

OILMIST



Filter systems for effective
removal of oil mist



DO YOU CONTROL OIL MIST?

We do. Oil mist or oil smoke arise when metalworking fluids are used to cool metal workpieces and/or lubricate parts and tools during the operation process. Oil mist must be captured to protect your staff's health, create a safe work environment and extend the lifespan of your machinery and tools. Plymovent offers system solutions to control oil mist in any work environment.

Plymovent has been specialising in capturing, filtration and removal of oil mist for over 25 years. We have knowledge, experience and state-of-the-art technology offering from plug & play products up to turnkey installations. As indoor air quality is becoming increasingly important, it is necessary to stay within the legal limits. As a company, you are obliged to meet national or local health and safety standards. Therefore, Plymovent supplies high-quality filtration systems to reduce the background concentration of oil mist ensuring clean air at work.

MISTELIMINATOR

Plymovent offers a modular filter range to reduce the background concentration of oil mist efficiently, according to your needs. We offer single filter units and extensive filter banks depending on the required capacity. Whether you are using a closed, half open or open (CNC) machine, we offer the right solution!

WHAT IS OIL MIST?

Oil mist arises when fast moving tools, hot surfaces and metalworking fluid (MWF) collide. MWF is used as a coolant and/or lubricant; it is a generic term for fluid used in metalworking processes.

MWFs reduce the heat and friction between the cutting tool and the workpiece. It helps to prevent burning and smoking, especially in high-speed rotation movement. MWFs also improve

the quality of the workpiece by continuously removing the fines, chips and turnings from the tool being used and the surface of the workpiece.

Please note that it is important to synchronise the metalworking process with the correct type and amount of MWF, to avoid generation of unnecessary oil mist at high temperatures.

- **MWF as a cooling fluid** is used to cool down a metal workpiece, the machinery or tool itself. Cooling fluid is an emulsion of mainly water and a smaller amount of lubricant, soluble oil or a synthetic lubricant. Graphite, anti-fog, anti-smog products or biocides and rust inhibitors are often used in combination with cooling fluids. Cooling fluid (depending on the production process) causes fumes, smoke, fog, vapor, gases, drops or aerosols*.

All these forms are oil mist, but they all require a different approach filtration wise. Plymovent can offer a tailored solution to best fit your needs.

- **MWF as a lubricant** is used to guarantee a smooth working process by reducing the friction between metal and tool. Lubricants are emulsions of water with a higher oil content than coolants or, which is often the case, straight mineral or biological oil without any water. A disadvantage is that lubricant can cause a slippery work environment. Therefore, high-quality filtration equipment is needed, to ensure a safe work environment.

* this list is not intended to be all-embracing.



OVERALL ADVANTAGES

- Comply with health and safety standards.
- Minimise health risks in the workplace:
 - limit exposure to hazardous fluids and oil mist.
- Safe work environment:
 - no slipping;
 - reduce the risk of fire.
- Improved productivity:
 - increased work moral due to clean air in the work environment;
 - shorter operator intervention time, due to clean atmosphere in CNC machine.
- Reduced maintenance/operational costs:
 - longer lifespan of machinery and tools;
 - protection of sensitive high-tech equipment;
 - clear sight within closed CNC machines.
- Energy saving; in case of recirculation.

RISKS OF OIL MIST

Oil mist causes a serious health and safety risk in working facilities.

Oil mist can:

- irreversibly damage the health of your employees;
- cause irritations to eyes, skin, throat and lungs;
- cause dangerous situations in the workplace (slippery floors);
- seriously damage machinery e.g. rust/corrosion; malfunctioning of control equipment and climate systems;
- cause high maintenance costs (stickiness);
- cause hygiene problems due to bacterial and mould growth;
- cause a fire (lack of maintenance).

MACHINES AND OPERATIONS THAT CAUSE OIL MIST

Metalworking processes that shape, form, heat treat or clean metal components can cause oil mist. These processes take place in lathes or dedicated (CNC) machine centres that can be closed, half open or entirely open. Effective capturing, filtration and removal of oil mist is subject to correct sizing, machinery and tools.

The main operations* that cause oil mist are:

- **Machine tool processes** for shaping, such as cutting, drilling, honing and boring.
- **Surface treatment** using an abrasive, such as wet grinding and polishing.
- **Forming processes** to shape metal and sheet metal components e.g. cold heading, deep drawing and stamping.
- **Heat treatment** e.g. material hardening.
- **Part washers** that clean metal components with oil, water and pressure.
- **EDM Electrical Discharge Machine** to shape metal by means of electrical discharge processes.

* this list is not intended to be all-embracing.



THE MODULAR MISTELIMINATOR PROGRAMME

The MistEliminator is modular and can be tailored to your needs in capacity, media and efficiency. It all depends on the choice of initial investment vs. operational costs. Whether you produce small or large amounts of oil mist or oil smoke, whether you work a few hours per day or continuously, whether you need to recirculate or channel to the outside. The MistEliminator from Plymovent suits any work environment!

SINGLE AND DUAL BASE FILTER BANKS

Both MistEliminator filter units, ME-31/32 and ME-41/42, are also available as single and dual base filter banks for larger capacities, up to 5 tiling units. The characteristics are exactly the same as the ordinary filter units. Depending on the type of oil mist, you can either choose the ME-3 or ME-4 series.



ME-31 AND ME-32

Economical choice for light applications or applications with a sticky oil residue

The ME-31 and ME-32 stationary units are developed for the filtration process of applications that release oil mist during metalworking processes. Both units are suitable for light applications using coolant or lubricant. For example MQL (Minimum Quantity Lubrication) applications.

Choosing the right MistEliminator all depends on your applications. If you come across lighter applications with sticky, high viscosity oil mist or collect polluted oil with solid particles, the ME-3 series is recommended.

The oil residue is not to be recycled (straight away), the residue still contains metal particles. In this case the self-draining cassettes are not an economical solution, therefore we recommend the ME-3 series.

The ME-31 and ME-32 are also suitable for applications where minor oil mist arises, such as MQL and low-speed metalworking processes, for example, grinding, drilling, sawing and hardening.



FILTRATION PROCESS ME-31/32

The ME-31 is based on a 4-step filtration method, where the filtered air is channelled outside. The ME-32 is based on a 5-step filtration method, for recirculation of the filtered air. The remaining oil drops down into the oil container beneath the unit.

ENERGY SAVING

In case of recirculation, use of the ME-32 is recommended, which is fitted with an additional HEPA filter. Recirculation ensures that expensively heated or cooled air stays within the workplace. Not only does this save energy, it also reduces your heating and ventilation costs.

5-STEP FILTRATION PROCESS

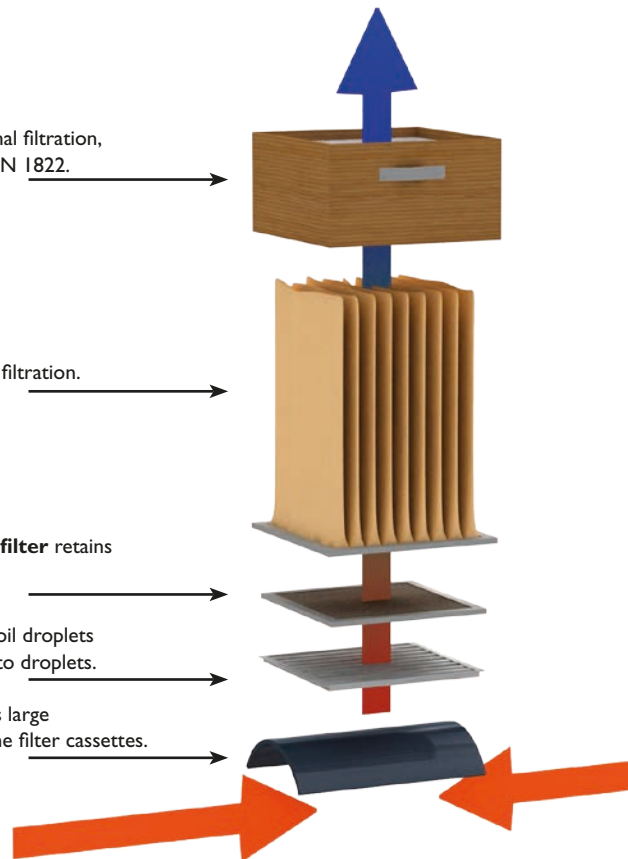
5. **HEPA filter*** ensures final filtration, H13 class according to EN 1822.

4. **Bag filter** ensures main filtration.

3. **Aluminium mesh pre filter** retains larger particles.

2. **HydroFilter** separates oil droplets and coalesces oil mist into droplets.

1. **Pre separator** prevents large particles from entering the filter cassettes.



*only applies to the ME-32.

The remaining oil drops down into the oil container beneath the unit.

ME-41 AND ME-42

Choice for heavy applications with a clean oil residue

The ME-41 and ME-42 stationary units are developed for the filtration process of applications that release oil mist during metalworking processes. Both units are suitable for heavy applications using coolant or lubricant.

Choosing the right MistEliminator all depends on your applications. If a substantial amount of low viscosity oil mist is being released during the operation processes, the ME-4 series is recommended.

The majority of high-speed CNC machine tool processes fall into this category. The filters are self-draining and with well-tuned CNC machines will make the ME-41 and ME-42 a self-cleaning, low maintenance and low costs operation.

INTEGRATED FAN

Apart from the stand-alone stationary units, Plymovent also offers all-in solutions. The ME-42/F1 and ME-42/F2 contain an integrated extraction fan on top of the standard filter unit. The main advantage of a built-in fan, is there is no need for ducting.

Both units are based on the 6-step filtration method of the ME-42, which allows for recirculation of the filtered air. Depending on the air volume, you can either choose a F1 (low capacity) or F2 (high capacity). The fan is fitted in a sound adsorbing box, ensuring low noise level.



FILTRATION PROCESS ME-41/42

The ME-41 is based on a 5-step filtration method, where the filtered air is channelled outside. The ME-42 is based on a 6-step filtration method, for recirculation of the filtered air.

ENERGY SAVING

In case of recirculation, use of the ME-42 is recommended, which is fitted with an additional HEPA filter. Recirculation ensures that expensively heated or cooled air stays within the workplace. Not only does this save energy, it also reduces your heating and ventilation costs.

6-STEP FILTRATION PROCESS

6. **HEPA filter*** ensures final filtration, H13 class according to EN 1822.

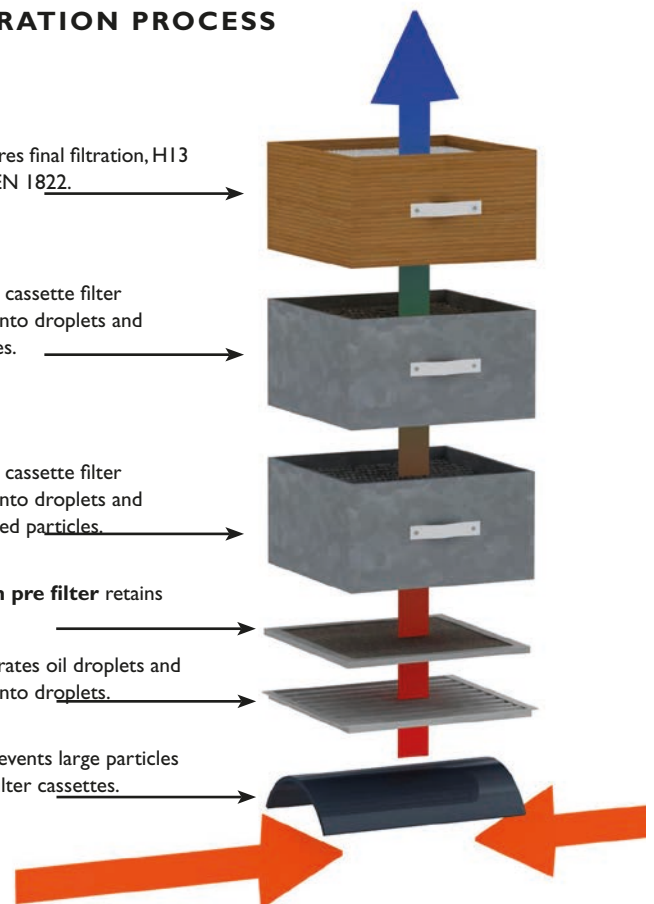
5. **OC-2** self-draining cassette filter coalesces oil mist into droplets and retains fine particles.

4. **OC-1** self-draining cassette filter coalesces oil mist into droplets and retains medium sized particles.

3. **Aluminium mesh pre filter** retains larger particles.

2. **HydroFilter** separates oil droplets and coalesces oil mist into droplets.

1. **Pre separator** prevents large particles from entering the filter cassettes.



*only applies to the ME-42.

The remaining oil drops down into the oil container beneath the unit.

MISTWIZARD™ THE PERFECT SOLUTION FOR SINGLE OR MULTIPLE MACHINE TOOL APPLICATIONS

Plymovent MistWizard™ is a highly effective mechanical filter for filtration of oil mist. It is designed to handle oil mist from both emulsions and straight metalworking fluids (MWF). The collected MWF can be re-used or disposed.

Plymovent MistWizard™ is ideal for single CNC machine tool enclosures where the internal volume is between 2 m³/70 ft³ and 4 m³/140 ft³. MistWizard™ is a self-contained metalworking fluid recovery system, which allows you the ability to direct mount the MistWizard™ to your machine tool and remote mount a central exhaust fan to create a system installation.

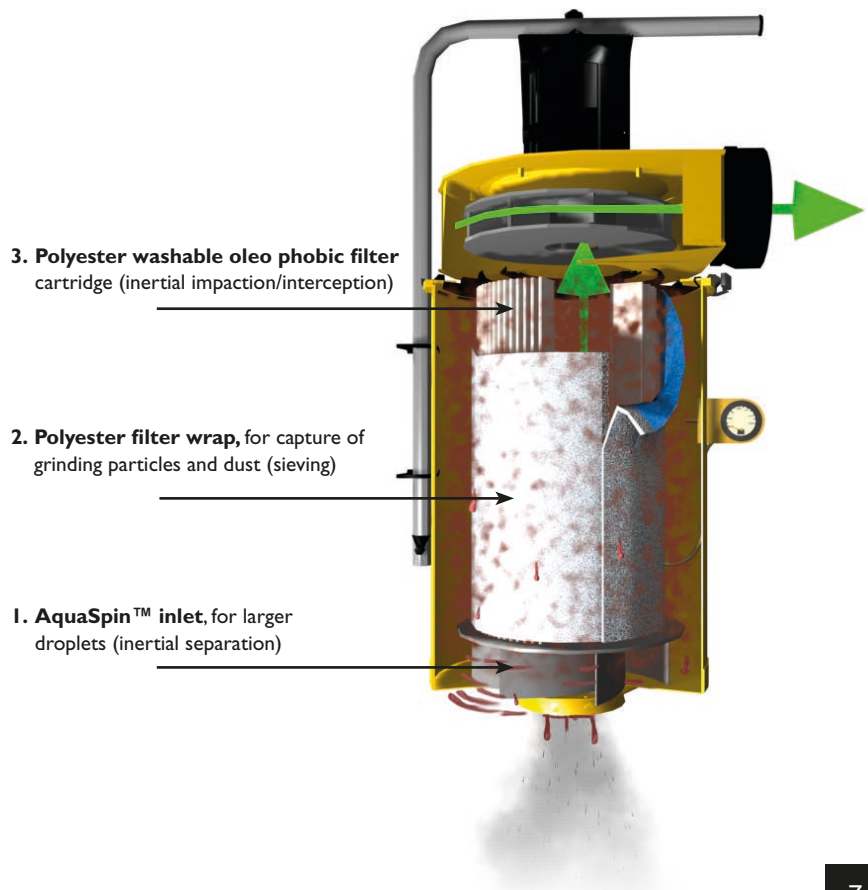
The advantage of a central system installation is that you can operate up to 12 MW-2 units just using one fan. This, in combination with the use of an energy saving variable frequency drive, will cut your energy consumption of the system by 25-50%.

BENEFITS

- Affordable compact design
- Low installation costs:
 - Easy versatile mounting of unit
 - Integrated part of machine tool, little ductwork
- Low maintenance costs:
 - Predictable maintenance with Δ pressure gauge
 - Quick and easy filter change
 - Fairly priced replacement filters



3-STEP FILTRATION PROCESS



PLYMOVENT COMPLETES THE PACKAGE

Besides the MistWizard and MistEliminator filter units and filter banks, Plymovent also offers other filtration methods to capture oil mist. The range consists of mechanical filter units, electrostatic filter units and adsorption systems, like the OilShield (limestone feeder).

Depending on your facility's specific needs, Plymovent can offer the right solution. Using half open CNC machines often requires extraction products. We offer various extraction arms to capture the oil mist at source very effectively. This way, oil mist does not get the chance to accumulate in your workplace. Extraction hoods are another option to capture oil mist, for example above an open CNC machine. Fans complete the package and are available in various sizes/capacities, depending on the local conditions.



PLYMOVENT OFFERS TOTAL SOLUTIONS FOR AIR CLEANING

Plymovent offers complete solutions for air cleaning. We have more than 40 years of experience in the extraction and filtration of welding fumes, grinding dust and oil mist in the metalworking industry. We are also specialists in the extraction of vehicle exhaust fumes and the removal of other impurities from indoor air.

FROM SCRATCH TO THE RIGHT SOLUTION

Plymovent is not just a manufacturer. We offer professional advice and engineering services to provide a solution tailored to your specific needs or requirements. In addition we offer service and maintenance services to keep your system functioning optimally. For more information please contact your authorised Plymovent distributor or visit our website.

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Your authorised Plymovent distributor:

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We offer products, systems and services which
ensure clean air at work, anywhere in the world.*

*We respect the environment and we deliver
high-quality products. Our expertise gained over
many years and our genuine commitment to
customer requirements enable us to provide
precisely the solutions you need.*