

Visible Emissions – What You Need to Know



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If you have an air permit for your printing operations, it is likely that it addresses limits on visible emissions in the permit terms and conditions regardless of the state in which you do business, the type of air permit, or the type of business. Here's what you need to know about what visible emissions are, how they're regulated, and how to stay in compliance with your air permit.

What Are Visible Emissions?

Visible emissions are exactly what you would expect – emissions that can be seen by the human eye. They may be vented through stacks or come from fugitive sources (e.g. visible emissions from uncontrolled heatset lithographic printing presses, visible emissions from boilers fueled by oil).

People often use the term “smoke” to describe visible emissions because incomplete combustion from boilers, furnaces, generators, and other combustion equipment fueled by solid and liquid fuels like coal and diesel oil were subjects of the original visible emissions evaluation system developed in the late 1800's. Since then, evaluation of visible emissions has expanded to include non-combustion equipment because visible emissions result from particulate matter that is emitted from more operations than just combustion sources. But the term “smoke” is still widely used to generally describe visible emissions.

What Is Opacity and Why Is It Important?

Opacity is a measure of how much light visible emissions block. High opacity means dirtier smoke, or a higher concentration of particulate matter in the exhaust air emitted through a stack or fugitively. The more opaque the emissions, the more pollution is being emitted.

How Are Visible Emissions Regulated?

You can find the federal opacity standards for various industries in 40 CFR Part 60 (Standards of Performance for New and Modified Stationary Sources), and 40 CFR Parts 61 and 62 (Emission Standards for Hazardous Air Pollutants). These standards require the use of Reference Method 9 or Reference Method 22 found in Appendix A of 40 CFR Part 60 for the determination of the level (opacity) or frequency of visible emissions by trained observers. State agencies will either adopt the federal opacity standards in full, or in some cases adopt more stringent standards. The allowable standards often vary from industry to industry.

“Exceedance of a visible emissions standard can result in severe financial penalties.”

What Requirements May Be Included in an Air Permit?

An air permit will typically limit the maximum allowable opacity across a specified period of time from each source of particulate matter emissions, including combustion equipment. For example, a common permit condition may read “visible particulate emissions from any stack shall not exceed 20 percent opacity, as a 6-minute average, except for a period of 6 consecutive minutes in any 60 minutes.”

How Can You Demonstrate Compliance with a Visible Emissions Limit?

Your air permit will not only include a limit on visible emissions measured in terms of opacity, and sometimes the frequency, but it will also include the appropriate reference test method that you must use to demonstrate compliance when testing is required. EPA Method 9 is the primary test method for visible emissions and is applied to emissions from stacks. If visible emissions testing is required and the demonstration of compliance is by EPA Method 9, a certified visible emissions reader must perform the test. Typically,

environmental agencies require a test plan and advanced notice of the test when Method 9 is being used to demonstrate compliance. The results of the Method 9 test must be summarized in a written report and submitted to the regulatory agency.

EPA Method 22 is a test method for demonstrating compliance from fugitive sources and from flares. It is not an alternative method to EPA Method 9. Instead of determining the opacity of emissions, EPA Method 22 determines the frequency of visible emissions. Unlike EPA Method 9, there is no certification requirement for the person conducting

EPA Method 22 testing. However, it is strongly recommended that you are familiar with visible emissions observations by completing a lecture course for EPA Method 9 and at least one “smoke” school test offered by the state environmental agency or a private firm.



What Else Do You Need to Know About Visible Emissions?

Some agencies consider the permitted source’s potential for generating visible emissions under normal operating conditions and only require an initial test upon startup of the new equipment. If the emissions source is controlled, then a visible emissions test may not be required at all, for example, a heatset web offset printing press controlled by a thermal oxidizer. Keep in mind that the visible emissions requirement is applicable during periods of startup, shut down, and malfunction when the control device may not be operational. It’s a best practice to have a record of the opacity and frequency of visible emissions during these situations.

By understanding these definitions and following the guidelines, you’ll remain in compliance with your air permit and successfully meet your visible emissions requirements.

Ann O’Brien, a Project Manager with SCS Engineers, has more than 30 years of experience in the printing industry. Ann is a certified visible emissions reader and has worked in the environmental field for much of her career, and her background includes air and water quality permitting, environmental recordkeeping, reporting and monitoring programs, hazardous waste management, employee EHS training, environmental compliance audits, and environmental site assessments and due diligence associated with real estate transactions and corporate acquisitions. For more information or help navigating reporting requirements, contact Ann at aobrien@scsengineers.com or Cheryl Moran at cmoran@scsengineers.com.



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