

**INDIAN STANDARD SPECIFICATIONS FOR DRINKING WATER
IS: 10500**

| S.NO. | Parameter | Requirement desirable Limit | Remarks |
|--------------|---------------------------------------|--|---|
| 1. | Colour | 5 | May be extended up to 50 if toxic substances are suspected |
| 2. | Turbidity | 10 | May be relaxed up to 25 in the absence of alternate |
| 3. | pH | 6.5 to 8.5 | May be relaxed up to 9.2 in the absence |
| 4. | Total Hardness | 300 | May be extended up to 600 |
| 5. | Calcium as Ca | 75 | May be extended up to 200 |
| 6. | Magnesium as Mg | 30 | May be extended up to 100 |
| 7. | Copper as Cu | 0.05 | May be relaxed up to 1.5 |
| 8. | Iron | 0.3 | May be extended up to 1 |
| 9. | Manganese | 0.1 | May be extended up to 0.5 |
| 10. | Chlorides | 250 | May be extended up to 1000 |
| 11. | Sulphates | 150 | May be extended up to 400 |
| 12. | Nitrates | 45 | No relaxation |
| 13. | Fluoride | 0.6 to 1.2 | If the limit is below 0.6 water should be rejected, Max. Limit is extended to 1.5 |
| 14. | Phenols | 0.001 | May be relaxed up to 0.002 |
| 15. | Mercury | 0.001 | No relaxation |
| 16. | Cadmium | 0.01 | No relaxation |
| 17. | Selenium | 0.01 | No relaxation |
| 18. | Arsenic | 0.05 | No relaxation |
| 19. | Cyanide | 0.05 | No relaxation |
| 20. | Lead | 0.1 | No relaxation |
| 21. | Zinc | 5.0 | May be extended up to 10.0 |
| 22. | Anionic detergents (MBAS) | 0.2 | May be relaxed up to 1 |
| 23. | Chromium as Cr ⁺⁶ | 0.05 | No relaxation |
| 24. | Poly nuclear aromatic Hydrocarbons | -- | -- |
| 25. | Mineral Oil | 0.01 | May be relaxed up to 0.03 |
| 26. | Residual free Chlorine | 0.2 | Applicable only when water is chlorinated |
| 27. | Pesticides | Absent | -- |
| 28. | Radio active | -- | -- |

DRINKING WATER SPECIFICATION: IS: 10500, 1992
(Reaffirmed 1993)

TOLERANCE LIMITS

| S.No | Parameter | IS: 10500 Requirement (Desirable limit) | Undesirable effect outside the desirable limit | IS: 10500 Permissible limit in the absence of alternate source |
|--|---|---|---|--|
| Essential Characteristics | | | | |
| 1. | pH | 6.5 – 8.5 | Beyond this range the water will effect the mucous membrane and / or water supply system | No relaxation |
| 2. | Colour (Hazen Units), Maximum | 5 | Above 5, consumer acceptance decreases | 25 |
| 3. | Odour | Unobjectionable | -- | -- |
| 4. | Taste | Agreeable | -- | -- |
| 5. | Turbidity, NTU, Max | 5 | Above 5, consumer acceptance decreases | 10 |
| Following Results are expressed in mg/l : | | | | |
| 6. | Total hardness as CaCO ₃ , Max | 300 | Encrustation in water supply structure and adverse effects on domestic use | 600 |
| 7. | Iron as Fe, Max | 0.30 | Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures, and promotes iron bacteria. | 1.0 |
| 8. | Chlorides as Cl, Max | 250 | Beyond this limit tast, corrosion and palatability are effected | 1000 |
| 9. | Residual, Free Chlorine, Min | 0.20 | -- | -- |
| Desirable Characteristics | | | | |
| 10. | Dissolved solids, Max | 500 | Beyond this palatability decreases and may cause gastro intentional irritation | 2000 |
| 11. | Calcium as Ca, Max | 75 | Encrustation in water supply structure and adverse effects on domestic use | 200 |

| | | | | |
|-----|---|-------|--|---------------|
| 12. | Magnesium as Mg, Max | 30 | -- | 100 |
| 13. | Copper as Cu, Max | 0.05 | Astringent taste, discoloration and corrosion of pipes, fitting and utensils will be caused beyond this | 1.5 |
| 14. | Manganese as Mn, Max | 0.1 | Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures | 0.3 |
| 15. | Sulphate as SO ₄ Max | 200 | Beyond this causes gastro intentional irritation when magnesium or sodium are present | 400 |
| 16. | Nitrates as NO ₃ | 45 | Beyond this methanemoglobinemia takes place | 100 |
| 17. | Fluoride, Max | 1.0 | Fluoride may be kept as low as possible. High fluoride may cause fluorosis | 1.5 |
| 18. | Phenolic compounds as C ₆ H ₅ OH, Max | 0.001 | Beyond this, it may cause objectionable taste and odour | 0.002 |
| 19. | Mercury as Hg, Max | 0.001 | Beyond this, the water becomes toxic | No relaxation |
| 20. | Cadmium as Cd, Max | 0.01 | Beyond this, the water becomes toxic | No relaxation |
| 21. | Selenium as Se, Max | 0.01 | Beyond this, the water becomes toxic | No relaxation |
| 22. | Arsenic as As, Max | 0.05 | Beyond this, the water becomes toxic | No relaxation |
| 23. | Cyanide as CN, Max | 0.05 | Beyond this, the water becomes toxic | No relaxation |
| 24. | Lead as Pb, Max | 0.05 | Beyond this, the water becomes toxic | No relaxation |
| 25. | Zinc as Zn, Max | 5 | Beyond this limit it can cause astringent taste and an opalescence in water | 15 |
| 26. | Anionic detergents as MBAS, Max | 0.2 | Beyond this limit it can cause a light froth in water | 1.0 |
| 27. | Chromium as Cr ⁶⁺ , Max | 0.05 | May be carcinogenic above this limit | No relaxation |
| 28. | Ploynuclear aromatic hydrocarbons as PAH, Max | -- | May be carcinogenic | -- |

| | | | | |
|-----|-----------------------------------|--------|---|-------|
| 29. | Mineral Oil, Max | 0.01 | Beyond this limit undesirable taste and odour after chlorination take place | 0.03 |
| 30. | Pesticides, Max | Absent | Toxic | 0.001 |
| 31. | Radioactive materials | -- | -- | 0.1 |
| | a) α emitters Bq/1, Max | -- | -- | 1 |
| | b) β emitters Pci/1, Max | | | |
| 32. | Alkalinity, Max | 200 | Beyond this limit taste becomes unpleasant | 600 |
| 33. | Aluminum as Al, Max | 0.03 | Cumulative effect is reported to cause dementia | 0.2 |
| 34. | Boron, Max | 1 | -- | 5 |

General Standards For Discharge Of Environmental Pollutants

Part – A: Effluents

| Sl. No. | Parameter | Standards | | | |
|---------|---|--|---------------|----------------------|---|
| | | Inland Surface water | Public Sewers | Land of irrigation | Marine/Costal areas |
| 1. | Colour and odour | Of Annexure-1 | -- | See 6 of Annexure -1 | See 6 of Annexure -1 |
| 2. | Suspended solids mg/l, max. | 100 | 600 | 200 | a. For process waste water 100 b. For cooling water effluent 10 per cent above total suspended mater of influent |
| 3. | Particle size of suspended solids | Shall pass 850 micron IS Sieve | -- | | a. Floatable solids, solids max. 3 mm b. Settleable solids. Max 856 microns |
| 4. | pH value | 5.5 to 9.0 | 5.5 to 9.0 | 5.5 to 9.0 | 5.5 to 9.0 |
| 5. | Temperature | Shall not exceed 5°C above the receiving water temperature | -- | -- | Shall not exceed 5°C above the receiving water temperature |
| 6. | Oil and grease, mg/l max. | 10 | 20 | 10 | 20 |
| 7. | Total residual chlorine, mg/l max | 1.0 | -- | -- | 1.0 |
| 8. | Ammonical nitrogen (as N), mg/l, max. | 50 | 50 | -- | 50 |
| 9. | Total nitrogen (as N), mg/l, max. | 100 | -- | -- | 100 |
| 10. | Free ammonia (as NH ₃), mg/l, max | 5.0 | -- | -- | 5.0 |
| 11. | Biochemical oxygen demand (3 days at 27°C), mg/l, max | 30 | 350 | 100 | 100 |

| | | | | | |
|-----|---|------------------|------------------|------------------|------------------|
| 12. | Chemical oxygen demand, mg/l, max | 250 | -- | -- | 250 |
| 13. | Arsenic (as As) mg/l, max | 0.2 | 0.2 | 0.2 | 0.2 |
| 14. | Mercury (as Hg), mg/l, max | 0.01 | 0.01 | -- | 0.01 |
| 15. | Lead (as Pb), mg/l, max | 0.1 | 0.1 | -- | 2.0 |
| 16. | Cadmium (as Cd) , mg/l, max | 2.0 | 1.0 | -- | 2.0 |
| 17. | Hexavalent chromium (as Cr+6), mg/l, max | 0.1 | 2.0 | -- | 1.0 |
| 18. | Total chromium (as Cr), mg/l, max | 2.0 | 2.0 | -- | 2.0 |
| 19. | Copper (as Cu), mg/l, max | 3.0 | 3.0 | -- | 30 |
| 20. | Zinc (as Zn), mg/l, max | 5.0 | 15 | -- | 15 |
| 21. | Selenium (as Se), mg/l, max | 0.05 | 0.05 | -- | 0.05 |
| 22. | Nickel (as Ni), mg/l, max | 3.0 | 3.0 | -- | 50 |
| 23. | Cyanide (as CN), mg/l, max | 0.2 | 2.0 | 0.2 | 0.2 |
| 24. | Fluoride (as F), mg/l, max | 2.0 | 15 | -- | 15 |
| 25. | Dissolved phosphates (as P), mg/l, max | 5.0 | -- | -- | -- |
| 26. | Sulphide (as S), mg/l, max | 2.0 | -- | -- | 5.0 |
| 27. | Phenolic compounds (as C ₆ H ₅ OH), mg/l, max | 1.0 | 5.0 | -- | 5.0 |
| 28. | Radioactive materials | | | | |
| | a. α emitters micro cure mg/l, max | 10 ⁻⁷ | 10 ⁻⁷ | 10 ⁻⁸ | 10 ⁻⁷ |
| | β emitters micro curemg/l, max | 10 ⁻⁶ | 10 ⁻⁶ | 10 ⁻⁷ | 10 ⁻⁶ |

| | | | | | |
|-----|-------------------|--|--|--|--|
| 29. | Bio-assay test | 90 % survival of fish after 96 hours in 100 % effluent | 90 % survival of fish after 96 hours in 100 % effluent | 90 % survival of fish after 96 hours in 100 % effluent | 90 % survival of fish after 96 hours in 100 % effluent |
| 30. | Manganese (as Mn) | 2 mg/l | 2 mg/l | 2 mg/l | 2 mg/l |
| 31. | Iron (as Fe) | 3 mg/l | 3 mg/l | 3 mg/l | 3 mg/l |
| 32. | Vanadium (as V) | 0.2 mg/l | 0.2 mg/l | -- | 0.2 mg/l |
| 33. | Nitrate Nitrogen | 10 mg/l | -- | -- | 20 mg/l |

* These standards shall be applicable for industries, operations or processes other than those industries. Operations or process for which standards have been specified in Schedule of the Environment Protection Rules 1989.

Ambient Air Quality Standards (National)

| Pollutants | Time-weighted average | Concentration in ambient air | | | Method of measurement |
|---|-----------------------|------------------------------|------------------------|----------------------------------|---|
| | | Sensitive of Area | Industrial Area | Residential, Rural & Other areas | |
| Sulphur | Annual Average* | 15 µg/m ³ | 80 µg/m ³ | 60 µg/m ³ | Improved West and Greek Method |
| Dioxide (SO ₂) | 24 hours** | 30 µg/m ³ | 120 µg/m ³ | 80 µg/m ³ | Ultraviolet Fluorescence |
| Oxide of Nitrogen as NO ₂ | Annual* | 15 µg/m ³ | 80 µg/m ³ | 60 µg/m ³ | Jacob & Ochheiser modified (Na-Arsenite) Method |
| | 24 hours** | 30 µg/m ³ | 120 µg/m ³ | 80 µg/m ³ | Gas Phase Chemilumloescence |
| Suspended Particulate Matter (SPM) | Annual | 70 µg/m ³ | 360 µg/m ³ | 140 µg/m ³ | High volume sampling. (Average flow rate not less than 1.1m ³ /minute) |
| | 24 hours** | 100 µg/m ³ | 500 µg/m ³ | 200 µg/m ³ | |
| Respirable Particulate matter (RPM), (size less than 10 µm) | Annual | 50 µg/m ³ | 120 µg/m ³ | 60 µg/m ³ | Respirable particulate matter sampler |
| | 24 hours** | 75 µg/m ³ | 150 µg/m ³ | 100 µg/m ³ | |
| Lead (Pb) | Annual | 0.50 µg/m ³ | 1.0 µg/m ³ | 0.75 µg/m ³ | ASS Method after sampling using EPM 2000 or equivalent Filter paper |
| | 24 hours** | 0.75 µg/m ³ | 1.5 µg/m ³ | 1.00 µg/m ³ | |
| Carbon Monoxide (CO) | 8 hours** | 1.0 µg/m ³ | 5.0 µg/m ³ | 2.0 µg/m ³ | Non dispersive infra red Spectroscopy |
| | 1 hour | 2.0 µg/m ³ | 10.0 µg/m ³ | 4.0 µg/m ³ | |

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly/8 hourly values should be met 98 % of the time in a year. However, 2 % of the time, it may exceed but not on two consecutive days.

NOTE:

1. National Ambient Air Quality Standard: The levels of air quality with an adequate margin of safety, to protect the public health, vegetation and property.
2. Whenever and wherever two consecutive values exceeds the limit specified above for the respective category, it would be considered adequate reason to institute regular / continuous monitoring and further investigations.

| CPCB Standards of Noise Levels | | | | | |
|---------------------------------------|------------------|--------------------------------|---|--------------|-------------------|
| Rural | Sub Urban | Residential (Urban) | Urban (Residential & Business) | City | Industrial |
| 25-35 | 30-40 | 35-45 | 40-50 | 45-50 | 50-60 |