WELDING FUME
EXTRACTION SYSTEMS AND BREATHING APPARATUS

BETTER WELDING RESULTS
IMPROVED COMFORT
HIGHLY EFFECTIVE PROTECTION
Joining and separating processes such as welding, brazing, and cutting all release gases and harmful substances into the air. If inhaled by the welder, these can have long-lasting health implications.

To meet occupational health standards and, most importantly, protect welders’ health, it is essential to maintain clean air conditions at work stations. Fronius’ products help meet legal requirements and standards, and provide the best possible protection for workers.
BETTER WELDING RESULTS
THANKS TO EFFECTIVE PROTECTIVE EQUIPMENT

The legislation governing the extraction of welding fumes and proper ventilation in production facilities varies widely and differs from country to country.

Employers must evaluate the risk in each case based on the welding process, site conditions, general working conditions, and the risk classification for the welding fume. All data must be documented in detail and, most importantly, appropriate measures must be put in place to protect workers.

Extraction systems and breathing apparatus are essential for protecting the long-term health of staff. A welder who is continuously exposed to polluted air will soon display signs of exhaustion. Conversely, welders working in clean-air environments are healthier and therefore more productive.

IMPROVED PERFORMANCE
THANKS TO BETTER WORKING CONDITIONS

The working environment has a significant impact on productivity.

Visibility levels, ambient temperature, how the equipment handles, and also the concentration of welding fume all have a direct impact on work quality. It is sometimes unavoidable that welders have to work in tight spaces or difficult conditions. However, the impact of welding fumes can be mitigated against.
RISK CLASSIFICATION
THE DIFFERENT WELDING PROCESSES
(TRGS 528 [German Technical Regulations for Hazardous Substances] 2009)

<table>
<thead>
<tr>
<th>WELDING PROCESS</th>
<th>Emissions rate (mg/s)</th>
<th>Damaging substances for respiratory tract and lungs</th>
<th>Toxic or irritative substances</th>
<th>Carcinogenic substances</th>
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<tr>
<td>Submerged-arc welding</td>
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<td>Gas welding (autogenous process)</td>
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<td>TIG welding</td>
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<td>Laser welding without filler metal</td>
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<td>MIG/MAG (low energy gas shielded arc welding)</td>
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<td>Manual arc welding, MIG (general)</td>
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<td>MAG (solid wire), flux-cored wire welding with shielding gas, laser welding with filler metal</td>
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<tr>
<td>MAG (flux core wire), flux-cored wire welding without shielding gas</td>
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<td>Brazing</td>
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<td>Flame cutting</td>
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<tr>
<td>Arc spraying</td>
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= Low  = Medium  = High  = Very high

Table 1: Welding processes assessed by emissions rate, taking into account material-specific factors and effects – Categorization by risk classification.

WELDING FUME EMISSIONS
Whether welding fume is emitted and how hazardous the fumes are depends on a combination of factors: welding process, parent material, and filler metals (welding wire and shielding gas). The majority of welding fume particles are generated by the filler metals.

It therefore makes sense to opt for processes that create low levels of welding spatter, since these use less filler material. Grinding work to remove spatter is also likely to release additional fine particles into the air.
4 STEPS TO IMPROVE WORKING CONDITIONS

INDIVIDUAL BREATHING APPARATUS

...fitted with a fan filter unit. This equipment protects welders’ health and also increases their sense of wellbeing and productivity. Modern particulate filter systems are so effective they can remove almost 100% of harmful particles.

EXTRACTION AT SOURCE

...of welding fume. Extraction works best directly on the arc; however care must be taken to ensure the gas shroud is not affected.

EXTRACTION HOODS AND TABLES

...are a good way to remove welding fumes at a particular work station. Both permanent extractors fixed to the workstation and mobile extraction devices provide a complete filter system.

VENTILATION

...keeps the ambient air in the whole production facility clean. Ventilation is particularly important in areas where fumes accumulate because extraction at source is not sufficient.
FRESH AIR COMBATS WELDING FUMES

In addition to glare protection, protection against welding fumes is a must for welders.

Employers must now meet more rigorous occupational health and safety standards when it comes to welding fumes. Air filter systems protect welders’ health. They also increase comfort during the welding process, particularly at high ambient temperatures.

HIGHEST SAFETY CLASS
Filters up to 99.8% of welding fume particles out of the ambient air.
THE FUNCTIONAL PRINCIPLE

The breathing apparatus consists of a fan filter unit, interconnecting hose, and harness. The fan filter unit attached to the harness filters up to 99.8% of welding fume particles out of the ambient air via a TH3 particle filter (highest possible classification) and directs the clean air directly into the welding helmet via the interconnecting hose. The user benefits from an almost 100 percent improvement in terms of exposure to welding fume particles.

ERGONOMICS+

The 4-point shoulder harness for the breathing apparatus ensures improved ergonomics when working. This relieves the strain on the welder and distributes the weight more evenly over the upper body.
EXTRACTION AT SOURCE

FUME EXTRACTION TORCH

Extracting the welding fumes right where they are generated means they are neutralized before they can spread. This protects not just the welder, but also those around them.

SAVE ENERGIE AND COSTS
K4 FUME EXTRACTION TORCH

/ Welding torch and extraction system in one
/ Compact welding torch with integrated extraction via the handle and hosepack
/ Improved user movement thanks to compact design
/ K4 fume extraction torch available with auxiliary airflow control, UpDown function and JobMaster function
/ Adjustable extraction nozzle

FumeEx EXTRACTION KIT

/ Upgrade set
/ Suitable for all TPS/i Standard, Multilock, PullMig and PullMig CMT with 45° torch body angle
/ Extraction hose rotates 360° for improved access to the workpiece
/ Adjustable extraction nozzle – the closer the nozzle is to the arc, the better the fume extraction
/ Gas shroud protected thanks to specially-designed shape of the extraction nozzle
FumeExJet is the perfect addition to Fronius’ fume extraction torch solutions. When combined with the FumeEx or K4, this high pressure welding fume extraction device is a powerful system for at-source welding fume extraction.

**VERSIONS**

**STANDARD**
Filter cartridge (x2 on XL model), dust collection drawer, mains cable, continuous volumetric flow control, maintenance-free generator, filter contamination indicator.

**AUTO**
Automatic compressed air filter cleaning system, control unit (Air Control) with plain text display, constant volumetric flow control, interface to external control system or sensor cable for automatic Start/Stop system.

**WELDING FUME EXTRACTION**
In combination with FumeEx extraction kit or K4 fume extraction torch

**EASY TO CLEAN**
Depending on the version, filter cartridges can be cleaned automatically or by hand and reused multiple times

**FILTER CARTRIDGES**
Removes 99% of fine dust particles extracted

**QUIET OPERATION**
Quiet extraction thanks to soundproof vacuum generator
EXTRACTION HOODS

Used in combination with a fume extraction torch, extraction hoods and tables prevent any additional welding fumes from spreading around the room. The extraction arm is positioned close to the arc in a compact configuration that provides a very efficient way of preventing welding fumes from spreading.

SUPERCLEAN

Welding fume extraction system with spin-on filter: The robust housing is made from power-coated steel plate and improved soundproofing keeps operating noise levels low. Moreover, the aerodynamic design of the inflow nozzle helps further reduce noise emissions, while also boosting the performance of the ventilator. Maximum extraction capacity on arm achieved with 750 W.

STANDARD FEATURES

/ Pre-filter pads
/ Particulate spin-on filter
/ 5 m connection cable
/ Operating display
/ Filter monitoring with acoustic warning
/ Operating hours indicator
/ Maintenance flap on front
/ Front swivel casters with locking brakes

PROFIJET

Welding fume extraction system with filter cartridges: The ProfiJet offers the same functions as the SuperClean; however this machine uses filter cartridges rather than spin-on filters. Depending on the version, the two integrated filter cartridges can be cleaned manually or automatically multiple times, which helps keep upkeep and maintenance costs low.

STANDARD FEATURES

/ Two filter cartridges made from polyester needle felt
/ Dust collection drawer
/ 5 m connection cable
/ Operating display
/ Filter monitoring with acoustic warning
/ Operating hours indicator
/ Maintenance flap on front and rear
/ Front swivel casters with locking brakes
THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 4,760 employees worldwide and 1,253 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com