

CORROSION RESISTANT FLANGES PRESSURE-TEMPERATURE RATINGS

This flange rating data is reprinted by permission of the American National Standards Institute from ANSI B16.5. See that Standard for complete listings.

Attention is directed to the following considerations when using these ratings:

1. The ratings apply to:
 - a) Ring joint facing.
 - b) Small tongue and groove facing with any type gasket.
 - c) Large tongue and groove facing with any type gasket, except flat solid metal.
 - d) Any other facing and gasket combination that results in a bolt load or flange moment no greater than for a), b), or c) above.
2. Temperatures used in establishing these ratings are the temperatures inside the pressure retaining structure.
3. Use of these ratings requires gaskets conforming to the limiting dimensions set forth in MSS SP-47. Care should be taken to select gaskets of dimensions and materials suitable for service conditions and able to withstand required bolt loading without injurious crushing.
4. Ratings shown are the maximum, non-shock pressures (psig) at the tabulated temperature and may be interpolated between the temperatures shown.

Material Group No.	Nominal Designation Steel	Forgings		Plates	
		Spec.-Gr	Notes	Spec.-Gr	Notes
2.1	18Cr-8Ni	A182-F304	(4)	A240-304	(4) (5)
		A182-F304H			
	18CR-8Ni				
2.2	16CR-12Ni-2Mo	A182-F316	(4)	A240-316	(4) (5)
		A182-F316H			
	18Cr-13Ni-3Mo			A240-317	(4) (5)
	18Cr-9Ni-2Mo				
2.3	18Cr-8Ni	A182-F304L	(8)	A240-304L	(8)
	16Cr-12Ni-2Mo	A182-F316L	(9)	A240-316L	(9)
2.4	18Cr-10Ni-Ti	A182-F321	(4)	A240-321	(4) (5)
		A182-F321H		A240-321H	(5)
2.5	18Cr-10Ni-Cb	A182-F347	(4)	A240-321	(4) (5)
		A182-F347H		A240-321H	(5)
		A182-F348	(4)	A240-348	(4) (5)
		A182-F348H		A240-348H	(5)
2.6	25Cr-12Ni				
	23Cr-12Ni			A240-309S	(4) (5)
2.7	25Cr-20Ni	A182-F310	(4) (7)	A240-310S	(4) (7)

Notes:

1. Materials shall not be used beyond the limits specified in the governing Code.
2. Class 150 lb. flanges are not rated above 1000°F.
3. Plate materials are listed only for use as blind flanges (see ANSI B16.5, par. 5.1). Additional plate materials listed in ANSI B16.34 may also be used, with corresponding B16.34 Standard class ratings.
4. At temperatures over 1000°F (540°C), use only when the carbon content is 0.04 percent or higher.
5. For temperatures above 1000°F (540°C), use only if the material is heat treated by heating it to a temperature of at least 1900°F (1040°C) and quenching in water or rapidly cooling by other means.
6. For service temperature above 850°F (455°C), it is recommended that killed steels containing not less than 0.10 percent residual silicon be used.
7. For service temperatures of 1050°F (566°C) and above, assurance must be provided that grain size is not finer than ASTM No. 6.
8. Not to be used over 800°F.
9. Not to be used over 850°F.

Mat'l Group	Class 150 (2)						
	2.1	2.2	2.3	2.4	2.5	2.6	2.7
	Type 304	Type 316	Type 304L	Type 321	Types 347, 348	Type 309	Type 310
Temp, °F			Type 316L				
-20 to 100	275	275	230	275	275	260	
200	235	240	195	235	245	230	
300	205	215	175	210	225	220	
400	180	195	160	190		200	
500		170	145			170	
600		140	140			140	
650		125	125			125	
700		110	110			110	
750		95	95			95	
800		80	80			80	
850		65	65			65	
900		50				50	
950		35				35	
1000		20				20	

PRESSURE TEMPERATURE RATINGS

Mat'l Group	Class 300							Class 400							Class 600							
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	
Materials	Type 304	Type 316	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310	Type 304	Type 316	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310	Type 304	Type 316	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310	
Temp °F																						
100	720	720	600	720	720	670		960	960	800	960	960	895		1440	1440	1200	1440	1440	1345		
200	600	620	505	610	635	605		800	825	675	815	850	805		1200	1240	1015	1220	1270	1210		
300	530	560	455	545	590	570		705	745	605	725	785	760		1055	1120	910	1090	1175	1140		
400	470	515	415	495	555	535		630	685	550	660	740	710		940	1030	825	990	1110	1065		
500	435	480	380	460	520	505		585	635	510	610	690	670		875	955	765	915	1035	1010		
600	415	450	360	435	490	480		555	600	480	585	655	635		830	905	720	875	985	955		
650	410	445	350	430	480	465		545	590	470	570	640	620		815	890	700	855	960	930		
700	405	430	345	420	470	455		540	575	460	560	625	610		805	865	685	840	935	910		
750	400	425	335	415	460	445		530	565	450	555	615	595		795	845	670	830	920	895		
800	395	415	330	415	455	435		525	555	440	550	610	580		790	830	660	825	910	870		
850	390	405	320	410	445	425		520	540	430	545	590	565		780	810	645	815	890	850		
900	385	395		405	430	415		510	525		540	575	555		770	790		810	865	830		
950	375	385		385	385	385		500	515		515	515	515		750	775		775	775	775		
1000	325	365		355	365	335	350	430	485		475	485	450	465	645	725		715	725	670	700	
1050	310	360		345	360	290	335	410	480		460	480	390	445	620	720		695	720	585	665	
1100	260	325		300	325	225	290	345	430		400	430	300	390	515	645		605	645	445	585	
1150	195	275		235	275	170	245	260	365		315	365	230	330	390	550		475	550	345	495	
1200	155	205		180	170	130	205	205	275		240	230	175	275	310	410		365	345	260	410	
1250	110	180		140	125	100	160	145	245		185	165	135	215	220	365		280	245	200	325	
1300	85	140		105	95	80	120	110	185		140	125	105	160	165	275		210	185	160	240	
1350	60	105		80	70	60	80	85	140		110	90	80	105	125	205		165	135	115	160	
1400	50	75		60	50	45	55	65	100		80	70	60	75	90	150		125	105	90	110	
1450	35	60		50	40	30	40	45	80		65	55	40	50	70	115		95	80	60	75	
1500	25	40		40	35	25	25	30	55		50	45	30	30	50	85		75	70	50	50	

PRESSURE TEMPERATURE RATINGS

Mat'l Group	Class 900							Class 1500							Class 2500						
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Materials	Type 304	Type 316	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310	Type 304	Type 316S	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310	Type 304	Type 316S	Type 304L Type 316L	Type 321	Types 347 348	Type 309	Type 310
Temp °F																					
100	2160	2160	1800	2160	2160	2015		3600	3600	3000	3600	3600	3360		6000	6000	5000	6000	6000	5600	
200	1800	1860	1520	1830	1910	1815		3000	3095	2530	3050	3180	3025		5000	5160	4220	5080	5300	5040	
300	1585	1680	1360	1635	1765	1705		2640	2795	2270	2725	2940	2845		4400	4660	3780	4540	4900	4740	
400	1410	1540	1240	1485	1665	1600		2350	2570	2065	2470	2770	2665		3920	4280	3440	4120	4620	4440	
500	1310	1435	1145	1375	1555	1510		2185	2390	1910	2290	2590	2520		3640	3980	3180	3820	4320	4200	
600	1245	1355	1080	1310	1475	1435		2075	2255	1800	2185	2460	2390		3460	3760	3000	3640	4100	3980	
650	1225	1330	1050	1280	1440	1395		2040	2220	1750	2135	2400	2330		3400	3700	2920	3560	4000	3880	
700	1210	1295	1030	1260	1405	1370		2015	2160	1715	2100	2340	2280		3360	3600	2860	3500	3900	3800	
750	1195	1270	1010	1245	1385	1340		1990	2110	1680	2075	2305	2230		3320	3520	2800	3460	3840	3720	
800	1180	1245	985	1240	1370	1305		1970	2075	1645	2065	2280	2170		3280	3460	2740	3440	3800	3620	
850	1165	1215	965	1225	1330	1275		1945	2030	1610	2040	2220	2125		3240	3380	2680	3400	3700	3540	
900	1150	1180		1215	1295	1245		1920	1970		2030	2160	2075		3200	3280		3380	3600	3460	
950	1125	1160		1160	1160	1160		1870	1930		1930	1930	1930		3120	3220		3220	3220	3220	
1000	965	1090		1070	1090	1010	1050	1610	1820		1785	1820	1680	1750	2685	3030		2970	3030	2800	2915
1050	925	1080		1040	1080	875	1000	1545	1800		1730	1800	1460	1665	2570	3000		2885	3000	2430	2770
1100	770	965		905	965	670	875	1285	1610		1510	1610	1115	1460	2145	2685		2515	2685	1860	2430
1150	585	825		710	825	515	740	980	1370		1185	1370	860	1235	1630	2285		1970	2285	1430	2060
1200	465	620		545	515	390	620	770	1030		910	855	650	1030	1285	1715		1515	1430	1085	1715
1250	330	545		420	370	300	485	550	910		705	615	495	805	915	1515		1170	1030	830	1345
1300	245	410		320	280	235	360	410	685		530	465	395	600	685	1145		885	770	660	1000
1350	185	310		245	205	175	235	310	515		410	345	290	395	515	860		685	570	485	660
1400	145	225		185	155	135	165	240	380		310	255	225	275	400	630		515	430	370	460
1450	105	175		145	125	95	115	170	290		240	205	155	190	285	485		400	345	260	315
1500	70	125		115	105	70	70	120	205		190	170	120	120	200	345		315	285	200	200