
EPA Schools Monitoring Initiative Fact Sheet

March 2010 Update: Acrolein Monitoring Results Are Uncertain

Summary: This document provides an update to EPA's October 2009 information about *acrolein* monitoring outside 40 schools in 16 states. Acrolein is a widespread pollutant that, at elevated concentrations, can irritate your eyes, nose and throat. Children and adults with asthma and allergies may be more sensitive to these effects. Acrolein comes from fires, industries, and things we use every day, such as cars and trucks. It also can form when other pollutants react in the air.

EPA, states and local air quality agencies remain concerned about acrolein in the outdoor air and are working to reduce this pollutant across the country. However, results of a recent short-term laboratory study have raised significant questions about the consistency and reliability of acrolein monitoring results. This means that while we know that monitors are detecting acrolein in the air, we cannot determine precisely how much. In light of this uncertainty, EPA will not use these acrolein data in evaluating the potential for health concerns from exposure to air toxics in outdoor air as part of the School Air Toxics Monitoring Project.

What We Have Learned:

- Acrolein is one of the most difficult chemicals to measure in the air, because it is highly reactive. This means it can react easily with other chemicals to form other compounds that complicate laboratory analysis.
- As the schools monitoring project has progressed, some of EPA's state and local partners noticed that different monitors located at the same schools were showing different results. The discrepancies in those results were big enough that EPA agreed they needed to be examined further.
- To check the differences, EPA worked with several state and local air quality agencies to conduct a short-term laboratory study to examine whether monitoring results were affected by the type of canister used to collect the air quality sample or how that canister is cleaned in preparation for sample collection.
- Based on the results of these initial tests, it appears that
 - Not using heat to clean canisters may affect acrolein monitoring results (making results somewhat higher); and
 - Results can be affected by the amount of time that passes between the time canisters are prepared to take air quality samples and the time those samples are analyzed

- In addition, when EPA’s contract lab and participating state and local air quality labs analyzed samples containing a known level of acrolein, the results varied significantly.
- EPA is conducting additional tests to further understand these results. However, based on the results of the initial tests, combined with past information on variability in acrolein analysis among labs, the Agency has concluded that additional work is necessary to improve the accuracy of acrolein sample collection and acrolein analysis.

What this Means for Health:

- **Acrolein remains an issue.** The questions raised by the preliminary laboratory tests were not significant enough to lessen our concern regarding levels of acrolein the outdoor air, including in areas around schools.
- **EPA will continue its work to reduce acrolein in the air.** Since 1990, EPA has taken a number of steps to reduce acrolein levels through regulations to reduce smog, and to limit air toxics emissions from industries and mobile sources.
- Based on the preliminary lab results, we do not believe we can accurately evaluate the potential for acrolein-specific health concerns for most schools at this time.
- When we complete evaluation of our monitoring and analysis methods and can implement steps to improve them, we will resume evaluation of acrolein in ambient air, including concentrations occurring at some schools.

Next Steps:

- EPA will make improvements to acrolein monitoring and analysis methods as part of our continuing effort to accurately measure levels of this pollutant in the air.
- In addition, we are beginning to evaluate promising new technologies for measuring acrolein that may provide accurate data in near real time.

Questions & Answers

Q: Why are you releasing acrolein data if you suspect the measurements are not accurate?

A: We are making these data public out of a commitment to transparency. We will not use these acrolein data as we evaluate the possible health concerns from air toxics at the monitored schools.

We have determined that our existing monitoring methods do not provide data of sufficient quality for us to evaluate the potential for health concerns from acrolein exposures at individual schools. However, we remain concerned about acrolein. While we cannot currently be certain of

exact acrolein concentrations at the monitored schools, the information we have does indicate that acrolein is present in the air.

Q: Why haven't you made improvements in the monitoring method before?

A: We have made several improvements, but we need to do more. Enhancements in monitoring technology have improved the accuracy of acrolein monitoring over the last several years. With improved analytical instruments available, EPA in 2006 added acrolein to the list of pollutants measured as part of its National Air Toxics Trends Stations (NATTS). The schools project has further increased scrutiny of acrolein monitoring results, which, in turn, has highlighted areas where we need to make additional improvements.

Q: Are the current methods over or under estimating the amount of acrolein in the air?

A: Our recent short-term study indicates that canisters not cleaned with heat may overestimate acrolein levels in the air, but there are not enough data yet to be certain. We are continuing to look into this. In addition, the study indicates that we have more work to do to help air quality laboratories improve the accuracy of their analyses.

Q: How can you tell that acrolein is a problem if you can't accurately measure for it?

A: We can't tell how much acrolein is in the air, but the monitoring methods are advanced enough to determine that acrolein is present in the air. In addition, we have seen levels at a couple of schools that cannot be explained by the monitoring issue we recently identified.

Q: Could acrolein levels in the air at schools be worse than your monitoring indicates?

A: Based on what we know at this time, we believe that we are more likely over- and not underestimating acrolein. We are continuing to look into this.

Q: Why is acrolein hard to measure in the air?

A: Acrolein is a highly reactive chemical compound. Depending on what other chemicals are present, acrolein can react with those chemicals and form other compounds that complicate analysis. Also, other chemical compounds can react to form acrolein, potentially even within canisters used for collecting air quality samples.

Q: How long will it take to improve the method to the point where you will have accurate results?

A: We plan to make improvements as they are identified. Some, we can make quickly, such as specifying that laboratories analyzing acrolein must clean canisters with heat, should we determine that is necessary. Other steps, such as evaluating promising new technologies for sampling and measuring acrolein, will take longer. We can't specify a date for those.