

Engineers Combine is a leading manufacturers of Industrial Valves, Automation, Strainers & Filters used in Oil, Gas, Petrochemicals, Pharmaceuticals and other process industries. We are manufacturing Gate, Globe, Check, Ball Valves as per international codes like API 6D, API 600, BS 5351/ISO 17292, BS 1873, BS 1868 etc. Flange tables can be of ASME/DIN/JIS standards. We are using investment casting (lost wax process) and sand castings sourced from reputed foundries with having all the facilities like NDT Testing facilities, Spectro etc.

We can provide all critical metallurgies like Duplex Stainless Steel, WCB, CF8, CF8M, CF3, CF3M and any other metal. We are catering to various reputed consultants/actual users like Mazda Limited, Rallis India, Lupin Limited, Cipla Limited, Concond Biotech, Sabarmati Gas, NIKO Resources, IOCL, BPCL, HPCL, Atul Limited, Century Pulp and Papers, BFCL Terminal, Bharat Foods Limited. All the air dryer/duplex filter manufacturers in India are buying our 3 way/4 way ball valve for diversion of fluid/media.

**Our moto is to satisfy our customers with timely delivery and required chemistry of the metal and good manufacturing practices.**

### OUR MAIN PRODUCTS

- **Ball Valves-fire Safe Type Tested Under DNV**
- **3 Way Ball Valves, 4Way Ball Valves Actuated / ROV's**
- **Gate Valve / Globe Valve / Swing Check Valve**
- **Dual Plate Non Slam Check Valve (Wafer/Lug/Flanged)**
- **Strainer and Filters**

### QUALITY CONTROL & INSPECTION

Strict quality control is maintained at every stage of manufacturing. All castings and forgings are of radiographic quality and chemical composition, physical properties and heat treatment standard laid down by the American Society of Testing Materials (ASTM). Radiographic inspection is carried out as per the ASME B 16.34. The system of stage wise inspection of various components for dimensions and other properties are followed strictly & records maintained. Achievements in a short span we have developed very good relation with various Indian/ International companies. We have exported at very short deliveries valves/strainer to various companies in Middle east. We are prompt in deliveries and competitive prices for the quality products for your process plants needs.



### TRIM MATERIAL

API TRIM NO.	DISC/WEDGE SURFACE	SEATRING SURFACE	STEM/HINGE PIN/ BACKSEAT	SERVICE
TRIM 1	13% Cr.	13% Cr.	13% Cr. (SS 410)	General corrosive and Non-corrosive service between -100°C & 400°C.
TRIM 2	18% Cr. - 8% Ni	18% Cr. - 8% Ni	18% Cr. - 8% Ni (SS 304)	For moderate pressure in non - corrosive or corrosive service between -265°C and 320°C.
TRIM 5	Hardfaced (ST- 6)	Hardfaced (ST- 6)	13% Cr. (SS 410)	For High Pressure in Slightly erosive and corrosive service between - 265°C and 650°C
TRIM 8	13% Cr.	Hardfaced (ST- 6)	13% Cr. (SS 410)	As per Trim no. 5 but for moderate Pressure
TRIM 9	Ni Cu Alloy (Monel)	Ni Cu Alloy (Monel)	Ni Cu Alloy (Monel)	Very corrosive fluids. Erosive - corrosive service between -240°C & 480°C
TRIM10	18Cr. - 8 Ni - Mo	18Cr. - 8 Ni - Mo	18Cr.-8 Ni-Mo (SS 316)	As per Trim no. 2
TRIM 11	Ni-Cu Alloy (Monel)& Hardfaced	Ni-Cu Alloy (Monel) & Hardfaced	Ni-Cu Alloy (Monel)	As per Trim No.2
TRIM12	18Cr. - 8 Ni - Mo	18Cr.-8 Ni-Mo (ST-6,Co,Cr)	18Cr.-8 Ni-Mo (SS 316)	As per Trim No. 10 but for medium pressure
TRIM 13	Alloy 20 (CN7M)	Alloy 20 (CN7M)	19Cr. - 29 Ni (Alloy-20)	As per Trim No. 10 but for medium pressure
TRIM 14	Alloy 20	Alloy 20 and Hard faced	19 Cr.- 29 Ni(Alloy-20)	For high pressure in Slightly erosive & corrosive service between -265°C
TRIM 15	Hardfaced	Hardfaced (ST- 6)	18 Cr. - 8 Ni (SS 304)	As per Trim No.2 but more erosive service and high pressure
TRIM 16	Hardfaced	Hardfaced (ST- 6)	18 Cr.-8 Ni-Mo (SS 316)	As per Trim No. 10 but more erosive service & high pressure
TRIM 17	Hardfaced	Hardfaced (ST- 6)	18 Cr.-10Ni-Cb (SS - 347)	As per Trim No. 13 but more corrosive service & High pressure, combines good corrosion resistance with high temperature resistance up to 800°C.
TRIM 18	Hardfaced	Hardfaced (ST- 6)	19 Cr.- 29 Ni (Alloy - 20)	As per Trim 13 but more corrosive service & higher pressure, water gas or low pressure steam to 230°C.

### SPECIFICATIONS & PROPERTIES OF MATERIAL

Specification ASTM	COMPOSITION									MECHANICAL CHARACTERISTICS				
	C (Max)	Mn (Max)	P (Max)	S (Max)	Si (Max)	Cr (Max)	Mo (Max)	Ni (Max)	OTHERS	UTS (Min)	Y S (Min) Mpa	Elong % (Min)	R A % (Min)	Hardness
A 216 WCB	0.30	1.0	0.04	0.045	0.60	0.50	0.20	0.50	Cu<0.3	485-655	250	22	35	-
A 216 WCC	0.25	1.20	0.04	0.045	0.60	0.50	0.20	0.50	Cu<0.3	485-655	275	22	35	-
A 351 CF 8	0.08	1.50	0.04	0.04	2.00	18.00-21.00	0.50	8.00-11.00	-	485	205	35	-	-
A 351 CF 8C	0.08	1.50	0.04	0.04	2.00	18.00-21.00	0.50	9.00-12.00	Cb + Min 0.8X	485	205	30	-	-
A 351 CF 8M	0.08	1.50	0.04	0.04	1.50	18.00-21.00	2.00-3.00	9.00-12.00	C max1.00	485	205	30	-	-
A 351 CF 3	0.03	1.50	0.04	0.04	2.00	17.00-21.00	0.50	8.00-12.00	-	485	205	35	-	-
A 351 C3M	0.03	1.50	0.04	0.04	1.50	17.00-21.00	2.00-3.00	9.00-13.00	-	485	205	30	-	-
A 351 CN 7M	0.07	1.50	0.04	0.04	1.50	19.00-22.00	2.00-3.00	27.5-30.5	Cu 3.00-4.00	425	170	35	-	-
A 352 LCB	0.30	1.0	0.04	0.045	0.60	0.50	0.20	0.50	Cu<0.3	450-620	240	24	35	-
A 352 LCC	0.25	1.20	0.04	0.045	0.60	0.50	0.20	0.50	-	485-655	275	22	35	-
A 217 WC 6	0.05-0.20	0.50-0.80	0.04	0.045	0.60	1.00-1.50	0.045-0.65	0.50	Cu<0.5	485-655	275	20	35	-
A 217 WC 9	0.05-0.18	0.40-0.70	0.04	0.045	0.60	2.00-2.75	0.90-1.20	0.50	Cu<0.5	485-655	275	20	35	-
A 217 C 5	0.20	0.40-0.70	0.04	0.045	0.75	4.00-6.50	0.45-0.65	0.50	Cu<0.5	620-795	415	18	35	-
A 217 C 12	0.20	0.35-0.65	0.04	0.045	1.00	8.00-10.00	0.90-1.20	0.50	Cu<0.5	620-795	415	18	35	-
A 217 CA 15	0.15	1.00	0.04	0.04	1.50	11.50-14.00	0.50	1.00	-	620-795	450	18	30	-
A 105	0.35	0.60-1.05	0.035	0.04	0.10-0.35	0.30	0.12	0.40	Cu<0.4	485	250	22	30	max 187 HB
A 182 F 5	0.15	0.30-0.60	0.03	0.03	0.50	4.00-6.00	0.44-0.65	0.50	-	485	275	20	35	143-217 BHN
A 182 F6 A	0.15	1.00	0.04	0.03	1.00	11.50-13.50	-	0.50	-	585	380	18	35	167-229 BHN
A 182 F11	0.10-0.20	0.30-0.80	0.04	0.04	0.50-1.00	1.00-1.50	0.44-0.65	-	-	485	275	20	30	143-207 BHN
A 182 F 12	0.10-0.20	0.30-0.80	0.04	0.04	0.10-0.60	0.80-1.25	0.44-0.65	-	-	485	275	20	30	143-207 BHN
A 182 F 22	0.05-0.15	0.30-0.60	0.04	0.04	0.50	2.00-2.50	0.87-1.13	-	-	515	310	20	30	156-207 BHN
A 182 F 304	0.08	2.00	0.045	0.03	1.00	18.00-20.00	-	8.00-11.00	N<0.1	515	205	30	50	-
A 182 F 316	0.08	2.00	0.045	0.03	1.00	16.00-18.00	2.00-3.00	10.00-14.00	N<0.1	515	205	30	50	-
A 350 LF 2	0.35	0.60-1.35	0.035	0.040	0.15-0.30	0.30	0.12	0.40	Cu<0.4	485-655	250	22	30	-
A 276 TP 410	0.15	1.00	0.04	0.03	1.00	11.50-13.50	-	-	-	480	275	20	45	-
A 276 TP 304	0.08	2.00	0.045	0.030	1.00	18.00-20.00	-	8.00-10.50	N<0.1	515	205	30	40	-
A 276 TP 316	0.08	2.00	0.045	0.03	1.00	16.00-18.00	2.00-3.00	10.00-14.00	N<0.1	515	205	30	40	-
A 276 TP 304 L	0.03	2.00	0.045	0.030	1.00	18.00-20.00	-	8.00-12.00	N<0.1	485	170	40	50	-
A 276 TP 316 L	0.03	2.00	0.045	0.03	1.00	16.00-18.00	2.00-3.00	10.00-14.00	N<0.1	485	170	40	50	-
B 164 - MOENL	0.30	2.00	-	0.24	0.50	-	-	63.00	Cu 28-34 Al max 3.00	550	275	30	-	-
STELLITE - 6	0.90-1.40	1.00	0.04	0.04	1.50	27.00-31.00	1.50	3.00	W3.5-5.5 Fe 3.00 Bal.Co	895	-	1	-	344 BHN min
439 D2C	2.90	1.80-2.40	0.08	-	1.00-3.00	0.50	-	21.00-24.00	-	400	193	20	-	121-171 BHN
AL - BRONZE - B 148 Gr. 955	-	3.50	-	-	-	-	-	3.00-5.50	Cu min 78.00 Fe 3.00-5.00 Al 10.00-11.50	620	275	6	-	190BHN
A 193 GR. B7	0.37-0.49	0.65-1.10	0.035	0.04	0.15-0.35	0.75-1.20	0.15-0.25	-	-	860	725	16	50	35 HRC max
A 193 GR. B7M	0.37-0.49	0.65-1.10	0.035	0.04	0.15-0.35	0.75-1.20	0.15-0.25	-	-	690	552	18	50	99 HRB max
A 193 GR. B16	0.36-0.47	0.45-0.70	0.035	0.04	0.15-0.35	0.80-1.15	0.50-0.65	-	VA0.25-0.35 Al 0.015	860	725	18	50	35 HRC max
A 193 GR. B8	0.08	2.00	0.045	0.03	1.00	18.00-20.00	-	8.00-11.00	-	517	207	30	50	96 HRB max
A 193 GR. B8M	0.08	2.00	0.045	0.030	1.00	16.00-18.00	2.00-3.00	10.00-14.00	-	517	207	30	50	96 HRB max
A 320 GR. L7	0.38-0.48	0.75-1.00	0.035	0.04	0.15-0.35	0.80-1.10	0.15-0.25	-	-	860	725	16	50	-
A 194 GR. 2H	Min.0.40	1.00	0.040	0.05	0.40	-	-	-	-	-	-	-	-	24-38 HRC
A 194 GR. 2HM	Min. 0.40	1.00	0.040	0.05	0.40	-	-	-	-	-	-	-	-	22 HRC max
A 194 GR. 8	0.08	2.00	0.045	0.03	1.00	18.00-20.00	-	8.00-11.00	-	-	-	-	-	126 - 300BHN
A 194 GR. 8M	0.08	2.00	0.045	0.03	1.00	16.00-18.00	2.00-3.00	10.00-14.00	-	-	-	-	-	126-300 BHN
A 194 GR.7	0.37-0.49	0.65-1.1	0.040	0.04	0.15-0.35	0.75-1.20	0.15-0.25	-	-	-	-	-	-	24-38 HRC
A 194 GR. 4	0.40-0.50	0.70-0.90	0.035	0.04	0.15-0.35	-	0.20-0.30	-	-	-	-	-	-	24-38 HRC