



VALVE TRIM MATERIALS STANDARD TRIM CONFIGURATIONS

API Trim No	Nonimal Trim	Trim code	Stem	Disc/Wedge	Seat	Hardness stem and other trim parts HB	Hardness disc/wedge HB	Hardness seat surface HB	Which trim for which service
1	F6	F6	410 (13Cr)	F6 (13Cr)	410 (13Cr)	200-275	200	250 min	For oil and oil vapors and general services with heat treated seats and wedges. General very low erosive or non-corrosive service between -100°C and 320°C. This stainless steel material lends itself readily to hardening by heat treatment and is excellent for contacting parts such as stems, gates, and discs. Steam, gas and general service to 370°C. Oil and Oil vapor 480°C.
2	304	304	304 (18Cr-8Ni)	304 (18Cr-8Ni)	304 (18Cr-8Ni)	-	-		For moderate pressure in corrosive, low erosive service between -265°C and 450°C.
3	310	310	(25Cr-20Ni)	310 (25Cr-20Ni)	310 (25Cr-20Ni)				For moderate pressure in corrosive or non corrosive service between -265°C and 450°C.
4	Hard 410	F6-H	410 (13Cr)	F6 (13Cr)	F6 (13Cr)	200-275	200-275	275 min	Seats 275 BHN min. As trim 1 but for medium pressure and more corrosive service.
5	410 Full Hard faced	F6-HF	410 (13Cr)	F6+St Gr6 (CoCr Alloy)	410+St Gr6 (CoCr Alloy)	200-275	350 min	350 min	High pressure slightly erosive and corrosive service between -265°C and 650°C and higher pressure. Premium trim service to 650°C. Excellent for high pressure water and steam service.
5A	410 Full Hard faced	F6-HF	410 (13Cr)	F6+Hardf. NiCr Alloy	410+Hardf. NiCr Alloy	200-275	350 min	350 min	As trim 5 where Co is not allowed.
6	410 and Ni-Cu	F6-HFS	410 (13Cr)	F6 (13Cr)	Monel 400 ® (NiCu Alloy)	200-275	250 min	175 min	As trim 1 and more corrosive service.
7	410 and Full Hard	410	410 (13Cr)	F6 (13Cr)	F6 (13Cr) (750 HB)	200-275	250 min	750	Seats 750 BHN min. As trim 1 but for higher pressure and more corrosive/erosive service.
8	410 and Hard faced	F6-HFS	410 (13Cr)	F6 (13Cr)	410+St Gr6 (CoCr Alloy)	200-275	250 min	350 min	Universal trim for general service requiring long service life up to 593°C. As trim 5 for moderate pressure and more corrosive service. Steam, gas and general service to 540°C. Standard trim for gate valves.
8A	410 and Hard faced	F6-HFS	410 (13Cr)	F6 (13Cr)	410+Hardf. NiCr Alloy	200-275	250 min	350 min	As trim 5A for moderate pressure and more corrosive service.
9	Monel	Monel	Monel® (NiCu Alloy)	Monel® (NiCu Alloy)	Monel 400 ® (NiCu Alloy)				For corrosive service to 450°C such as acids, alkalies, salt solutions, etc. Very corrosive fluids. Erosive-corrosive service between -240°C and 480°C. Resistant to sea water, acids, alkalies. Has excellent corrosion resistance in chlorine and alkylation service.
10	316	316	316 (18Cr-Ni-Mo)	316 (18Cr-8Ni-Mo)	316 (18Cr-8Ni-Mo)				For superior resistance to corrosion for liquids and gases which are corrosive to 410 stainless steel up to 455°C. As trim 2 but a higher level of corrosive service. Provides excellent resistance to corrosive media at high temperatures and toughness for service at low temperatures. Low temperature service standard for 316SS valves.
11	Monel and Hard faced	Monel-HFS	Monel® (NiCu Alloy)	Monel® (NiCu Alloy)	Monel 400 ® St Gr6			350 min	As trim 9 but for medium pressure and more corrosive service.
11A	Monel and Hard faced	Monel-HFS	Monel® (NiCu Alloy)	Monel® (NiCu Alloy)	Monel 400 ® Hardf. NiCrA			350 min	As trim 9 but for medium pressure and more corrosive service.
12	316 and Hard faced	316-HFS	316 (18Cr-Ni-Mo)	316 (18Cr-8Ni-Mo)	316+St Gr6			350 min	As trim 10 but for medium pressure and more corrosive service.
12A	316 and Hard faced	316-HFS	316 (18Cr-Ni-Mo)	316 (18Cr-8Ni-Mo)	316 Hardf. NiCr Alloy			350 min	As trim 10 but for medium pressure and more corrosive service.
13	Alloy 20	Alloy 20	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)				Very corrosive service. For moderate pressure between -45°C and 320°C.
14	Alloy 20 & Hard faced	Alloy 20-HFS	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 St Gr6				As trim 13 but for medium pressure and more corrosive service.
14A	Alloy 20 & Hard faced	Alloy 20-HFS	Alloy 20 (19Cr-29Ni)	Alloy 20 (19Cr-29Ni)	Alloy 20 hardf. NiCr Alloy			350 min	As trim 13 but for medium pressure and more corrosive service.
15	304 Full Hard faced	304-HF	304 (18Cr-8Ni-Mo)	304+St Gr6	304+St Gr6			350 min	As trim 2 but more erosive service and higher pressure.
16	316 Full Hard faced	316-HF	316 HF (18Cr-8Ni-Mo)	316+St Gr6	316+St Gr6		320 min	350 min	As trim 10 but more erosive service and higher pressure.
17	347 Full Hard faced	347-HF	347 HF (18Cr-10Ni-Cb)	347+St Gr6	347+St Gr6		350 min	350 min	As trim 13 but more corrosive service and higher pressure. Combines good corrosion resistance with high temperature resistance up to 800°C.
18	Alloy 20 Full Hard faced	Alloy 20-HF	Alloy 20 (19Cr-29Ni)	Alloy 20+St Gr6	Alloy 20+St Gr6		350 min	350 min	As trim 13 but more corrosive service and higher pressure. Water, gas or low pressure steam to 230°C.
n/a	Bronze	Bronze	410 (Cr)	Bronze	Bronze				Water, oil, gas, or low pressure steam to 232°C.
NACE									Specially treated 316 or 410 trim combined with B7M bolts and 2HM nuts to meet NACE MR-01-75 requirements.
n/a	Alloy 625	Alloy 625	Alloy 625	Alloy 625	Alloy 625				

TRIM MATERIAL EQUIVALENT GRADES

TRIM	UNS	TYPE	Grade (forged)	ASTM wrought	DIN
F6	UNS S41000	13Cr	A182 F6a	A276-410	X12Cr13
304	UNS S30400	18-8 Cr-Ni	A182 F304	A276-304	X5CrNi 18 10
316	UNS S31600	18-8 Cr-Ni (18-10-2)	A182 F316	A276-316	X5CrNiMo 18 10
321	UNS S32100	18 Cr-10 Ni-Ti	A182 F321	A276-321	X6CrNiTi 18 10
347	UNS S34700	18 Cr-10 Ni-Cb	A182 F347	A276-347	X6CrNiNb 18 10
MONEL®	UNS N04400	67Ni-30Cu	B564-N04400	B164-N04400	17743
ALLOY 20	UNS N08020	28Ni-19Cr-Cu-Mo	A182-F20*	B473	14500
ALLOY 625	UNS N06625	60Ni-22Cr-9Mo-3.5Cb	B564-N06625	B564-N06625	17381
C276	UNS N10276	54Ni-15Cr-16Mo	B564-N10276	B574-N10276	NiMo 16 Cr 15 W
17/4PH	UNS S17400	0Cr17Ni4Cu4Nb	A705 UNS S17400	A564 UNS S17400	X5CrNiCuNb 17-4-4
St. Gr6†	UNS R30006	Co Cr-A	AMS 5894	Stellite(R) Gr6	

† Hard facing weld overlay.
 * No longer referenced in ANSI B16.34 - 2009.
 The disc/wedge/seat surface should be of the mentioned material. This can be achieved by either a solid execution of the mentioned part or a facing of the material
 The base material of a disc/wedge/seat should be at least equal in *corrosion resistance* of the body material
 The disc/wedge and seat materials can be used for either of the 2, there is no preference