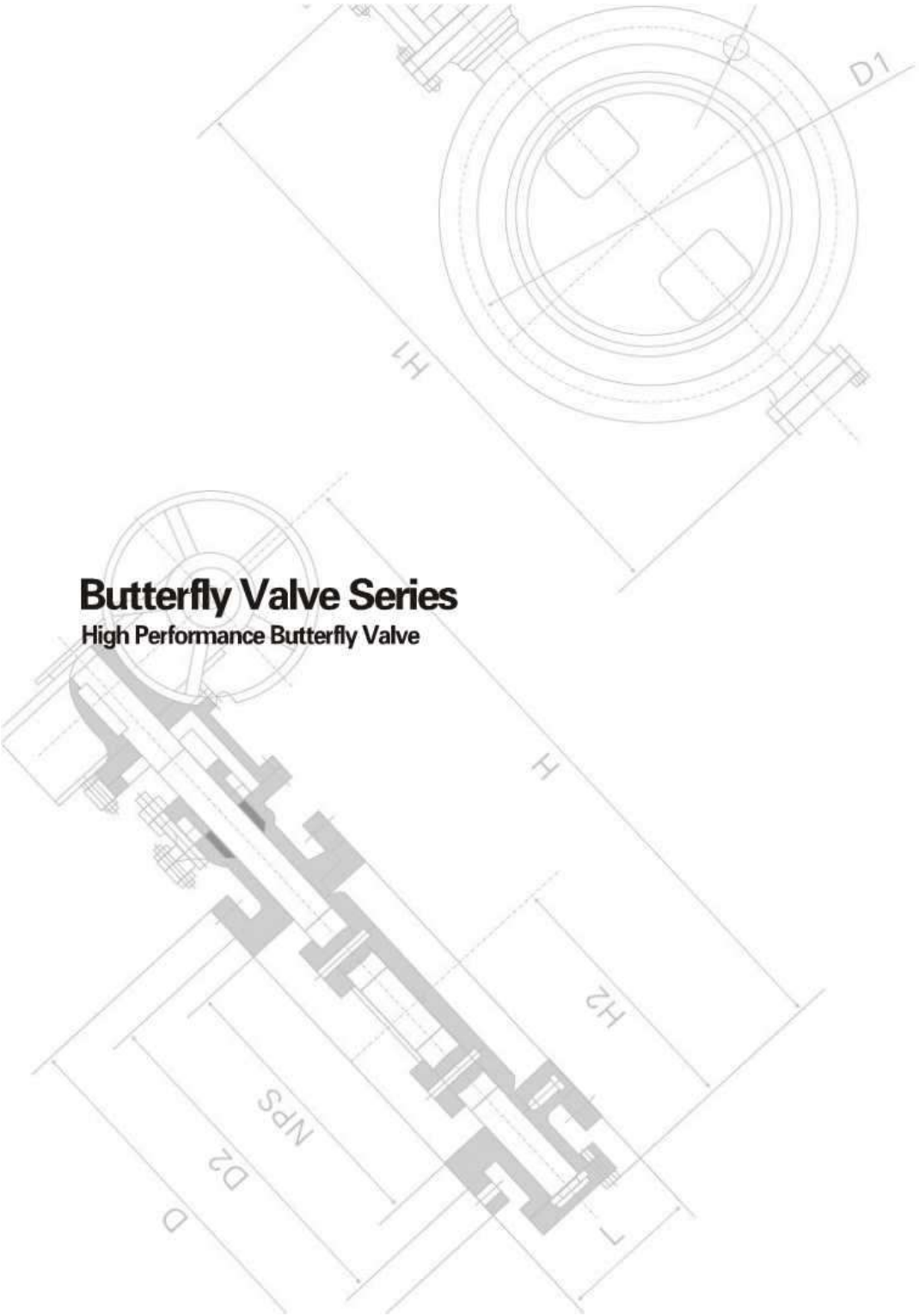


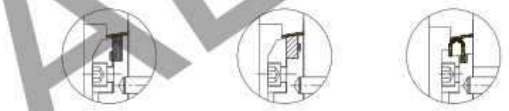
Butterfly Valve Series

High Performance Butterfly Valve

Applicable Standards:

DESIGN & MANUFACTURE CONFORMS WITH ： API609、MSS SP-67
CONNECTION DIMENSION CONFORMS WTIH ： ASME B16.5、ASME B16.47
STRUCTURE & LENGTH CONFORMS WITH ： API 609、MSS SP-67 ，ISO 5752
INSPECTION & TEST CONFORMS WITH ： ISO 5208、API 598

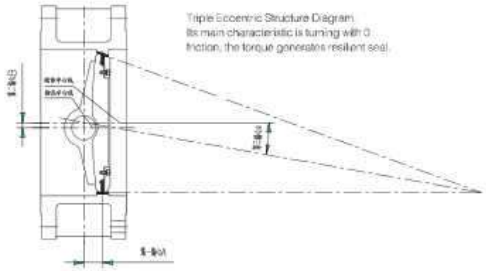
No	Part Name	No	Part Name
1	Body	10	Bottom end cover
2	Disc	11	Gasket
3	Clamp	12	Packing
4	Seat	13	Yoke
5	Ring	14	Nut
6	Screw	15	Bolt
7	Stem	16	Packing restrainer
8	Check pin	17	Flat key
9	Bushing Sleeve	18	Bisect rings

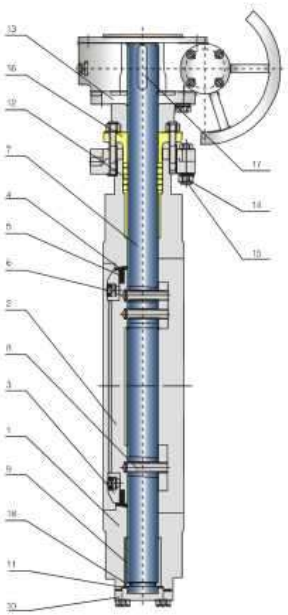


Multiple arrangement
metal hard sealed structure

metal resilient sealed structure

U metal sealed structure



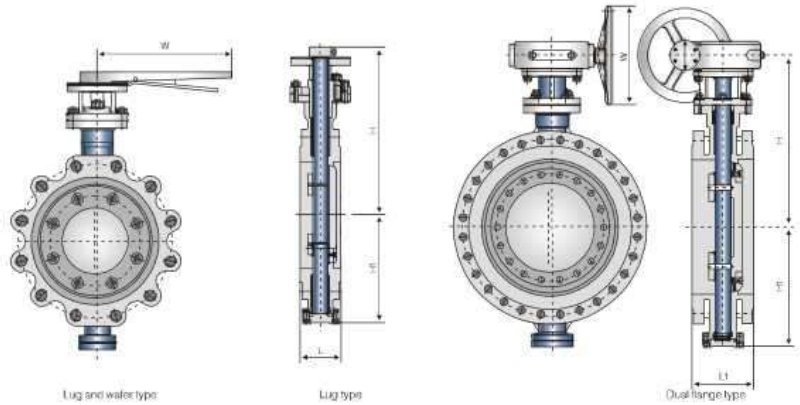


Features and Application:

Three eccentric butterfly valve series is the newly-developed long life and energy-saving products. The sealing is metal to metal, which couldbe changed to be seal ring to metal, stainless steel plate and composite
graphite to metal. Under the working condition of high temperature and high pressure, it still has a stable sealing performance. Our company adopts optimization design and new technology, so that the torque is small, gainning the point of energy-saving, labor-saving and reliable sealing performance, thus to ensure the high-reliability of corrosion-resistantance, stand fire and wear-resistantance.

This product is widely used in petroleum, natural gas, piped gas and medicine, food industry, industrial environmental water treatment and shipping industry.

Materials of parts	
Body	WCB/LCB/CF8M/CF8/CF3M/CF3/WC6/WC9/CD3MN
Disc	WCB+ENP/LCB/CF8M/CF8/CF3M/CF3/WC6/WC9/CD3MN
Seat	STL/13Cr/316/316L/304/304L/F316L/Monel/F51
Stem	F6a/17-4PH/F304/F316/F304L/F316L/F51/Monel
Ring	304+Flexible graphite/316+Flexible graphite Stainless steel series
Bolt	B7M/B8M/L7M/B16M
Nut	2HM/8M/7M/4M
Clamp	A36+ENP/Stainless steel series
Bushing sleeve	C95200/C95500/SS+304
Gasket	Flexible graphite+304/Flexible graphite +316
Packing	Flexible graphite
Materials could be choosed according to customers' requirement & working condition.	



Dimensional datas

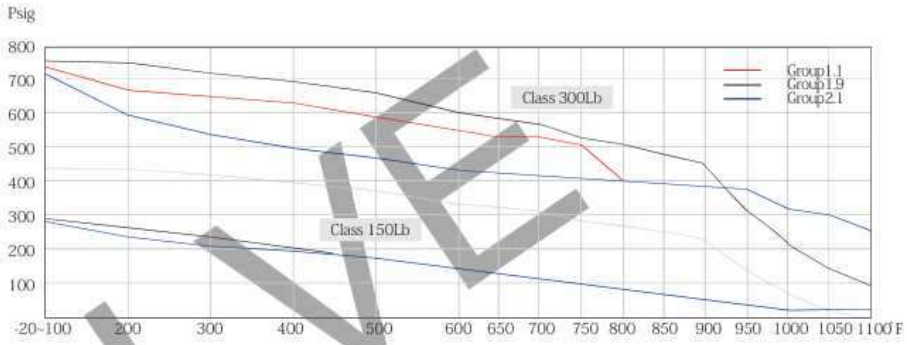
NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m	NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m
ANSI Class 150Lb																	
2	50	43	108	112	225	220	10	55	★16	400	102	216	352	540	600	160	4128
3	80	48	114	126	255	270	12	226	★18	450	114	222	386	585	600	200	5511
4	100	54	127	146	285	270	16	325	★20	500	127	229	415	642	600	270	7190
★6	150	57	140	170	332	360	25	615	★24	600	154	267	482	693	600	420	7814
★8	200	64	152	218	386	300	36	902	★30	750	165	318	622	868	600	700	16450
★10	250	71	165	245	427	300	60	1278	★36	900	200	330	678	1000	700	1050	23501
★12	300	81	178	290	498	500	80	2628	★42	1050	251	410	755	1058	700	1500	31963
★14		92	190	316	510	500	120	3276	★48	1200	276	470	866	1278	700	1845	47000

Dimensional datas

NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m	NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m
ANSI Class 300Lb																	
-	50	-	-	-	-	-	-	-	★16	400	133	216	392	582	600	185	8152
3	80	48	114	130	265	270	15	352	★18	450	149	222	420	651	600	230	10223
4	100	54	127	150	290	270	19	514	★20	500	159	229	465	704	600	330	13469
★6	150	59	140	185	355	300	35	1073	★24	600	181	267	532	780	600	460	22827
★8	200	73	152	236	418	500	42	1954	★30	750	-	318	642	908	700	1280	39726
★10	250	83	165	273	456	500	68	2453	★36	900	-	330	703	1108	700	2150	63452
★12	300	92	178	313	498	600	88	3260	★42	1050	-	410	785	1258	700	3150	85326
★14		117	190	338	547	600	144	5405	★48	1200	-	470	906	1478	1000	4885	126742

Dimensional datas

NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m	NPS inch	DN	L mm	L1 mm	H1 mm	H mm	W mm	MT (Wafer) kg	T N.m
ANSI Class 600Lb																	
-	-	-	-	-	-	-	-	-	★12	300	140	270	378	690	600	398	14236
3	80	54	180	152	305	270	38	575	★14	350	155	290	412	715	600	535	16947
4	100	64	190	193	338	360	58	1043	★16	400	178	310	450	823	600	780	20473
★6	150	78	210	248	416	500	120	3673	★18	450	200	330	512	897	600	898	25218
★8	200	102	230	295	490	600	154	4520	★20	500	216	350	563	1094	700	1266	31861
★10	250	117	250	342	580	600	297	7061	★24	600	232	390	622	1186	700	1622	46095



ASME B16.34 Maximum Allowable Non-Shock Pressure Psig

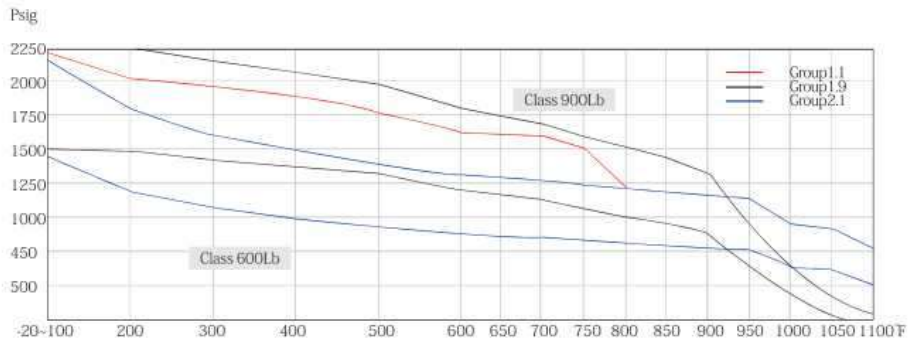
TEMPERATURE		ASTM MATERIALS															
		ANSI Class 150Lb								ANSI Class 300Lb							
°F	℃	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2
-20~100	20~38	285	290	265	290	290	290	275	275	740	750	695	750	750	750	720	720
200	93	260	260	250	230	260	260	230	235	670	750	655	750	750	745	600	620
300	149	230	230	230	230	230	230	205	215	655	730	640	720	720	715	540	560
400	204	200	200	200	200	200	200	190	195	635	705	620	695	695	705	495	515
500	260	170	170	170	170	170	170	170	170	600	665	585	665	665	665	465	480
600	316	140	140	140	140	140	140	140	140	550	605	535	605	605	605	435	450
650	343	125	125	125	125	125	125	125	125	535	590	525	590	590	590	430	445
700	371	110	110		110	110	110	110	110	535	570		570	570	570	425	430
750	399	95	95		95	95	95	95	95	505	505		530	530	530	415	425
800	427	80	80		80	80	80	80	80	410	410		510	510	510	405	420
850	454				65	65	65	65	65				485	485	485	395	420
900	482				50	50	50	50	50				450	450	370	390	415
950	510				35	35	35	35	35				320	375	275	380	385
1000	538				20	20	20	20	20				215	260	200	320	350
1050	566				20	20	20	20	20				145	175	145	310	345
1100	593				20[f]	20[f]	20[f]	20[f]	20[f]				95	110	100	255	305
TEST PRESSURE BY API 598																	
Hydrostatic shell test		450	450	400	450	450	450	425	425	1125	1125	1050	1125	1125	1125	1100	1100
Hydrostatic seal test		315	320	295	320	320	320	305	305	815	825	765	825	825	825	795	795
Air seat test		80± 20								80± 20							

Metric conversions by API STD 2564 pressure: 1 pound per square inch(psig)=0.06894757 bar=0.006894757 MPa temperature:℃=(5/9)(°F-32)

ASME B16.34 Materials Group			
Group1.1	A105[a]	A216-WCB [e]	
Group1.2	A216-WCC [d]	A352-LCC [d]	
Group1.3	A352-LCB [d]		
Group1.9	A217-WC6 [d]		
Group1.10	A217-WC9 [d]		
Group1.13	A217-C5		
Group2.1	A182-F304	A351-CF8	A351-CF3 [b]
Group2.2	A182-F316	A352-CF8M	A351-CF3M [c]

a).Not to be used over 650°F(343℃).
b).Not to be used over 650°F(427℃).
c).Not to be used over 650°F(538℃).
b).Not to be used over 650°F(593℃).
e).Permissible,but not recommended for prolonged use above 800°F (427℃).
f)For welding end valve only, flanged end rating terminates at 1000°F(538℃).

GMK VALVE



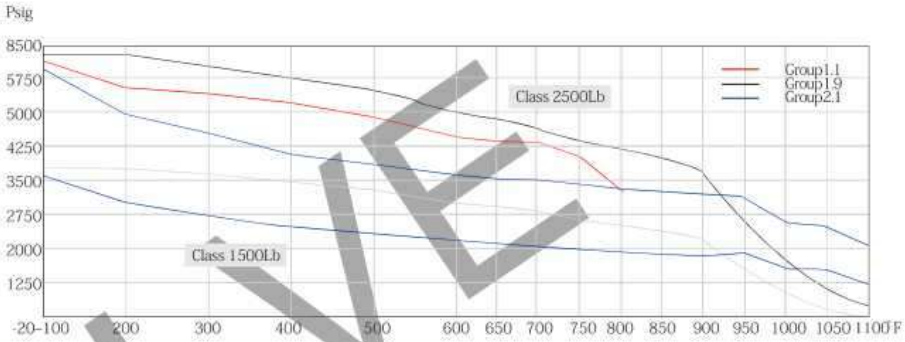
ASME B16.34 Maximum Allowable Non-Shock Pressure Psig

TEMPERATURE		ASTM MATERIALS															
		ANSI Class 600Lb								ANSI Class 900Lb							
°F	℃	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2
-20~100	-20~38	1480	1500	1390	1500	1500	1500	1440	1440	2220	2250	2085	2250	2250	2250	2160	2160
200	93	1350	1500	1315	1500	1500	1490	1200	1240	2025	2250	1970	2250	2250	2235	1800	1860
300	149	1315	1455	1275	1445	1455	1430	1080	1120	1970	2185	1915	2165	2185	2150	1620	1680
400	204	1270	1410	1235	1385	1410	1410	995	1025	1900	2115	1850	2080	2115	2115	1490	1540
500	260	1200	1330	1165	1330	1330	1330	930	955	1795	1995	1745	1995	1995	1995	1395	1435
600	316	1095	1210	1065	1210	1210	1210	875	1640	1640	1815	1600	1815	1815	1815	1310	1355
650	343	1075	1175	1045	1175	1175	1175	860	1610	1610	1765	1570	1765	1765	1765	1290	1330
700	371	1065	1135		1135	1135	1135	850	1600	1600	1705		1705	1705	1705	1275	1305
750	399	1010	1010		1065	1065	1055	830	1510	1510	1510		1595	1595	1585	1245	1280
800	427	825	825		1015	1015	1015	805	1235	1235	1235		1525	1525	1525	1210	1265
850	454				975	975	965	790					1460	1460	1450	1190	1255
900	482				900	900	740	780					1350	1350	1110	1165	1245
950	510				640	755	550	765					955	1130	825	1145	1160
1000	538				430	520	400	640					650	780	595	965	1050
1050	566				290	350	290	615					430	525	430	925	1030
1100	593				190	220	200	515					290	330	300	770	915
TEST PRESSURE BY API 598																	
Hydrostatic shell test		2225	2250	2100	2250	2250	2250	2175	3350	3350	3375	3150	3375	3375	3250	3250	3250
Hydrostatic seal test		1630	1650	1530	1650	1650	1650	1585	2445	2445	2475	2295	2475	2475	2380	2380	2380
Air seat test		80± 20															

Metric conversions by API STD 2564 pressure: 1 pound per square inch(psig)=0.06894757 bar=0.006894757 MPa temperature:℃=(5/9)(°F-32)

ASME B16.34 Materials Group			
Group1.1	A105[a]	A216-WCB [e]	
Group1.2	A216-WCC [d]	A352-LCC [e]	
Group1.3	A352-LCB [e]		
Group1.9	A217-WC6 [d]		
Group1.10	A217-WC9 [d]		
Group1.13	A217-C5		
Group2.1	A182-F304	A351-CF8	A351-CF3 [b]
Group2.2	A182-F316	A352-CF8M	A351-CF3M [c]

a).Not to be used over 650 °F(343℃).
b).Not to be used over 650 °F(427℃).
c).Not to be used over 650 °F(538℃).
b).Not to be used over 650 °F(593℃).
e).Permissible,but not recommended for prolonged use above 800 °F(427℃).



ASME B16.34 Maximum Allowable Non-Shock Pressure Psig

TEMPERATURE		ASTM MATERIALS															
		ANSI Class 1500Lb								ANSI Class 2500Lb							
°F	℃	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2	Group 1.1	Group 1.2	Group 1.3	Group 1.9	Group 1.10	Group 1.13	Group 2.1	Group 2.2
-20~100	-20~38	3705	3750	3470	3750	3750	3750	3600	3600	6170	6250	5785	6250	6250	6250	6000	6000
200	93	3375	3750	3280	3750	3750	3725	3000	3095	5625	6250	5470	6250	6250	6205	5000	5160
300	149	3280	3640	3190	3610	3640	3580	2700	2795	5470	6070	5315	6015	6070	5965	4500	4660
400	204	3170	3530	3085	3465	3530	3530	2485	2570	5280	5880	5145	5775	5880	5880	4140	4280
500	260	2995	3325	2910	3325	3325	3325	2330	2390	4990	5540	4850	5540	5540	5540	3880	3980
600	316	2735	3025	2665	3025	3025	3025	2185	2255	4560	5040	4440	5040	5040	5040	3640	3760
650	343	2685	2940	2615	2940	2940	2940	2150	2220	4475	4905	4355	4905	4905	4905	3580	3700
700	371	2665	2840		2840	2840	2840	2125	2170	4440	4730		4730	4730	4730	3540	3620
750	399	2520	2520		2660	2660	2640	2075	2135	4200	4200		4430	4430	4400	3460	3560
800	427	2060	2060		2540	2540	2540	2015	2110	3430	3430		4230	4230	4230	3360	3520
850	454				2435	2435	2415	1980	2090				4060	4060	4030	3300	3480
900	482				2245	2245	1850	1945	2075				3745	3745	3085	3240	3460
950	510				1595	1885	1370	1910	1930				2655	3145	2285	3180	3220
1000	538				1080	1305	995	1605	1750				1800	2170	1655	2675	2915
1050	566				720	875	720	1545	1720				1200	1455	1200	2570	2865
1100	593				480	550	495	1285	1525				800	915	830	2145	2545
TEST PRESSURE BY API 598																	
Hydrostatic shell test		5575	5625	5225	5625	5625	5625	5400	5400	9275	9375	8700	9375	9375	9375	9000	9000
Hydrostatic seal test		4080	4125	3820	4125	4125	4125	2960	3960	6790	6875	6365	6875	6875	6875	6600	6600
Air seat test		80± 20															

Metric conversions by API STD 2564 pressure: 1 pound per square inch(psig)=0.06894757 bar=0.006894757 MPa temperature:℃=(5/9)(°F-32)

ASME B16.34 Materials Group			
Group1.1	A105[a]	A216-WCB [e]	
Group1.2	A216-WCC [d]	A352-LCC [e]	
Group1.3	A352-LCB [e]		
Group1.9	A217-WC6 [d]		
Group1.10	A217-WC9 [d]		
Group1.13	A217-C5		
Group2.1	A182-F304	A351-CF8	A351-CF3 [b]
Group2.2	A182-F316	A352-CF8M	A351-CF3M [c]

a).Not to be used over 650 °F(343℃).
b).Not to be used over 650 °F(427℃).
c).Not to be used over 650 °F(538℃).
b).Not to be used over 650 °F(593℃).
e).Permissible,but not recommended for prolonged use above 800 F°(427 ℃).

GMK VALVE

Materials Characteristic

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		Chemical Analysis										Mechanical Properties				
ASTM Specification		C	Mn	Si	P	S	Cr	Ni	Mo	Cu	V	Tensile	Yield	Elongation	Reduction	Hardness
		Carbon	Manganese	Silicon	Phosphorus	Sulfur	Chromium	Nickel	Molybdenum	Copper	Vanadium	Mpa	Mpa	%	of area,%	HB
		Nominal or maximum,%										Min				Max
																Cast steel
Carbon steel	A216-WCA	0.25	0.70	0.60	0.040	0.045	0.50	0.50	0.20	0.30	0.03	415-585	205	24	35	-
	A216-WCB	0.30	1.00	0.60	0.040	0.045	0.50	0.50	0.20	0.30	0.03	485-655	250	22	35	-
	A216-WCC	0.25	1.20	0.60	0.040	0.045	0.50	0.50	0.20	0.30	0.03	485-655	275	22	35	-
																Cast steel
Chrome-molybdenum steel	A217-WC1	0.25	0.50-0.80	0.60	0.040	0.045	0.35	0.45-0.65	0.45-0.65	0.50	-	450-620	240	24	35	-
	A217-WC6	0.05-0.20	0.50-0.80	0.60	0.040	0.045	1.00-1.50	0.50	0.45-0.65	0.50	-	485-655	275	20	35	-
	A217-WC9	0.02-0.18	0.40-0.70	0.60	0.040	0.045	2.00-2.75	0.50	0.90-1.20	0.50	-	485-655	275	20	35	-
	A217-C5	0.20	0.40-0.70	0.75	0.040	0.045	4.00-6.50	0.50	0.45-0.65	0.50	-	620-795	415	18	35	-
	A217-C12	0.20	0.35-0.65	1.00	0.040	0.045	8.00-10.0	0.50	0.90-1.20	0.50	-	620-795	415	18	35	-
																Cast steel
Ni-alloy steel	A494 M-35-1	0.35	1.50	1.25	0.030	0.030	-	Allowance	-	26.0-33.0	Fe≤3.50	450	170	25	-	-
	A494 CW-6M	0.07	1.00	1.00	0.040	0.030	17.0-20.0	Allowance	17.0-20.0	-	Fe≤3.00	495	275	25	-	-
	A494 CY-40	0.40	1.50	3.00	0.030	0.030	14.0-17.0	Allowance	-	-	Fe≤11.0	185	195	30	-	-
																Cast steel
Stainless steel	A351-CF8	0.08	1.50	2.00	0.040	0.040	18.0-21.0	8.0-11.0	0.50	-	-	485	205	35	35	-
	A351-CF8M	0.08	1.50	1.50	0.040	0.040	18.0-21.0	9.0-12.0	2.0-3.0	-	-	485	205	30	30	-
	A351-CF3	0.03	1.50	2.00	0.040	0.040	17.0-21.0	8.0-12.0	0.50	-	-	485	205	35	35	-
	A351-CF3M	0.03	1.50	1.50	0.040	0.040	17.0-21.0	9.0-13.0	2.0-3.0	-	-	485	205	30	30	-
	A351-CN7M	0.07	1.50	1.50	0.040	0.040	19.0-22.0	27.5-30.5	2.0-3.0	3.0-4.0	-	450	170	35	35	-
																Cast steel
Carbon steel	A352-LCB	0.30	1.00	0.60	0.040	0.045	0.50	0.50	0.20	0.30	0.03	450-650	240	24	35	-
	A352-LCC	0.25	1.20	0.60	0.040	0.045	0.50	0.50	0.20	0.30	0.03	485-655	275	22	35	-
	A352-LC1	0.25	0.50-0.80	0.60	0.040	0.045	-	-	0.45-0.65	-	-	450-620	240	24	35	-
	A352-LC2	0.25	0.50-0.80	0.60	0.040	0.045	-	2.00-3.00	-	-	-	485-655	275	24	35	-
	A352-LC3	0.15	0.50-0.80	0.60	0.040	0.045	-	3.00-4.00	-	-	-	485-655	275	24	35	-
																Forged steel
Carbon steel	A105(N)	0.35	0.60-1.05	0.35	0.040	0.050	0.30	0.40	0.12	0.40	0.03	485	250	30	30	187
	A350-LF1	0.30	1.35	0.15-0.3	0.035	0.040	0.30	0.40	0.12	0.40	0.03	415-585	205	25	38	-
	A350-LF2	0.30	1.35	0.15-0.30	0.035	0.040	0.30	0.40	0.12	0.40	0.03	485-655	252	22	30	-
	A350-LF3	0.20	0.90	0.20-0.35	0.035	0.040	0.30	3.25-3.7	0.12	0.40	0.03	485-655	260	22	35	-
	A350-LF9	0.20	0.40-1.06	-	0.035	0.040	0.30	1.60-2.24	0.12	0.75-1.25	0.03	435-605	315	25	38	-
																Forged steel
Stainless steel	A182-F304	0.08	2.00	1.00	0.040	0.030	18.0-20.0	8.0-11.0	-	-	-	515	205	30	50	-
	A182-F316	0.08	2.00	1.00	0.040	0.030	16.0-18.0	10.0-14.0	2.0-3.0	-	-	515	205	30	50	-
	A182-F304L	0.03	2.00	1.00	0.045	0.030	18.0-20.0	8.0-13.0	-	-	-	485	170	30	50	-
	A182-F316L	0.03	2.00	1.00	0.045	0.030	16.0-18.0	10.0-15.0	2.0-3.0	-	-	485	170	30	50	-
																Component part
Trim	A276-304	0.08	2.00	1.00	0.045	0.030	18.0-20.0	8.0-10.5	-	-	-	515	205	40	50	-
	A276-316	0.05	2.00	1.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0	-	-	485	170	40	50	-
	A276-410	0.15	1.00	1.00	0.040	0.030	11.5-13.5	-	-	-	-	480	275	20	45	-
	A276-420	0.15	1.00	1.00	0.040	0.030	12.0-14.0	-	-	-	-	-	-	-	-	241
	A182-F6A	0.15	1.00	1.00	0.040	0.030	11.5-13.5	0.50	-	-	-	585	380	18	35	167-229
																Fastening piece
Stud	A193-B7	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	-	0.15-0.25	-	-	860	720	16	50	-
	A193-B7M	0.37-0.49	0.65-1.10	0.15-0.35	0.035	0.040	0.75-1.20	-	0.15-0.25	-	-	690	550	18	50	235
	A193-B8	0.08	2.00	1.00	0.045	0.030	18.0-20.0	8.0-10.50	-	-	-	515	205	30	50	223
	A193-B8A	0.08	2.00	1.00	0.045	0.030	18.0-20.0	8.0-10.50	-	-	-	515	205	30	50	192
	A193-B8M	0.08	2.00	1.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0	-	-	515	205	30	50	192
	A320-L7	0.38-0.48	0.75-1.00	0.15-0.35	0.035	0.040	0.80-1.10	-	0.15-0.25	-	-	860	725	16	50	-
Nut	A194-2H	>0.40	1.00	0.40	0.040	0.050	-	-	-	-	-	-	-	-	-	248-352
	A194-2HM	>0.40	1.00	0.40	0.040	0.050	-	-	-	-	-	-	-	-	-	159-237
	A194-7	0.37-0.49	0.65-1.00	0.15-0.35	0.040	0.040	0.75-1.20	-	0.15-0.25	-	-	-	-	-	-	248-352
	A197-8	0.08	2.00	1.00	0.045	0.030	18.0-1.20	8.0-10.5	-	-	-	-	-	-	-	126-300
	A194-8M	0.08	2.00	1.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0	-	-	-	-	-	-	126-300

NACE Valves:

For service four gases of other hydrogen sulfide bearing hydrocarbon fluids, GMK offers NACE valves made of component materials specially heat treated and hardness-controlled in conformity with NACE MR 0175 standard. Typical NACE material configuration is shown. Below for GMK cast steel valve, a note should be taken as the fact that NACE hardness requirement conflicts with the one of valve seating surface specified by API600, Table13.GMK steel valves are available only at user option.

The Demands About Resistant SSC(Sulfur Stress Crack)Material That Be Used For The Equipment That The Working Medium Include H S Carbon-HYdride Compound

No	Part Name	ASTM Material	NACE Hardness	API600 Hardness
1	Body	A216-WCB	≤HRC 22 (237 HB)	-
2	Bonnet/yoke	A216-WCB		-
3	Seat ring	A105 With 13cr overlay		≥250 HB*
4	Wedge/disc	A216-WCB/ A105 with 13cr overlay		≥250HB*
5	Stem	ANSI type410/A182-F6a	≤HRC 22 (237 HB)	≥200HB
6	Backseat bushing			≥250HB
7	Lantern ring			-
8	Gland			-
9	Bonnet gasket	316SS+Graphite	-	-
		316SS(RTJ)	≤HRC 22	-
10	Bonnet bolt	A193-B7	-	-
		A194-B7M	≤HRC 22	-
11	Bonnet nut	A194-2H	-	-
		A194-2HM	≤HRC 22	-

Minimum hardness differential of 50 HB between the seats

All the cast steel valves in this catalogue can be manufactured according to NACE MR 0175 specification for sour oil and gas service.

a).All NACE valves meet API standard, except as modified to meet a HRC 22 maximum hardness requirements of NACE specification.

b).Standard body and bonnet ASTM A216-WCB have the maximum carbon equivalent 0.43%.

c).Seat rings are screwed in to eliminate potential hardness problem with welds and HAZ(HEAT AFFECTED ZONES).

d).Bonnet gasket for ANSI class 150Lb gate valve only, bonnet gasket in flexible graphite with stainless steel 316 sheet reinforcement, for ANSI class 300Lb gate valve and ANSI class 150Lb and 300Lb globe and check valve, bonnet gasket in stainless steel 316 spiral wound with graphite filler.

e).Standard trim is hardness controlled 13%cr steel with hard faced seats(api trim no.8).

f).Standard bonnet bolting is class II nut and bolt.

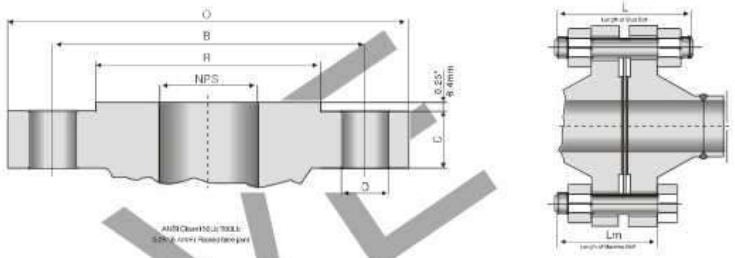
G).All NACE valves are further identified by additional works"NACE MR 0175" shown on the nameplate for traceability and certification of conformance.

Typical NACE Material Specifications are Shown In Above Table And Other Material Application Are Available At Customer's Option.

Spectrum test, Portable And Mobile On-Site Metal Analysers

International Materials Standards

Materials		United states	Germany			Great Britain		China
		ASTM/AISI/SAE/ASME	DIN NO	DIN TYPE	MATERIALNUMBER	BSNUMBER	BS GRADE	GB
								Cast steel
Carbon steel	A216-WCA	ASTM A216-WCA	1681	GS-38	1.042	1504-161	430	WCA
	A216-WCB	ASTM A216-WCB	17245	GS-C25	1.0619	1504-161	480	WCB
	A216-WCC							WCC
								Cast steel
Chrome-molybdenum steel	A217-WC1	ASTM A217-WC1	17245	GS-22Mo4	1.5419			ZG20Mo
	A217-WC6	ASTM A217-WC6	17245	GS-17CrMo55	1.7357			15CrMo
	A217-WC9	ASTM A217-WC9	17245	GS-18CrMo810	1.7379			12Cr1Mo1V
	A217-C5	ASTM A217-C5	VDeh SPW 595	GS-12CrMo195	17363	1504	625E	1Cr5Mo
	A217-C12	ASTM A217-C12	VDeh SPW 595	G-X120CrMo101	17389	1504	629E	9Cr1Mo
Ni-alby steel	A494 M-35-1							
	A494 CW-6M							
	A494 CY-40							
								Cast steel
Stainless steel	A351-CF8	ASTM A351-CF8	17445	G-X6CrNi189	1.4308	1504-304	C15	0Cr18Ni9
	A351-CF8M	ASTM A351-CF8M	17445	G-X6CrNiMo1810	1.4408	1504-316	C16	1Cr18Ni12MoZTi
	A351-CF3	ASTM A351-CF3	17440	G-X2CrNiN189	1.4306	970/1	304S 11	00Cr18Ni10
	A351-CF3M	ASTM A351-CS3M	17440	G-X2CrNiMoN1810	1.4404	2056	316S11	00Cr17Ni14Mo2
	A351-CN7M	ASTM A351-CN7M				1504	332C11E	
								Cast steel
Carbon steel	A352-LCB	ASTM A352-LCB	SFW 685	GS+21Mo5	1.1138			LCB
	A352-LCC	ASTM A352-LCC	17173	GS-26CrMo4	1.7219			LCC
	A352-LC1	ASTM A352-LC1				1504	245LT50	
	A352-LC2	ASTM A352-LC2						ZG0CRMNVA1
	A352-LC3	ASTM A352-LC3	SEW 685	GS10Ni14	1.5638	1504-503	Lt60	
								Forged steel
Carbon steel	A105(N)	ASTM A105	17100	St50-2	1.005	1503	221-490	25
	A350-LF1	ASTM A350-LF1	SEW 680	TTSt41	1.0437			
	A350-LF2	ASTM A350-LF2	17155	19Mn5	1.0482			
	A350-LF3	ASTM A350-LF3	17173	10Ni14	1.5367	1503	50Gr.490	
	A350-LF9	ASTM A350-LF9						
								Forged steel
Stainless steel	A182-F304	ASTM A182-F304	17440	X5CrNi189	1.4301	1503	304S31	0Cr18Ni9
	A182-F316	ASTM A182-F316	17440	X5CrNiMo1810	1.4401	1503	316S31	0Cr17Ni12Mo2
	A182-F304L	ASTM A182-F304L	17440	X2CrNi810	1.4311			00Cr18Ni10
	A182-F316L	ASTM A182-F316L	17440	X2CrNiMo1810	1.4404	1503	316S11	00Cr17Ni14Mo2
								Component part
Trim	A276-304	ASTM A276-304						0Cr18Ni9
	A276-316	ASTM A276-316						0CR17N12MO2
	A276-410	ASTM A276-410						1Cr13
	A276-420	ASTM A276-420						2Cr13
	A182-F6A	ASTM A182-F6A						2Cr13
								Fastening piece
Stud	A193-B7	ASTM A193-GRAD B7	17240	40CrMoV47	1.7711	1506-630	790	35CrMoA
	A193-B7M	ASTM A193 GRAD B7M						
	A193-B8	ASTM A193 GRAD B8	17440	X5CrNi189	1.4301			0Cr18Ni9
	A193-B8A							
	A193-B8M	ASTM A193 GRAD B8M	17245	X6CrNiMoTi17 12 2	1.4571	1506-316	S31	0Cr17Ni12Mo2
	A320-L7	ASTM A320 GR L7	17200	42CrMo4	1.7225	4882		42CrMo
	A194-2H	ASTM A194 GRAD 2H	17400	CK35	1.1181	1506-162		45
Nut	A194-2HM	ASTM A194 GRAD 2HM						
	A194-7	ASTM A194 GRAD7	17200	24CrMo5	1.7258	1506-162		20CrMo
	A197-8	ASTM A194 GRAD8	17245	X6CrNiMo17 12 2	1.4571	1506-316	S31	0Cr18Ni9
	A194-8M	ASTM A194-GR8M	17440	X5CrNiMo1810	1.4401			0Cr17Ni12Mo



Class150Lb

NPS		O		C		R		B		D		Bolt		L		Lm	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	QTY	Diam	in	mm	in	mm
2	50	6.00	152.4	0.75	19.1	3.62	91.9	4.75	120.7	0.75	19.1	4	5/8	3.25	82.6	2.75	69.9
2 1/2	65	7.00	177.8	0.88	2.4	4.12	104.6	5.50	139.7	0.75	19.1	4	5/8	3.50	88.9	3.00	76.2
3	80	7.50	190.5	0.94	23.9	5.00	127.0	6.00	152.4	0.75	19.1	4	5/8	3.50	88.9	3.00	76.2
4	100	9.00	228.6	0.94	23.9	6.19	157.2	7.50	190.5	0.75	19.1	8	5/8	3.50	88.9	3.00	76.2
5	25	10.00	254.0	0.94	23.9	7.31	185.7	8.50	215.9	0.88	22.4	8	3/4	3.75	95.3	3.25	82.6
6	150	11.00	279.4	1.00	25.4	8.50	215.9	9.50	241.3	0.88	22.4	8	3/4	4.00	101.6	3.25	8.6
8	200	13.50	342.9	1.12	28.4	10.62	269.7	11.75	298.5	0.88	22.4	8	3/4	4.25	108.0	3.50	88.9
10	250	16.00	406.4	1.19	30.2	12.75	323.9	14.25	362.0	1.00	25.4	12	7/8	4.50	114.3	4.00	101.6
12	300	19.00	482.6	1.25	31.8	15.00	381.0	17.00	431.8	1.00	25.4	12	7/8	4.75	120.7	4.00	101.6
14	350	21.00	533.4	1.38	35.1	16.25	412.8	18.75	476.3	1.12	28.4	12	1	5.25	133.4	4.50	114.3
16	400	23.50	596.9	1.44	36.6	18.50	469.9	21.25	539.8	1.12	28.4	16	1	5.25	133.4	4.50	114.3
18	450	25.00	635.0	1.56	39.6	21.00	533.4	22.75	577.9	1.25	31.8	16	1 1/8	5.75	146.1	5.00	127.0
20	500	27.50	698.5	1.69	42.9	23.00	584.2	25.00	635.0	1.25	31.8	20	1 1/8	6.25	158.8	5.50	139.7
24	600	32.00	812.88	1.88	47.8	27.25	692.2	39.50	749.3	1.38	35.1	20	1 1/4	6.75	171.5	6.00	152.4
26	650	34.25	70.0	2.69	68.3	29.50	749.3	31.75	806.5	1.38	35.1	24	1 1/4	8.25	209.6	7.50	190.5
28	700	36.50	927.1	2.81	71.4	31.50	800.1	34.00	863.6	1.38	35.1	28	1 1/4	8.50	215.9	7.75	196.9
30	750	38.75	984.3	2.94	74.7	33.75	857.3	36.00	914.4	1.38	35.1	28	1 1/4	9.00	228.6	8.00	203.2
32	800	41.75	1060.5	3.18	80.8	36.00	914.4	38.50	977.9	1.62	41.1	28	1 1/2	9.75	247.7	8.75	222.3
34	850	43.75	1111.3	3.25	82.6	38.00	965.2	40.50	1028.7	1.62	41.1	32	1 1/2	10.00	254.0	9.00	228.6
36	900	46.00	1168.4	3.56	90.4	40.25	1022.4	42.75	1085.9	1.62	41.1	32	1 1/2	10.50	266.7	9.50	241.3

Class300Lb

NPS		O		C		R		B		D		Bolt		L		Lm	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	QTY	Diam	in	mm	in	mm
2	50	6.50	165.1	0.88	22.4	3.62	91.9	5.00	127.0	0.75	19.1	8	5/8	3.50	101.6	3.00	76.2
2 1/2	65	7.50	190.5	1.00	25.4	4.12	104.6	5.88	149.4	0.88	22.4	8	3/4	4.00	1143.3	3.25	82.6
3	80	8.25	209.6	11.12	28.4	5.00	127.0	6.62	168.1	0.88	22.4	8	3/4	4.25	120.7	3.50	88.9
4	100	10.00	254.0	1.25	31.8	6.19	157.2	7.88	200.2	0.88	22.4	8	3/4	4.50	127.0	3.75	95.3
5	25	11.00	279.4	1.38	35.1	7.31	185.7	9.25	235.0	0.88	22.4	8	3/4	4.75	133.4	4.25	108.0
6	150	12.50	317.5	1.44	36.6	8.50	215.9	0.62	269.7	0.88	22.4	12	3/4	4.75	139.7	4.25	108.0
8	200	15.00	381.0	1.62	41.1	10.62	269.7	13.00	330.2	1.00	25.4	12	7/8	5.50	152.4	4.75	120.7
10	250	17.50	444.5	1.88	47.8	12.75	323.9	15.25	387.4	1.12	28.4	16	1	6.25	171.5	5.50	139.7
12	300	20.50	520.7	2.00	50.8	15.00	381.0	17.75	450.9	1.25	31.8	16	1 1/8	6.75	184.2	5.75	146.1
14	350	23.00	584.2	2.12	53.8	16.25	412.8	20.25	514.4	1.25	31.8	20	1 1/8	7.00	190.5	6.25	158.8
16	400	25.50	647.7	2.25	57.2	18.50	469.9	22.50	571.5	1.38	35.1	20	1 1/4	7.50	203.2	6.50	165.1
18	450	28.00	711.2	2.38	60.5	21.00	533.4	24.75	628.7	1.38	35.1	24	1 1/4	7.75	209.3	6.75	171.5
20	500	30.50	774.7	2.50	63.5	23.00	584.2	27.00	685.8	1.38	35.1	24	1 1/4	8.00	222.3	7.25	184.2
24	600	36.00	914.4	2.75	69.9	27.25	692.2	32.00	812.8	1.62	41.1	24	1 1/2	9.00	254.0	8.00	203.2
26	650	38.25	971.6	3.12	79.2	29.50	749.3	34.50	876.3	1.75	44.5	28	1 5/8	10.25	285.8	9.25	235.0
28	700	40.75	1035.1	3.38	85.9	31.50	800.1	37.00	939.8	1.75	44.5	28	1 5/8	10.75	298.5	9.75	247.7
30	750	43.00	1092.2	3.62	91.9	33.75	857.3	39.25	997.0	1.88	47.8	28	1 3/4	11.50	317.5	10.50	266.7
32	800	45.25	1149.4	3.88	98.6	36.00	914.4	41.50	1054.1	2.00	50.8	28	1 7/8	12.25	342.9	11.25	285.8
34	850	47.50	1206.5	4.00	101.6	38.00	965.2	43.50	1104.9	2.00	50.8	28	1 7/8	12.75	349.3	11.75	298.5
36	900	50.00	1270.0	4.12	104.6	40.25	1022.4	46.00	1168.4	2.12	53.8	32	2	13.25	362.0	12.25	311.2

a) NPS24" and smaller flanged ends by ANSI B16.5,NPS26" and larger by MSS SP-44.
b) Flange of 150Lb and 300Lb with the raised face of 0.06(1.6mm)is included in the smallest flange of thickness C.
c) The length L of the double end bolt doesn't include the terminal length.
d) Flange gasket of the matching flange ASME B16.20.