

Laboratory RVN Laboratory, Plot No. 1A, VOC Street, ICF Colony, Chennai, Tamil Nadu

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6640

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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	WATER			
1.	Water/ Drinking water/ Food Processed water/ Swimming pool water/ Construction water	Color	APHA 2120 C	1 Hazen units to 100 Hazen units
		Temperature	IS 3025 (Part 9): 1984 (RA 2002)	1 °C to 100 °C
		Odor	IS 3025 (Part 5): 1983 (RA 2002)	Qualitative (Agreeable/Disagreeable)
		Turbidity	APHA 23rd Edition 2012 2130B	1 NTU to 50 NTU
		pH Value	APHA 23rd Edition 2012 4500-H+B	1 units to 14 units
		Electrical Conductivity	APHA 23rd Edition 2012 2510 B	1 µmhos/cm to 10000 µmhos/cm
		Total Suspended Solids	APHA 23 rd Edition 2012 2540 D	2 mg/l to 1000 mg/l
		Total Dissolved Solids	APHA 23 rd Edition 2012 2540 C	2 mg/l to 15000 mg/l
		Total Solids	APHA 23 rd EDITION 2012 2540 B	2 mg/l to 20000 mg/l
		Chlorides as Cl ⁻	APHA 23 rd Edition 2012 4500Cl ⁻ B	1 mg/l to 15000 mg/l
		Sulphates as SO ₄ ²⁻	APHA 23 rd Edition 2012 4500 SO ₄ ²⁻ E	1 mg/l to 10000 mg/l
		Alkalinity as CaCO ₃	APHA 23 rd Edition 2012 2320 B	1 mg/l to 2000 mg/l
		Total Hardness and Magnesium hardness as CaCO ₃	APHA 23 rd Edition 2012 2340 C	1 mg/l to 5000 mg/l
	Calcium Hardness & Calcium as CaCO ₃	APHA 23 rd Edition 2012 3500 Ca B	1 mg/l to 2000 mg/l	

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		Magnesium as Mg	APHA 23 rd Edition 2012 2340 C	0.24 mg/l to 2000 mg/l
		Chloramines as Cl ₂	IS: 3025 (Part 26)1986 RA.2009	1.0 mg/l to 10 mg/l
		Total Iron as Fe	APHA 23 rd Edition 2012 3111 B/4500B Fe	0.05 mg/l to 100 mg/l
		Silica as SiO ₂	APHA 23 rd Edition 2012 4500-Sio2 C	0.1 mg/l to 200 mg/l
		Free Residual Chlorine as Cl ₂	APHA 23 rd Edition 2012 4500-Cl B	0.2 mg/l to 10 mg/l
		Nitrite Nitrogen as NO ₂ -N	IS 3025 (Part :34) 1988 RA 2003/ APHA 23 rd Edition 2012 4500-NO ₂ B	0.05 mg/l to 50 mg/l
		Nitrate Nitrogen as NO ₃	IS 3025 (Part :34)1988 RA 2003 APHA 23 rd Edition 2012 4500-NO ₃ B	0.5 mg/l to 400 mg/l
		Total Phosphorous as PO ₄	APHA 23 rd Edition 2012 4500-P B,D	0.05 mg/l to 100 mg/l
		Sulfide as S ²⁻	APHA 23 rd Edition 2012 4500-S ²⁻ F	1 mg/l to 100 mg/l
		Sodium as Na	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 3000 mg/l
		Hexavalent Chromium as Cr ⁶⁺	APHA 23 rd Edition 2012 3500-Cr B	0.01 mg/l to 20 mg/l
		Copper as Cu	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 50 mg/l
		Manganese as Mn	APHA 23 rd Edition 2012 3111 B	0.01 to 50 mg/l
		Aluminum as Al	APHA 23 rd Edition 2012 3111 D	0.01 to 50 mg/l
		Boron as B	APHA 23 rd Edition 2012 4500 B, B	0.01 mg/l to 20 mg/l

Anand Deep Gupta
Convenor

N. Venkateswaran
Program Director

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		Barium as Ba	IS 15302:2003	0.01 mg/l to 5.0 mg/l
		Cyanide	IS 3025 (Part 27) 1986 2003 APHA 23 rd Edition 2012 4500 CN- E	0.01 mg/l to 250 mg/l
		Lead	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 50 mg/l
		Fluorides	APHA 23 rd Edition 2012 4500F , D	0.10 mg/l to 20 mg/l
		Ammonia	IS 3025 (Part 34) 1998, RA.2009	0.1 mg/l to 10 mg/l
		Phenolic compounds	APHA 23 rd Edition 2012 5530 B,C,D IS 3025 (Part 43)-1992, RA.2003	1.50 µg/L to 50000 µg/L
		Anionic Detergenta as MBAS	APHA 23 rd Edition 2012 5540 C	0.1 mg/l to 5 mg/l
		Vanadium	APHA 23 rd Edition 2012 3111 B	0.05 mg/l to 10mg/l
		Silver as Ag	APHA 23 rd Edition 2012 3111B	0.01 mg/l to 5 mg/l
		Zinc	APHA 23 rd Edition 2012 3111B	0.01 mg/l to 20 mg/l
		Cadmium	APHA 23 rd Edition 2012 3111B	1 µg/l to 5 µg/l
		Mercury	APHA 23 rd Edition 2012 3112 B	1 µg/l to 5 µg/l
		Arsenic	APHA 23 rd Edition 2012 3114 B	1 µg/l to 5 µg/l
		Cobalt	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 5 mg/l
		Total Chromium	APHA 23 rd Edition 2012 3111 B,D	0.02 mg/l to 25 mg/l
		Nickel	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 25 mg/l

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		Acidity	IS 3025 (Part 22) : 1986 (RA 2009)	0.1ml to 100 ml
		Alkalinity	IS 3025 (Part 23):1986 (RA 2009)	0.1ml to 100ml
		Volatile &Fixed Solids	IS 3025 (Part18)1984	2 mg/l to 20000mg/l
II.	POLLUTION & ENVIRONMENT			
1.	WASTE WATER	Color	APHA 2120 C	1 Hazen units to 100 Hazen units
		Temperature	IS 3025 (Part 09) 1984 RA.2002	1°C to 100 °C
		Odor	IS 3025 (Part 05) 1983 (RA. 2002)	Qualitative (Agreeable/Disagreeable)
		pH Value	APHA 23 rd Edition 2012 4500-H+B	1 units to 13 units
		Total Suspended Solids	APHA 23 rd Edition 2012 2540 D	2 mg/l to 10000 mg/l
		Total Dissolved Solids	APHA 23 rd Edition 2012 2540 C	2 mg/l to 20000 mg/l
		Chlorides as Cl ⁻	APHA 23 rd Edition 2012 4500Cl- B	1 mg/l to 20000 mg/l
		Sulphates as SO ₄ ²⁻	APHA 23 rd Edition 2012 4500 SO42- E	1 mg/l to 10000 mg/l
		Alkalinity as CaCO ₃	APHA 23 rd Edition 2012 2320 B	1 mg/l to 5000 mg/l
		Calcium Hardness & calcium as CaCO ₃	APHA 23 rd EDITION 2012 3500-Ca B	1 mg/l to 5000 mg/l
		Total Hardness and Magnesium Hardness as CaCO ₃	APHA 23 rd Edition 2012 2340 C	1 mg/l to 2000 mg/l
		Magnesium as Mg	APHA 23 rd Edition 2012 2340 C	0.24 mg/l to 2000 mg/l

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		Total Iron as Fe	APHA 23 rd Edition 2012 3111 B	0.05 mg/l to 100 mg/l
		Silica as SiO ₂	APHA 23 rd Edition 2012 4500-Sio2 C	0.02 mg/l to 100 mg/l
		Dissolved oxygen as O ₂	APHA 23 rd Edition 2012 4500-O B,C	0.2 mg/l to 10 mg/l
		Chemical Oxygen Demand (COD)	APHA 23 rd Edition 2012 5220 B,C	5 mg/l to 50000 mg/l
		Biochemical Oxygen Demand (BOD)	APHA 23 rd Edition 2012 5210 B/ 4500 O-C (5 days @ 20°C/ IS 3025:Part 44 (3 days, 27°C)	5 mg/l to 20000 mg/l
		Residual Free Chlorine as Cl ₂	APHA 23 rd Edition 2012 4500-Cl B	0.2 mg/l to 50 mg/l
		Total Phosphorous as P	APHA 23 rd Edition 2012 4500-P B,D	0.05 mg/l to 100 mg/l
		Sulfide as S ²⁻	APHA 23 rd Edition 2012 4500-S ²⁻ F	1 mg/l to 100 mg/l
		Sodium as Na	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 5000 mg/l
		Potassium as K	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 5000 mg/l
		Hexavalent Chromium as Cr ⁶⁺	APHA 23 rd Edition 2012 3500-Cr B	0.05 mg/l to 100 mg/l
		Copper as Cu	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 200 mg/l
		Manganese as Mn	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 200 mg/l
		Oil and Grease	APHA 23 rd Edition 2012 5520 O & G B,C	2 mg/l to 2000 mg/l
		Aluminium as Al	APHA 23 rd Edition 2012 3111 D	0.01 mg/l to 50 mg/l
		Cyanide	APHA 23 rd Edition 2012 4500 CN- C,E	0.01 mg/l to 250 mg/l

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		Lead	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 50 mg/l
		Fluorides	APHA 23 rd Edition 2012 4500F B, D	0.10 mg/l to 20 mg/l
		Ammonical Nitrogen	APHA 23 rd Edition 2012 4500 NH3 B,C	1 mg/l to 500 mg/l
		Free ammonia	IS: 3025 (Part 34) 1988, RA 2009	0.1 mg/l to 10 mg/l
		Total Kjethal Nitrogen	APHA 23 rd Edition 2012 4500 N.(org)B	1 mg/l to 500 mg/l
		Phenolic compounds	APHA 23 rd Edition 2012 5530 B,C,D	0.01 mg/l to 250 mg/l
		Vanadium	APHA 23 rd Edition 2012 3111 B	0.5 mg/l to 10mg/l
		Selenium	APHA 23 rd Edition 2012 3114 C	0.02 mg/l to 5 mg/l
		Particulate Size of Suspended Solids (850 micron)	IS: 6339 -2013;Annex E (clause 8.2) – Sieve analysis.	Passing thro'/ Not passing thro' (Qualitative)
		Zinc	APHA 23 rd Edition 2012 3111B	0.01 mg/l to 250 mg/l
		Cadmium	APHA 23 rd Edition 2012 3111B	0.01 mg/l to 5 mg/l
		Mercury	APHA 23 rd Edition 2012 3112 B	0.001 mg/l to 5 mg/l
		Arsenic	APHA 23 rd Edition 2012 3114 B	0.001 mg/l to 2 mg/l
		Cobalt	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 5 mg/l
		Chromium	APHA 23 rd Edition 2012 3111 B,D	0.05 mg/l to 25 mg/l
		Nickel	APHA 23 rd Edition 2012 3111 B	0.01 mg/l to 250 mg/l

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III.	ATMOSPHERIC POLLUTION			
1.	Ambient Air Quality Monitoring	Suspended Particulate matter (SPM)	IS 5182 (Part 4) - 1999 (RA 2010)	5 µg/m ³ to 1500 µg/m ³
		Respirable Suspended Particulate Matter (RSPM < PM10)	IS 5182 (Part 23) - 2006 (RA 2012)	5 µg/m ³ to 1000 µg/m ³
		Particulate Matter (PM 2.5)	RVNL/SOP/01 (Issue No/Date : 01/16.08.2010) based on CPCB Guidelines for Manual Sampling & Analysis - May 2011	10 µg/m ³ to 500 µg /m ³
		Sulphur dioxide as SO ₂	IS 5182 (Part 2) - 2001 (RA: 2012)	4 µg/m ³ to 100 µg/m ³
		Oxides of Nitrogen as NO ₂	IS 5182(Part 6) -2006 (RA:2012)	6 µg/m ³ to 750 µg/m ³
		Benzene	IS 5182 (Part -11):2006 (RA:2012)	2.5 µg/m ³ to 20.0 µg /m ³
		Benzo(a) Pyrene (Particulate Phase only)	IS:5182 (Part -12):2006 (RA:2009)	1 ng /m ³ to 20.0 ng /m ³
		Carbon Monoxide (CO)	IS 5182 (Part -10) - 1999 (RA: 2009) Indicator tube method	2.3 µg/m ³ to 20 µg/m ³
		Ozone	IS 5182 (Part -9) – 1974(RA:2009)	20 µg/m ³ to 300 µg/m ³
		Lead	IS 5182(Part 22)- 2004 (RA:2009)	0.01 µg/m ³ to 10 µg/m ³
		Ammonia	RVNL/SOP/02 (Issue No/Date : 01/16.08.2010) based on CPCB Guidelines for Manual Sampling & Analysis - May 2011	2 µg/m ³ to 400 µg/m ³

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		Arsenic	USEPA Compendium method IO-3.4 1999.	2.0 ng /m ³ to 50 ng /m ³
		Nickel	USEPA Compendium method IO-3.4 1999	2.0 ng /m ³ to 100 ng /m ³
		Aluminum	USEPA Compendium method IO-3.4 -1999	0.5 µg/m ³ to 50 µg/m ³
		Copper	USEPA Compendium method IO-3.4-1999	0.5 µg/m ³ to 50 µg/m ³
		Temperature	ISO - 4677 (Part 2) - 1985	25 °C to 50°C
		Relative Humidity	ISO - 4677 (Part 2) – 1985	20 % to 95%
2.	Stack Emission	Temperature	IS 11255 (Part 3) - 2008 (RA:2003)	Ambient to 1500°C
		Velocity	IS 11255 (Part 3) - 2008 (RA:2003)	0.8 m/sec to 50 m/sec
		Volume of gas discharge	IS 11255 (Part 3) - 2008 (RA:2003)	70 Nm ³ /hr to 100000 Nm ³ /hr
		Particulate matter	IS 11255 (Part 1) - 1985 (RA:2003)	5 mg/Nm ³ to 10000 mg/Nm ³
		Sulphur dioxide as SO ₂	IS 11255 (Part 2) - 1985 (RA:2003)	5 mg/Nm ³ to 1000 mg/Nm ³
		Oxides of Nitrogen as NO ₂	IS 11255 (Part 7) : 2005	2 mg/Nm ³ to 1000 mg/Nm ³
		Orsat Analyzer (% V/V)		
		Oxygen as O ₂	IS 13270:1992 (RA: 2009)	0.2% to 25 %
		Carbon Dioxide as CO ₂	IS 13270:1992 (RA: 2009)	0.2% to 25 %
		Carbon Monoxide as CO	IS 13270:1992 (RA: 2009)	0.2 % to 25 %

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IV.	POLLUTION AND ENVIRONMENT			
1.	Solid Waste / Sludge / Soil	pH	IS 10158-1982 (RA:2009) IS 2720 (Part 26)-1987 (RA:2011)	2 to 12
		Moisture	IS 2720 (Part 2)-1973 (RA:2005)	0.1%to 90 %
		Gross calorific value	IS 10158-1982 (RA:2009) USEPA 5050 – Sep 1994	50 k.Cal/kg to 12000 k.Cal/kg
		Electrical Conductivity @ 25 °C	IS 14767-2000 (RA: 2010)	1 µS/cm to 10000 µS/cm
		Loss on ignition	IS 10158-1982 (RA:2009)	0.1 %to 40%
		Chloride	USEPA 9253 A-Sep 1994	10 mg/kg to 10000 mg/kg
		Total Soluble Sulphate	IS:2720 (Part 27)-1977(RA:2006) USEPA 9038 – Sep 1986	10 mg/kg to 10000 mg/kg
		Total Organic Carbon	IS 2720 (Part:22) – 1972 (RA:2010)	0.1 % to 50%
		Inorganic cyanide	USEPA 9010 C-Nov 2004 (Rev 3)	1 mg/kg to 100 mg/kg
		Metals		
		Cadmium	USEPA 3050 B –Dec1996 USEPA 7130 – Sep 1986	5 mg/kg to 5000 mg/kg
		Chromium,	USEPA 3050 B Dec1996 USEPA 3060 A-Dec 1996 (Rev1)	5 mg/kg to 5000 mg/kg
		Mercury	USEPA 3050 B Dec1996 USEPA 7471 A-Sep 1994 (Rev1)	1 mg/kg to 5000 mg/kg
		Arsenic	USEPA 3050 B Dec1996 USEPA 7061 A–Jul 1992 (Rev1)	1 mg/kg to 5000 mg/kg
		Cobalt	USEPA 3050 B Dec1996 USEPA 7200-Sep 1986	5 mg/kg to 5000 mg/kg

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		Copper	USEPA 3050 B Dec1996 USEPA 7210-Sep 1986	5 mg/kg to 5000 mg/kg
		Lead	USEPA 3050 B Dec1996 USEPA 7420-Sep 1986	5 mg/kg to 5000 mg/kg
		Nickel	USEPA 3050 B Dec1996 USEPA 7520-Sep 1986	5 mg/kg to 5000 mg/kg
		Vanadium	USEPA 3050 B Dec1996 USEPA 7910-Sep 1986	10 mg/kg to 5000 mg/kg
		Silver	USEPA 3050 B Dec1996 USEPA 7760 A-Jul 1992	5 mg/kg to 5000 mg/kg
2.	Waste Oil / Used Oil	Lead	USEPA 3031 – December 1996	10 mg/kg to 5000 mg/kg
		Cadmium	USEPA 3031 – December 1996	10 mg/kg to 5000 mg/kg
		Nickel	USEPA 3031 – December 1996	10 mg/kg to 5000 mg/kg
		Arsenic	USEPA 3031 – December 1996	1 mg/kg to 5000 mg/kg
		Chromium	USEPA 3031 – December 1996	10 mg/kg to 5000 mg/kg

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ON SITE				
III.	ATMOSPHERIC POLLUTION			
1.	Sound Level Monitoring	Noise Level (Ambient)	IS 9989-1985 (RA:2001)	30 dB(A) to 130 dB(A)
		Noise Level (Source)	IS 4758 -1968(RA:2002)	30 dB(A) to130 dB(A)
2.	Illumination Monitoring	Lux	RVNL/SOP/07 (Issue No/ Date : 01/ 16.08.2010)	5Lux to 400000 Lux