

Laboratory	Inspectorate Griffith India Pvt. Ltd., Gandhidham Laboratory, Plot No. 12, Ground Floor, Sector-1, Gandhidham, Kutch, Gujarat		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	28.01.2015
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	COAL, COKE & OTHER SOLID FUEL			
1.	Coal/Coke	Total Moisture	IS 1350 (Part 1): 1984 (RA 2002) ISO-579-2013, ISO-589-2008, ASTM-D 3302/D3302 M-12,D2961-11, ASTM D 4931-06 (2011)	0.5 % to 40 %
		IM, Moisture in analysis Sample	IS 1350 (Part 1): 1984 (RA 2002) ISO 687-2010, ISO 11722-2013; ASTMD 3173-11	0.1 % to 20 %
		Volatile Matter	IS 1350 (Part 1): 1984 (RA 2002) ASTM- D3175-11, ISO 562-2010	0.1 % to 50 %
		Ash	IS 1350 (Part 1): 1984 (RA 2002) ASTM D3174-12, ASTM D 4422-13, ISO 1171:2010	0.1 % to 50 %
		Gross Calorific Value	IS 1350 (Part II): 1970 (RA 2005) ASTM D 5865-13, ISO 1928-2009	(2000 to 8300) kcal/kg
		Fixed Carbon	IS 1350 (Part I): 1984(RA 2002) (By calculation), ASTM D3172- 13	-
		Phosphorous	IS 1350 (Part V): 1979 (RA 2001)	0.005 % to 0.1 %
		Total Sulphur	IS 1350 (Part III): 1969 (RA 2005) ASTM D4239-14, ISO 334: 2013, ISO 19579:2006	0.05 % to 33 %

Alok Jain
Convenor

N. Venkateswaran
Program Manager

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	Coal/Coke	Chlorine	IS 1350 (Part-V)1979 (RA 2001) ISO-587:1997E	0.05 % to 0.1 %
		Ultimate Analysis		
		Carbon	ASTM D 5373 – 08	10.0 % to 100.0 %
		Hydrogen	ASTM D 5373 – 08	0.2 % to 15.0 %
		Nitrogen	ASTM D 5373 – 08	0.2 % to 5.0 %
		Sulphur	ASTM D 4239 – 14	0.05 % to 10.0 %
		Oxygen	ASTM D 3176 – 09	0.04 % to 90 %
		Ash Fusion Temperature IDT, ST, HT, FT (Oxidizing & Reducing)	ISO 540-2008 ASTM D 1857/D 1857M-04(2010)	900 °C to1500 °C
		Hardgrove Grindability Index	ASTM D 409/409M-12 IS:4433-1979(Reapproved 2000)	30 Unit to 90 Unit
		CRI-CSR	ASTM D 5341-1999(RA2010 E1)	CRI 10 % to 65 % CSR 20 % to 80 %
2.	Pet Coke	Nickel	ASTM D 5056 – 2004 (RA 2010)	Upto 0.050 %
		Iron	ASTM D 5056 – 2004 (RA 2010)	Upto 0.050 %
		Vanadium	ASTM D 5056 – 2004 (RA 2010)	Upto 0.050 %
		Calcium	ASTM D 5056 – 2004 (RA 2010)	Upto 0.050 %
		Aluminum	ASTM D 5056 – 2004 (RA 2010)	Upto 0.050 %
		Hardgrove Grind ability Index	ASTM D 5003-06a (RA 2011)	30 Unit to 90 Unit

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3.	Chemical Composition of Ash of Coal & Coke	SiO ₂	IS 1355: 1984 (RA 2001)	0.1 % to 60 %
		Fe ₂ O ₃	IS 1355: 1984 (RA 2001)	0.1 % to 35%
		Al ₂ O ₃	IS 1355: 1984 (RA 2001)	0.5 % to 30 %
		CaO	IS 1355: 1984 (RA 2001)	0.5 % to 20 %
		MgO	IS 1355: 1984 (RA 2001)	0.5 % to 10 %
		Na ₂ O	IS 1355: 1984 (RA 2001)	0.001 % to 5 %
		K ₂ O	IS 1355: 1984 (RA 2001)	0.001 % to 5 %
		TiO ₂	IS 1355: 1984 (RA 2001)	0.05 % to 20 %
		MnO	IS 1355: 1984 (RA 2001)	0.05 % to 7.5 %
		P ₂ O ₅	IS 1355: 1984 (RA 2001)	0.005 % to 1 %
		SO ₃	IS 1355: 1984 (RA 2001)	0.1 % to 20 %
4.	Brown Coal and Lignite	Total Moisture	ISO 5068 (Part 1) 2007	1 % to 50 %
		IM, Moisture in analysis sample	ISO 5068 (Part 2) 2007	0.1 % to 20 %
		Volatile Matter	ISO 5071 (Part 1) 2013	0.1 % to 50 %
5.	Coal	IM, Moisture in analysis sample (TGA)	ASTM D 7582 : 2012	0.1 % to 20 %
		Volatile Matter (TGA)	ASTM D 7582 : 2012	0.1 % to 55 %
		Ash (TGA)	ASTM D 7582 : 2012	0.1 % to 50 %
		FC	ASTM D 7582 : 2012	-

**Alok Jain
Convenor**

**N. Venkateswaran
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6.	Coke	IM, Moisture in analysis sample (TGA)	ASTM D 7582 : 2012	0.1 % to 20 %
		Volatile Matter (TGA)	ASTM D 7582 : 2012	0.1 % to 50 %
		Ash (TGA)	ASTM D 7582 : 2012	0.1 % to 50 %
		FC	ASTM D 7582 : 2012	-
II. ORES & MINERALS				
1.	Iron Ore	Silica	IS 1493(Part I): 1981 (RA 2001)	0.1 % to 25 %
		Total Iron	IS 1493(Part I): 1981 (RA 2001)	25 % to 70 %
		Alumina	IS 1493:1959 (RA 2001) IGI/GDM/LAB/TPM/07, Issue 03, Dated 01.03.2013	0.1 % to 25 %
		Titanium Oxide	IS 1493:1959 (RA 2001) IGI/GDM/LAB/TPM/06, Issue 03, Dated 01.03.2013	0.05 % to 20.0 %
		Calcium Oxide	IS 1493:1959 (RA 2001) IGI/GDM/LAB/TPM/08, Issue 03, Dated 01.03.2013	0.1% to 5 %
		Phosphorous	IS 1493(Part I): 1981 (RA 2001)	0.01% to 1%
		Sulphur	IS 1493: 1959	0.005 % to 0.5 %
2.	Bauxite	Loss on Ignition	IS 2000 (Part 1): 1985	5.0 % to 30 %
		Silica	IS 2000 (Part 2): 1985	0.5 % to 30.0 %
		Alumina	IS 2000 (Part 3): 1985	10.0 % to 85.0 %

Alok Jain
Convenor

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3.	Bauxite	Ferric Oxide	IS 2000 (Part 4): 1985	0.5 % to 35.0 %
		Titanium Oxide	IS 2000 (Part 5): 1985	0.50 % to 20.0 %
		Calcium Oxide	IS 2000(Part 9): 1989	0.50 % to 5.0 %
	Limestone & Dolomite	Loss on Ignition	IS 1760 (Part 1): 1991	5.0 % to 50.0 %
		Silica	IS 1760 (Part 2): 1991	1.0 % to 20.0 %
		Ferric Oxide	IS 1760 (Part 3): 1992 IGI/GDM/LAB/TPM/09, Issue 03, Dated 01.03.2013	0.05% to 10.0 %
		Alumina	IS 1760 (Part 3): 1992	0.05 % to 10.0 %
		Calcium Oxide	IS 1760 (Part 3): 1992	10.0 % to 70.0 %
		Magnesium Oxide	IS 1760 (Part 3): 1992 (RA 2001)	0.2 % to 35 %
		Sulphur	ASTM C 25 – 2011	0.005% to 0.1 %
		Phosphorous	ASTM C 25 – 2011	0.005 % to 0.1 %
4.	Gypsum	Calcium Oxide	IS 1288: 1982	5 % to 40 %
		Manganese Oxide	IS 1288: 1982	0.1 % to 5 %
		Silica as SiO ₂	IS 1288: 1982	0.1 % to 10 %
		Combined Water	IS 1288: 1982	5 % to 20 %
		Purity as CaSO ₄ .2H	IS 1288: 1982	60 % to 98 %

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Convenor**

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5.	Rock Phosphate	P ₂ O ₅	IS 11224: 1985	10 % to 50 %
		SiO ₂	IS 11224: 1985 IGI/GDM/LAB/TPM/10, Issue 03, Dated 01.03.2013	0.5 % to 40 %
		Al ₂ O ₃	IS 11224 – 1985 IGI/GDM/LAB/TPM/11, Issue 03, Dated 01.03.2013	0.1 % to 30 %
		Fe ₂ O ₃	IS 11224 – 1985 IGI/GDM/LAB/TPM/12, Issue 03, Dated 01.03.2013	0.1 % to 5 %
		CaO	IS 9386: 1979	10 % to 50 %
		Moisture	IS 11224: 1985	0.1 % to 10 %
III. METAL & ALLOYS				
1.	Ferro Manganese	Carbon	IGI/GDM/TPM/CS 800, Issue 03, Dated 01.03.2013	0.01 % to 8.0 %
		Silicon	IS 1559: 1961 (RA 2002)	0.2 % to 6.0 %
		Sulphur	IS 1559-1961(RA 2002) IGI/GDM/TPM/CS 800, Issue 03, Dated 01.03.2013	0.005 % to 0.5 %
		Phosphorus	IS 1559: 1961 (RA 2002)	0.01% to 1.0%
		Manganese	IS 1559: 1961 (RA 2002)	25 % to 90 %
2.	Silico Manganese	Carbon	IGI/GDM/TPM/CS 800, Issue 03, Dated 01.03.2013	0.3 % to 3.0 %
		Silicon	IS 1559: 1961 (RA 2002)	5 % to 25 %

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3.	Silico Manganese	Sulphur	IS 1559: 1961(RA 2002) TPM ELTRA CS 800, Issue 03, Dated 01.03.2013	0.005 % to 0.1 %
		Phosphorus	IS 1559: 1961 (RA 2002)	0.01 % to 1.0 %
		Manganese	IS 1559: 1961 (RA 2002)	25 % to 70 %
	Mill Scale	Iron As Fe	IS 1493: 1959 (RA 2006)	45.00 % to 75.00 %
		Silica as SiO ₂	IS 1493: 1959 (RA 2006)	0.50 % to 15.00%
		Alumina as Al ₂ O ₃	IS 1493: 1959 (RA 2006) IGI/GDM/LAB/TPM/07, Issue 03, Dated 01.03.2013	0.50 % to 10.0 %
		Phosphorus as P	IS 1493: 1959 (RA 2006)	0.01 % to 0.10 %
		Sulphur as S	IS 1493: 1959 (RA 2006)	0.005 % to 0.25 %
IV. BUILDING MATERIALS				
1.	Clay	Moisture	IS 7589: 1974 (RA 2011)	0.2 % to 2 %
		Loss on Ignition	IS 2840: 2002 (RA 2008) Cl. A-6	8 % to 15 %
		Silica	IGI/GDM/LAB/TPM/13, Issue 03, Dated 05.12.2014	40 % to 70 %
		Ferric Oxide	IS 2840 : 2002 (RA 2008) Cl. A-8	0.1 % to 0.5 % 0.5 % to 2 %
		Titanium Dioxide	IS 2840: 2002 (RA 2008) Cl. A-9	0.1 % to 1 % 1 % to 5 %
		Alumina	IS 2840: 2002 (RA 2008) Cl. A-7	20 % to 40 %

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	Clay	Calcium Oxide	IS 5949- 1990 (RA 2010) IGI/GDM/LAB/TPM/13, Issue 03,Dated 05.12.2014	0.1 % to 0.5 % Above 0.5 to 2 %
		Magnesium	IS 5949- 1990 RA 2010 IGI/GDM/LAB/TPM/13, Issue 03, Dated 05.12.2014	0.1 % to 0.5 % 0.5 % to 2 %
		Na ₂ O	IS 9749: 2007	0.02 % to 0.5 % 0.5 % to 5.0 %
		K ₂ O	IS 9749: 2007	0.02 % to 0.5 % 0.5 % to 5.0 %
2.	Fly Ash	SiO ₂	IS 1727: 1967 Cl. 5.4	20 % to 65 %
		Al ₂ O ₃	IS 1727: 1967 Cl. 5.5 & 5.7	0.5 % to 35 %
		Fe ₂ O ₃	IS 1727: 1967 Cl. 5.6	0.5 % to 30 %
		CaO	IS 1727: 1967 Cl. 5.8	0.5% to 20 %
		MgO	IS 1727: 1967 Cl. 5.9	0.5 % to 10 %
		SO ₃	IS 1727: 1967 Cl. 5.10	0.1 % to 10 %
		TiO ₂	ASTM C 114 – 2013 Cl. 12	0.05 % to 10 %
		P ₂ O ₅	ASTM C 114 – 2013 Cl. 28	0.005% to 1 %
		Na ₂ O	IS 9749:2007	0.01 % to 5 %
		K ₂ O	IS 9749:2007	0.01 % to 5 %
		LOI	IS 1727: 1967 Cl. 5.3	0.1 % to 15.0 %

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V.	FOODS AND AGRICULTURAL PRODUCTS			
1.	Feeding Stuffs :- (Extractions/ De-oiled Cakes)	Moisture	GAFTA-130/2014-2.1	2 % to 20 %
		Crude Protein	GAFTA-130/2014-04:1	8 % to 65 %
		Crude Ash	GAFTA-130/2014-11:0	1 % to 20 %
		Ash insoluble in Hydrochloric Acid (Sand and/or Silica)	GAFTA-130/2014-12:0	0.1 % to 15 %
		Crude Fibre	GAFTA-130/2014-09:0	3 % to 40 %
		Crude Oil & Fats	GAFTA-130/2014-03:0	0.3 % to 20 %
		Urease Activity	GAFTA-130/2014-22:0	0.05 to 1.0 mg of N/g/minutes @30°C
2.	Food Grains	Moisture (Except Maize)	IS 4333 (Part 2): 2002	2 % to 25 %
		Moisture (For Maize)	ISO:6540:1980	2 % to 25 %
		Protein	GAFTA-130/2014-04:1	5 % to 20 %
		Wet Gluten (Wheat Flour)	IS 8162 :1998	15 % to 35 %
		Average Grain Length (In Rice)	ISO 7301:1998	2.50 mm to 10 mm
		Weight of 1000 grains	IS 4333 (Part 4) 2002	-
		Refractions	IS 2813:1995 (2005) & IS 4333 (Part 1):1996, Re-approved 2008	0.01 % to 25 %

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3.	Oils, Fats & related products	Moisture & Volatile Matter	AOCS Ca 2c - 25, Re-approved 2009	0.01 % to 1 %
		Free Fatty Acid (FFA)	AOCS Ca 5a - 40, Re-approved 1997	0.05 % to 10 %
		Acid Value	AOCS Cd 3d - 63, Re-approved 2009	(0.1 to 22) mg KOH/gm
		Iodine Value	AOCS Cd 1d-92, Re-approved 2009	18 Units to 165 Units
4.	White Sugar	Moisture by loss on drying	ICUMSA GS 2/1/3/9-15 (2007)	0.01 % to 0.10 %
		Conductivity Ash	ICUMSA GS2/3-17 (2002)	0.01 % to 0.10 %
		Colour	ICUMSA GS2/3-10 (2007)	20 IU to 50 IU

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Alok Jain
Convenor

N. Venkateswaran
Program Manager