

Case Study

Welding protection in Aluminium automotive body construction



3M helps to keep you safer in a changing world. From smelting to fabrication, our technology, expertise and energy drive innovative solutions to help you control your environment, so you can focus on the job at hand. We provide safety solutions that can help improve comfort while helping employers increase compliance, with complete personal protective equipment (PPE) solutions for everything from your eyes to ears and respiratory system.

Automotive lightweight construction places high demands on occupational health and safety

Lightweight design is one of the defining technology trends in the automotive industry: less weight means better fuel efficiency. The use of non-steel components and materials, including the use of aluminium body parts and panels, helps automotive manufacturers reach their aims.

The light metal body construction, including aluminium components, helps optimise vehicle fuel efficiency in use. The counterbalance of using these materials and processing techniques can result in different or increased levels of hazard which in turn need additional control measures to reduce worker exposures. For example, aluminium welding requires meticulous surface preparation, a good deal of skill as well as specialist welding equipment. Along with protection from the light and particularly UV radiation created by the arc, molten metal particles and sparks, welders also need to be protected from exposure to welding fume and ozone gas (an unwanted by-product of aluminium welding) through their entire working shift.

For one major international car manufacturer, the increased use of aluminium means more manual rather than robotic welding and grinding leading to increased occupational and health safety challenges. Although other controls were implemented to eliminate or reduce exposures, flexible and adaptable PPE solutions were still required to help protect workers.

Identifying the welders' health and safety issues

Since up to four coachbuilders often work in a small space on a vehicle at the same time, even the best control measures cannot prevent the ambient air from being contaminated with welding fume, ozone and grinding dust. Welding fume, and particularly the fume from welding aluminium and aluminium alloys, can contain many different hazardous chemicals and metals that may cause both short-term (acute) and long-term (chronic) health effects for employees. The employer identified the need to protect their workers from all these hazards and recognised that other control measures alone would not be enough. Flexibility, ease of movement, worker comfort and productivity were also requirements for any solution.

Selecting the right PPE

Having analysed the problems and the various PPE options, to provide a combination of protection during grinding and welding, the car manufacturer opted to use 3M™ Speedglas™ 9100 FX-Air Welding Helmets with 3M™ Jupiter™ Powered Air Turbos. This combination of respiratory protective equipment performs three important functions:

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helps provide respiratory protection, helps protect the eyes from optical radiation, and helps the welders stay comfortable by supplying a constant flow of filtered air with the help of the turbo unit. The workers found the systems convenient and easy-to-use, with a range of particulate, gas and vapour filters available for different applications.

Integrated eye and respiratory protection for Aluminium processing

The 3M™ Speedglas™ 9100 FX-Air Welding Helmets also help protect the wearer's eyes and face not only from splashes and sparks, but also from UV, visible and IR radiation from the arc and molten metal. Workers found that the Speedglas auto-darkening filter technology made welding easier as they did not have to constantly raise and lower your shield, but with a clear view of the workpiece, and fast reaction to the arc, the helmet helped the wearer conduct precise welding work with optimal results and quality.

The Speedglas 9100 FX-Air also has a flip-up front welding visor, allowing the welding visor to be folded up when it is not needed. The underlying clear curved visor and headtop covers the head and face, so that the wearer can grind in the next operation with continued levels of respiratory and eye and face protection from particles, gases and vapours. Workers found this feature to be extremely effective in the application because the helmet switches from welding to grinding with the simple flip-up of the welding visor – unlike other options, the worker does not have to change his or her entire welding headtop for a different visor or helmet for grinding.

Acceptance from workers

The convenience of use, levels of protection and the comfort of the system when worn have led to high levels of worker acceptance. Currently, the automotive manufacturer uses about 500 complete 3M™ Speedglas™ 9100 FX-Air Welding Helmets with 3M™ Jupiter™ Powered Air Turbos systems for aluminium body construction.

Contact 3M to get support from our experts and help find the right PPE for your workers

At 3M we have a passion for welding and we know the challenges and hazards of your profession. With our 3M™ Speedglas™ helmets providing protection from hot sparks and bright light you can be confident in having full safety protection with the added benefit of comfort and enhanced productivity. Plus, with our wide range of respiratory and hearing PPE, you can have confidence that we will help you find the right solution to keep your workers safe. Get in contact with us and speak to a 3M personal safety expert for more information.

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