



Information Release

Mirachem, LLC

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Industrial Cleaning and Air Quality Regulatory Compliance - FAQ



Approved for Release to: All Mirachem Customers, sales agents, distributors, and team members

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It's not news to anyone that environmental regulations are here to stay. It's also widely understood that these rules are getting more complex and more restrictive. As governments work to reduce the impact of human existence on the planet while balancing the needs of industry to remain productive and profitable, it can be difficult for businesses to find the best way to forward.

Many customers' first contact with Mirachem technologies comes as a result of new air quality regulations. Jurisdictions are updating regulations to limit or prohibit many cleaning processes that rely on traditional chemistries with air quality concerns. When faced with the need to find another way to clean, Mirachem is often one of the first resources customers find.

We've prepared this list of Frequently Asked Questions to help operators better understand these air quality directives, prepare a plan for evaluating alternatives, and learn that you don't have to trade performance for safety.

For more information concerning Mirachem's products and how they can help you meet air quality requirements, please contact our Sales Support team at Sales.Support@Mirachem.com, or call us at 800-847-3527.

Q: *What does cleaning have to do with air pollution?*

A: The US National Park Service publishes a helpful infographic that explains the main sources of air pollution.¹ These are:

1. Mobile Sources: such as cars, buses, planes, trucks, and trains
2. Stationary Sources: such as power plants, oil refineries, industrial facilities, and factories
3. Area Sources: such as agricultural areas, cities, and wood burning fireplaces
4. Natural Sources – such as wind-blown dust, wildfires, and volcanoes

Stationary Sources represent the second biggest contributor to air pollution. Industrial cleaning applications, which often involve the use of some form of parts cleaning equipment, contribute significantly to the amount of stationary source pollution. Because of the sheer number of parts washing machines in use and the relative ease of adapting these

applications to safer processes, improvements in industrial cleaning has become a favored way of quickly improving air quality.

Q: How can my parts washer contribute to air pollution?

A: There are three things factor into how parts cleaning causes air pollution:

1. The cleaning chemistry (product) used in the equipment
2. How the parts washer is used in day-to-day processes
3. The design of the parts cleaning equipment

Cleaning chemistry: Cleaning applications have historically been designed around the use of hydrocarbon solvents. Over time, scientists have raised concerns over these chemistries and what they release into the air when they evaporate, referred to as *volatilization* or being *volatile*. These concerns primarily include toxic materials (often referred to as *air toxics* or *hazardous air pollutants*), irritating particles (called *particulate matter* or *PM*), substances that damage the earth's protective ozone layer (identified as *Ozone Depleting Compounds*), and substances that combine with other materials in the air to create smog, (called *Volatile Organic Compounds*, or *VOC*). Also, certain materials, when released into the air, help trap heat closer to the earth's surface (so called *greenhouse gasses*) raising climate change concerns.

How Parts Washers are Used: General industry cleaning applications generally come in three types: *Process* or *Critical Cleaning*, *Repair and Maintenance*, and *Janitorial*. The type of cleaning application and the needs of the organization will dictate how parts cleaning equipment is used, which in turn can have an impact on air quality issues. Factors include:

1. How much heat is or is not used
2. How much time equipment spends open or closed to the air
3. Concentration of the selected cleaning chemistry
4. Amount of volatilized chemistry beneath a cover (referred to as *freeboard space* or *ratio*)

Design of Parts Cleaning Equipment: The design features of a parts washing machine selected for a particular application may have an impact of air quality considerations. These include:

1. Vapor degreaser or "cold cleaning" ² units
2. Remote reservoir unit versus a soak or dip tank
3. Manual cleaning, batch cleaning or automated spray cleaning
4. Equipment with or without lids
5. Amount of cleaning chemistry in use and how it circulates through equipment
6. Surface area of the air/chemistry interface
7. Recovery or ventilation systems

Q: How do the rules improve air quality?

A: Governments enact regulations that try to eliminate the sources of pollution or reduce the amount of pollution generated.

In the case of air quality rules, this means targeting Mobile Sources, Stationary Sources, Area Sources and Natural Sources. This is why you hear discussion about things like “auto emissions standards” (mobile sources), “no burn days” (area sources) and “dust control measures” (natural sources).

Related to industrial cleaning, air pollution laws work to regulate which cleaning chemistries can be used in certain applications, the requirements for equipment used in those applications, and how they must be used together on a day-to-day basis to meet specified requirements.

For example, air quality regulations might specify a maximum amount of VOC present in a selected chemistry, enforce a ban on uncovered parts cleaning equipment in certain uses, or require a vapor recovery system if certain kinds of equipment is used. Often, regulations contain provisions relating to all of these areas.

Q: What do air pollution regulations control?

A: In general, air quality rules seek to eliminate or reduce air toxics, ozone depleting compounds, greenhouse gases, particulate, and VOC's. These substances are either typically either banned outright, or their emissions are permitted, monitored and controlled.

The information on what materials to ban or regulate comes from several sources.

Under the authority of the Clean Air Act (CAA), the US Environmental Protection Agency (EPA) maintains a list of Hazardous Air Pollutants (commonly referred to as HAP's). The EPA defines HAP's as “pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects”, and as of February 2020, there are 187 pollutants on the Initial List of Hazardous Air Pollutants with Modifications.³

The Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer), commonly known as the *Montreal Protocols*, “is an international treaty designed to protect the ozone layer by reducing and eliminating known ozone depleting compounds”⁴. This treaty has been the force behind efforts to eliminate Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), and Hydrofluorocarbons (HFCs).

The Kyoto Protocol is another international treaty that evolved out of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that prompts countries to reduce greenhouse gas emissions. The Kyoto Protocol seeks to reduce emissions of six greenhouse gases listed in its Annex A: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆).⁵

According to the Environmental Protection Agency (EPA), Particulate Matter (PM) is a "mixture of extremely small particles and liquid droplets." Air quality professionals pay attention to particulate matter because these very small particles can cause health problems when inhaled.⁶

Volatile organic compounds (VOCs) are compounds that easily become vapors or gases. VOCs are released from burning fuel such as gasoline, wood, coal, or natural gas. They are also released from many cleaning products. When VOCs combine with nitrogen oxides in the air, they form smog.⁷

If a regulation does not ban a substance, it typically sets a limit on how much material can be emitted by a particular process over a certain amount of time. These limits may represent an absolute threshold that may not be exceeded, establish a level at which permitting is required, or be used as a factor for permit fees, reporting calculations, etc. These limits are usually expressed in the form of an amount of material in a volume of material. For example, PM is measured as micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), while VOC's are usually expressed as pounds per gallon (lbs/gal) or grams per liter (g/L).

Q: *Why am I always hearing about VOC standards?*

A: Aside from large factories or industrial operations with smokestacks or large emissions, the most common types of air quality regulations that apply to businesses are those that deal with their everyday processes. Cleaning, paint and coating, printing, and chemical manufacturing applications are common tasks impacted by air pollution rules. Most often, the rules pertaining to these operations involve VOC standards for products used during these processes.

In some cases, the VOC standard has to do with keeping track of the materials used and completing a report on how much VOC was generated as a result. This can be a time consuming and expensive task. Avoiding the effort and cost of this type of reporting requirement is often a significant consideration in prompting businesses to adopt safer practices.

Other types of regulations may require that only certain products may be used in a particular application. A common example in cleaning applications is a requirement to use products with a certain VOC content. These are generally referred to as "Low VOC" regulations and depending on the jurisdiction and the application, may require products with a VOC content between 25 and 300 g/L.

It is also increasingly common for rules to identify pre-approved or exempt materials that may be used with reduced or no regulation. An example of this is California's South Coast Air Quality Management District's (SCAQMD) Clean Air Solvent Certification program.⁸

In response to the increasing demands of these ever-expanding VOC regulations, many companies are adopting internal standards to reduce or eliminate VOC's in their operations. It's not as difficult as you might think to adopt air-friendly practices and avoid getting caught short by changing regulations. Mirachem and our environmental services partner, Crystal Clean, can help you update your operation to not only comply with new air quality rules, but also upgrade your productivity to save time and money.

Q: *Why is all of this such a big deal now?*

A: That depends on who you ask. Some people would say it's because the environment is at risk and humans must act now to save it. Others would argue that there is now too much government regulation and it's raising costs and making it difficult to do business. Whatever your point of view, there's no doubt that environmental responsibility is a topic that isn't going away.

Practically speaking, however, if you look past the headlines, more pollution control regulations are being put in place these days because it makes financial sense to do so. To put it another way, the costs associated with a new rule are, over the long term, now less expensive than leaving things as they are. For example:

1. Advances in technology are making it possible to replace older manufacturing processes that generate more pollution. New equipment may be expensive to purchase, but it's also more efficient to operate and ultimately generates a cost savings.

2. Modern medical science has identified links between pollution and illness. Reducing pollution can help reduce healthcare costs.
3. Manufacturing processes designed for environmental responsibility use fewer resources. That's less raw materials, power, and waste disposal that companies have to pay for.
4. Hazardous materials used in cleaning processes are expensive to purchase, handle, store and dispose of. Switching to a safer, compliant product can reduce the cost of transportation, training, worker safety, storage, waste management, and compliance recordkeeping.

Of course, this isn't to say that change comes easily or without cost. Being forced to adapt processes is disruptive and a need to purchase new equipment creates expense. It's always wise, however, to look at the bigger picture when evaluating overall impact.

Q: *How do I know if a regulation even applies to me?*

A: That's a good question with a few different answers.

Air quality rules tend to be specific to certain sources (mobile, stationary, etc.) industries (printing, aerospace, painting and coatings, etc.), or applications (parts cleaning, vapor degreasing, hand wipe, etc.). Sometimes it's obvious that a rule does or does not apply to your operation.

Most jurisdictions also conduct a great deal of public outreach concerning new requirements. If your organization is permitted by or registered with the regulatory agency you can expect to receive notices in the mail or via email explaining how the new rule applies to your permitted or registered practices. It's also not unusual for field-level inspectors to make visits.

It's also true, however, that air quality regulations are written in "legalese" and usually refer to very technical standards. There is also room for interpretation about which of your processes are covered by what rules, and not all inspectors do their work in the exactly same way. This can make compliance efforts a confusing and frustrating proposition.

It's useful to talk to your current vendors about any new regulations. Reputable suppliers, like Mirachem and Crystal Clean, should have technical personnel on staff that can help you understand how rules apply to your situation and what products or services are available to help you comply.

Q: *I don't understand these complicated regulations. Do I have to hire someone to do this for me?*

A: No. Environmental regulations do contain many technical terms and lots of legal language. But they can almost always be reduced to a few key points that anyone can understand. Your local regulatory agency usually provides simplified materials to help you comply, and in many cases, will provide a web or telephone "hotline" to contact for assistance.

Many companies include compliance information in their product support materials. For example, Mirachem publishes the VOC content of our products in Section 9 of the Safety Data Sheet (SDS), and has issued a support document, [Mirachem Products and Air Quality Regulations](#), to provide guidance on using Mirachem technologies to comply with air updated rules.

You can also get hands-on help without having to hire a dedicated compliance specialist. A reputable, full service environmental solutions company can help you evaluate your current processes and provide options to help you comply with the law. Your provider should also be able to help you find opportunities to increase productivity, reduce cost, and improve your environmental responsibility profile. Mirachem recommends our environmental services partner, Heritage-Crystal Clean.

Q: *Can I really comply with all of these air quality regulations and still get the job done?*

A: In virtually all cases, the answer should be yes. Of course, the only way to know for certain is to go through the process. But unless your application is both uncommon and significantly different from most industrial cleaning tasks you have little reason to be concerned.

The important thing to remember when adapting cleaning tasks to new regulations, especially if the change involves converting from a petrochemical solvent to a water-based chemistry, is that there may be several parts of the process that have to change. And if you want to take advantage of the change process to boost productivity and overall cost savings, the evaluation process can take some time.

If you are looking at making a change from solvent cleaning to working with a Mirachem aqueous technology, we recommend consulting our information release [Switching To Aqueous Cleaning - FAQ](#). This resource can help you plan your evaluation and make your switch as painless as possible.

If you're also interested in parts cleaning equipment that can make your work more productive, turnkey service programs to help make maintenance easier, or professional waste disposal and environmental service support, you should also consider talking with Heritage-Crystal Clean. As Mirachem's environmental services partner, Crystal Clean can not only help you find the right product for your application, but also provide everything you need to get the most out of your cleaning process.

Q: *If the rules are trying to do away with solvents, why are they still talking about cleaning solvents?*

A: That's a great question and an area of confusion with many regulations.

Within the parts cleaning industry, there is a distinction drawn between cleaning with petrochemical solvents, such as traditional 105^o flash solvent or perchlorethylene, and cleaning with water-based chemistries. Regulators, however, often refer to all cleaning solutions as "solvent", regardless of whether the products are hydrocarbon or aqueous in origin. So when a rule discusses "cleaning solvent" you can usually assume that it means any cleaning product that you might use in a parts cleaning application.

It might help to think of things this way:

1. Most air quality rules don't specifically prohibit or mandate the use of any particular cleaning product. The rules probably won't come out and say that hydrocarbon solvents are illegal, but may very well specify a VOC limit that is virtually impossible to meet with a chlorinated solvent.
2. To meet the required VOC limits, it will probably be necessary to use a water-based product. So practically speaking, the laws largely have the effect of eliminating "solvents" in favor of "aqueous" products.

3. Regardless of the practical impact in the marketplace, the regulators have to be careful what words they use in drafting rules. So, it's easier to use generic words that, in many cases, are used in other rules. And for cleaning products, that word of convenience is "solvent".

Q: *Can water-based cleaners REALLY replace hydrocarbon solvents?*

A: Yes, they can, and they can do it in almost all cases.

Water-based cleaners started being looked at seriously for industrial cleaning in the late 1970's. These early aqueous chemistries usually offered inferior performance to Stoddard, mineral spirits, and other petrochemical solvents. Environmentally friendly products were great, but they didn't work.

Aqueous parts washing has come a long way since then. Water-based cleaning is effective, and there's plenty of proof in the marketplace. In 1998, Southern California's South Coast Air Quality Management District (SCAQMD) implemented its Rule 1171 that mandated a VOC limit of 25 g/L, effectively banning the use of petrochemical solvents in most parts cleaning applications. The rule came about after years of testing and field study to validate that low-VOC products could deliver cleaning performance. Over 20 years later, Rule 1171 is still the law in Southern California because aqueous cleaning works.

Low-VOC air quality rules for industrial cleaning are here to stay. The 25 g/L VOC standard introduced with Rule 1171 is now in place for most of the state of California. This VOC limit is now being considered, or is in the process of implementation, in many other jurisdictions, including the US states of New York, Delaware, and other members of the Ozone Transport Commission (OTC). And while many more jurisdictions have yet to mandate 25 g/L, low-VOC limits are on the books for counties and air quality districts across the US and around the world.

Mirachem has been manufacturing our advanced aqueous technologies since 1978. For over 40 years, we've worked with businesses large and small to find water-based alternatives to cleaning processes that use hazardous chemistries. Water really can get the job done and we can help you see for yourself.

Q: *What are the odds that these rules will go away in the future?*

A: Virtually zero.

Fifty years of air quality data shows that these laws do improve air quality. Now that the performance of water-based cleaners is a proven fact, there is little room to argue that the requirements of these rules can't reasonably be met. The genie, as they say, is out of the bottle. It would be seen as irresponsible for regulators to reverse a successful effort.

Q: *This is all very confusing. Where do I start?*

A: We suggest getting some expert assistance. And the good news is, it doesn't have to cost you a thing.



Mirachem has been in the business of providing safer alternatives for over 40 years. Our advanced aqueous technologies have been engineered from the ground up to be compliant with the latest air quality standards. But more than that, our experienced team of professionals understands that safer doesn't mean much if you can't get the job done. You can count on our full line of water-based products to perform in virtually any application. You can learn more at Mirachem.com, or contact us at Support@Mirachem.com or 800-847-3527.


While you're updating your processes, why not take a look at boosting productivity and performance to the next level? We can offer you much more than aqueous cleaning through our environmental service partner, Crystal Clean. State of the art parts cleaning equipment, complete service programs, waste disposal, and vacuum services are just some of the services available from Crystal Clean. You can also take advantage of highly trained experts that can help you evaluate your entire cleaning process to help find ways of saving you time and money. Visit Crystal Clean online at Crystal-Clean.com, or call 877-938-7948 for more information.

Footnotes

1. <i>US National Park Service</i> : Where Does Air Pollution Come From	https://www.nps.gov/subjects/air/sources.htm
2. <i>Cold Cleaning</i>	<p>Historically, "cold cleaning" referred to sink-on-a-drum style parts cleaning equipment that used hydrocarbon solvents. The term was used to distinguish between heated vapor degreasing applications and non-heated manual parts washing tasks.</p> <p>Many rules now enforce low VOC limits on "cold cleaning" applications. This typically prompts the use of water-based cleaning products, which are generally used in heated parts washers. However, most regulations do not take note of this fact and still use the term "cold cleaning" to refer to sink-on-a-drum style manual parts cleaning tasks.</p>
3. <i>US EPA</i> : What are Hazardous Air Pollutants?	https://www.epa.gov/haps/what-are-hazardous-air-pollutants
4. <i>Wikipedia</i> : Montreal Protocol	https://en.wikipedia.org/wiki/Montreal_Protocol
5. <i>Wikipedia</i> : Kyoto Protocol	https://en.wikipedia.org/wiki/Kyoto_Protocol
6. <i>Alaska DEC</i> : Particulate Matter-Background Information	https://dec.alaska.gov/air/anpms/particulate-matter/background/
7. <i>US National Library of Medicine</i> : Volatile Organic Compounds (VOCs)	https://toxtown.nlm.nih.gov/chemicals-and-contaminants/volatile-organic-compounds-vocs
8. <i>South Coast Air Quality Management District (SCAQMD)</i> : Certified Clean Air Solvents	http://www.aqmd.gov/home/programs/business/business-detail?title=certified-clean-air-solvents

Related Resources:

Switching To Aqueous Cleaning - FAQ - Information Release (INF-1113)		Mirachem.info/INF-1113
Mirachem Products and Air Quality Regulations - Product Release (PR-1462)		Mirachem.info/PR-1462

SCAQMD Certified Clean Air Solvents - Support Resource (RR-2875)*		Mirachem.info/RR-2875
* External weblink		

About Mirachem, LLC

Mirachem, LLC, a Heritage-Crystal Clean company, is a manufacturer and marketer of environmentally and worker-safe cleaning technologies, and provides advanced customer and technical support for users in a variety of applications, across many industries and business segments. Headquartered in Phoenix, AZ, Mirachem was founded in 1978 as The Mirachem Corporation, and has been offering superior alternatives to traditional, hazardous cleaning chemistries for over 40 years. For more information, visit Mirachem.com/AboutUs.

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