

Plastic blast media comes of age

Mac'Ants – the leading UK practitioner in the manufacture and application of this relatively new material in the surface preparation and blast cleaning market, one which is firmly established in the aerospace sector – sees huge potential for plastic media across the general industrial market.

Created in 1973 by Jim MACLaughlin and ANTHONY Lutkin – from which the name derives – the Mac'Ants Group, based at Dinnington, near Sheffield, has gradually grown in its specialised field of abrasive supply, related equipment ('METS') and services ('MSE').

Originally established as a recycler and processor of aluminas and silicone carbides, the company has developed today into an organisation that offers a comprehensive service in its field, enabling customers in a wide range of sectors to benefit from a single source providing products, equipment and expertise. Mac'Ants is the only company in the UK that manufactures both a range of abrasive blast media and the equipment that uses it.

From its origins, the Mac'Ants Group has focused on providing a blend of quality, value, service and product choice to its customers and throughout has maintained a commitment to environmental protection. Its pioneering work and continuing development in the field of plastic media is evidence of this ongoing focus. The company remains committed to innovation as demonstrated by its position as the only non-USA-based manufacturer that has achieved approval to military specification for the supply of plastic media.

No substrate damage

The use of plastic media was pioneered in the 1980s by the United States Air Force, specifically for paint removal from aircraft. Over the last two decades the 'PMB' (Plastic Media Blasting) or 'PMS' (Plastic Media Stripping) process has been adopted by the Royal Air Force and – more recently by DARA (the UK Defence Aviation Repair Agency). The process has become an accepted part of aviation repair and refurbishment procedures.

The big benefit of plastic media surface preparation is that paint can be removed 'gently', without fear of damaging the substrate and existing first-stage surface treatments such as anodising. Today, using the right match of media and equipment, the process is so controllable that paint can be removed layer-by-layer.

Added to this, plastic media paint removal supersedes the use of stripping chemicals with their potential to harm structures, operators and the working and external environments. The solid waste produced is also safer and easier to deal with than chemical effluent.

As well as its environmental advantages, plastic media stripping offers significant economic benefits. With up to 90% reduction in labour requirements, PMS can result in saving of both labour and downtime.

Unlike chemical stripping, it is an all-weather stripping method. Cool temperatures, which can render stripping chemicals almost inert, have no effect on the PMS process; likewise, warmer temperatures, which cause rapid drying of chemical stripper films before they have completed their work, have no effect on PMS. The process does not etch, warp, stretch or remove metal resulting in a stripped surface without compromising critical surface or mechanical dimensions. This results in longer equipment service life and virtually eliminates the need for filling primers to achieve a smooth finish. The use of PMS also reduces the extensive masking normally required prior to chemical stripping or other forms of grit or abrasive blasting. The process also does not harm bearings, seals or many other components that could otherwise be damaged by the more commonly used stripping methods.

The general industrial market has been slow to capitalise on the major benefits of plastic media stripping, although Mac'Ants is now seeing a growing demand encompassing other defence applications and the automotive and electronics industries. As well as paint stripping, other typical tasks for the process include deflashing circuit boards and cleaning delicate moulds. Graffiti removal is another potential large-scale application for which Mac'Ants has undertaken trials.

The product range

Mac'Ants plastic media is manufactured from fully cured thermoset materials to Mil-Spec standards at the company's Dinnington facility. The manufacturing plant was used originally for the production of alox abrasive blast media, but was modified two years ago and has been progressively expanded over the last two years to include specialised plastics milling, separation, sieving, grading and bagging equipment – much of which has been purpose designed and manufactured by Mac'Ants itself. It was no longer viable to produce alox media in the UK – much of it is now imported from the Far East – so Mac'Ants grasped the opportunity to switch to the specialised and more difficult to produce plastics, and has since become one of the world's premier producers, exporting the material to many countries.



Plastic media stripping (PMS) is used widely for removing paint from civil and military aircraft.

Says company spokesman, Kent Martin: "Although originally designed for aviation applications, the use of plastic blast media is growing across the spectrum of industry.

"We have focused our investment in this area on ensuring that the range of plastic media that we offer is equally applicable across these diverse market sectors. This has resulted in a choice of material that includes, for example, 'Type II' (urea), 'Type III' (Melamine) and 'Type V' (acrylic) materials while further developments have been engineered to provide a combination of hardness, density, angular cutting and consistent sizing. At the same time, we are very happy to custom manufacture for specific application requirements."

By way of illustration, he also draws attention to the Mac'Ants 'Avia-Lite' range of plastic abrasives that deliver a high stripping rate and a consistent performance – ideal for paint stripping, deburring, deflashing, and cleaning. Available with a choice of base materials including urea, melamine, acrylic, polyamide and polycarbonate, different levels of performance in terms of abrasiveness and aggression can be specified. Avia Lite Type 3, for example, is a thermoset melamine that provides the highest level of aggression – up to six times of that normally associated with urea.

"This focus on building a high technical edge into our products has been recognised across much of our customer base," continues Kent Martin. "Indeed, the approach has not only resulted in our gaining ISO 9001:2000 approved supplier status, but has also led directly to Rolls-Royce CSS227 approval and to our becoming the only approved manufacturer to the Mil-P-85891a specification for multiple types of plastic media outside continental America."

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Because the use of plastic media provides the ideal combination of control and substrate protection, the development is seen of being of particular note where relatively delicate applications are required. Again, the company highlights paint removal from aircraft during maintenance and refurbishment procedures as well as the loosening of deposits from glass fibre boats as prime examples where its benefits are well illustrated.

Alongside this general choice of plastic media, however, Mac'Ants has also developed specific products within its range that have been shown to be highly effective for even more precise applications. One example is 'PolyFlash', a polycarbonate de-flashing media, which is formed from extruded polycarbonate rather than the Mil specification 'Type VI' alternative. PolyFlash is well suited for de-flashing plastics and can also be supplied as cryogenic grade for rubber removal. 'NyFlash' is another example – offering lower density than PolyFlash, it is typically used for de-flashing plastic components or delicate castings and is ideal for use in a wheel or air blast system.

"Apart from the manufacturing and engineering sectors, there are a number of other application areas for plastic media which are becoming increasingly popular," says Kent Martin. "These include material for blasting buildings and stonework – markedly different from the precision engineering sector but of particular note because of the environmental benefits the products offer."

Each batch of media is assessed in the company's fully equipped testing facility to ensure consistent quality standards. Product development is continually in the spotlight through a focus on liaising with customers to develop new applications where appropriate – all fully supported by comprehensive technical assistance.

"Mac'Ants is now a genuine global supplier and we have a wide network of distributors and agents throughout the world," comments Sean Williams, the company's international account manager. "Indeed, we are proud to have risen to become one of the top five producers of plastic blast media."

"This growth has been based on product quality, technical excellence and a willingness to build relationships with distributors and assist growth," he continues, "and also from our strong position of being able to offer all solutions to surface preparation problems from our large stocks held at our premises in Sheffield."

"We are confident that our growing range of plastic media reflects greater awareness of its benefits across our customer base," adds Kent Martin. "In conjunction with equipment and services from our METS and MSE divisions respectively, we believe this is an area where the growth in sales that we have seen in recent times is set to continue."

Mac'Ants – the "one-stop" shop

In addition to its proven expertise in the field of plastic media, the Mac'Ants Group prides itself on being a true "one-stop-shop" for surface preparation and blast finishing equipment and services.

The company supplies alumina-based materials from stringently controlled fusion and grading plants worldwide including China, India and Eastern Europe, as well as other media types, including glass beads, silicone carbides, vegetable products, expendable synthetics and natural minerals.

Added to this, the METS Division of Mac'Ants works closely with both the abrasive and plastic media elements of the business in providing a complementary range of application equipment. This includes surface finishing machines, cabinets, blast rooms and wheeled machines as well as a comprehensive back up service, spares and maintenance.

The company's MSE Business Division was developed to provide a dedicated sub-contract blasting service to customers. This is of particular note where in-house plants and operators are not available and often provides a solution to short term capacity requirements. The division offers a full range of surface finishing processes and re-coating facilities.

With the twin aims of improved performance and environmental betterment, the Mac'Ants Group maintains a long-standing commitment to product, equipment and service innovation. Its success in processing and recycling material as well as in developing techniques such as plastic media stripping are evidence of its leading position in this field. Indeed, its activities in the recycling and re-processing sector bring the organisation back full circle to its origins. In particular, the re-processing of spent alumina, glass and plastics into construction and refractory materials pays testimony to its ongoing expertise.

The Mac'Ants Group is also a supply partner to the AeroChemicals Group brand – the dynamic alliance of international specialists. Seen by customers as a mark of confidence and capability, it is an achievement which positions Mac'Ants in a global context within which it has a close liaison with other group members who have achieved leading positions as international specialists in the aerospace sector. **Tel: 01909 552500, www.macants.co.uk**

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Automatic system increases throughput

A recent example of Mac'Ants 'METS' blast finishing equipment in action is pictured here. The purpose-designed system has achieved a six-fold increase in throughput at one of the country's leading suppliers of rubber and metal finishing services – Birmingham based, Blastrim.

The facility is dedicated to the removal of flux deposits in four specific welded areas of sunroof frames destined for a highly prestigious automotive OEM. Blastrim's customer – specialist manufacturer Webasto – uses a weld in each of the frames' four corners to fix short tubes that in turn link to the panels' drainage system. This can leave deposits from each weld that, unless removed, could inhibit the eventual painting process and potentially affect the high quality for which the marque has a leading reputation.

The previously manual operation has now been fully automated with the Mac'Ants equipment, enabling Blastrim to meet significantly increased production turnaround demands, as Technical Manager Nigel Byrne explains: "Initially, volumes were such that we were able to meet Webasto's requirements via manual processing. Now, with this new installation, we can meet dramatically increased demand, which calls for up to 275 individual roof panels per day to be processed over the next 18 months."

The self-contained blast cabinet features four fixed nozzles positioned to direct chilled iron grit blast media at the welded fittings. The process now requires each panel to be simply loaded from a mobile carrier by hand onto guide rails, which position the units in the cabinet at the touch of a button. After completion, in no more than 15 seconds, the machine then ejects each panel for cleaning-off and placement onto a separate carrier for onward shipping to the customer. This automatic process not only now meets the throughput requirement but also produces a highly consistent, high quality result. Also, because it is self-contained, there is no significant environmental impact for the operators.

The installation of the blast cabinet is just the latest of a series of projects undertaken by the Mac'Ants Group over the last two years for Blastrim. The organisation also supplies blast media for other applications, notably its cryogenic de-flashing operation – the company is one of only two in the UK to offer this service.

