

Laboratory T.R. Associates Laboratory, Survey No. 272/3, Royal Enfield Show Room Lane, S.G. Highway, Ahmedabad, Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7896 (in lieu of T-3189)

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|-----|----------------------------|-------------------------|---|--|
|-----|----------------------------|-------------------------|---|--|

CHEMICAL TESTING

| I. | ATMOSPHERIC POLLUTION | | | |
|----|--|---------------------------------------|--|---|
| 1. | Stack Emission | Sulphur Dioxide (SO ₂) | IS 11255 (Part 2):1985 (RA 2014) | 5 mg/Nm ³ to 5000 mg/Nm ³ |
| | | Oxides Of Nitrogen (NO ₂) | IS 11255 (Part 7):2012 (RA 2017) | 6 mg/Nm ³ to 400 mg/Nm ³ |
| | | Particulate Matter | IS 11255 (Part 1):1985 (RA 2014) | 1 mg/Nm ³ to 5000 mg/Nm ³ |
| | | Ammonia (as NH ₃) | IS 11255 (Par 6):1999 (RA 2014) | 5 mg/Nm ³ to 500 mg/Nm ³ |
| 2. | Ambient Air | Particulate Matter (PM-10) | IS 5182 (Part 23):2006 (RA 2017) | 10 µg/m ³ to 1000 µg/m ³ |
| | | Particulate Matter (PM-2.5) | TRA/STP/AA/02 D/I 27/10/2014 | 10 µg/m ³ to 1000 µg/m ³ |
| | | Sulphur Dioxide (SO ₂) | IS 5182 (Part 2):2001 (RA 2017) | 5 µg/m ³ to 1050 µg/m ³ |
| | | Oxides Of Nitrogen (NO ₂) | IS 5182 (Part 6):2006 (RA 2017) | 5 µg/m ³ to 750 µg/m ³ |
| | | Ammonia | TRA/STP/AA/05 D/I 1/11/2013 (Indophenol blue method based on CPCB Guideline) | 5 µg/m ³ to 1000 µg/m ³ |
| | | Chlorine | IS 5182 (Part 19):1982 (RA 2014) | 5 µg/m ³ to 400 µg/m ³ |
| | | Total VOCs as Isobutylene | TRA/STP/AA/07 Issue no. 01 Dt 01/07/2018 | 0.1 ppm to 19999 ppm |
| CO | TRA/STP/AA/08 Issue no. 01 Dt 01/07/2018 | 1 ppm to 1000 ppm | | |
| 3. | Meteorological Parameters | Temperature | BIS SP61:1994 / TRA/SOP/AW/01 Issue No.02 Dt 01/05/2016 | -40 °C to 123.8 °C |

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| | | Relative Humidity | BIS SP61:1994 / TRA/SOP/AW/01 Issue No.02 Dt 01/05/2016 | Upto 100% |
| | | Wind speed | BIS SP61:1994 / TRA/SOP/AW/01 Issue No.02 Dt 01/05/2016 | 1.4 m/s to 56 m/s |
| | | Wind direction | BIS SP61:1994 / TRA/SOP/AW/01 Issue No.02 Dt 01/05/2016 | Upto 360° |
| | | Rain fall | BIS SP61:1994 / TRA/SOP/AW/01 Issue No.02 Dt 01/05/2016 | 1 mm/minutes to 20 mm/minutes |
| 4. | Ambient Noise Levels | Noise | IS 9989:1991 | 30 dB(A) to 130 dB (A) |
| 5. | Source Noise Levels | Noise | TRA/STP/SN/02 Issue No.02 Dt 01/05/2016 | 30 dB(A) to 130 dB (A) |
| II. | POLLUTION & ENVIRONMENT | | | |
| 1. | Waste Water (Effluent / Sewage) | Temperature | IS 3025 (Part 9):1984 (RA 2017) | 1 °C to 100 °C |
| | | Acidity | IS 3025 (Part 22):1986 (RA 2014) | 5 mg/L to 1000 mg/L |
| | | Alkalinity | IS 3025 (Part 23):1986 (RA 2014) | 5 mg/L to 1000 mg/L |
| | | Biochemical Oxygen Demand | IS 3025 (Part 44):1993 (RA 2014) | 1 mg/L to 10000 mg/L |
| | | Chemical Oxygen Demand | APHA (23 rd Edition) 5220 B | 5 mg/L to 20000 mg/L |
| | | Dissolved Oxygen | IS 3025 (Part 38):1989 (RA 2014) | 0.1 mg/L to 15 mg/L |
| | | Total Solids | IS 3025 (Part 15):1984 (RA 2014) | 5 mg/L to 10000 mg/L |

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| | | Total Dissolved Solids | IS 3025 (Part 16):1984 (RA 2017) | 5 mg/L to 10000 mg/L |
| | | Total Suspended Solids | IS 3025 (Part 17):1984 (RA 2017) | 5 mg/L to 10000 mg/L |
| | | Total Hardness | APHA (23 rd Edition) 2340-C | 5 mg/L to 5000 mg/L |
| | | Calcium Hardness | APHA (23 rd Edition) 3500-Ca:B | 5 mg/L to 5000 mg/L |
| | | Magnesium Hardness | APHA (23 rd Edition) 3500-Mg B | 5 mg/L to 5000 mg/L |
| | | Calcium As Ca ⁺² | APHA (23 rd Edition) 3500-Ca:B | 2 mg/L to 500 mg/L |
| | | Magnesium As Mg ⁺² | APHA (23 rd Edition) 3500-Mg B | 1 mg/L to 500 mg/L |
| | | Oil and Grease | IS 3025 (Part 39):1991 (RA 2009) | 5 mg/L to 500 mg/L |
| | | pH | IS 3025 (Part 11):1983 (RA 2017) | 1 to 14 |
| | | Electric Conductivity | IS 3025 (Part 14):2013 | 0.1 µS to 200 mS |
| | | Chloride As Cl ⁻ | IS 3025 (Part 32):1988 (RA 2014) | 5 mg/L to 20000 mg/L |
| | | Sulphate As SO ₄ ⁻² | APHA (23 rd Edition) 4500 SO ₄ ⁻² E | 5 mg/L to 500 mg/L |
| | | Colour | APHA (23 rd Edition) 2120 B | 5 CU to 500 CU |
| | | Turbidity | APHA (23 rd Edition) 2130 B | 0.1 NTU to 1000 NTU |
| | | Volatile And Fixed Residue | IS 3025 (Part 18):1984 (RA 2017) | 2 mg/L to 1000 mg/L |
| | | Sulphite | APHA (23 rd Edition) 4500 SO ₃ ^{-B} | 2 mg/L to 250 mg/L |
| | | Ammonical Nitrogen | APHA (23 rd Edition) 4500 NH ₃ C | 0.5 mg/L to 500 mg/L |
| | | Hexa Chromium | IS 3025 (Part 52):2014 | 0.1 mg/L to 20 mg/L |
| | | Total Chromium | IS 3025 (Part 52):2014 | 0.1 mg/L to 20 mg/L |

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|-----|----------------------------|-------------------------|---|--|
| | | Sodium | APHA (23 rd Edition) 3500 Na B | 1 mg/L to 100 mg/L |
| | | Potassium | APHA (23 rd Edition) 3500 K B | 2 mg/L to 100 mg/L |
| | | Sulphide | APHA (23 rd Edition) 4500 | 1 mg/L to 100 mg/L |
| | | Phenol | APHA (23 rd Edition) 5530 D | 0.01 mg/L to 10 mg/L |
| | | Residual Chlorine | APHA (23 rd Edition) 4500 Cl B | 1 mg/L to 100 mg/L |
| | | Nickel | IS 3025 (Part 54):2009 | 0.5 mg/L to 25 mg/L |
| | | Phosphate | APHA (23 rd Edition) , Stannous Chloride Method | 1 mg/L to 50 mg/L |
| | | Phosphorous | APHA (23 rd Edition) 4500 P D | 1 mg/L to 20 mg/L |
| | | Silica | APHA (23 rd Edition) 4500 SiO ₂ :C | 1 mg/L to 20 mg/L |
| | | Cyanide | APHA (23 rd Edition) 4500 CNE | 0.01 mg/L to 5 mg/L |
| | | Aluminum | APHA (23 rd Edition) 3500 Al B | 0.02 mg/L to 5 mg/L |
| | | Copper | APHA (23 rd Edition) 3500 Cu C | 0.1 mg/L to 5 mg/L |
| | | Iron | APHA (23 rd Edition) 3500 Fe B | 0.2 mg/L to 100 mg/L |
| | | Fluoride | APHA (23 rd Edition) 4500 F-D | 0.2 mg/L to 70 mg/L |
| | | Manganese | APHA (23 rd Edition) 3500 Mn B | 0.5 mg/L to 20 mg/L |
| | | Boron | IS 3025 (Part 57):2005 (RA 2017) | 1 mg/L to 40 mg/L |
| | | Nitrate | IS 3025 (Part 34):2009 | 0.1 mg/L to 100 mg/L |
| | | Nitrite | IS 3025 (Part 34):1988 (RA 2014) | 0.01 mg/L to 10 mg/L |

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|-----|----------------------------|-------------------------------|---|--|
| 2. | Soil | pH | IS 2720 (Part 26): 1987, (RA 2011) | 1 to 14 |
| | | Electrical Conductivity | IS 14767 : 2000, (RA 2016) | 0.1 mS/cm to 200 mS/cm |
| | | Moisture | IS 2720 (Part 2):1973, (RA 2015) | 1 % to 90 % |
| | | Water Holding Capacity | TRA/STP/SL/04 Issue No. 01 Dt 01/05/2016 | 1 % to 90 % |
| | | Cation Exchange Capacity | TRA/STP/SL/05 Issue No. 01 Dt 01/05/2016 | 5 meq/100g to 500 meq/100g |
| | | Total Nitrogen | TRA/STP/SL/06 Issue No. 01 Dt 01/05/2016 | 1 % to 100 % |
| | | Available Phosphorous | TRA/STP/SL/07 Issue No. 01 Issue Date 01/05/2016 | 1 mg/kg to 100 mg/kg |
| | | Potassium as K | TRA/STP/SL/08 Issue No. 01 Issue Date 01/05/2016 | 1 mg/g to 500 mg/g |
| | | Sodium as Na | TRA/STP/SL/09 Issue No. 01 Issue Date 01/05/2016 | 1 mg/g to 500 mg/g |
| | | Calcium as Ca | TRA/STP/SL/10 Issue No. 01 Dt 01/05/2016 | 0.1 meq/100g to 500 meq/100g |
| | | Magnesium as Mg | TRA/STP/SL/11 Issue No. 01 Dt 01/05/2016 | 0.1 meq/100g to 500 meq/100g |
| | | SAR | TRA/STP/SL/12 Issue No. 01 Dt 01/05/2016 | 1 to 50 |
| | | Organic Matter/Organic Carbon | TRA/STP/SL/13 Issue No. 01 Dt 01/05/2016 | 0.1 % to 50 % |

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|-------------------|--|-------------------------------|---|--|
| III. | WATER | | | |
| 1. | Water Surface Water Ground Water Drinking Water Industrial Water from Purifiers | Temperature | IS 3025 (Part 9):1984 (RA 2017) | 1 °C to 100 °C |
| | | Acidity | IS 3025 (Part 22):1986 (RA 2014) | 5 mg/L to 1000 mg/L |
| | | Alkalinity | IS 3025 (Part 23):1986 (RA 2014) | 5 mg/L to 1000 mg/L |
| | | Dissolved Oxygen | IS 3025 (Part 38):1989 (RA 2014) | 0.1 mg/L to 15 mg/L |
| | | Total Solids | IS 3025 (Part 15):1984 (RA 2014) | 5 mg/L to 10000 mg/L |
| | | Total Dissolved Solids | IS 3025 (Part 16):1984 (RA 2017) | 5 mg/L to 10000 mg/L |
| | | Total Suspended Solids | IS 3025 (Part 17):1984 (RA 2017) | 5 mg/L to 10000 mg/L |
| | | Total Hardness | APHA (23 rd Edition) 2340-C | 5 mg/L to 5000 mg/L |
| | | Calcium Hardness | APHA (23 rd Edition) 3500-Ca:B | 5 mg/L to 5000 mg/L |
| | | Magnesium Hardness | APHA (23 rd Edition) 3500-Mg B | 5 mg/L to 5000 mg/L |
| | | Calcium As Ca ⁺² | APHA (23 rd Edition) 3500-Ca:B | 2 mg/L to 500 mg/L |
| | | Magnesium As Mg ⁺² | APHA (23 rd Edition) 3500-Mg B | 1 mg/L to 500 mg/L |
| | | Oil And Grease | IS 3025 (Part 39):1991 (RA 2014) | 5 mg/L to 500 mg/L |
| | | pH | IS 3025 (Part 11):1983 (RA 2017) | 1 to 14 |
| Sulphide | APHA (23 rd Edition) 4500 S ² -F | 0.01 mg/L to 20 mg/L | | |
| Residual Chlorine | APHA (23 rd Edition) 4500 Cl B | 1 mg/L to 10 mg/L | | |

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|-----|----------------------------|---------------------------|--|--|
| | | Nickel | IS 3025 (Part 54):2009 | 0.05 mg/L to 0.5 mg/L |
| | | Phosphate | APHA (23 rd Edition) 4500 P D | 1 mg/L to 20 mg/L |
| | | Phosphorous | APHA (23 rd Edition) 4500 P D | 1 mg/L to 20 mg/L |
| | | Silica | APHA (23 rd Edition) 4500 SiO ₂ -C | 0.01 mg/L to 5 mg/L |
| | | Cyanide | APHA (23 rd Edition) 4500 CN-E | 0.01 mg/L to 5 mg/L |
| | | Aluminum | APHA (23 rd Edition) 3500 Al-B | 0.05 mg/L to 5 mg/L |
| | | Copper | APHA (23 rd Edition) 3500 Cu C | 0.02 mg/L to 5 mg/L |
| | | Iron | APHA (23 rd Edition) 3500 Fe B | 0.2 mg/L to 10 mg/L |
| | | Fluoride | APHA (23 rd Edition) 4500 F-D | 0.2 mg/L to 10 mg/L |
| | | Manganese | APHA (23 rd Edition) 3500 Mn B | 0.02 mg/L to 5 mg/L |
| | | Boron | IS 3025 (Part 57):2009 | 1 µg/L to 10 µg/L |
| | | Nitrate | IS 3025 (Part-34): 1988 (RA 2014) | 1 mg/L to 100 mg/L |
| | | Nitrite | IS 3025 (Part-34): 1988 (RA 2014) | 0.01 mg/L to 10 mg/L |
| | | Phenol | APHA (23 rd Edition) 5530 D Direct Photometric Method | 0.01 mg/L to 10 mg/L |
| | | Biochemical Oxygen Demand | IS 3025 (Part 44):1993 (RA 2009) | 1 mg/L to 100 mg/L |
| | | Chemical Oxygen Demand | APHA (23 rd Edition) 5220 B | 5 mg/L to 100 mg/L |
| | | Electric Conductivity | IS 3025 (Part 14):2013 | 0.1 µS to 200 mS |
| | | Chloride As Cl- | IS 3025 (Part 32):1988 (RA 2014) | 5 mg/L to 2000 mg/L |

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| | | Sulphate As SO_4^{2-} | APHA (23 rd Edition) 4500 SO_4^{2-} E | 5 mg/L to 2000 mg/L |
| | | Colour | APHA (23 rd Edition) 2120 B | 5 CU to 100 CU |
| | | Turbidity | APHA (23 rd Edition) 2130 B | 0.1 NTU to 100 NTU |
| | | Volatile And Fixed Residue | IS 3025 (Part 18):1984 (RA 2012) | 2 mg/L to 1000 mg/L |
| | | Sulphite | APHA (23 rd Edition) 4500 SO_3^{2-} B | 2 mg/L to 250 mg/L |
| | | Ammonical Nitrogen | APHA (23 rd Edition) 4500 NH_3 C | 0.5 mg/L to 10 mg/L |
| | | Hexa Chromium | IS 3025 (Part 52):2003 | 0.1 mg/L to 20 mg/L |
| | | Total Chromium | IS 3025 (Part 52):2009 | 0.03 mg/L to 20 mg/L |
| | | Sodium | APHA (23 rd Edition) 3500 Na B | 1 mg/L to 100 mg/L |
| | | Potassium | APHA (23 rd Edition) 3500 K B | 2 mg/L to 100 mg/L |

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