

Do you remove fumes from robotic welding and laser cutting?

HEALTH AND SAFETY IN THE AUTOMOTIVE INDUSTRY



DO YOU OFFER A SAFE AND HEALTHY WORKING ENVIRONMENT?

We do. To ensure a pleasant workplace for your personnel and to be code compliant in the automotive industry you need to control welding, cutting, grinding fumes, (oil) mist and smoke.

Metal fabrication plays a significant part in the manufacturing processes of the automotive industry. To produce automotive parts and components more effectively, automation -such as by welding with robots- is used on a large scale.

For more than 35 years, Plymovent has specialised in the extraction and filtration of pollution in the metalworking industry. We offer solutions that keep workplace exposure to welding and laser cutting fumes within legal limits, in accordance with international guidelines.

THE AUTOMOTIVE INDUSTRY AND TODAY'S GREATER DEMANDS

The automotive industry is one of the largest and most important economic sectors worldwide.

Today's demands in the automotive industry are much greater than ever before. For example, vehicles are graded on stricter and more precise parameters, from weight to safety to durability. In addition automotive manufacturers and suppliers have to respond to greater demands within their production facilities, to provide a safer, healthier and more environmentally-friendly workplace.

Regulations are not the only reason for automotive manufacturers and

suppliers to take steps to improve the production environment's health and safety.

Other reasons are:

- Improved productivity levels.
- Protection of sensitive production equipment and controls.
- Reduced facility energy costs and carbon footprint.
- Reduced overall operational costs.
- Attracting and retaining highly skilled workers.
- Reducing employee turnover costs.

Plymovent offers system solutions to create clean air at work.

RISK OF FIRE IN THE AUTOMOTIVE INDUSTRY

The automotive industry is well-known for its oily applications. Processes with oil and/or liquids with a low flash point¹ form a higher risk -of welding fume extraction and filtration systems catching fire- than ordinary dry welding activities in the metalworking industry. Robotic welding of pressed, stamped or oily parts for example, can generate fumes containing oil with a low flash point. These fumes can easily be ignited by sparks or could spontaneously combust by sweltering² in the dustbin. Filter units can catch fire not only at the time of installation, but also years later.

This potential risk of fire applies to many processes of metal fabrication, including laser cutting, manual and robotic welding of oily components and parts. Unfortunately, fires in extraction and filtration systems are a frequent and common occurrence in the automotive industry, bringing significant unforeseen production downtime and costs.

Plymovent can reduce the risk and potential costs of fire to a minimum.

- ¹ The flash point is the lowest temperature at which a liquid/oil produces enough vapours to constitute an ignitable mixture.
- ² Sweltering is a chemical conversion that generates heat and can cause spontaneous combustion and fire.

FIRE RISK UNDER CONTROL

Plymovent has worked closely together with Tier One and Tier Two automotive suppliers in developing and testing various solutions to minimise the risk of fire in filtration systems. *SHIELD fire safety solutions* are the result of this collaboration!

SHIELD fire safety solutions*:

- Reduce the risk of fire to a minimum.
- Decrease filter replacement costs, by increasing filter life.
- Minimise the risk of production downtime.
- Increase the performance and lifespan of overall extraction and filtration system.

* Patent pending, see page 6.





ROBOTIC WELDING

Robotic welding really took off in the nineteen eighties. The automotive industry first began to use robots extensively for spot welding. Since then, robotic welding has grown rapidly and has become widespread throughout the automotive industry.

Robotic welding processes and laser welding in cells generate a significant amount of fumes. Therefore Plymovent has developed various solutions to capture and remove these fumes. Each system solution has its own unique characteristics and benefits.

An extraction hood can capture and remove welding fumes effectively, isolating a robotic welding area. A general filtration system such as the Push-Pull system can on the other hand cover large workshops to control welding fumes, ensuring that the legal workplace limits for welding fumes are not exceeded.

FLEXHOOD (SMALL TO MEDIUM-SIZED EXTRACTION SYSTEM)

FlexHood -the extraction hood of Plymovent- removes welding fumes, mists and aerosols from welding robots and laser welding machines. Combined with filters, fans and energy saving controls, FlexHood is an extremely effective system solution. It is modular and can be tailored to any need. You can choose its required width and length (to cover a cell), use the integral hoisting eyes to hang the hood from the ceiling or use the optional aluminium legs to support it. For safety reasons and optimum extraction we highly recommend welding strips. Welding strips are ideal to isolate a working area, cover a welding area or create a confined space. Depending on the welding process, you can choose for transparent, semi-transparent or non-transparent welding strips to protect welders and personnel working nearby from the welding light and weld flash. The FlexHood can be installed to any central filter unit of Plymovent, meeting the exact capacity requirements that you need.

PUSH-PULL SYSTEM (GENERAL FILTRATION SYSTEM)

When you need to cover a larger area, Plymovent recommends the Push-Pull system. The Push-Pull system is a general extraction and filtration system, ideal for automotive plants with multiple robotic installations and crane transportation. The main aspect of the Push-Pull system is that it can be installed in all kinds of settings, for example in a U-shape or parallel. With its push and pull grids, central filter unit, fan, controls and overall system design, the Push-Pull system removes the haze or 'blanket' of fumes in your production facility by continuously pushing and pulling (extracting) the fumes. The Push-Pull system removes this layer in a controlled way at a particular height (usually between 4-6 metres). The air is then filtered and usually recirculated.

The FlexHood and Push-Pull system of Plymovent primarily capture and remove welding fumes, ensuring a safe and healthy working environment.

TAILORED TO YOUR NEEDS

To determine the most effective system solution for your production facility, you need to consider all aspects; the manufacturing processes, operator's procedures, existing ventilation, air movements, overall volume and the general construction of your workshop.

Both the FlexHood system and the Push-Pull system are engineered solutions and have to be tailored to the needs and requirements of your automotive plant. Plymovent gives advice and offers system design services, as every manufacturing facility is different.

SAVING ENERGY

Extraction systems in combination with the appropriate filter unit, fan and control equipment are not only extremely effective, they are also an energy saving solution as the filtered clean air is recirculated back into the workplace. Programming the right settings can control and optimise the airflow, reducing operational and energy costs.

FILTRATION TECHNOLOGY

Worldwide, Plymovent is well-known for its filtration technology. We have been specialists in filtration for more than 35 years. Industrial pollution and welding fumes in particular have always been special areas of attention. As experts we know about the work, the discomforts and risks welders face on a daily basis. As a result of this we have developed solutions in accordance with international guidelines. Innovative technology, practical knowledge and years of experience have resulted in a wide range of highquality system solutions.



accidents, like supping. So, the working environment is much safer than before. In addition, the air quality is much better. Less fumes, mist and smoke make it a healthier place for our employees. Our personnel noticed the difference immediately. Plymovent thought of everything. We are now code-compliant, we offer a safe and healthy working environment, the integrated spark arrester (deflector plate) reduces the risk of fire and on top of that we are saving energy and operational costs!"



FIRE RISK UNDER CONTROL WITH SHIELD FIRE SAFETY SOLUTIONS*

Plymovent takes the risks of fire in filtration systems very seriously, especially for high-risk welding applications, like welding oily parts. Therefore we developed SHIELD fire safety solutions^{*}. The SHIELD programme contains several components which can be combined to create a system solution. Each product has its own unique features and benefits. The components have been tested and certified by several internationally recognised institutes.

SHIELD fire safety solutions^{*} reduce the risk of fire to a minimum, and in the event of fire, ensure that any consequential damage is minor.

* Patent pending.



I. Prevention (spark arrester)

Plymovent understands the causes of fire during metal fabrication better than anyone. The SHIELD programme combined with our know-how and experience in the field makes it possible to control the risk of fire.We offer tailormade solutions that keep fire risks under control in any automotive plant!

I. PREVENTION

The first step is to prevent fire. An effective spark arrester prevents sparks, spatters and cigarette butts from entering the ductwork and reaching the filter cartridge and debris in the dustbin. Additionally, we offer a limestone feeder which feeds limestone into the ductwork where it mixes with oils/oily fumes,



2. Detection (smoke detector)

decreasing the combustibility of oil and preventing spontaneous combustion.

2. DETECTION

In the unlikely event of a fire it is important to detect the first signs such as heat, sparks or smoke immediately. A control panel responds adequately and activates the suppression measures.

3. SUPPRESSION

When the alarm is triggered, Shield-Control stops the fan and isolates the filter with sliding valves, thus cutting off the airflow. Within seconds the fire is under control. FlameShield makes sure that any damage is minor.



3. Suppression (fire extinguisher)

OIL MIST FROM MACHINING

In addition to welding and cutting processes, Plymovent also offers solutions for machining and tooling processes for shaping, forming, drilling and pressing. Effective capture, filtration and removal of oil mist is important to ensure a safe and healthy working environment and to extend the lifespan of your machinery and tools.

METALWORKING FLUID (MWF)

Many suppliers and subcontractors in the automotive industry manufacture parts and components (e.g. motor, chassis, body, frame, drive train, suspension or seats), using metalworking fluid (MWF). MWF can be used to cool down a metal workpiece, the machinery and/or tool itself. MWF can also be used as a lubricant to guarantee a smooth working process by reducing the friction between metal and tool. MWF can cause oil mist, fumes, smoke, fog, steam, gas, droplets or aerosols, depending on the production process.

MISTELIMINATOR

Plymovent offers a modular filter range to reduce the background concentration of oil mist efficiently, whether you use a closed, half open or open CNC machine. We offer single filter units and extensive filter banks depending on the required capacity. The MistEliminator has been developed especially to capture and remove oily mist, fumes and any other possible contaminants generated by machining and tooling processes within your automotive plant.

OVERALL ADVANTAGES

- Compliance with health and safety standards.
- Reduction to a minimum of the health risks of your employees:
 - limitation of exposure to welding fumes, smoke and oil mist.
- A safe working environment:
 - reduces the potential risk of fire.
 - maintains a non-slip floor.
- Improved productivity:
 - better working morale, thanks to clean air at work.
 - shorter operator intervention time, due to the clean atmosphere in CNC machine.
 - less downtime.
- Reduced maintenance/operational costs:
 - longer lifespan of machinery and tools.
 - protection of sensitive high-tech equipment and controls.
- Energy saving:
 - where air is recirculated.
 - using control equipment.





Image: MistEliminator filter bank ME-31/5.



PLYM SVENT®

clean air at work

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PLYMOVENT OFFERS TOTAL SOLUTIONS FOR AIR CLEANING

Plymovent has extensive knowledge of the extraction and filtration of welding and cutting fumes in the automotive industry. In addition we are also specialists in the extraction and filtration of grinding dust and oil mist in the metalworking industry and the removal of vehicle exhaust fumes in production plants, repair garages and service stations to ensure clean air at work.

THE ALL-IN-ONE PACKAGE

Plymovent is more than a manufacturer. We offer professional advice, design and engineering services to provide a solution tailored to your specific needs and requirements. In addition, Plymovent offers preventative maintenance services to keep your system functioning optimally and to your full satisfaction.

For more information, please contact us directly or visit our website.

Your authorised Plymovent distributor:

Plymovent cares about the air you breathe. 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.