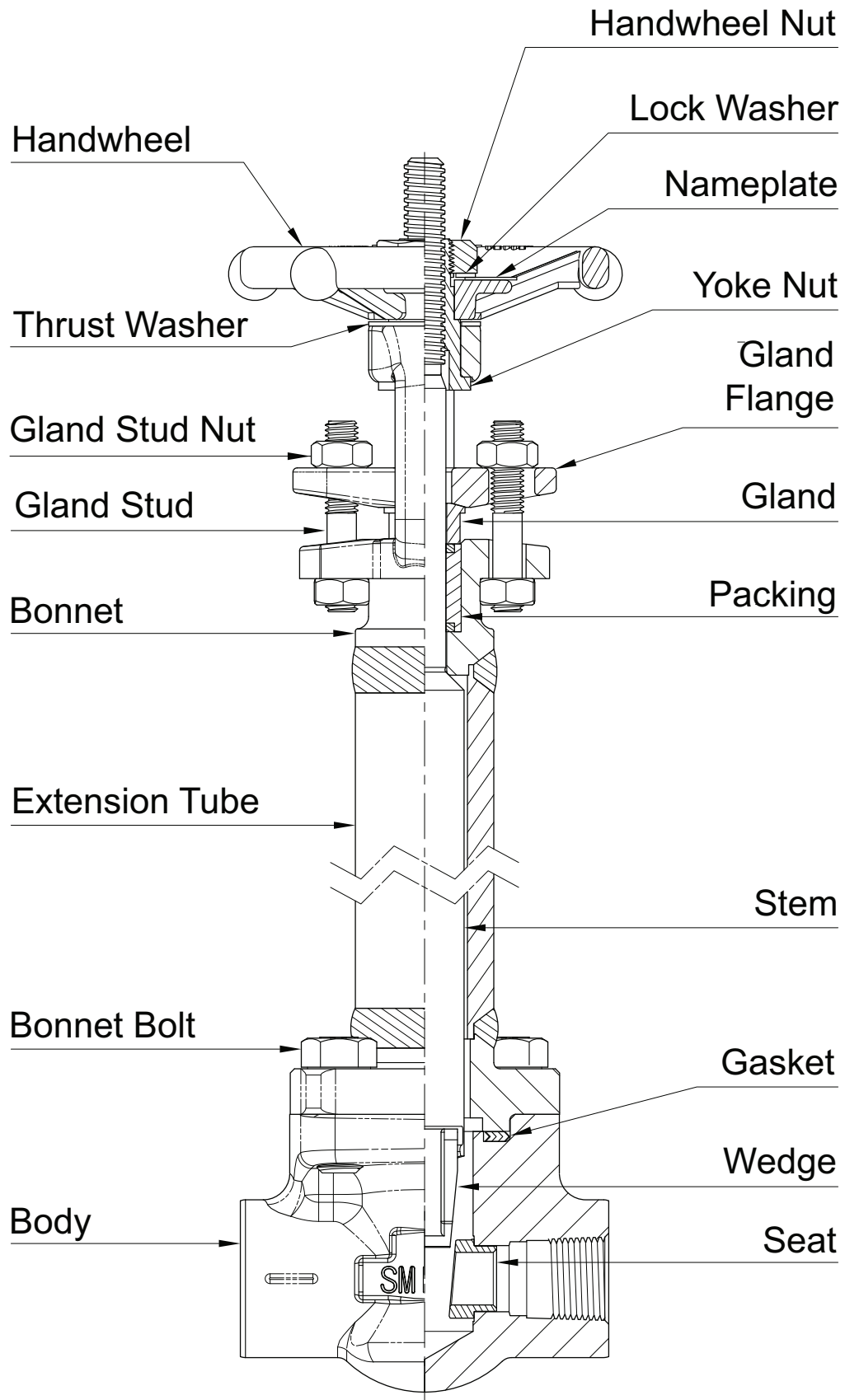




Cryogenic Valves





Standard Bills of Materials

GATE VALVES

Item	Description	Carbon Steel API Trim 8	Carbon Steel API Trim 12	Alloy Steel API Trim 8	Stainless Steel API Trim 12
1	Body	A105	A105	A182 F9	A182 F316
2	Bonnet	A105	A105	A182 F9	A182 F316
3	Seat	A276 410+HF	A276 316+HF	A276 410+HF	A276 316+HF
4	Wedge	A743 CA40	A351 CF8M	A743 CA40	A351 CF8M
5	Stem	A276 410	A276 316	A276 410	A276 316
6	Gasket	316/Graphite	316/Graphite	Inconel 600/Graphite	316/Graphite
7	Bonnet Bolts	A193 B7	A193 B7	A193 B16	A193 B8M-CI. 2/B8MA-CI. 1A
8	Packing	Grafoil/Braided End Ring	Grafoil/Braided End Ring	Grafoil/Braided End Ring	Grafoil/Braided End Ring
9	Gland	B783 F-0008-30	B783 F-0008-30	B783 F-0008-30	B783 SS-316N2-33
10	Gland Flange	A105	A105	A105	A182 F316
11	Gland Stud	A193 B7	A193 B7	A193 B7H	A193 B8
12	Gland Nut	A194 2H	A194 2H	A194 2H	A194 8
14	Yoke Nut	A582 416	A582 416	A582 416	A582 416
15	Thrust Washer	A276 410	A276 410	A276 410	A276 410
16	Handwheel	Malleable Iron	Malleable Iron	Malleable Iron	Malleable Iron
17	Nameplate	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	Lock Washer	Steel	Steel	Steel	Steel
19	Handwheel Nut	Steel	Steel	Steel	Steel
20	Packing Ring	Steel	Steel	Steel	Steel

GLOBE VALVES

Item	Description	Carbon Steel API Trim 8	Carbon Steel API Trim 12	Alloy Steel API Trim 8	Stainless Steel API Trim 12
1	Body	A105	A105	A182 F9	A182 F316
2	Bonnet	A105	A105	A182 F9	A182 F316
3	Seat	Int. + HF	Int. + HF	Int. + HF	Int. + HF
4	Disc	A743 CA40	A351 CF8M	A743 CA40	A351 CF8M
5	Stem	A276 410	A276 316	A276 410	A276 316
6	Gasket	316/Graphite	316/Graphite	Inconel 600/Graphite	316/Graphite
7	Bonnet Bolts	A193 B7	A193 B7	A193 B7	A193 B8M-CI. 2/B8MA-CI. 1A
8	Packing	Grafoil/Braided End Ring	Grafoil/Braided End Ring	Grafoil/Braided End Ring	Grafoil/Braided End Ring
9	Gland	B783 F-0008-30	B783 F-0008-30	B783 F-0008-30	B783 SS-316N2-33
10	Gland Flange	A105	A105	A105	A182 F316
11	Gland Stud	A193 B7	A193 B7	A193 B16	A193 B8
12	Gland Nut	A194 2H	A194 2H	A194 2H	A194 8
14	Yoke Nut	A582 416	A582 416	A582 416	A582 416
16	Handwheel	Malleable Iron	Malleable Iron	Malleable Iron	Malleable Iron
17	Nameplate	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
19	Handwheel Nut	Steel	Steel	Steel	Steel



Pressure Temperature Chart, PSI

MATERIAL	CARBON STEEL A105 & A350-LF2 (Note 2)						ALLOY STEEL						316 STAINLESS				MATERIAL CLASS
	(Note 3)						A182-F5		A182-F9		A182-F316		A182-F316L				
							800	1500	800	1500	800	1500	800	1500			
TEMP.	150	300	600	800	900	1500	800	1500	800	1500	800	1500	800	1500	TEMP.		
-20 to 100 °F	285	740	1,480	1,973	2,220	3,705	2,000	3,750	2,000	3,750	2,000	3,750	1,920	3,600	1,600	3,000	-31 to 38 °C
200 °F	260	680	1,360	1,810	2,035	3,395	2,000	3,750	1,963	3,680	2,000	3,750	1,653	3,095	1,363	2,555	93 °C
300 °F	230	655	1,310	1,747	1,965	3,270	1,925	3,610	1,867	3,495	1,942	3,640	1,493	2,795	1,217	2,280	149 °C
400 °F	200	635	1,265	1,688	1,900	3,170	1,848	3,465	1,782	3,345	1,880	3,530	1,368	2,570	1,120	2,100	204 °C
500 °F	170	605	1,205	1,608	1,810	3,015	1,773	3,325	1,723	3,230	1,773	3,325	1,275	2,390	1,048	1,970	260 °C
600 °F	140	570	1,135	1,515	1,705	2,840	1,613	3,025	1,613	3,025	1,613	3,025	1,203	2,255	992	1,860	316 °C
650 °F	125	550	1,100	1,467	1,650	2,745	1,568	2,940	1,568	2,940	1,568	2,940	1,178	2,210	973	1,825	343 °C
700 °F	110	530	1,060	1,413	1,590	2,665	1,515	2,840	1,515	2,840	1,515	2,840	1,160	2,170	960	1,800	371 °C
750 °F	95	505	1,015	1,352	1,520	2,535	1,418	2,660	1,418	2,660	1,418	2,660	1,138	2,135	942	1,765	399 °C
800 °F	80	410	825	1,098	1,235	2,055	1,355	2,540	1,355	2,540	1,355	2,540	1,125	2,110	920	1,730	427 °C
850 °F	65	320	640	850	955	1,595	1,298	2,435	1,298	2,435	1,298	2,435	1,115	2,090	902	1,690	454 °C
900 °F	50	230	460	613	690	1,150	1,200	2,245	995	1,870	1,200	2,245	1,107	2,075			482 °C
950 °F	35	135	275	365	410	685	850	1,595	733	1,370	1,005	1,885	1,032	1,930			510 °C
1000 °F	20	85	170	227	255	430	577	1,080	530	995	675	1,270	968	1,820			538 °C
1050 °F							383	720	383	720	458	855	960	1,800			566 °C
1100 °F							257	480	257	480	302	565	813	1,525			593 °C
1150 °F							173	325	165	310	200	375	632	1,185			621 °C
1200 °F							110	205	93	170	138	255	493	925			649 °C
1250 °F													392	735			677 °C
1300 °F													312	585			704 °C
1350 °F																	
1400 °F													257	480			732 °C
1450 °F													200	380			760 °C
1500 °F													155	290			788 °C
													112	205			816 °C

Notes:

1. Data in Table are maximum fluid pressures at temperatures shown in side columns per ASME B16.34 - 2004. User should be aware of specification changes.
2. Permissible, but not recommended, for prolonged use above 800°F / 427°C.
3. Permissible, but not recommended, for prolonged use above 1100°F / 593°C.
4. For other materials, refer to ASME B16.34.