**What is particle pollution?**

Particle pollution is a complex mixture of extremely small solids and liquid droplets suspended in air. This pollution, also known as particulate matter, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles and allergens (such as fragments of pollen or mold spores).

Particle pollution is also produced when fuels such as coal, oil, diesel, or wood are burned. Common sources include gas powered engines, fuel combustion from coal, oil, diesel, or wood, or motor vehicles (e.g., cars, trucks, buses, and boat engines). These particles are also produced by construction equipment, agricultural and trash burning and forest fires. Particle pollution is not just an urban problem — it can occur in rural areas as well. Elevated particle levels can be very localized or quite regional, depending on the source and weather conditions.

EPA groups particle pollution into two categories that carry the most concern:

- **Fine particles**, such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires or they can form when gases emitted from power plant, industries and automobiles react in the air.
- **Inhalable coarse particles**, such as those found near roadways, in wind-blown dust and from dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter.

The size of particles is directly linked to their potential for causing health problems. The smaller the particle, the greater the health risks. Small particles less than 10 micrometers in diameter pose the greatest problems because these particles can more easily pass through the throat and nose and can get deep into your lungs. Once inhaled, these particles can possibly enter into your bloodstream thus affecting both your lungs and your heart.

Larger particles pose less of a risk but can still irritate your eyes, nose and throat.

**How can particles affect health?**

Particle exposure can lead to a variety of health effects. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks; and
- premature death in people with heart or lung disease.

**Short-term exposures** to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy adults and children may experience temporary minor irritation when particle levels are elevated.

**Long-term exposures**, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death.

**Who is at risk from particles?**

There are several groups of people considered at greater risk from particles, especially when physically active. Physical exertion causes people to breathe faster and more deeply, allowing small particles to go deeper into the lungs. Even if you are healthy, you may experience temporary symptoms from exposure to elevated levels of particle pollution.

**People with heart or lung diseases** – such as coronary artery disease, congestive heart failure, and asthma or chronic obstructive pulmonary disease – are at increased risk, because particles can aggravate these diseases. People with diabetes also may be at an increased risk, because they are more likely to have underlying cardiovascular disease.

**Older adults** are at greater risk, because of the possibility of an undiagnosed heart or lung disease or diabetes.

Studies show that on days when particle pollution levels are elevated, older adults are more likely to be hospitalized due to aggravated heart or lung disease.

**Children** are also at increased risk. Children’s lungs are still developing; they spend more time doing high level activities outdoors and are more likely to have asthma or acute respiratory diseases, which can be aggravated when particle pollution levels are high.

**How can you avoid unhealthy exposure?**

On days when particle pollution levels are high, everyone is susceptible. Even if you are healthy, you may experience temporary symptoms, such as irritation of the eyes, nose and throat; coughing; phlegm; chest tightness; and shortness of breath. Your chances of being affected by particle pollution increase the more strenuous your activity and the longer you are active outdoors.

If you can, reduce the amount of time you spend doing prolonged or heavy physical activity or try to substitute a different activity that involves less exertion. For example, go for a walk instead of a jog. Another option is to follow the particle pollution Air Quality Index (AQI) forecasts and schedule outdoor activities for days when levels are lower. Last, try not to exercise near busy roads since particle levels are typically higher in those areas.
Air Quality Index

Even Wisconsin has days when the air quality is potentially unhealthy. Becoming familiar with a national tool called the Air Quality Index, or AQI, is vital for all Wisconsinites, especially those who are sensitive to the harmful effects of poor air quality.

The Air Quality Index is a scale used to report actual levels of particle pollution and other common pollutants in the air. The higher the AQI value, the greater the health concern. As shown in the table, the AQI scale is divided into categories that correspond to different levels of health concern. Each AQI category has a specifically assigned color. For example, orange means current air quality is in an “unhealthy for sensitive groups” condition. This color scheme can help you quickly determine if particle pollutants are reaching unhealthy levels in your area.

Wisconsin’s AQI system relays messages through the National Weather Service, making it easy for the public to receive and understand the messages. However, the system includes other ways to access air quality information as well. You may find the AQI for particle pollution or other pollutants reported in your local or national newspaper, on your local television station and/or on the radio. And you can sign up to receive email notifications whenever the DNR issues an Air Quality Watch or Air Quality Advisory anywhere in Wisconsin by visiting: http://dnr.wi.gov/air/.

You can receive daily air quality information by calling, toll free, 1-866-DAILY AIR.

**What can I do to help reduce particle pollution?**
- Do not burn leaves, trash, and other material.
- Decrease your use of small engine equipment.
- Keep gas-powered lawn and garden equipment properly maintained.
- Stop idling for even half a minute. Turn off your vehicle engine when not in use.
- Drive slowly on unpaved roads and other dirt surfaces.
- Carpool, use public transportation, bike, or walk whenever possible.
- Take steps to reduce energy use.

For more information on actions you can take to improve Wisconsin's air quality, visit http://dnr.wi.gov/airpubinfo/educ/italladdsup.htm.

**Wisconsin’s Air Monitoring Network**
Wisconsin’s outdoor air quality monitors provide timely access to air quality information at specific sites and supports air quality improvement planning. The network collects data on: ozone, particle pollution, sulfur dioxide, nitrogen dioxide, and carbon monoxide. For today’s Wisconsin air pollution levels, including particle pollution, go to: http://dnrmapp.wi.gov/dailyair

**AIR NOW** (www.airnow.gov) is a web site that provides daily information about air quality, including particle pollution and how it may affect you. The web site offers daily AQI forecasts as well as real-time AQI conditions for over 300 cities across the US, and provides links to more detailed state and local air quality web sites.

**AIR QUALITY INDEX FOR PARTICLE POLLUTION**

<table>
<thead>
<tr>
<th>Index Values</th>
<th>Air Quality Descriptor</th>
<th>Protect Your Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 50</td>
<td>Good</td>
<td>No health impacts are expected when air quality is in this range.</td>
</tr>
<tr>
<td>51 to 100</td>
<td>Moderate</td>
<td>Extremely sensitive people should consider reducing prolonged or heavy exertion.</td>
</tr>
<tr>
<td>101 to 150</td>
<td>Unhealthy for Sensitive Groups</td>
<td>People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.</td>
</tr>
<tr>
<td>151 to 200</td>
<td>Unhealthy</td>
<td>People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.</td>
</tr>
</tbody>
</table>

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