

JIS

JAPANESE INDUSTRIAL STANDARD

**Fiberglass reinforced
plastic mortar pipes**

JIS A 5350—1991

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**In the event of any doubt arising,
the original Standard in Japanese is to be final authority.**

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Fiberglass reinforced plastic mortar pipes

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1. Scope

This Japanese Industrial Standard specifies the fiberglass reinforced plastic mortar pipes, hereinafter referred to as the "pipes", used mainly for the water-way.

Remarks 1. The applicable standards to this Standard are given in the followings:

JIS K 6353-Rubber Goods for Water Works Service

JIS K 6919-Liquid Unsaturated Polyester Resin for Reinforced Plastics

JIS R 3412-Glass Roving

JIS S 6040-Adhesives for General Works

2. The units and numerical values given in { } in this Standard are in accordance with the International System of Units (SI), and are appended for informative reference.

Furthermore, the traditional units and numerical values in this Standard shall be changed to the SI units and numerical values from April 1, 1995.

2. Definitions

For the purposes of this standard, the following definitions apply:

- (1) internal pressure pipe The pipe designed for both internal and external pressures.
- (2) external pressure pipe The pipe designed for external pressure.
- (3) reference deflection In an external pressure test, the amount of deflection when an external pressure for reference deflection is judged.
- (4) external pressure for reference deflection In an external pressure test, the load when the reference deflection has been reached, and with which the rigidity of the pipe is judged.
- (5) test internal pressure In the internal pressure test of an internal pressure pipe, that internal pressure under which the pipe shall not leak water, and with which its internal pressure strength is judged.
- (6) test external pressure In the external pressure test of an external pressure pipe, that pressure under which its external pressure strength is judged.

- (7) rupture external pressure In an external pressure test of an external pressure pipe, that pressure under which its external pressure strength is judged.
- (8) effective length of pipe This means the practical length of the pipe when a pipe has been jointed with another pipe, and it is a subtracted value of this insertion allowance (P) of a socket from the total length of the pipe.

3. Types

The types of the pipes shall be classified by the division of internal pressure and external pressure, strengths and shapes ⁽¹⁾, and the relations of types and nominal diameters shall be as given in Table 1.

Furthermore, Type B, Type C and Type T in the shapes shall be applicable to those of the filament-winding molding method, and Type D to those of the centrifugal force molding method.

Note ⁽¹⁾ Shapes shall be classified as given in the following:

- (1) Type B That type which is so constructed that the rubber ring of the joint part is preliminarily adhered to the outer face of spigot part of a pipe by an adhesive.
- (2) Type C That type which is so constructed that the rubber ring of joint part is preliminarily adhered to the inner face of socket part of a pipe by an adhesive.
- (3) Type D That type which is so constructed that the rubber ring of joint part is preliminarily mounted in the grooves which have been provided on the inner face of socket part of a pipe
- (4) Type T That type which is so constructed that the rubber ring of joint part is mounted in the groove which has been provided on the inner face of socket pipe at the time of field setting.

Table 1. Types

Division by internal pressure and external pressure	Division by strength	Division by shapes			
		Type B (nominal diameter)	Type C (nominal diameter)	Type D (nominal diameter)	Type T (nominal diameter)
Internal pressure pipes	Class 1	500 to 3,000	200 to 2,400	200 to 2,400	500 to 3,000
	Class 2				
	Class 3				-
	Class 4				
	Class 5				
External pressure pipes	Class 1	200 to 3,000	200 to 2,400	200 to 2,400	-
	Class 2				

4. Qualities

4.1 Internal pressure pipes

4.1.1 Appearance The pipes shall be free from injurious flaws and the inner surfaces thereof shall be smooth.

4.1.2 Internal pressure strength The internal pressure strength of the pipe when subjected to the internal pressure test specified in 8.1, shall be such that no leakage of water could take place under the test internal pressure given in Table 2 or Table 3.

Table (Applicable until
March 31, 1995)

Unit: kgf/cm ² {MPa}	
Division by strength	Test internal pressure
Class 1	27 {2.6}
Class 2	21 {2.1}
Class 3	14 {1.4}
Class 4	10 {1.0}
Class 5	5 {0.5}

Table 3 (Applicable from
April 1, 1995)

Unit: MPa	
Division by strength	Test internal pressure
Class 1	2.6
Class 2	2.1
Class 3	1.4
Class 4	1.0
Class 5	0.5

4.1.3 External pressure strengths The external pressure strengths of the pipe shall be in accordance with the following external pressure for reference deflection and test external pressure.

- (1) External pressure for reference deflection In carrying out the external pressure test specified in 8.2, when the deflection has reached the reference deflection given in Table 4 or Table 5, the load which has been applied to the test specimen shall be not less than the external pressure value for reference deflection given in Table 4 or Table 5.
- (2) Test external pressure In carrying out the external pressure test specified in 8.2, the test specimen shall withstand the test external pressure value given in Table 4 or Table 5.

Table 4. External pressure strengths of internal pressure pipes
(Applicable until March 31, 1995)

Unit: kgf/m {kN/m}

Nominal diameter	Reference deflection (mm)	External pressures for reference deflection					Test external pressure				
		Class 1	Class 2	Class 3	Class 4	Class 5	Class 1	Class 2	Class 3	Class 4	Class 5
200	10	3 200{ 31.3 }	2 850{ 28.0 }	2 340{ 22.8 }	2 080{ 20.4 }	1 990{ 19.6 }	4 760{ 46.6 }	4 660{ 45.7 }	4 170{ 40.9 }	3 570{ 35.1 }	3 370{ 33.2 }
250	13	2 660{ 26.0 }	2 370{ 23.3 }	1 940{ 19.0 }	1 720{ 17.0 }	1 650{ 16.2 }	4 400{ 43.0 }	4 300{ 42.1 }	3 850{ 37.7 }	3 300{ 32.4 }	3 110{ 30.6 }
300	15	2 290{ 22.5 }	2 060{ 20.2 }	1 710{ 16.7 }	1 530{ 14.9 }	1 470{ 14.5 }	4 440{ 43.6 }	4 360{ 42.7 }	3 920{ 38.5 }	3 400{ 33.3 }	3 220{ 31.5 }
350	18	2 090{ 20.5 }	1 880{ 18.5 }	1 560{ 15.2 }	1 400{ 13.6 }	1 340{ 13.2 }	4 310{ 42.2 }	4 230{ 41.4 }	3 800{ 37.3 }	3 300{ 32.3 }	3 130{ 30.6 }
400	20	1 950{ 19.2 }	1 760{ 17.3 }	1 480{ 14.5 }	1 330{ 13.1 }	1 290{ 12.6 }	4 480{ 44.0 }	4 400{ 43.2 }	3 990{ 39.0 }	3 490{ 34.2 }	3 320{ 32.6 }
450	23	1 860{ 18.3 }	1 680{ 16.5 }	1 410{ 13.8 }	1 270{ 12.5 }	1 230{ 12.0 }	4 450{ 43.6 }	4 360{ 42.8 }	3 950{ 38.7 }	3 460{ 33.9 }	3 290{ 32.3 }
500	26	1 930{ 18.9 }	1 750{ 17.2 }	1 490{ 14.6 }	1 360{ 13.3 }	1 320{ 12.9 }	4 770{ 46.7 }	4 690{ 45.9 }	4 280{ 41.9 }	3 780{ 37.2 }	3 620{ 35.5 }
600	31	2 300{ 22.6 }	2 090{ 20.5 }	1 780{ 17.5 }	1 620{ 15.9 }	1 570{ 15.4 }	5 720{ 56.0 }	5 620{ 55.0 }	5 130{ 50.3 }	4 540{ 44.6 }	4 340{ 42.6 }
700	36	2 670{ 26.2 }	2 430{ 23.8 }	2 060{ 20.3 }	1 880{ 18.5 }	1 820{ 17.8 }	6 680{ 65.4 }	6 560{ 64.2 }	5 990{ 58.7 }	5 290{ 52.0 }	5 060{ 49.7 }
800	41	3 040{ 29.9 }	2 770{ 27.1 }	2 350{ 23.1 }	2 140{ 21.0 }	2 070{ 20.3 }	7 630{ 74.7 }	7 500{ 73.4 }	6 840{ 67.1 }	6 050{ 59.5 }	5 790{ 56.8 }
900	46	3 410{ 33.5 }	3 100{ 30.4 }	2 640{ 25.9 }	2 400{ 23.6 }	2 330{ 22.8 }	8 580{ 84.1 }	8 440{ 82.6 }	7 700{ 75.5 }	6 810{ 66.9 }	6 510{ 63.9 }
1 000	51	3 780{ 37.2 }	3 440{ 33.7 }	2 920{ 28.7 }	2 670{ 26.1 }	2 580{ 25.3 }	9 540{ 93.4 }	9 370{ 91.7 }	8 550{ 83.9 }	7 560{ 74.3 }	7 230{ 71.0 }
1 100	56	4 160{ 40.8 }	3 780{ 37.0 }	3 210{ 31.5 }	2 930{ 28.7 }	2 830{ 27.8 }	10 500{ 103 }	10 300{ 101 }	9 410{ 92.2 }	8 320{ 81.8 }	7 960{ 78.1 }
1 200	61	4 530{ 44.4 }	4 120{ 40.3 }	3 500{ 34.4 }	3 190{ 31.3 }	3 090{ 30.2 }	11 400{ 112 }	11 200{ 110 }	10 300{ 101 }	9 080{ 89.2 }	8 680{ 85.2 }
1 350	69	5 120{ 50.3 }	4 650{ 45.6 }	3 960{ 38.9 }	3 610{ 35.4 }	3 490{ 34.2 }	12 900{ 126 }	12 700{ 124 }	11 500{ 113 }	10 200{ 100 }	9 770{ 95.9 }
1 500	77	5 710{ 56.1 }	5 190{ 50.9 }	4 420{ 43.4 }	4 030{ 39.5 }	3 900{ 38.2 }	14 300{ 140 }	14 100{ 138 }	12 800{ 126 }	11 300{ 111 }	10 900{ 107 }
1 650	84	6 230{ 61.2 }	5 670{ 55.5 }	4 820{ 47.3 }	4 390{ 43.1 }	4 250{ 41.6 }	15 700{ 154 }	15 500{ 151 }	14 100{ 138 }	12 500{ 123 }	11 900{ 117 }
1 800	92	6 830{ 67.0 }	6 210{ 60.8 }	5 280{ 51.8 }	4 810{ 47.2 }	4 660{ 45.6 }	17 200{ 168 }	16 900{ 165 }	15 400{ 151 }	13 600{ 134 }	13 000{ 128 }
2 000	102	7 570{ 74.3 }	6 880{ 67.4 }	5 850{ 57.5 }	5 330{ 52.3 }	5 160{ 50.6 }	19 100{ 187 }	18 700{ 183 }	17 100{ 168 }	15 100{ 149 }	14 500{ 142 }
2 200	112	8 310{ 81.6 }	7 560{ 74.0 }	6 420{ 63.1 }	5 860{ 57.4 }	5 670{ 55.5 }	21 000{ 205 }	20 600{ 202 }	18 800{ 184 }	16 600{ 164 }	15 900{ 156 }
2 400	122	9 050{ 88.9 }	8 230{ 80.7 }	7 000{ 68.7 }	6 380{ 62.5 }	6 170{ 60.5 }	22 900{ 224 }	22 500{ 220 }	20 500{ 201 }	18 200{ 178 }	17 400{ 170 }
2 600	133	9 870{ 96.9 }	8 970{ 87.9 }	7 630{ 74.9 }	6 950{ 68.2 }	6 730{ 65.9 }	24 800{ 243 }	24 400{ 239 }	22 200{ 218 }	19 700{ 193 }	18 800{ 185 }
2 800	143	10 600{ 104 }	9 650{ 94.5 }	8 200{ 80.5 }	7 480{ 73.3 }	7 240{ 70.9 }	26 700{ 262 }	26 200{ 257 }	23 900{ 235 }	21 200{ 208 }	20 300{ 199 }
3 000	153	11 400{ 111 }	10 300{ 101 }	8 770{ 86.2 }	8 000{ 78.4 }	7 740{ 75.9 }	28 600{ 280 }	28 100{ 275 }	25 700{ 252 }	22 700{ 223 }	21 700{ 213 }