



SANGIR PLASTICS P. LTD.

www.sangir.com

REVOLUTIONISING THERMOPLASTICS

Innovative piping and sheets solutions
for industries constantly evolving for a
better tomorrow.

PP

Piping
systems



Product
Catalogué

Our Brands



SANGiR®
Piping System

PlastNova®
Sheets, Film & Profiles

Novathene PE Sheets

NovaLene PP Sheets

NovaLene-H PP-H Sheets

NovaStrong UHMW-PE Sheets

NovaKyn PVDF Sheets

NovaRex PVC Sheets (Rigid)

NovaFoam PVC Foam Sheets

NovaRene HIPS Sheets

NovaTherm ABS Sheets

NovaOrtho Sheets

NovaFab Fabric backed sheets

NovaWeld & NovaStic Rods

Polyethylene (PE)

Polypropylene (PP)

Polyvinylidene Flouride (PVDF)

SanFloats®
Floatation Systems

Custom Roto Solutions



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PP / PPH Piping Systems

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about sangir

At Sangir, we love to offer best quality cost effective solutions for our customers, partnering with them to provide solutions within their budgets and time lines, with products made from advanced raw materials and machineries that deploy the best of contemporary technology.



Sangir Plastics Pvt Ltd, an ISO 9001:2000 & ISO 14001: 2004 Certified Company, prides itself as a quality manufacturer of thermoplastics piping and sheet solutions. A broad array of products includes quality thermoplastic piping systems including solution and roto moulded products made from PP, PPH, Nucleated PP, HDPE, PVDF, PPGL, HIPS, PPA, PPFR & PP conductive grades. The company is also known for having successfully executed turnkey jobs at the largest companies in the country.

The Company is spread over a total area of over 500000 sq feet, conveniently located in the industrial town of Vapi, Gujarat & Jaipur, Rajasthan in Western India. The company enjoys quick access to the Western Express Highway and is suitably within close reach of the Mumbai port. We pride ourselves in the loyalty of 150+ talented employees, who move in tandem with the leadership of an experienced management team, well qualified in their functional fields. To achieve its quality benchmarks, the company sources its machinery from the best suppliers worldwide, with technological superiority and in-house research teams.

Sangirs' products are exported to over 35 different countries in 5 continents. Products are widely used in diverse applications handling a range of fluids, gases and slurries at temperatures between -40°C to 200°C.



ISO 14001:2004

Our Commitment to Environment - ICARE

- **I**mplement, review & improve critical processes for promoting a safe & healthy workplace environment
- **C**omply & exceed local and state environment legislation
- **A**chieve optimal utilization of resources including water, energy & raw materials
- **R**aise awareness, encourage participation and train employees in environmental matter for reducing pollution, emissions & waste
- **E**ncourage & promote environmental standards with customers & suppliers

standards & quality assurance

Sangir Plastics has built up an outstanding reputation for quality and is constantly striving to enhance it further.

At Sangir Plastics we set high standards on our own performance, and for all our undertakings, quality requirements are our guiding principle. Our staff checks every phase of the work against our quality systems which is certified according to ISO 9001-2008. This internal quality system and our stringent execution procedures ensure considerable time savings on our projects. From our people you may always expect know-how, flexibility and imagination. Every project brings new challenges, but also new opportunities. Nothing is more vulnerable than a leading edge in know-how and technology. We therefore constantly invest in new techniques and systems, but above all, in people. Education and training are essential elements of our company policy. Sangir Plastics agreements will stand and always be honoured. Reliability might sound old-fashioned, but as far as we are concerned it is certainly not out of date.



ISO 9001:2008

ISO 4427

ISO 10931

DIN 16962

DIN 8077

ASNZ 4130

IS 8008

ASTM Sch 40 / 80

IS 14151:1999



CM/L-7312357

IS 4984:1995



CM/L-1285855

IS 14333:1996



CM/L-7754389

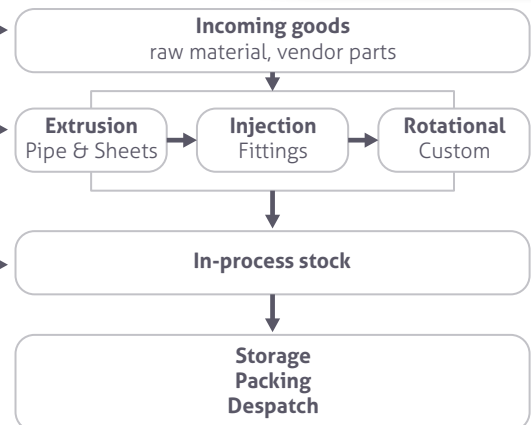
System control

Test and acceptance

In-process inspection process monitoring

Final inspection

- dimensional control
- surface finish
- melt flow index
- impact bending test
- Heat reversion test
- density
- hydraulic pressure
- drop impact
- hardness



Product Inspection & Consultant approvals

- Aker Solutions Pvt. Ltd
- Bureau Veritas Pvt. Ltd
- Toyo Engineering Pvt Ltd
- SGS India Pvt. Ltd.
- Lloyds Register
- Indian Register of Shipping
- Dalal & Consultants
- CMPDI Ltd
- Tata Projects Ltd
- Indian Institute of Technology (Powai)
- Dodsall Engineering
- SNC Lavalin
- IBR Chematur
- Shroff & Associates
- M. N. Dastur

Government bodies

- National Thermal Power Corporation Ltd.
- Nuclear Power Corporation India Ltd.
- Certified Engineers India Ltd. (GWSSB))
- Gujarat Water Sewerage & Supply Board
- Municipal Corporation of Greater Mumbai Ltd.
- Bureau of Indian Standards
- Mahanagar Gas Ltd
- Tata Consulting Engineers Ltd.
- CIPET
- Maharashtra Jeevan Pradhikaran
- CIDCO
- Heavy Water Board

production & supply programme

Sangir manufactures and supplies a wide range of industrial products from advanced engineering plastics. A variety of products are made in compliance with different industrial standards to serve the needs of customers around the globe. DIN, ASTM, ISO, EN, IS and ASNZ compliant products are readily available for all your needs.

Product Line	Range	Standards Followed
Pipes & Pipe Fittings		
HDPE / MDPE Pipes & Fittings	16 - 1200mm OD / max PN20	IS 4984/14333, ISO 4427, DIN 8074, AZ4130
PP / PPH Pipes and Fittings, PP Liner Pipes	16 - 630mm OD / max PN20	DIN8077/8078, DIN16962, ASTM Sch 40/80
PVDF KYNAR® Pipes & Fittings, Liner Pipes	16 - 200mm OD / max PN20	ISO 10931, DIN 16962, ASTM Sch 40/80
PVC / CPVC Pipes & Fittings*	16 - 400mm OD / max PN20	IS 4985, DIN 8062 / 8063
HIPS Pipes, Cores, Fire Retardant Piping	up to 315mm	Custom
PP + FRP Piping, PPH+FRP piping Systems*	up to 500mm	Custom
Plastic Sheet Solutions		
Polypropylene Sheets		ISO 15013
PP & PP-Homo & PP copolymer Sheets	0.5 to 225mm, max 1.5m wide	Extruded 1 - 30mm, Cast 40 - 225mm
PP Fabric Backed - PPGL / PPHGL Sheets	1 to 10mm, max 1.5m wide	Custom Extruded
PP Fire Retardant - PPFR Sheets	1 to 15mm, max 1.5m wide	
Polyethylene Sheets		
HDPE / MDPE / Pe80 / PE100 Sheets	0.5 to 150mm, max 1.5m wide	ISO 14632
LDPE Sheets	0.5 to 15mm, max 1.5m wide	ISO 14632
UHMWPE Sheets	2 to 100mm, max 1.22m wide	Cast
Geomembranes*	0.5 to 6mm, max 8m wide	Extruded
PolyVinylChloride Sheets		ISO 11833
PVC Rigid Sheets	1 to 50mm, max 1.22m wide	Extruded up to 50mm
PVC Foam Sheets	1 to 10mm, max 1.22m wide	Extruded
PVC Flexible , Gasket & Transperant Sheets	1 to 8mm, max 1.22m wide	Extruded
CPVC Sheets*	1 to 30mm, max 1.22m wide	Extruded
High Impact Polystyrene - HIPS Sheets	1 to 8mm, max 1.22m wide	Custom Extruded
Acrylonitrile Butadiene Styrene - ABS, FR Sheets*	1 to 10mm, max 1.22m wide	Custom Extruded
PVDF Regular and Fabric Backed Sheets*	1 to 10mm, max 1.5m wide	ISO 15014
PP Corrugated Sheets, Flute Boards*	1 to 10mm, max 1.22m wide	Custom Extruded
Plastic Solid Rods & Welding Rods		
PP / PE / PPH / PVC / CPVC / PVDF weld Rods	1 to 5mm, roll form	Various Shapes, Spools available
PP Solid Rods, PPH Solid Rods	16 - 250mm, max 1.0m L	Extruded
PE Solid Rods, HDPE Solid Rods*	16 - 100mm, max 1.0m L	Extruded
PVC, CPVC PVDF Solid Rods*	16 - 250mm, max 1.0m L	Extruded
Fabrication Services		
Piping Installation & Commissioning jobs	Custom	DVS 2207
Custom Fabrication / Welding Jobs	Custom	DVS 2207
Plastic Tanks, Hoods, Vessels	Custom	DVS 2207
Other Products		
Profiles & Custom Fabricated Solution	-	Custom
Garbage Chute, Klean Chute for debris, waste disposal.	700mm max OD	UL rated options and installations available
Custom Roto moulded products	Custom	ARMO

*Supply only

plastics at sangir

- a world of possibilities

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Technical Details & Applications

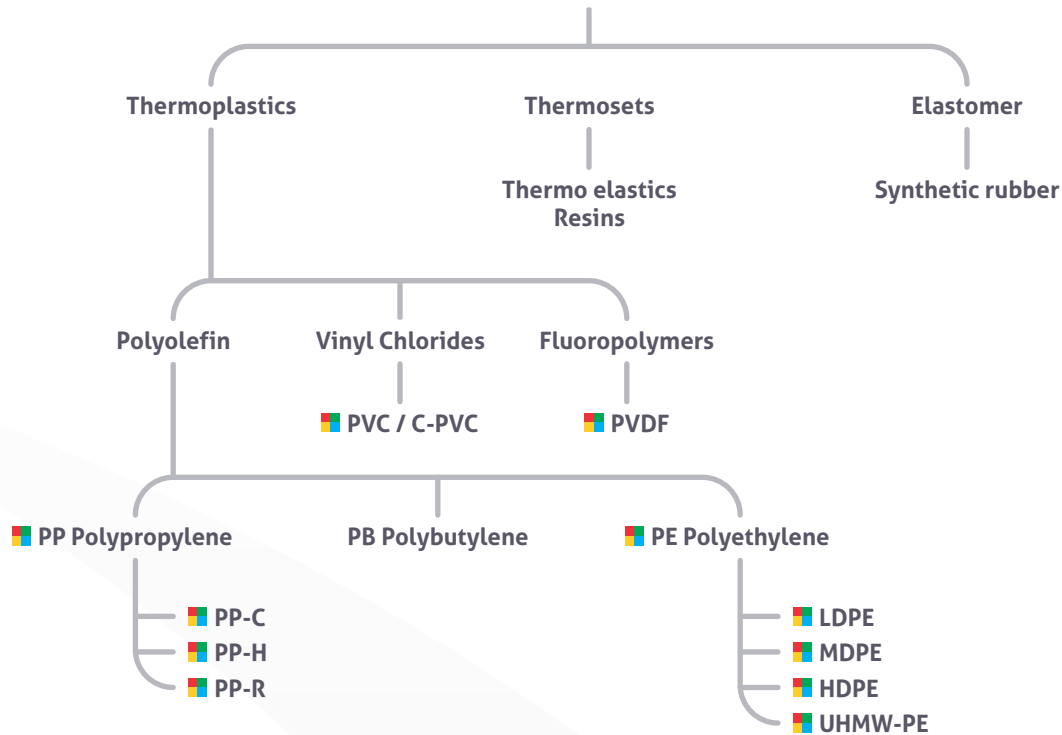
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classification

Classification of plastics



 Available at Sangir

Features reference chart

	Elastic		Wear resistant		Non-toxic
	Impact resistant		Insulating		Homogenous welded joints
	Thermal resistant		Chemical resistant		Prefabricated
	Smooth inner walls		Poor heat conductivity		Light weight
	Weather resistant		Highly suitable for welding		

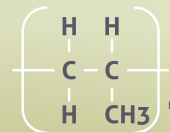
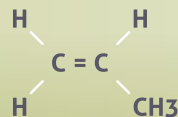
comparison of materials

Attribute of the raw material used			PE-HD	PEUHMW	PP	PVDF	PVC-U	PVC-C (Corzan®)	ABS
Physical Properties									
1. Specific gravity (ρ)	ISO1183	g/cm ³	0.95	0.93	0.91	1.78	1.36	1.55	1.04
2. Water absorption	ISO62	%	0.01	0.01	0.01	≥ 0.4	0.2	0.2	0.4
3. Chemical resistance		-	DIN8075	DIN8075	-	-	DIN8061	DIN8061	-
4. Max. permissible service temperature	Upper	°C	90	90	100	150	60	85	70
	Lower	°C	-50	-150	5	-30	-15	-15	-50
Mechanical Properties									
1. Tensile strength at yield (σ _S)	ISO527	Mpa	27	17	30	50	55	57	45
2. Elongation at yield (ε _S)	ISO527	%	9	≥ 20	10	9	3	3	-
3. Tensile strength at break (σ _R)	ISO527	Mpa	35	40	-	46	30	80	-
4. Elongation at break (ε _R)	ISO527	%	≥ 700	≥ 50	≥ 50	≥ 50	≥ 50	15	-
5. Impact strength (a _n)	ISO179	kJ/m ²	No break	No break	No break	252	No break	No break	333
6. Notch impact strength (a _k)	ISO179	kJ/m ²	29	No break	50	22	3	8	37
7. Ball indentation hardn (H _k)/Rockwell	ISO2039	Mpa	-	35	67	80	120	150	R105
8. Shore-D	DIN53505	-	64	61	70	78	82	90	70
9. Flexural strength (σ _B 3,5%)	ISO178	Mpa	22	27	-	80	90	90	67
10. Modulus of elasticity (E _t)	ISO527	Mpa	1150	680	1200	2000	3000	2500	2260
Thermal Properties									
1. Vicat softening temp. VST/B/50	ISO306	°C	80	80	91	140	75	105	103
		°C	129	-	-	160	-	-	-
2. Heat deflection temperature HDT/B	ISO75	°C	69	65	96	145	72	102	100
		°C	-	42	-	104	-	-	88
3. Coef. of linear therm. expansion (α)	DIN53752	K ⁻¹ x 10 ⁻⁴	1.5	2	-	1.2	0.8	0.6	-
4. Thermal conductivity at 20 °C (λ)	DIN52612	W/(mxK)	0.42	0.42	-	0.13	0.14	0.14	-
Electrical Properties									
1. Volume resistivity (ρ _D)	VDE0303	Ω x cm	≥ 10 ¹⁵	≥ 10 ¹⁴	≥ 10 ¹⁶	≥ 10 ¹³	≥ 10 ¹⁵	≥ 10 ¹⁵	-
2. Surface resistivity (R _o)	VDE0303	Ω	≥ 10 ¹⁶	≥ 10 ¹²	-	≥ 10 ¹⁴	≥ 10 ¹³	≥ 10 ¹³	-
3. Dielectric constant at 1 MHz (ε _r)	DIN53483		2.35	3	2.3	7.25	3	3	-
4. Diel. loss factor at 1 MHz (tanδ)	DIN53483		0.0003	0.0001	0.0002	0.18	0.01	0.01	-
5. Dielectric strength	VDE0303	kV/mm	17	45	-	22	20-40	20-40	-
6. Tracking resistance	IEC60112	V	-	KB ≥ 600	-	CTI300	KB600	KB600	-
Additional Data									
1. Bondability			+	-	+	O ²⁾	+	+	+
2. Physiological indifference according ³⁾	EEC90/128		+	+	+	-	+	-	-
	FDA		+	+	+	+	+	-	-
3. Friction coefficient	DIN53375		0.3	0.25		0.34	0.6	0.6	
4. Flammability	UL94		HB	HB	HB	V-0	V-0	V-0	HB
5. UV stabilisation ⁴⁾			0	-	0	+	0	-	-
Chemical Properties									
1. Acid resistance			+	+	+	+	+	+	+
2. Hydroxid resistance (dilute)			+	+	+	+	+	+	-
3. Hydrocarbonat resistance			+	+	+	+	+	+	0
4. CKW resistance			-	-	0	+	-	-	-
5. Aromatic resistance			0	0	-	+	0	0	-
6. Ketone resistance			+	+	+	0	-	-	-
7. Resistance against hot water			0	0	+	+	-	0	0

+ Yes; 0 Limited; - No

Note:

1. Above information is from generally available sources and does not include any binding legal guarantee of certain properties. Users should determine their own values and ascertain applications with independent judgement.
2. Pretreatment necessary.
3. Physiological indifferences are valid for nature coloured materials.
4. Valid for natural coloured materials. An additional UV protection can be provided by special pigments e.g. carbon black.



Technical details and applications

Polypropylene

Polypropylene (PP) is a thermoplastic from the polyolefin group. It is a semi-rigid, translucent polymer with good toughness and weather resistance properties, low water absorption and is easily moulded to desired shapes. PP is a largely non-polar, partially crystalline thermoplastic with a crystallinity of 60 to 70% and a density of 0.90 to 0.91 g/cm³ which is amongst the lowest for all plastics. It is generally available in three advanced forms:

- **PP-Homopolymer (PP-H):** Produced by a continuous chain of polypropylene units which results in a high stiffness material. Advanced homopolymer types like beta nucleated PP, are used to make piping systems and sheets.
- **PP-Copolymer (PP-C):** Produced by adding 4-15% ethylene to the polypropylene gives much improved impact strength and considerably lowers the brittle point to below normal service temperatures i.e. -15°C to -20°C.
- **PP Random Copolymer (PP-R):** Random copolymer polypropylene is a clear, semi-crystalline polymer which exhibits high stiffness, better impact strength and good electrical insulation properties.

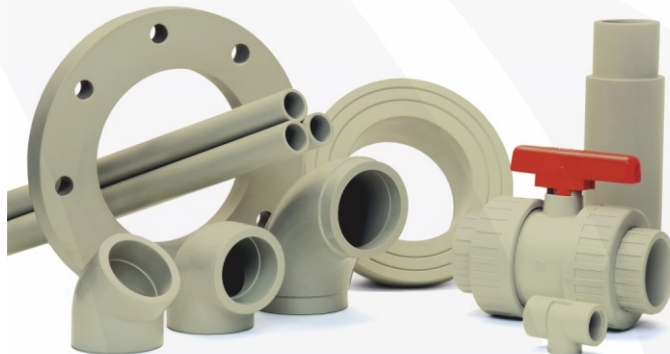
Other options in PP include fire retardant and electro-conductive grades. PP can also be UV stabilized.

Technical information

			PP-C	PP-H	PP-R	PP2222
Specific gravity (p)	ISO 1183	g/cm ³	0.91	0.9	0.909	0.912
Max. permissible service temp		°C	0 to 75	5 to 100	5 to 100	5 to 100
Tensile strength at yield (σ _S)	ISO 527	Mpa	26	31	26.1	26
Elongation at break (ε _R)	ISO 527	%	-	≥ 400	≥ 400	≥ 400
Impact strength (a _n)	ISO 179	kJ/m ²	No Break	No Break	No Break	No Break
Modulus of elasticity (E _t)	ISO 527	Mpa	1200	1400	1200	1200
Coef. of linear therm. expansion (α)	DIN 53752	K ⁻¹ x 10 ⁻⁴	1.5	1.5	1.5	1.5
Vicat Softening Temp	ISO306	°C	148	150	131.3	148
Shore Hardness	ISO 868	Shore D	67	70	60	67

Features & advantages

- Excellent Chemical Resistance: Increases reliability and scope of use
- High Thermal Resistance: Less vulnerable to weathering
- High Stress Crack Resistance: Prevents inching growth of cracks
- Excellent Fusion Capabilities: Ease of installation
- Low density, Low weight: Ease of transportation
- Homogenous structure: Aesthetically superior.
- Good elasticity: Easy installation
- Non Toxic, Food Grade
- High Impact Strength: Better durability
- Smooth Inner surface: Low frictional loss
- Good Thermal insulation
- Very good fatigue resistance
- Excellent dielectric properties



PP products available at Sangir:

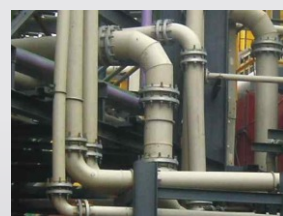
- ✓ Pipes
- ✓ Fittings
- ✓ Sheets
- ✓ Weld & solid rods
- ✓ Profiles

Applications of Polypropylene



Applications

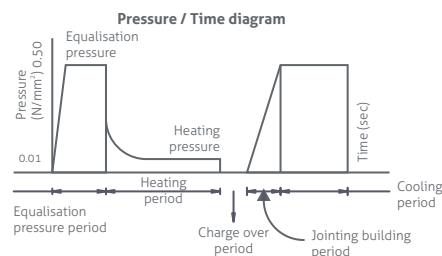
- Acid Fillings Stations
- Laboratories
- Automotive Industry
- Nuclear Research Centres
- Chemical Industry
- Paper & Pulp Mills
- Construction (Plumbing)
- Pharmaceutical Industry
- Desalination Plants
- Pickling Lines
- Effluent Treatment / Disposal Plants
- Refineries
- Electroplating Plants
- Textile Mills; Food & Beverage
- Thermal Baths
- Galvanizing Plants
- Water Purification Plants
- Industrial washing / bleaching lines
- Packaging of Electrical Components
- Suction & exhaust pipelines
- Lined Pipings (Mild Steel + PP), (FRP + PP)
- Water, effluent transport
- Storage tank for chemicals
- Hoods, Fume Ducts



Joining techniques for pipes



Butt Welding: In butt fusion the pipe ends to be joined are brought together in a dedicated butt fusion machine. The end faces are squared up by planing with a mechanical trimmer, then heated with thermostatically controlled non-stick heater plate. When molten, the faces are pushed together and allowed to cool. The butt fusion process generates weld beads both inside and outside the pipe. These can be removed easily to produce a smooth bore or outer surface. Inspection of beads is also a useful quality check on the weld.



The welding cycle is divided in 5+1 different phases:
 Phase 1: Bead formation t_1 (bead formation)
 Phase 2: Heating up t_1 (Continual heating)
 Phase 3: Change over t_3 (Change over)
 Phase 4: Bringing up pressure t_4
 Phase 5: Cooling down under pressure t_5
 Phase 6: Cooling down out of the machine t_6
 p_2 = Pressure during continual heating
 p_1 = Pressure during bead formation and cooling down

Values of butt fusion jointing process.

Pipe wall thickness (mm)	Heating element temp °C	Equalisation at $P = 0.1 \text{ N/mm}^2$ Height of bead (mm)	Heating time (s) at $P = 0.01 \text{ N/mm}^2$ for various materials			Change over time (s)	Time (s) to reach full jointing pressure	Cooling time (s) under jointing pressure $P = 0.15 \text{ N/mm}^2$
			PP	HDPE	PVDF			
2-3.7	215	0.5	-	30-40	40-70	4	3-6	4-5
4.3-6.9	210	0.5	65 - 115	40-70	70-40	5	5-8	6-10
7.1-11.4	205	1	115 - 180	70-120	90-120	6	8-10	10-20
12.2-18.2	200	1	180 - 290	120-170	120-150	8	10-15	20-30
20.1-25.5	195	1.5	290 - 330	170-210	-	10	15-20	25-38

Socket Welding: Used mainly to fabricate PP and PVDF piping systems and involves the use of a socket type fitting.



The welding cycle consists of a heating phase and a cooling phase. A socket mounted on a hot plate is used to heat the outside surface of the pipe being welded. On the opposite side of the hot plate, a spigot is used to heat the inside surface of the injection moulded fitting. Both the fitting and pipe are heated for a set 'heating time'. When the heating time is complete, the heated pipe and fitting are removed from the socket and spigot, and the pipe is pushed inside the fitting, producing the weld. Depending on the pipe size, this process is carried out by hand (<50mm OD) or on a mechanical / hydraulic machine (>63mm OD).

Pipe OD	Pipe insertion depth (into fitting)	PP			PVDF		
		Min. Wall (mm)	Heating time (secs)	Cooling time (secs)	Min. Wall (mm)	Heating time (secs)	Cooling time (secs)
16	13	2	5	2	1.5	4	2
20	13	2.5	5	2	1.9	6	2
25	15	2.7	7	2	1.9	8	2
32	17	3	8	4	2.4	10	4
40	19	3.7	12	4	2.4	12	4
50	22	4.6	18	4	3	18	4
63	25	3.6	24	6	3	20	6
75	29	4.3	30	6	3.6	22	6
90	33	5.1	40	6	4.3	25	6
110	39	6.3	50	8	5.3	30	8

Flange Connections: Stub flanges / Pipe ends / collars as butt welded to each side of a length of pipe after inserting two slip-on metal flanges (one for each side). A continuous line can then be made by simply bolting the flanges together which are held securely in place. A leak proof joint is ensured by inserting an sealing gasket thus providing a demountable joint or to match up with pumps, valves etc. . Primarily used where the pipes need cleaning or relocation.



Electro-Fusion Welding: This process involves an electrically conducting implant being incorporated into the socket and / or fitting to be jointed to the pipe. A high electric current is applied via a power source causing resistive heating which melts and fuses materials.

Extrusion Welding: The process involves continuously extruding molten thermoplastic material into a weld preparation on the plastic component or structure which is being joined. A thermoplastic rod or granule feedstock is fed into the rear of the barrel of an extrusion gun and the material is heated. The ejected material is shaped to match the profile being welded. At the leading edge, hot gas is used to ensure sufficient heat in the substrate material to form the weld. Typical welding speeds are 0.5-1 m/min. Extrusion welding is generally used to weld custom fabrications with sheet, nozzles etc.



Other methods of welding include infrared, bead and crevice free, friction welding depending on the requirements of the application and ultimate use of the manufactured product.

Machining Guidelines

	Turning Peak Radius r to be min. 0.5 mm					Drilling Twisting Angle β to be ca. 12° bis 16°				
	α	γ	χ	v	s	α	γ	φ	v	s
PVC	8 - 10	0 - 5	50 - 60	200 - 750	0.3 - 0.5	5 - 10	3 - 5	60 - 100	30 - 120	0.1 - 0.5
PP / PE-HD	6 - 10	0 - 5	45 - 60	250 - 500	0.1 - 0.5	5 - 15	10 - 20	60 - 90	50 - 150	0.1 - 0.3
ABS	5 - 15	25 - 30	15	200 - 500	0.2 - 0.5	8 - 12	10 - 30	60 - 90	50 - 200	0.2 - 0.3
PMMA	5 - 10	0 - 4	15	200 - 300	0.1 - 0.2	3 - 8	0 - 4	60 - 90	20 - 60	0.1 - 0.5
PC / PPE	5 - 12	6 - 8	45 - 60	200 - 350	0.1 - 0.5	8 - 10	10 - 20	90	50 - 100	0.1 - 0.3
PA	6 - 10	0 - 5	45 - 60	200 - 500	0.1 - 0.4	5 - 15	10 - 25	90	50 - 150	0.1 - 0.3
PVDF	5 - 12	5 - 15	10	150 - 500	0.1 - 0.3	10 - 16	5 - 20	110 - 130	150 - 300	0.1 - 0.3

	Milling Allow feed up to 0.5 mm/tooth			Belt saw				Circular saw			
	α	γ	χ	α	γ	v	t	α	γ	v	t
PVC	5 - 10	0 - 15	300 - 1000	30 - 40	0 - 5	1200	3	5 - 10	0 - 5	3000 - 4000	3 - 5
PP / PE-HD	10 - 20	5 - 15	250 - 500	20 - 30	2 - 5	500	3 - 8	20 - 30	6 - 10	2000	3 - 8
ABS	5 - 10	0 - 10	300 - 500	15 - 30	0 - 5	300	2 - 8	5 - 10	0 - 5	1000	2 - 5
PMMA	2 - 10	2 - 10	2000	30 - 40	0 - 5	1200	3	5 - 10	0 - 5	1500 - 2000	3 - 5
PC / PPE	5 - 20	5 - 15	250 - 350	15 - 30	5 - 8	300 - 500	2 - 8	15 - 30	5 - 8	1800 - 2500	2 - 8
PA	10 - 20	5 - 15	250 - 500	15 - 30	0 - 5	300 - 500	2 - 8	15 - 30	0 - 8	1800 - 2500	2 - 8
PVDF	5 - 15	5 - 15	250 - 500	15 - 40	5 - 8	300 - 500	2 - 5	5 - 10	0 - 10	1000 - 2500	2 - 5

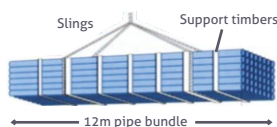
α Setting Angle ° γ Rake Angle ° χ Recessing Angle ° v Cutting Speed m/mN s Feed mm/U φ Peel Angle ° t Tooth Pitch mm

■ Due to the danger of stress cracking we do not recommend oil based cooling agents (or to clean the parts well after machining). Amorphous materials should be annealed during machining.

■ To avoid treatment problems we recommend a heating up of the materials on approx. 120 °C. Use only sharpened tools with small feed.

■ With these materials we should pay attention to a good exhaust of the machining area.

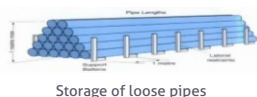
Storage & transportation



General Handling: Plastic is a resilient material, lightweight and easy to handle. Still, care should be taken not to cause scuffing or gouging of the surface of plastic products.

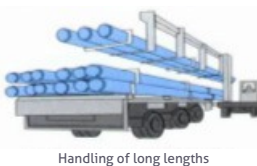
bundles be by crane; do not use chains, hooks or hawsers. For lengths greater than six metres, load-spreading beams should be inserted at equal distances apart.

Loading, off-loading lengths and bundles: A flat-bed vehicle, free from sharp objects, projections should be used for transportation of pipe systems. Wideband slings should be used to lift pipe



Storage: Badly stacked pallets, coils or bundles may slip or collapse, causing injury to personnel or damage to the pipe. Pipe-end caps, intended to prevent ingress of contamination, should be kept in place during storage.

- Pipes can be stored telescopically by storing lower dimension pipes inside pipes
- Storage heights should not exceed 1m where pipes are being piled together. Pipes may be stored in wooden / metal racks with proper insulation to avoid damage to pipe surface
- Unless the pipes have been stabilized for UV - pipes should not be stored under the sun to avoid damage due to radiation. UV- non-stabilized Sangir PP Homo and PP-FR in natural and grey colour should therefore be stored inside covered warehouses
- Fittings may be stored in separate pigeon hole drums to avoid mixing and exposure to dust / sunlight
- Impact and Bending stresses should be avoided for extremely low temperature situations



Lengths

Pipe lengths stored individually should be stacked in a pyramid not more than one metre high, with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens at one-metre centres. On site, pipes may be laid out individually in strings. (Where appropriate, protective barriers should be placed with adequate warning.)

Sheets: Plastics sheets are best stored on edge in "A" frame storage racks. These racks give full support to the sheets yet permit easy removal of individual sheets from any rack. If sheets must be stored flat, care should be taken to avoid trapping chips and dirt between the sheets which may scratch or press into the surface of the material. Piles of plastics sheet should ideally not be over 18" high.

Rigid sheets should be laid flat on pallets. Sheets in roll form should be stacked on one end. Never use hooks to lift sheets. Use of fork lifts with wide fork attachments is recommended.

Fittings: Never use hooks to lift fittings. Ensure the tines on forklift trucks are adequately covered (eg. by scrap PE pipe offcuts).

Transportation

- Pipes may travel telescopically however they should be properly aligned parallel to each other
- Care should be taken in extremely cold temperatures to avoid unnecessary bends or stresses during loading
- Material may be loaded into vehicles that have proper covering from sunlight and can hold the pipes compactly to avoid unnecessary friction and damage during transport

product range & specifications

Technical information

Technical data sheet

Technical data sheet				Specialty Advanced PP		
Typical Properties		Method	Value Unit	Block Co-Poly	Homo	Beta Nucleated
Physical						
Density		ISO 1183	g/cm³	0.912	0.9	0.905
Melt flow rate (MFR)	(230°C/2.16 kg)	ISO 1133	g/10m	0.3	0.3	0.3
	(230°C/5 kg)		g/10in	1.3	1.3	-
Mechanical						
Tensile Modulus (23°C, v = 1 mm/min, Secant)			MPa	1150	1300	1300
Tensile Stress at Yield (23°C, v = 50 mm/min)		ISO 527-1, 2	MPa	26	30	30
Tensile Strain at Yield (23°C, v = 50 mm/min)		ISO 527-1, 2	%	11	9	10
Tensile Creep Modulus 1h		ISO 527-1, 2	MPa	1050	1250	-
Impact						
Charpy unnotched impact strength	(0°C)	ISO 179	kJ/m²	8.0	200	-
	(23°C)		kJ/m²	40	26	-
Charpy notched impact strength	(0°C)	ISO 179	kJ/m²	NoBreak	2.8	-
	(23°C)		kJ/m²	NoBreak	2.2	50
Shore hardness (Shore D (3 sec))		ISO 868	MPa	67	70	-
Ball indentation hardness (H 132/30, 358/30)		ISO 2039-1	MPa	54	67	-
Thermal						
Heat deflection temperature Unannealed	B (0.45 MPa)	ISO 75B-1, 2	°C	73	90	
	A (1.80 MPa)	ISO 75A-1, 2	°C	50	54	
Vicat softening temperature	(VST/A/50 K/h (10N))	ISO 306	°C	72	150	
	(VST/B/50 K/h (50 N))		°C	165	90	83
Melting Temperature		ISO3146	°C	48	165	

The above are typical values taken from raw material manufacturers of existing grades. These may be subject to change depending on availability of these grades and newer updated technology. Actual values may therefore differ.

Support Distances L for PPH pipes of PN10 rating

OD	20°C	30°C	40°C	50°C	60°C	70°C	80°C
20	70	67	65	62	60	57	55
25	80	77	75	72	70	67	65
32	95	92	90	87	85	80	75
40	110	107	105	100	95	92	87
50	125	122	120	115	110	105	100
63	165	160	155	150	145	140	135
75	155	150	145	140	135	130	125
90	145	142	140	135	130	125	120
110	185	180	175	170	160	150	140
125	200	195	190	180	170	160	150
140	210	205	200	190	180	170	160
160	225	220	210	200	190	180	170
200	250	240	230	220	210	200	190
225	265	255	245	235	225	215	200
250	280	270	260	250	240	230	215
280	295	285	275	265	255	245	230
315	315	305	295	285	270	260	245
355	355	325	315	300	285	275	260
400	355	345	335	320	305	290	275

For other pressure ratings support distances may be changed as follows:

PN2.5	-25%
PN6 / 6.3	-9%
PN16	+7%

For Gases with density <0.01 g/cm³ support distances will be increased by:

PN 6	47%
PN10	30%
PN16	21%

Fluids of higher density, between 1 g/cm³ to 1.25 g/cm³, reduced by 4%.

Permissible Operating Temperatures

Pipe Series - S		20	16	12.5	8.3	8	5	4	3.2	2.5	2
Pressure Rating - PN		3	3.2	4	6	6.3	10	12.5	16	20	25
Std. Dimension Ratio:		41	33	26	17.6	17	11	9	7.4	6	5
Temp. (°C)	DR Operation period (yrs)	Permissible component operating pressure (bar) ^{1,2}									
10	1	4.5	5.7	7.1	10.8	11.4	18	22.7	28.6	36	45.3
	5	4.1	5.2	6.5	9.9	10.4	16.5	20.8	26.2	33	41.6
	10	4	5	6.3	9.6	10	15.9	20.1	25.3	31.8	40.1
	25	3.8	4.8	6	9.1	9.5	15.2	19.1	24.1	30.3	38.1
	50	3.6	4.6	5.8	8.8	9.2	14.6	18.4	23.2	29.2	36.8
	100	3.5	4.4	5.6	8.4	8.9	14.1	17.7	22.3	28.1	35.4
20	1	3.9	4.9	6.2	9.3	9.8	15.6	19.6	24.7	31.1	39.2
	5	3.5	4.5	5.6	8.5	8.9	14.2	17.9	22.5	28.4	35.7
	10	3.4	4.3	5.4	8.2	8.6	13.6	17.2	21.6	27.3	34.3
	25	3.2	4.1	5.1	7.8	8.1	12.9	16.3	20.5	25.9	32.6
	50	3.1	3.9	4.9	7.5	7.8	12.4	16.7	19.7	24.9	31.3
	100	3	3.7	4.7	7.2	7.5	12	16.1	19	23.9	30.1
30	1	3.3	4.2	5.3	8	8.4	13.3	16.8	21.1	26.6	33.5
	5	3	3.8	4.8	7.2	7.6	12.1	15.2	19.2	24.1	30.4
	10	2.9	3.6	4.6	6.9	7.3	11.6	14.6	18.4	23.1	29.1
	25	2.7	3.4	4.3	6.6	6.9	10.9	13.8	17.4	21.9	27.5
	50	2.6	3.3	4.1	6.3	6.6	10.5	13.2	16.6	21	26.4
	100	2.5	3.1	4	6	6.3	10	12.7	16.0	20.1	25.3
40	1	3.2	4	5.1	7.7	8.1	12.9	16.3	20.5	25.8	32.5
	5	2.9	3.6	4.6	7	7.3	11.6	14.6	18.4	23.2	29.3
	10	2.8	3.5	4.4	6.7	7	11.1	14	17.6	22.2	28
	25	2.6	3.3	4.1	6.3	6.6	10.5	13.2	16.6	20.9	26.4
	50	2.5	3.1	4	6	6.3	10	12.6	15.9	20	25.2
	100	2.4	3	3.8	5.7	6	9.6	12	15.2	19.1	24.1
50	1	2.7	3.4	4.3	6.5	6.8	10.8	13.6	17.2	21.6	27.2
	5	2.4	3	3.8	5.8	6.1	9.7	12.2	15.4	19.3	24.4
	10	2.3	2.9	3.6	5.5	5.8	9.2	11.6	14.6	18.4	23.2
	25	2.1	2.7	3.4	5.2	5.4	8.6	10.9	13.7	17.3	21.8
	50	2	2.6	3.3	4.9	5.2	8.2	10.4	13.1	16.5	20.8
	100	1.9	2.4	3.1	4.7	4.9	7.9	9.9	12.5	15.7	19.8
60	1	2.5	3.1	4	6	6.3	10	12.6	15.9	20.1	25.3
	5	2.2	2.8	3.5	5.3	5.6	8.9	11.2	14.1	17.8	22.5
	10	2.1	2.6	3.3	5.1	5.3	8.5	10.7	13.4	16.9	21.3
	25	1.9	2.5	3.1	4.7	5	7.9	10	12.6	15.8	19.9
	50	1.8	2.3	2.9	4.4	4.6	7.4	9.3	11.7	14.8	18.6
	100	1.7	2.2	2.8	4.3	4.5	7.2	9.1	11.5	14.5	18.2
70	1	2	2.6	3.2	4.9	5.2	8.2	10.3	13	16.4	20.7
	5	1.8	2.2	2.8	4.3	4.5	7.2	9.1	11.5	14.5	18.2
	10	1.7	2.1	2.7	4.1	4.3	6.8	8.6	10.9	13.7	17.2
	25	1.4	1.7	2.2	3.4	3.5	5.6	7.1	9	11.3	14.2
	50	1.2	1.5	1.9	2.8	3	4.8	6	7.6	9.5	12
	100	1.1	1.4	1.8	2.7	2.9	4.6	5.8	7.3	9.2	11.6
80	1	1.6	2.1	2.6	4	4.1	6.6	8.3	10.5	13.2	16.7
	5	1.3	1.7	2.2	3.3	3.5	5.5	7	8.8	11.1	13.9
	10	1.1	1.4	1.8	2.8	2.9	4.7	5.9	7.4	9.3	11.8
	25	0.9	1.1	1.4	2.2	2.3	3.7	4.7	5.9	7.5	9.4
	50	0.7	0.9	1.2	1.8	1.9	3.1	3.9	4.9	6.2	7.8
	100	0.6	0.8	1	1.5	1.6	2.6	3.3	4.1	5.2	6.6

1 The above values are adapted from DIN 8077. They have to be adjusted by a reducing co-efficient for every application depending on media temperature, concentration and composition. Also, UV radiation is not assumed in these values. Values are determined using a creep curve with safety coefficient of 1.6 to 1.25

2 Values stated are for standard PP-Homopolymer. However specialty grades of PP may have better features

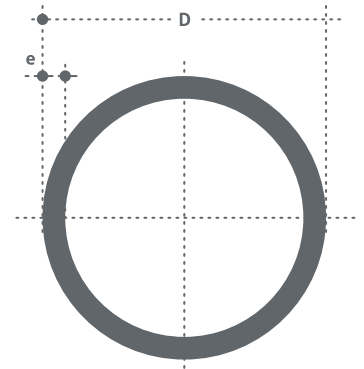
3 Values in brackets are valid at proof of longer testing periods >1 year for 110°C tests

PP Pipes

PP / PPH pipes as per DIN 8077 / 78

Outer Diameter		SDR 41	SDR 26	SDR 17.6	SDR 11	SDR 7.4	SDR 6
		Pressure Rating					
		PN 2.5	PN 4	PN 6	PN 10	PN 16	PN 20
mm	inches	e	e	e	e	e	e
16	-	-	-	-	-	2.2	2.7
20	1/2	-	-	-	1.9	2.8	3.4
25	3/4	-	-	-	2.3	3.5	4.2
32	1	-	-	1.8	2.9	4.4	5.4
40	1.25	-	1.8	2.3	3.7	5.5	6.7
50	1.5	-	2	2.9	4.6	6.9	8.3
63	2	1.8	2.5	3.6	5.8	8.6	10.5
75	2.5	1.9	2.9	4.3	6.8	10.3	12.5
90	3	2.2	3.5	5.1	8.2	12.3	15
110	4	2.7	4.2	6.3	10	15.1	18.3
125	5	3.1	4.8	7.1	11.4	17.1	20.8
140	5	3.5	5.4	8	12.7	19.2	23.3
160	6	4	6.2	9.1	14.6	21.9	26.6
180	7	4.4	6.9	10.2	16.4	24.6	29
200	8	4.9	7.7	11.4	18.2	27.4	33.2
225	8	5.5	8.6	12.8	20.5	30.8	37.4
250	10	6.2	9.6	14.2	22.7	34.2	-
280	10	6.9	10.7	15.9	25.4	38.3	-
315	12	7.7	12.1	17.9	28.6	-	-
355	14	8.7	13.6	20.1	32.2	-	-
400	16	9.8	15.3	22.7	36.3	-	-
450	18	11	17.2	25.5	40.9	-	-
500	20	12.3	19.1	28.4	-	-	-
560	22	13.7	21.4	31.7	-	-	-
630	24	15.4	24.1	35.7	-	-	-

Wall thickness Chart



Regular Pipes (Plain End)

Please note:

- All dimensions in mm
- SDR Rating / Pipe Specs Standard to be specified
- Please refer pipe wall thickness chart for thickness
- Standard Length: 6 mtrs
- Also available: Pipes in special lengths, Ventilation pipes; SDR 33 / 17 / 9 / 5 thickness; Pipes per ASTM Sch 40 / 80; Flanged Pipes

Liner Pipes

For use with MS / SS lined Piping

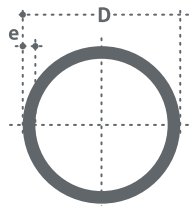


Outer Diameter		
mm	inches	e
29.2	1"	4
44.7	1.5"	4.1
56	2"	4.5
81.9	3"	4.5
107.1	4"	5.3
164.2	6"	5.7
206	8"	6.2

Other non-standard sizes available on request.



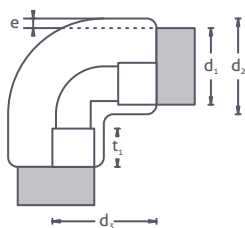
PP fittings


Please note:

- All dimensions in mm
- SDR Rating / Pipe Specs Standard to be specified
- Dimensions may change without prior notice
- Please refer pipe wall thickness chart for thickness
- Fittings as per DIN 16962

Moulded Elbows 90°

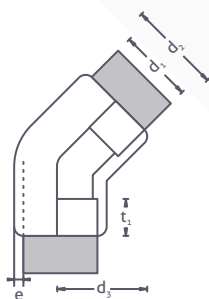
Weld Type: Socket



Code	Size	d ₂	d ₁	d ₃	t ₁	e
PPEL90020S	20	27.5	19.5	25.5	14.5	4
PPEL90025S	25	33.5	24.5	29.5	16	4.5
PPEL90032S	32	41.3	31.5	35	18	4.9
PPEL90040S	40	50.6	39.45	41.5	20.5	5.6
PPEL90050S	50	63.7	49.45	49.5	23.5	7.1
PPEL90063S	63	79	62.5	60	27.5	8.3
PPEL90075S	75	91.5	74.9	69.5	31	8.3
PPEL90090S	90	111.5	89.9	79	33	10.8
PPEL90110S	110	134.5	110	97.5	37	12.3

Moulded Elbows 45°

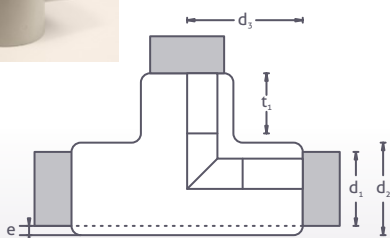
Weld Type: Socket



Code	Size	d ₂	d ₁	d ₃	t ₁	e
PPEL45020S	20	27.5	19.5	19.5	14.5	4
PPEL45025S	25	32.5	24.5	22	16	4
PPEL45032S	32	40.7	31.5	25.5	18	4.6
PPEL45040S	40	50.5	39.45	30	20.5	5.5
PPEL45050S	50	63.5	49.5	35	23.5	7.0
PPEL45063S	63	76	62.5	41.5	27.5	6.8
PPEL45075S	75	91.3	74.9	46.5	31	8.2
PPEL45090S	90	111.5	89.9	52.5	33	10.8

Moulded Tees Equal

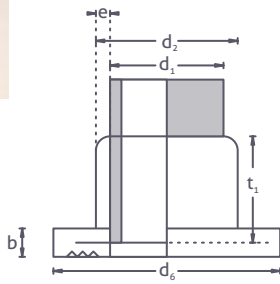
Weld Type: Socket



Code	Size	d ₂	d ₁	d ₃	t ₁	e
PPTEEQ020S	20	27.5	19.5	25.5	14.5	4
PPTEEQ025S	25	33.5	24.5	29.5	16	4.5
PPTEEQ032S	32	41.3	31.5	35	18	4.9
PPTEEQ040S	40	50.6	39.5	41.5	20.5	5.6
PPTEEQ050S	50	63.7	49.5	49.5	23.5	7.1
PPTEEQ063S	63	79	62.5	60	27.5	8.3
PPTEEQ075S	75	91.5	74.9	69.5	31	8.3
PPTEEQ090S	90	111.5	89.9	79	33	10.8
PPTEEQ110S	110	134.5	110	97.5	37	12.3

Stubend Flange Adaptor

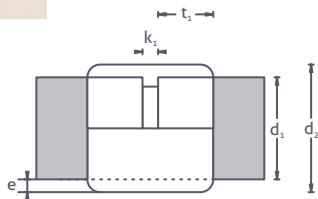
Weld Type: Socket



Code	Size	d ₂	d ₁	t ₁	b	d ₆	e
PPSE020S	20	27	19.5	14.5	7	45	3.8
PPSE025S	25	33	24.5	16	9	58	4.3
PPSE032S	32	41	31.5	18	10	68	4.8
PPSE040S	40	50	39.4	20.5	11	78	5.3
PPSE050S	50	61	49.4	23.5	12	88	5.8
PPSE063S	63	76	62.5	27.5	14	102	6.8
PPSE075S	75	90	74.9	31	16	122	7.6
PPSE090S	90	108	89.9	33	17	138	10.1
PPSE110S	110	131	110	37	18	158	10.6

Socket

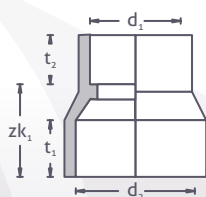
Weld Type: Socket



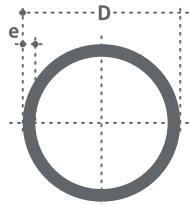
Code	Size	d ₂	d ₁	t ₁	k ₁	e
PPSO020S	20	25	19.5	14.5	3	2.8
PPSO025S	25	32	24.5	16	3	3.8
PPSO032S	32	40	31.5	18	3	4.3
PPSO040S	40	50	39.5	20.5	3	5.3
PPSO050S	50	63	49.5	23.5	3	6.8
PPSO063S	63	75	62.5	27.5	3	6.3
PPSO075S	75	90	74.9	31	4	7.6
PPSO090S	90	110	89.9	33	5	10.1
PPSO110S	110	131	110	37	5	10.5

Reducers

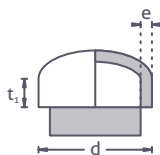
Weld Type: Socket



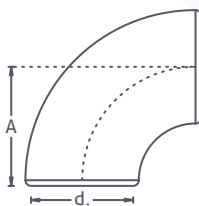
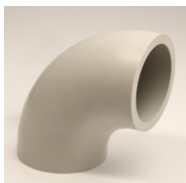
Code	d ₂	d ₁	t ₁	t ₂	zk ₁
PPRE25X20S	25	19.5	14.5	12.5	18.5
PPRE32X20S	32	19.5	14.5	14.6	22.5
PPRE32X25S	32	24.5	16	14.6	22.5
PPRE40X32S	40	31.5	14.5	17	27
PPRE50X25S	50	24.5	16	20	32.5
PPRE50X32S	50	31.5	18.1	20	32.5
PPRE50X40S	50	39.5	20.5	20	32.5
PPRE63X25S	63	24.5	16	24	39.5
PPRE63X32S	63	31.5	18.1	24	39.5
PPRE63X50S	63	49.5	23.5	24	39.5
PPRE75X63S	75	62.5	27.4	25	43.5
PPRE90X63S	90	62.5	27.4	28	50.5
PPRE90X75S	90	74.9	30	28	50.5
PPRE110X90S	110	89.9	33	32	59.5

**Please note:**

- All dimensions in mm
- SDR Rating / Pipe Specs Standard to be specified
- Dimensions may change without prior notice
- Please refer pipe wall thickness chart for thickness
- Fittings as per DIN 16962

Moulded End Caps**Weld Type: Socket**

Code	Size	d	t ₁	e
PPEC020S	20	19.5	14.5	3.8
PPEC025S	25	24.5	16	4.3
PPEC032S	32	31.5	18	4.8
PPEC040S	40	39.5	20.5	5.3
PPEC050S	50	49.5	23.5	5.8
PPEC063S	63	62.5	27.5	6.8
PPEC075S	75	74.9	31	7.6
PPEC090S	90	89.9	33	10.1
PPEC110S	110	110	37	10.6

Moulded Bends 90°**Weld Type: Butt**

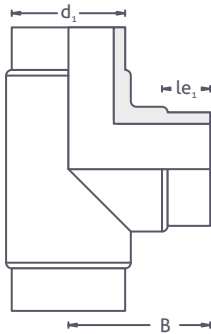
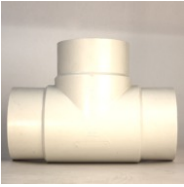
Code	d ₁	A
PPBE020	20	19
PPBE025	25	23
PPBE032	32	30
PPBE040	40	38
PPBE050	50	48
PPBE063	63	61
PPBE075	75	72
PPBE090	90	87
PPBE110	110	107
PPBE125	125	122
PPBE140	140	137
PPBE160	160	157
PPBE180	180	176
PPBE200	200	196
PPBE225	225	220

Moulded End Caps**Weld Type: Butt**

Code	d ₁	A	l
PPEC020	20	45	35
PPEC025	25	52	40
PPEC032	32	58	44
PPEC040	40	67	50
PPEC050	50	75	55
PPEC063	63	85	62
PPEC075	75	95	63
PPEC090	90	110	79
PPEC110	110	127	88
PPEC125	125	138	102
PPEC140	140	144	106
PPEC160	160	154	109
PPEC180	180	191	141

Moulded Tees Equal

Weld Type: Butt

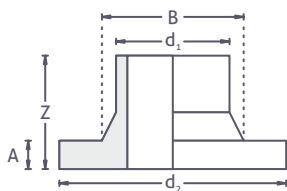
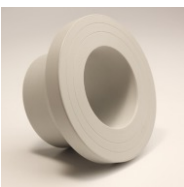


Code	d	B	le ₁
PPTE020	20	20	5
PPTE025	25	25	6
PPTE032	32	32	8
PPTE040	40	40	10
PPTE050	50	50	12
PPTE063	63	63	16
PPTE075	75	75	19
PPTE090	90	90	22
PPTE110	110	110	28
PPTE160	160	145	40
PPTE180	180	155	45
PPTE200	200	170	50
PPTE225	225	220	55

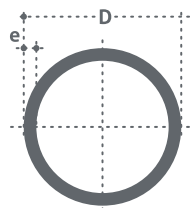
Unequal tees also available

Stub Flange / Adaptor

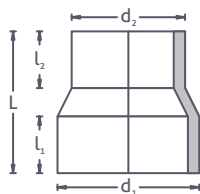
Weld Type: Butt



Code	d ₁	B	d ₂	Z	A	
					SDR17	SDR11
PPSE020	20	26	51	50	-	7
PPSE025	25	30	58	50	-	9
PPSE032	32	38	64	50	-	10
PPSE040	40	44	70	50	-	11
PPSE050	50	54	81	50	-	12
PPSE063	63	68	95	50	-	14
PPSE075	75	78	107	50	-	16
PPSE090	90	96	126	80	-	17
PPSE110	110	116	158	80	18	18
PPSE125	125	132	158	80	18	25
PPSE140	140	155	188	80	18	25
PPSE160	160	165	212	80	18	25
PPSE180	180	180	212	80	20	30
PPSE220	220	232	268	100	24	32
PPSE225	225	235	268	100	24	32
PPSE250	250	285	320	100	25	35
PPSE280	280	291	320	100	25	35
PPSE315	315	335	370	100	46	60
PPSE355	355	373	430	120	25	35
PPSE400	400	427	482	120	46	60
PPSE450	450	514	585	120	30	40
PPSE500	500	530	585	120	50	60
PPSE560	560	615	685	120	33	46
PPSE630	630	642	685	120	50	60

**Please note:**

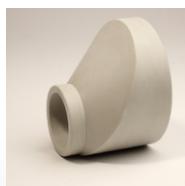
- All dimensions in mm
- SDR Rating / Pipe Specs Standard to be specified
- Dimensions may change without prior notice
- Please refer pipe wall thickness chart for thickness
- Fittings as per DIN 16962

Concentric Reducers**Weld Type: Butt**

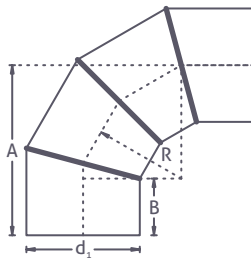
Code	d1	d2	Z	l1	l2
PPCR025020	25	20	50	23	25
PPCR032020	32	20	50	22	22
PPCR032025	32	25	50	21	21
PPCR040020	40	20	50	21	21
PPCR040025	40	25	50	21	22
PPCR040032	40	32	50	21	24
PPCR050025	50	25	50	20	20
PPCR050032	50	32	50	20	21
PPCR050040	50	40	50	20	24
PPCR063032	63	32	60	25	22
PPCR063040	63	40	60	25	24
PPCR063050	63	50	60	25	27
PPCR075032	75	32	70	30	25
PPCR075040	75	40	70	30	25
PPCR075050	75	50	70	30	28
PPCR075063	75	63	70	30	33
PPCR090050	90	50	80	35	28
PPCR090063	90	63	80	35	32
PPCR090075	90	75	80	35	36
PPCR110050	110	50	90	35	34
PPCR110063	110	63	90	35	35
PPCR110075	110	75	90	35	38
PPCR110090	110	90	90	35	43
PPCR125063	125	63	100	40	38
PPCR125075	125	75	100	40	39
PPCR125090	125	90	100	40	43
PPCR125110	125	110	100	40	51
PPCR140075	140	75	110	50	37
PPCR140090	140	90	110	50	39
PPCR140110	140	110	110	50	45
PPCR140125	140	125	110	50	51
PPCR160090	160	90	120	55	40
PPCR160110	160	110	120	55	44
PPCR160125	160	125	120	55	48
PPCR160140	160	140	120	55	53
PPCR180090	180	90	130	60	44
PPCR180110	180	110	130	60	45
PPCR180125	180	125	130	60	47
PPCR180140	180	140	130	60	50
PPCR180160	180	160	130	60	58
PPCR200140	200	140	140	60	48
PPCR200160	200	160	140	60	54

Code	d1	d2	Z	l1	l2
PPCR200180	200	180	140	60	58
PPCR225140	225	140	160	70	58
PPCR225160	225	160	160	70	58
PPCR225180	225	180	160	70	60
PPCR225200	225	200	160	70	60
PPCR250160	250	160	180	75	63
PPCR250180	250	180	180	75	66
PPCR250200	250	200	180	75	72
PPCR250225	250	225	180	75	83
PPCR280180	280	180	200	85	70
PPCR280200	280	200	200	85	72
PPCR280225	280	225	200	85	80
PPCR280250	280	250	200	85	90
PPCR315200	315	200	230	95	85
PPCR315225	315	225	230	95	88
PPCR315250	315	250	230	95	95
PPCR315280	315	280	230	95	107
PPCR355225	355	225	140	57	40
PPCR355250	355	250	130	54	40
PPCR355280	355	280	120	53	40
PPCR355315	355	315	110	53	40
PPCR400225	400	225	160	64	40
PPCR400250	400	250	150	61	40
PPCR400280	400	280	140	60	40
PPCR400315	400	315	120	50	40
PPCR400355	400	355	110	51	40
PPCR450280	450	280	160	65	40
PPCR450315	450	315	140	55	40
PPCR450355	450	355	130	57	40
PPCR450400	450	400	120	60	40
PPCR500315	500	315	170	71	40
PPCR500355	500	355	150	62	40
PPCR500400	500	400	140	65	40
PPCR500450	500	450	120	60	40
PPCR560355	560	355	180	75	40
PPCR560400	560	400	160	68	40
PPCR560450	560	450	140	62	40
PPCR560500	560	500	130	67	40
PPCR630400	630	400	190	78	40
PPCR630450	630	450	170	72	40
PPCR630500	630	500	150	67	40
PPCR630560	630	560	130	64	40

SDR 7.4 / 9 / 13.6 / 17.6 also available

**Eccentric Reducers also available**

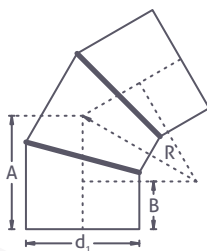
Fabricated bends - segment welded 90°. Weld Type: Butt



Code	d	B	r	A min	
				90°	
PPBEF110	110	150	165	315	
PPBEF125	125		188	338	
PPBEF140	140		210	360	
PPBEF160	160		240	390	
PPBEF180	180		270	420	
PPBEF200	200		300	450	
PPBEF225	225	250	338	488	
PPBEF250	250		375	625	
PPBEF280	280	300	420	670	
PPBEF315	315		473	773	
PPBEF355	355		533	833	
PPBEF400	400		600	900	
PPBEF450	450	350	675	975	
PPBEF500	500		750	1100	
PPBEF560	560		840	1190	
PPBEF630	630		945	1295	

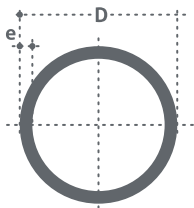
Reduction tee also available

Fabricated bends - segment welded 60°, 45°, 30°



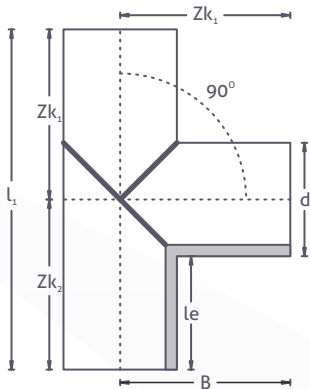
Code	d	B	r	A min		
				60°	45°	30°
PPBEF110	110	150	165	245	216	194
PPBEF125	125		188	258	228	200
PPBEF140	140		210	271	237	206
PPBEF160	160		240	288	249	214
PPBEF180	180		270	305	262	222
PPBEF200	200		300	323	274	230
PPBEF225	225	250	338	345	290	241
PPBEF250	250		375	466	412	350
PPBEF280	280	300	420	492	424	362
PPBEF315	315		473	576	498	428
PPBEF355	355		533	606	520	443
PPBEF400	400		600	646	548	461
PPBEF450	450	350	675	689	580	481
PPBEF500	500		750	783	665	551
PPBEF560	560		840	835	698	575
PPBEF630	630		945	896	741	603

Reduction Tee also available as per standards.



- Please note:**
- All dimensions in mm
 - SDR Rating / Pipe Specs Standard to be specified
 - Dimensions may change without prior notice
 - Please refer pipe wall thickness chart for thickness
 - Fittings as per DIN 16962

Fabricated tees equal /
branch 60°. Weld Type: Butt

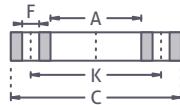
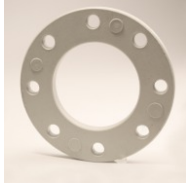


Code	d	le	Equal tee		60°Branch		
			Zk ₁	L ₁	Zk ₁	Zk ₂	L ₁
PPTEF110	110	150	205	410	325	175	500
PPTEF125	125	150	215	430	355	190	545
PPTEF140	140	150	220	440	375	205	581
PPTEF160	160	150	230	460	412	230	642
PPTEF180	180	150	240	480	450	250	700
PPTEF200	200	150	250	500	487	272	759
PPTEF225	225	150	265	530	530	300	830
PPTEF250	250	250	375	750	580	325	905
PPTEF280	280	250	390	780	630	365	995
PPTEF315	315	300	460	920	690	400	1090
PPTEF355	355	300	480	960	730	425	1155
PPTEF400	400	300	500	1000	800	450	1250
PPTEF450	450	300	525	1050	850	475	1325
PPTEF500	500	350	600	1200	900	500	1400
PPTEF560	560	350	630	1260	950	530	1480
PPTEF630	630	350	665	1330	1000	545	1545

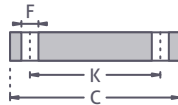
Reduction Tee also available as per standards.

Slip On Backing Ring & Blind Flange

Slip on



Blind



Size	ASA 150lbs, ANSI 16.5					BS 10 Table D					DIN 2501				
d	A	K	C	F	Bolt	A	K	C	F	Bolt	A	K	C	F	Bolt
20	32	60.5	90	4 X 16	M12	32	67	95	4 X 14	M12	28	65	95	4 x 14	M12
25	37	70	98	4 X 16	M12	37	73	100	4 X 14	M12	34	75	105	4 x 14	M12
32	44	79.5	108	4 X 16	M12	44	83	115	4 X 14	M12	42	85	115	4 x 14	M12
40	52	89	117	4 X 16	M12	52	87	120	4 X 14	M12	51	100	140	4 X 18	M16
50	62	98.5	127	4 X 16	M12	62	98	135	4 X 14	M12	62	110	150	4 X 18	M16
63	78	120.5	152	4 X 20	M16	78	114	150	4 X 18	M16	78	125	165	4 X 18	M16
75	92	139.5	178	4 X 20	M16	92	127	165	4 X 18	M16	92	145	185	4 X 18	M16
90	108	152	191	4 X 20	M16	108	146	185	4 X 18	M16	108	160	200	8 X 18	M16
110	128	190.5	229	8 X 20	M16	128	178	215	4 X 18	M16	128	180	220	8 X 18	M16
125	140	216	254	8 X 23	M16	140	210	255	8 X 18	M16	135	180	220	8 X 18	M16
140	158	216	254	8 X 23	M16	158	210	255	8 X 18	M16	158	210	250	8 X 18	M16
160	178	241	279	8 X 23	M20	178	235	280	8 X 18	M16	178	240	285	8 X 23	M20
180	195	241	279	8 X 23	M20	195	235	280	8 X 18	M16	188	240	285	8 X 23	M20
200	235	298.5	343	8 X 23	M20	235	292	335	8 X 18	M16	235	295	340	8 X 23	M20
225	240	298.5	343	8 X 23	M20	240	292	335	8 X 18	M16	238	295	340	8 X 23	M20
250	290	362	406	12 X 26	M24	290	356	405	8 X 22	M20	288	350	395	12 X 23	M20
280	300	362	406	12 X 26	M24	300	356	405	8 X 22	M20	294	350	395	12 X 23	M20
315	345	432	483	12 X 26	M24	345	406	455	12 X 22	M20	338	400	445	12 X 23	M20
355	376	476	535	12 X 29	M24	376	470	525	12 X 26	M24	376	460	505	16 X 23	M20
400	430	540	600	16 X 29	M24	430	521	580	12 X 26	M24	430	515	565	16 X 27	M24
450	480	578	635	16 X 32	M30	480	584	640	12 X 26	M24	517	565	615	20 X 27	M24
500	533	635	700	20 X 32	M30	533	641	705	16 X 26	M24	533	620	670	20 X 27	M24
560	590	692	749	20 X 32	M30	590	699	760	16 X 30	M27	618	725	780	20 X 30	M27
630	660	749	813	20 X 35	M30	660	756	825	16 X 30	M27	645	725	780	20 X 30	M27

Galvanized Steel, Stainless Steel Flanges available Table E & Table F also.

PP-GF as per ASA 150 and DIN 2501 available.

Flange thickness provided as per pressure ratings requirement.

Flanges also available for socket fusion adaptors. Note: "A" is smaller.

installation services



Sangir Plastics has a complete independent team handling on-site installation and commissioning and off-site pre-fabrication work. A dedicated workshop equipped with advanced welding equipment from European companies like Wegner and Technodue, provides high quality fabricated fittings and custom fabrication jobs in-house. Sangir is able to take up turnkey jobs which would consists of designing, supplying, installation, erection and commissioning of complete piping systems with guaranteed performance for decades.

A total combined experience of the services management team exceeds 50 years in the field and the supervisors include among the best available in the country.

Installations completed in following industries:

- Metallurgy plants
- Chemical industry
- Fluorochemical industry
- Phosphoric acid plants
- Chemical waste treatment plants
- Steel Plants
- Oil manufacturing plants
- Nuclear Power Plants
- Pickling Lines
- Textile Industry
- Effluent Treatment
- Marine Outfall

Custome Fabriation jobs undertaken inclue:

- Tanks
- Vessels
- Hoods
- Ducts
- Lined pipes etc.



chemical resistance chart

- + resistant
- o partly resistant
- non-resistant

		PVC-U		PP		PE-H		PE-UHMW		PMMA		ABS		PC		PPE		PA6		PA6.6		POM		PET		PVDF		ECTFE		PSU		PPSU		PEI		PPS		PEEK	
	conc. (%)	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C	20°C	60°C
Acetone	100	—	—	+	+/o	+	+/o	+	+/o	—	—	—	—	—	—	+	—	0	0	0	0	+	0	0	+/o	+/o	+	+	+	—	—	—	—	—	—	+	+	+	+
Formic acid	10	+	o	+	+	+	+	+	+	—	—	+	+	+	—	+	+	—	—	—	—	+	—	+	o	+	+	+	+	—	—	—	—	—	+	+	0	0	
Ammonia	conc.	+	o	+	+	+	+	+	+	+	+	+	+	—	—	+	+	+/o	—	+/o	—	+	+	0	—	+	+	+	+	0	+	+	+	+	+	+	+		
Ammonium chloride		+	+	+	+	+	+	+	+			+	—	+	+			+	+		+	0			+	+	+	+					+	+	+	+	+	+	
Amyl alcohol		+	o	+	+	+	+	+	+	—	—	+	—					+		+		+			+	+									+	+	+	+	
Apple juice		+	+							+		+		0	0	+	+				+		+	+	+	+					+				+	+	+	+	
Benzene		—	—	o	—	+/o	o/—	+	+/o	—	—	—	—	—	—	+	+	+	+	+	0	0	0	—	+	+	+	+	+	—	—	0	0			+	0	+	
Bleaching solution	12.5 Cl	+	—	o	o	o	—							—	—	—	—	—	—	—	—	—	—	0	+	+	+	+	+	—	—					+	0	+	
Boric acid	100	+	o	+	+	+	+	+	+			—	—	+	+			+/o	o	+/o	o	o/—	—		+	+	+	+								+	+		
Brake fluid		+	+	+	+	+	+	+	+		—														+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Butyl acetate		—	—	o	—	+	o	+	+	—	—	—	—	—	—			+		+		+	0	+	+	+	—	+	+	+	+	+	+	+/o		+	+	+	
Calcium chloride		+	+	+	+	+	+	+	+	+	+			+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+		
Chlorine, gas	100	o	—	—	—	o	—			0		—	—	o				—	—	—	—				+	+	+	+								+	+		
Chlorobenzene	100	—	—	+	o/—	o	—					—	—	—	—	+		+			0	0	—	—	+	+	+	+	—	—			+		+/o	o	+		
Chloroform		—	—	o	—	o/—	—			—	—	—	—	—	—	—	—	—	—	0	o/—	—	—	—	—	+	+			—	—			+	+/o	o	+		
Cyclohexene	100	+	o	+	—	+	+	+	+	—	—	+	—	—	+	+		+		+		+			+	+	+	+	+		+				+	+	+		
Cyclohexanone	100	—	—	+	o/—	+	+/o	+	+	—	—	—	—	—	+	+		+		+		+			+	o	+	0						+	+	+	o/—		
Diethylene oxide, THF		—	—	o	+	+	o			—	—	—	—	—	—			+		+		+	+	+		+	+	+	+		+			+	+	+	+		
1,4 Dioxane	100	—	—	o/—		+		+				—	—	+/o	—	0		+	+	+	+	0	0	0	0	—	+	+					+	+	+	+			
Diesel fuel		+		+	+	+	+	+	+	+		+		o	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+			
Acetic acid	100	+	—	+	o	+	o	+	+	—	—	—	—	—	—	+	—	—	—	—	0	—	—	—	+	0	+	+	+	+	+			+	+	+	+		
Vinegar, standard	5-10	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+		+	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+		
Ethyl acetate	100	—	—	+	+/o	+	+/o	+	+	—	—	—	—	—	+	+		+		+		0	0	+/o	—	+	0		—	—			+	+	+	+			
Ethyl alcohol	96	+	o	+	+	+	+	+	+	+/o	—	—	—	0	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Ethylene chloride	100	—	—	+/o		+/o				—	—	—	—	—	—			+		+				o/—	—	+	+	+	+				+	+	+	+			
Hydrofluoric acid	40	+	o	+	+	+	o	+		—	—	0	—	—	+			—	—	—	—	—	—	—	+	+	+	+	0	o/—					—	—			
Formaldehyde, aqu	40	+	+	+	+	+	+	+	+	+		+	o	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+		+			+	+	+	+		
Frost protection agent		+	+	+	+	+	+	+	+			+		+	+	+	+	+	+	+	+	+	+	0	+	+	+	+	+	+			+	+	+	+	+		
Glycerin	100	+	+	+	+	+	+	+	+	+		+	+	+/o	o	+	+	+	+	+	+	+	0	+	+	+	+	+	+			+	+	+	+	+			
Glycol	100	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	o	+	+	+	+	+	0	+	+	+	+	+	+			+	+	+	+			
Heating oil		+	+	+	+/o	+	+	+	+	+		+	+	0		+	+	+	+	+	+	+	+	+	+	+	+	+	+					+		+	+		
Heptane	100	+	+	o	o	+	+/o	+	+/o	+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+		+				+	+	+	+			
Isopropyl alcohol	100	+		+	+	+	+	+	+	+/o		0	—	0	+	+	+	+	+	+	+	+	+	+	+	0	+	+		+/o		+		+	+	+			
Mercurochrome		o	—	+	o	+	+/o	+	+		—	0	0	0	+	+	—	—	—	—	—	—		+	+	+	+	+						+		0	0		
Potassium hydroxide liquor	50	+	+	+	+	+	+	+	+	+		+	+/o	—	—	+		0		0		0		—	—	+	+						—		+	+			
Cresol		—	—	+	+	+	+	+	+	—	—	—	—	—	—			—	—	—	—				+	+													
Linseed oil		+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+							+	+		
Methyl alcohol	100	+	+/o	+	+	+	+	+	+	—	—	—	—	—	—	+		+	+	+	+	+	+	0	+	+			+		o	o	+	+	+	+			
Methylene chloride	100	—	—	o/—	—	o/—	—	o/—	—	—	—	—	—	—	—			0	0	0		—	—	—	0	—	+	0	—	—	—	—	—	—	o/—		+		
Methyl ethyl ketone	100	—	—	+	o	+	—	+	+	—	—	—	—	—	—	+		+		+	0	0	+	o/—	—	—	+	—	—	—	—	0	o	0	0	+	0		
Milk		+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+			
2-Hydroxypropionic acid	90	+	+	+	+	+	+	+	+			+/o		+	—	—	—	—	—	—	+	—			+/o	0		+	+						+	+			
Mineral oils (aromatic free)		+	+	+	+/o	+	+/o	+	+	+				+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Sodium hyrogen sulphite		+	+	+	+	+	+	+	+	+		+		+				+	+	+	+	+	—	—	+	+	+	+	+	+	+	+	+	+	+	+			
Sodium carbonate, aqu		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+			+	+		+			
Sodium chloride, aqu		+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+			
Sodium nitrate, aqu		+	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					+	+			
Sodium sulfate		+	+	+	+	+	+	+	+	+		+	+										+		+	+	+	+								+	+		
Sodium thiosulfate		+	+	+	+	+	+	+	+	+		+	+										+		+	+	+	+								+	+		
Sodium hydroxide liquor	15	+	+	+	+	+	+	+	+	+		+	+	—	—	+		+		+		+	0	—	—	+	+		+	+				+	+	+	+		
Sodium hydroxide liquor	60	+	+	+	+	+	+	+	+	—	—	+	—	—	—	+		0		0		0	—	—	+	0		+							o/—	+	+		
Nitrobenzene		—	—	+	+/o	+	+/o	+	+	—	—	—	—	—	—			0		0		0			+	0										+	+		
Oxalic acid		+	+	+	+	+	+	+	+	+		+	+	+	+	+		0		0		—			+	0	+	+	+							+	+		
Ozone, gas	< 0.5 ppm	+	+	—	—	+/o	—	+/o	+	+		+	+	0		+		—	—	—	—	—			+	+	+	+								+	0		
Paraffine oil	100	+	o	+	+	+	+	+	+	+		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+				+			+	+			
Perchloroethylene		—	—	o	—	o	—	o	—	o		—	—	—	—			0	—	0	—	+	0	+/o	—	+	+		—	—					+	0	+		
Petroleum ether	100	+	+	+	o	+	o	+	o	+		—	—	o		+		+		+		+	+	+	+										+	+			
Petroleum	100	+	+							0		0	o/—	0	—	+						+	+	+	+	+	+									+	+		
Phenol, aqu	ca. 9	o	—	+	+	+	+	+	+	—	—	0		—	—	—	—	—	—	—	—	—	—		+	+	+	+					+	0	+	+			
Phosphoric acid	50	+	+	+	+	+	+	+	+</																														

*Figures indicated are approximate values and may be affected by the temperature, operating time, concentration and stress level of the component involved, by mechanical loads, etc., and the user must perform checks and trials before use.

The values indicated here are compiled on the basis of current experiences and findings and are not subject to a legal binding guarantee of certain properties.

Also, suitability for a specific application cannot be inferred from the present data.



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