

3M helps to deliver safety and productivity for Bombardier

Keeping the UK's trains running is a huge task. There are over 22,000 trains in motion every day, with almost 1.7 billion passenger journeys each year. And things are set to get even more challenging as use of the rail network for both passengers and freight is rising fast; Network Rail predicts another 400 million rail journeys annually by 2020, while freight demand is expected to grow by 30 per cent over the next decade.¹

The job of maintaining and servicing the UK's trains is undertaken by a network of specialised engineering firms. Of these, Bombardier is perhaps one of the best known suppliers, being famous as a manufacturer of aircraft – including the iconic Learjet – as well as a range of high speed, light rail, metro, commuter and regional trains. These run on many different Intercity, metro and underground lines, including London's new Elizabeth line, where the latest energy efficient, lightweight and modular design AVENTRA™ trains will be in service.



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3M Bombardier case study

As well as being a manufacturer, Bombardier also provides dedicated fleet management, engineering, refurbishment and maintenance services. These are provided through strategically located centres around the UK.

At the Ilford heavy maintenance services site, for example, the company is able to undertake the complete refurbishment of rail carriages; this work includes mileage- or time-based vehicle overhauls, asset life extension, rebranding, tyre turning and remote project execution.

C6 Refurbishment

The Ilford site extends over 39,000m² and has recently been the subject of a major investment programme, with workshops for vehicle strip-down, where each carriage is typically taken back to the bare shell; corrosion removal and bare metal preparation; paint preparation and spraying; rebuild and testing. Much of this work falls into the category of industry specific C6 projects, typically covering the



vehicle interiors, doors, seals and exterior refurbishment, with contracts frequently covering the refurbishment of Class 317, 357 and 365 vehicles.

For the various workshop teams at the Ilford site, the focus throughout is on safety, efficiency and productivity. Paint Shop Manager, Colin McCann, explains, "As a company, health and safety is at the heart of everything we do.

At our Ilford site, where much of the work that we carry out involves a combination of arduous manual tasks, often with heavy machinery, and the use of a wide range of abrasives, paints and solvents, we've invested heavily in systems, processes and training to create as safe a working environment as possible."

Safety focus

A particular area of focus has been to reduce hand-arm vibration, as many of the maintenance and repair staff regularly use hand grinding, drilling, sanding, polishing and spraying tools. "We set the maximum exposure limit to hand-arm vibration at just a quarter of the limit recommended by the Health and Safety Executive," explains Colin McCann. "Although this protects our staff it also means that we need to be as productive as possible when using this type of equipment. That's where 3M is able to step in."

3M has worked closely with Bombardier to help the company strike an effective balance between



a safe working environment and optimum levels of productivity. In particular, the company supplies its latest disc sanders and 3M™ Cubitron™ II Bonded Abrasive Grinding and Cut-off Wheels.

The Random Orbital Sanders feature advanced, precision balanced motors, with ergonomically designed hand grips and the use of composite materials to reduce weight, vibration and operator fatigue. “We’d previously tested equipment from a number of suppliers and found that, in the case of the sanders in particular, the 3M products offer far lower levels of vibration without affecting their power, reliability or efficiency,” says Colin McCann.

Similarly, the precision shaped grain ceramic mineral found in 3M™ Cubitron™ II abrasives (see separate panel) allows each

task to be completed faster, thereby improving productivity while reducing the time that each grinder is being used. Steve Rose, Corrosion Support Manager, points out, “The Cubitron II product offers us a number of important advantages, as it cuts quicker and lasts longer for the tasks that we have to carry out. Typically, these will be removing areas of corrosion on steel bodied vehicles. This means that my team can get the job done faster, with minimal exposure to vibration, and then move on to the next stage of each refurbishment.”

The same approach to safety and productivity can be found in other areas, such as the welding and grinding bays, where 3M™ Speedglas™ Welding Helmets are used. These feature innovative 3M technology, which automatically darkens the visor to an adjustable



and pre-set density within 0.1 millisecond of an arc flash occurring. This provides complete visual safety, while the lightweight ergonomically designed helmet automatically adjusts to each head shape, making it comfortable to wear for extended periods.



3M™ Cubitron™ II: Precision shaped ceramic grain technology

Traditional ceramic abrasives use an irregularly shaped grain structure. Instead of a clean, cutting action, this ploughs through the surface being cut, causing a rapid build-up of heat, slowing down cutting speeds and reducing the operating life.

By comparison, 3M™ Cubitron™ II abrasives have a patented, precision shaped triangular ceramic abrasive grain. Each triangular structure is electrostatically oriented to maximise its cutting potential, allowing it to mirror the action of a conventional cutting tool, slicing through metal without the problems associated with excessive heat. Each grain also self-sharpenes as the grain tips break away in use leaving a constantly sharp edge. This allows Cubitron II abrasive belts, discs and bonded abrasive wheels to run cooler and keep on working, long after conventional abrasives have dulled, glazed over and been thrown out.

Products such as Cubitron II have also helped Bombardier reduce its overall expenditure on consumable materials. 3M has also worked with Bombardier on its masking solutions. Constant evaluation to ensure the most cost effective product type and size are being used to suit the critical applications. Savings such as these are important, as they help Bombardier reduce the prices it charges to its customers, making the company more competitive in a challenging marketplace.

Moving off-site

In addition to the refurbishment facility at Ilford, and similar specialised sites around the UK, Bombardier provides fleet management services, where vehicles undergo regular internal and external inspections using advanced scanning and monitoring systems. If damage or wear is identified then this is often fixed

on-site to avoid the costs and delays associated with moving vehicles from location to location. "Many of the products from 3M play an important role, helping us improve worker safety while improving efficiency, to bring vehicles back into service as quickly as possible," explains Colin McCann.

A strong relationship

Bombardier and 3M also work closely with their distribution partners. A recent innovation has been the installation of a computer controlled inventory and stock control vending system, with consumable products in the corrosion and paint shops being dispensed only after an authorised user has logged in and input exactly the product required. Reorders are automatically generated and sent direct to the distributors, with the relevant tote bins being replenished on a daily basis.

This system has helped to reduce inventory costs still further, while ensuring that each consumable item or pack of consumables is fully used before a new one is issued to avoid unnecessary waste.

Working with partners such as 3M in this way has brought a number of benefits to Bombardier, as Colin McCann concludes. "Helping us improve levels of cost control, efficiency and productivity have been an important advantage. In addition, 3M has an extensive range of industrial products, which makes it far simpler to source most of what we need from a single supplier, while their product quality and consistency is exceptionally good, enabling our team to get on with every job quickly, efficiently and, above all, safely."

Bombardier uses a wide range of products from 3M. These include:

- 3M™ Hookit™ Abrasive Discs 316U (Paint, corrosion removal and primer sanding)
- Scotch® Masking Tape (For waterborne paint)
- 3M™ Perfect-it™ Fast Cut PLUS Compound
- 3M™ DA Sanders
- 3M™ Masking Film (#80110)
- Scotch® Fine Line Tape
- 3M™ Scotch-Brite™ products
- 3M™ Sprayable Sealer
- 3M™ Wetordry™ Abrasive Paper
- 3M™ Roloc™ Discs
- 3M™ Cubitron™ II Abrasive Cut-off Wheels
- 3M™ Cubitron™ II Fibre Discs / Grinding Wheels
- Coveralls
- 3M™ Reusable Respirators
- 3M™ Speedglas™ Welding Helmets
- 3M™ Supplied Air Systems



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¹ Source: <https://www.networkrail.co.uk/running-the-railway/>

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