

# No.86 Applicable Standards for UR P4.7 (Feb 2005) “Requirements for Type Approval of Plastic Pipes”

Table 1: Typical requirements for all systems

	Test	Typical Standard	Notes
1	Internal pressure <sup>(1)</sup>	P4.3.1.3(i), ASTM D 1599, ASTM D 2992 ISO 15493 or equivalent	Top, Middle, Bottom (of range) Tests are to be carried out on pipe spools made of different pipe sizes, fittings and pipe connections.
2	External pressure <sup>(1)</sup>	P4.3.1.3(ii), ISO 15493 or equivalent	As above, for straight pipes only.
3	Axial strength	P4.3.2	As above
4	Load deformation	ASTM D 2412 or equivalent	Top, Middle, Bottom (of each pressure range)
5	Temperature limitations	ISO 75 Method A GRP piping system: HDT test on each type of resin acc. to ISO 75 method A  Thermoplastic piping systems: ISO 75 Method A ISO 306 Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST) VICAT test according to ISO 2507  Polyesters with an HDT below 80°C should not be used.	Each type of resin
6	Impact resistance	ISO 9854: 1994, ISO 9653: 1991 ISO 15493 ASTM D 2444, or equivalent	Representative sample of each type of construction
7	Ageing	Manufacturer's standard ISO 9142:1990	Each type of construction
8	Fatigue	Manufacturer's standard or service experience.	Each type of construction
9	Fluid absorption	ISO 8361:1991	
10	Material compatibility <sup>(2)</sup>	ASTM C581 Manufacturer's standard	

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Table 2: Typical additional requirements depending on service and/or locations of piping

	Test	Typical Standard	Notes
1	Fire endurance <sup>(1)(2)</sup>	IMO Res. A753 (18), Appendix 1, 2	Representative samples of each type of construction and type of pipe connection
2	Flame spread <sup>(1)(2)</sup>	UR P4.4.2	Representative samples of each type of construction.
3	Smoke generation <sup>(2)</sup>	IMO Fire Test Procedures Code	Representative samples of each type of construction.
4	Toxicity <sup>(2)</sup>	IMO Fire Test Procedures Code	Representative samples of each type of construction
5	Electrical conductivity <sup>(1)(2)</sup>	ASTM F1173-95 or ASTM, D 257, NS 6126 para. 11.2 or equivalent	Representative samples of each type of construction

**Footnotes:**

- (1) Test to be witnessed by a Classification Society's Surveyor.  
(2) If applicable.

**Note:** Tests 1, 2 and 5 of Table 2 are optional however, if carried out, the range of approved applications for the pipes will be limited accordingly (see UR P4.4, Table 1).

END