

## Reference Data

### Pressure-Temperature Ratings of Common Flange Materials

Recommended Maximum Pressure-Temperature Ratings<sup>1</sup> for Catalog Flange Immersion & Circulation Heaters<sup>2</sup>

Temp. (°F)	Class 150 (Pressures in psig)							Class 300 (Pressures in psig)							Class 600 (Pressures in psig)							Temp (°F)
	B-16.5 Material Group Number																					
	1.1	1.9	2.1	2.2	2.3	2.4	2.5	1.1	1.9	2.1	2.2	2.3	2.4	2.5	1.1	1.9	2.1	2.2	2.3	2.4	2.5	
	Car- bon Steel	Alloy Steel 1-½ Cr- ½ Mo	Austenitic Steels					Car- bon Steel	Alloy Steel 1-½ Cr- ½ Mo	Austenitic Steels					Car- bon Steel	Alloy Steel 1-½ Cr- ½ Mo	Austenitic Steels					
		Type 304	Type 316	Type 304L 316L	Type 321	Type 347, 348			Type 304	Type 316	Type 304L 316L	Type 321	Type 347, 348			Type 304	Type 316	Type 304L 316L	Type 321	Type 347, 348		
-20 to	285	290	275	275	230	275	275	740	750	720	720	600	720	720	1,480	1,500	1,440	144	1,200	1,440	1,440	-20 to
100	260	260	235	240	195	235	245	675	710	600	620	505	610	635	1,350	1,425	1,200	124	1,015	1,220	1,270	100
200	230	230	205	215	175	210	225	655	675	530	560	455	545	590	1,315	1,345	1,055	112	910	1,090	1,175	200
300	200	200	180	195	160	190	200	635	660	470	515	415	495	555	1,270	1,315	940	103	825	990	1,110	300
400	170	170	170	170	145	170	170	600	640	435	480	380	460	520	1,200	1,285	875	955	765	915	1,035	400
500	140	140	140	140	140	140	140	550	605	415	450	360	435	490	1,095	1,210	830	905	720	875	985	500
600	125	125	125	125	125	125	125	535	590	410	445	350	430	480	1,075	1,175	815	890	700	855	960	600
650	110	110	110	110	110	110	110	535	570	405	430	345	420	470	1,065	1,135	805	865	685	840	935	650
700	95	95	95	95	95	95	95	505	530	400	425	335	415	460	1,010	1,065	795	845	670	830	920	700
750	80	80	80	80	80	80	80	410	510	395	415	330	415	455	825	1,015	790	830	660	825	910	750
800	65	65	65	65	65	65	65	270	485	390	405	320	410	445	535	975	780	810	645	815	890	800
850	50	50	50	50	50	50	50	170	450	385	395	—	405	430	345	900	770	790	—	810	865	850
900	35	35	35	35	35	35	35	105	380	375	385	—	385	385	205	755	750	775	—	775	775	900
950	20	20	20	20	20	20	20	50	225	325	365	—	355	365	105	445	645	725	—	715	725	950
1000																						1000
1050								Notes	140	310	360	—	345	360	—	275	620	720	—	695	720	1050
1100	1.1	A-105, A516-70						A, B	95	260	325	—	300	325	—	190	515	645	—	605	645	1100
1150	1.1	A350-LF2						C	50	195	275	—	235	275	—	105	390	550	—	475	550	1150
1200	1.9	A182-F11, A182-F12						D	35	155	205	—	180	170	—	70	310	410	—	365	345	1200
1250	2.1	A182-F304, F304H and A240-304							—	—	—	—	—	125	—	—	220	365	—	280	245	1250
1300	2.2	A182-F316, F316H and A240-316							—	85	140	—	105	95	—	—	165	275	—	210	185	1300
1350	2.3	A182-F304L, F316L and A240-304L						E, F	—	60	105	—	80	70	—	—	125	205	—	165	135	1350
1400	2.4	A182-F321, F321H and A240-321, 321H						G	—	50	75	—	60	50	—	—	90	150	—	125	105	1400
1450	2.5	A182-F347, F347H and A240-347, 347H						H	—	35	60	—	50	40	—	—	70	115	—	95	80	1450
1500									—	25	40	—	40	35	—	—	50	85	—	75	70	1500

- The above table is in accordance with ANSI B16.5, 1988 Edition. For other materials, critical applications or for higher pressure-temperature requirements, refer to ANSI Std. B16.5 or contact your Local Chromalox Sales office.
- Pressure-temperature ratings for ASME pressure vessels and flanges may vary from the values shown in the above table due to Code requirements, re-inforcement and ligament calculations. Contact your Local Chromalox Sales office for further information and specific recommendations for ASME Coded flanges and heaters.

**Other Notes —**

- A. Not recommended for prolonged use above 800°F.
- B. Do not use A105 flanges above 1000°F or A516-70 plate over 850°F.
- C. Do not use A350-LF2 flanges above 650°F.
- D. Not recommended for prolonged use above 1100°F.
- E. Do not use A182-F304L flanges or A240-304L plate above 800°F.
- F. Do not use A182-F316L flanges or A240-316L plate above 850°F.
- G. Do not use A182-F321 flanges or A240-321 over 1000°F.
- H. Do not use A182-F347 flanges or A240-347 plate above 1000°F.

### Pipe Specifications — Standard (Schedule 40) Steel & Stainless Pipe

Nominal Pipe Size	Pipe Schedule	Outside Dia. (In.)	Wall Thickness (In.)	Inside Dia. (In.)	Inside Area (In <sup>2</sup> )	Weight (Lbs./Ft.)	Volume (Gal./Ft.)	Wt. Water (Lbs./Ft.)	Thds./In. (NPT)
1/8	Sch 40 (Std)	0.405	0.068	0.269	0.0568	0.245	0.0030	0.0246	27
1/4	Sch 40 (Std)	0.540	0.088	0.364	0.1041	0.425	0.0054	0.0451	18
3/8	Sch 40 (Std)	0.675	0.091	0.493	0.191	0.568	0.0099	0.0827	18
1/2	Sch 40 (Std)	0.840	0.109	0.622	0.304	0.851	0.0157	0.1316	14
3/4	Sch 40 (Std)	1.050	0.113	0.824	0.533	1.131	0.0277	0.2301	14
1	Sch 40 (Std)	1.315	0.133	1.049	0.864	1.679	0.0449	0.374	11-1/2
1-1/4	Sch 40 (Std)	1.660	0.140	1.380	1.496	2.273	0.0779	0.648	11-1/2
1-1/2	Sch 40 (Std)	1.900	0.145	1.610	2.036	2.718	0.106	0.882	11-1/2
2	Sch 40 (Std)	2.375	0.154	2.067	3.360	3.653	0.174	1.455	11-1/2
2-1/2	Sch 40 (Std)	2.875	0.203	2.469	4.079	5.793	0.249	2.076	8
3	Sch 40 (Std)	3.500	0.216	3.068	7.039	7.578	0.384	3.20	8
3-1/2	Sch 40 (Std)	4.000	0.226	3.548	9.89	9.11	0.514	4.28	8
4	Sch 40 (Std)	4.500	0.237	4.026	12.73	10.79	0.661	5.51	8
5	Sch 40 (Std)	5.563	0.258	5.047	20.01	14.62	1.04	8.66	8
6	Sch 40 (Std)	6.625	0.280	6.065	28.89	18.97	1.50	12.51	8
8	Sch 40 (Std)	8.625	0.322	7.981	50.00	28.55	2.66	21.69	8
10	Sch 40 (Std)	10.75	0.365	10.02	78.90	40.48	4.19	34.10	8
12	Standard	12.75	0.375	12.00	113.10	49.56	5.96	49.00	8
14	Standard	14.00	0.375	13.25	137.90	54.57	7.19	59.70	8