



**CASE STUDY**

# OIL MIST

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# OIL MIST

## ➔ What is Oil Mist?

To understand how US Tubing works with oil mist, we must first define it. Oil mist refers to oil droplets suspended in the air, most often as a byproduct of metalworking fluids that encounter fast-rotating gears and parts in a machine. ALL metal machining operations create oil mist and oil smoke to some extent. These suspended droplets, or the smoke they produce when burning off on the hot portions of a machine, are harmful to humans, animals, and the environment.



## ➔ What is so bad about Oil Mist?

Since tiny amounts of oil mist often go unnoticed, it is hard to say when exactly a slight mist becomes a bigger problem. However, if you see that tell-tale black oily drip near a machine port (or in the surrounding duct)— you can safely assume you have an oil mist problem.

If it gets bad enough...you will see oily residue on the floor, walls, and ceiling in a facility where the suspended droplets have gone unchecked. Using specialized tools, experts can track how much oil mist is suspended in the air and determine if someone has an unseen terror residing in the air around them.



When this oil mist residue builds up in a facility, it can cause slipping, fire, and explosion hazards. The buildup of droplets in the air can create a significant particulate explosion risk, and physically speaking—it is dangerous to have on your skin, hair, and clothes. From a medical standpoint, it is even worse. Asthma, permanent breathing issues, cancer, and reproductive harm (specifically tumors on the scrotum) are all KNOWN side effects

of short and long-term oil mist exposure. That is right...you can lose the ability to have children or breathe freely without assistance, all from drops of oil you cannot even see.

The damage it can cause to the environment is just as dire, and if your health does not concern you, the safety of the world and its population might. It is no surprise to find that oil mist has been responsible for disasters, such as the 2010 Puebla Oil Pipeline Explosion in Mexico. A simple spark or source of heat is all it takes to ignite these drops, which are nothing but semi-vaporized particles of fuel.



## WHY DO WE WORK WITH IT, AND WHAT CAN WE DO ABOUT IT?

Oil mist is not usually such a severe problem. Machines that use our duct or tubing are built and designed to limit the amount of waste and byproducts they create, oil mist being one of them. Since it is inevitable in a metalworking application, many countries (by law) and companies require that machines be installed with oil mist eliminators, demisters, mist separators, or oil mist filters.



These devices can help separate, contain, or virtually eliminate most, if not all, particulates. Oil mist that would otherwise shoot off into the facility, atmosphere, or burn from the hot moving parts of the machine, forming a noxious smoke. In addition, using flanged or tubed products, such as our gasket-flange duct or US Tubing lines of ductwork, can help eliminate oil residue leaking from the duct or spraying out into a cloud of fine suspended droplets. This is done by sealing the pipes to the outside, preventing leakage, and helping maintain a safe, environmentally friendly setting.

Mist eliminators work by utilizing composite mesh or vane plate surfaces to mechanically separate mist droplets from air/gas

streams via inertial impaction (i.e., using inertia to separate the oil). Other oil mist separators filter oil-laden air through vacuum-driven air. An additional channel of air vacuum pumps a stream of suction that forces the oil droplets through a series of filters that create a path of resistance until, eventually, none remain.

US Duct's oil mist accumulators work by using a cylindrical metal enclosure containing three or more mesh cones. The cones are placed in the direction of the air stream, causing the oil to run down the surface of the cone via agglomeration and a slower air stream. When it reaches the edges, it drops into a sump below. These devices, including US ducts, return the lubricating oil to the machine.

## WHY DO THESE MACHINES USE OIL?

Believe it or not, your car isn't the only thing that uses oil. Oil lubricates the moving parts and bits in metalworking machines and helps to cool the parts and keep them from having major repairs, breaks, or issues. If a machine overheats, dries out or makes complete metal-to-metal contact with its internal moving parts, you could be down thousands, if not millions—depending on the machine in question.

Oil mist is a small byproduct of a working machine and is a necessary evil to tackle when designing and installing a duct system where it may be incurred. Without the oil used to lubricate and cool the machines, many facilities would not be able to operate at the constant level of production they can now.

Thankfully, US DUCT can create 100% leak-free ducts and vertical and horizontal oil mist accumulators—which can virtually eliminate all oil mist issues in metalworking facilities. We asked our good friend and loyal customer Shawn V. to offer his thoughts on tubing and its uses and efficacies in oil mist applications:



US Tubing is the best solution for mist collection currently. After using other types of the pipe over the years with moderate to bad results, this is the best product for ducting multiple mist sources to a central collection unit.



### Sources

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