

TORO 25 system consists of monolayer pipes made of Random Copolymer Polypropylene, used to supply fluids under pressure.

TORO 25 system represents a modern option to the use of traditional materials for the transport of pressure fluids in hot/cold water supply systems, in the residential, commercial, industrial and naval sectors, as it guarantees a higher performance than those made with traditional metal materials.

The range includes:

- PP-R pipes (PP-R 100) from d. 20 mm to d. 63 mm in PN10, PN16 and PN20 with SDR6, SDR7,4, SDR11;
- PP-R EvO pipes (PP-RCT) from d. 75 mm to d. 315 mm in PN10, PN16, PN20 and PN25 with SDR6, SDR7,4, SDR9, SDR11, SDR17.

TORO 25 system pipes are perfectly compatible with all TORO 25 accessories.



APPLICATION FIELDS



drinking water and hygienic requirements



shipbuilding installation



heating-cooling networks



industrial equipment and installation




chilled water and air conditioning (HVAC)

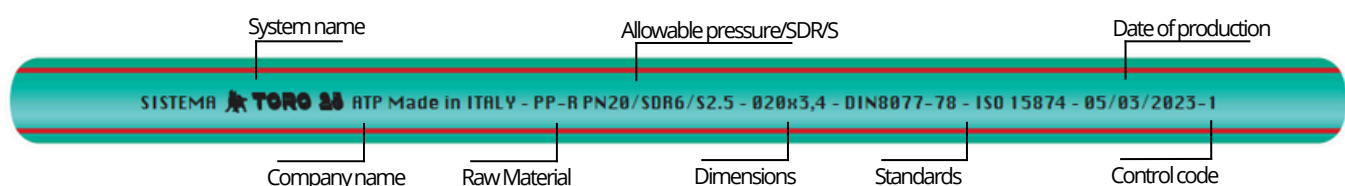


rainwater application

ADVANTAGES

- non-toxic materials
- easy installation
- lightness
- durability
- efficiency and versatility
- no noise and vibration
- safety against frost
- safety against corrosion
- safety against abrasion and deposits
- safety against condensation and heat loss
- safety against stray currents
- 100% recyclable (Green Building Product )

MARKING



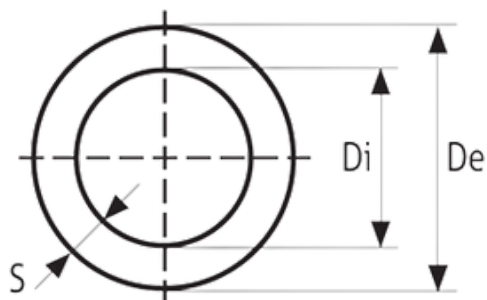
DIMENSIONS

SDR	Article	De mm	Di mm	Wall Thickness (S) mm	Weight Kg/m
PN10 - SDR11 / S5					
11	TUB 20 A10	20	15,8	2,1 (+0,4)	0,112
	TUB 25 A10	25	20,0	2,5 (+0,5)	0,168
	TUB 32 A10	32	26,2	2,9 (+0,5)	0,269
	TUB 40 A10	40	32,6	3,7 (+0,6)	0,415
	TUB 50 A10	50	40,8	4,6 (+0,7)	0,643
	TUB 63 A10	63	51,4	5,8 (+0,8)	1,015
EvO - PN10 - SDR17 / S8					
17	TUB 75 A10 E	75	66,0	4,5 (+0,7)	0,980
	TUB 90 A10 E	90	79,2	5,4 (+0,8)	1,450
	TUB 110 A10 E	110	96,8	6,6 (+0,9)	2,150
	TUB 125 A10 E	125	110,2	7,4 (+1,0)	2,750
	TUB 160 A10 E	160	141,0	9,5 (+1,2)	4,400
	TUB 200 A10 E	200	176,2	11,9 (+1,4)	6,800
	TUB 250 A10 E	250	220,4	14,8 (+1,7)	10,500

SDR	Article	De mm	Di mm	Wall Thickness (S) mm	Weight Kg/m
PN20 - SDR6 / S2,5					
6	TUB 20 A20	20	13,2	3,4 (+0,6)	0,174
	TUB 25 A20	25	16,6	4,2 (+0,7)	0,268
	TUB 32 A20	32	21,2	5,4 (+0,8)	0,438
	TUB 40 A20	40	26,6	6,7 (+0,9)	0,675
	TUB 50 A20	50	33,4	8,3 (+1,1)	1,045
	TUB 63 A20	63	42,0	10,5 (+1,3)	1,669
EvO - PN20 - SDR7,4 / S3,2					
7,4	TUB 75 A20 E	75	54,4	10,3 (+1,3)	1,961
	TUB 90 A20 E	90	65,4	12,3 (+1,5)	2,938
	TUB 110 A20 E	110	79,8	15,1 (+1,8)	4,355
	TUB 125 A20 E	125	90,8	17,1 (+2,0)	5,555
	TUB 160 A20 E	160	116,2	21,9 (+2,4)	9,290
EvO - PN20 - SDR9 / S4					
9	TUB 200 A20 E	200	155,2	22,4 (+2,5)	11,900
	TUB 250 A20 E	250	194,2	27,9 (+3,0)	18,500

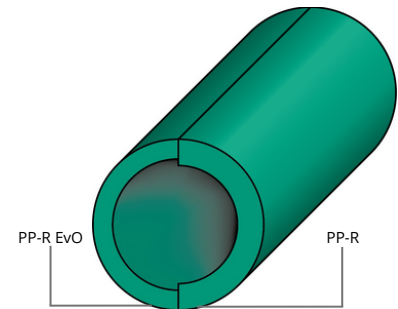
SDR	Article	De mm	Di mm	Wall Thickness (S) mm	Weight Kg/m
PN16 - SDR7,4 / S3,2					
7,4	TUB 20 A16	20	14,4	2,8 (+0,5)	0,150
	TUB 25 A16	25	18,0	3,5 (+0,6)	0,229
	TUB 32 A16	32	23,2	4,4 (+0,7)	0,377
	TUB 40 A16	40	29,0	5,5 (+0,8)	0,577
	TUB 50 A16	50	36,2	6,9 (+0,9)	0,867
	TUB 63 A16	63	45,8	8,6 (+1,1)	1,384
EvO - PN16 - SDR11 / S5					
11	TUB 75 A16 E	75	61,4	6,8 (+0,9)	1,440
	TUB 90 A16 E	90	73,6	8,2 (+1,1)	2,030
	TUB 110 A16 E	110	90,0	10,0 (+1,2)	3,080
	TUB 125 A16 E	125	102,2	11,4 (+1,4)	3,910
	TUB 160 A16 E	160	130,8	14,6 (+1,7)	6,330
	TUB 200 A16 E	200	163,6	18,2 (+2,1)	9,808
	TUB 250 A16 E	250	204,6	22,7 (+2,5)	15,289
	TUB 315 A16 E	315	257,8	28,6 (+3,1)	23,700
	TUB 355 A16 E	355	290,6	32,2 (+3,6)	32,200

SDR	Article	De mm	Di mm	Wall Thickness (S) mm	Weight Kg/m
EvO - PN25 - SDR6 / S2,5					
6	TUB 20 A25 E	20	13,2	3,4 (+0,6)	0,174
	TUB 25 A25 E	25	16,6	4,2 (+0,7)	0,268
	TUB 32 A25 E	32	21,2	5,4 (+0,8)	0,438
	TUB 40 A25 E	40	26,6	6,7 (+0,9)	0,675
	TUB 50 A25 E	50	33,4	8,3 (+1,1)	1,045
	TUB 63 A25 E	63	42,0	10,5 (+1,3)	1,669
	TUB 75 A25 E	75	50,0	12,5 (+1,5)	2,345
	TUB 90 A25 E	90	60,0	15,0 (+1,7)	3,378
	TUB 110 A25 E	110	73,4	18,3 (+2,1)	5,052
	TUB 125 A25 E	125	83,4	20,8 (+2,3)	6,470
TUB 160 A25 E	160	106,8	26,6 (+2,9)	10,600	



The production of diameters from d. 75 mm to d. 315 mm is made using the raw material PP-R EvO (PP-RCT), which allows to meet the most complex plant requirements and to obtain the following advantages:

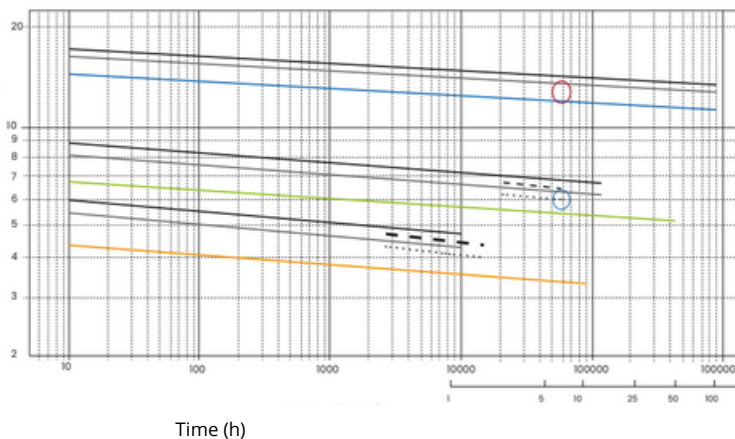
- Increased load capacity: reduced wall thickness resulting greater hydraulic capacity with the same external diameter;
- Lower weight: 13% reduction in the amount of raw material used compared to PP-R (PP-R 100);
- Increased resistance: the special and improved crystalline structure allows a higher resistance to temperature and pressure.



Standard Method: ISO 9080:2003, 4 - parameter model 20 - 95°C e t (max) at 110 °C. Dotted lines show the contribution using 110 °C t (max) for extrapolation PP-R EvO reference lines according to DIN 8078: 2008-09

	Unit	PP-R EvO	PP-R
Minimun Required Strenght	MPa	12,5	10
Melt index (230/5)	g/10 min	1,1	1,3
Melt index (190/5)	g/10 min	0,4	0,5
Melt index (230/2.16)	g/10 min	0,2	0,3
Tensile Modulus	MPa	850	850

	Unit	PP-R EvO	PP-R
Stress at Yield	MPa	26	24
Charpy impact 0 °C	kJ/m ²	8	12
Melting point	°C	136	139
Vicat temperature	°C	132	132
Density	g/cm ²	132	132



PP-R EvO Reference lines
 20°C water in water — blue
 70°C water in water — green
 95°C water in water — orange
 LTHS XN125-P Regression — black
 LPL XN125-P Regression — dotted

Extrapolation using t(max) at 110°C according to ISO/CD 9080:2008

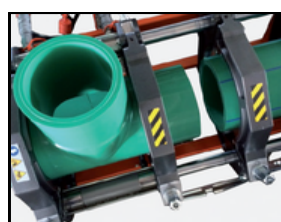
50 Years $\sigma_{LPL(70^\circ C)} = 5.93 \text{ MPa}$

50 Years $\sigma_{LPL} = 12.68 \text{ MPa}$
 MRS = 12.5 MPa

WELDING TECHNIQUES



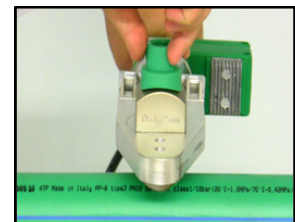
socket welding



butt welding



electrofusion



saddle welding

PHYSICAL-MECHANICAL CHARACTERISTICS

Hygienic compatibility:	supply of drinking water and food fluids for human consumption
Thermal transmission coefficient:	$\lambda = 0,15 \text{ W/m}^\circ\text{C}$
Coefficient of thermal expansion:	$\alpha = 0,15 \text{ mm/m}^\circ\text{C}$
Fire resistance classification:	E (UNI-EN ISO 13501-1:2007)
Internal roughness:	$\mu = 0,0020 \text{ mm}$
Welding system:	thermofusion; electrofusion
Pipe structure:	monolayer
Material:	PP-R 100; PP-R EvO
Finish:	mat
Color:	light green with four coextruded lines: PN10: light brown - PN16: blue - PN20: red - PN25: white
Supply:	4 m rods in sacks
Compatibility with all TORO 25 system PP-R fittings	

For technical and installation warnings, please consult the official catalogue

STANDARD

DIN 8077 / 8078 / 16962	RINA-ASTM D 635:2010
DVS 2207 / 2208	UNI EN 11861-15:2003
EN ISO 15874-2-3-5	ISO 8795:2001
EN ISO 15494	ASTM D 2444:2010
SGBP 2018-1968	NSF / ANSI / CAN61
WRAS	

CERTIFICATIONS

