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INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

IAPMO GUIDE CRITERIA FOR

CORRUGATED STAINLESS STEEL HOT- AND COLD- WATER DISTRIBUTION SYSTEMS

IGC 233-2009

1. PURPOSE

- 1.1** The purpose of this standard is to establish a generally acceptable standard for corrugated stainless steel hot- and cold- water distribution systems. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users; to promote understanding regarding materials, manufacture and installation; and to provide for identifying corrugated stainless steel hot- and cold- water distribution systems complying with this standard.
- 1.2** The provisions of this standard are not intended to prevent the use of any alternate material or method of construction provided any such alternate meets the intent and requirements of this document and changes are amended to this standard.

2. SCOPE

- 2.1** This standard applies to corrugated stainless steel hot- and cold- water distribution systems and covers general requirements and performance tests for such products, in addition to method of markings and identification.
- 2.2** Components within this system comprise of corrugated stainless steel pipe and metallic fittings made in one standard dimension ratio and intended for 147 psi (1012.8 kPa) water service up to and including a maximum working temperature of 212°F (100°C).

3. REFERENCED STANDARDS

- 3.1** All standards referenced herein shall be the current edition of the standards.

ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASSE 1061	Removable and Non-Removable Push-Fit Fittings
ASTM A 240	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A 312/A 321M	Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

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ASTM D 4101
ASTM D 3350
CSA B137.0

IAPMO PS 66
NSF/ANSI 61

Propylene Plastic Injection and Extrusion Material
Polyethylene Injection and Extrusion Material
Definitions, General Requirements, and Methods of
Testing for Thermoplastic Pressure Piping
Dielectric Waterway Fittings
Drinking Water System Components – Health Effects

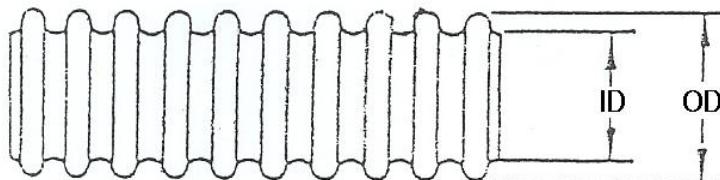
4. MATERIAL REQUIREMENTS

- 4.1 Materials.** Stainless steel material shall be a minimum type 304 complying with the requirements of ASTM A 240 or ASTM A 312/312M. Copper alloys material shall contain at least 58% copper and maximum 8% lead content.
- 4.2 Toxicity.** All materials that come in contact with potable water shall be non-toxic and shall show compliance with NSF/ANSI 61.
- 4.3 Piping.** Corrugated piping dimensions and tolerances shall comply with the following Table 1.

Table 1: Dimensional Requirements of Tubing

Normal Diameter In. (mm)	Inner Diameter In. (mm)		Outer Diameter In. (mm)		Thickness In. (mm)	Convulsions / 3.94 (100mm)	Minimum Radius Diameter In. (mm)
	Standard	Tolerance	Standard	Tolerance			
3/8" (10A)	.504 (12.8)	± .012 (0.3)	.638 (16.2)	± .012 (0.3)	.010 (0.25)	min. 24	1.18 (30)
1/2" (15A)	.555 (14.1)		.713 (18.1)			min. 20	1.18 (30)
3/4" (20A)	.827 (21.0)		1.00 (5.6)		.012 (0.3)	min. 19	1.57 (40)
1" (25A)	1.03 (27.0)		1.26 (32.0)			min. 18	1.97 (50)
1 1/4" (32A)	1.26 (32.0)		1.48 (37.6)			min. 18	3.15 (80)

Figure 1: Annular Type Corrugation Tube



- 4.4 Fittings.** Dielectric waterway fittings shall comply with the requirements in IAPMO PS 66. Threaded ends shall comply with ASME B1.20.1. Fittings and manifolds shall be compatible with the piping made to the requirements in Table 1. Push fit end connection shall comply with the applicable requirements in ASSE 1061.

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4.5 Plastic Coating. Polypropylene material shall comply with the requirements in ASTM D 4101 or CSA B137 and Polyethylene material shall comply with the requirements in ASTM D 3350 or CSA B137.

4.6 Sizing. Water systems using the stainless steel piping shall be determined in accordance with Table 2 in this standard.

Table 2: Fixture Unit Table for Determining Stainless Steel Corrugation Flexible Tube

Pressure Range - 30 to 45 psi (207 to 310kPa)

Dia. Size	Maximum Allowable Length in Feet(Meter)								
	40 (12)	60 (18)	80 (24)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	400 (122)
3/8"(10mm)	3.4	2.8	2.3	1.7	1.1	0.6	0.5	0.5	0.4
1/2"(15mm)	6	5	4	3	2	1	1	1	1
3/4"(20mm)	16	16	14	12	9	6	5	5	4
1"(25mm)	29	25	23	21	17	15	13	12	10
1 1/4"(32mm)	36	33	31	28	24	23	21	19	17

Pressure Range - 46 to 60 psi (317 to 414kPa)

Dia. Size	Maximum Allowable Length in Feet(Meter)								
	40 (12)	60 (18)	80 (24)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	400 (122)
3/8"(10mm)	4	3.9	3.4	2.8	2.3	1.7	1.1	1.1	0.6
1/2"(15mm)	7	7	6	5	4	3	2	2	1
3/4"(20mm)	20	20	19	17	14	11	9	8	6
1"(25mm)	39	39	36	33	28	23	21	19	17
1 1/4"(32mm)	39	39	39	39	39	39	34	32	27

Pressure Range - over 60 psi (414kPa)

Dia. Size	Maximum Allowable Length in Feet(Meter)								
	40 (12)	60 (18)	80 (24)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	400 (122)
3/8"(10mm)	4	3.9	3.8	3.4	2.8	2.3	1.7	1.6	1.1
1/2"(15mm)	7	7	7	6	5	4	3	3	2
3/4"(20mm)	20	20	20	20	17	13	11	10	8
1"(25mm)	39	39	39	39	35	30	27	24	21
1 1/4"(32mm)	39	39	39	39	39	39	39	39	34

* Available static pressure after head loss.

* Above table is available to building internal branches.

5. PERFORMANCE REQUIREMENTS

5.1 Sampling. A sufficient quantity of tubing or fittings, as agreed upon by the purchaser and the seller, shall be selected and tested to determine conformance with this standard.

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