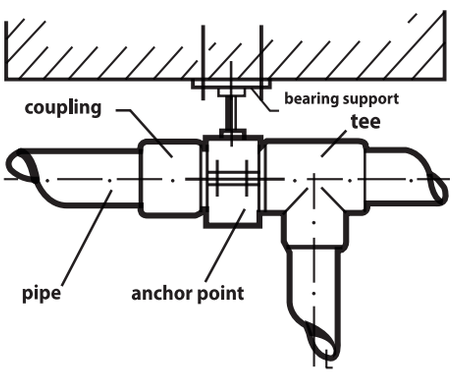
LINEAR THERMAL EXPANSION

Some of the supports are fixed acting as anchor points.

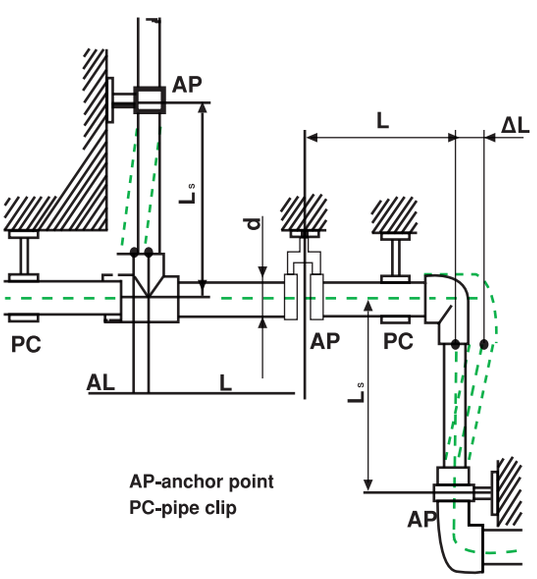
They direct the pipe movements through pipe clips to the expansion compensators.

Any pipe clip used in conjunction with a polypropylene system should allow for free axial pipe movement in order to control its thermal movement and afford lateral restraint.

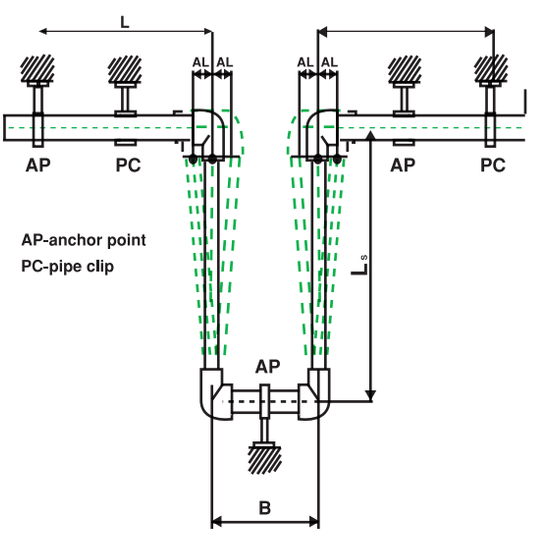
The direction of the pipe movement can then be controlled by the use of the anchor points at strategic positions. An anchor point can fix two couplings, or a coupling and a tee, at both sides of the pipe. Do not try to fix the anchor support by pressing the pipe.



Pic 3:
Thermal expansion compensation on PPR pipeline



Pic4:
Square expansion compensator



CHANGE IN PPR PIPE LENGTH

The necessary length of the flexible pipe segment of the compensator LS (see Pictures 3 & 4) can be calculated by the following formula:

$$LS = C\sqrt{dX\Delta L}$$

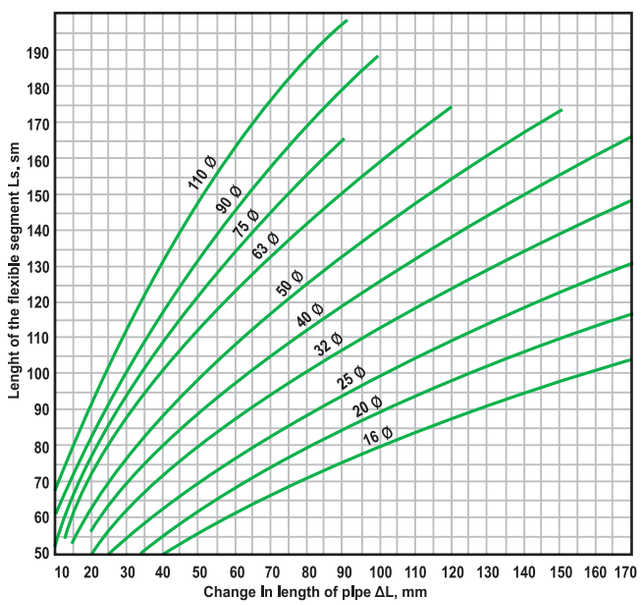
Where,

LS – Curve arm's lenght (mm).
C – Constant (25 ~ 30).
d – Outer Diameter of the pipe.
ΔL – the change in the pipe's length.

Additional accommodation of the thermal movements of the pipe can be gained by its preliminary stressing in the desired direction.

To accommodate the pressured pipe segment, the flexible segment LS can be made 30% shorter.

The accommodation of PPR pipe extension can be gained by the preliminary bending of the pipes and installing them in a wavy way on the solid support, which should be wide enough to let the pipeline bend when the temperature changes.



Pic 5: Monogram for the flexible segment "LS"

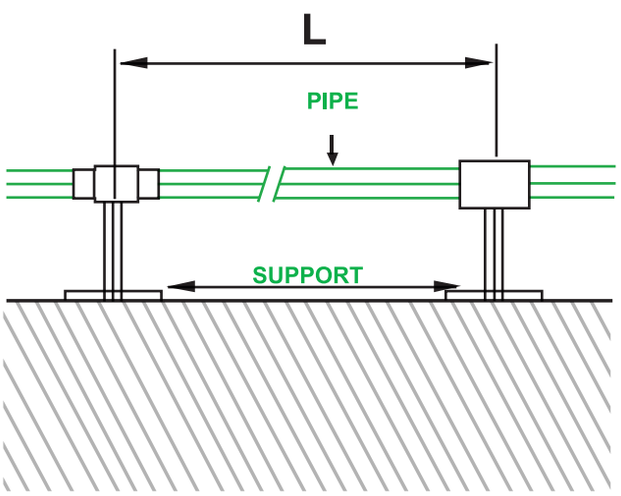
Length determination To prepare a free flexible loop you have to calculate the length of the free flexible segment "LS" with the help of the formula as explained in Free Flexible Pipe Segment (Expansion Arm)

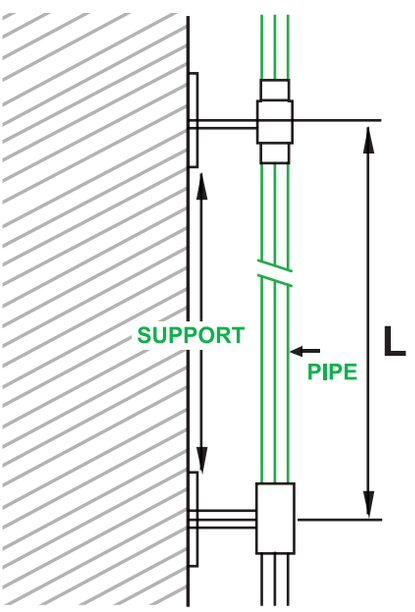
• The minimum width (B) between two arms of the loop = 10 times the outside diameter of the pipe.

SPACING DISTANCE
BETWEEN SUPPORTS

PIPE DIA. mm	Horizontal clamp spacing distance 'L' according to change in temperatures, In cm						
	20°C	30°C	40°C	50°C	60°C	70°C	80°C
20	65	63	61	60	58	53	48
25	75	74	70	68	66	61	56
32	90	88	86	83	80	75	70
40	110	110	105	100	95	90	85
50	125	120	115	110	105	100	90
63	140	135	130	125	120	115	105
75	155	150	145	135	130	125	115
90	165	160	155	145	140	130	120
110	175	175	170	165	155	145	135

PIPE DIA. mm	Vertical clamp spacing distance 'L' according to change in temperatures, In cm						
	20°C	30°C	40°C	50°C	60°C	70°C	80°C
20	85	82	78	78	75	69	62
25	98	96	91	88	86	79	73
32	117	114	112	108	104	98	91
40	143	143	137	130	124	117	111
50	163	156	150	143	137	130	117
63	182	176	169	163	156	150	137
75	202	195	189	176	169	163	150
90	215	208	202	189	182	169	156
110	228	228	215	215	202	189	176



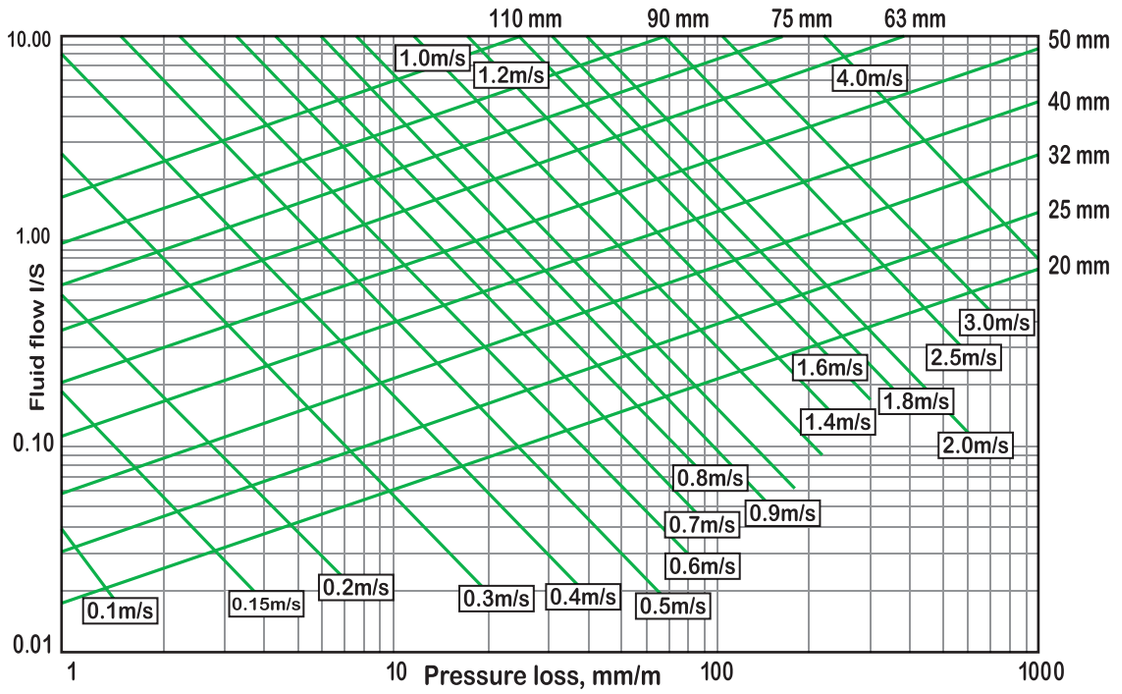


SPACING DISTANCE BETWEEN SUPPORTS

Hydraulic Design

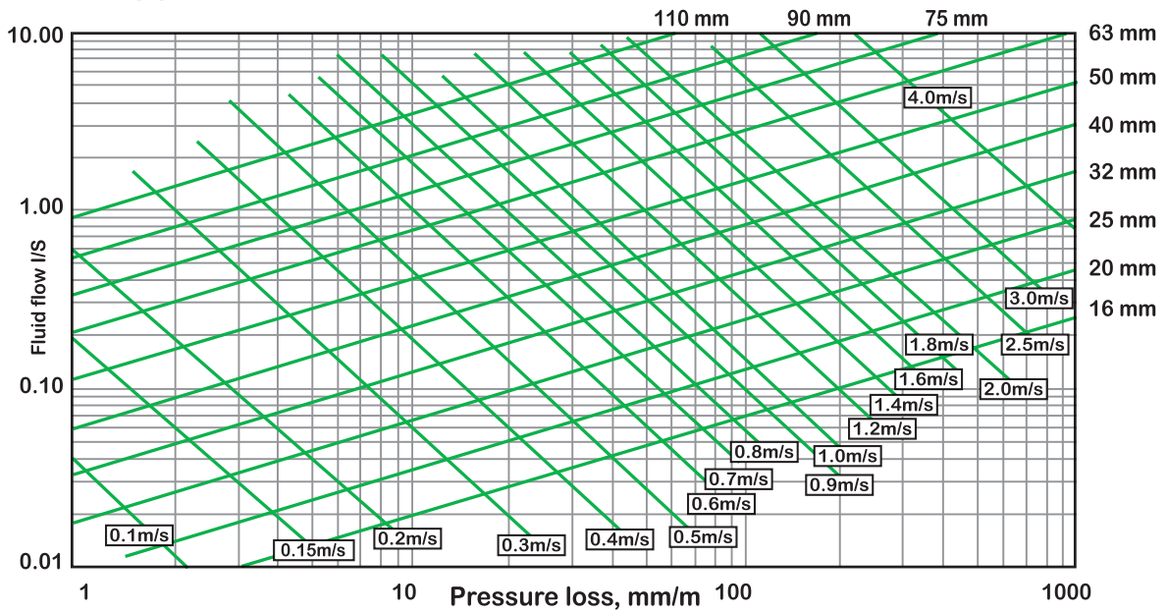
Pipeline Hydraulic Design is the estimation of the total pressure loss in transported liquids, which occurs as a result of hydraulic resistance in the pipe as well as sharp bends and diameter changes in fittings and hardware. Hydraulic pressure loss in the pipe can be calculated according to monograms, see Pictures 6.7 and 8.

Pic 6: Monogram for cold water supply hydraulic design of PPR PN-10 Pipes (20 °C)

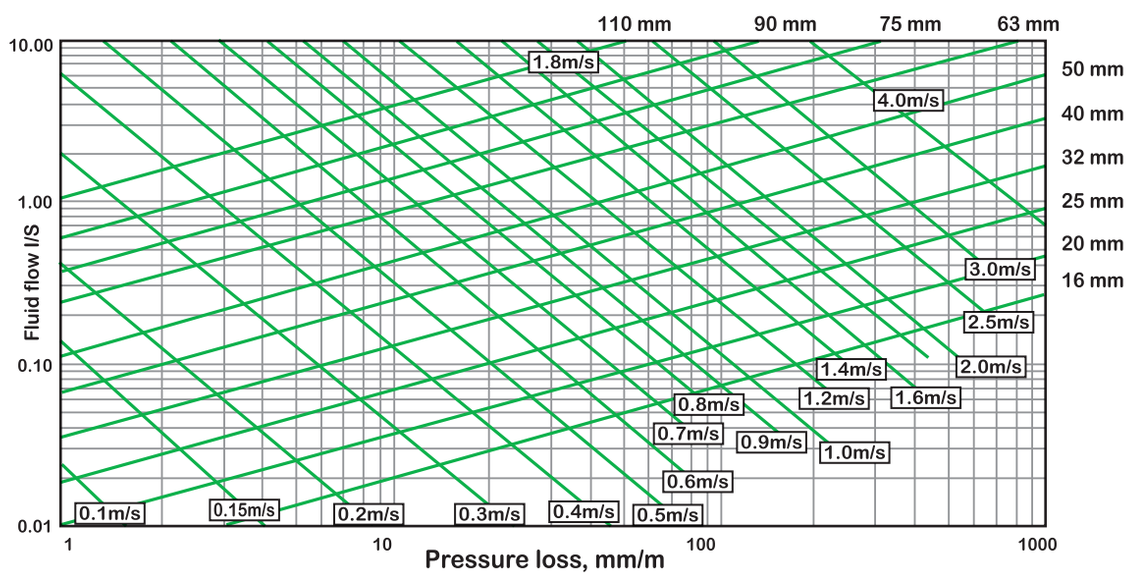


SPACING DISTANCE BETWEEN SUPPORTS

Pic 7: Monogram for cold water supply hydraulic design of PPR PN-20 and PN-25 pipes (20 °C)



Pic 8: Monogram for hot water supply hydraulic design of PPR PN-20 and PN-25 pipes (60 °C)



QUALITY CONTROL

It is our mission at **Roxy** Plast to maintain the highest level of quality through clear operating procedures, work instructions as well as forms and records. Statistical quality control and sound documentation ensure that traceability is maintained at anytime in the future.

This means that all corporate and plant functions within **Roxy** Plast, whether commercial or operational, are required to be clearly stated and documented, ensuring that the quality of our product is never compromised or coincidental.

Roxy Plast always maintains the highest standards of quality for its users. This is why it warrants a 50-year guarantee for all its piping network components starting from the date of purchase.

Roxy Plast maintains a comprehensive quality control system. From designing the required specifications and controlling the incoming raw materials, processing, packing, storing and shipping the product to the customer, to the after-sale service. This is accomplished in parallel to the Quality Assurance Program, with the objective to ensure that total quality, not only localized quality, is maintained as required.

The overall quality system operation and documented by **Roxy** Plast is implemented throughout the plant. It has been designed to exceed requirements stated by national and international authorities and institutions. Regular checks are done to further eliminate any chance of quality deviation.

Below you will find some of the tests done in our plants laboratory to ensure high **Roxy** Plast quality:

- Hydrostatic Pressure Test
- Impact Test (pendulum test)
- Density (for determination density)
- Oven for Heat reversion determination
- M.F.R For determination melt flow rate of material

ROXYPLAST
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PPR Water Supply PLUMBING SYSTEM

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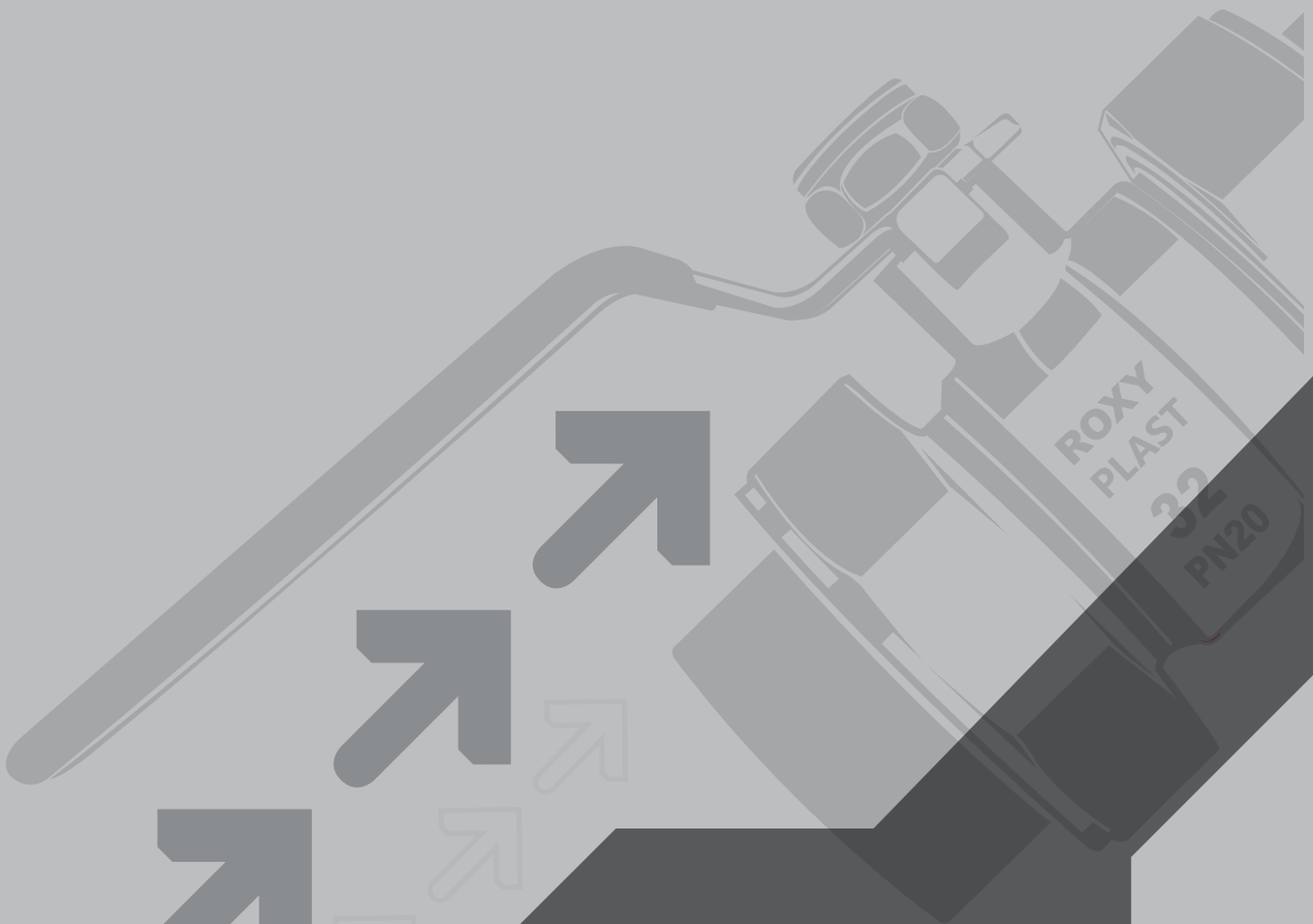

PPR WATER SUPPLY

PLUMBING SYSTEM

PRODUCT SPECIFICATION:

Material

POLYPROPYLENE RANDOM COPOLYMER (PPR)

Standards & Regulations

Manufactured According to
DIN 8077: POLYPROPYLENE (PP) pipes-PP-H,PP-B,PP-R,PP-RCT-dimensions
ISO 15874 Part 1,2,3,5&7
Full range of pipes and fitting available from nominal diameters (20mm Up to 160mm) available in (single layer, Multi-layer fiberglass, multi-layer UV, multi-layer UV & fiberglass)

Bends produced by

segment inserts for butt welding dimensions.
ISO 9001 – 2015: quality management system .
Working Temperature : up to 95°C
Working Pressure: PPR PIPES - 10 , 16 , 20 & 25 bar, PPR FITTINGS - 25 bar.

Range

PN10- 20mm to 160 mm (for cold application)
PN16- 20mm to 160 mm (Higher Pressure Hot and Cold Water)
PN20- 20mm to 160 mm (Higher Pressure Hot and Cold Water & all relevant Plain)
PN25- 20mm to 160 mm (Higher Pressure Hot and Cold Water & all relevant Plain)
Available in Maltilayer (Fiber Glass & UV & UV Fiber Glass)
All Fittings are PN 25 (Higher Pressure Hot and Cold Water) & all relevant Plain & Threaded Fittings)

PPR WATER SUPPLY

PLUMBING SYSTEM

Fields of Application

For more than 30 years, polypropylene has been successfully used in pressure water supply lines for buildings in many countries all over The World.
The combination of such excellent properties as chemical resistance, homogeneous connection, resistance to pressure and easy laying make it a reliable and lasting system suitable for various applications.
In many countries it is gradually replacing such traditional materials as copper and galvanized steel.

Properties of ROXY

- Enormous durability thanks to high-quality materials and processing
- Homogeneous connection guarantees high operational reliability
- Good thermal load capacity, therefore high operational reliability
- High chemical resistance guarantees high durability
- Minor flow noise makes living highly comfortable
- High dimensional accuracy and low weight, therefore time- and cost-saving pipe laying

Possible Uses

the ROXY installation system fulfils a variety of demands made on supply lines. It is suitable for universal use in:

- New buildings
- Refurbishment
- Repairs

In drinking water installations for cold and hot water pipes in residential buildings, buildings, hospital, hotels, office buildings, schools, etc., example:

- Service connections
- Boiler connections
- Water distributing systems
- Rising lines
- Floor-level distributing systems
- Fittings

As well as piping networks for:

- Rainwater systems
- Outside pipe laying

PPR WATER SUPPLY

PLUMBING SYSTEM

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Roxy piping PPR system are used in:

- Potable installations inside houses, high, rise buildings, hotels, hospitals and virtually all types of commercial and residential buildings.
- Factories with high-pressure water and compressed air circuits.
- Rain drainage and collection systems.
- Indoor and outdoor swimming pools, gyms and their water filtration circuits and water installa tions.
- Piping networks for all types of irrigation and agriculture applications and pressurized networks.
- Piping networks for all types for industrial applications for the delivery of aggressive chemicals including many acidic, alkaline and other reactive and corrosive chemicals.
- Connections from municipality mains to the tanks and reservoirs.
- Boilers and radiator connections and networks.
- Risers for water delivery, ventilation, and pressure relief.
- Water transport from pumps to upper tanks and distribution points.
- Connections through meters, and distributor manifolds.
- Distributions inside flats, apartments, houses etc...
- Underfloor network distribution and underfloor heating networks.

Roxy plast fiber composite pipe technology

Roxy plast pipes integrated with fiber layer developed for exposed hot& cold water installations.
Roxy composite pipes are convenient and reliable due to its superior characteristics

Roxy (UV) layer-with fiber

for exposed and open air installations under direct sunlight or UV radiation, Roxy remains physically stable through a specially developed external black layer (UV resistant), in adherence with the UV layer.

Roxy plast composite pipe installations are applied from building connection points or distribution station to the very last endpoints of the installation.

For heating installations Roxy plast composite pipes are installed starting from the boiler outlets or water-heating unit, up to the individual radiators or heat exchangers.
In hot water application the use of Roxy plast pipe is always advisable due to reduced longitudinal expansion during heat load.

PPR WATER SUPPLY

PLUMBING SYSTEM

Roxy Plast Fiber

- Potable water pipe networks for cold and hot water installations, in residential buildings, hotels, hospitals, and shipbuilding and other buildings.
- Pipe networks for compressed air plants
- Pipe networks for swimming pool facilities
- Pipe networks for solar plants
- Pipe networks in agriculture
- Pipe networks for industry and application where transport of aggressive fluids is required

Advantages

Roxy plast fiber composite with UV layer:

- Length extension reduced by at least 70% compared with single layer pipe.
- Impact rate higher than the standard pipe.
- Excellent internal pressure resistance even at high temperatures.
- Supports intervals can be increased with less of mounting clips are used compared with plastic pipes.
- UV-resistance, long service life

PPR WATER SUPPLY

PLUMbING SYSTEM

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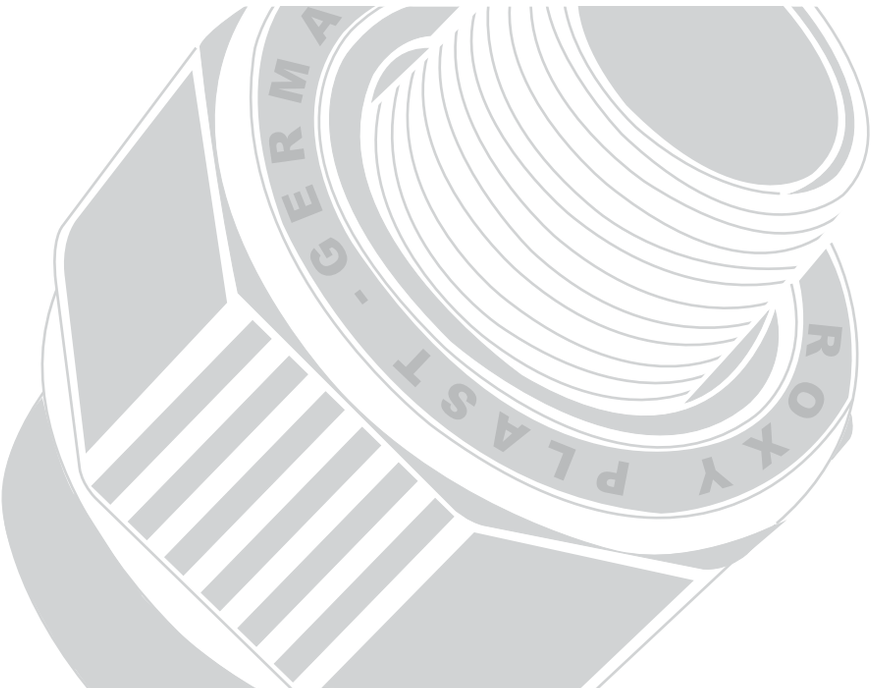

Easy, reliable installation

Roxy plast system components are joined by simple-to-use putt fusion-welding techniques. Pure and consistent resins of the highest quality, used in the manufacture of our components, ensure reliable and repeatable and welding over and over again. No matter where or when, each junction can be joined in merely a few seconds.

Through, simple-to-use instructions

Our manuals provide the highest degree step-by-step instructions guiding you to easily build up an impressive and complex network of efficient piping system, no matter what your application is supported & serviced by **Roxy**.

Support & service

Our support team is available around the clock for your technical inqueries, providing you with techniql ecperts team

expertise to ensure your continuous success in the design and installation of your network.

Roxy plast system...your unparalleled Advantages

- Durability for both hot and cold water delivery installations.
- Reliability and longevity in service life.
- Corrosion resistance, as compared with other systems.
- Quality and finishing of the products.
- Environmentally friendly.
- Ease and speed of installation.
- Adaptability of the system to the building's structure.
- Cost-competitiveness of the complete installation.
- Readily available support and through easy-to-use installations.

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ROXY PPR PRODUCTS

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ROXY PPR PIPE

PPR PIPE PN10

COMPOSITION: 1 LAYER PPR-C

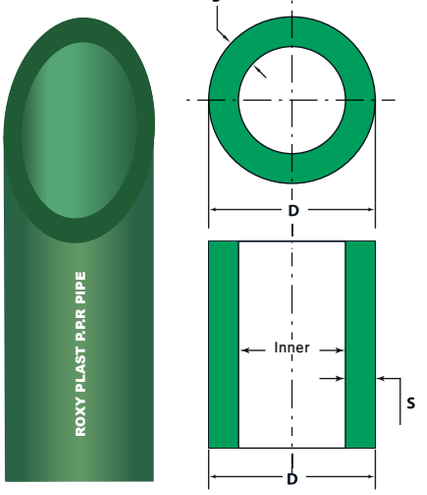
PRESSURE RATING: PN10

PIPE SERIES: SDR 11 , S 5

COLOR: GREEN PIPE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	1.9	2.3	2.9	3.7	4.6	5.8	6.8	8.2	10.0	11.4	12.7	14.6
Inner (mm)	16.2	20.4	26.2	32.6	40.8	51.4	61.4	73.6	90	102.2	114.6	130.8
Weight (kg/m)	0.107	0.164	0.261	0.412	0.638	1.010	1.410	2.030	3.010	3.910	4.870	6.380



PPR PIPE PN16

COMPOSITION: 1 LAYER PPR-C

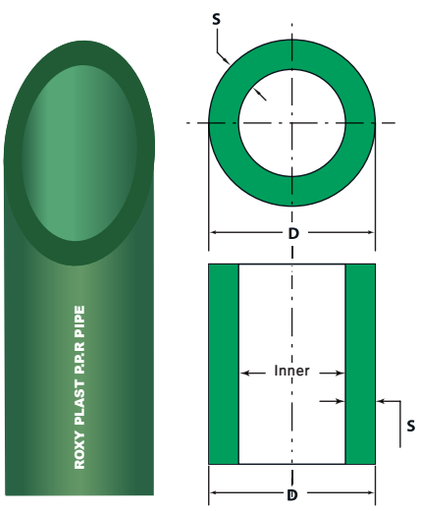
PRESSURE RATING: PN16

PIPE SERIES: SDR 7.4 , S 3.2

COLOR: GREEN PIPE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	2.80	3.50	4.40	5.50	6.90	8.60	10.30	12.30	15.10	17.10	19.2	21.90
Inner (mm)	14.4	18	23.2	29	36.2	45.8	54.4	65.4	79.8	90.8	101.6	116.2
Weight (kg/m)	0.148	0.230	0.370	0.575	0.896	1.410	2.010	2.870	4.300	5.530	6.950	9.040



ROXY PPR PIPE

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PPR PIPE PN20

COMPOSITION: 1 LAYER PPR-C

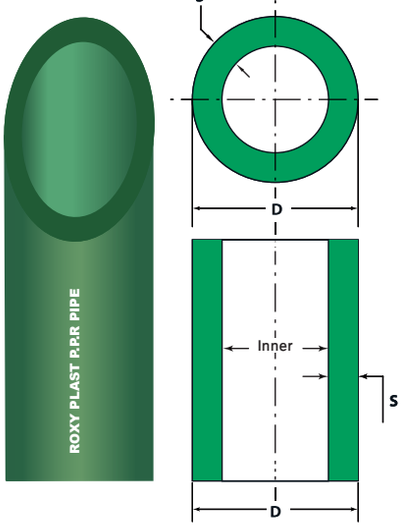
PRESSURE RATING: PN20

PIPE SERIES: SDR 6 , S 2.5

COLOR: GREEN PIPE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	3.40	4.20	5.40	6.70	8.30	10.50	12.50	15.00	18.30	20.80	23.3	26.60
Inner (mm)	13.2	16.6	21.2	26.6	33.4	42	50	60	73.4	83.4	83.8	106.8
Weight (kg/m)	0.172	0.266	0.434	0.671	1.040	1.650	2.340	3.360	5.010	6.470	8.12	10.600



PPR PIPE PN25

COMPOSITION: 1 LAYER PPR-C

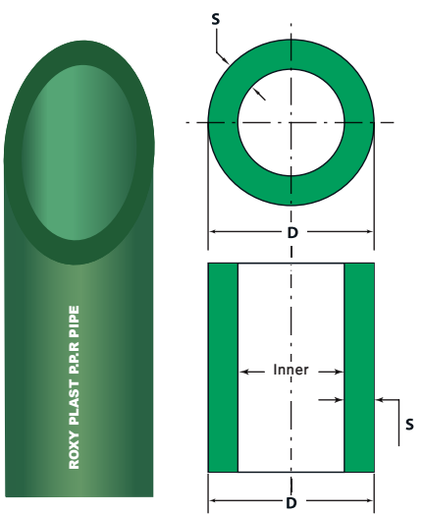
PRESSURE RATING: PN25

PIPE SERIES: SDR 5 , S 2

COLOR: GREEN PIPE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	4.1	5.1	6.5	8.1	10.1	12.7	15.1	18.1	22.1	25.1	28.1	32.1
Inner (mm)	11.8	14.8	19	23.8	29.8	37.6	44.8	53.8	65.8	74.8	83.8	95.8
Weight (kg/m)	0.198	0.307	0.498	0.775	1.210	1.910	2.700	3.880	5.780	7.460	9.350	12.200



ROXY PPR PIPE

Roxy For Modern Water Systems

MULTILAYER FIBER GLASS RINFORCED PIPE PN25

COMPOSITION: 3 LAYERS PPR-C & INNER LAYER OF FIBER GLASS

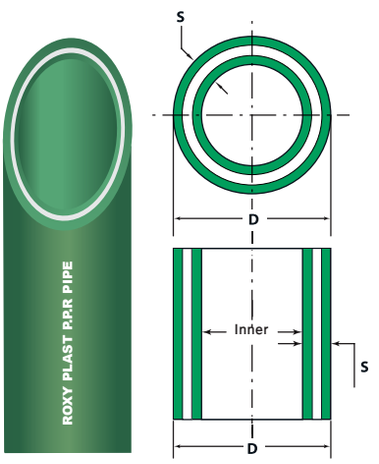
PRESSURE RATING: PN25

PIPE SERIES: SDR 5 , S 2

COLOR: OUTER AND INNER LAYERS GREEN & MIDDLE LAYER ORANGE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	4.1	5.1	6.5	8.1	10.1	12.7	15.1	18.1	22.1	25.1	28.1	32.1
Inner (mm)	11.8	14.8	19	23.8	29.8	37.6	44.8	53.8	65.8	74.8	83.8	95.8
Weight (kg/m)	0.198	0.307	0.498	0.775	1.210	1.910	2.700	3.880	5.780	7.460	9.350	12.200



MULTILAYER FIBER GLASS RINFORCED PIPE PN20

COMPOSITION: 3 LAYERS PPR-C & INNER LAYER OF FIBER GLASS

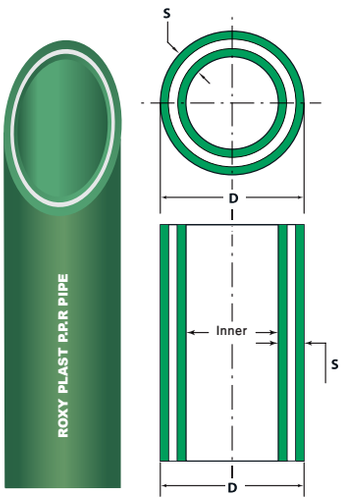
PRESSURE RATING: PN20

PIPE SERIES: SDR 6 , S 2.5

COLOR: OUTER AND INNER LAYERS GREEN & MIDDLE LAYER ORANGE

SUPPLY FORM: 4M STRAIGHT LENGTH OR AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	3.40	4.20	5.40	6.70	8.30	10.50	12.50	15.00	18.30	20.80	23.3	26.60
Inner (mm)	13.2	16.6	21.2	26.6	33.4	42	50	60	73.4	83.4	83.8	106.8
Weight (kg/m)	0.172	0.266	0.434	0.671	1.040	1.650	2.340	3.360	5.010	6.470	8.12	10.600



ROXY PPR PIPE

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MULTILAYER FIBER GLASS RINFORCED PIPE PN16

COMPOSITION: 3 LAYERS PPR-C & INNER LAYER OF FIBER GLASS

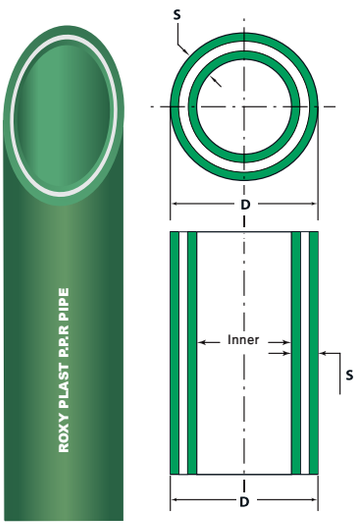
PRESSURE RATING: PN16

PIPE SERIES: SDR 7.4 , S 3.2

COLOR: OUTER AND INNER LAYERS GREEN & MIDDLE LAYER ORANGE

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	2.80	3.50	4.40	5.50	6.90	8.60	10.30	12.30	15.10	17.10	19.2	21.90
Inner (mm)	14.4	18	23.2	29	36.2	45.8	54.4	65.4	79.8	90.8	101.6	116.2
Weight (kg/m)	0.148	0.230	0.370	0.575	0.896	1.410	2.010	2.870	4.300	5.530	6.950	9.040



MALTILAYER UV STABILIZED PIPE PN25

COMPOSITION: 2 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER PPR-C)

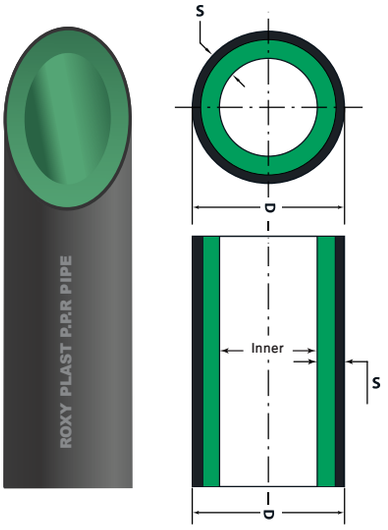
PRESSURE RATING: PN 25

PIPE SERIES: SDR 5 , S 2

COLOR: OUTER LAYERS BLACK & INNER LAYER GREEN

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	4.1	5.1	6.5	8.1	10.1	12.7	15.1	18.1	22.1	25.1	28.1	32.1
Inner (mm)	11.8	14.8	19	23.8	29.8	37.6	44.8	53.8	65.8	74.8	83.8	95.8
Weight (kg/m)	0.198	0.307	0.498	0.775	1.210	1.910	2.700	3.880	5.780	7.460	9.350	12.200



ROXY PP-RPRODUCTS

ROXY PPR PIPE

Roxy For Modern Water Systems

MALTILAYER UV STABILIZED PIPE PN20

COMPOSITION: 2 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER PPR-C)

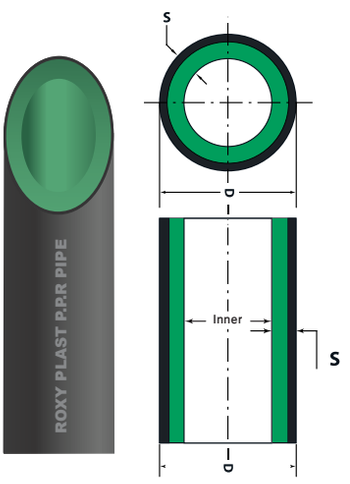
PRESSURE RATING: PN 20

PIPE SERIES: SDR 6 , S 2.5

COLOR: OUTER LAYERS BLACK & INNER LAYER GREEN

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	3.40	4.20	5.40	6.70	8.30	10.50	12.50	15.00	18.30	20.80	23.3	26.60
Inner (mm)	13.2	16.6	21.2	26.6	33.4	42	50	60	73.4	83.4	83.8	106.8
Weight (kg/m)	0.172	0.266	0.434	0.671	1.040	1.650	2.340	3.360	5.010	6.470	8.12	10.600



MALTILAYER UV STABILIZED PIPE PN16

COMPOSITION: 2 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER PPR-C)

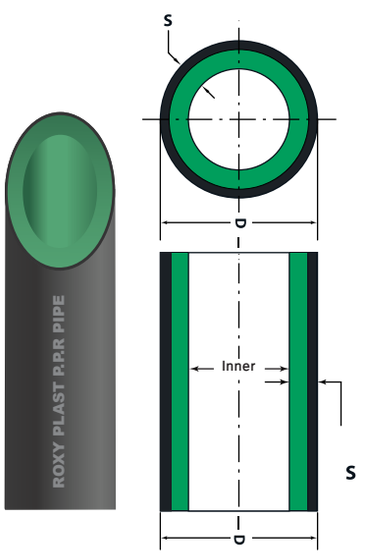
PRESSURE RATING: PN 16

PIPE SERIES: SDR 7.4 , S 3.2

COLOR: OUTER LAYERS BLACK & INNER LAYER GREEN

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	2.80	3.50	4.40	5.50	6.90	8.60	10.30	12.30	15.10	17.10	19.2	21.90
Inner (mm)	14.4	18	23.2	29	36.2	45.8	54.4	65.4	79.8	90.8	101.6	116.2
Weight (kg/m)	0.148	0.230	0.370	0.575	0.896	1.410	2.010	2.870	4.300	5.530	6.950	9.040



MULTILAYER UV STABILIZED & FIBER GLASS PIPE PN25

COMPOSITION: 4 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER of fiber Glass)

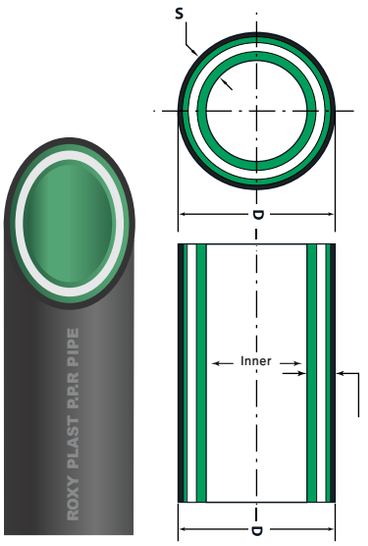
PRESSURE RATING: PN 25

PIPE SERIES: SDR 5 , S 2

COLOR: OUTER LAYERS BLACK, SECOND LAYER GREEN, THIRD LAYER ORANGE IN THE COLOR OF THIRD OR MIDDLE LAYER

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	4.1	5.1	6.5	8.1	10.1	12.7	15.1	18.1	22.1	25.1	28.1	32.1
Inner (mm)	11.8	14.8	19	23.8	29.8	37.6	44.8	53.8	65.8	74.8	83.8	95.8
Weight (kg/m)	0.198	0.307	0.498	0.775	1.210	1.910	2.700	3.880	5.780	7.460	9.350	12.200



MULTILAYER UV STABILIZED & FIBER GLASS PIPE PN20

COMPOSITION: 4 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER of fiber Glass)

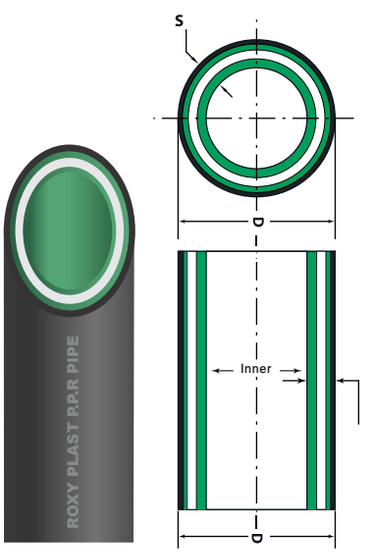
PRESSURE RATING: PN 20

PIPE SERIES: SDR 6 , S 2.5

COLOR: OUTER LAYERS BLACK, SECOND LAYER GREEN, THIRD LAYER ORANGE IN THE COLOR OF THIRD OR MIDDLE LAYER

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	3.40	4.20	5.40	6.70	8.30	10.50	12.50	15.00	18.30	20.80	23.3	26.60
Inner (mm)	13.2	16.6	21.2	26.6	33.4	42	50	60	73.4	83.4	83.8	106.8
Weight (kg/m)	0.172	0.266	0.434	0.671	1.040	1.650	2.340	3.360	5.010	6.470	8.12	10.600



ROXY PPR PIPE

Roxy For Modern Water Systems

ROXY PP-RPRODUCTS

MULTILAYER UV STABILIZED & FIBER GLASS PIPE PN16

COMPOSITION: 4 LAYERS (OUTER LAYER MIXTURE OF PPR-C AND UV STABILIZER & INNER LAYER of fiber Glass)

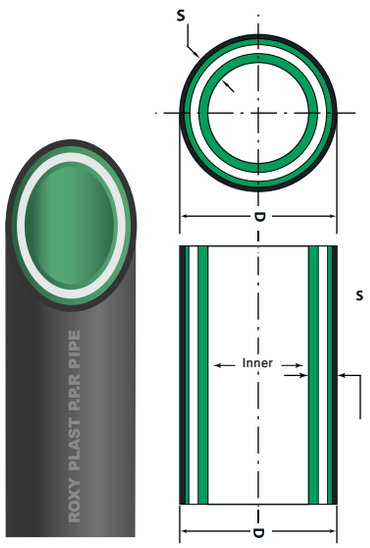
PRESSURE RATING: PN 16

PIPE SERIES: SDR 7.4 , S 3.2

COLOR: OUTER LAYERS BLACK, SECOND LAYER GREEN, THIRD LAYER ORANGE IN THE COLOR OF THIRD OR MIDDLE LAYER

SUPPLY FORM: 4M STRAIGHT LENGTH AS PER CUSTMER REQUIREMENTS

Outer (mm)	20	25	32	40	50	63	75	90	110	125	140	160
S (mm)	2.80	3.50	4.40	5.50	6.90	8.60	10.30	12.30	15.10	17.10	19.2	21.90
Inner (mm)	14.4	18	23.2	29	36.2	45.8	54.4	65.4	79.8	90.8	101.6	116.2
Weight (kg/m)	0.148	0.230	0.370	0.575	0.896	1.410	2.010	2.870	4.300	5.530	6.950	9.040



ROXY PPR FITTINGS

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Circle Of Trust For Every Client

ELBOW 90° - PP – R / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

ELBOW 45° - PP-R/ PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

COUPLING - PP-R/ PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

TEE PP – R / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

END CAP - PPR-C / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

SHORT CROSS OVER - PPR-C / PN 25

Size (mm)	20	25	32	40

CROSS OVER - PPR-C / PN 25

Size (mm)	20	25	32	40

REDUCER TEE - PP-R/ PN 25

Size (mm)															
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63
	20	20	25	20	25	32	20	25	32	40	20	25	32	40	50
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63

Size (mm)														
	75	75	75	75	75	75	90	90	110	110	110	110	160	160
	20	25	32	40	50	63	63	75	50	63	75	90	90	110
	75	75	75	75	75	75	90	90	110	110	110	110	160	160

REDUCER - PPR-C / PN 25

Size (mm)															
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63
	20	20	25	20	25	32	20	25	32	40	20	25	32	40	50

Size (mm)											
	75	75	90	90	90	110	110	110	110	160	160
	50	63	50	63	75	50	63	75	90	90	110

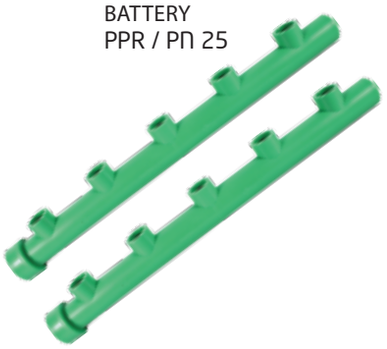
ROXY PPR FITTINGS

Roxy For Modern Water Systems

TEE CROSS
PPR / PN 25

Size (mm)
25

BATTERY
PPR / PN 25



Size (mm/inch″)
50 X 25
50 X 32
63 X 25
63 X 32

TAIL ELOBOW
PPR / PN 25

Size (mm)
25
32

MALE UNION
PPR / PN 25

Size (mm/inch″)
20 × ½
25 × ¾″
32 × 1″
40 × 1 ¼″
50 × 1 ½″
63 × 2″

CLAMP
PPR / PN 25

Size (mm)
20
25
32

FEMALE UNION
PPR / PN 25

Size (mm/inch″)
20 × ½
25 × ¾″
32 × 1″
40 × 1 ¼″
50 × 1 ½″
63 × 2″

ROXY PPR FITTINGS

Roxy For Modern Water Systems

ELBOW 90° MALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

ELBOW 90° FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

TEE FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

ADAPTOR MALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″
50 / 1 ½″
63 / 2″

ADAPTOR FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″
50 / 1 ½″
63 / 2″

DOUBLE ELBOW
PPR-C / PN 25

Size (mm/inch″)
25 / ½″
25 / ¾″

BALL VALVE - PPR-C / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110

END PLUG - PPR-C

Size (mm)	20	25

ANGEL VALVE - PPR-C / PN 25

Size (mm)	20

CONCEALED VALVE - PPR-C / PN 25

Size (mm)	20	25	32	40

ROXY PPR FITTINGS

uv stabilized fittings

ELBOW 90° - PP – R / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

ELBOW 45° - PP-R/ PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

COUPLING - PP-R/ PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

T PP – R / PN 25

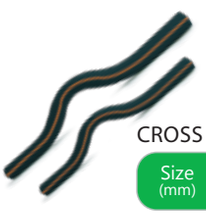
Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

END CAP - PPR-C / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110	125	140	160

SHORT CROSS OVER - PPR-C / PN 25

Size (mm)	20	25	32	40



CROSS OVER - PPR-C / PN 25

Size (mm)	20	25	32	40

REDUCER TEE - PP-R/ PN 25

Size (mm)															
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63
	20	20	25	20	25	32	20	25	32	40	20	25	32	40	50
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63

Size (mm)														
	75	75	75	75	75	75	90	90	110	110	110	110	160	160
	20	25	32	40	50	63	63	75	50	63	75	90	90	110
	75	75	75	75	75	75	90	90	110	110	110	110	160	160

REDUCER - PPR-C / PN 25

Size (mm)															
	25	32	32	40	40	40	50	50	50	50	63	63	63	63	63
	20	20	25	20	25	32	20	25	32	40	20	25	32	40	50

Size (mm)											
	75	75	90	90	90	110	110	110	110	160	160
	50	63	50	63	75	50	63	75	90	90	110

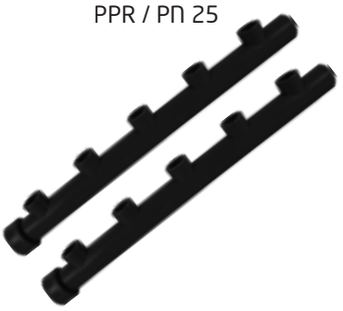
ROXY PPR FITTINGS

uv stabilized fittings

TEE CROSS
PPR / PN 25

Size (mm)
25

BATTERY
PPR / PN 25



Size (mm/inch")
50 X 25
50 X 32
63 X 25
63 X 32

TAIL ELOBOW
PPR / PN 25

Size (mm)
25
32

MALE UNION
PPR / PN 25

Size (mm/inch")
20 × ½
25 × ¾"
32 × 1"
40 × 1 ¼"
50 × 1 ½"
63 × 2"

CLAMP
PPR / PN 25

Size (mm)
20
25
32

FEMALE UNION
PPR / PN 25

Size (mm/inch")
20 × ½
25 × ¾"
32 × 1"
40 × 1 ¼"
50 × 1 ½"
63 × 2"

ROXY PPR FITTINGS

Roxy For Modern Water Systems

ELBOW 90° MALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

ELBOW 90° FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

TEE FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″

ADAPTOR MALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″
50 / 1 ½″
63 / 2″

ADAPTOR FEMALE THREADED
PPR-C / PN 25

Size (mm/inch″)
20 / ½″
25 / ½″
25 / ¾″
32 / ¾″
32 / 1″
50 / 1 ½″
63 / 2″

BALL VALVE - PPR-C / PN 25

Size (mm)	20	25	32	40	50	63	75	90	110

DOUBLE ELBOW
PPR-C / PN 25

Size (mm/inch″)
25 / ½″
25 / ¾″

CONCEALED VALVE

PPR-C Concealed Valve. This valve is manufactured using optimum grade brass and cutting-edge techniques in compliance with set industry standards. It is widely used for controlling the pressure and flow of liquid in unique direction. Our offered valve is made available in different specifications for our clients to choose from. We offer this valve to our valuable clients at affordable rate as all our valves are italian and german with all it's certificates.

Features:

•Anti corrosive

•Smooth finishing

•Material PPR-C

Properties :

-Healthy and non-toxic,becterogical natural, conforming to drinking water application

-Resistant to high temperature.

-Good impact strength.

-German connection technique.

-Excellent heat-insulation.

-Light weight.

-Smooth inner surface reduce pressure loss and increase flow speed.

TECHNICAL DATA:

Size Range:

•20 to 32 mm

Pressure Rating:

•PN25

Joining Technology:

•Welding

Materials

•Polypropylene

•Alloy

BALL VALVES

Ball valves shut off the flow of water using a small sphere, or ball, inside the valve.
The sphere has an opening inside. When in the "on" position, the opening is in line with the pipe, allowing water to flow freely. When in the "off" position, the opening is perpendicular to the flow of water, stopping the flow completely.
In a ball valve, flow is controlled with a lever. Placing the lever perpendicular to the pipe allows water to flow. Moving it at 90-degree angle stops the flow.

Ball valves have several advantages.

They are easy to turn on and off quickly, and can be used by individuals who cannot maneuver a wheel-operated valve due to disability.

They allow the user to tell at a glance if the valve is open or not.

they are durable, rarely freeze even with years of use, provide reliable service, and are extremely versatile. Ball valves are used in home plumbing, industrial applications, oil and gas applications, marine applications, pharmaceuticals, and many other fields as they are manufactured from pure brass and the ball are made from pure alloy to resistant corrosin.

So,

The ball valves probably the most widely-used valve design, ball valves employ a cored, rotating ball to control flow. Usually operated by lever handle, they also offer a quick view of their status.
Their design makes them ideal for full-flow applications, and their easy, low-wear operation is also excellent for throttling.

TECHNICAL DATA:

Size Range:

From 20 to 110 mm

Pressure Rating:

PN25

Joining Technology:

Welding

Materials

•Polypropylene

•Brass

•Alloy

BRASS SPEC

The alloy of the brass insert that **Roxy Plast** uses in its products is made according to EN-12449, that ensures the safety of the user's health in regards to drinking water.

Also, the design of the brass inserts give very high fixation between Brass and PP-R materials to prevent any leakage that can cause damages.

Finally, by the use of Italian brass we can produce and offer a product with both high quality and high safety, because our mission is to build a circle of trust for every client.

Featured

- Corrosion Resistance
- Impact Resistance
- Dimensional accuracy
- Can withstand high pressures for more than fifty years
- Non-toxic
- Optimal endurance
- Moisture resistance
- Sturdiness

PPR PIPES AND FITTINGS **ROXY**PLAST www.**ROXYPLAST**.com

ROXYPLAST
GERMAN TECHNOLOGY

GLOSSARY

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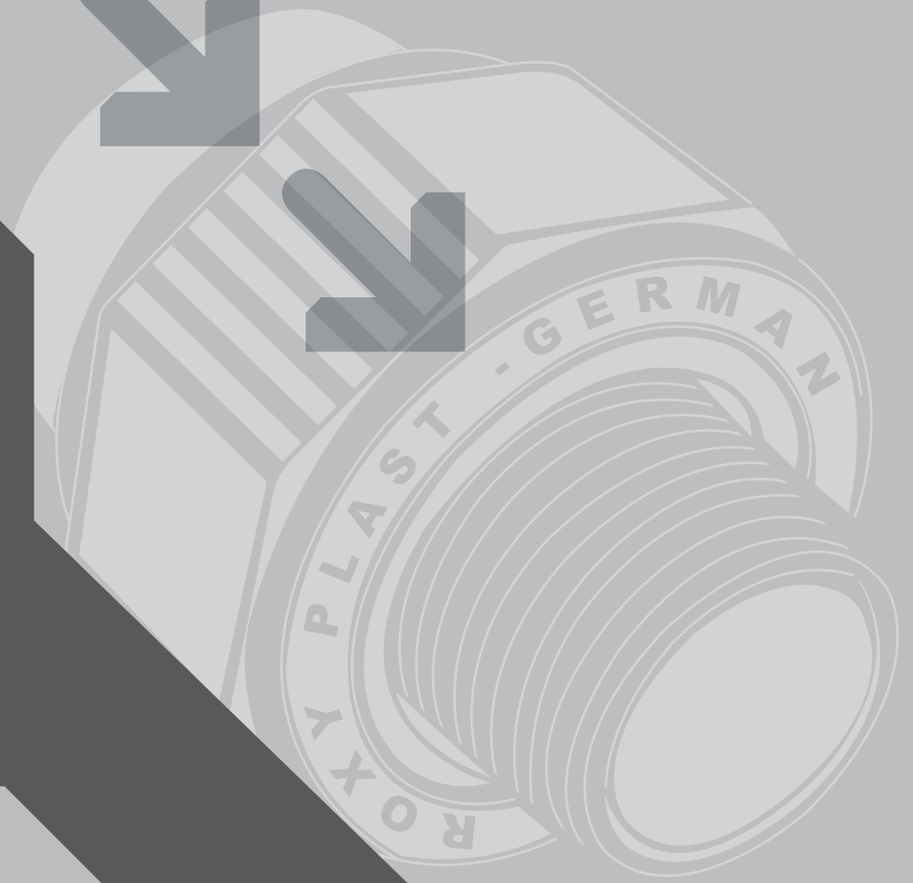

GLOSSARY

ABRASION RESISTANCE
The measure of a material's ability to withstand erosion when subjected to rubbing, scraping, wearing, scouring, etc.

AGING
The act or effect of exposed materials to an environment for a long period of time.

ANTIOXIDANT
A substance added to a plastic compound to retard degradation due to contact with air (Oxygen).

BEAM LOADING
The process of applying a specified force (load) to a piece of pipe that is supported at two points. It is usually expressed in pounds per the distance between the center of the supports.

BELLED-END
A term used to describe a pipe end which has been enlarged to have the same inside dimensions as a fitting socket. It acts as a coupling when joining pipes.

BLISTER
An undesirable air or gas bubble (bump) on the surface of a plastic part.

BOND
To attach by the use of an adhesive.

BURST STRENGTH
The maximum amount of internal pressure a piece of pipe or a fitting will withstand before breaking.

CHEMICAL RESISTANCE
The ability of a plastic to withstand the effects of chemicals at various concentrations and temperatures.

COLD FLOW
A change in the shape or the dimensions of a plastic part when subjected to a load (weight or pressure) at room temperature.

COMPOUND
The mixture of ingredients, consisting of a plastic resin and specified additives, used to manufacture a plastic part.

CONDENSATION
A chemical reaction involving the combination of two or more molecules that results in the elimination of a simple molecule, such as water, and the formation of a more complex compound of greater molecular weight.

COPOLYMER
The product formed by the simultaneous polymerization of two or more polymerizes Chemicals (monomers).

CREEP
The dimensional change, beyond the initial elastic elongation caused by the application of a load, over a specified period of time. It is normally expressed in inches per unit of time.

GLOSSARY

CURE
To change the properties of a polymer to a stable and usable final state by the use of chemical agents, heat or radiation.

DEFLECTION TEMPERATURE (HEAT DISTORTION)
The temperature which will cause a plastic specimen to deflect a certain distance when a specified load is applied.

DEGRADATION
A detrimental change in the chemical structure, physical properties or appearance of a plastic.

DELAMINATION
The separation of the layers of material in a laminate.

DETERIORATION
A permanent change in the physical properties of a plastic piece evidenced by impairment of these Properties.

DIELECTRIC STRENGTH
The force required to drive an electric current through a specific thickness of a material.

DIFFUSION
The movement of gas or liquid particles or molecules in a body of fluid through or into a medium and away from the main body of fluid.

DIMENSIONAL STABILITY
The capability of a plastic part to maintain its original shape and dimensions under conditions of use.

ELASTICITY
The property of a plastic that allows it to return to its original dimensions after deformation.

ELASTIC LIMIT
The load point at which a material will not return to its original shape and size after the load has been released.

ELASTOMER
A substance which when stretched to approximately twice its length, at room temperature, will quickly return to its original
length when the stretching load is relieved.

ELECTRICAL PROPERTIES
The resistance of a plastic to the passage of electricity.

ELONGATION
The lengthening of a material to an extent under tension without failing.

ENVIRONMENTAL STRESS CRACKING
Cracks which develop when a plastic part is subjected to incompatible chemicals or put under stress.

EXTRUSION
The process used to continuously form a shape by forcing a heated or unheated plastic through a shaping orifice (die).

FILLER
A relatively inert material added to a plastic to modify its strength, permanence, working properties and other qualities, or merely to lower costs.

FLEXURAL STRENGTH
The measure of a material's ability to withstand a specified deformation under a beam load (bending) at 73°F. Normally expressed in PSI.

GLOSSARY

FORMING
A process in which the shape of plastic pieces such as sheets, rods or tubes are changed to a desired configuration.

FORMULATION
The combination of ingredients used to make a finished plastic product. Also see "Compound".

FUSE
To join together plastic parts by softening the material with heat or solvents.

GATE
The constriction in the flow channel between the runner and the mold cavity in an injection mold.

GLASS TRANSITION
The reversible change in an amorphous polymer from a viscous condition to a hard and relatively brittle one, and vice versa.

GLASS TRANSITION TEMPERATURE
The approximate midpoint of the temperature range over which the glass transition takes place.

GUSSET
A piece used to give additional size or strength to a plastic part at a particular location.

HARDNESS
The measure of a material's ability to resist indentation.

HEAT RESISTANCE
The ability of a material to withstand the effects of exposure to high temperatures.

HOOP STRESS
The circumferential stress imposed on a pipe wall when exposed to an internal pressure load. Usually expressed in PSI.

IMPACT STRENGTH
A measure of a plastic part's ability to withstand the effects of dropping and/or striking. There are two commonly used test methods, Notched Izod and Tup. Notched Izod uses a pendulum type machine to strike a notched specimen. Tup Testing uses a falling weight (tup) to strike a pipe or fitting specimen.

INJECTION MOLDING
The process used to form a shape by forcing a heated plastic, in a fluid state and under pressure, into the cavity of a closed mold.

ISO EQUATION
The equation which shows the relationship between stress, pressure and dimensions of a pipe.

JOINT
The point where a pipe and its fitting or two separate pipes are connected together.

LIGHT STABILITY
A feature of a plastic which allows it to retain its original color and physical properties when exposed to sun or artificial light.

LIGHT TRANSMISSION
The amount of light which a plastic will allow to pass through.

LONGITUDINAL STRESS
A tensile or compressive force placed upon the long axis of a plastic part.

LUBRICANT
Any substance which reduces the friction between moving solid surfaces.

GLOSSARY

MODULUS
A term used to describe the load required to cause a specified percentage of elongation.
It is usually expressed in PSI or kilos per square centimeter.

MONOMER
A low-molecular-weight substance whose molecules can react with other molecules to form a polymer.

NON-FLAMMABLE
Incapable of igniting.

NON-TOXIC
Non-poisonous.

OLEFIN PLASTICS
A group of plastics based on polymers made by the polymerization or copolymerization of olefins with other monomers, with the olefins being at least 50% of the weight. For example, polypropylene, polyethylene and polybutylene.

ORGANIC CHEMICAL
Any chemical that contains carbon.

PLASTIC
A material that contains as an essential ingredient one or more organic polymeric substances of large molecular weight. It is solid in its finished state and, at some stage in its manufacturing process into finished articles, can be shaped by flow.

PLASTICITY
The property of plastics, which allows them to be formed, without rupture, continuously and permanently by the application of a force, which exceeds the yield value of the material.

PLASTICIZER
A substance incorporated into a plastic to increase its workability, flexibility, or dispensability.

PLASTIC PIPE
A hollow cylinder of a plastic material in which the wall thickness is usually small compared to the diameter, and in which the inside and outside walls are essentially concentric.

POLYBUTYLENE PLASTICS
Plastics based on polymers with butane as the sole monomer.

POLYETHYLENE PLASTICS
Plastics based on polymers with ethylene as the sole monomer.

POLYMER
A product formed by the chemical reaction of the addition of a large number of small molecules which have the ability to combine and reach high molecular weights.

POLYMERIZATION
A chemical reaction in which the molecules of monomers are linked together to form polymers.

POLYOLEFIN PLASTICS
Plastics based on polymers with olefin as the sole monomer.

POLYPROPYLENE PLASTICS
Plastics based on polymers with propylene as the sole monomer.

POLYSTYRENE
A polymer prepared by the polymerization of styrene as the sole monomer.

GLOSSARY

POLYVINYL CHLORIDE PLASTICS
Plastics obtained by the polymerization of vinyl chloride. The addition of various ingredients, such as stabilizers, colorants, lubricants and fillers enhance the process-ability and performance.

POROSITY
A term describing a plastic part that has many visible voids.

PRESSURE RATING
The maximum pressure at which a plastic part can safely function without failing.

QUICK BURST
A term used to describe the amount of internal pressure required to burst a pipe or fitting when the pressure is built up over a 60-70 second interval of time.

REINFORCED PLASTIC
A plastic with high strength fillers imbedded in the composition, causing some mechanical properties to be superior to those of the base resin.

RESIN
A solid or pseudo-solid organic material, often having a high molecular weight, which exhibits a tendency to flow when subjected to stress. It usually has a softening or melting range and usually fractures accordingly.

RUNNER
The secondary feed channel in an injection mold that runs from the inner end of the spruce to the cavity gate. Also, the solidified piece of plastic, which forms in the feed channel when the injection's molded part, cools down.

SAMPLE
A small part or portion of a material or product intended to be representative of the whole.

SCHEDULE
A pipe sizing system for the outside diameter and wall thickness dimensions which was launched by the iron pipe industry; as the diameter increases, the pressure rating decreases for any given schedule of pipe.

SELF-EXTINGUISHING
A term describing a plastic material that stops burning when the source of ignition is removed.

SHRINK MARK
A depression in the surface of a molded plastic part where it has retracted from the mold.

SOFTENING POINT
The temperature at which a plastic changes from rigid to soft.

SOLVENT
A medium into which a substance is dissolved.

SOLVENT CEMENT
An adhesive consisting of plastic dissolved into a solvent and used to bond plastic surfaces.

SOLVENT CEMENTING
Using a solvent cement to make pipe joints.

SPECIFIC GRAVITY
The ratio of the mass of a material to the mass of an equal volume of water.

SPRUE
The primary feed channel that runs from the outer face of an injection mold to the runner or the gate.

GLOSSARY

STABILIZER
An ingredient added to a plastic compound to inhibit or slow down any undesirable changes in the material.

STANDARD DIMENSION RATIO (SDR) PIPE
A type of pipe in which the dimension ratios are constant for any given class. Unlike “schedule” pipe, as the diameter increases the pressure rating remains constant for any given class of pipe.

STIFFNESS FACTOR
A term describing the degree of flexibility of a piece of pipe when subjected to an external load.

STRESS-CRACK
An external or internal crack in a plastic caused by tensile stresses less than its short-time mechanical strength.

SUSTAINED PRESSURE TEST
A test in which a plastic part is subjected to a constant internal pressure load for 1000 hours.

TEAR STRENGTH
A measure of a material’s ability to resist tearing.

TENSILE STRENGTH
The measure of a plastic’s ability to resist a stretching force. It requires rupturing a test specimen. It is normally expressed in the PSI.

THERMAL CONDUCTIVITY
A measure of a plastic’s ability to conduct heat.

THERMAL CONTRACTION
The decrease in length of a plastic part due to a change in temperature.

THERMAL EXPANSION
The increase in length of a plastic part due to a change in temperature.

THERMOPLASTICS
A group of plastics which can repeatedly be softened by heating and hardened by cooling.

THERMOSETTING PLASTICS
A group of plastics which, having been cured by heat, chemicals or other means, are substantially infusible and insoluble. They are permanently hardened.

VINYL CHLORIDE PLASTICS
Plastics based on polymers or copolymers of vinyl chloride with other monomers, with the vinyl chloride being the greatest amount by weight.

VISCOSITY
A term describing a material’s resistance to flow.

VOLATILE
A property of liquids in which they pass away by evaporating.

WELD LINE (KNIT LINE)
A term used to describe a mark on a molded plastic part formed by the union of two or more streams of plastic flowing together.

YIELD POINT
The point at which a plastic material will not withstand a stretching force. It will continue to elongate with no increase in load after reaching that point.

UNIT CONVERSION TABLE

Table 1 Multiples and Submultiples of SI units

Prefix	Symbol	Multiplying Factor	
exa	E	10^{18}	1 000 000 000 000 000 000
peta	P	10^{15}	1 000 000 000 000 000
tera	T	10^{12}	1 000 000 000 000
giga	G	10^{9}	1 000 000 000
mega	M	10^{6}	1 000 000
kilo	k	10^{3}	1 000
hecto*	h	10^{2}	100
deca*	da	10	10
deci*	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	u	10^{-6}	0.000 001
nano	n	10^{-9}	0.000 000 001
pico	p	10^{-12}	0.000 000 000 001
femto	f	10^{-15}	0.000 000 000 000 001
atto	a	10^{-18}	0.000 000 000 000 000 001

Table 2 Length units

Millimeters	Centimeters	Meters	Kilometers	Inches	Feet	Yards	Miles
mm	cm	m	km	in	ft	yd	mi
1	0.1	0.001	0.000001	0.03937	0.003281	0.001094	6.21e-07
10	1	0.01	0.00001	0.393701	0.032808	0.010936	0.000006
1000	100	1	0.001	39.37008	3.28084	1.093613	0.000621
1000000	100000	1000	1	39370.08	3280.84	1093.613	0.621371
25.4	2.54	0.0254	0.000025	1	0.083333	0.027778	0.000016
304.8	30.48	0.3048	0.000305	12	1	0.333333	0.000189
914.4	91.44	0.9144	0.000914	36	3	1	0.000568
1609344	160934.4	1609.344	1.609344	63360	5280	1760	1

Table 3 Area Units

Millimeter square	Centimeter square	Meter square	Inch square	Foot square	Yard square
mm^2	cm^2	m^2	in^2	ft^2	yd^2
1	0.01	0.000001	0.00155	0.000011	0.000001
100	1	0.0001	0.155	0.001076	0.00012
1000000	10000	1	1550.003	10.76391	1.19599
645.16	6.4516	0.000645	1	0.006944	0.000772
92903	929.0304	0.092903	144	1	0.111111
836127	8361.274	0.836127	1296	9	1

UNIT CONVERSATION TABLEV

Table 4 Volume Units

Centimeter cube	Meter cube	Liter	nch cube	Foot cube	US gallons	Imperial gallons	US barrel(oil)
cm3	m3	ltr	in3	ft3	US gal	Imp.gal	US brl
1	0.000001	0.001	0.061024	0.000035	0.000264	0.00022	0.000006
1000000	1	1000	61024	35	264	220	6.29
1000	0.001	1	61	0.035	0.264201	0.22	0.00629
16.4	0.000016	0.016387	1	0.000579	0.004329	0.003605	0.000103
28317	0.028317	28.31685	1728	1	7.481333	6.229712	0.178127
3785	0.003785	3.79	231	0.13	1	0.832701	0.02381
4545	0.004545	4.55	277	0.16	1.20	1	0.028593
158970	0.15897	159	9701	6	42	35	1

Table 5 Mass Units

Grams	Kilograms	Metric tonnes	Short ton	Long ton	Pounds	Ounces
g	kg	tonne	sh-ton	L-ton	lb	oz
1	0.001	0.000001	0.000001	9.84-07	0.002205	0.035273
1000	1	0.001	0.001102	0.000984	2.204586	35.27337
1000000	1000	1	1.102293	0.984252	2204.586	35273.37
907200	907.2	0.9072	1	0.892913	2000	32000
1016000	1016	1.016	1.119929	1	2239.859	35837.74
453.6	0.4536	0.000454	0.0005	0.000446	1	16
28	0.02835	0.000028	0.000031	0.000028	0.0625	1

Table 6 Density Units

Gram/milliliter	Kilogram/meter cube	Pound/foot cube	Pound/inch cube
g/ml	kg/m3	lb/ft3	lb/in3
1	1000	62.42197	0.036127
0.001	1	0.062422	0.000036
0.01602	16.02	1	0.000579
27.68	27680	1727.84	1

Table 7 Volumetric Liquid Flow Units

Liter/second	Liter/minute	Meter cube/hour	Foot cube/minute	Foot cube/hour	US gallons/minute	US barrels (oil)/day
L/sec	L/min	M^3/hr	ft^3/min	ft^3/hr	gal/min	US brl/d
1	60	3.6	2.119093	127.1197	15.85037	543.4783
0.016666	1	0.06	0.035317	2.118577	0.264162	9.057609
0.277778	16.6667	1	0.588637	35.31102	4.40288	150.9661
0.4719	28.31513	1.69884	1	60	7.479791	256.4674
0.007867	0.472015	0.02832	0.01667	1	0.124689	4.275326
0.06309	3.785551	0.227124	0.133694	8.019983	1	34.28804
0.00184	0.110404	0.006624	0.003899	0.2339	0.029165	1

UNIT CONVERSATION TABLEV

Table 8 Volumetric Gas Flow Units

Normal meter cube/hour	Standard cubic feet/hour	Standard cubic feet/minute
$Nm^3/hr.$	Scfh	scfm
1	35.31073	0.588582
0.02832	1	0.016669
1.699	59.99294	1

Table 9 Mass Flow Units

Kilogram/hour	Pound/hour	Kilogram/second	Ton/hour
kg/h	lb/hour	kg/s	t/h
1	2.204586	0.000278	0.001
0.4536	1	0.000126	0.000454
3600	7936.508	1	3.6
1000	2204.586	0.277778	1

Table 10 High Pressure Units

Bar	Pound/square inch	Kilopascal	Mega Pascal	Kilogram force/ centimeter square	Millimeter of mercury	Atmospheres
Bar	Psi	K Pa	MPa	Kg f /cm2	Mm Hg	Mm Hg
1	14.50326	100	0.1	1.01968	750.0188	750.0188
0.06895	1	6.895	0.006895	0.070307	51.71379	51.71379
0.01	0.1450	1	0.001	0.01020	7.5002	7.5002
10	145.03	1000	1	10.197	7500.2	7500.2
0.9807	14.22335	98.07	0.09807	1	735.5434	735.5434
0.001333	0.019337	0.13333	0.000133	0.00136	1	1
1.013	14.69181	101.3	0.1013	1.032936	759.769	759.769

Table 11 Low Pressure Units

Meter of water	Foot of water	Centimeter of mercury	Inches of mercury	Inches of water	Pascal
M H_2O	Ft H_2O	Cm Hg	In Hg	In H_2O	Pa
1	3.280696	7.356339	2.896043	39.36572	9806
0.304813	1	2.242311	0.882753	11.9992	2989
0.135937	0.445969	1	0.39368	5.351265	1333
0.345299	1.13282	2.540135	1	13.59293	3386
0.025403	0.083339	0.186872	0.073568	1	249.1
0.000102	0.000335	0.00075	0.000295	0.004014	1

Table 12 Speed Units

Meter/second	Meter/minute	Kilometer/hour	Foot/second	Foot/minute	Miles/hour
m/s	m/min	km/h	Ft /s	Ft /min	mi/h
1	59.988	3.599712	3.28084	196.8504	2.237136
0.01667	1	0.060007	0.054692	3.281496	0.037293
0.2778	16.66467	1	0.911417	54.68504	0.621477
0.3048	18.28434	1.097192	1	60	0.681879
0.00508	0.304739	0.018287	0.016667	1	0.011365
0.447	26.81464	1.609071	1.466535	87.99213	1

Table 13 Torgue Units

Newton meter	Kilogram force meter	Foot pound	Inch pound
Nm	kgfm	ftlb	inlb
1	0.101972	0.737561	8.850732
9.80665	1	7.233003	86.79603
1.35582	0.138255	1	12
0.112985	0.011521	0.083333	1

Table 14 Dynamic Viscosity Units

Centipoise*	Poise	Pound /foot · second
Cp	poise	Lb / (ft·s)
1	0.01	0.000672
100	1	0.067197
1488.16	14.8816	1

Table 15 Kinematic Viscosity Units

Centistoke*	Stoke	Foot square/second	Meter square /second
cs	St	ft2/s	m2/s
1	0.01	0.000011	0.000001
100	1	0.001076	0.0001
92903	929.03	1	0.092903
1000000	10000	10.76392	1

Table 16 Temperature Conversion Formulas

Degree Celsius (°C)	(°F - 32) x 5/9
	(K - 273.15)
Degree Fahrenheit (°F)	(°C x 9/5) + 32
	(1.8 x K) - 459.67
Kelvin (K)	(°C + 273.15)
	(°F + 459.67) ÷ 1.8

CERTIFICATES

NOTE

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