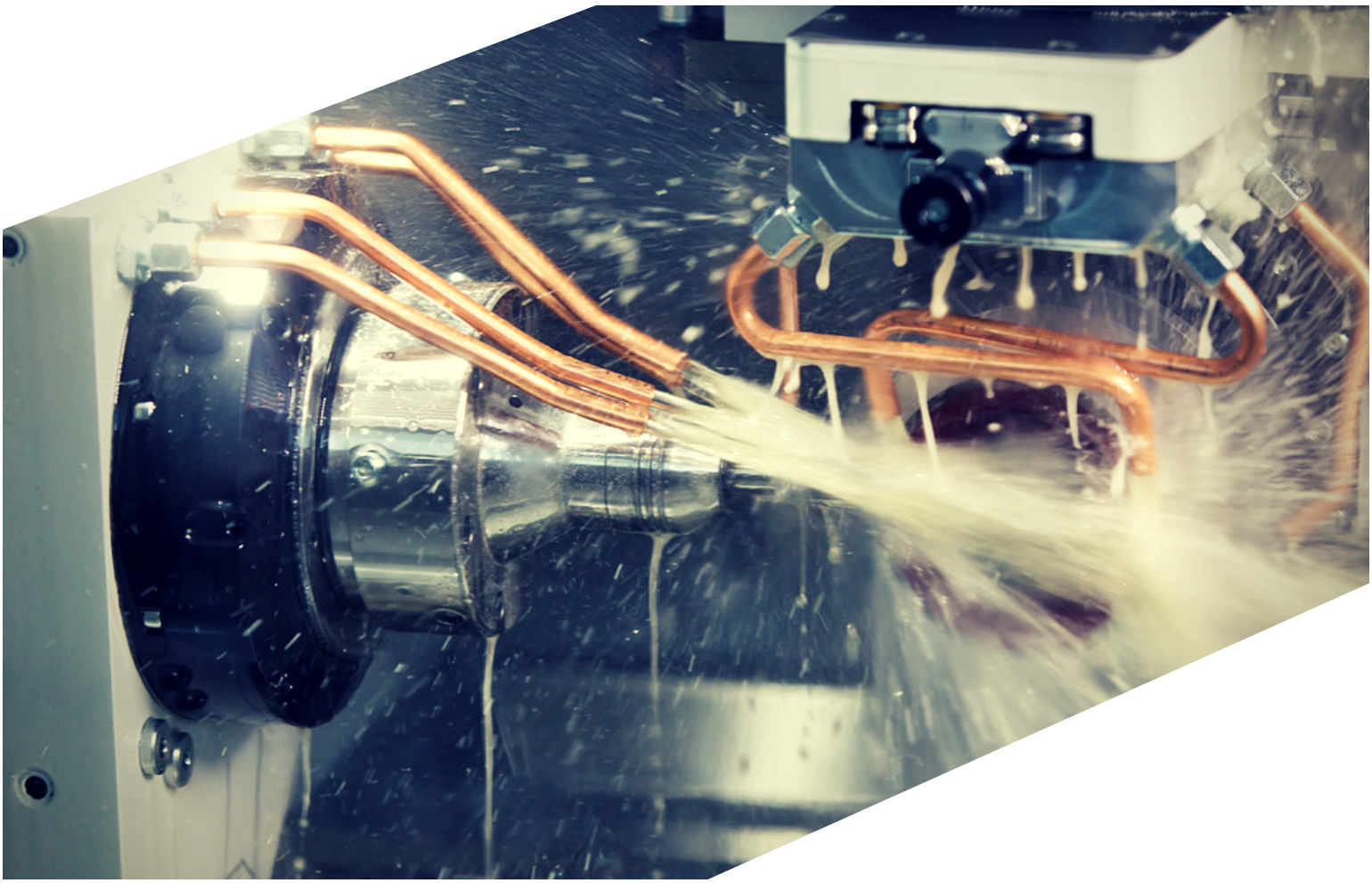
MIST COLLECTION
A DECISIVE GUIDE



A GUIDE TO SELECTING THE RIGHT MIST COLLECTION SYSTEM TO ELIMINATE COOLANT MIST

MIST COLLECTION

A DECISIVE GUIDE

If you are reading this guide it's because you have made the critical decision to:

- Clean your metal working shop by eliminating oil dripping from the ceiling, smeared on the walls or floor, and most importantly, clean the air.
- Keep employees healthy.
- Comply with OSHA and NIOSH regulations.
- Reduce machine downtime.
- Reduce your HAVC filter replacement costs.

This guide will help you to select the best mist collector required to accomplish your goals.

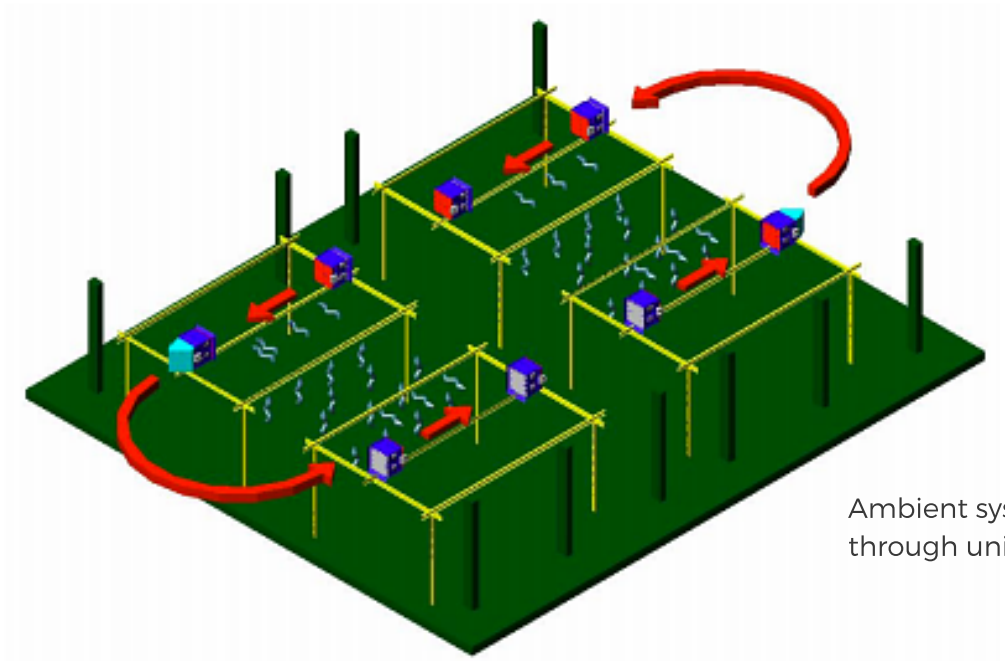
#1 SOURCE CAPTURE VS AMBIENT SYSTEM

A Source Capture System captures the mist where it is being created. On the other hand, an Ambient System improves the overall air quality in a room.

Experts agree that source capture by utilizing a machine enclosure or hood is the most effective way to collect and eliminate oil mist. Ambient filtration should be used as a secondary system when the source capture process is not 100% effective.

If you already have an ambient system, adding source capture units will help reduce maintenance and filter replacement costs on your ambient system.

This image shows a single unit source capture mist collector with the mist intake hose connected to the machine enclosure.



Ambient system where polluted air is drawn through units situated above the machinery floor.

#2 SINGLE UNIT, CELLULAR SYSTEM OR CENTRAL SYSTEM

The single unit installation offers the most flexibility if machines need to be moved.

Ducting is not required and the unit requires simple maintenance and the ability to run the mist collector only when the machine is on.

The cellular system may be more practical when 3 or 4 machines close to each other require mist collection.

A cellular system requires floor space, rigid ducting, and balancing air flow to each machine can prove to be tricky.

The central mist collection systems were popular many years ago. These systems require a lot of floor space and considerable investment in rigid ducting.

During maintenance or system break down, all mist collection must be shut down and balancing air flow to each machine is difficult.

Single unit installation.

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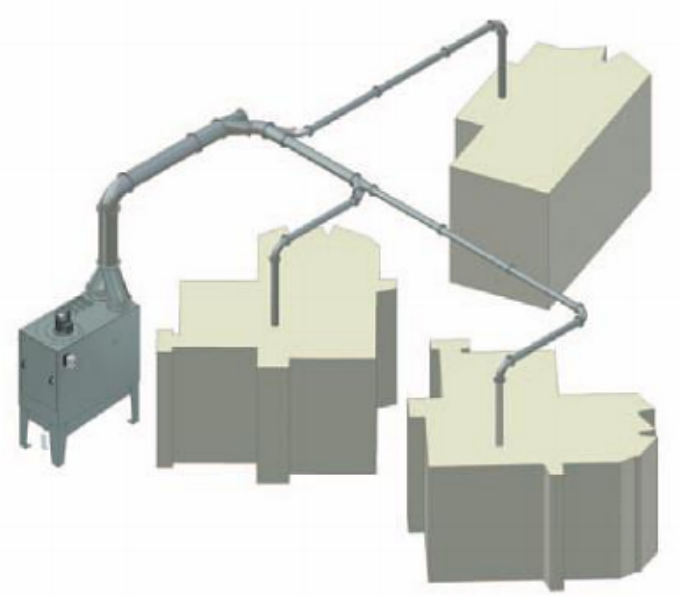
#2 SINGLE UNIT, CELLULAR SYSTEM OR CENTRAL SYSTEM

CELLULAR SYSTEM

This image shows a cellular system collecting mist from 3 machines using localized ducting.

This system is effective for machines that are situated in close proximity.

There are additional costs for installation and ducting and if machines are moved regularly, single units would be preferable



CENTRAL SYSTEM

This image shows the amount of space required for a central system.

A central system can be placed outside, but for climates where the temperature drops below freezing, the central system needs to be indoors.

The disadvantage is that the system will take up a great deal of floor space.

#3 TECHNOLOGY & TYPES OF MIST COLLECTORS

The three major technologies used in mist collectors are: Centrifugal, Electrostatic and Media Filtration.

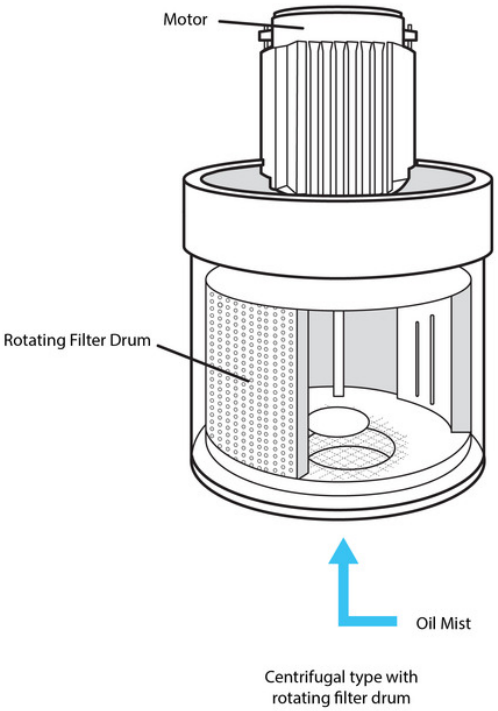
CENTRIFUGAL TYPE WITH ROTATING FILTER DRUM

These units utilize a rotating filter drum which doubles as a fan. The mist enters the rotating drum and is captured by a filter located within the drum. From there, the mist coalesces into large droplets which are thrown onto the inner wall of the unit by centrifugal force (created by the rotating filter drum) where it continues to a drain.

Moreover, these units are source capture systems that can be easily mounted on machines offering advantages such as; machines can be easily moved, no floor space is needed, and simple maintenance.

A problem with these units is that the rotating filter drum will also capture swarf and grit that can cause it to go out of balance, ultimately creating loud noise and vibration.

The vibration from the mist collector is then transferred to the machine tool which can lead to the machined workpiece having a poor finish or be out of tolerance. A hybrid of the centrifugal type mist collector is one that does not have a rotating filter drum.



Centrifugal type with rotating filter drum

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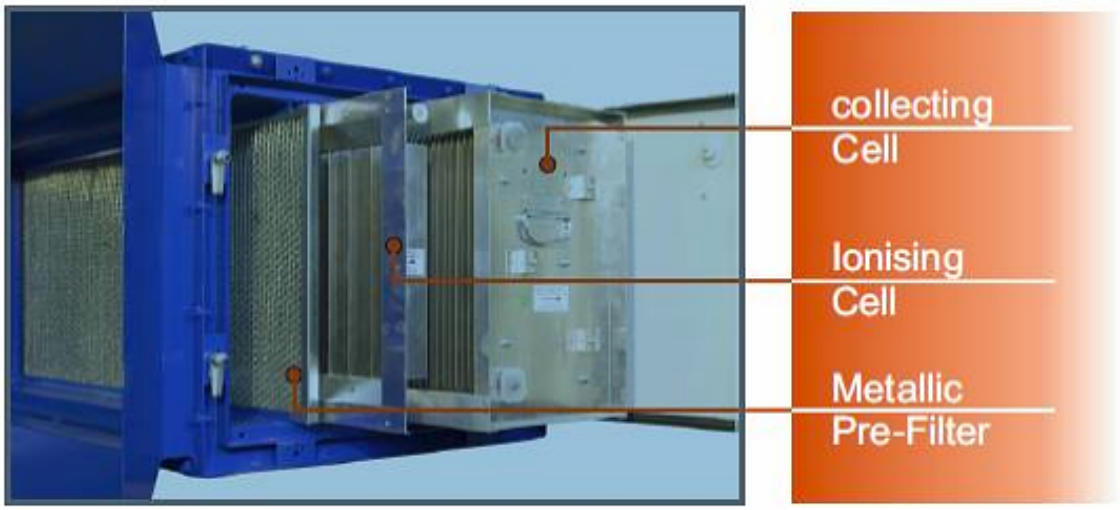
#3 TECHNOLOGY & TYPES OF MIST COLLECTORS

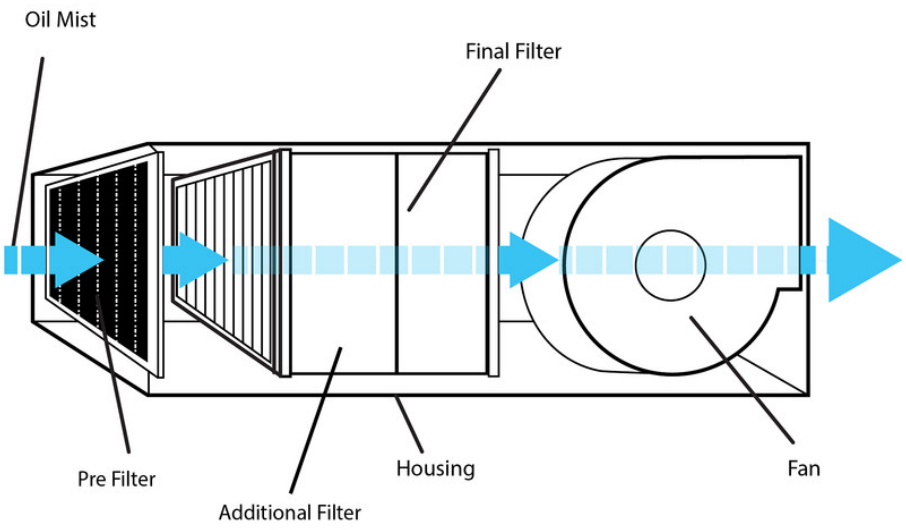
ELECTROSTATIC TYPE



The electrostatic mist collector uses a blower to draw mist past an ionizer which electrically charges the mist particles. The mist particles then pass through collection plates where mist particles are removed from the air stream.

The system is efficient as long as the collection plates are clean. The efficiency notably drops off as the collection plates become covered with particles. In order to maintain maximum efficiency, the electrostatic type mist collector requires frequent maintenance The advantage this system offers is that no replacement filters are required.

MEDIA TYPE FILTRATION



This type of mist collector uses a blower to pass the contaminated air through a series of filters that capture the mist that eventually coalesces and drips to the bottom of the unit.

The problem with this technology is that the filters easily become clogged requiring frequent filter replacement.

#4 INSTALLATION

The number of machines that need mist collection and their layout are big factors in considering which mist collector best suits your shop.

Single unit mist collectors are the most flexible and easy to install, so they are typically preferred.

They do not require any valuable floor space (actually very little floor space if they are mounted on a floor stand). The single unit mist collector can be installed in a variety of ways:

- Next to the machine using a floor stand
- On a wall mounting bracket if the machine is near a wall
- Hung from the ceiling, as long as there is no interference with a crane
- Mounted directly on the machine (this is the most preferred installation)

If there are many machines to be considered and floor space is not an issue, cellular or central systems can be cost effective.

Cellular systems require a relatively small footprint local to the group of machines being covered by the unit.

Central systems need a considerable amount of floor space and both systems require rigid ducting.

Something else to keep in mind when installing a mist collector is the pick-up point. Ideally you only want to pick-up mist and stay away from coolant and chips.

Deflectors can be used to reduce coolant and chip suction.

#5 POST FILTER

Post Filters are needed in applications where a very fine mist is produced or where heavy smoke is present (when using very high coolant pressure, very high machine spindle RPM, etc.).

Most mist collector suppliers will use expensive HEPA filters that are not washable.

This image shows a Coral Model Noil mist collector with a washable polyester post filter.

#6 MAINTENANCE

Mist collectors do need to be maintained and the amount of maintenance required differs between the various types. Machine downtime can be attributed to mist collectors requiring frequent maintenance

CENTRIFUGAL TYPE

Because of the inherent out of balance problem, these types of units generally require frequent maintenance.

AMBIENT SYSTEM

These units are elevated so a maintenance routine is required to keep this system effective. Using an Ambient system as a secondary system rather than primary will help reduce maintenance intervals due to the reduced mist processing.

ELECTROSTATIC TYPE

Electrostatic mist collectors reduce effectiveness over time as the collection plates become covered with oil and dirt, ultimately becoming ineffective in removing the mist. The collection cell needs to be removed and washed regularly.

MEDIA FILTRATION TYPE

This system totally relies on filters which need to be washed and/or replaced on a regular basis.

#7 COST / PRICING

We've found that in the mist collector industry, the highest cost doesn't always lead to the best system. We hope the tips in this guide will help you select the most effective system for your application. There are 3 main costs to consider when purchasing a mist collection system:

INITIAL EQUIPMENT COSTS

Include installation, mounting and ducting in your initial equipment estimates.

MAINTENANCE COSTS

Filters: Consider frequency of filter washing and replacement.

RE-DUCTING COSTS

Your system will require re-ducting if machine configurations change. This may be a key factor in choosing between a single source capture, cellular or central system. Our experienced team at ITA would be happy to help you evaluate the best solution for your application.

#8 WARRANTY

Most mist collectors come with a warranty, however it's important to know what it covers. Some manufacturers claim a 5 year warranty, but exclude the motor and controls.

When you evaluate the system ask if the warranty includes the motor and all electrics (motor starter and protector). Ensure your warranty doesn't exclude the motor and electrics after the first year.

#9 TRIAL PERIOD

Some manufacturers offer a trial period so that you can test the unit on your specific application to be sure it works before committing to the purchase.

Manufacturers that are confident their product will work for you should be happy to provide a 30 day trial of their unit.

Please note, trial periods only apply to single source mist collectors.

OUR RECOMMENDATION FOR A SINGLE SOURCE CAPTURE MIST COLLECTOR: THE NOIL BY CORAL

The Coral Noil Mist Collector is a hybrid. It does not have a rotating filter drum, therefore it will not go out of balance and will not create vibrations; it is also very quiet.

The mist is collected on the blades of the dynamically balanced impeller and slung to the internal body of the unit where it liquefies and is returned to the machine.

The air then continues to two high efficiently, long lasting cartridge filters (most Noil customers report 2 plus years before needing washing or replacement).

The final filter is washable and it is rated 99.9% @ 2 micron particle size.

Not only does the Coral Noil capture the mist, it converts it back to a liquid and sends it back to the machine.

It also filters the air clean so that it can return to the shop and air conditioned or heated air is not wasted and HVAC filters last much longer.

For Post Filters, the Noil offers two options; in most cases the polyester filter (which is washable) with a high efficiency rating of 99.9% at 0.3 micron will trap ultra-fine particles ensuring only clean air is returned to the work area.

For those rare occasions where heavy smoke is present, a HEPA Post Filter can easily be added to the Noil.

CONTACT US

With over 24 years' experience in the machine tool industry, we have seen many installations and have attempted to give you a balanced overview of the different systems.

We would be happy to discuss your specific application with you in order to help determine the best solutions for your metal working shop.

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