



FERRO ALLOYS & FLUXES FOR MELTING SHOP:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) ±10%
1	Ferro Silicon (lumps)*	Si-70-75, Al- <u>0-1.75(max)</u>	10-150
2	Ferro Silicon (Chip)*	Si-70-75, Al- <u>0-1.5(max)</u>	<u>4-12</u>
3	Ferro Silicon (Innoculant Powder)*	Si-70-75, Al- <u>0-1.75(max)</u>	<u>0.25-3</u>
4 (a)	High Carbon Ferro Manganese *	C-6.0-9.0, S-0- <u>.05(max)</u> , P- <u>0-0.4 max</u> , Si- <u>0-1.50(max)</u> , Mn-70-75	<u>10-100</u>
4(b)	Low Carbon Ferro Manganese*	C- <u>0-1.5(max)</u> , S- <u>0-.05(max)</u> , P- <u>0-0.4 max</u> , Si- <u>1.50(max)</u> , Mn-70-75	<u>10-100</u>
5	High Carbon Ferro Chromium* (<u>lump</u>)	C-6.0-9.0, S- <u>0.005-0.05(max)</u> , Si- <u>0.1-2.0 (max)</u> , Cr- <u>58-70</u>	<u>25-100</u>
6	Low Carbon Ferro Chromium*(<u>lump</u>)	C- <u>0-0.20(max)</u> , S- <u>0-0.02(max)</u> , Si- <u>0-1.50 (max)</u> , Cr- <u>60-75</u>	<u>20-75</u>
7	Ferro Vanadium* (Low Al)	Al- <u>0-0.5</u> , C- <u>0.05-0.40(max)</u> , S- <u>0-0.05 (max)</u> , Si- <u>0-1.5</u> , V- <u>48-55 (min)</u>	10-30
8	Ferro Vanadium* (<u>ordinary</u>)	Al- <u>0.05-1.5</u> , C- <u>0.05-0.40(max)</u> , S- <u>0-0.05</u> Si- <u>0.05-1.5</u> , V- <u>48-55</u>	10-30
9	Ferro Molybdenum*	C- <u>0-0.10</u> , S- <u>0-0.10(max)</u> , Mo- <u>58-75</u>	10-100
11	Ferro Phosphorous*	P-20-30	10-50
12	Ferro Titanium*	S- <u>0.005-0.05</u> , Ti- <u>30-75</u>	<u>10-30</u>
13	Aluminium notch bar*	<u>Al-97-99.5</u>	<u>0.9-1.2 Kg/pc</u>
14	Aluminium Shots*	Al- <u>97-99.5%</u>	<u>3-6</u>
15	Barinoc Chips	Si- <u>70-75%</u>	<u>2-6</u>
16	Carbo Coke*/C.P.C	Fixed Carbon- <u>98.0-99.99%</u>	2-7
18	Burnt Lime*	SiO ₂ - <u>0.5-3.0%</u> , CaO- <u>85-95%</u> , MgO- <u>0-10 % (air tight packing)</u>	<u>20-100</u>
19	Calcium Silicide Chips)*	Si- <u>55-65</u> , Ca- <u>28-38%</u>	<u>10-30</u>
20	Ferro Nickel (Shots/lumps)*	Ni- <u>35(min)</u> , S- <u>0.04(max)</u>	3-6
21	Ferro Boron	B- <u>15-20%</u> , Si- <u>0-2%</u> , Al- <u>0-1%</u> Free from moisture	<u>10-30</u>
22	Pure Nickel*	Ni- <u>99.8-99.999%</u>	10-100
23	Nickel Magnesium*	Ni-79-82, Mg-16-18	50-75
24	Ferro Silicon Magnesium*	Si-40-50, Mg-8-10	25-50
25	Ferro Tungsten*	W-60-70%, S-0.005-0.05	25-75
26	Lime Stone*	SiO ₂ - <u>0-1.5%</u> , CaO- <u>50-60</u> , MgO- <u>0-8%</u> , LOI- <u>40-60</u>	20-70
27	Fluorspar *	CaF ₂ - <u>80-99%</u>	20-50
28	Graphite DC-2	Fixed Carbon- <u>98-99.99</u>	100mesh-90-100% retained 10 mesh-0-5% retained
29	Ferro Niobium	Nb- <u>60-70%</u> , C- <u>0-0.10</u> , S- <u>0.005-0.05 %</u>	10 – 40
30	Ferro Chrome Powder	C-6.0-9.0, S-0.005-0.05(max), Si-0.1-2.0 (max), Cr-58-70	0.25-2

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Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) ±10%
31	<u>Ferrous Sulphide*</u>	<u>S-15-30%</u>	<u>10-40</u>
32	<u>Mish Metal</u>	<u>Rare earth.>70%, Ca>1.5%</u> <u>Free from moisture</u>	<u>NA</u>
33	<u>Zircinoc for in-mould</u>	<u>Si-70-75%</u>	<u>1-3</u>
34	<u>Zircinoc chips</u>	<u>Si-70-75%</u>	<u>2-6</u>
35	<u>Copper (Pure)</u>	<u>Cu-99.7-99.99%</u>	<u>NA</u>
36	<u>Iron Ore</u>	<u>Fe-50-70%</u>	<u>NA</u>

FOUNDRY MATERIALS:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) ±10%
1(a)	<u>Bentonite* Powder</u>	<u>Na-Base, Swelling-95-98, Jell- 30-50, pH-7-11</u>	<u>200 mesh – 0-5% retained</u>
1(b)	<u>Bentonite* (Kutch)</u>	<u>Na-Base. Swelling-98-99.5, Jell- 50-70, pH-7-11</u>	<u>200 mesh – 0-5% retained</u>
1(c)	<u>Green Bond Bentonite*</u>	<u>Na-Base, Swelling-98-99.9, Jell- 60-75, pH-7-11</u>	<u>200 mesh – 0-5% retained</u>
2 (a)	<u>Fire clay (for Melting grade)*</u>	<u>SiO2-50-55, Al2O3-30-45</u>	<u>30 mesh- 0-5% retained, 100 mesh- 90-100% retained</u>
2 (b)	<u>Fire clay (for Foundry grade)*</u>	<u>SiO2-50-60, Al2O3-30 -60</u>	<u>200 mesh– 0-5% retained</u>
3	<u>Clay sand*</u>	<u>Clay-45-55</u>	<u>NA</u>
4 (a)	<u>Silica sand*</u>	<u>SiO2-98(min), Clay-1.0(max)</u>	<u>AFS-24-30</u>
4 (b)	<u>Allahabad Sand</u>	<u>SiO2- 99-99.98%, Clay-0-0.02 max</u>	<u>AFS 50-54</u>
4 (c)	<u>Silica sand (Special quality)</u>	<u>SiO2-97-99, Clay-1.0(max)</u>	<u>AFS-25-35</u>
5	<u>Zirconium Paint*</u>	<u>PH-6.5-7.5, ZrO2-58-62, Water-25-35</u>	<u>NA</u>
6	<u>Graphite powder for spray</u>	<u>Fixed Carbon-98-99.99%,</u>	<u>200 mesh – 0-5% retained</u>
7	<u>Ferrogen(Flux)*</u>	<u>Foseco make or equivalent</u>	<u>NA</u>
8 (a)	<u>Zircon Flour (Special Grade)*</u>	<u>ZrO2-60% Min, % retention – 140 sieve < 2%, 200 sieve 10-15%, 240 sieve 15-20%, 300 sieve 10-15%, 350 sieve 1-5%</u>	<u>As indicated in spec</u>
8 (b)	<u>Zircon Flour (Ordinary)*</u>	<u>ZrO2-63-70, % retention –200 sieve 0-5%</u>	<u>As indicated in spec</u>
9	<u>Silica Flour *</u>	<u>SiO2-98% Min, % retention – 140 sieve < 3%, 200 sieve 10-15%, 240 sieve 10-15%, 300 sieve 20-30%, 350 sieve 1-5%</u>	<u>As indicated in spec</u>
10	<u>Zircon Sand*</u>	<u>ZrO2 – 60-70%</u>	<u>As indicated in spec</u>



MELTING SCRAP:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) \pm 10%
1	SG-Scrap Rolls*	P-0.10(max), S-0.015(max)	NA
2	CC-Scrap Rolls	Si<0.9,Cr<0.5, P<0.5, Mn<0.4	NA
3	Steel-Scrap Rolls	C-2% max, S<0.05, P<0.04, Mn-1.2(max), Si-0.7 max	NA
4	ICDP Scrap Rolls	C-2.5-3.5, Si-0.6-1.3, Mn-0.4-0.9, P-0.1 max, S-0.04 max, Ni- 2.8-4.6, Cr-0.65-2 (max), Mo-0.2-0.5	NA
5	IC Scrap Rolls	C-2.5-3.5, Si-0.6-1.3, Mn-0.4-1.2, P-0.15 max, S-0.08 max, Ni- 1.5-2.5, Cr-0.8-1.5 (max), Mo-0.2-0.5	NA
6	HSS Scrap Rolls	C-0.8-2.2, Si-0.3-0.9, Mn-0.4-0.9, P-0.1 max, S-0.02 max, Ni- 0.4-1.5, Cr-3-6 (max), Mo-2-9, Ni- 2 max, V- 1-6, W- 3 max	NA
	C.I/Broken Ingot Mould*	C-<4.00, Si<2.0, Mn<0.50, P<0.20, S<0.10, Cr-0.20(max)	NA
5	Sponge Iron*	C-0.2(max), S-0.035(max), P-0.05(max), Metallisation-81(min)	3-20
6	Steel Scrap*	S<0.05, P<0.05,	NA
7	Pig Iron (SG Grade)	C-3.2-4.5%, Si-2.5% max, Mn-0.45% Max., P-0.1% max S-0.02% max.	NA
8	Pig Iron (Hollow Grade)	C-3.2-4.5%, Si-0.6%, Mn-0.45% Max., P-0.15% max S-0.05% max.	NA
9	Sorel Pig	C-4-4.5%, S-0.0008% max, Si- .02-.03%	NA
10	Side Trimming (Hi-Cr)	C-0.01-0.6, Mn-0.1-0.5, P-0.01-0.05, S-0.005-0.025, Si-0.001-0.1	NA

MATERIALS FOR MACHINE SHOP:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) \pm 10%
1	Carbide Insert and tips*	Sandvik, Kennametal, Ceratizit, Seco	NA
2	Grinding wheel*	Grindwell Norton, Carborandum	NA

MATERIALS FOR MAINTENANCE DEPARTMENT (MECHANICAL):

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise) \pm 10%
1	V-Belts	Fenner, Dunlop, Hilton	Dimensions
2	Bearings	SKF or equivalent	NA
3	Lubricating Oil	BPCL/IOCL	NA

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MATERIALS FOR MAINTENANCE DEPARTMENT (MECHANICAL):

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise)±10%
3	a) Grade 150 b) Grade 68 c) Grade46 d) Grade 220 e) Grade 460	a) Viscosity @ 400C, cSt 142, Flash point 264°C, Pour point -14°C b) Viscosity @ 400C, cSt 65.4, Flash point 249°C, Pour point -19°C c) Viscosity @ 400C, cSt 45, Flash point 249°C, Pour point -19°C d) Viscosity @ 400C, cSt 212.5, Flash point 270°C, Pour point -12°C e) Viscosity @ 400C, cSt 442.5, Flash point 275°C, Pour point -5°C	NA

MATERIALS FOR MAINTENANCE DEPARTMENT (ELECTRICAL):

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise)±10%
1	Power cables	Nicco, ICC, Gloster	NA
2	Control cables	Nicco, Finolex, Evershine KDK, Lapp	NA
3	Electrodes	Essab, Advani-Oerlikon, L & T, Valency	NA
4	Temperature controller/recorders	Masibus, Sietex, TIEL, Industrial, Instrumentation, Siemens, MB control	NA
5	Insulating motor varnish	Dr. Beck	NA
6	Super enamel copper winding wire	Debidayal, Indo-American, Magnet, HWP,HTP	NA
7	Thermocouple Tips*	Positherm / Fykays or Equivalent	NA

SPECIFICATION FOR FORGED BLANK:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise)±10%
1	Forged Blank*	<u>C 0.5-1.1, Mn- 0.2 -1.1, P- 0.025 (max), S - 0.015 (Max) , Si -0.2-1.0 , Ni- 0.02-0.6, Cr 2.5--5.5, Mo-0.1-0.6 , V- 0.001-0.25</u>	<u>As per PR/Drg. Ultrasonic-conforming ASTM A 388-2001</u>
1 (a)	<u>Forged Blank Annealed</u>	<u>C--0.8 to 0.92%, Si--0.30 to 0.45%, Mn--0.30 to 0.45%, P-- 0.025%MAX, S--0 to 0.008%,Ni--0.30% MAX, Mo--0.08 to 0.30%, V--0.005 to 0.03%, Gas content -- H=2 ppm max, N=70-90 ppm max, O=15 ppm & All together gas content should be less than 120 ppm ASTM Grain Size--6 to 8, hardness--30 SH D(approx). Macro Etch Test--As per ASTM A381-1995. Inclusion Rating--A-1.0/1.5max , B-1.5/0.5 max ,C-0.5 max ,D-1.0/1.5 max of thin & thick series. MP Test to be done as per ASTM E 709-2001.</u>	<u>Ultrasonic--Solid forged blank conforming ASTM A 388-2001. Blank Dimension -- As Per Purchase Requisition & / or Drawing</u>

* These materials are Standard Items

** Elements are given in weight percent.

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SPECIFICATION FOR FORGED BLANK:

Sl. No.	Materials Name	** Specification / Supplier	Size in mm (or Otherwise)±10%
1(b)	<u>Forged Blank-Ind Hardened</u>	<u>C--0.8 to 0.92%, Si--0.30 to 0.45%, Mn--0.30 to 0.45%, P-- 0.025%MAX, S--0 to 0.008%,Ni--0.30% MAX, Mo--0.08 to 0.30%, V--0.005 to 0.03%, Gas content -- H=2ppm max, N=70-90ppm max, O=25-30ppm & All together gas content should be less than 120 ppm. ASTM Grain Size--6 to 8, Macro Etch Test--As per ASTM A381-1995. Inclusion Rating--A-1.0/1.5 max, B-1.5/0.5 max , C-0.5 max ,D-1.0/1.5 max of thin & thick series. MP Test to be done as per ASTM E 709-2001</u>	<u>Ultrasonic--Solid forged blank conforming ASTM A 388-2001. Blank Dimension & Hardness -- As Per Purchase Requisition & / or Drawing . (As applicable).</u>
1 (c)	<u>Forged Blank Volume Hardened</u>	<u>C--0.8 to 0.92%, Si--0.30 to 0.45%, Mn--0.30 to 0.45%, P-- 0.025%MAX, S--0 to 0.008%,Ni--0.30% MAX, Mo--0.08 to 0.30%, V--0.005 to 0.03%, Gas content -- H=2ppm max, N=70-90ppm max, O=25-30ppm & All together gas content should be less than 120 ppm. ASTM Grain Size--6 to 8, Macro Etch Test--As per ASTM A381-1995. Inclusion Rating--A-1.0/1.5 max , B-1.5/0.5 max , C-0.5 max ,D-1.0/1.5 max of thin & thick series. MP Test to be done as per ASTM E 709-2001.</u>	<u>Ultrasonic--Solid forged blank conforming ASTM A 388-2001. Blank Dimension & Hardness -- As Per Purchase Requisition & / or Drawing (As applicable).</u>