

# U. S. Air Force help to success

## Plastic Blast Media (PBM) -on the advance - worldwide-

For depainting of large objects like jets, helicopters or other aircrafts with sensitive surfaces, Plastic Blast Media are used – worldwide. Pic.SP

More or less unnoticed by the market Plastic Blast Media have captured worldwide a considerable, continuously increasing spectrum of application. Not only in the technically highly developed countries but also in the lesser developed regions is a growing demand for that kind of “soft” abrasive blast medium. It’s application is comparatively simple and it has quite a few advantages over the other abrasive media.

The plastic blast media can be divided into two categories.

A) The **thermoplastic media**, made of Polyamid 6 and/ Polycarbonate. These are in use already since the mid or the last century. The main application has been an still is the deflashing of thermoset- and rubber parts at low temperature.

B) The **thermoset media** which are made of completely hardened parts of Urea Formaldehyde. These blast media are in use since 1981/1982. Because of the greater hardness of this medium, compared to the thermoplastic media, (Mohs 3,5 vs Mohs 3,0) the range of application became wider.

This article concentrates more or less on the development of the thermoset blast media which was “born” in Dillenburg, the location of the Fischer GmbH. The production of this seemingly “simple” product, however, required the control of quite a few techniques and considerable experience in processing of thermoset materials. It had to be guaranteed, that the initial product was exactly of the right type. It had to be without contamination whatsoever, particularly no ferromagnetic particles were allowed. The initial material had to be without fillers such as minerals, glass-fibre or cotton-fibre. Only completely hardened parts and waste of thermoset material with cellulose fillers had to be used.

The techniques of shredding, crushing, grinding and sieving had to be on a high level in order to make sure that the finished product was within very narrow tolerances as requested by the applicants.

Than it was observed that in some applications a problem with dust, sticking at the surface of blasted objects, occurred. This happened especially with applications of the rubber-industry and of powder coating production processes.

The cause for this sticking of dust was the electrostatic charge of the PBM surface. After extensive tests a very efficient antistaticum has been developed which completely neutralizes the electrostatic charges.

As mentioned above, the contamination of the medium by ferromagnetic particles had to be reduced to literally zero. In order to avoid that kind of contamination extremely strong permanent magnets and induction separators had to be installed into the production system.

A milestone in the history of PBM was the fact that the U. S. Air Force started activities as to test the product and the application processes of that rather new medium. Until that time the Air Force used chemical substances and dry ice for jobs such as complete depainting of jets, helicopters and other equipment. Chemicals and dry ice however turned out to have substantial disadvantages.

After the blasting with plastic media became standard for the Air Force a very detailed MIL-Specification has been created for PBM. This MIL-P-85891A (here referring to the so called Type II, UREA) specifies over 20 technical parameters which have to be met by the product.

For example: hardness, colour, spectogram material type, iron content, specific gravity, conductivity, water absorption, anti-static behavior, particle size, paint stripping rate in sq.ft/min, aggressiveness, product consumption etc. On top of that the method of packing and general workmanship are specified.



Removal of graffiti is usually done by applying the wet blasting method.



Depainting of expensive cast iron parts. The right hand side shows the surface with paint completely removed.

Besides of all these technical parameter the AIR Force requests a very strict quality control, the complete documentation of all material delivered under MIL-specification and a guarantee of a longterm delivery capability.

Only if all that is guaranteed, a manufacturer will be approved by “type and supplier”. In many application segments, even in “non-military” application, customers just order material according to MIL-Spec. They thus take advantage of the clear technical definition set forth by the MIL.

The worldwide increase in demand for PBM has also influenced the manufacturer of blasting cabinets, blasting robots as well as of mobile blasting equipment. In order to increase the efficiency of the blasting of big objects such as airplanes or vessels, huge halls have been built enabling a completely automatic blasting process in several steps.

The advantages of the plastic blasting method are obvious. It is a clean, technically simple method. The material can be stored over a very long period without changing its properties. It is within a wide range insensitive against temperature and thus does not, as other media, need to be stored in special storage rooms.

The plastic blasting is inexpensive because it can, in a closed system, be used up to 8 – 10 times. Handling is quite simple and much tailor-made equipment such as blasting cabinets are available. Last but not least, the PBM is chemically inert and thus not hazardous for the environment. Of course there are safety rules to be observed but that is not because of the PBM but rather because of the removed substances of the blasted surfaces.

Because of all of these criterias the PBM are used worldwide on an ever increasing scale. Typical examples are:

**DEPAINTING** of vessels, aircrafts, helicopters, motorcars, as well as of engine parts, wheels, high quality cases and components of all kinds.

**CLEANING** of extruder screws, engine parts, facades (removing of graffiti) monuments, memorials, objects of art, ships hulls, press moulds.

**DEFLASHING** of parts of all kinds such as composites, aluminium and titanium, electric and electronic components.

On top of that there are applications such as treatment of metallic and non metallic surfaces.

A new and very promising range of application seems to be the treatment of surfaces of composite materials such as GFK and CFK. The ever increasing percentage of such material in virtually all kinds of industrial production request a quality of surface treatment that can perfectly be met by applying plastic media blasting.

It can safely be concluded that the worldwide potential for plastic blast media is by far not yet exhausted.

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