

Laboratory **Santhome Enviro Services, L 4/2, East Avenue Road, Korattur, Chennai, Tamil Nadu**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-7144**

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Validity **18.04.2018 to 17.04.2020**

Last Amended on --

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.	Surface Water, Ground Water, Drinking Water, Construction Water, Swimming Pool Water, Industrial Water, Irrigation Water, Water from purifiers	Temperature	APHA 23 rd Edition 2550 B, IS:3025:(Part .9)	20°C to 50 °C
		Odor	APHA 23 rd Edition 2150 B, IS 3025 (Part . 5)	Agreeable/ Disagreeable
		Turbidity	APHA 23 rd Edition 2130 B, IS:3025 (Part .10)	2.0 NTU to 400 NTU
		pH Value	APHA 23 rd Edition 4500 H+, IS :3025 : (Part .11)	2 to 12
		Electrical Conductivity	APHA 23 rd Edition 2510 B, IS:3025:(Part .14)	5 µS/cm to 50000 µS/cm
		Total Suspended Solids	APHA 23 rd Edition 2540 D, IS:3025: (Part .17)	1 mg/L to 10000 mg/L
		Total Dissolved Solids	APHA 23 rd Edition 2540 C, IS 3025:(Part .16)	1 mg/L to 10000 mg/L
		Total Solids	APHA 23 rd Edition 2540B, IS:3025: (Part .15)	1 mg/L to 10000 mg/L
		Fixed Solids	APHA 23 rd Edition 2540 E, IS:3025: (Part .18)	1 mg/L to 5000 mg/L
		Volatile Solids	APHA 23 rd Edition 2540 E, IS:3025: (Part .18)	1 mg/L to 5000 mg/L

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		Chlorides as Cl	APHA 23 rd Edition 4500 Cl ⁻ B, IS:3025: (Part .32)	1 mg/L to 50,000 mg/L
		Sulphates as SO ₄	APHA 23 rd Edition 4500 SO ₄ ²⁻ E, IS: 3025 :(Part .24)	1 mg/L to 10,000 mg/L
		Total Alkalinity as CaCO ₃	APHA 23 rd Edition 2320 B, IS:3025:(Part .23)	1 mg/L to 10000 mg/L
		Total Hardness as CaCO ₃	APHA 23 rd Edition 2340 C, IS:3025:(Part .21)	1 mg/L to 5000 mg/L
		Calcium Hardness as CaCO ₃	APHA 23 rd Edition /3500 Ca B	1 mg/L to 3000 mg/L
		Magnesium Hardness as CaCO ₃	APHA 23 rd Edition 3500 Mg B	1 mg/L to 2000 mg/L
		Total Acidity as CaCO ₃	APHA 23 rd Edition 2310 B, IS:3025:(Part .22)	1 mg/L to 10,000 mg/L
		Total Iron as Fe	APHA 23 rd Edition 3500 Fe- B, IS:3025:(Part .53)	0.01 mg/L to 20mg/L
		Reactive Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS: 3025: (Part .35)	0.04 mg/L to 200 mg/L
		Carbonate Hardness as CaCO ₃	APHA 23 rd Edition 2340A	1 mg/L to 10,000 mg/L
		Non carbonate- Hardness as CaCO ₃	APHA 23 rd Edition 2340A	1 mg/L to 10000 mg/L
		Free carbon dioxide as CO ₂	APHA 23 rd Edition 4500 CO ₂ C	0.8 mg/L to 100 mg/L
		Carbonates as CaCO ₃	IS 3025 (Part . 51)	1 mg/L to 10000/1.0 mg/L
		Bicarbonates as CaCO ₃	IS 3025 (Part . 51)	1 mg/L to 10000/1.0 mg/L

Pankaj Johri
Convenor

Avijit Das
Program Director

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		Dissolved oxygen	APHA 23 rd Edition 4500 O C, IS :3025 :(Part . 38)	0.5 mg/L to 10 mg/L
		Chemical Oxygen Demand	APHA 23 rd Edition 5220 B	4 mg/L to 50000 mg/L
		Biochemical Oxygen Demand (3 days at 27°C)	IS: 3025 :(Part. 44)	2 mg/L to 10000 mg/L
		Free Residual Chlorine as Cl ₂	APHA 23 rd Edition 4500 Cl B , IS:3025: (Part .26)	1.0 mg/L to 1000 mg/L
		Nitrate as NO ₃	APHA 23 rd Edition 4500 NO ₃ B	2 mg/L to 1000 mg/L
		Nitrite as NO ₂	APHA 23 rd Edition 4500 NO ₂ B, IS 3025:(Part :34)	0.1 mg/L to 1000 mg/L
		Total Phosphorous as P	APHA 23 rd Edition 4500 (Part D , IS 3025:(Part :31)	0.1 mg/L to 50 mg/L
		Fluoride as F	APHA 23 rd Edition 4500 F D	0.05 mg/L to 20 mg/L
		Sodium as Na	APHA 23 rd Edition 3500 Na B , IS:3025 :(Part .45)	1.0 mg/L to 2000 mg/L
		Potassium as K	APHA 23 rd Edition 3500 K B , IS:3025 :(Part .45)	1.0 mg/L to 1000 mg/L
		Ammoniacal Nitrogen as NH ₃ -N	IS 3025:(Part :34)	1.0 mg/L to 500mg/L
		Nitrogen Total as N	IS 3025:(Part :34)	1.0 mg/L to 500mg/L
		Calcium as ca	APHA 23 rd Edition 3500 Ca B , IS:3025:(Part .40)	0.4 mg/L to 20000 mg/L
		Magnesium as Mg	APHA 23 rd Edition 2340 B ,	0.24 mg/L to 12000 mg/L

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			IS:3025:(Part .46)	
		Oil and Grease	IS:3025:(Part :39)	4 mg/L to 1000 mg/L
		Sulfide as S	APHA 23 rd Edition 4500 S ²⁻ -F, IS: 3025: (Part .29)	0.4 mg/L to 50 mg/L
		Particulate Size of Suspended Solids (850 micron)	APHA 23 rd Edition 2560 A	Pass / Not Pass
		Chromium - Total as Cr	APHA 23 rd Edition 3500 Cr , IS:3025:(Part .52)	0.05 mg/L to 20 mg/L
		Chromium–Hexavalent as Cr ⁺⁶	APHA 23 rd Edition 3500 Cr , IS:3025:(Part .52)	0.05 mg/L to 20 mg/L
		Boron as B	APHA 23 rd Edition 4500 B B	0.03 mg/L to 100 mg/L
		Oxygen Absorbed after 4 hrs	IS: 3025 (Part : 63)	0.1 mg/L to 100 mg/L
		Aluminum as Al	APHA 23 rd Edition 3500 Al B , IS 3025: (Part 55)	0.05 mg/L to 50 mg/L
		Percentage Sodium	SOP/WW – 061) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	10 % to 90 %
		Residual Sodium Carbonate	SOP/ WW – 062) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	1 m.equ/L to 10 m.equ/L
		Sodium Absorption Ratio	SOP / WW – 063) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	0.1 m.equ/L to 20 m.equ/L

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		Colloidal Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS:3025: (Part .35)	0.04 mg/L to 200 mg/L
		Total Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS:3025: (Part .35)	0.04 mg/L to 200 mg/L
		Dissolved Iron as Fe	APHA 23 rd Edition 3500 Fe , IS: 3025: (Part .53)	0.01 mg/L to 20mg/L
		Dissolved Phosphorous as P	APHA 23 rd Edition 4500 (Part D , IS 3025:(Part :31)	0.02 mg/L to 50mg/L
		<u>Water Neutralization</u> a)To neutralize 100ml of sample water using Phenolphthalein as an indicator using 0.02 N NaOH	APHA 23 rd Edition 2320 B IS:3025:(Part .22)	0.1 mL to 100 mL
		b)To neutralize 100ml of sample water using Mixed indicator using 0.02N H ₂ SO ₄	APHA 23 rd Edition 2320 B, IS:3025:(Part .23)	0.1 mL to 100 mL
		Organic Solids	APHA 23 rd Edition 2540 E	1.0 mg/L to 10000 mg/L
		Inorganic Solids	APHA 23 rd Edition 2540 E	1.0 mg/L to 10000 mg/L
		Color Retention of KMnO ₄ at 27° C	IS 1070 Annex A	Qualitative

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II.	POLLUTION & ENVIRONMENT			
1.	Waste Water Effluent / Sewage	Temperature	APHA 23 rd Edition 2550 B , IS:3025:(Part .9)	20°C to 50°C
		Odor	APHA 23 rd Edition 2150 B , IS 3025 (Part . 5)	Objectionable / Unobjectionable
		Turbidity	APHA 23 rd Edition 2130 B , IS:3025 (Part .10)	2.0 NTU to 400 NTU
		pH Value	APHA 23 rd Edition 4500 H+ , IS :3025 : (Part .11)	2 to 12
		Electrical Conductivity	APHA 23 rd Edition 2510 B , IS:3025:(Part .14)	5 µS/cm to 50000 µS/cm
		Total Suspended Solids	APHA 23 rd Edition 2540 D , IS:3025: (Part .17)	1 mg/L to 10000 mg/L
		Total Dissolved Solids	APHA 23 rd Edition 2540 C , IS 3025:(Part .16)	1 mg/L to 10000 mg/L
		Total Solids	APHA 23 rd Edition 2540B , IS:3025: (Part .15)	1 mg/L to 10000 mg/L
		Fixed Solids	APHA 23 rd Edition 2540 E , IS:3025: (Part .18)	1 mg/L to 5000 mg/L
		Volatile Solids	APHA 23 rd Edition 2540 E , IS:3025: (Part .18)	1 mg/L to 5000 mg/L
		Chlorides as Cl	APHA 23 rd Edition 4500 Cl- B , IS:3025: (Part .32)	1 mg/L to 50000 mg/L

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		Sulphates as SO ₄	APHA 23 rd Edition 4500 SO ₄ ²⁻ E , IS: 3025 :(Part .24)	1 mg/L to 10000 mg/L
		Total Alkalinity as CaCO ₃	APHA 23 rd Edition 2320 B , IS:3025:(Part .23)	1 mg/L to 10000 mg/L
		Total Hardness as CaCO ₃	APHA 23 rd Edition 2340 C , IS:3025:(Part .21)	1 mg/L to 5000 mg/L
		Calcium Hardness as CaCO ₃	APHA 23 rd Edition 3500 Ca B	1 mg/L to 3000 mg/L
		Magnesium Hardness as CaCO ₃	APHA 23 rd Edition 3500 Mg B	1 mg/L to 2000 mg/L
		Total Acidity as CaCO ₃	APHA 23 rd Edition 2310 B , IS:3025:(Part .22)	1 mg/L to 10000 mg/L
		Total Iron as Fe	APHA 23 rd Edition 3500 Fe- B, IS:3025:(Part .53)	0.01 mg/L to 20mg/L
		Reactive Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS: 3025: (Part .35)	0.04 mg/L to 200 mg/L
		Carbonate Hardness as CaCO ₃	APHA 23 rd Edition 2340A	1 mg/L to 10000 mg/L
		Non Carbonate-Hardness as CaCO ₃	APHA 23 rd Edition 2340A	1 mg/L to 10000 mg/L
		Free Carbon Dioxide as CO ₂	APHA 23 rd Edition 4500 CO ₂ C	0.8 mg/L to 100 mg/L
		Carbonates as CaCO ₃	IS 3025 (Part . 51)	1 mg/L to 10000/1.0 mg/L
		Bicarbonates as CaCO ₃	IS 3025 (Part . 51)	1 mg/L to 10000/1.0 mg/L
		Dissolved Oxygen	APHA 23 rd Edition 4500 O C, IS: 3025 :(Part. 38)	0.5 mg/L to 10 mg/L

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		Chemical Oxygen Demand	APHA 23 rd Edition 5220 B	4 mg/L to 50000 mg/L
		Biochemical Oxygen Demand (3 days at 27 °C)	IS: 3025: (Part.44)	2 mg/L to 10000 mg/L
		Free Residual Chlorine as Cl ₂	APHA 23 rd Edition 4500 Cl B , IS:3025: (Part.26)	1.0 mg/L to 1000 mg/L
		Nitrate as NO ₃	IS 3025:(Part 34)	2 mg/L to 1000 mg/L
		Nitrite as NO ₂	APHA 23 rd Edition 4500 NO ₂ B, IS 3025:(Part: 34)	0.1 mg/L to 1000 mg/L
		Total Phosphorous as P	APHA 23 rd Edition 4500 (Part D), IS 3025:(Part:31)	0.1 mg/L to 50 mg/L
		Fluoride as F	APHA 23 rd Edition 4500 F D	0.05 mg/L to 20 mg/L
		Sodium as Na	APHA 23 rd Edition 3500 Na B , IS:3025 :(Part.45)	1.0 mg/L to 2000 mg/L
		Potassium as K	APHA 23 rd Edition 3500 K B, IS:3025 :(Part .45)	1.0 mg/L to 1000 mg/L
		Ammoniacal Nitrogen as NH ₃ -N	IS 3025:(Part:34)	1.0 mg/L to 500 mg/L
		Nitrogen Total as N	IS 3025:(Part:34)	1.0 mg/L to 500 mg/L
		Calcium as Ca	APHA 23 rd Edition 3500 Ca B , IS:3025:(Part.40)	0.4 mg/L to 20000 mg/L
		Magnesium as Mg	APHA 23 rd Edition 2340 B , IS:3025:(Part.46)	0.24 mg/L to 12000 mg/L
		Oil and Grease	IS:3025:(Part:39)	4 mg/L to 1000 mg/L

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		Sulfide as S	APHA 23 rd Edition 4500 S ²⁻ F, IS: 3025: (Part.29)	0.4 mg/L to 50 mg/L
		Chromium - Total as Cr	APHA 23 rd Edition 3500 Cr , IS:3025:(Part.52)	0.05 mg/L to 20 mg/L
		Chromium– Hexavalent as Cr ⁺⁶	APHA 23 rd Edition 3500 Cr , IS:3025:(Part.52)	0.05 mg/L to 20 mg/L
		Boron as B	APHA 23 rd Edition 4500 B B	0.03 mg/L to 100 mg/L
		Oxygen Absorbed after 4 hrs	IS: 3025 (Part : 63)	0.1 mg/L to 100 mg/L
		Aluminum as Al	APHA 23 rd Edition 3500 Al B , IS 3025: (Part 55)	0.05 mg/L to 50 mg/L
		Percentage Sodium	SOP/ WW – 061) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	10% to 90 %
		Residual Sodium Carbonate	SOP / WW– 062) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	1 meq/L to 10 meq/L
		Sodium Absorption Ratio	SOP / WW– 063) Issue No.01, Issue Date :07.04.17 Ref :IS 11624	0.1 meq/L to 20 meq/L
		Colloidal Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS:3025: (Part.35)	0.04 mg/L to 200 mg/L
		Total Silica as SiO ₂	APHA 23 rd Edition 4500 SiO ₂ C , IS:3025: (Part 35)	0.04 mg/L to 200 mg/L

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		Dissolved Iron as Fe	APHA 23 rd Edition 3500 Fe , IS: 3025: (Part .53)	0.01 mg/L to 20 mg/L
		Ferrous Iron as Fe	APHA 23 rd Edition 3500 Fe- B , IS: 3025: (Part .53)	0.01 mg/L to 20 mg/L
		Dissolved Phosphorous as P	APHA 23 rd Edition 4500 (Part D , IS 3025:(Part :31)	0.02 mg/L to 50 mg/L
2.	Soil	pH	IS 2720 (Part .26) (Using pH Meter)	1.0 to 14
		Organic Matter	IS 2720 (Part .22)	0.5% to 20 %
		Total Soluble Solids	IS 2720 (Part .21) (Evaporation Method)	1%to 20 %
		Water Content	IS 2720 (Part .2)	0.5% to 20 %
		Soluble Sulphate	IS 2720 (Part .27) (Turbidimetric Method)	0.1%to 20 %
		Total Nitrogen	IS:14684,FAO 2007 (Kjeldahl Method)	0.1% to 20 %
		Total Phosphorous	IS:14684 (Stannous Chloride Method)	0.1% to 20 %
III.	ATMOSPHERIC POLLUTION			
1.	Ambient Air	Particulate Matter (PM _{2.5}) Respirable	SOP-SAS-001 (Based on CPCB Guidelines) Issue/Date : 01/ 07.02.17	15 µg/m ³ to 200 µg/m ³
		Respirable Suspended Particulate Matter (PM ₁₀)	IS :5182 (Part 23)	10 µg /m ³ to 1000 µg /m ³
		Sulphur Dioxide	IS :5182 (Part 2)	5 µg /m ³ to 100 µg /m ³
		Oxides of Nitrogen	IS :5182 (Part :6)	3 µg /m ³ to 100 µg /m ³
		Carbon Monoxide (Co)	IS 5182 (Part:10)	1.15 µg /m ³ to 5 mg/m ³
		Ozone	IS 5182 (Part: 9)	20 µg /m ³ to 500 µg /m ³

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		Ammonia	SOP-SAS -007 (Based on CPCB Guidelines) Issue/Date : 01/ 07.02.17	0.5 µg /m ³ to 2000 µg /m ³
2.	Ambient Noise	SPL	IS:9989	30 dB (A) to 130 dB (A)
3.	Illumination	Illumination	IS:3646	30 to 2000 Lux
4.	Indoor Air Quality	Relative Humidity	SOP-SAS-015 In-house validated method Issue/Date : 01/ 07.02.17	20%to 80%
		Suspended Particulate matter (SPM)	SOP-SAS-016 In house validated method Issue/Date : 01/ 07.02.17	5 µg/m ³ to 50 µg/m ³
		Temperature	SOP-SAS-017 In house validated method Issue/Date : 01/ 07.02.17	15 °C to 50 °C
5.	Stack Emission	Particulate Matter	IS :11255 (Part 1)	10mg/Nm ³ to 1000 mg/Nm ³
		Sulphur Dioxide	IS :11255 (Part 2)	5 mg/Nm ³ to 100 mg/Nm ³
		Oxide of Nitrogen	IS :11255 (Part 7)	2.0mg/Nm ³ to 100 mg/Nm ³
		Carbon Dioxide	IS :13270 (Orsat Method)	0.2% to 18%
		Carbon Monoxide	IS :13270 (Orsat Method)	0.2% to 4%
		Oxygen	IS 13270 (Orsat Method)	0.2% to 22%