



NABL

SCOPE OF ACCREDITATION

| | | | |
|------------------------|---|-------------|------------|
| Laboratory | RCA Laboratories, Unit No. P 27, Phase 1, Kasba Industrial Estate-1, Kolkata, West Bengal | | |
| Accreditation Standard | ISO/IEC 17025: 2005 | | |
| Discipline | Chemical Testing | Issue Date | 21.07.2015 |
| Certificate Number | T-3513 | Valid Until | 20.07.2017 |
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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 AND OTHER SOLID FUELS | | | | |
| 1. | Coal/ Coke | Total Moisture | IS 1350 (Part 1): 1984 (RA 2007)/ ASTM D 3302 - 12 / ISO 589: 2008 | 5 % to 40 % |
| | | Air-dried Moisture | IS 1350 (Part 1): 1984 (RA 2007)/ ASTM D 3173 - 11 / ISO 11722: 1999 | 0.1 % to 20 % |
| | | Volatile Matter | IS 1350 (Part 1): 1984 (RA 2007)/ ASTM D 3175 - 11 / ISO 562: 2010 | 0.1 % to 50 % |
| | | Ash | IS 1350 (Part 1): 1984 (RA 2007)/ ASTM D 3174 - 12 / ISO 1171: 2010 | 0.1% to 50 % |
| | | Gross Calorific Value | IS 1350 (Part 2): 1970 (RA 2009) / ASTM D 5865 -13 / ISO 1928: 2009 | 2000 kcal/kg to 9000 kcal/kg |
| | | Fixed Carbon | IS 1350 (Part 1): 1984 (RA 2007)/ ASTM D 3172 - 13 / ISO 17246: 2010 | 15% to 95 % |
| | | Phosphorous | IS 1350 (Part 5): 1979 (RA 2009) | 0.001 % to 0.10 % |

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|------------------------------|----------------------------|---------------------------|--|--|
| | Coal/ Coke | Total Sulphur | IS 1350 (Part 3): 1969 (RA 2005) / ASTM D 4239- 97 & ASTM D 3177- 02 / ISO 334: 2013 | 0.1 % to 5 % |
| | | HGI | IS 4433: 1979 (RA 2005)/ ASTM D 409 -12 | 37 % to 89 % |
| | | CSN | IS 1353: 1993 (RA 2005) | 1 to 9 |
| | | Carbon | ASTM D 5373 -14 | 10 % to 85 % |
| | | Nitrogen | ASTM D 5373 -14 | 0.5 % to 4 % |
| | | Hydrogen | ASTM D 5373 -14 | 2.5 % to 6 % |
| | | Oxygen | ASTM D 3176 -14 | By Calculation |
| | | Deformation Temperature | ASTM D 1857 -04 | 1000 °C to 1500 °C |
| | | Softening Temperature | ASTM D 1857 -04 | 1000 °C to 1500 °C |
| | | Hemispherical Temperature | ASTM D 1857 - 04 | 1100 °C to 1550 °C |
| | | Flow Temperature | ASTM D 1857 - 04 | 1100 °C to 1550 °C |
| II. ORES AND MINERALS | | | | |
| I. | Iron Ore | Silica | IS 1493 (Part 1): 1981 (RA 2006) | 0.1 % to 10 % |
| | | Total Iron | IS 1493 (Part 1): 1981 (RA 2006) | 25 % to 70 % |

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|-------|----------------------------|-------------------------|---|--|
| | Iron Ore | Alumina | IS 1493 (Part 1): 1981 (RA 2006) | 0.1 % to 10 % |
| | | Phosphorous | IS 1493 (Part 1): 1981 (RA 2006) | 0.01 % to 1.0 % |
| | | Sulphur | IS 1493: 1959 (RA 2006) | 0.001 % to 0.5 % |
| | | TML & FMP | IMS BC Code Annexure 12 Appendix 2, Flow Table Test Method | 4 % to 20 % |
| 2. | Manganese Ore | Silica | IS 1473: 2004 | 0.1 % to 20 % |
| | | Manganese | IS 1473: 2004 | 30 % to 65 % |
| | | Iron | IS 1473: 2004 | 1 % to 15 % |
| | | Alumina | IS 1473: 2004 | 0.5 % to 15 % |
| | | Sulphur | IS 1473: 2004 | 0.001 % to 0.15 % |
| | | Phosphorous | IS 1473: 2004 | 0.005 % to 1.0 % |
| 3. | Chromite Ore | Silica | IS 4737: 1982 (RA 2006) | 0.5 % to 20 % |
| | | Chromium Oxide | IS 4737: 1982 (RA 2006) | 25 % to 68 % |
| | | Total Iron | IS 4737: 1982 (RA 2006) | 5 % to 35 % |
| | | Alumina | IS 4737: 1982 (RA 2006) | 1 % to 25 % |
| | | Calcium Oxide | IS 4737: 1982 (RA 2006) | 0.1 % to 5 % |
| | | Magnesium Oxide | IS 4737: 1982 (RA 2006) | 1 % to 25 % |

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|-------|----------------------------|-------------------------|--|--|
| 4. | Bauxite | Loss of Ignition | IS 2000 (Part 1): 1985 (RA 2007) | 5 % to 30 % |
| | | Silica | IS 2000 (Part 2): 1985 (RA 2007) | 0.1 % to 25 % |
| | | Alumina | IS 2000 (Part 3): 1985 (RA 2006) | 5 % to 65 % |
| | | Ferric Oxide | IS 2000 (Part 4): 1985 (RA 2007) | 1 % to 25% |
| 5. | Limestone & Dolomite | Loss of Ignition | IS 1760 (Part 1): 1991 (RA 2006) | 5 % to 50 % |
| | | Silica | IS 1760 (Part 2): 1991 (RA 2006) | 0.1 % to 20 % |
| | | Ferric Oxide | RCA/KOL/TPM/SOP – 001 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.01 % to 10 % |
| | | Alumina | IS 1760 (Part 3): 1992 (RA 2006) | 0.05 % to 10 % |
| | | Calcium Oxide | IS 1760 (Part 3): 1992 (RA 2006) | 10 % to 56 % |
| | | Magnesium Oxide | IS 1760 (Part 3): 1992 (RA 2006) | 0.1 % to 10 % |
| | | Sulphur | ISO 9556: 1989 | 0.005 % to 1.0 % |

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|-------|----------------------------|-------------------------|--|--|
| | Limestone & Dolomite | Phosphorus | RCA/KOL/TPM/SOP – 002 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.005 % to 1.0 % |
| | | Sodium Oxide | RCA/KOL/TPM/SOP – 003 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.005 % to 0.5 % |
| | | Potassium Oxide | RCA/KOL/TPM/SOP – 003 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.005 % to 0.5 % |
| 6. | Rock Phosphate | Phosphorus Pentoxide | IS 11224: 1985 (RA 2010) | 25 % to 45 % |
| | | Silica | IS 11224: 1985 (RA 2010) | 0.1 % to 15 % |
| | | Calcium Oxide | IS 9386: 1979 (RA 2001) | 40 % to 60 % |
| | | Magnesium Oxide | IS 11224: 1985 (RA 2010) | 0.1 % to 5 % |
| | | Alumina | IS 11224: 1985 (RA 2010) | 0.01 % to 5 % |
| | | Organic Matter | IS 11224: 1985 (RA 2010) | 0.001 % to 0.5 % |
| | | Chlorine | IS 11224: 1985 (RA 2010) | 0.001 % to 0.5 % |
| | | Sodium Oxide | RCA/KOL/TPM/SOP – 004 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.01 % to 1.0 % |
| | | Potassium Oxide | RCA/KOL/TPM/SOP – 004 Issue# 01, Issue Date : 03.11.2014, Rev 00 | 0.01 % to 1.0 % |

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|-------|----------------------------|---|---|--|
| | Rock Phosphate | Fluorine | IS 11224: 1985 (RA 2010) | 1 % to 10 % |
| | | Carbon Dioxide | IS 11224: 1985 (RA 2010) | 1 % to 10 % |
| | | Loss Of Ignition | IS 11224: 1985 (RA 2010) | 1 % to 15 % |
| | | Moisture | IS 11224: 1985 (RA 2010) | 0.5 % to 10 % |
| 7. | Gypsum | Free Water | IS 1288: 1982 (RA 2006) | 0.1 % to 10 % |
| | | Combined Water | IS 1288: 1982 (RA 2006) | 18 % to 21 % |
| | | CaSO ₄ .2H ₂ O | IS 1288: 1982 (RA 2006) | 40 % to 98 % |
| | | CaO | IS 1288: 1982 (RA 2006) | 25 % to 40 % |
| | | MgO | IS 1288: 1982 (RA 2006) | 0.1 % to 10 % |
| | | SiO ₂ | IS 1288: 1982 (RA 2006) | 0.5 % to 5 % |
| | | Al ₂ O ₃ & Fe ₂ O ₃ | IS 1288: 1982 (RA 2006) | 0.1 % to 2 % |
| | | NaCl | IS 1288: 1982 (RA 2006) | 0.005 % to 0.5 % |
| 8. | Ferro Silicon | Silicon | IS 1559 (Part 1): 1988 (RA 2009) | 30 % to 80 % |
| | | Aluminium | IS 1559 (Part 5): 2003 (RA 2009) | 0.05 % to 6.0 % |
| | | Sulphur | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.001 % to 0.5 % |

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|-------|----------------------------|-------------------------|--|--|
| | Ferro Silicon | Phosphorus | IS 1559 (Part 4): 1982 (RA 2002) | 0.005 % to 0.3 % |
| | | Carbon | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.05 % to 1.0 % |
| 9. | Ferro Manganese | Manganese | IS 1559: 1961 (RA 2007) | 30 % to 75 % |
| | | Carbon | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.01 % to 8 % |
| | | Silicon | IS 1559: 1961 (RA 2007) | 0.1 % to 20 % |
| | | Sulphur | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.005 % to 0.5 % |
| | | Phosphorus | IS 1559: 1961 (RA 2007) | 0.01 % to 1 % |
| 10. | Silico Manganese | Manganese | IS 1559: 1961 (RA 2007) | 30 % to 80 % |
| | | Carbon | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.3 % to 3 % |
| | | Silicon | IS 1559: 1961 (RA 2007) | 5 % to 25 % |

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| 11. | Silico Manganese | Sulphur | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 (by LECO CS Analyser) | 0.005 % to 0.5 % |
| | | Phosphorus | IS 1559: 1961 (RA 2007) | 0.01 % to 1.0 % |
| | Ferro Chrome | Carbon (LCFC) | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 by LECO CS Analyser | 0.05 % to 0.30 % |
| | | Carbon (HCFC) | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 by LECO CS Analyser | 5 % to 10 % |
| | | Silicon | IS 13452 (Part 1): 1992 (RA 2007) | 0.2 % to 5 % |
| | | Chromium (LCFC) | IS 13452 (Part 6): 2002 (RA 2007) | 60 % to 70 % |
| | | Chromium (HCFC) | IS 13452 (Part 5): 2003 (RA 2009) | 45 % to 66 % |
| | | Sulphur | RCA/KOL/TPM/SOP – 005 Issue# 01, Issue Date : 03.11.2014, Rev 00 by LECO CS Analyser | 0.005 % to 0.50 % |
| | Phosphorus | IS 1559: 1961 (RA 2007) | 0.003 % to 0.10 % | |

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| III. METALS & ALLOYS | | | | |
| 1. Iron, Steel and Ferro Alloys | | | | |
| a. | Pig Iron / Cast Iron | Carbon | ASTM E1019 - 11 | 0.5 % to 4.5 % |
| | | Manganese | IS 12308 (Part 10): 1991 (RA 2001) | 0.05 % to 3.0 % |
| | | | IS 12308 (Part 6): 1991 (RA 2001) | 0.2 % to 2.5 % |
| | | | Sulphur | ASTM E1019 - 11 |
| | | Phosphorus | IS 12308 (Part 5): 1991 (RA 1999) | 0.01 % to 0.5 % |
| | | Nickel | IS 12308 (Part 7): 1991 (RA 2001) | 0.5 % to 3.0 % |
| | | Chromium | IS 12308 (Part 8): 1997 (RA 2002) | 0.1 % to 3.0 % |

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