

Laboratory Alex Stewart International (India) Private Limited, 25-12-40, Ground & 2nd Floor, PVR Chambers, Godeyvari Street, Visakhapatnam, Andhra Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6911 (in lieu of T-2185)

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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CHEMICAL TESTING

I.	ORES & MINERALS			
1.	Iron Ore	Moisture	IS 1493 : Part 1 IS 11690 ISO 3087 IMSBC Code Appx.-2	1% to 15%
		Silica	IS 1493 : Part 1 ISO 2598-1	0.3% to 10%
		Total Iron	IS 1493 : Part 1 ISO 2597-1	35% to 69%
		Alumina	IS 1493 : Part 1 ISO 6830	0.3% to 10%
		Phosphorus	IS 1493 ISO 2599 Chemical & Instrumental Analysis of Ores, Indian Bureau of Mines : 2012	0.01% to 0.2%
		Sulphur	IS 1493 : Part 1 ISO 4689 ASTM E 1915	0.004% to 0.3%
		Loss on Ignition	Chemical & Instrumental Analysis of Ores, Indian Bureau of Mines : 2012, Page 292	0.5% to 10%
		Flow Moisture Point (FMP) & Transportable Moisture Limit (TML)	IMSBC Code, Appx.-2 (By Flow Table Method and Modified Proctor-Fagerberg Method)	5% to 20%
		Angle of Repose	IMSBC Code, Appx.-2 (By Tilting Box method)	30 degree to 45 degree

Iti Saxena
Convenor

Alok Jain
Program Director

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2.	Manganese Ore	Total Moisture	IS 1473 / IS 1449	1% to 15%
		Manganese	IS 1473	15% to 60%
		Silica	IS 1473	1% to 15%
		Total Iron	IS 1473	1% to 30%
		Alumina	IS 1473	0.5% to 8%
		Phosphorus	IS 1473	0.015% to 0.5%
		Sulphur	IS 1473	0.01% to 0.2%
II.	METALS & ALLOYS			
1.	Silicomanganese	Silicon	IS 1559	10% to 25%
		Manganese	IS 1559 ISO 4159	55% to 75%
		Phosphorus	IS 1559 ASIIPL/VSP/IHM/SiMn/03 Issue No.: 02, Issue Date: 2.1.2017	0.05% to 0.5%
		Sulphur	ASTM E 1019	0.005% to 0.05%
		Carbon	ASTM E 1019	0.05% to 3.5%
		2.	Ferrochromium	Silicon
HCFC	ISO 4158			
LCFC	IS 13452 (Part 2)			0.2% to 6%
Chromium	IS 13452 (Part 5)			50% to 70%
HCFC	ISO 4140			
LCFC	IS 13452 (Part 6)			55% to 85%
Phosphorus	IS 13452 (Part 7) ASIIPL/VSP/IHM/HCFC/01 ASIIPL/VSP/IHM/LCFC/05 Issue No.: 02, Issue Date: 2.1.2017			0.01% to 0.06%
Sulphur	ASTM E 1019	0.005% to 0.5%		
	HCFC / LCFC		0.004% to 0.5%	

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		Carbon HCFC / LCFC	ASTM E 1019	4% to 10% 0.05% to 0.4%
3.	Ferromanganese	Silicon	IS 1559	0.2% to 4%
		Manganese	IS 1559 / ISO 4159	55% to 90%
		Phosphorus	IS 1559 ASIIPL/VSP/IHM/FeMn/04 Issue No.: 02, Issue Date: 2.1.2017	0.05% to 0.5%
		Sulphur	ASTM E 1019	0.005% to 0.1%
4.	Ferrosilicon	Carbon	ASTM E 1019	0.1% to 8%
		Silicon	IS 1559 (Part 1)	60% to 80%
		Aluminium	IS 1559 (Part 5)	0.05% to 2.00%
		Phosphorus	IS 1559 (Part 4) ASIIPL/VSP/IHM/FeSi/02 Issue No.: 02, Issue Date: 2.1.2017	0.005% to 0.05%
		Sulphur	ASTM E 1019	0.003% to 0.1%
		Carbon	ASTM E 1019	0.03% to 1%
III.	FOOD AND AGRICULTURAL PRODUCTS			
A.	Edible Oils & Fats			
1.	Crude Palm Oil (CPO)	Moisture and Volatile Matter	IS 548 (Part I) ISO 662 /FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 3.0	0.01% to 0.50%
		Insoluble Impurities	IS 548 (Part I) ISO 663	0.003% to 0.10%
		Acid Value/ Free Fatty Acid	IS 548 (Part I) ISO 660 FSSAI: Manual of Methods	1.0% to 12%

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			of Analysis of Foods (Oils & Fats) Sr. No. 11.0	
		Refractive Index	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 5.0	1.40 to 1.47
		Unsaponifiable Matter	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No.10.0	0.1 % to 1.5%
		Saponification Value	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 9.0	188 mg KOH/g to 220 mg KOH/g
		Specific Gravity/ Density	IS 548 (Part I) ISO 6883 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 4.0	0.895g/ml to 0.906 g/ml
		Iodine Value (Wijs Method)	IS 548 (Part I) ISO 3961 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 12.0	40 to 60
		Peroxide Value	IS 548 (Part I)	0.5 to 10 meq per 1000 g
		Colour	IS 548 (Part I) ISO 15305 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 7.0	40 units to 120 units
		Melting Point (Open Tube Capillary Slip Method)	IS 548 (Part I) ISO 6321 FSSAI: Manual of Methods	30 °C to 42 °C

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			of Analysis of Foods (Oils & Fats) Sr. No. 8.0	
		Flash Point (Pensky Martens Closed Cup Method)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats). Sr. No. 6.0	105 to 300 deg C
		Mineral Oil (Holde's Test)	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 28.0	Qualitative (Present / Absent)
		Cotton Seed Oil (Halphen Test)	IS 548 (Part II) /FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 16.0	Qualitative (Present / Absent)
		Sesame Oil (Baudouin Test)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 15.0	Qualitative (Present / Absent)
		Castor Oil	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 29.0	Qualitative (Present / Absent)
		Total carotenoid as beta-Carotene	BS 684-2.20:1977/ FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 37	250 mg/kg to 1500 mg/kg
2.	Crude Palm Kernel Oil (CPKO)	Moisture and Volatile Matter	IS 548 (Part I) / ISO 662 / FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 3.0	0.05% to 0.50%
		Insoluble Impurities	IS 548 (Part I)/ ISO 663	0.003% to 0.10%

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		Acid Value/ Free Fatty Acid	IS 548 (Part I)/ ISO 660/ FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 11.0	1.0 % to 10%
		Refractive Index	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 5.0	1.4200 to 1.4800
		Unsaponifiable Matter	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No.10.0	0.1% to 1.5%
		Saponification Value	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 9.0	220 mg KOH/g to 270 mg KOH/g
		Specific Gravity/ Density	IS 548 (Part I) ISO 6883 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 4.0	0.910 g/ml to 0.917 g/ml
		Iodine Value (Wijs Method)	IS 548 (Part I) ISO 3961 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 12.0	10 to 25
		Peroxide Value	IS 548 (Part I)	0.5 per 1000 g to 10 meq per 1000 g
		Flash Point (Pensky Martens Closed Cup Method)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 6.0	105 °C to 300 °C

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		Colour	IS 548 (Part I) ISO 15305 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 7.0	20 to 70 units
		Melting Point (Open Tube Capillary Slip Method)	IS 548 (Part I) ISO 6321 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 8.0	20 °C to 30 °C
3.	Crude Sunflower Seed Oil (CSFO)	Moisture and Volatile Matter	IS 548 (Part I) ISO 662 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 3.0	0.05% to 0.50%
		Acid Value/ Free Fatty Acid	IS 548 (Part I) ISO 660 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 11.0	0.40% to 10%
		Insoluble Impurities	IS 548 (Part I) ISO 663	0.003% to 0.10%
		Refractive Index	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 5.0	1.4400 to 1.4800
		Unsaponifiable Matter	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No.10.0	0.1% to 1.5%
		Saponification Value	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 9.0	180 mg KOH/g to 220 mg KOH/g

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		Specific Gravity/ Density	IS 548 (Part I) ISO 6883 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 4.0	0.910 g/ml to 0.915 g/ml
		Iodine Value (Wijs Method)	IS 548 (Part I) ISO 3961 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 12.0	95 to 150
		Peroxide Value	IS 548 (Part I)	0.5 meq per 1000 g to 15 meq per 1000 g
		Colour	IS 548 (Part I) ISO 15305 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 7.0	10 units to 50 units
		Bleachability	AOCS Cc 8b-52	38% to 90%
		Acetone Insolubles	AOCS Ja 4-46	0.1% to 1.0%
		Mineral Oil (Holde's Test)	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 28.0	Qualitative (Present / Absent)
		Cotton Seed Oil (Halphens Test)	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 16.0	Qualitative (Present / Absent)
		Sesame Oil (Baudouin Test).	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats-2016). Sr. No. 15.0	Qualitative (Present / Absent)
		Flash Point (Pensky Martens Closed Cup Method)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 6.0	105 °C to 300 °C

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4.	Refined Bleached Deodorized Palm Olein (RBD)	Moisture and Volatile Matter	IS 548 (Part I) ISO 662 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 3.0	0.04% to 0.50%
		Insoluble Impurities	IS 548 (Part I) ISO 663	0.003% to 0.10%
		Acid Value / Free Fatty Acid	IS 548 (Part I) ISO 660 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 11.0	0.05% to 10%
		Refractive Index	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 5.0	1.4500 to 1.4700
		Unsaponifiable Matter	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No.10.0	0.1% to 1.5%
		Saponification Value	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 9.0	190 mg KOH/g to 220 mg KOH/g
		Specific Gravity/ Density	IS 548 (Part I) ISO 6883 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 4.0	0.900 g/ml to 0.906 g/ml
		Iodine Value (Wijs Method)	IS 548 (Part I) ISO 3961 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 12.0	48 to 70

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		Peroxide Value	IS 548 (Part I)	0.5 meq per 1000 g to 10 meq per 1000 g
		Colour	IS 548 (Part I) ISO 15305 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 7.0	20 units to 80 units
		Melting Point (Open Tube Capillary Slip method)	IS 548 (Part I) ISO 6321 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 8.0	20 °C to 40 °C
		Flash Point (Pensky Martens Closed Cup method)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 6.0	105 °C to 300 °C
		Mineral Oil (Holde's Test)	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 28.0	Qualitative (Present / Absent)
		Cotton Seed Oil (Halphen Test)	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 16.0	Qualitative (Present / Absent)
		Sesame Oil (Baudouin Test).	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 15.0	Qualitative (Present / Absent)
		Castor Oil	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 29.0	Qualitative (Present / Absent)
		Hydrocyanic Acid	IS 548 (Part II) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 32.0	Qualitative (Present / Absent)

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		Cloud Point	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 17.0	7 °C to 20 °C
5.	Crude Degummed Soyabean Oil (CDSBO)	Moisture and Volatile Matter	IS 548 (Part I) ISO 662 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 3.0	0.04% to 0.50%
		Insoluble Impurities	IS 548 (Part I) ISO 663	0.005% to 0.10%
		Acid Value / Free Fatty Acid	IS 548 (Part I) ISO 660 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 11.0	0.5% to 10%
		Refractive Index	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 5.0	1.4600 to 1.4720
		Unsaponifiable Matter	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No.10.0	0.1% to 1.5%
		Saponification Value	IS 548 (Part I) FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 9.0	180 mg KOH/g to 210 mg KOH/g
		Specific Gravity/ Density	IS 548 (Part I) ISO 6883 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 4.0	0.910 g/ml to 0.915 g/ml

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		Iodine Value (Wijs Method)	IS 548 (Part I) ISO 3961 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 12.0	110 to 150
		Peroxide Value	IS 548 (Part I)	0.5 meq per 1000 g to 10 meq per 1000 g
		Colour	IS 548 (Part I) ISO 15305 FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 7.0	20 units to 40 units
		Bleachability	AOCS Cc 8b-52	40% to 90%
		Flash Point (Pensky Martens Closed Cup method)	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats-) Sr. No. 6.0	105 °C to 300 °C
		Phosphorus	FSSAI: Manual of Methods of Analysis of Foods (Oils & Fats) Sr. No. 34.0	0.003 %to 0.20%
IV.	SOLID FUELS			
1.	Coal	Total Moisture	IS 1350 (Part 1) ASTM D3302 / D3302M ASTM D2961/ D2961M	1.0% to 50%
		Moisture in analysis sample	IS 1350 (Part 1) ASTM D3173/D3173M	0.5% to 20%
		Moisture at 60% RH & 40 °C (Equilibrated Moisture)	IS 1350 (Part 1)	0.1% to 10%
		Volatile Matter	IS 1350 (Part 1) ASTM D3175	10% to 60%

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		Volatile Matter (Equilibrated at 60% RH & 40°C)	IS 1350 (Part 1)	10% to 60%
		Ash	IS 1350 (Part 1) ASTM D3174	1.0% to 60%
		Ash (Equilibrated at 60% RH & 40°C)	IS 1350 (Part 1)	1.0% to 60%
		Fixed Carbon	IS 1350 (Part 1) ASTM D3172	Calculated Value (By Difference)
		Equilibrated Fixed Carbon	IS 1350 (Part 1)	Calculated Value (By Difference)
		Gross Calorific Value	IS 1350 (Part 2)	1000 kcal/kg to 8000 kcal/kg
			ASTM D5865	1000 kcal/kg to 8000 kcal/kg
		Gross Calorific Value (Equilibrated at 60% RH & 40°C)	IS 1350 (Part 2)	1000 kcal/kg to 8000 kcal/kg
		Sulphur	IS 1350 (Part 3)	0.1% to 5%
		Sulphur (Equilibrated at 60% RH & 40°C)	IS 1350 (Part 3) IS 1350 (Part 2)	0.1% to 5%