

Laboratory Therapeutics Chemical Research Corporation, 2nd & 3rd Floor, Shiv Industrial Estate, K. V. Balmukund Marg, Chinchpokli (East), Mumbai, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC- 6456 (in lieu of T-1949)

Page 1 of 5

Validity 24.09.2017 to 23.09.2019

Last Amended on 27.12.2018

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
<u>CHEMICAL TESTING</u>				
I.	SOLID FUELS			
1.	Coal & Coke	Total Moisture	IS 1350 (Part I): 1984 ISO 589:2013 & 579:2013 ASTM D 3302/3302 M:2015 & D 2961-11	1% to 55%
		Equilibrated Moisture	IS 1350 (Part I): 1984	0.1 % to 10%
		Moisture (Air Dried/As determine/Dried Basis)	IS 1350 (Part I): 1984 ISO 11722-2013 ASTM D 3173-11	0.1% to 30 %
		Volatile matter	IS 1350 (Part I): 1984 ISO 562-2010 ASTM D 3175-11	1% to 60%
		Ash	IS 1350 (Part I): 1984 ISO 1171:2010 ASTM D 3174:12	0.5% to 60%
		Gross calorific value as GCV	IS 1350 (Part II): 1970 ISO 1928:2009 ASTM D 5865-13	1000 kcal per kg to 9000 kcal per kg
		Net Calorific Value as NCV	IS 1350 (Part II): 1970 ISO 1928:2009 ASTM D 5865-13	1000 kcal per kg to 9000 kcal per kg
		Total Sulphur	IS 1350 (Part III): 1969 ISO 334-2013 (E) ASTM D 4239:2017 ISO 19579:2006 ASTM D 1552:2016	0.1% to 5% 0.1 % to 10% 0.1 % to 10% 0.1% to 24%
		Crucible Swelling Number/Free Swelling Index	IS:1353-1993 ASTM D 720 M:15 ISO 501: 2012	1 to 9

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Page 2 of 5

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		Ash fusion temperature (Oxidising) Deformation Temp.(DT) Sphere Temp.(ST) Hemi Sphere Temp.(HT) Flow Temp. (FT)	IS 12891-1990 ISO 540 :2008 ASTM D 1857 M-04:2010	900 °C to >1500 °C
		Ash fusion temperature (Reducing) Deformation Temp.(DT) Sphere Temp.(ST) Hemi Sphere Temp.(HT) Flow Temp. (FT)	IS 12891-1990 ISO 540 :2008 ASTM D 1857 M-04:2010	900 °C to >1500 °C
		Hard Groove Grind ability Index	IS 4433-1979 ISO 5074: 2015 ASTM D 409/D409 M:12	30 to110
		Ultimate Analysis Carbon Hydrogen Nitrogen Oxygen	ASTM D 5373-14 ISO 29541:2010	0.04 % to 95 % 0.2% to15% 0.2% to 5% 1% to 90 %
2.	Graphite	Moisture	IS 1305-1984 :RA 2005	0.05 % to 3%
		Volatile matter	IS 1305-1984 :RA 2005	0.1% to 5%
		Ash	IS 1305-1984 :RA 2005	0.1% to 10%
		Non Graphitic Carbon	IS 1305 -1984 :RA 2005	0.1 % to 10%
II.	ORES & MINERALS			
1.	Iron Ore	Silica	IS 1493 : (Part I) : 1981 (RA 2011)	0.5% to 70 %
		Total Iron	IS 1493 : (Part I) : 1981 (RA 2011)	2 %to 70%
		Aluminum	IS 1493 : (Part I) : 1981 (RA 2011)	0.4% to 30%
		Phosphorus	IS 1493 : (Part I) : 1981 (RA 2011)	0.01%to 2 %

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Page 3 of 5

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		Sulphur	IS 1493 : (Part I): 1981 (RA 2011)	0.005% to 0.30%
		Moisture	IS 1493 : (Part I): 1981 (RA 2011) IS 11690:1986 (RA 2014)	2 % to 20%
2.	Bauxite Ore	Loss on Ignition	IS 2000 (Part-1) : 1985, (RA 2017)	0.1% to 30%
		Silica	IS 2000 : (Part-2) : 1985, (RA 2017)	0.1% to 40%
		Alumina	IS 2000 : (Part-3): 1985, (RA 2017)	5% to 70%
		Ferric Oxide	IS 2000 : (Part-4) : 1985, (RA 2017)	0.5% to 30%
		Titanium Oxide	IS 2000 : (Part-5) : 1985, (RA 2017)	0.5% to 10%
		Moisture	TCRC/SOP/ Baux-Mois/2	0.2 % to 10%
3.	Limestone/ Dolomite	Loss on Ignition	IS 1760 (Part 1):1991, (RA 2017)	25%.0 to 47.0 %
		Silica	IS 1760 (Part 2):1991, (RA 2017)	0.1% to 10.0 %
		Ferric Oxide	IS 1760 (Part 3):1992, (RA 2017)	0.03% to 5.0 %
		Alumina	IS 1760 (Part 3):1992, (RA 2017)	0.03% to 4.0 %
		Calcium Oxide	IS 1760 (Part 3):1992, (RA 2017)	20.0 % to 56.0 %
		Magnesium Oxide	IS 1760 (Part 3):1992, (RA 2017)	0.1% to 32.0 %
4.	Fines of Bulk Cargo (Iron Ore, Bauxite, Chrome Ore, Barites, Coal)	Flow moisture permit (FMP)/ Transport moisture Limit(TML) Transport moisture Limit (TML)	IMSBC Appendix-2,1.1 Flow table test, Edition 2016 IMSBC Appendix-2, Edition 2018; 1.3 & 1.4 Proctor/Fagerberg & Modified proctor/Fagerberg	4% to 20% 4% to 20% 4% to 20%

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Page 4 of 5

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III.	FOOD & AGRICULTURAL PRODUCTS			
1.	Animal Feed & Feed stuff	Moisture	IS 7874 (Part-I)-1975 (RA 2014)	5.0% to 15.0%
		Crude Protein	IS 7874 (Part-I) -1975 (RA 2014)	10.0% to 50.0%
		Crude fat	IS 7874 (Part-I) -1975 (RA 2014)	0.5% to 20.0%
		Crude fibre	IS 7874(Part-I) -1975 (RA 2014)	1.0 %to 12.0%
		Total Ash	IS 7874(Part-I) -1975 (RA 2014)	1.0% to 10.0%
		Acid insoluble ash	IS 7874 (Part-I) -1975 (RA 2014)	0.2% to 5.0%
2.	Spices & Condiments	Moisture	IS 1797-1985 (RA 2013)	0.1% to 10%
		Total Ash	IS 1797-1985 (RA 2013)	0.1% to 10%
		Acid Insoluble Ash	IS 1797-1985 (RA 2013)	0.1% to 2%
3.	Oil Seeds	Moisture	IS 3579 -1966 (RA 2015)	1.0 % to 12%
		Oil	IS 3579 -1966 (RA 2015)	10% to 65%
		Acid Value of Extracted Oil	IS 3579 -1966 (RA 2015)	1 mg of KOH/gm to 20 mg of KOH/gm
		Damaged & Weevilled Seeds	IS 3579 -1966 (RA 2015)	0.1% to 15%
		Shriveled & Immature Seeds	IS 3579 -1966 (RA 2015)	0.1% to 15%
		Split & Broken	IS 3579 -1966 (RA 2015)	0.1% to 25%
		Impurities	IS 3579 -1966 (RA 2015)	0.1% to 20%
4.	Food Grains	Moisture	IS 4333 (Part II)-2002 (RA :2012)	0.1% to 20%
		Damaged kernel	IS 4333 (Part I)-1996 (RA: 2012)	0.2% to 1.0%
		Foreign Matter	IS 4333 (Part I) -1996 (RA: 2012)	0.1% to 20%

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Page 5 of 5

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		Shriveled /Shrunken / Broken Seeds	IS 4333 (Part I) -1996 (RA: 2012)	0.2% to 2.0%