

Customer Case Study

Significant reduction in Hand-Arm Vibration (HAV) at BiFab

Burntisland Fabrications (BiFab) is a leading UK manufacturer of large steel structures, such as pin-piles and underwater support structures for wind turbines for the offshore renewable energy, oil and gas sectors. The challenge for manufacturing companies like BiFab is to develop working practices that protect the health and safety of employees, while also ensuring that the production and engineering demands of the business can be met efficiently and profitably.

Multiple benefits – Improving Safety and Productivity

As part of BiFab’s continuous improvement, they carry out regular productivity and process reviews. During a recent abrasives review, BiFab was introduced to 3M by a 3M Specialist Distributor.

“Although our initial focus was on finding ways of improving productivity, for which the 3M abrasives offered clear advantages, it quickly became clear that the same products were capable of giving us significant health and safety benefits.”

Rob Lloyd, Continuous Improvement Manager at BiFab



Trial Results

BiFab used a conventional grinding disc for weld preparation and wanted to trial the 3M™ Cubitron™ II Fibre Disc 982C for this application. This abrasive clearly proved itself to be superior to BiFab’s existing grinding discs. The time taken to remove a weld was significantly reduced and the improved surface finish meant that it was possible to eliminate the secondary finishing operation, which required the use of a flap disc.

By reducing the time needed on-tool for each operation, the 3M™ Cubitron™ II Fibre Disc 982C led to a significant reduction in hand-arm vibration (HAV) levels, while also reducing noise levels and airborne dust.

As a result of the review, 3M™ Cubitron™ II abrasives are steadily being introduced where appropriate across the company’s fabrication operations and have become the abrasive of choice for BiFab’s shop-floor engineers.

“3M™ Cubitron™ II is a great product. We can cut and grind faster and with much better results, but with far lower levels of vibration and fatigue”

Callum Ravenscroft, Senior Weld Fabricator at BiFab



Enhance your safety levels with the complete solution by 3M.

Let 3M be your partner in providing you the complete solution to make your workforce more productive and adequately protected. Our specialists will deliver you combined expertise - optimising your process with world-class abrasives and personal protective equipment.

3M™ Cubitron™ II Abrasives

Product	Product description
	3M™ Cubitron™ II Fibre Disc 982C
	3M™ High Performance Ribbed Back-Up Pad
	3M™ Cubitron™ II Flap Disc 969F
	3M™ Cubitron™ II Depressed Centre Grinding Wheel T27
	3M™ Cubitron™ II Cut-Off Wheel T41
	3M™ Cubitron™ II Hookit™ Clean Sanding Film Disc 775L

Full portfolio of sizes and grades are available.

Contact us

If you want to learn more about abrasive hazards and how the proper choice of abrasives positively impacts worker safety, please contact your local 3M Representative or 3M Distributor.

For more information on our abrasives and personal protective equipment please visit our website: [3M.co.uk/metalworking](https://3m.co.uk/metalworking)

3M™ Personal Protective Equipment

Product	Product description
	3M™ Headgear Combination, G500V5F11H51-GU (includes hearing protection)
	3M™ Versaflo™ Faceshield with Flame Resistant Poly Faceseal M-207 with 3M™ Adflo™
	3M™ Adflo™ High-Altitude Powered Air Respirator (to be combined with 3M headtops)
	3M™ SecureFit™ 400X Series Safety Glasses
	3M™ SecureFit™ 3700 Series Overspectacles
	3M™ GoggleGear™ 500 Series Goggle
	3M™ Aura™ Disposable Respirators 9300+ Series
	3M™ SecureClick™ Half Mask Reusable Respirator HF 800 Series
	3M™ E-A-R™ Flexible Fit Earplug HA 328-100
	3M™ PELTOR™ Electronic Earplug, EEP-100
	3M™ PELTOR™ Earmuff X4
	3M™ PELTOR™ X4 and Wireless Communication Accessory



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3M Science.  
Applied to Life.™

Abrasive Safety  
Short Form Guide

CUBITRON II


SAFETY  
BUILT IN




Abrasive safety

Abrasive applications such as cutting, grinding and sanding can involve a multitude of hazards, and identifying those hazards and the best safety solutions to address these is not always easy. The high speeds, temperatures and forces involved with the use of abrasives can create immediate safety hazards such as cuts and burns. If not properly managed, the routine use of abrasive can also create longer-term health risks from vibration, airborne particles and noise.


Abrasive workplace hazards




Hand-arm vibration



Airborne particles



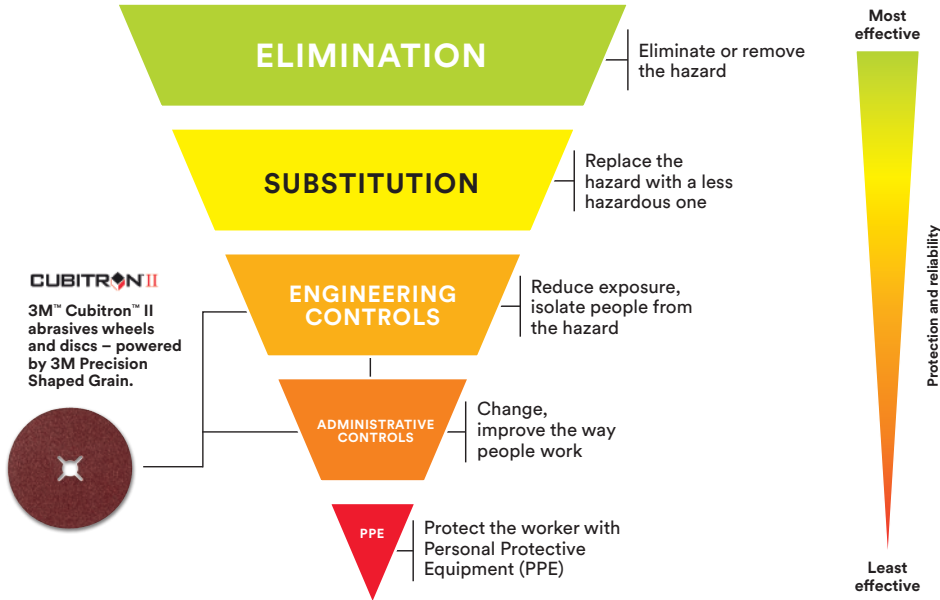
Noise



Injury

Best practice in health and safety management begins with a thorough risk assessment. Once hazards have been identified and categorised for risk, the next step is to implement preventative measures and appropriate controls, such as the Hierarchy of Controls framework.

Hierarchy of Controls

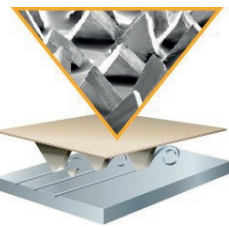


Why choose 3M™ Cubitron™ II Abrasives?

As well as being fast and efficient, 3M’s Precision Shaped Grain technology in 3M™ Cubitron™ II hand-held abrasives can help reduce the risks from exposure to hazards in the workplace.

This abrasive technology continuously fractures to form sharp points and edges – slicing cleaner and faster, staying cooler and lasting longer than conventional abrasives.

As a result, 3M™ Cubitron™ II hand-held abrasives require less pressure, resulting in less operator fatigue. They slice through metal creating heavier metal chips (swarf) that stay airborne for less time. They also cut faster, reducing the time that the operator spends holding the tool and being exposed to vibration.



Choosing the right abrasive

Selecting the most appropriate abrasive product can have a positive impact on safety in the workplace, mitigating risk against hand-arm vibration, airborne particles and noise hazards.

Currently using Grinding Wheel used with an angle grinder

Application:

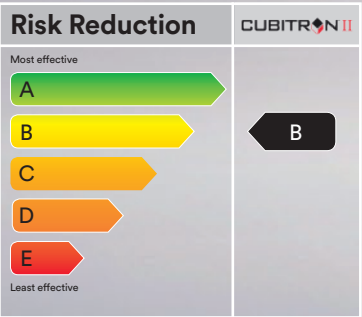
Flat heavy weld removal, bevelling and edge prep.

We suggest 3M™ Cubitron™ II Fibre Disc 982C, used with the 3M™ Cubitron™ II Red Ribbed Back Up Pad.

How 3M can help

When considering health and safety risks associated with metal fabrication, grinding wheels are among the most hazardous.

The 3M™ Cubitron™ II Fibre Disc 982C, is a flexible sanding disc, offering exceptional cutting ability and is perfect for most heavy metal grinding applications. Compared to a standard grinding wheel it can significantly reduce the level of risk against hand-arm vibration, airborne particles and noise hazards, as shown on the risk reduction indicators.



HAZARD REDUCTION:

**Noise**



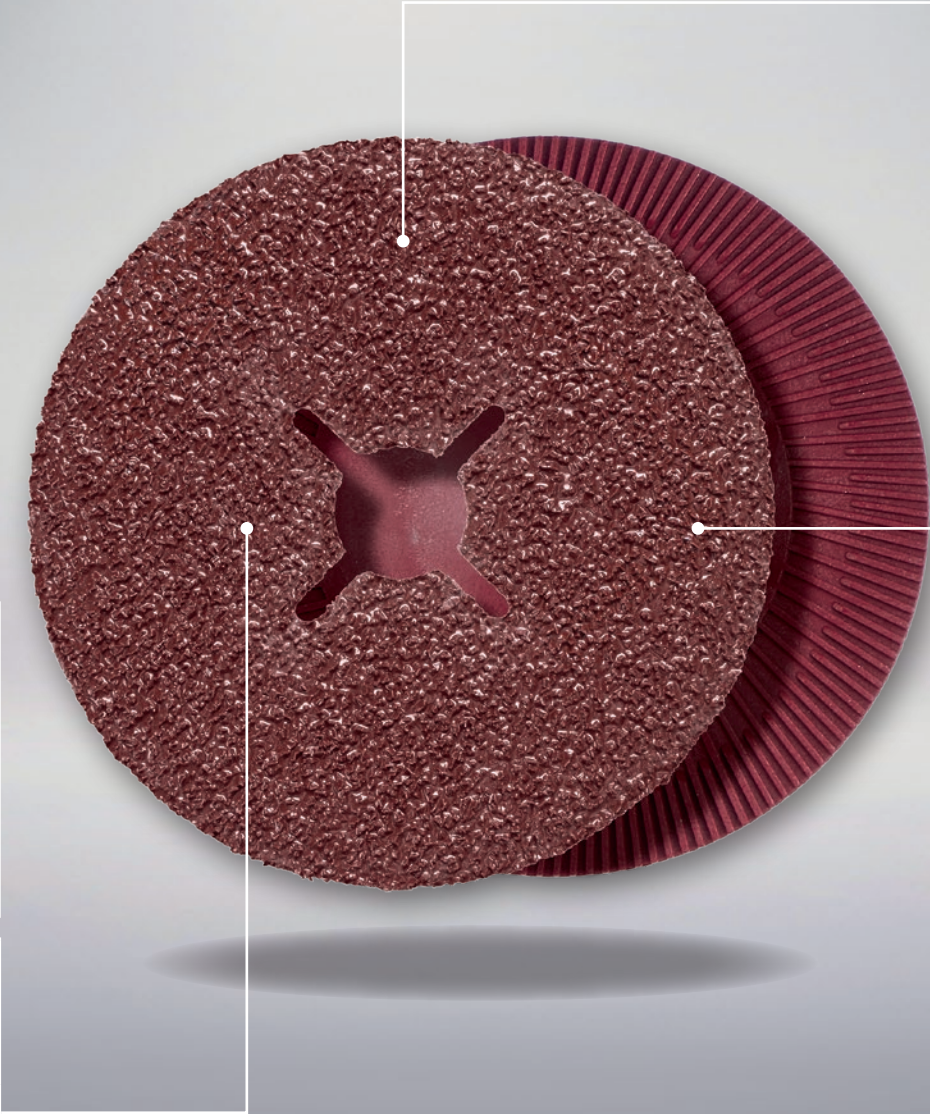
Reduce noise energy by up to **75%\***



Reduce the risk to those in the immediate vicinity




Up to **6dB\*** quieter




HAZARD REDUCTION:

**Airborne particles**



Up to **71%\*\*** less airborne particle



Innovative slicing action means larger, longer metal chips (swarf) staying **airborne for less time**

Conventional grinding tools produce more airborne particles as they wear. **Moving to a fibre disc construction can significantly reduce the hazard**

**Risk reduction**

Most effective

A B C D E


Least effective

CUBITRON II


B

HAZARD REDUCTION:

**Hand-arm vibration**




Up to **91%\*** reduction in vibration exposure



**Less applied pressure is required**, minimising operator fatigue

Less rigid and lightweight, **it transmits less vibration to the operator**



**Reduced trigger time** due to a better material removal rate further cuts vibration exposure

**Risk reduction**

Most effective

A B C D E


Least effective

CUBITRON II


B

**3M™ Cubitron™ II Abrasive wheels and discs**


We can also help **mitigate risk** against the same hazards with these cutting, grinding and sanding abrasive products.



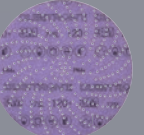
3M™ Cubitron™ II Cut-Off Wheels



3M™ Cubitron™ II Depressed Centre Grinding Wheels



3M™ Cubitron™ II Flap Discs 969F



3M™ Cubitron™ II Film Discs 775L

\* Noise and hand-arm vibration compared Tyrolit basic 2in1 Wheel and 3M™ Cubitron™ II Fibre Disc 982C – According to independent testing by Fraunhofer Institute.

\*\* Airborne particles compared 3M™ High Performance Grinding Wheel to 3M™ Cubitron™ II Fibre Disc 982C – According to independent testing by VITO.

For information on the independent test data please email: abrasives.uk@mmm.com