

# SOOT AND BLACK CARBON

**ARMED  
WITH THE  
FACTS**

## WHAT IS SOOT?

Soot is an environmental contaminant. It is the result of the incomplete combustion of hydrocarbons. You can see soot belching from the exhaust pipes of diesel trucks as well as smokestacks; it accumulates on your windowsills if you live near a major road.

Soot is the common name by which we refer to "particulate matter" or particle pollution—a complex mixture of tiny particles and liquid droplets formed in our air from **metals, acids, and chemicals like sulfur dioxides and nitrogen oxides** that are emitted from power plants, industrial boilers, manufacturing, oil refining, motor vehicles, and wood stoves.

Particulate matter, or PM, as it is often called, can be so small that it can only be detected with an electron microscope. Those particles enter our lungs without our even knowing it.

The composition of soot is different depending on where you are. In the northeast, for instance, a larger portion of the particles are made up of sulfur (most likely because they come from transportation sources).

The actual size and composition of the particles makes the biggest difference with respect to our health.

## IS SOOT JUST DIRTY?

No. **Soot is deadly.** Soot causes thousands of premature deaths, asthma attacks, and heart attacks each year.

The size of those tiny particles is directly linked to the terrible trouble they cause. Particles smaller than a speck of dust, and less than 1/30th the width of a human hair, can easily pass through the nose and throat, **penetrate and embed in the lungs, and enter the bloodstream.**

The smallest particles cause the largest amount of damage because they can penetrate furthest into the lungs and in some cases react directly with DNA.

## WHERE DOES SOOT COME FROM?

The most significant sources of soot are diesel engines, vehicle tailpipes, coal plant smokestacks, oil refineries, and fires—the burning of large forests for agricultural purposes produces soot, and so does the use of grills, fireplaces and cookstoves for cooking and heating.

Currently, more than 70 million Americans live in areas that are in violation of the health standards set by the Environmental Protection Agency (EPA).

That's 70 million people exposed to spikes in fine particle pollution at levels that EPA deems unsafe.

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## HOW IS SOOT CONNECTED TO GLOBAL WARMING?

**Soot is a major cause of global warming.** While carbon pollution gets most of the headlines, soot is a very important contributor to the problems caused by climate change.

Climate scientists refer to black carbon—the main component of soot—as a “climate forcer.” **Soot particles absorb radiation from the sun and can hasten the melting of snow and ice cover when they fall to the ground.**

Getting our soot problem under control would be a huge win for the Earth’s climate. Black carbon has a short lifespan: it can wash out of our atmosphere in a matter of days, unlike carbon, which hangs in our atmosphere for centuries.

We have proven, affordable technologies for ridding our air of black carbon.

## THE GOOD NEWS ABOUT SOOT

**We can do something about soot pollution--quickly!  
But we have to fight for strong soot regulations.**

We have good, affordable equipment to cut soot emissions from tailpipes and smokestacks—particle traps and filters.

We can take the worst-polluting vehicles off the road.

We can use low-emission diesel engines and equipment.

We can clean up large industrial boilers, coke ovens, and brick kilns.

This means we can protect our health—and especially the well-being of those most vulnerable to soot, our children and our elderly.

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