

Ambient Air Quality Standards in India

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Ambient air quality refers to the condition or quality of air surrounding us in the outdoors. National Ambient Air Quality Standards are the standards for ambient air quality set by the Central Pollution Control Board (<http://cpcb.nic.in/>) (CPCB) that is applicable nationwide. The CPCB has been conferred this power by the Air (Prevention and Control of Pollution) Act, 1981.

Ambient Air Quality Standards in India

The Air (Prevention and Control of Pollution) Act 1981 (<http://www.envfor.nic.in/legis/air/air1.html>) was enacted by the Central Government with the objective of arresting the deterioration of air quality. The Air (Prevention and Control of Pollution) Act 1981 describes the main functions of the Central Pollution Control Board (CPCB) as follows:

- To advise the Central Government on any matter concerning the improvement of the quality the air and the prevention, control and abatement of air pollution.
- To plan and cause to be executed a nation-wide programme for the prevention, control and abatement of air pollution.
- To provide technical assistance and guidance to the State Pollution Control Board.
- To carry out and sponsor investigations and research related to prevention, control and abatement of air pollution.
- To collect, compile and publish technical and statistical data related to air pollution; and
- To lay down and annul standards for the quality of air

The mandate provided to the CPCB under the Air (Prevention and Control of Pollution) Act empowers it to set standards for the quality of air.

The current National Ambient Air Quality Standards were notified on 18 November 2009 (http://www.cpcb.nic.in/upload/Latest/Latest_48_FINAL_AIR_STANDARD.pdf) by the Central Pollution Control Board.

Table 1: National Ambient Air Quality Standards

Pollutant	Time Weighted Concentration in Ambient Air		
	Average	Industrial, Residential, Rural and Other Areas	Ecologically Sensitive Area (notified by Central Government)
Sulphur Dioxide (SO ₂), µg/m ³	Annual* 24 hours**	50 80	20 80
Nitrogen Dioxide (NO ₂), µg/m ³	Annual* 24 hours**	40 80	30 80

Particulate Matter (size less than 10 μm) or PM_{10} $\mu\text{g}/\text{m}^3$	Annual* 24 hours**	60 100	60 100
Particulate Matter (size less than 2.5 μm) or $\text{PM}_{2.5}$ $\mu\text{g}/\text{m}^3$	Annual* 24 hours**	40 60	40 60
Ozone (O_3) $\mu\text{g}/\text{m}^3$	8 hours* 1 hour**	100 180	100 180
Lead (Pb) $\mu\text{g}/\text{m}^3$	Annual* 24 hours**	0.50 1.0	0.50 1.0
Carbon Monoxide (CO) mg/m^3	8 hours* 1 hour**	02 04	02 04
Ammonia (NH_3) $\mu\text{g}/\text{m}^3$	Annual* 24 hours**	100 400	100 400
Benzene (C_6H_6) $\mu\text{g}/\text{m}^3$	Annual*	5	5
Benzo(a)Pyrene (BaP)-particulate phase only, ng/m^3	Annual*	1	1
Arsenic(As), ng/m^3	Annual*	6	60
Nickel (Ni), ng/m^3	Annual*	20	20

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Source: National Ambient Air Quality Standards, Central Pollution Control Board Notification in the Gazette of India, Extraordinary, New Delhi, 18th November, 2009

Prior to the November 2009 standards, India had set Air Quality standards on 11 April 1994, and this was later revised on 14 October 1998. The 2009 standards further lowered the maximum permissible limits for pollutants and made the standards uniform across the nation. Earlier, less stringent standards were prescribed for industrial zones as compared to residential areas.

Further, a new National Air Quality Index (AQI) (http://www.arthapedia.in/index.php?title=National_Air_Quality_Index) has been launched in October 2014 to disseminate information on air quality in an easily understandable form for the general public. The measurement of air quality is based on eight pollutants, namely, PM_{10} , $\text{PM}_{2.5}$, NO_2 , SO_2 , CO, O_3 , NH_3 , and Pb for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed and the worst reading in these pollutants represents the AQI for that city.

International Standards

The 2005 World Health Organization's "WHO Air quality guidelines" (http://whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf?ua=1) offer global guidance on thresholds and limits for 4 key air pollutants that pose health risks - particulate matter (PM), ozone (O_3), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2).

Guideline values prescribed by WHO are**PM_{2.5}**10 $\mu\text{g}/\text{m}^3$ annual mean25 $\mu\text{g}/\text{m}^3$ 24-hour mean**PM₁₀**20 $\mu\text{g}/\text{m}^3$ annual mean50 $\mu\text{g}/\text{m}^3$ 24-hour mean**O₃**100 $\mu\text{g}/\text{m}^3$ 8-hour mean**NO₂**40 $\mu\text{g}/\text{m}^3$ annual mean200 $\mu\text{g}/\text{m}^3$ 1-hour mean**SO₂**20 $\mu\text{g}/\text{m}^3$ 24-hour mean500 $\mu\text{g}/\text{m}^3$ 10-minute mean

The WHO Guidelines indicate that by reducing particulate matter (PM₁₀) pollution from 70 to 20 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$), air pollution-related deaths can be cut by around 15%^[1]. Indian Standards are slightly less stringent as compared to WHO guidelines. However, the world's average PM₁₀ levels by region range from 26 to 208 $\mu\text{g}/\text{m}^3$, with a world's average of 71 $\mu\text{g}/\text{m}^3$ as per WHO estimates (http://www.who.int/phe/health_topics/outdoorair/databases/cities/en/) published in 2014.

Many countries have their own Ambient Air Quality Standards prescribed for their territories. The Clean Air Act in the US requires the Environment Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS). Two types of Ambient Air Quality Standards are identified in the Clean Air Act: *Primary standards* provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly and *Secondary standards* provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.^[2] NAAQS has been set for six pollutants in the US, namely, carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution and sulphur dioxide. The values for these pollutants may be seen here (<http://www.epa.gov/air/criteria.html>) .

The European Union has also developed legislations on air quality standards. The pollutants for which the standards are specified are: PM_{2.5}, sulphur dioxide (SO₂), nitrogen dioxide (NO₂), PM₁₀, lead (Pb), carbon monoxide (CO), Benzene, Ozone, Arsenic (As), Cadmium (Cd), Nickel (Ni), Polycyclic Aromatic Hydrocarbons.^[3] Details may be seen here (<http://ec.europa.eu/environment/air/quality/standards.htm>) .

1. Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide in 2012 according to WHO.

2. <http://www.epa.gov/air/criteria.html>

3. <http://ec.europa.eu/environment/air/quality/standards.htm>

Also See

- National Air Quality Index (http://www.arthapedia.in/index.php?title=National_Air_Quality_Index)

References

- National Ambient Air Quality Standards, Central Pollution Control Board Notification (http://www.cpcb.nic.in/upload/Latest/Latest_48_FINAL_AIR_STANDARD.pdf) in the Gazette of India, Extraordinary, New Delhi, 18th November, 2009
- Comparative study of European and US air quality standards (http://ec.europa.eu/environment/archives/caf/activities/pdf/case_study2.pdf)
- WHO Factsheet on ambient air quality as updated in March 2014 (<http://www.who.int/mediacentre/factsheets/fs313/en/>)

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