

## 10.5 Flanged Connections acc. to JIS B 2220/2239

There are two main standards covering flanges according to Japanese JIS (Japanese Industrial Standard) standards:

JIS B 2220 edition 2004: steel flanges  
 JIS B 2239 edition 2004: cast iron flanges

JIS B 2220 and JIS B 2239 contain dimensions as well as pressure temperature ratings.

Please note that the Korean Standard (KS) is identical to JIS.

### 10.5.1 Pressure/Temperature Ratings acc. to JIS B 2220/2239

#### Overview of materials and their groups

LESER standard materials		
Material	Material group	Further materials of material group
SA 395	D1	JIS B 8270 FCD-S (1) JIS G 5502 FCD 350 JIS G 5502 FCD 400 JIS G 5502 FCD 450 ISO 1083 350-22 ISO 1083 400-15 ISO 1083 450-10
SA 105 SA 216 Gr. WCB	1.1	JIS G 3101 SS 400 JIS G 4051 S 20 C JIS G 4051 S 25 C JIS G 3201 SF 390A JIS G 3202 SFVC 1 JIS G 3201 SF 440A JIS G 3202 SFVC 2A JIS G 5101 SC410 JIS G 5151 SCPH 1 JIS G 5101 SC 480 JIS G 5151 SCPH 11 ISO 9328-2 PH 290 ISO 9328-2 PH 315 ISO 9328-2 PH 355 ISO 2604-1 F13 ISO 2604-1 F18 ISO 2604-1 F72 ISO 4991 C26-52H SA 515 70 SA 516 70 SA 537 CL1 SA 350 LF2
SA 217 Gr. WC6	1.9	ISO 4991 C32H A 387 11 CL2 SA 182 F11 CL2 SA 182 F12 CL2
SA 351 Gr. CF8M	2.2	JIS G 4304 SUS 316 JIS G 4305 SUS 316 JIS G 3214 SUS F316 JIS G 5121 SCS 14A JIS G 5121 SCS 16A ISO 9328-5 X 5 CrNiMo 17 12 ISO 9328-5 X 7 CrNiMo 17 12 ISO 2604-1 F62 ISO 2604-1 F64 ISO 4991 C57 ISO 4991 C60 ISO 4991 C61 ISO 4991 C61LC SA 240 316 SA 240 316H SA 20 317 SA 182 F316 SA 182 F316H
SA 479 Gr. 316L	2.3	JIS G 4304 SUS304L JIS G 4305 SUS304L JIS G 3214 SUS F304L JIS G 4304 SUS316L JIS G 4305 SUS316L JIS G 3214 SUS F316L ISO 9328-5 X 2 CrNi 18 10 ISO 9328-5 X 2 CrNiMo 17 12 ISO 9328-5 X 2 CrNiMo 17 13 ISO 2604-1 F46 ISO 2604-1 F59 SA 240 304L SA 182 F304L

Table 10.5.1-1: JIS – material groups

## Overview of materials and their groups

Further materials in standard which are not used by LESER generally		
Material group	Further materials of material group	
G1 (2)		SA 126 A
G2	JIS G 5501 FC 200	ISO 185 200 SA 126 B
G3	JIS G 5501 FC 250	ISO 185 250
D2 (2)		ISO 2531 400-5 ISO 1083 600-3
M1	JIS G 5705 FCMB 27-05	ISO/DIS 5922 BF 27-05 ISO/DIS 5922 BF 30-06
M2	JIS G 5705 FCMB 35-10 JIS G 5705 FCMB 35-10S (1)	SA 47 32510 ISO/DIS 5922 BF 35-10
1.3	JIS G 3203 SFVA F1	JIS G 5151 SCPH 11
1.5	JIS G 3203 SFVA F11A JIS G 5151 SCPH 21	A 204 A A 204 B A 182 F1 A 217 WC1 A 352 LC1 ISO 9328-2 16 Mo 3 ISO 2604-1 F28 ISO 4991 C28H

Table 10.5.1-2: JIS – material groups (continued)

### Notes:

- (1) Impact values need not to be considered unless the impact value specified in the material standard requires to be satisfied by the regulation applied
- (2) The material group symbols G1 and D2 are shown as information to indicate the configuration of the material group. The numerals of the mechanical properties indicates in ( ) are based on the corresponding standard.

### Divisions

JIS B 2220 distinguishes between Division I, II and III depending on the type and size of flange. Division II is the rating with some limitations put on that of Division I, while Divisions III is the rating with further limitations put on that of Division II.

For flange type WN (welding neck) and IT (integral) generally Division I applies. Therefore only pressure/temperature ratings for Division I are listed in this section of ENGINEERING. The only exemption in the scope of this section is material group: 2.3 (SA 479 Gr. 316L) where Division II applies for JIS 16K and flanges sizes > DN 200, see Table 10.5.1-8.

## Pressure/temperature ratings acc. to JIS B 2220/2239

Material group: D1 (SA 395)

	Maximum temperature [°C]				
	-10	120	220	300	350
<b>Class</b>	<b>Maximum pressure [bar]</b>				
10K	14	14	12	10	-
16K	22	22	20	18	16
20K	28	28	25	23	20

Table 10.5.1-3: Pressure/temperature ratings acc. to JIS B 2239 – D1

Material group: 1.1 (SA 216 Gr. WCB)

	Maximum temperature [°C]									
	T <sub>L</sub> to 120	120	220	300	350	400	425	450	475	490
<b>Class</b>	<b>Maximum pressure [bar]</b>									
10K	14	14	12	10	-	-	-	-	-	-
16K	27	27	25	23	21	18 <sup>(9)</sup>	16 <sup>(9)</sup>	-	-	-
20K	34	34	31	29	26	23 <sup>(9)</sup>	20 <sup>(9)</sup>	-	-	-
30K	51	51	46	43	39	34 <sup>(9)</sup>	30 <sup>(9)</sup>	-	-	-

Table 10.5.1-4: Pressure/temperature ratings acc. to JIS B 2220 – 1.1

Material group: 1.1 (SA 216 Gr. WCB)

	Maximum temperature [°C]											
	T <sub>A</sub> to 120	120	220	300	350	400	425	450	475	490	500	510
<b>Class</b>	<b>Maximum pressure [bar]</b>											
40K	68	68	62	57	52	46 <sup>(14)</sup>	40 <sup>(14)</sup>	-	-	-	-	-
63K	107	107	97	90	81	72 <sup>(14)</sup>	63 <sup>(14)</sup>	-	-	-	-	-

Table 10.5.1-5: Pressure/temperature ratings acc. to JIS B 2220 Annex 6 – 1.1

Material group: 2.2 (SA 351 Gr. CF8M)

	Maximum temperature [°C]										
	T <sub>L</sub> to 120	120	220	300	350	400	425	450	475	490	
<b>Class</b>	<b>Maximum pressure [bar]</b>										
10K	14	14	12	10	-	-	-	-	-	-	
16K	27	27	25	23	21	18	16	-	-	-	
20K	34	34	31	29	26	23	20	-	-	-	
30K	51	51	46	43	39	38	36	34 <sup>(11)</sup>	32 <sup>(11)(12)</sup>	30 <sup>(11)(12)</sup>	

Table 10.5.1-6: Pressure/temperature ratings acc. to JIS B 2220 – 2.2

Material group: 2.3 (SA 479 Gr. 316L) – Division I  
(≤ DN 200)

	Maximum temperature [°C]									
	T <sub>L</sub> to 120	120	220	300	350	400	425	450	475	490
Class	Maximum pressure [bar]									
10K	14	14	12	10	-	-	-	-	-	-
16K	27	27	25	23	21	18	16	-	-	-
20K	34	34	31	29	26	23	20	-	-	-
30K	51	51	46	43	39	38	36	34 <sup>(13)</sup>	-	-

Table 10.5.1-7: Pressure/temperature ratings acc. to JIS B 2220 – 2.3

Material group: 2.3 (SA 479 Gr. 316L) – Division II  
(> DN 200)

	Maximum temperature [°C]									
	T <sub>L</sub> to 120	120	220	300	350	400	425	450	475	490
Class	Maximum pressure [bar]									
16K	16	16	16	15	14	13	13	-	-	-

Table 10.5.1-8: Pressure/temperature ratings acc. to JIS B 2220 – 2.3

### General notes:

- (1) T<sub>L</sub> is a minimum working temperature which is the normal temperature or below. The minimum working temperature lower than the normal temperature shall be subjected to the agreement between the parties concerned.  
T<sub>A</sub> is the normal temperature.

### Notes:

- (9) Not applicable to JIS G 5101 SC 480 of material group 002 and ASTM SA 537 CLI and ISO 9328-2 PH355 of material group 1.1  
 (11) Not applicable to ASTM SA 351 CF3 and ISO 4991 C46 of material group 021b and 2.1  
 (12) Not applicable to ASTM SA 351 CF3M of material group 022b and 2.2, ISO 4991 C57, ISO 4991 C60, ISO 4991 C61 and ISO 4991 C61LC  
 (13) Not applicable to ASTM SA 240 304L of material group 023a and 2.3, ASTM A 182 F304L and ISO 9328-5 X 2CrNi 1810  
 (14) Not to be applied to SC 480 of material group 002