TECHNOLOGY FOR THE WELDER'S WORLD.

Welding fume extraction torches

Why they should become the standard

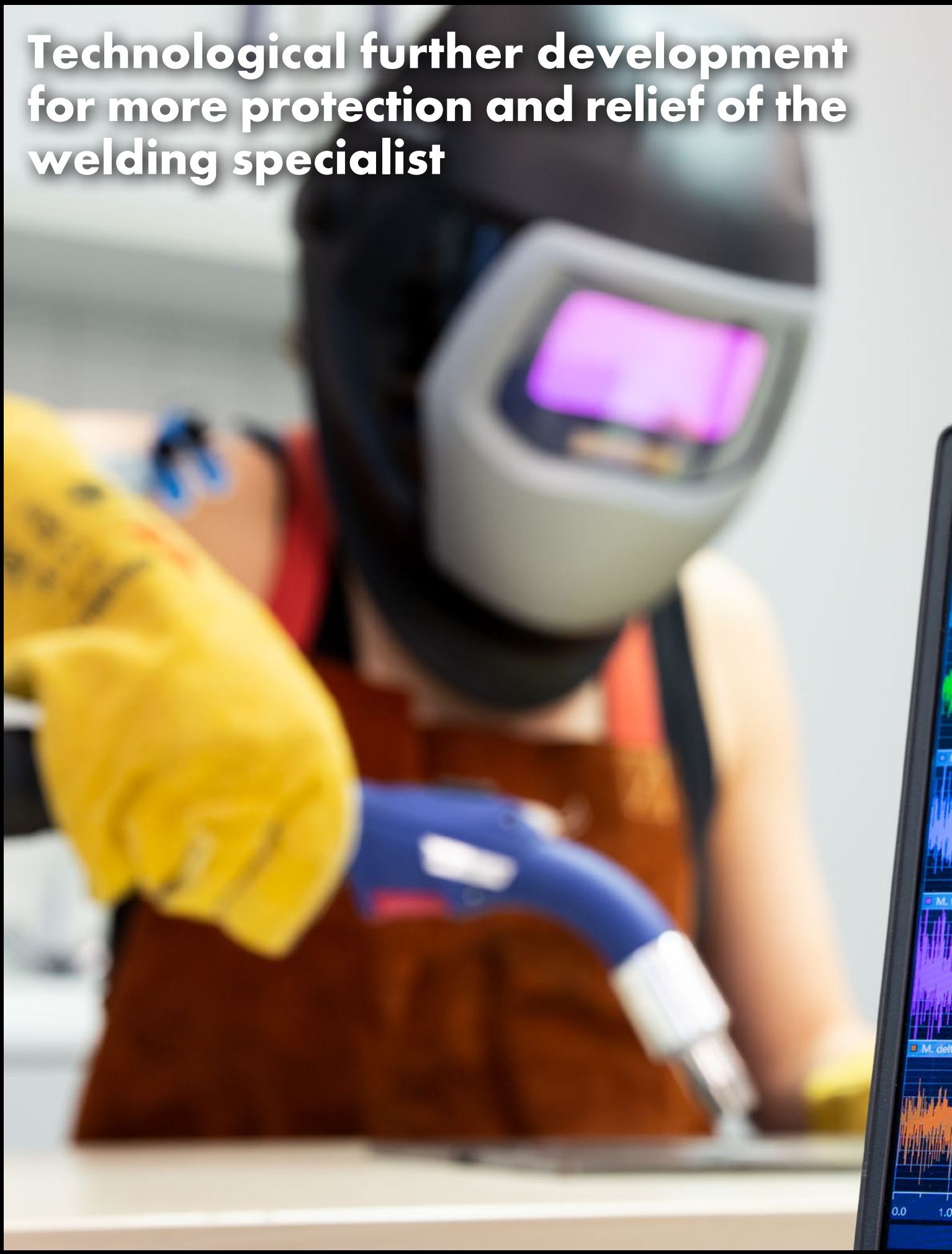
Study results proven by sports science

JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

ABICOR BINZEL®

www.binzel-abicor.com

Technological further development for more protection and relief of the welding specialist



Collection of strain data using electromyography (EMG)

Fact so far

Fume extraction torches are unwieldy, heavy and quickly lead to fatigue. This can now be disproved by sports science.

Fact today

Modern fume extraction torches are much better than their reputation in terms of weight, handling and visibility of the process. Some types are almost indistinguishable from a comparable standard welding torch!

Compared to fume extraction torches from other manufacturers, how do ABICOR BINZEL's fume extraction torches perform in terms of the strain experienced by welding specialists? How does a fume extraction torch model perform versus a comparable standard torch of the same power class?

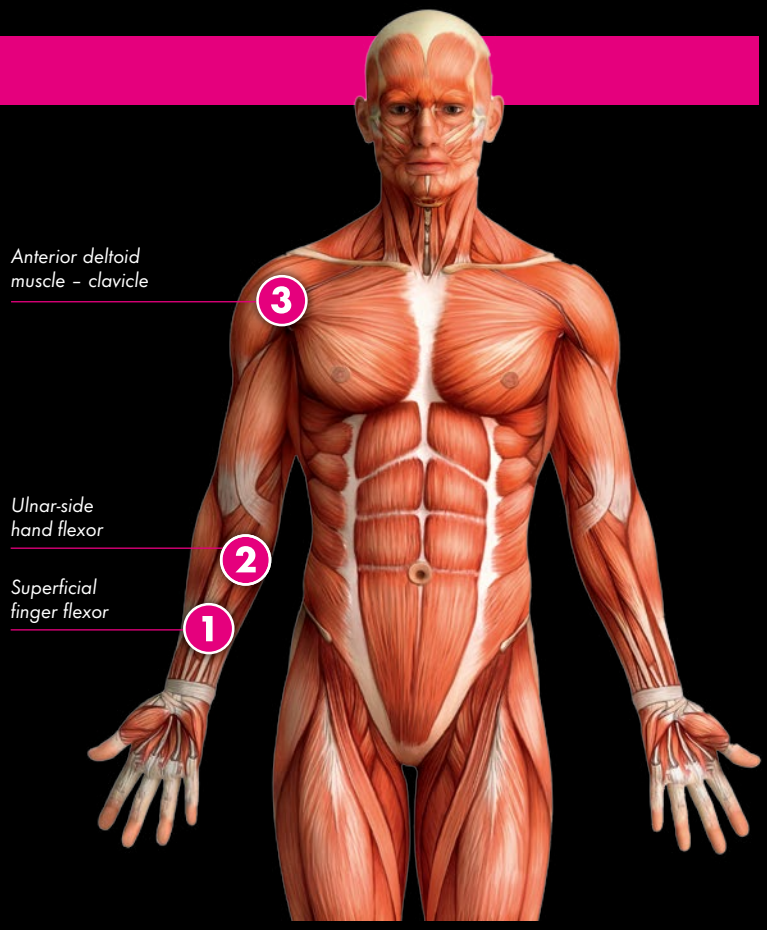
A scientific study by the Department of Sports Science and Performance Physiology at the Justus Liebig University in Giessen provides decisive answers to these questions.

Measurements under strain

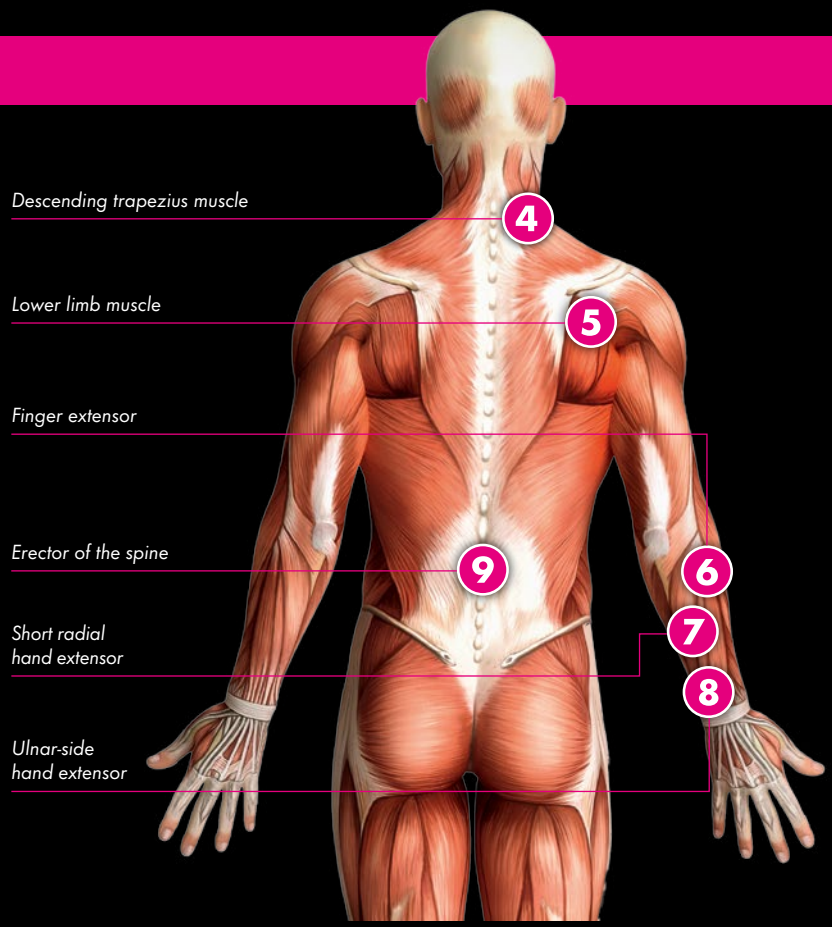
In a study at the **Institute of Sports Science at the Justus Liebig University in Giessen, strain measurements of stressed muscle parts** of welders were carried out. In each case with the new extraction torches of the xFUME® PRO series from ABICOR BINZEL in comparison with extraction torches from other suppliers. Likewise with the xFUME® COMPACT in direct comparison with a standard torch from ABICOR BINZEL of the same performance class.

Comprehensive electromyography (EMG) measurements in a sitting forward bent position **(PA)** and in a standing overhead position **(PE)** were made for the study. Measurement points were placed on muscle groups of the back, shoulders, arms and hands.

Sitting forward bent position (PA)

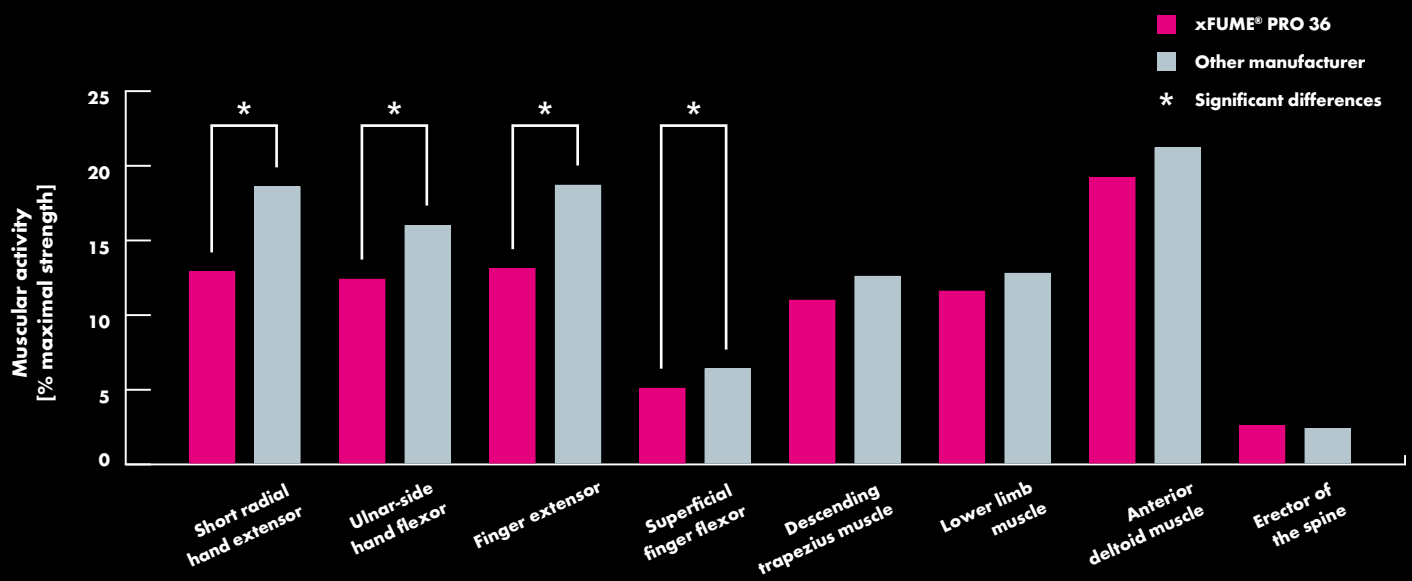


Standing overhead position (PE)

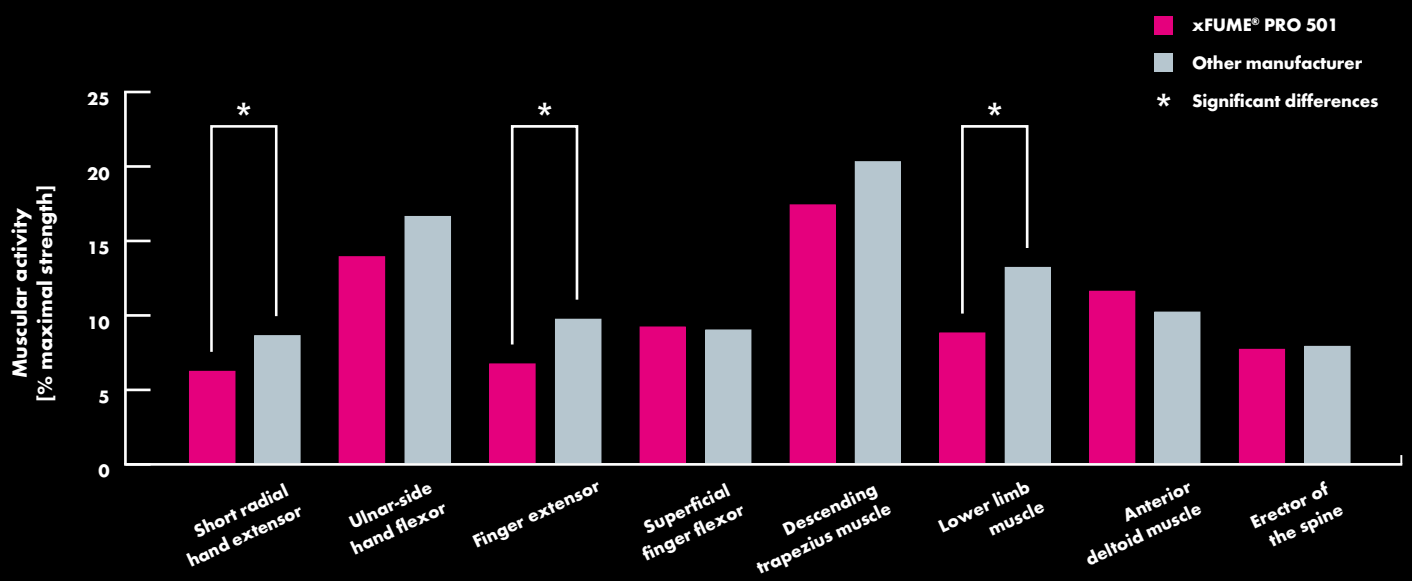


The results of the xFUME® PRO extraction series compared to fume extraction torches of other manufacturers

Example: Standing overhead position (PE) – gas cooled



Example: Sitting forward bent position (PA) – liquid cooled



xFUME® PRO – gas cooled

Significant differences position PA

1. Lower stress on the superficial finger flexor
3. Reduced stress on the anterior deltoid muscle
8. Reduced stress on the ulnar-side hand extensor

➡ Less force is required to grip and hold the ABICOR BINZEL extraction torch in a sitting, bent-forward position than is the case with extraction torches from other suppliers.

Significant differences position PE

Lower stress on all four examined muscles of the forearm (7 short radial hand extensor, 8 ulnar-side hand extensor, 6 finger extensor and 1 superficial finger flexor)

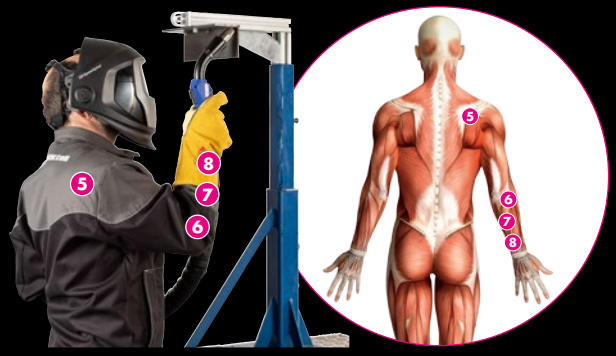
➡ Improved grip strength and less fatigue when using a gas cooled extraction torch from ABICOR BINZEL compared to models from other manufacturers.

xFUME® PRO – liquid cooled

Significant differences position PA

7. Lower stress on the short radial hand extensor
6. Lower stress on the finger extensor
5. Lower stress on the lower limb muscle

➡ Better handling also reduces the strain on the shoulder muscles, which are important for rotation as well as stabilisation of the upper arm in the shoulder joint. Welding with a high-amperage, liquid cooled fume extraction torch from ABICOR BINZEL is less stressful than with extraction torches from other suppliers.



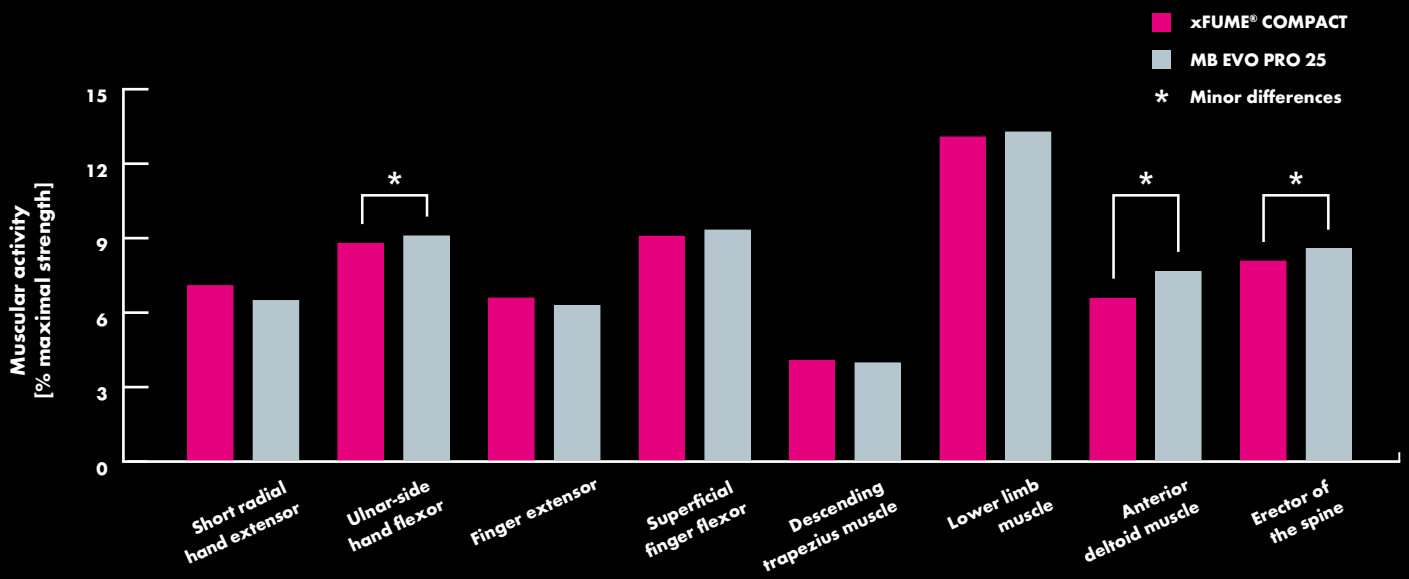
Significant differences position PE

6. Lower stress on the finger extensor
7. Lower stress on the short radial hand extensor
2. Lower stress on the ulnar-side hand flexor and
8. ulnar-side hand extensor

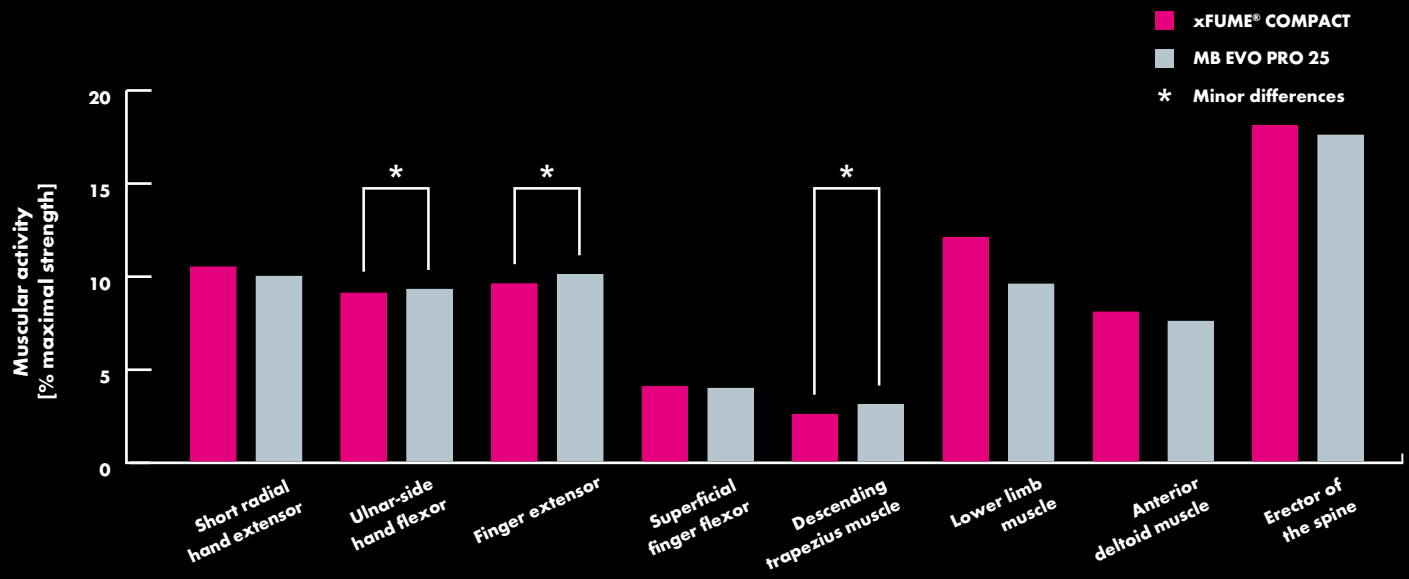
➡ The reduced strain on the forearm facilitates overall handling and enables overhead welding with less fatigue than with other brands of extraction torches.

The results of the xFUME® COMPACT extraction torch compared to an ABICOR BINZEL standard torch of the same performance class

Sitting forward bent position (PA) – gas cooled



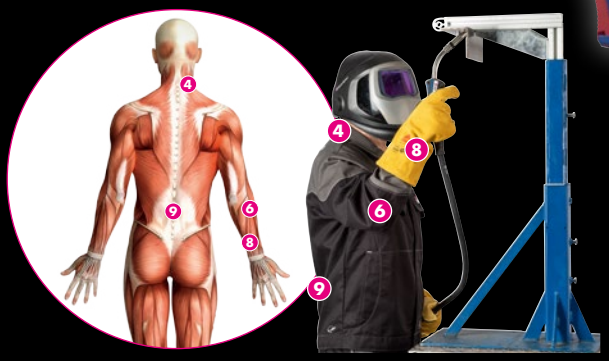
Standing overhead position (PE) – gas cooled



No significant differences were determined between the xFUME® COMPACT 25 and the MB EVO PRO for any of the muscle groups measured. For this reason, the study classifies the objective as well as the subjective muscular strain from both torches as the same.

But a closer look reveals even slightly lower values in the strain test in favour of the xFUME® COMPACT fume extraction torch.

xFUME® COMPACT 25 – gas cooled



Position PA

- 8 Reduced strain on the ulnar-side hand extensor
- 3 Significantly reduced strain on the anterior deltoid muscle
- 9 Reduced strain on the erector of the spine

➡ The low handling weight makes it easy in a sitting position to push the torch head down and keep the balance with the cable assembly weight.

Position PE

- 8 Slightly reduced strain on the ulnar side of the hand flexor when using the extraction torch
- 6 Less strain on the finger extensor when using the extraction torch
- 4 Less strain on the descending trapezius muscle when using the extraction torch

➡ It is obviously easier to lift and hold the extraction torch in a standing position. In the 250 ampere range, gas cooled, there is almost no reason to prefer a standard torch over an extraction torch.

Test set-up at the Institute of Sports Science at the Justus Liebig University in Giessen for overhead welding

What distinguishes the new xFUME® extraction torches

Less weight

Extraction pipe bend, extraction hose, extraction nozzle – additional components of an extraction torch mean more weight. Not with the new extraction torches of the xFUME® series, because ...

- they have components made of aluminum instead of steel.
- the gas cooled version is equipped with an extraction hose with integrated lightweight BIKOX®, which is up to 30 % lighter than that of other manufacturers.
- the liquid cooled version is more than 10 % lighter, which is due to a specific adaptation of the torch neck and the wear parts.

Improved handling

The xFUME® extraction torches are compact, surprisingly light and strikingly well balanced. In the future, the trigger on the handle can be easily extended with just one click. Unpleasant gripping of the handle is thus a thing of the past.

High robustness

An extraction torch must be robust for use in a craftsman's workshop as well as in the tough everyday industrial environment of a large company. At the same time, it must be easy to handle. The extraction torches of the xFUME® series from ABICOR BINZEL are suitable for every application from thin sheet welding to thick sheet welding (liquid cooled up to 500 amps CO_2 and max. 1.6 mm wire diameter) and provide for clean air at the workplace everywhere.

With every xFUME® extraction torch, it feels as if you have a standard welding torch in your hand.

Reliable extraction performance via flow simulation

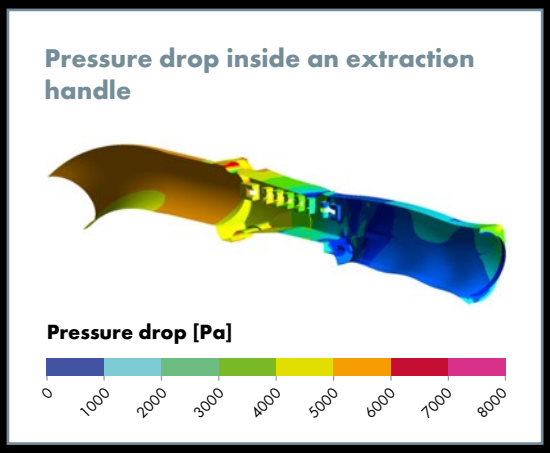
All new xFUME® extraction torches provide optimised flow behaviour inside the handle. Modified geometries inside the handle ensure a uniformly high volume flow and reduce dirt deposits.

This study shows:

Compared to extraction torches from other suppliers, the new extraction torches of the xFUME® series from ABICOR BINZEL are significantly lighter, better in handling and therefore less stressful for welders.

Through the intensive further development of fume extraction torches ABICOR BINZEL has succeeded in setting a new standard in extraction technology. Objections against the use of extraction torches can also be scientifically refuted now.

In terms of handling and load, the gas cooled xFUME® COMPACT is even partly better than the standard welding torch of the same performance class from ABICOR BINZEL. This is the best proof of what 10 years in the development of new torch technologies can achieve.



With these fume extraction torches, there is no longer any reason to refrain from using spot extraction, i.e. fume extraction at the source.

Welding fume extraction torches – the new standard in arc welding!

You weld, protect.

Our product range

MANUAL
- MIG/MAG welding torches
- TIG welding torches
- Plasma cutting torches
- Plasma welding torches

EXTRACTION TECHNOLOGY
- Fume extraction systems
- Fume extraction torches
- Fume extraction & power source combination system

ROBOTIC SYSTEMS
- Robot torches MIG/TIG/Plasma
- Robot switch-off protections
- Torch cleaning stations
- Wire cutting devices
- Robot power source
- System solutions for cobots
- Pipe welding robot
- Wire feeder systems
- Seam tracking sensors
- Gas management systems

LASER SYSTEMS
- Remote laser scanner
- Tactile laser optics
- Wire feeder systems
- Process monitoring tools
- Weld seam inspection

ORBITAL WELDING
- Orbital welding systems
- Positioning bands
- Coated contact tips

HARD AUTOMATION
- Welding tractors
- Welding tractor & power source combination system
- MIG/MAG automatic torches
- Plasma automatic welding and cutting torches

WELDING ACCESSORIES
- Wear parts MIG/TIG/Plasma
- Intermediate cable
- Sockets and plugs
- Electrode holders
- Gouging torches
- Gouging electrodes
- Utilities and tools
- Cooling units
- Wire feeding units
- Equipment for weld seam treatment
- Anti-spatter agents, sprays and pastes

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