

JIS G3446 Stainless steel pipes for machine and structural purposes

1. Scope

This Japanese Industrial Standard specifies the stainless steel pie (hereafter referred to as "pipes") used for machinery, automobiles, bicycles, furniture, apparatus, other mechanical parts and structures.

2. The standards cited in this Standard are shown in Attached Table 1.

6. Sectional Shape and Dimensions of Pipe and Section

6.1 Sectional Shape and Dimensions of Circular Type 1

6.1.1 The dimensions of the circular type 1 pipe shall be as given in Table 4.

Table 4 Dimensions of Circular Type 1 Pipe Unit: mm

Symbol	Nominal dia. D	Plate thickness t				
		1.6	2.0	2.7	3.2	4.0
SCP 1R	400	O	O	O	O	O
	600	O	O	O	O	O
	800	O	O	O	O	O
	1000	O	O	O	O	O
	1200	O	O	O	O	O
	1350	O	O	O	O	O
	1500	O	O	O	O	O
	1650	O	O	O	O	O
	1800	O	O	O	O	O

Remark

The plate thickness indicates the thickness of the original plate before plating.

6.1.2 The sectional shape and dimensions of the circular type 1 section shall be as given in Table 5.

Table 5 Sectional Shape and Dimensions of Circular Type 1 Section Unit: mm

Symbol	Dimensions						
	Corrugation pitch <i>P</i>	Corrugation height <i>H</i>	Bend radius of corrugation <i>r</i>	Effective length <i>L</i>	Flange length <i>f</i>	Hole position in axial direction <i>g</i>	Lap allowance in axial direction <i>l</i>
SCP 1R	68.0	13.0	17.5	612	55	25	19
				1020			

6.1.3 The number of bolt holes of the circular type 1 section shall be as given in Table 6.

Table 6 Number of Bolt Holes of Circular Type 1 Section

Nominal diameter of section D	Number of bolt, holes		Help patch in circumferential direction mm
	Axial direction	Circumferential direction (both sides)	
400	1 per pitch of corrugation	None	-
600		None	-
800		None	-
1000		None	-
1200		8	500
1350		8	500
1500		10	500
1650		10	500
1800		10	500

6.2 Sectional Shape and Dimensions of Circular Type 1 S

6.2.1 The sectional shape and dimensions of the circular type 1 S pipe shall be as given in Tables 7 and 8.

Table 7 Dimensions of Circular Type 1 S Pipe Unit: mm

Symbol	Nominal dis. D	Plate thickness <i>t</i>				Length L
		1.6	2.0	2.7	3.2	
SCP 1RS	300	0	0	-	-	Specified length from 4000 to
	400	0	0	-	-	

	450	O	O	-	-	6000 incl.
	600	O	O	O	-	
	800	O	O	O	-	
	1000	O	O	O	O	
	1200	O	O	O	O	
	1350	O	O	O	O	
	1500	O	O	O	O	
	1650	O	O	O	O	
	1800	O	O	O	O	

Remark

The plate thickness indicates the thickness of the original plate before plating.

Table 8 Sectional Shape and Dimensions of Circular 1 S Pipe Unit: mm

Symbol	Dimensions		
	Corrugation pitch	Corrugation height	Bend radius of corrugation r
	P	H	
SCP 1RS	68.0	13.0	17.5

6.2.2 The sectional shape and dimensions of the coupling band to be used for the circular type 1 S pipe shall be as given in Table 9.

Table 9 Sectional Shape and Dimensions of Coupling Band Used for Circular Type 1 S Pipe Unit: mm

Symbol	Plate thickness and width of band	Nominal dia. of pipe D	300	400	450	600	800	1000	1200	1350	1500	1650	1800		
D-1	Plate thickness t		1.6					-							
	Width W		270					-							
D-2	Plate thickness t		-					2.0					2.7		
	Width W		-					410					410		
S-1	Plate thickness t		1.6,2.0			1.6,2.0,2.7		1.6,2.0,2.7,3.2							
	Width W		410			410		410							
S-2	Plate thickness t		-										3.2		

	Width W	-	410
--	---------	---	-----

6.3 Sectional Shape and Dimensions of Circular Type 2

6.3.1 The dimensions of the circular type 2 shall be as given in Table 10.

Table 10 Dimensions of Circular Type 2 Pipe and Number of Sections Forming Pipe Unit: mm

Symbol	Plate thickness	Plate thickness t							Number of sections forming pipe (example)		
	D	2.7	3.2	4.0	4.5	5.3	6.0	7.0	9pitches	6pitches	3pitches
SCP 2R	1500	0	0	0	0	0	0	0	-	2	2
	1750	0	0	0	0	0	0	0	-	3	1
	2000	0	0	0	0	0	0	0	-	4	-
	2500	0	0	0	0	0	0	0	2	2	-
	3000	0	0	0	0	0	0	0	4	-	-
	3500	0	0	0	0	0	0	0	2	4	-
	4000	0	0	0	0	0	0	0	4	2	-
	4500	0	0	0	0	0	0	0	6	-	-
	5000	0	0	0	0	0	0	0	4	4	-
	6000	0	0	0	0	0	0	0	8	-	-
	7000	0	0	0	0	0	0	0	8	2	-
	8000	0	0	0	0	0	0	0	8	4	-
	9000	0	0	0	0	0	0	0	12	-	-
	10000	0	0	0	0	0	0	0	12	2	-
	11000	0	0	0	0	0	0	0	12	4	-
	12000	0	0	0	0	0	0	0	16	-	-
13000	0	0	0	0	0	0	0	16	2	-	
14000	0	0	0	0	0	0	0	16	4	-	
15000	0	0	0	0	0	0	0	20	-	-	

Remark

The plate thickness indicates the thickness of the original plate before plating.

6.3.2 The sectional shape and dimensions of the circular type 2 section shall be as given in Table 11.

Table 11 Sectional Shape and Dimensions of Circular Type 2 Section Unit:mm

Symbol	Dimensions						
	Corrugation pitch <i>P</i>	Corrugation height <i>H</i>	Bend radius of corrugation <i>r</i>	Effective length <i>L</i>	Lap allowance in axial direction <i>l</i>	Lap allowance in circumferential direction	
						<i>g1</i>	<i>g2</i>
SPC 2R	150.0	48.0	28.0	450	50	35	50
				600			
				750			
	150.0	50.0	28.0	900			
				1050			
			1200				

Remarks

1. O mark indicates the positions of bolt holes. However, ≤ mark indicates the position of bolr holes to be provided in addition when the plate thickness is 6.0mm or 7.0mm.
2. The distances *g1* and *g2* and the distance between holes (262 mm) in the circumferential direction shall be the dimension before corrugation.
3. Number *n* shall be 3, 6 and 9 and referred to as 3 pitches, 6 pitches and 9 pitches.
4. Dimension *a* (length of chord) and dimension *b* (effective circumference) shall be calculated from the following formula.

where *r1* shall be as follows

Circular type: $D/2$

Elongation type: r_1, r_2, r_3

Pipe arch type: r_1, r_2, r_3

Arch type: r_s

6.3.3 The number of bolt holes of the circular type 2 section shall be as given in Table 12.

Table 12 Number of Bolt Holes of Circular Type 2 Section

Plate thickness of section <i>t</i> mm	Number of bolt holes	
	Axial direction	Circumferential direction
5.3 max.	Not less than 2 per corrugation pitch	1 per 262 mm
6.0 min.	Not less than 3 per corrugation pitch	1 per 262 mm

6.4 Sectional Shape and Dimensions of Circular Types 3 S

6.4.1 The sectional shape and the dimensions of the circular type 3 S pipe shall be as given in Tables 13 and 14.

Table 13 Dimensions of Circular Type 3 S Pipe

Symbol	Nominal dia. D	Plate thickness t				Length L
		1.6	2.0	2.7	3.2	
SCP 3RS	900	O	O	O	O	Specified length from 4000 to 6000 inch.
	1000	O	O	O	O	
	1200	O	O	O	O	
	1350	O	O	O	O	
	1500	O	O	O	O	
	1650	O	O	O	O	
	1800	O	O	O	O	
	2000	O	O	O	O	
	2200	O	O	O	O	
	2400	O	O	O	O	

Remark

The plate thickness indicates the thickness of the original plate before plating.

Table 14 Sectional Shape and Dimensions of Circular Type 3 S Pipe Unit: mm

Symbol	Dimensions		
	Corrugation pitch P	Corrugation height H	Bend radius of corrugation r
	SCP 3RS	76.2	25.4

6.4.2 The sectional shape and dimensions of the coupling band to be used for the circular type 3 S pipe shall be as given in Table 15.

Table 15 Sectional Shape and Dimensions of Coupling Band to Be Used for Circular Type 3 S Pipe Unit: mm

Symbol	Plate thickness and width of band	Nominal dia. of pipe D	900	1000	1200	1350	1500	1650	1800	2000	2200	2400	
S-3	plate thickness t		1.6, 2.0, 2.7, 3.2						-				
	Width W		460						-				

S-4	plate thickness t	-	3.2
	Width W	-	460

6.5 Sectional Shape and Dimensions of Elongation Type

6.5.1 The dimensions of the elongation type shall be as given in Table 16. However, the sectional shape and dimensions of the section and the number of holes of the section shall be as given in Tables 11 and 12.

Table 16 Dimensions of Elongation Type and Number of Sections Forming Pipe Unit: mm

Symbol	Nominal dia. D	Span S	Rise R	Radius			Plate thickness t							Number of sections forming pipe (example)											
				r1	r2	r3	2.7	3.2	4.0	4.5	5.3	6.0	7.0	9pitches			6pitches			3pitches					
														r1	r2	r3	r1	r2	r3	r1	r2	r3			
SCP 2E	1500	1405	1575	680	947	680	0	0	0	0	0	0	0	0	0	0	-	-	-	1	-	1	-	2	-
	1750	1668	1839	705	979	804	0	0	0	0	0	0	0	0	0	0	-	-	-	-	2	1	1	-	-
	2000	1898	2100	892	1140	892	0	0	0	0	0	0	0	0	0	0	-	-	-	1	2	1	-	-	-
	2500	2317	2625	1092	1385	1092	0	0	0	0	0	0	0	0	0	0	-	2	-	1	-	1	-	-	-
	3000	2846	3150	1338	1710	1338	0	0	0	0	0	0	0	0	0	1	2	1	-	-	-	-	-	-	-
	3500	3333	3675	1540	1953	1540	0	0	0	0	0	0	0	0	1	-	1	-	4	-	-	-	-	-	-
	4000	3844	4200	1645	2157	1645	0	0	0	0	0	0	0	0	-	4	-	1	-	1	-	-	-	-	-
	4500	4305	4725	1925	2460	1925	0	0	0	0	0	0	0	0	1	4	1	-	-	-	-	-	-	-	-

Remark

The plate thickness indicates the thickness of the original plate before plating.

6.6 Sectional Shape and Dimensions of Pipe Arch Type

6.6.1 The dimensions of the pipe arch type shall be as given in Table 17. However, the sectional shape and dimensions of the section and the number of bolt holes of the section shall be as given in Table 11 and 12.

Table 17 Dimensions of Pipe Arch Type and Number of Sections Forming Pipe Unit: mm

Symbol	Nominal dia. D	Span S	Rise R	Bottom depth B	C	Radius			Plate thickness t							Number of sections forming pipe (example)									
						r1	r2	r3	2.7	3.2	4.0	4.5	5.3	6.0	7.0	9pitches			6pitches			3pitches			
																r1	r2	r3	r1	r2	r3	r1	r2	r3	
SCP 2P	1500	1500	810	662	947	1057	1446	530	0	0	0	0	0	0	0	0	1	-	-	-	1	-	-	-	2

2000	2000	1060	624	1231	1160	2588	530	O	O	O	O	O	O	O	-	-	-	2	1	-	-	-	2
2500	2500	1310	777	1641	1463	2018	530	O	O	O	O	O	O	O	-	1	-	2	-	-	-	-	2
3000	3000	1560	711	1917	1529	3157	530	O	O	O	O	O	O	O	1	1	-	1	-	-	-	-	2
3500	3500	1810	813	2611	1914	3684	530	O	O	O	O	O	O	O	2	-	-	-	2	-	-	-	2
4000	4000	2060	925	3309	2312	4191	530	O	O	O	O	O	O	O	1	1	-	2	1	-	-	-	2
4500	4500	2310	1045	4009	2720	4688	530	O	O	O	O	O	O	O	2	2	-	1	-	-	-	-	2
5000	5000	2560	1171	4710	3138	5176	530	O	O	O	O	O	O	O	3	1	-	-	2	-	-	-	2

Remark

The plate thickness indicates the thickness of the original plate before plating.

6.7 Sectional Shape and Dimensions of Arch Type

6.7.1 The dimensions of the arch type shall be as given in Table 18. However, the sectional shape and dimensions of the section and the number of bolt holes of the section shall be as given in Tables 11 and 12.

Table 18 Dimensions of Arch Type and Number of Sections Forming Pipe

Symbol	Nominal dia. D	Span S	Rise R	Plate thickness t							Number of sections forming arch (example)		
				2.7	3.2	4.0	4.5	5.3	6.0	7.0	9pitches	6pitches	3pitches
SCP 2P	1500	1500	810	O	O	O	O	O	O	O	-	1	1
	2000	2000	1060	O	O	O	O	O	O	O	-	2	-
	2500	2500	1310	O	O	O	O	O	O	O	1	1	-
	3000	3000	1560	O	O	O	O	O	O	O	-	3	-
	3500	3500	1810	O	O	O	O	O	O	O	1	2	-
	4000	4000	2060	O	O	O	O	O	O	O	2	1	-
	4500	4500	2310	O	O	O	O	O	O	O	3	-	-
	5000	5000	2560	O	O	O	O	O	O	O	2	2	-
	5500	5500	2810	O	O	O	O	O	O	O	3	1	-
	6000	6000	3060	O	O	O	O	O	O	O	2	3	-
6500	6500	3310	O	O	O	O	O	O	O	3	2	-	

	7000	7000	3560	O	O	O	O	O	O	O	4	1	-
--	------	------	------	---	---	---	---	---	---	---	---	---	---

Remark

The plate thickness indicates the thickness of the original plate before plating

World Standard Comparative Table

KS		ASTM		JIS		DIN		BS	
NUMBER	GRADE	NUMBER	GRADE	NUMBER	GRADE	NUMBER	GRADE	NUMBER	GRADE
D 3536	STS430TKA	A511	MT430	G3446	SUS430TKA	17455 17456	X6Cr 17	-	-
	STS430TKC	A511	MT430		SUS430TKC	-	-	-	-
	STS304TKA	A511	MT304		SUS304TKA	17455 17456	X5Cr Ni 1810	3014	Gr 1
	STS304TKB	-	-		SUS304TKB	-	-	-	-
	STS304TKC	A511	MT304		SUS304TKC	-	-	-	-
	STS304TKA	A511	MT316		SUS316TKA	17455 17456	X5Cr Ni Mo17122	3014	Gr 6
	STS304TKB	-	-		SUS316TKB	-	-	-	-
	STS316TKC	A511	MT316		SUS316TKC	-	-	-	-
	STS321TKA	A511	MT321		SUS321TKA	17455 17456	X6Cr Ni Ti 1810	6323	LW 18
	STS321TKB	-	-		SUS321TKB	-	-	-	-
	STS347TKA	A511	MT347		SUS347TKA	17455 17456	X6Cr Ni Nb1810	-	-
	STS347TKB	-	-		SUS347TKB	-	-	-	-
	STS410TKA	A511	MT410		SUS410TKA	17456	X10Cr 13	-	-
	STS410TKB	-	-		SUS410TKB	-	-	-	-
	STS410TKC	A511	MT410		SUS410TKC	-	-	-	-
	STS420J1TKA	-	-		SUS420J1TKA	-	-	-	-
	STS420J2TKA	-	-		SUS420J2TKA	-	-	-	-

			MT302						
			MT303Se						
			MT304L						
			MT305L						
			MT309S						
			MT310S						
			MT316L						
			MT317						
			MT403						
			MT410						
			MT414						
			MT416Se						
			MT431						
			MT440A						
			MT405						
			MT443						
			MT446-1						
			MT446-2						
			29-4						
			29-4-2						

3. Grade and symbol

Pipes shall be classified into 12 grades, and their symbols shall be as given in Table 1.

4. Method of manufacture

5. Chemical composition

6. Mechanical properties

7. Tolerances on dimensions

7.1 The dimensional tolerances on the circular type 1, circular type 2, elongation type, pipe arch type and arch type sections shall be as given in Table 19.

Table 19 Dimensional Tolerances on Circular Type 1, Circular Type 2, Elongation Type, Pipe Arch Type and Arch Type Sections

8. Appearance

The appearance shall be as follows.

- a) The pipes shall be practically straight, and their two ends shall be at right angles to the axis of the pipes.
- b) The pipes shall be free from defects detrimental to practical use.
- c) When particularly requested by the purchaser, the surface finishing of pipes shall be subjected to the agreement between the purchaser and supplier.

9. Tests

10. Inspection

10.1 Inspection

The inspection shall be as follows

- 1) General matters for inspection shall be as specified in JIS G 0303.
- 2) The chemical composition shall conform to the requirements specified in 4.
- 3) The mechanical properties shall conform to the requirements specified in 5.
- 4) The dimensions shall conform to the requirements specified in 6.
- 5) The appearance shall conform to the requirements specified in 7.
- 6) The purchaser may specify a flaring test, a hydraulic test, etc. in addition to the inspection items specified in (2) to (5). In this acceptance criteria shall previously be agreed upon between the purchaser and supplier.

10.2 Reinspection

The pipe may be retested in accordance with 4.4 of JIS G 0303.

11. Marking

Each pipe having passed the inspection shall be legibly marked with the following items. The order of arranging the items is not specified, In this case of small pipes or with a request from the purchaser, however, pipes may be bundled and be marked for each bundle by a suitable means.

Further, when approved by the purchaser, a part of the items may be omitted.

- (1) Symbol of grade

