

## 41. ENVIRONMENT

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## 41. ENVIRONMENT

### 41.1 AVERAGE GASEOUS COMPOSITION OF DRY AIR IN THE TROPOSPHERE 2022-23

<i>Gas</i>	<i>Percent by Volume (%)</i>	<i>By Weight Parts Per Million (ppm)</i>
Nitrogen	78.08	780800
Oxygen	20.95	209500
Argon	0.934	9340
Carbon dioxide	0.3978	397.80
Neon	0.001818	18.18
Helium	0.000524	5.24
Methane	0.000181	1.81
Krypton	0.000114	1.14
Hydrogen	0.000055	0.55
Xenon	0.000009	0.09
Ozone	0.02 TO 0.07	0.02-0.07
Nitrous Oxide	0.0000325	0.33
Carbon Monoxide	0.00001	0.10
Ammonia	Trace	Trace
Nitrogen Dioxide	0.000002	0.02
Nitric Oxide	Trace	Trace
Sulphur Dioxide	Trace	Trace
Hydrogen Sulphide	-	-

Source: Tamil Nadu Pollution Control Board, Chennai-32

## 41.2 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

<i>Pollutant</i>	<i>Time Weighted Average</i>	<i>CONCENTRATION IN AMBIENT AIR (in <math>\mu\text{g}/\text{m}^3</math>)</i>		
		<i>Industrial, Residential Rural &amp; Other Areas</i>	<i>Ecologically Sensitive Area</i>	<i>Methods of Measurement</i>
Sulphur Dioxide ( $\text{SO}_2$ )	Annual *	50	20	Improved West & Goake, Ultraviolet fluorescence
	24 Hours **	80	80	
Nitrogen Dioxide ( $\text{NO}_2$ )	Annual *	40	30	Modified Jacob & Hochheister (Na-Arsenite) Chemiluminescence
	24 Hours **	80	80	
Particulate matter (Size less than $10 \mu\text{m}$ ) or $\text{PM}_{10}$	Annual *	60	60	Gravimetric, TOEM, Beta attenuation
	24 Hours **	100	100	
Particulate matter (Size less than $2.5 \mu\text{m}$ ) or $\text{PM}_{2.5}$	Annual *	40	40	Gravimetric, TOEM, Attenuation
	24 Hours **	60	60	
Ozone ( $\text{O}_3$ )	8 Hours *	100	100	UV photometric, Chemiluminescence chemical method
	1 Hour	180	180	
Lead (P)	Annual *	0.5	0.5	ASS / ISP method after sampling on EPM 2000 or equivalent filter paper ED-XRF using Teflon filter
	24 Hours **	1	1	
Carbon Monoxide ( $\text{CO}$ )	Annual *	0.2	0.2	Non-dispersive Infra Red (NDIR) Spectroscopy
	24 Hours **	0.4	0.4	
Ammonia ( $\text{NH}_3$ )	Annual *	100	100	Chemiluminescence, Indophenol's blue method
	24 Hours **	400	400	
Benzene ( $\text{C}_6\text{H}_6$ )	Annual *	0.5	0.5	Gas Chromatography based continuous analyzer. Adsorption and desorption followed by GC analysis
Benzo (a) Pyrene (BoP)-particulate phase only	Annual *	0.1	0.1	Solvent extraction followed by HPLC / GC analysis
Arsenic (As)	Annual *	0.6	0.6	AAS/ ICP method after sampling on EPM 2000 or equivalent filter paper
Nickel(Ni)	Annual *	20	20	-do-

Note: \* Annual Arithmetic Mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform intervals.

\*\* 24 hourly or 8 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

1. National Ambient Air Quality standard. The levels of an air quality necessary with an adequate margin of safety, to protect the public health, vegetation and property.
2. Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limit specified above for the respective category, it shall be considered adequate reason to institute regular / continuous monitoring and further investigations.

**Source: National Ambient Air Quality Standards published by MoEF&CC, Delhi**

**41.3 STATE OF AMBIENT AIR QUALITY IN MAJOR CITIES OF  
TAMIL NADU 2022-23 (ANNUAL AVERAGE)**

(All values are in  $\mu\text{g}/\text{m}^3$ )

<i>City</i>	<i>Category</i>	<i>SO<sub>2</sub></i>	<i>NO<sub>2</sub></i>	<i>PM<sub>10</sub></i>
<b>I CHENNAI</b>				
1. Kathivakkam	Industrial	12	15	55
2. Manali	Industrial	14	17	58
3. Thiruvottiyur	Industrial	13	17	55
4. Anna Nagar	Residential	11	21	58
5. Adyar	Residential	10	20	50
6. Kilpauk	Commercial	11	21	66
7. Thiyagarayanagar	Commercial	11	21	58
8. Nungambakkam	Commercial	12	22	61
<b>II MADURAI</b>				
9. Hotel Tamil Nadu	Residential	15	17	55
10. Pitchai Pillai Chavadi	Industrial	20	22	79
11. Birla Guest House	Commercial	17	20	64
<b>III COIMBATORE</b>				
12. DCO	Commercial	7	16	47
13. Kavundampalayam	Residential	7	16	51
14. SIDCO, Kurichi	Industrial	9	18	56
<b>IV SALEM</b>				
15. Siva Tower, Meyyanur Main Road	Commercial	8	21	46
<b>V THOOTHUKUDI</b>				
16. Raja Agencies	Industrial	10	13	68
17. AVM Buildings	Commercial	7	11	64
18. SIPCOT	Industrial	7	12	63
<b>VI TRICHIRAPPALLI</b>				
19. Thennur	Commercial	11	14	40
20. Main Guard Gate	Traffic Inter-Section	13	17	64
21. Bishop Heber College	Industrial	10	13	35
22. Golden Rock	Residential	10	14	38
23. Central Bus Stand	Traffic Inter-Section	12	15	47
<b>VII. CUDDALORE</b>				
24. Eachangadu Village	Residential	14	16	42
25. DEE Office	Commercial	16	18	44
26. SIPCOT	Industrial	18	21	47
<b>VIII. METTUR</b>				
27. Raman Nagar	Residential	7	20	38
28. SIDCO	Industrial	13	24	48

	NEW STATION			
<b>I THIRUVANNAMALAI</b>				
01 .O/o,DEE,TVM,Building	Commercial	5	14	52
02 .O/o,Municipal Commissioner,TVM	Commercial	5	14	50
03 .O/o,Joint Director, Animal Husbandary TVM	Residential	6	15	70
<b>SIVAGANGAI</b>				
04 .DEE Office Building,SVG	Commercial	10	13	34
05 .SIDCO	Industrial	11	14	39
06 .Muthu Mahal	Commercial	16	18	57
<b>THENI</b>				
07 .Ragavan Colony	Residential	12	18	45
08 .SIDCO-Complex	Commercial	13	20	56
09 .SAR -Complex, Poothipuram	Industrial	15	21	64
<b>THIRUVARUR</b>				
10 .Thiru.Vi.Ka,Govt .Arts & Science College	Residential	12	15	42
11 .Govt Thiruvavarur Medical College & Hospital	Industrial	20	17	44
12 .Bharath Matriculation HSS	Silence	15	17	51
<b>VILLUPURAM</b>				
13 .University College Of Engineering	Residential	15	17	50
14 .Govt. Medical College &Hospital	Sensitive	14	16	47
15 .O/o, DEE.TNPCB, Building	Commercial	14	16	43
<b>PERAMBALUR</b>				
16 .Govt, Head Quarters Hospital	Industrial	10	13	33
17 .Aavin Pariour Building	Commercial	12	15	41
18 .House Top Of Thiru P. Rabi	Industrial	9	14	32
<b>DHARMAPURI</b>				
19 .Mr.S.Fayazutheen Collector Office	Residential	8	23	35
20 .SIDCO Industrial Estate	Industrial	10	25	49
21. Thiru. D.N.Gopal building, Siddha Verrappa Chetty St.	Commercial	9	24	50
<b>NAGERCOIL</b>				
22 .Anna University Campus	Industrial	11	15	47
23 .Scott Christian College	Residential	6	9	45
24. Aavin Parlour building	Commercial	10	13	48

Source: Tamil Nadu Pollution Control Board, Chennai-32

#### 41.3 (A) STATE OF AMBIENT AIR QUALITY IN CHENNAI CITY 2022-23 (in $\mu\text{g}/\text{m}^3$ )

Station	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>
1. Anna Nagar	11	21	58
2. Adyar	10	20	50
3. Kilpauk *	11	21	66
4. T. Nagar *	11	21	58
5. Nungambakkam	12	22	61

SO<sub>2</sub> : Sulphur dioxide

NO<sub>x</sub> : Oxides of Nitrogen

PM 10 : Respirable Suspended Particulate Matter (<10 Micron size)

\* : Traffic intersection areas

Source: Tamil Nadu Pollution Control Board, Chennai-32

**41.4 AMBIENT NOISE STANDARDS AS PRESCRIBED BY  
POLLUTION CONTROL BOARD 2022-23**

<i>Area</i>	<i>Log dB (A)</i>	
	<b>Day Time *</b> <b>dB (A)</b>	<b>Night Time **</b> <b>dB (A)</b>
<b>Industrial Area</b>	<b>75</b>	<b>70</b>
<b>Commercial Area</b>	<b>65</b>	<b>55</b>
<b>Residential Area</b>	<b>55</b>	<b>45</b>
<b>Silence Zone</b>	<b>50</b>	<b>40</b>

\* Day Time : 06.00 Hours to 22.00 Hours (16 Hours)

\*\* Night Time : 22.00 Hours to 06.00 Hours (08 Hours)

*Source: Tamil Nadu Pollution Control Board, Chennai-32*

**41.5 EMISSION LIMIT FOR DIESEL-DRIVEN VEHICLES 2022-23**

<i>Test</i>	<i>Light Absorption Co-efficient 1/m</i>	<i>Standard Smoke Density</i>	
		<b>Bosch Units</b>	<b>Hartridge Units</b>
<b>Full load at a speed of 60% to 70% of maximum engine rated speed declare</b>	<b>Data not available with TNPCB</b>		
<b>Free Acceleration Test</b>			

*Source: Tamil Nadu Pollution Control Board, Chennai-32*

## 41.6 NATIONAL AMBIENT AIR QUALITY MONITORING, CHENNAI 2022-23

Place	Annual Mean Concentrations of Air Pollutants $\mu\text{g}/\text{m}^3$					
	Industrial			Residential/ Commercial		
	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>
Chennai	13	16	56	11	21	54
Madurai	20	22	79	15	17	55
Coimbatore	9	18	56	7	16	51
Salem	13	24	48	7	20	38
Thoothukudi SIPCOT	7	12	63	7	11	64
Trichirappalli	10	13	35	10	14	38
Cuddalore	18	21	47	14	16	42
Mettur	13	24	48	7	20	38
	NEW STATION					
THIRUVANNAMALAI	*	*	*	6	15	70
SIVAGANGAI	11	14	39	16	18	57
THENI	15	21	64	12	18	45
THIRUVARUR	21	17	44	12	15	42
VILLUPURAM	*	*	*	15	17	50
PERAMBALUR	10	13	33	12	15	41
DHARMABURI	10	25	49	8	23	35
NAGERCOIL	11	15	47	6	9	45

Source: Tamil Nadu Pollution Control Board, Chennai-32

**41.7 SUMMARY STATUS OF POLLUTION CONTROL IN 17 CATEGORIES OF INDUSTRIES IN TAMILNADU**

**(As on 31-03-2022)**

	<i>Category</i>	<i>No. of Units</i>	<i>Comp-lying</i>	<i>Defau- lting</i>	<i>Closed</i>
1.	Aluminum Smelter	0	0	0	0
2.	Chlor Alkali	3	3	0	0
3.	Cement	25	24	0	1
4.	Copper Smelter	2	0	0	2
5.	Distillery including fermentation industry	18	11	0	7
6.	Dyes and Dye Intermediates	1	1	0	0
7.	Fertilizers	6	6	0	0
8.	Iron & Steel	3	3	0	0
9.	Oil Refineries	6	1	5	0
10.	Pesticides	2	2	0	0
11.	Petrochemicals	8	8	0	0
12.	Pharmaceuticals	22	22	0	0
13.	Pulp & Paper	3	1	1	1
14.	Sugar	43	30	0	13
15.	Thermal Power Plant	78	58	3	17
16.	Zinc Smelter	0	0	0	0
17.	Tanneries	13	11	0	2
	<b>TOTAL</b>	<b>233</b>	<b>181</b>	<b>9</b>	<b>43</b>

*Source: Tamil Nadu Pollution Control Board, Chennai-32*



**41.8 ANALYTICAL OUTPUT (WATER) OF  
TAMIL NADU POLLUTION CONTROL BOARD LABORATORIES**

<i>Year</i>	<i>Trade Effluents (Received / Analysed)</i>
<b>2009-10</b>	<b>16605</b>
<b>2010-11</b>	<b>16238</b>
<b>2011-12</b>	<b>15257</b>
<b>2012-13</b>	<b>17374</b>
<b>2013-14</b>	<b>22368</b>
<b>2014-15</b>	<b>17421</b>
<b>2015-16</b>	<b>15453</b>
<b>2016-17</b>	<b>17198</b>
<b>2017-18</b>	<b>15597</b>
<b>2018-19</b>	<b>26730</b>
<b>2019-20</b>	<b>24695</b>
<b>2020-21</b>	<b>22005</b>
<b>2021-22</b>	<b>15497</b>
<b>2022-23</b>	<b>18786</b>

*Source: Tamil Nadu Pollution Control Board, Chennai-32*

**41.9 NUMBER OF INDUSTRIES VISITED FOR AIR SURVEY AND  
NUMBER OF AAQS/SM SAMPLES COLLECTED**

<i>Period of Monitoring</i>	<i>No. of Industries</i>	<i>Number of Samples Collected</i>	
		<b>AAQS</b>	<b>SM</b>
<b>2009-10</b>	<b>973</b>	<b>5367</b>	<b>2530</b>
<b>2010-11</b>	<b>1134</b>	<b>6031</b>	<b>3105</b>
<b>2011-12</b>	<b>1066</b>	<b>5627</b>	<b>2869</b>
<b>2012-13</b>	<b>994</b>	<b>5546</b>	<b>2940</b>
<b>2013-14</b>	<b>1156</b>	<b>6991</b>	<b>3644</b>
<b>2014-15</b>	<b>1084</b>	<b>6331</b>	<b>3436</b>
<b>2015-16</b>	<b>1213</b>	<b>7308</b>	<b>3608</b>
<b>2016-17</b>	<b>1233</b>	<b>6866</b>	<b>3597</b>
<b>2017-18</b>	<b>1181</b>	<b>6549</b>	<b>3571</b>
<b>2018-19</b>	<b>1184</b>	<b>6649</b>	<b>3646</b>
<b>2019-20</b>	<b>1272</b>	<b>6996</b>	<b>3509</b>
<b>2020-21</b>	<b>1300</b>	<b>7361</b>	<b>3647</b>
<b>2021-22</b>	<b>1401</b>	<b>8257</b>	<b>4248</b>
<b>2022-23</b>	<b>1475</b>	<b>8737</b>	<b>4708</b>

*Source: Tamil Nadu Pollution Control Board, Chennai-32*

### 41.10 NUMBER OF GOODS AND TRANSPORT VEHICLES TESTED AND EMISSION LEVEL RECORDED DURING 2022-23

<i>Station</i>	<i>Diesel</i>		
	<i>Total Vehicles</i>	<i>Within the limit</i>	<i>Exceeding the limit</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Chennai Chengalpattu Kancheepuram Udhagamandalam Katterly Dindigul Palani	The Vehicle monitoring stations monitored by TNPCB are closed and not in operation, hence the data are not available with TNPCB		
<b>TOTAL</b>			

<i>Station</i>	<i>Petrol</i>		
	<i>Total Vehicles</i>	<i>Within the limit</i>	<i>Exceeding the limit</i>
<i>1</i>	<i>5</i>	<i>6</i>	<i>7</i>
Chennai Chengalpattu Kancheepuram Udhagamandalam Katterly Dindigul Palani	The Vehicle monitoring stations monitored by TNPCB are closed and not in operation, hence the data are not available with TNPCB		
<b>TOTAL</b>	-	-	-

<i>Station</i>	<i>Total (Diesel + Petrol)</i>		
	<i>Total Vehicles</i>	<i>Within the limit</i>	<i>Exceeding the limit</i>
<i>1</i>	<i>8</i>	<i>9</i>	<i>10</i>
Chennai Chengalpattu Kancheepuram Udhagamandalam Katterly Dindigul Palani	The Vehicle monitoring stations monitored by TNPCB are closed and not in operation, hence the data are not available with TNPCB		
<b>TOTAL</b>			

Source: Tamil Nadu Pollution Control Board, Chennai-32