

Airborne particles

Airborne particles are solids suspended in the air.

Larger particles - larger than $100\ \mu\text{m}$

- terminal velocities $> 0.5\ \text{m/s}$
- fall out quickly
- includes hail, snow, insect debris, room dust, soot aggregates, coarse sand, gravel, and sea spray

Medium-size particles - in the range $1\ \text{to}\ 100\ \mu\text{m}$

- sedimentation velocities greater than $0.2\ \text{m/s}$
- settles out slowly
- includes fine ice crystals, pollen, hair, large bacteria, windblown dust, fly ash, coal dust, silt, fine sand, and small dust

Small particles - less than $1\ \mu\text{m}$

- falls slowly, take days to years to settle out of a quiet atmosphere. In a turbulent atmosphere they may never settle out
- can be washed out by water or rain
- includes viruses, small bacteria, metallurgical fumes, soot, oil smoke, tobacco smoke, clay, and fumes

Hazardous Dust Particles

Smaller dust particles can be hazardous for humans. In many jurisdictions dust fractions at specified particle sizes in working environments are required to be measured.

Inhalable Dust

Airborne particles which can enter the nose and mouth during normal breathing. Particles of 100 microns diameter or less.

Thoracic Dust

Particles that will pass through the nose and throat, reaching the lungs. Particles of 10 microns diameter and less. Referred to as PM_{10} in the USA.

Respirable Dust

Particles that will penetrate into the gas exchange region of the lungs. A hazardous particulate size less than 5 *microns*. Particle sizes of 2.5 *micron* ($PM_{2.5}$) are often used in USA.

The total allowable particle concentration - building materials, combustion products, mineral fibers and syntetic fibers (particles less than 10 μm) - specified by EPA (U.S. Environmental Protection Agency)

- 50 $\mu\text{g}/\text{m}^3$ (0.000022 grain/ft³) - allowable exposure per day over the course of 1 year
- 150 $\mu\text{g}/\text{m}^3$ (0.000022 grain/ft³) - allowable exposure over 24 hours