

Laboratory **SGS India Private Limited, D.No. # 45-56-3/5/1, Narasimha Nagar,
1st Lane, Akkayapalem, Visakhapatnam, Andhra Pradesh**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-6292 (in lieu of T-1020)**

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Validity **11.09.2017 to 10.09.2019**

Last Amended on **25.07.2018**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
CHEMICAL TESTING				
I.	ORES & MINERALS			
1.	Iron Ore	Total Moisture	IS 1493 (Part-1)	0.10% to 10.0%
		Loss on Ignition (LOI)	SGS/IN/VIZ/IHM-01/WI-07 Issue No 1.0/29.12.2016	0.50% to 10.0%
		Silica as SiO ₂	IS 1493 (Part-1)	0.50% to 10.0%
		Alumina as Al ₂ O ₃	IS 1493 (Part-1)	0.30% to 6.0%
		Total Iron as Fe	IS 1493 (Part-1)	45.0% to 69.0%
		Titanium as TiO ₂	IS 1493 (RA 2011)	0.05% to 2.0%
		Ferrous Oxide as FeO	SGS/IN/VIZ/IHM-01/WI-13 Issue No 1.0/26.05.2017	0.5% to 5.0%
		Manganese as Mn	IS 1493	0.05% to 0.5%
		Calcium as CaO	IS 1493	0.10% to 1.0%
		Magnesium as MgO	IS 1493	0.10% to 1.0%
		Sodium as Na ₂ O	IS 1493 (Part-6)	0.02% to 0.5%
		Potassium as K ₂ O	IS 1493 (Part-6)	0.02% to 0.5%
		Sulphur as S	IS 1493	0.01% to 0.03%
		Phosphorus as P	IS 1493 (Part-1)	0.02% to 0.10%
2.	Manganese Ore	Manganese as Mn	IS 1473	15.0% to 60.0%
		Silica as SiO ₂	IS 1473	0.8% to 20.0%
		Iron as Fe	IS 1473	0.5% to 20.0%
		Alumina as Al ₂ O ₃	SGS-IN-VIZ-IHM-01/WI-08 Issue No 1.0/01.06.2016	0.5% to 10.0%
		Phosphorus as P	IS 1473	0.02% to 0.30%
		Sulphur as S	IS 1473	0.01% to 0.02%
		Total Moisture	ISO 4299	0.50% to 10.0%
		Calcium as CaO	SGS-IN-VIZ-IHM-01/WI-05/ Issue No 1.0/19.01.2017	0.10% to 3.0%

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		Magnesium as MgO	SGS-IN-VIZ-IHM-01/WI-06 Issue No 1.0/25.01.2017	0.10% to 2.0%
3.	Chrome Ore	Chromium as Cr ₂ O ₃	IS 4737	1.0% to 60.0%
		Total Iron as FeO	IS 4737	5.0% to 30.0%
		Silica as SiO ₂	IS 4737	1.0% to 20.0%
		Alumina as Al ₂ O ₃	IS 4737	5.0% to 15.0%
		Calcium as CaO	IS 4737	1.0% to 5.0%
		Magnesium as MgO	IS 4737	1.0% to 20.0%
4.	Bauxite	Sulphur as S	ASTM E 1019	0.01% to 0.05%
		Silica as SiO ₂	IS 2000 (Part-2)	0.50% to 20.0%
		Alumina as Al ₂ O ₃	IS 2000 (Part-3)	25.0% to 60.0%
		Iron as Fe ₂ O ₃	IS 2000 (Part-4)	1.0% to 30.0%
		Calcium as CaO	SGS-IN-VIZ-IHM-01/WI-15/ Issue No 1.0/ 01.06.2017	0.25% to 4.0%
		Magnesium as MgO	SGS-IN-VIZ-IHM-01/WI-16 Issue No 1.0/ 11.06.2017	0.1% to 4.0%
		Total Moisture	SGS-IN-VIZ-IHM-01/WI-17 / Issue No 1.0 / 05.07.2017	0.5% to 10.0%
		Titanium as TiO ₂	IS 2000 (Part-5)	0.5% to 5.0%
		Loss on Ignition (LOI)	IS 2000 (Part-1)	1.0% to 30.0%
		Tri hydrate Alumina (THA)	SGS/IN/VIZ/IHM-01/WI- 14/Issue No 1.0/12.06.2017	25.0 % to 60.0%
		Total Available Alumina (TAA)	SGS/IN/VIZ/IHM-01/WI- 18/Issue No 1.0/16.08.2017	25.0 % to 60.0%
		Mono Hydrate Alumina (MHA)	SGS/IN/VIZ/IHM-01/WI- 18/Issue No 1.0/16.08.2017 (By Calculation)	0.50% to 30.0%
		Reactive Silica R-SiO ₂	IBM Manual (Ver 2004/Page No : 23)	0.50% to 20.0%
5.	Potassium Feldspar	Sodium as Na ₂ O	IS 9749	1.0% to 10.0%
		Potassium as K ₂ O	IS 9749	1.0% to 20.0%
		Silica as SiO ₂	IS 9749	40.0% to 70.0%

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		Alumina as Al ₂ O ₃	IS 9749	12.0% to 25.0%
		Iron as Fe ₂ O ₃	IS 9749	0.05% to 1.00%
		Combined Oxide (CaO+MgO)	IS 9749	0.5% to 2.00%
		Loss On Ignition (LOI)	IS 9749	0.02% to 0.50%
6.	BF Slag	Silica as SiO ₂	IS 4032	20.0% to 38.0%
		Alumina as Al ₂ O ₃	IS 4032	14.0% to 20.0%
		Iron as Fe ₂ O ₃	IS 4032	0.2% to 5.0%
		Calcium as CaO	IS 4032	30.0% to 40.0%
		Magnesium as MgO	IS 4032	5.0% to 15.0%
		Insoluble Residue as IR	IS 4032	0.5% to 2.0%
		Sulphur as SO ₃	IS 4032	0.05% to 3.0%
7.	Limestone	Silica as SiO ₂	IS 1760 (Part-2)	0.2% to 15.0%
		Alumina as Al ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 12/ Issue No 1.0/ 11.07.2016	0.2% to 2.00%
		Iron as Fe ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 11 Issue No 1.0/29.06.2016	0.2% to 1.5%
		Calcium as CaO	IS 1760 (Part-3)	40.0% to 56.0%
		Magnesium as MgO	IS 1760 (Part-3)	0.10% to 5.0%
		Loss on Ignition	IS 1760 (Part-1)	30.0% to 46.0%
8.	Dolomite	Silica as SiO ₂	IS 1760 (Part-2)	0.2% to 15.0%
		Alumina as Al ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 12/ Issue No 1.0/ 11.07.2016	0.2% to 2.00%
		Iron as Fe ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 11/ Issue No 1.0/ 29.06.2016	0.2% to 1.50%
		Calcium as CaO	IS 1760 (Part-3)	18.0% to 35.0%
		Magnesium as MgO	IS 1760 (Part-3)	5.0% to 30.0%
		Loss on Ignition	IS 1760 (Part-1)	30.0% to 46.0%
9.	Quartz	Loss on Ignition	IS 1917 (Part-1)	0.50% to 1.0%
		Silica as SiO ₂	IS 1917 (Part-3)	95.0% to 99.5%
		Titanium as TiO ₂	IS 1917 (Part-7)	0.1% to 0.20%

Sachin Tomar
Convenor

Battal Singh
Program Manager

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		Sodium as Na ₂ O	IS 1917 (Part-2)	0.01% to 0.10%
		Potassium as K ₂ O	IS 1917 (Part-2)	0.01% to 0.10%
		Iron as Fe ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 09/ Issue No 1.0 / 10.06.2016	0.10% to 1.5%
		Alumina as Al ₂ O ₃	SGS/IN/VIZ/ IHM 02 / WI 10/ Issue N 1.0 / 20.06.2016	0.10% to 1.5%
10.	Hydrated Lime	Available Lime as Ca(OH) ₂ .2H ₂ O	IS 1514	50.0% to 95.0%
		Acid insoluble and SiO ₂	IS 1514	0.2% to 10.0%
		Magnesium as MgO	IS 1514	0.5% to 9.00%
		Loss on Ignition (LOI)	IS 1514	5.0% to 20.0%
		Calcium as CaO	IS 1514	30.0% to 75.0%
		Moisture	IS 1514	0.5% to 5.0%
11.	Illuminate Sand	Total Moisture	IS 1493	0.05% to 2.00%
12.	Gypsum	CaSO ₄ .2H ₂ O Content	IS 1288 ASTM -471C-13	50.0% to 98.0%
		Sulphur as SO ₃	IS 1288	15.0% to 45.0%
		Combined Water	IS 1288	1.0% to 20.0%
		Free water	IS 1288 ASTM -471C-13	0.5% to 5.0%
		Silica and Acid insoluble's	IS 1288	0.1% to 5.0%
		Calcium as CaO	IS 1288	15.0% to 40.0%
		Magnesium as MgO	IS 1288	0.1% to 5.0%
13.	Rock Phosphate	Total Phosphorus as P ₂ O ₅	IS 11224 & AOAC Official Method 962.02	25.0% to 45.0% 25.0% to 45.0%
		Silica as SiO ₂	IS 11224	0.50% to 10.0%
		Loss on Ignition (LOI)	IS 11224	0.5% to 10.0%
		Chlorides as Cl	IS 11224 & AOAC Official Method 928.02	0.012% to 0.020% 100 ppm% to 300 ppm

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		Calcium as CaO	IS 11224	30.0% to 55.0%
		Magnesium as MgO	IS 11224	0.1% to 3.0%
		Mixed Oxide (Fe ₂ O ₃ % +Al ₂ O ₃)	IS 11224	0.05% to 1.50%
II.	SOLID FUELS			
1.	Coal/Coke	Total Moisture (TM)	ASTM D 3302/D3302M	1.00% to 50.0%
		Total Moisture (TM)	IS 1350 (Part-1)	1.00% to 50.0%
		Total Moisture (TM)	ISO 579	0.5% to 15.0%
		Inherent Moisture	IS 1350 (Part-1)	0.5% to 20.0%
		Ash content	IS 1350 (Part-1)	0.5% to 50.0%
		Volatile Matter	IS 1350 (Part-1)	0.5% to 35.0%
		Fixed Carbon (FC)	IS 1350 (Part-1)	Qualitative (By Calculation)
		Sulphur as S	IS 1350 (Part-3)	0.01% to 0.65%
2.	Coal/Coke Ash Analysis	Phosphorus as P ₂ O ₅	IS 1355	0.05% to 1.0%
		Manganese as Mn	IS 1355	0.01% to 1.0%
		Titanium as TiO ₂	IS 1355	0.5% to 3.0%
		Silica as SiO ₂	IS 1355	30.0% to 60.0%
		Alumina as Al ₂ O ₃	IS 1355	12.0% to 30.0%
		Iron as Fe ₂ O ₃	IS 1355	2.0% to 15.0%
		Calcium as CaO	IS 1355	1.0% to 5.0%
		Magnesium as MgO	IS 1355	0.50% to 2.50%
		Sulphur as S	IS 1355	0.2% to 1.0%
		Sodium as Na ₂ O	IS 1355	0.05% to 2.0%
		Potassium as K ₂ O	IS 1355	0.05% to 1.0%
III.	METALS & ALLOYS			
1.	Ferro Manganese	Manganese as Mn	IS 1559	60.0% to 80.0%
		Silicon as Si	IS 1559	0.2% to 2.0%
		Phosphorus as P	IS 1559	0.02% to 0.2%

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		Carbon as C	ASTM E 1019	6.0% to 9.0%
		Sulphur as S	ASTM E 1019	0.02% to 0.06%
2.	Silico Manganese	Manganese as Mn	IS 1559	50.0% to 68.0%
		Silicon as Si	IS 1559	13.0% to 20.0%
		Phosphorus as P	IS 1559	0.15% to 0.4%
		Carbon as C	ASTM E 1019	1.0% to 2.5%
		Sulphur as S	ASTM E 1019	0.02% to 0.06%
3.	Ferro Silicon	Silicon as Si	IS 1559 (Part-1)	50.0% to 80.0%
		Phosphorus as P	IS 1559 (Part-4)	0.01% to 0.04%
		Manganese as Mn	IS 1559 (Part-7)	0.01% to 1.5%
		Carbon as C	ASTM E 1019	0.05% to 0.3%
		Sulphur as S	ASTM E 1019	0.005% to 0.01%
4.	HC Ferro Chrome	Chromium as Cr	IS 13452 (Part-5)	55.0% to 67.0%
		Silicon as Si	IS 13452 (Part-1)	0.5% to 5.0%
		Phosphorus as P	IS 13452 (Part-7)	0.02% to 0.07%
		Carbon as C	ASTM E 1019	5.0% to 9.0%
		Sulphur as S	ASTM E 1019	0.02% to 0.04%
5.	LC Ferro Chrome	Chromium as Cr	IS13452 (Part-6)	60% to 75.0%
		Silicon as Si	IS13452 (Part-2)	0.2% to 5.00%
		Phosphorus as P	IS13452 (Part-3)	0.01% to 0.04%
		Carbon as C	ASTM E 1019	0.1% to 1.0%
		Sulphur as S	ASTM E 1019	0.02% to 0.05%
6.	Pig Iron/Cast Iron	Manganese as Mn	IS 12308 (Part-3)	0.10% to 1.2%
		Silicon as Si	IS 12308 (Part-6)	0.10% to 2.5%
		Chromium as Cr	IS 12308 (Part-8)	0.10% to 2.0%
		Phosphorus as P	IS 12308 (Part-5)	0.01% to 0.20%
		Carbon as C	ASTM E 1019	0.50% to 4.0%
		Sulphur as S	ASTM E 1019	0.01% to 0.08%
7.	Sponge Iron	Metallic Fe as Fe(M)	IS15774	77.0% to 90.0%
		Total Iron as Fe(T)	IS 1493 (Part-1)	75.0% to 95.0%
		Metallization	IS 15774	80.0% to 90.0% (By calculation)

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		Silica as SiO ₂	IS 1493 (Part-1)	1.00% to 5.00%
		Alumina as Al ₂ O ₃	IS 1493 (Part-1)	1.50% to 2.00%
		Phosphorus as P	IS 1493 (Part-1)	0.02% to 0.05%
		Carbon as C	ASTM E 1019	0.5% to 2.00%
		Sulphur as S%	ASTM E 1019	0.02% to 0.09%
8.	Stainless Steel	Nickel as Ni	IS 12308 (Part-7)	0.50% to 20.0%
		Silicon as Si	IS 12308 (Part-6)	0.10% to 1.5%
		Manganese as Mn	IS 12308 (Part-3)	0.10% to 1.0%
		Chromium as Cr	IS 12308 (Part-8)	0.10% to 20.0%
		Phosphorus as P	IS 12308 (Part-5)	0.02% to 0.20%
		Carbon as C	ASTM E 1019	0.05% to 2.0%
		Sulphur as S	ASTM E 1019	0.02% to 0.06%
24	Ferro Molybdenum	Molybdenum as Mo	IS12614 (Part-1)	35.0% to 75.0%
IV.	FERTILIZERS			
1.	Murat of Potash (MOP)	Moisture	FCO-NOV13:1985	0.05% to 0.5%
		Sodium as NaCl	FCO-NOV13: 1985	1.0% to 3.5%
		Potassium as K ₂ O	FCO-NOV13: 1985	59.0% to 63.0%
		Size analysis +0.25 mm,	FCO-NOV13: 1985	1.0% to 99.0%
2.	Urea	Moisture	FCO-NOV13: 1985	0.05% to 0.5%
		Total Nitrogen as N	FCO-NOV13: 1985	40.0% to 47.0%
3.	Di ammonium Phosphate (DAP)	Moisture	FCO-NOV13: 1985	0.01% to 1.0%
		Total Nitrogen as N	FCO-NOV13: 1985	15.0% to 20.0%
		Ammonical Nitrogen as N	FCO-NOV13: 1985	15.0% to 18.0%