

HOW TO MANAGE

OIL MIST

(and Other Wet, Heavy Effluent)
Like a Pro



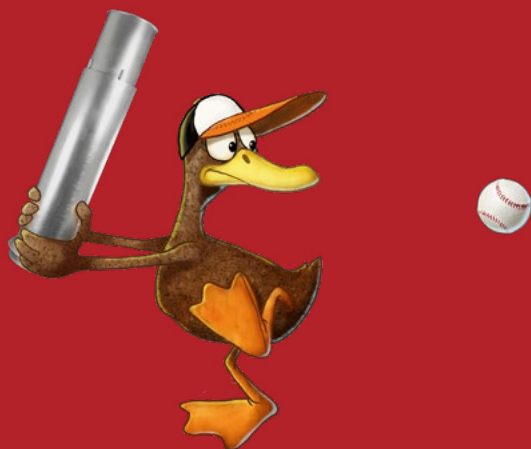
US
DUCT
DUCTWORK MADE EASY



Many available ductwork systems seem comparable on paper, but in practice, they often don't stand up to the demands of creating a truly leak-free environment.

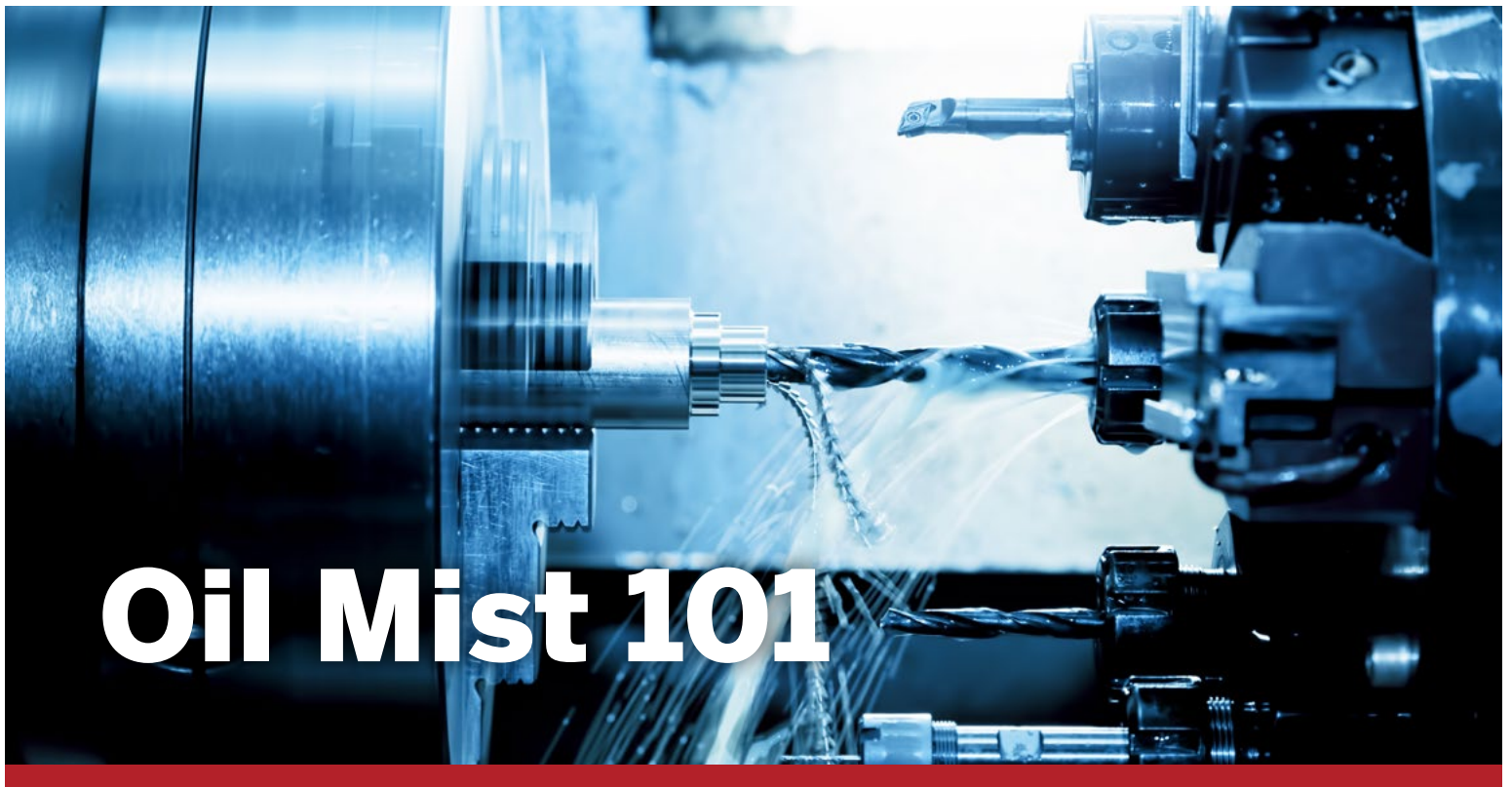
Clamp together, spiral, and flanged ducting are suitable solutions for industrial ventilation of dust and other dry particulate. However, in applications with heavy, wet effluent, the effluent will find its way out.

Leaking wet effluent, such as oil mist, has much greater health and safety concerns when it's released into the ambient air. Not only does it pollute the air we breathe with cancer-causing agents, but it can also create puddles on the floor — cue the “slippery when wet” signs and workers' comp forms.



Although excess, unattended oil mist can be problematic both inside and outside of mechanical systems, an effective collection system can help:

- Keep hazardous substances out of employees' respiratory systems
- Prevent dangerous slips caused by oil collected on the floor
- Lighten the load of the airflow
- Reduce the chance of leaks caused by over-pooled effluent
- Save significant amounts of money by re-upping and re-using reclaimed oil
- Protect the system's health and longevity by keeping it clean and slowing corrosion



Oil Mist 101

WHAT IS OIL MIST?

It's that greasy film you've noticed building up on the surface of machinery. Oil mist is a byproduct of using metalworking fluids (MWFs) in an industrial machining or cutting process.

WHAT CAUSES OIL MIST?

Processes like cutting, grinding, turning, or milling require MWFs and generate machining mist. While the fluid is essential to the machine's efficiency, it produces oil mist that is often released into the ambient air.

IS OIL MIST A PROBLEM?

Yes and no. Oil mist is an inevitable byproduct of using MWFs. While it can be captured at the source, the liquid mist will always find a way to leak out — usually through ductwork seams or joints. Most facilities know it's a nuisance but have come to accept it as a part of manufacturing or production that requires regular cleaning and maintenance. Although MWFs can prolong the tools' lives and make it easier to cut through materials, the oil mist they produce can also pollute the manufacturing space and overload collectors.

Are there other byproducts I need to contain?

Oil mist is a metalworking problem, but other leaking effluents are just as harmful. Fluids escaping or produced by other processes can significantly impact air quality, safety, and operations.

PLASTICIZERS

Plasticizers can make material more flexible and durable. They are often seen in plastic and PVC production and found in vinyl flooring, adhesives, and detergents. Although plasticizers don't pose much of a health threat to end-users, plasticizers may irritate the lungs or throat if inhaled during production.



PARTS WASHING BYPRODUCT

Parts washing creates a wet, misty byproduct that needs to be collected and funneled away from the process. At high temperatures, parts washing makes excess steam and heat in a work environment that can damage surrounding work stations, be dangerous to personnel, and increase the costs of cooling the facility.





Why Leaking Oil Mist Is Inevitable

1

The hose to ductwork connection can never be tight enough

(trust us on this one)

In a wet system, leaks between the flex hose and ducting are unavoidable. The final connection between the machining center and ductwork often needs to be joined with flex hose due to unusual pick-up placement or overhead constraint. The hose's flexibility makes the connection possible; however, the flex hose and hose clamp will always leak — and no amount of adjusting or tightening will prevent it.

moisture's weight through it or when the system is turned off, causing any mist that was suspended in the moving air to drop and pool in the bottom of the ducting.

The ductwork isn't installed properly

Correctly installing ductwork means precisely aligning the joints' angles, tightening connections as much as the method allows, and securely anchoring the system to the ceiling or walls. Even the smallest gaps in ill-fitting and loose connections will leak, and any additional torquing or vibrating will only amplify this problem.


3

2

Effluent pools when the system is off or becomes overloaded

Leakage at connection points occurs when effluent pools inside the ducting or overloads the collector's filtration medium. Pooling can happen when the system's cubic feet per minute (CFM) cannot adequately and continuously move the

PRO TIP



The right mix of duct hangers can adequately secure the system, slowing the impact of everyday wear and tear. Stabilizing-style hangers will reduce movement, and suspension-style hangers will support the system's weight.

Application consideration is essential for designing the right ductwork system.

Here's a quick guide to selecting ductwork connection types based on the seal they offer.

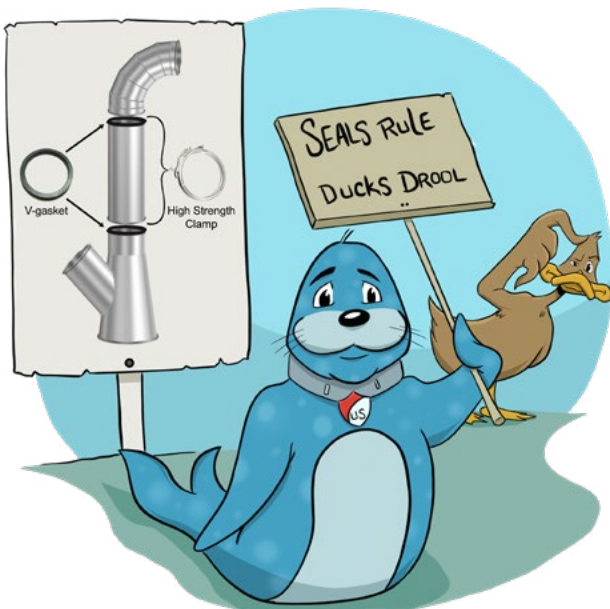
Connection	Installation	Description	Leakage	Byproduct best managed	Common Applications
Spiral Ducting	Quick	The insertion of the tap screws into the ducting creates weep holes that effluent an leak through	Prone to leaking	Dust/dry particulate	Dust collection, welding fumes, nuance particles
Clamp together ducting	Quick Additional labor and material costs for sealing	Offers a modular system with an integrated gasket inside the clamp Connections must be modified with additional gaskets or caulking	Enhanced seal compared to other quick-install options	Dust/dry particulate	Air knife, coffee roasting, dust collection
Welded and flange and gasket connections	Time-consuming and labor-intensive	These systems cannot be adjusted or reused High labor costs associated with cleaning, removing, and relocating	Reliable seal	Dust/dry particulate Heavy and wet effluent	Dry particulate, wet and oil mist collection, caustic debris
US Tubing	Quick	Pipe ends are turned back 90 degrees to create a Vanstone edge, with a fully encompassing gasket on one side Pipe ends are joined using an adjustable v-groove clamp that sandwiches the gasket and Vanstone ends together	Reliable seal	Dust/dry particulate Heavy and wet effluent	Oil mist, pneumatic conveying, MRI quenching

Not All Hope Is Lost

Leaks will happen — but it doesn't mean you can't control the escaping oil mist or wet effluent and mitigate the damage it can cause. While careful and precise installation is pivotal to a leak-free system's success, the product you select can make or break it — and that product usually doesn't work on its own. **US Duct manufactures a line of airtight ducting (US Tubing), oil mist curbs, and oil mist accumulators that help manage oil mist.**

US Tubing: The sweet spot

US Tubing is an airtight and modular ducting system that uses a v-shaped gasket and torque-tightened clamp. It's designed to create leak-free connections and provide The Ultimate Seal®.



SEAL...

Each ductwork component has a Vanstone-flanged end, meaning the end is turned at a 90-degree angle to the pipe. Rather than embedding the gasket within the clamp or applying it to the lip's face (as it is commonly done with rolled lip duct), it's applied directly to the end of the flanged duct. Its v shape allows it to fit snugly around the pipe's end as it fully encompasses the edge.

... AND CLAMP

With the gasket snug and secure around the end of the flanged duct, a high-strength, torque-tightened clamp is applied around the pieces. This force compresses the pipe and gasket together more strongly than securing the gasket with a pre-set tension, ensuring that the system is airtight and leak-free. For safety purposes, a latch on each handle helps to protect the fixture from any accidental release.

The torque-tightened clamp and full gasket system make US Tubing an airtight — and mist-tight — solution for maintaining efficient processes and a clean facility.

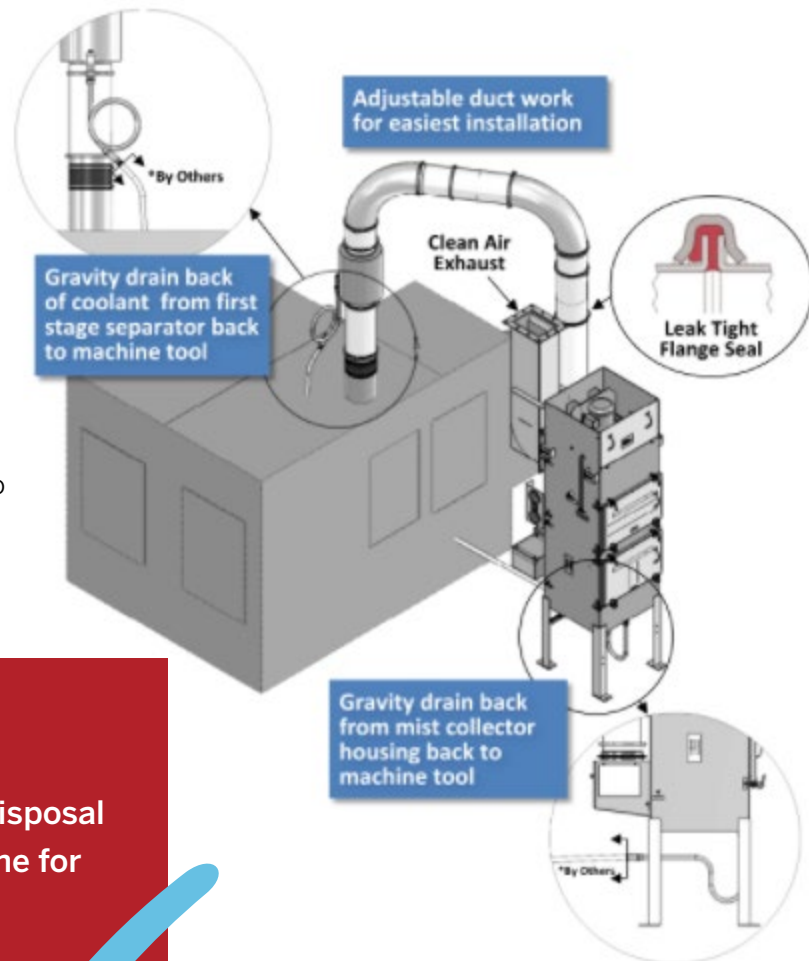
In-line oil mist eliminators: Next-level protection

Oil mist eliminators are designed to keep ambient air free of harmful products and reduce the amount of fluid that enters the mist collection system, allowing the system to function more efficiently. Eliminators can be installed at one of two places:

- On the outside of the machine. An eliminator is mounted on the machine to remove excess effluent before it enters ambient air or ducting. Many cutting and milling machines are equipped with collectors to control oil mist at the source.
- Within ducting. The eliminator (sometimes called a separator or accumulator) is installed in-line to remove excess effluent as it travels through the ducting before reaching the collector. Rather than being installed to a specific machine and removing the oil mist before it enters the ducting, these are designed specifically to work within the ducting and remove the oil mist once it enters the filtration system.

Accumulate, contain, drain

US Duct's in-line oil mist accumulators are typically mesh with woven fibers or mesh specifically made for slowing the airstream and catching oil particulates. The oil coalesces on the fibers, gathering and growing until the volume weighs it down enough to fall into a drain port (also referred to as a drum). US Duct's accumulator uses three wire mesh cones that slow the airflow down, creating more time for the oil mist to accumulate along the surfaces. The captured effluent pools within the device, instead of leaking.



PRO TIP

The drain port can be connected to a disposal canister or routed back into the machine for reuse, depending on the application.



Choosing an oil mist eliminator — one size does not fit all

While installation location is one differentiating factor to consider when it comes to oil mist eliminators or accumulators, you should also consider your application and the size of the oil mist particles you need to filter.

Oil Mist Size	Eliminator Type	Pro	Con
Submicron	Fiber bed	Very effective at extracting tiny amounts of excess oil mist	Only works with horizontal airflow
Submicron — ~5 microns	Mesh	Usually best value for the price Vertical and horizontal installation	Decreases in efficiency as particle size increase
10–20+ microns	Vane	Very sturdy Vertical and horizontal installation	Typically more expensive and not efficient for small particles

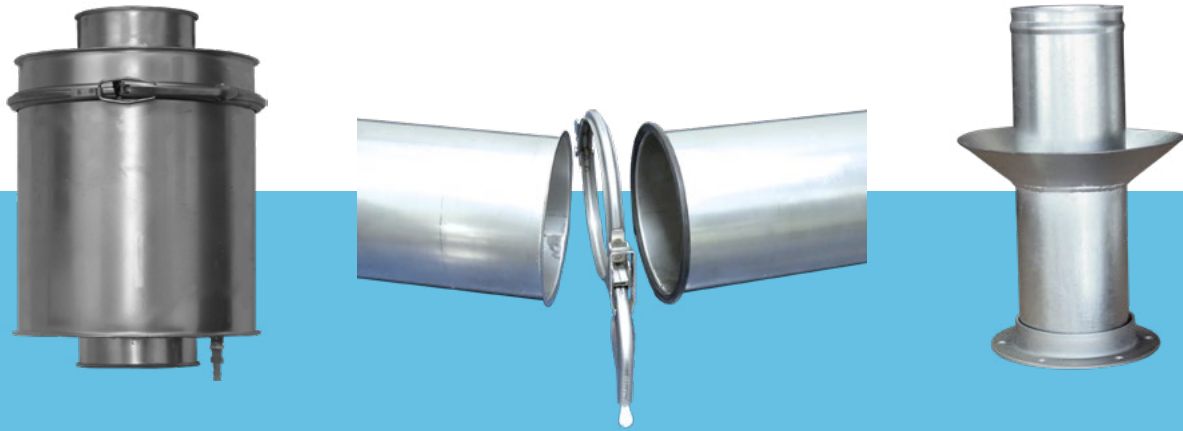


Curbs: Solving the leaky flex hose to ductwork connection

Given that the flex hose is positioned at the ductwork connection point, it will always leak. Oil mist curbs, commonly called drip curbs, are responsible for catching the flex hose's unavoidable run-off mist. A welded trough around the curb contains all escaping oil, and 1/8-inch holes slowly redirect the oil back into the machining system. This helps increase efficiency, decrease waste, and prevents the oil from falling to the floor and creating a safety hazard.

PRO TIP

Although curbs are a cost-effective and straightforward means of containing the liquid that escapes around the flex hose, there are likely other leaking points in the system. Selecting the right connection type for your application is one of the most significant factors in keeping a clean and safe facility.



The trifecta of oil mist management

The truth is that even modern collection systems that are specifically designed to handle moist, wet, or toxic debris will inevitably leak — but there are ways to mitigate the adverse effects and contain oil mist. **The right combination of equipment can make all the difference in your efforts to capture oil mist.**

Oil mist accumulators and **oil mist curbs** are highly effective, but they can't do it all on their own. Pairing these two components with **a fully-welded, airtight, clamp-connect system like US Tubing** is key to controlling leaks, eliminating pooling oil, and maintaining a clean facility.

Still “mist-ified?”

Let us know. Our team of Duct Guys is dedicated to keeping your systems running smoothly and your desks free of workers comp files. We're here to answer any questions you have and are happy to advise on how to best manage oil mist within your applications.

US Duct is an American owned and operated, industry-leading manufacturer and supplier of industrial ductwork systems and custom solutions.

The combination of a dedicated sales team and skilled fabricators gives contractors, ductwork installers, and OEM representatives everything needed to select and sell ductwork to end-users. US Duct has extensive knowledge of ductwork applications, design, and manufacturing that allows us to offer comprehensive lines of clamp together ductwork, air-tight tubing, flanged ductwork, and special solution products.

From take-off design services to on-time delivery to installation, we will provide the support you need for any project. We know that when you succeed, we succeed. That's why we're committed to developing long-term partnerships that save you time, money, and the stress of selling ductwork. And you may even have a little bit of fun along the way.



CONTACT A DUCT GUY TO SEE HOW US DUCT CAN MAKE DUCTWORK EASY FOR YOU.

CONTACT US

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