

## JIANZHI Grooved Fitting Technical Data

—Written by William.Zhang

➤ Production Standard : FM1920

➤ Ductile cast iron standard :

Material: ASTM A536, Grade 65-45-12, QT450-12

Threads: ASME B1.20.1, EN 10226, ISO7-1, GB7306

Tensile strength:  $\geq 450\text{mpa}$

Elongation:  $\geq 12\%$

Hardness: 160 ~ 210HBW

	GB5135	JIANZHI standard
Tensile strength	$\geq 450\text{mpa}$	$\geq 500\text{mpa}$
Elongation	$\geq 12\%$	$\geq 17\%$

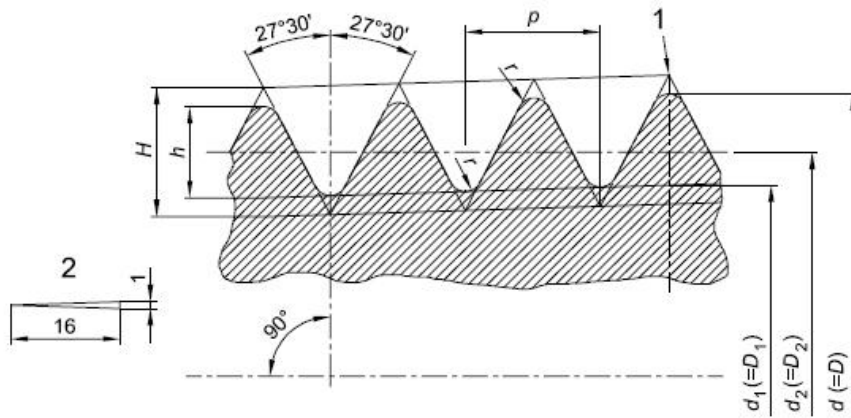
—Data from JIANZHI laboratory

### Gasket Data

Name	Temperature Range	General Service Recommendations
EDPM	-34~+110°C (-30~+230°F)	Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 or cold+86°F(+30°) and hot +180°F(+82°C) potable water service. Not recommended for petroleum service.
NITRILE	-29~+82°C (-20~+180°F)	Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature

		range. Not recommended for hot water services.
SILICON	-40~+177°C (-40~+350°F)	Recommended for high temperature dry air and some high temperature chemical products.

External threads are taper (R), image from EN10226

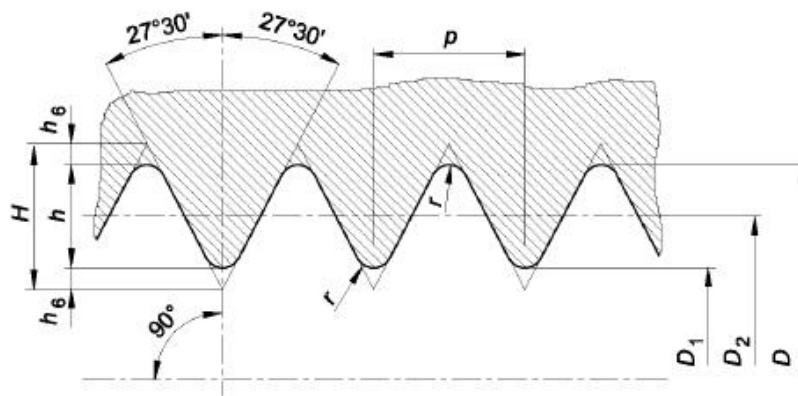


**Key**

- 1 gauge plane
- 2 taper
- $P$  pitch
- $H$   $0,960237P$
- $h$   $0,640327P$
- $r$   $0,137278P$

**Figure 2 — Taper thread (external)**

Internal thread is parallel (RP), image from EN10226



**Key**

- $P$  pitch
- $H$  0,960491 $P$
- $h$  0,640327 $P$
- $r$  0,137329 $P$

**Figure 1 — Parallel thread (internal)**

For back-nut, union nuts and their mating threads are in accordance with ISO228-1/ENISO228.

The axes of the screw thread is accurate to within  $\pm 0.5^\circ$  of the specified angle according to ISO7-1, JIANZHI axes of the screw thread accuracy is  $\pm 0.3^\circ$ , higher 40% than ISO7-1.

	ISO7-1/EN10226	JIANZHI standard
Axe angle	$\pm 0.5^\circ$	$\pm 0.3^\circ$

**Pipe thread dimensions according ISO7-1**

Thread size	Number of threads in 25,4 mm	Pitch		Diameters at gauge plane			Gauge length (external thread)				Assembly length		Length of useful external thread not less than			Tolerance on position of gauge plane on internal thread		Equivalent diametral tolerance <sup>a</sup> on parallel internal threads	
		$P$	$h$	Major (gauge diameter) $d=D$	Pitch $d_2=D_2$	Minor $d_1=D_1$	Nominal mm	Tolerance $T_1/2$		max. mm	min. mm	Turns of thread	For nominal gauge length mm	For maximum gauge length mm	For minimum gauge length mm	Tolerance $T_2/2$			
		mm	mm	mm	mm	mm		mm <sup>b</sup>	Turns of thread							mm <sup>b</sup>	mm <sup>b</sup>		
1/16	28	0,907	0,581	7,723	7,142	6,561	4	$\pm 0,9$	1	4,9	3,1	2,5	2,34	6,5	7,4	5,6	$\pm 1,1$	1,14	$\pm 0,071$
1/8	28	0,907	0,581	9,728	9,147	8,566	4	$\pm 0,9$	1	4,9	3,1	2,5	2,34	6,5	7,4	5,6	$\pm 1,1$	1,14	$\pm 0,071$
1/4	19	1,337	0,856	13,157	12,301	11,445	6	$\pm 1,3$	1	7,3	4,7	3,7	2,34	9,7	11	8,4	$\pm 1,7$	1,14	$\pm 0,104$
3/8	19	1,337	0,856	16,662	15,806	14,950	6,4	$\pm 1,3$	1	7,7	5,1	3,7	2,34	10,1	11,4	8,8	$\pm 1,7$	1,14	$\pm 0,104$
1/2	14	1,814	1,162	20,955	19,793	18,631	8,2	$\pm 1,8$	1	10,0	6,4	5,0	2,34	13,2	15	11,4	$\pm 2,3$	1,14	$\pm 0,142$
3/4	14	1,814	1,162	26,441	25,279	24,117	9,5	$\pm 1,8$	1	11,3	7,7	5,0	2,34	14,5	16,3	12,7	$\pm 2,3$	1,14	$\pm 0,142$
1	11	2,309	1,479	33,249	31,770	30,291	10,4	$\pm 2,3$	1	12,7	8,1	6,4	2,34	16,8	19,1	14,5	$\pm 2,9$	1,14	$\pm 0,180$
1 1/4	11	2,309	1,479	41,910	40,431	38,952	12,7	$\pm 2,3$	1	15,0	10,4	6,4	2,34	19,1	21,4	16,8	$\pm 2,9$	1,14	$\pm 0,180$
1 1/2	11	2,309	1,479	47,803	46,324	44,845	12,7	$\pm 2,3$	1	15,0	10,4	6,4	2,34	19,1	21,4	16,8	$\pm 2,9$	1,14	$\pm 0,180$
2	11	2,309	1,479	59,614	58,135	56,656	15,9	$\pm 2,3$	1	18,2	13,6	7,5	3,14	23,4	25,7	21,1	$\pm 2,9$	1,14	$\pm 0,180$
2 1/4	11	2,309	1,479	75,184	73,705	72,226	17,5	$\pm 3,5$	1.1/2	21,0	14,0	9,2	4	26,7	30,2	23,2	$\pm 3,5$	1.1/2	$\pm 0,216$
3	11	2,309	1,479	87,884	86,405	84,926	20,6	$\pm 3,5$	1.1/2	24,1	17,1	9,2	4	29,8	33,3	26,3	$\pm 3,5$	1.1/2	$\pm 0,216$
4	11	2,309	1,479	113,090	111,551	110,072	25,4	$\pm 3,5$	1.1/2	28,9	21,9	10,4	4.1/2	35,8	39,3	32,3	$\pm 3,5$	1.1/2	$\pm 0,216$
5	11	2,309	1,479	138,430	136,951	135,472	28,6	$\pm 3,5$	1.1/2	32,1	25,1	11,5	5	40,1	43,6	36,6	$\pm 3,5$	1.1/2	$\pm 0,216$
6	11	2,309	1,479	163,830	162,351	160,872	28,6	$\pm 3,5$	1.1/2	32,1	25,1	11,5	5	40,1	43,6	36,6	$\pm 3,5$	1.1/2	$\pm 0,216$

	ISO7-1/EN10226	JIANZHI standard
Turns of thread of external thread	$\pm 1$ -- $\pm 1 \frac{1}{2}$	Only $\pm 1$
Turns of thread of internal thread	$\pm 1 \frac{1}{4}$ --- $\pm 1 \frac{1}{2}$	$\pm 1$

—Data from JIANZHI laboratory

➤ Surface Treatment:

Painted

Electroplated

Black

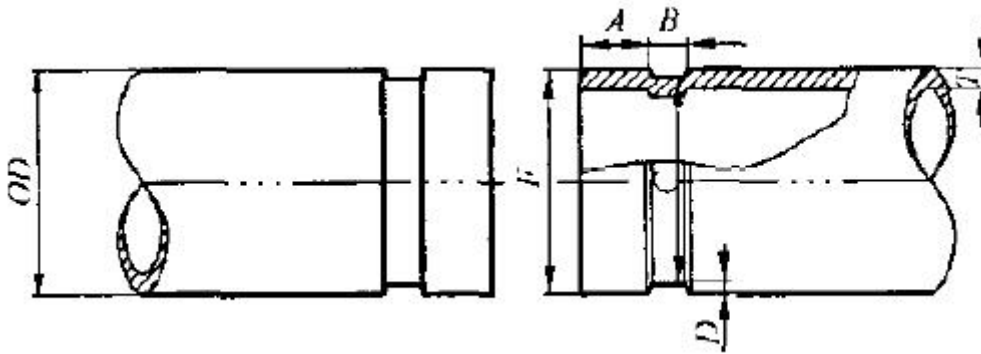
Epoxy

Hot-dip Galvanized

➤ Dimensions and tolerances:

Please check our product pages or download our production catalog.

Dimensions samples(mm)




Nominal Size	Pipe O.D.			A	B	C	T	D
	Basic	Tolerance						
in	in	in	in	in	in	in	in	in
mm	mm	mm	mm	mm	mm	mm	mm	mm
3/4	1.050	+0.010	-0.010	0.625	0.313	0.938-0.015	0.113	0.056
20	26.7	+0.25	-0.25	15.88	7.95	23.83-0.38	2.87	1.42
1	1.315	+0.028	-0.015	0.625	0.313	1.190-0.015	0.133	0.063
25	33.4	+0.71	-0.38	15.88	7.95	30.23-0.38	3.38	1.60
1-1/4	1.660	+0.029	-0.016	0.625	0.313	1.535-0.015	0.140	0.063
32	42.2	+0.74	-0.41	15.88	7.95	38.99-0.38	3.56	1.6
1-1/2	1.900	+0.019	-0.019	0.625	0.313	1.775-0.015	0.145	0.063
40	48.3	+0.48	-0.48	15.88	7.95	45.09-0.38	3.68	1.60
2	2.375	+0.024	-0.024	0.625	0.313	2.250-0.015	0.154	0.063
50	60.3	+0.61	-0.61	15.88	7.95	57.15-0.38	3.91	1.60

2-1/2 65	2.875 73.0	+0.029 +0.74	-0.029 -0.74	0.625 15.88	0.313 7.95	2.720-0.018 69.09-0.46	0.188 4.78	0.078 1.98
76.1mm	3.000 76.1	+0.030 +0.76	-0.030 -0.76	0.625 15.88	0.313 7.95	2.845-0.018 72.26-0.46	0.188 4.78	0.076 1.93
3 80	3.500 88.9	+0.035 +0.89	-0.031 -0.79	0.625 15.88	0.313 7.95	3.344-0.018 84.94-0.46	0.188 4.78	0.078 1.98
101.6mm	4.000 101.6	+0.040 +1.02	-0.031 -0.79	0.625 15.88	0.313 7.95	3.834-0.020 97.38-0.51	0.188 4.78	0.078 1.98
108.0mm	4.250 108.0	+0.042 +1.07	-0.031 -0.79	0.625 15.88	0.375 9.53	4.084-0.020 103.73-0.51	0.203 5.16	0.083 2.11
4 100	4.500 114.3	+0.045 +1.14	-0.031 -0.79	0.625 15.88	0.375 9.53	4.334-0.020 110.08-0.51	0.203 5.16	0.083 2.11
133.0mm	5.250 133.0	+0.052 +1.32	-0.031 -0.79	0.625 15.88	0.375 9.53	5.084-0.020 129.13-0.51	0.203 5.16	0.083 2.11
139.7mm	5.500 139.7	+0.056 +1.42	-0.031 -0.79	0.625 15.88	0.375 9.53	5.334-0.022 135.48-0.56	0.203 5.16	0.083 2.11
5 125	5.563 141.3	+0.056 +1.42	-0.031 -0.79	0.625 15.88	0.375 9.53	5.395-0.022 137.03-0.56	0.203 5.16	0.084 2.13
159.0mm	6.250 159.0	+0.063 +1.60	-0.031 -0.79	0.625 15.88	0.375 9.53	6.084-0.022 154.53-0.56	0.219 5.56	0.083 2.11
165.1mm	6.500 165.1	+0.063 +1.60	-0.031 -0.79	0.625 15.88	0.375 9.53	6.330-0.022 160.78-0.56	0.219 5.56	0.085 2.16
6 150	6.625 168.3	+0.063 +1.60	-0.031 -0.79	0.625 15.88	0.375 9.53	6.455-0.022 163.96-0.56	0.219 5.56	0.085 2.16
8 200	8.625 219.1	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.438 11.13	8.441-0.025 214.40-0.64	0.238 6.05	0.092 2.34
10 250	10.750 273.0	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	10.562-0.027 268.27-0.69	0.250 6.35	0.094 2.39
12 300	12.750 323.9	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	12.531-0.030 318.29-0.76	0.279 7.09	0.109 2.77
200 JIS	8.516 216.3	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.438 11.13	8.331-0.022 211.61-0.56	0.238 6.05	0.092 2.34
250 JIS	10.528 267.4	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	10.339-0.027 262.60-0.69	0.250 6.35	0.094 2.39

——Quote from <GB5135.11-2006>

➤ Marking:



All JIANZHI pipe fitting will mark  as our brand. Each pipe fittings with this brand marking is ensured with trusty quality and our highest compensation standard.

➤ Quality assurance system: ISO 9001:2015

- Occupational health and safety management system: OHSAS 18001:2007
- Environmental management system: ISO 14001:2015

➤ Fitting size and normal size

Nominal Size		Outside Diameter (O.D.)								
Inches (Imperial)	DN (Metric.mm)	mm (Actual Pipe O.D.)	DIN mm	BS mm	ISO mm	JIS mm	ANSI mm	GB mm	India	
									IS1239	IS3589
1/2	15	21.3	DN15	DN15	DN15	21.7	1/2	DN15	DN15	-
3/4	20	26.7	26.9	DN20	DN20	27.2	3/4	DN20	DN20	-
1	25	33.4	33.4	DN25	DN25	34.0	1	DN25	DN25	-
1-1/4	32	42.2	42.4	DN32	DN32	42.7	1-1/4	DN32	DN32	-
1-1/2	40	48.3	DN40	DN40	DN40	48.6	1-1/2	DN40	DN40	-
2	50	60.3	DN50	DN50	DN50	60.5	2	DN50	DN50	-
2-1/2	65	73.1	-	-	-	-	2-1/2	-	-	-
		76.1 BS/ISO	76.1	76.1	76.1	76.1	-	76.1*	76.1	-
3	80	88.9	DN80	DN80	DN90	DN80	3	DN80	DN80	-
3-1/2	90	101.6	-	-	-	-	-	-	-	-
4	100	108.00 China(&old DIN)	DIN133	-	-	-	-	-	108.0*	-
		114.3mm	DN100	DN100	DN100	DN100	4	DN100	DN100	DN100
-	127.00	127.00	-	-	-	-	-	-	-	-
5	125	133.0 China	-	-	-	-	-	-	-	-
		139.7 BS/ISO	DN125	139.7	139.7	139.8	-	139.7	139.7	-
		141.3	-	-	-	-	5	-	-	-
-	152.4	152.4	-	-	-	-	-	-	-	-
6	150	159.00 China	-	-	-	-	-	159.0	-	-
		165.1 JIS/BS	-	165.1	-	165.2	-	-	165.1	-
		168.3	DN150	-	DN150	-	6	DN150	-	DN150
-	6	193.7	-	-	-	-	-	-	-	193.7
-	203.2	203.2	-	-	-	-	-	-	-	-
8	200	216.3 JIS	-	-	-	216.3	-	-	-	-
		219.1	DN200	DN200	DN200	-	8	DN200	DN200	DN200
-	254.0	254.0	-	-	-	-	-	-	-	-
10	250	267.4 JIS	-	-	-	267.4	-	-	-	-

		273.0	DN250	DN250	DN250	-	10	DN250	DN250	DN250
-	304.8	304.8	-	-	-	-	-	-	-	-
12	300	318.5	-	-	-	318.5	-	-	-	-
		JIS								
		323.9	DN300	DN300	DN300	-	12	-	-	-
14	350	355.6	DN350	DN350	DN350	DN350	14	DN350	-	-
		377.0	-	-	-	-	-	377.0	-	-
		China								
16	400	406.4	DN400	DN400	DN400	DN400	16	DN400	-	-
		426.0	-	-	-	-	-	426.0	-	-
		China								
18	450	457.2	DN450	DN450	DN450	DN450	18	DN450	-	-
		480.0	-	-	-	-	-	480.0	-	-
		China								
20	500	508.0	DN500	DN500	DN500	DN500	20	DN500	-	-
		530.0	-	-	-	-	-	530.0	-	-
		China								
22	550	558.8	-	-	-	DN550	22	559.0	-	-
		580.0	-	-	-	-	-	580.0	-	-
		China								
24	600	610.0	DN600	DN600	DN600	DN600	24	DN600	-	-
		630.0	630.0 China	-	-	-	-	630.0	-	-
		China								

**Important Note:**

**Nominal designations are used where the actual O.D. of the pipe matches the ANSI size.**

**Otherwise both the nominal and actual O.D. are listed.**

**China sizes are listed as actual O.D. in mm.**

**\*China size are tubing sizes.**

**Engineering Test**

No.	Item	Standard Requirements
1	Vacuum Test	Grooved couplings, grooved reducing couplings, grooved split flanges, mechanical tees, and plain end couplings shall be able to withstand the effects of vacuum conditions encountered when sprinkler systems are drained. Samples of each nominal size and style of gasketed coupling and fitting shall be subjected to an internal vacuum of 25 inHg(85 kPa) for a duration of 5 minutes. Following the vacuum test, the test assembly shall be pneumatically pressurized from zero to 50 psi (345 kPa) while submerged in a water bath. There shall be no leakage or permanent deformation as a result of this test.
2	Hydrostatic Strength Test	All items shall be able to withstand an internal hydrostatic pressure equal to three - five times the rated working pressure without cracking, rupture, or permanent distortion. The test shall be conducted for a duration of 1 minute. (Test size ≤6", Five times; 8"-10", 4 times; ≥12", 3 times)
3	Air leakage Test	The coupling assembly shall be pressurized with air to 3 bar +0.5/-0 bar. The assembly shall be immersed in water to establish that there is no visible leakage.

4	Moment Test	The moment resistance shall be demonstrated while the test assembly is internally pressurized to the rated working pressure. Then a force was applied to the test assembly. There shall be no leakage, cracking, or fitting or coupling pull-off as a result of this test.
5	Hot Gasket Test	Standard gaskets shall be assembled to short lengths of pipe, and subjected to 275°F (135°C) for a duration of 45 days. After exposure, the test assembly shall be submerged in a water bath and subjected to an air under water leakage test from zero to 50 psi (0 to 345kPa) in order to evaluate for leakage. After the air under water testing is completed, the test assembly shall be disassembled and the gasket shall not crack when squeezed together from any two diametrically opposite points, or twisted into a figure-eight shape. The gasket shall then be visually inspected for signs of cracking, tearing, or excessive degradation as a result of this test.
6	Cold Gasket Test	The low temperature exposure shall consist of -40°F (-40°C) air exposure for 4 days. After exposure, the assembly while submerged in -40°F (-40°C) antifreeze, shall be pneumatically pressurized from 0 to 50 psi (0-345kPa). No leakage shall occur. The assembly shall be allowed to warm to ambient temperature and then be disassembled. The gasket, after removal from the assembly, shall not crack when squeezed together from any two diametrically opposite points, or twisted into a figure eight shape.
7	Flame test	The test shall be conducted in a room free from air draught., The test joint is mounted, U-bent on the test apparatus and filled with water. The angle corresponds to the angle documented as a result of the test Subsequently the test joint is drained. The fuel pan is placed centrally below the pipe joint Fuel is filled into the pan and the fuel is ignited. Burning times 5 min for nominal diameters < DN 100; 8 min for nominal diameters ≥ DN 100 For reducer couplings the dimension of the smaller nominal diameter shall apply for the determination of the burning time. The flame shall be extinguished immediately once the burning time has expired (5 min or 8 min) and the test joint shall be cooled down. For cooling the test joint is immediately sprayed with water until steam formation is no longer visible, but at least for 3 min. The test joint is then filled completely with water and exposed to a test pressure which corresponds to the maximum permissible pressure and is checked visibly for leaks. Water may leak in form of drop, however, not in form of flowing water or a water spray. The test joint is then pressure relieved ( force and internal pressure).
8	Cycling pressure Resistance (Water Hammer Test)	Prior to the cycling, assemblies shall be subjected to a hydrostatic strength test to the rated working pressure, 175 psi (1205Kpa) minimum, for a duration of 5 minutes. Without leakage or cracking. Assemblies shall then be subjected to 20,000 cycles from zero pressure to the rated working pressure, 175 psi (1205Kpa) minimum. After cycling, the test assembly shall be tested Hydrostatic Strength and maintain 5 minutes without leakage and cracking.
9	Friction Loss Determination	The construction and installation of the coupling or fitting shall be such that obstruction to the passage of water through the coupling or fitting body is minimal. The loss in pressure through the coupling or fitting shall not exceed 5.0 psi (35 kPa) at a flow producing a velocity of 20 ft/s (6.1 m/s) in Schedule 40 steel pipe of the same nominal diameter as the coupling or fitting.
10	Leakage test- Assembly without gasket	Leakage from a gasket-less coupling assembly or fitting shall not exceed that of an operating sprinkler head whose discharge coefficient (K-factor) is 5.3 to 5.8 gal/min(psi) <sup>1/2</sup> [76-84 L/min/(bar) <sup>1/2</sup> ]. This test is for nominal pipe sizes normally associated with over-head piping, less than or equal to 12 in. NPS (300 mm).
11	Flexibility Test for Flexible fittings	With the assembly pressurized to its rated pressure, a bending moment is to be applied to deflect the joint to the maximum angle specified by the manufacturer, while not less than 1 degree for nominal pipe diameters less than 8 inches (203.2mm) or 0.5 degrees for 8 inches (203.2mm) and larger.



		Observations are to be made for leakage or pipe damage.
12	Seismic Evaluation	In order to evaluate the use of grooved couplings in Earthquake zones 50 through 500 years, test assemblies utilizing flexible couplings and short lengths of steel pipe, in the same nominal size, will be subjected to cyclic testing. The test will deflect the assembly to the manufacturer's maximum recommended angle in the forward and reverse direction for a total 15 cycles with the internal pressure equal to the rated working pressure. There shall be no leakage, cracking, or rupture as a result of this test.
13	Lateral Displacement	The coupling shall not leak during any of the tests, within the manufacturer's stated limitations for angular deflection or lateral displacement of associated pipework.
14	Fire Test	If a gasket pipe coupling or fitting employs non-ferrous materials for its substantial structural components, or if in the judgment of FM Approvals, the design is otherwise suspect with respect to fire resistance, a fire test shall be conducted. A representative size assembled joint without a gasket shall be exposed to a 1000°F (538°C) fire environment for 5 minutes. The assembly shall be dry for the duration of this exposure. Immediately after the exposure, a water flow shall be introduced through the joint and sustained until the assembly is cool to the touch. No cracking or distortion of any component of the coupling or fitting shall occur. The coupling or fitting shall then be disassembled and the gasket installed. After reassembly, the joint shall be hydrostatically tested, as described in to the hydrostatic test.

—Quote from <GB5135.22-2006>