

Lasting Connections

FAQ
BÖHLER AIR
PAPR-SYSTEM



BÖHLER AIR - PAPR SYSTEM

FREQUENTLY ASKED QUESTIONS

GENERAL QUESTIONS

1. What does PAPR mean and of which components does it consist?

PAPR means 'Powered Air Purifying Respirator'

The equipment is a battery operated motor unit which supplies clean air to a welding helmet. It includes a breathing tube to connect the motor unit to the helmet and a particulate filter / gas filter. (HEPA – high efficiency particulate air) A PAPR uses a blower unit to pass contaminated air through a HEPA filter, which removes the contaminant and supplies purified air to the welding helmet.

2. Why does voestalpine Böhler Welding recommend a PAPR-system for Welding and Grinding Applications?

voestalpine Böhler Welding wants its Welders to be and stay safe, that's why we recommend a PAPR-system for most kind of welding and grinding applications. Breathing air becomes cleaner up to 500 times with our system certified according to TH3 standard.

For a better understanding, Klas Weman wrote in the Welding Processes Handbook (Second Edition), 2012:

17.2 Welding fumes and gases:

Fumes and gases from the use of coated electrodes are produced mainly from the electrode coating and core material. Welding fumes include small solid particles of iron oxides and manganese oxides, while the coating produces mostly what is known as inert dust, although basic electrodes will also release fluorides. Evolution of smoke and fumes increases with increasing welding current, with up to 1 g/minute being evolved from the thickest high-yield electrodes.

Manganese, which is often a constituent of the smoke, can harm the nervous system, known as manganism. Welding high-alloy steels and stainless steels releases chromium and nickel compounds. A low hygienic limit is set for this fume, as it is a cancer risk.

Base Materials with various surface treatments also require particular attention. Welding galvanised steel produces substantial quantities of fume due to the low boiling point of the zinc. Inhalation of this fume can cause metal fume fever (zinc shakes) with nausea, while red lead or other paints that can release irritants must be removed from weld areas before welding. Polyurethane paints and foamed insulation form isocyanates when heated, which can affect the airways and possibly cause asthma. Oil fumes are formed if the workpiece is oily or greasy.

Most harmful substances have occupational exposure limits (OEL) which are regularly revised. The most common of these limit values specifies the average concentration which does not normally represent a health risk during eight hours of work a day (level limit value). A maximum exposure limit or short-term limit value is also specified for certain substances (see Table 17.1).

Substance	Threshold limit value, mg/m ³
Dust, inorganic, respirable	5
Iron oxides	3.5
Manganese, total	0.2
Manganese, respirable dust	0.1
Fluorides	2
Chromium (VI) compounds	0.005
Nickel compounds	0.1

Table 17.1. Permissible limit values (2007) for some constituents of welding fumes.

As the gases and particles which form affect the body in different ways, it is important that the regulations issued by the authorities and the instructions issued by manufacturers are followed in order to avoid ill-health. Material Safety Data Sheets (MSDS) are also available. On these sheets, the manufacturer provides detailed information. Hygienic limit values specify the maximum concentration of some contaminant that is regarded as not presenting a health risk. They are expressed as average values.

Some abbreviations: MAC = Maximum Admissible Concentration. TLV = Threshold Limit Value, OEL = Occupational Exposure Limit.

The normal protective measures consist of good ventilation, preferably in the form of local extraction immediately above the weld. The ideal is to arrange some form of spot extraction that captures the fume at source. Various systems are available, depending on how mobile the welder needs to be. A common arrangement is that of adjustable fume extraction arms which can be positioned close to the welding operation.

On average, the fume produced by MIG/MAG welding is less than that produced by the use of coated electrodes. Particular care should be taken in certain cases:

- » If unusually large amounts of fume are produced. Cored wire containing flux, and welding with high welding data, can produce substantial quantities of fume.
- » Ozone is formed for example when MIG welding aluminium at high currents and with a high-radiance arc. Note, however, that shielding gases are available that actively help to break down the ozone.
- » The fume from aluminium can cause damage to the nervous system.
- » It is important to avoid welding in the presence of chlorinated hydrocarbon solvents (e.g. trichloroethylene): a chemical reaction can produce phosgene, which is poisonous and damages the lungs.
- » The use of CO₂ as the shielding gas can produce carbon monoxide which, under certain circumstances, can reach hazardous levels.
- » To avoid fumes and gases from paint or other surface treatment, the base metal must be cleaned for at least 10 cm, sometimes even more, from the point of welding.

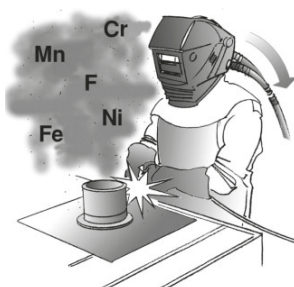


Figure 17.2. When welding in confined spaces where there is a risk that the concentration of fumes and gases could be too high, the welder must use breathing protection with a supply of clean air.

In these situations, and also when welding in confined spaces where there is insufficient ventilation, it can be appropriate to use a fresh air breathing mask. Welding guns with integral extraction can also remove most of the fume before it reaches the surrounding air (Figure 17.2). The position of the extraction nozzle should be adjustable, in order to avoid interfering with the shielding gas.

3. To which countries voestalpine Böhler Welding is offering the product?

European Union (EU)

4. What kind of regulations/laws are in place for PAPR-systems in the marketed countries?

Our PAPR-system is certified according to the following standards:

EN 12941 TH3

EN 14594 Supplied Air

As regulations are very different from country to country, please always contact the public authorities for workers safety in order to fulfill the local requirements with our PAPR-systems.

TECHNICAL QUESTIONS GENERAL / BÖHLER PAPR-SYSTEM

5. What standard Böhler Air / PAPR-system is certified for?

EN12941 TH3

TH3 means the highest standard for a powered respirator tested to EN12941. With TH1 have up to 10% inwards leakage, TH2 having up to 2% inwards leakage and TH3 having up to 0.2 % inwards leakage only.

6. voestalpine Böhler Welding PAPR-system can be used with particle filters and gas-filters. What kind of additional protection gas-filtration provides?

voestalpine Böhler welding is one of only a few manufactures that provides you with the extended protection against harmful fumes defined as follows

A1 B1 E1 (Gas filtration) protects you additionally from:

Organic gases and vapours with a boiling point > 65 °C, inorganic gases and vapours, acid gases

Examples: Working with solvents created by varnish, paints and adhesives, working with chlorine, bromine, hydrogen cyanide, sulfur dioxide, hydrochloric acid and other acid gases

7. What is the purpose of the pre-filter?

The pre-filter will stop larger particulates from clogging the main filter and prolonging it's life. It should be replaced daily.

8. Do we need a spark protection as other products in the market need?

Bohler's filter cover has a built in spark deflector unlike the competition. But a stainless mesh will also be provided. The stainless mesh is mounted in front of the pre-filter.

9. What is the meaning of airflow rate of the voestalpine Böhler Welding system and can it be adjusted?

Do we provide an automatic airflow and what does that mean?

Böhler Air has 6 speeds ranging from 180L to 220L per minute. The system is flow controlled which means that once a speed has been selected the motor will try to maintain that speed even if the filter starts to clog. It does so by speeding up the motor, but once the flow rate cannot be maintained it will automatically shift down a speed and keep doing so until it can maintain the speed – or sound the alarms (audio/visual) if it goes below 170 L/min.

10. Which parts need to be replaced on a regular basis and how often?

- » particle/gas filters – within 2 weeks
- » pre-filter – every day/every shift
- » face-seal – when it becomes worn-out
- » spark filter – it is available as spare part, but can be cleaned
- » sweat band – if it gets worn out

11. How long does the battery last before it needs to be recharged? Is there a visual /acoustic signal when the battery runs low?

Böhler uses a 'state of the art' brushless motor for class-leading run-times.

In a clean environment with a new filter and battery, on low speed run times of over 14 hours have been seen for the heavy-duty battery (7.800 mAh).

When the alarms sound the user needs to check whether the filter is blocked and needs to be changed or if the battery is low. To check the battery the user should press the Start button and depending on the number of red LEDs showing, that shows the state of the battery charge. For example: six red LEDs equals fully charged whereas 1 LED means it needs charging. Six LEDs (full battery) with alarms means that the pre-filter and/or master filter needs to be changed.

12. Does the system need to be cleaned on a regular basis?

It is essential that users take care of their safety equipment and ensure the system kept clean, filters changed regularly and batteries fully charge before use.

13. Does voestalpine Böhler welding also offer a supplied air solution?

Yes, voestalpine Böhler is also offering a supplied air solution.

A supplied air system takes air from a compressor and cleans it through a series of bottles (optional) and provides clean air directly to the user. It is essential that the compressor is drawing clean air from outside the welding zone and from an open space.

Supplied air systems could be used where the environment is too dirty for a powered respirator or where an operator does not need to move around a lot.

14. Is it possible to use the Böhler Guardian Air helmets also with PAPR-blowers of other producers or helmets from other suppliers with our Böhler Air?

Only if certified correctly at a CE test house.

15. Which kind of Spare Parts will voestalpine Böhler welding offer?

All necessary spare parts of the complete system will be available as Spare parts.

16. Can our existing helmets without Airduct be upgraded?

No, a new helmet with airduct and face seal must be purchased, the ADF however can be reused.

17. What is the weight of Böhler Air?

The blower unit (including heavy-duty battery and particle filter) weighs 1120 grams excluding belt. It is one of the lightest systems in the market and follows our light-weight philosophy.

18. What is the advantage of the multiple air outlets inside the Böhler Guardian Air helmets?

This guarantees that at least 80% of the air is provided to the breathing zone and up to 20% for cooling the forehead. Simple systems just provide 100% over the head in front of the face, this can give dry eyes.

19. What are the Warranty periods?

According to European law there is a 12 months warranty period for the motor unit.

ADVANTAGES OF VOESTALPINE BÖHLER WELDING PAPR-SYSTEM

20. Why should the customer decide in favour of our system?

- » our system is certified according to the highest standard possible (TH3)
- » It provides the welder with even air supply via multiple outlets in the inside of the helmet (cooling of forehead and main air stream to the breathing zone)
- » We stay committed to our light-weight philosophy. Böhrer Air weights 1120 grams (without belt).
- » Our system provides the opportunity for gas filtration, this only a few companies can provide. Our solution guarantees an extended protection to the Welder.
- » The Welding helmet with Airduct can be used also for a supplied air solution
- » voestalpine is a producer of Welding consumables since 1926. This ensures a sustainable solution to the customer.
- » We want all Welders to be and stay safe – and make the product affordable.

