

Plastic Blast Media (PBM) from 1979 until today.

(from Ing. grad. Hans-Heiner Sochurek)



Back in 1979 when Dipl. Ing. Volker Fischer developed his ideas about recycling of thermoset parts and waste he did not intend to develop blast medias. At that time there was in Germany an ever increasing consciousness for environmental protection. His approach was to simply crushing and sieving such material to powder and to mix it to a certain extend with the moulding compound.

This would mean recycling of waste and reduction of production cost.

It looked like a “simple” product. However it was already at that time obvious that a considerable know-how was required to produce it.

A) It had to be guaranteed, that the recycled material was exactly of that type which it should later be mixed with.

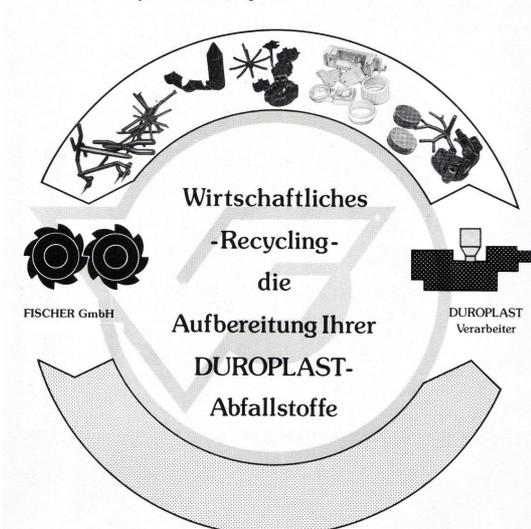
B) It had to be “pure” which means no contamination whatsoever, particularly no ferromagnetic particles were allowed.

C) It had to be processed into a powder with particle sizes exactly within a very narrow fraction range of 0 – 0,5 mm.

Only if these three requirements were met the material could be mixed to some 15% with new moulding material.

The object was achieved! The manufacturer of thermoset parts and components registered a cost reduction.

Phenolharz-, Harnstoffharz-, Melaminharz-, Melamin-Phenolharz-, Polyesterharz-, Epoxid-Formmasseabfälle



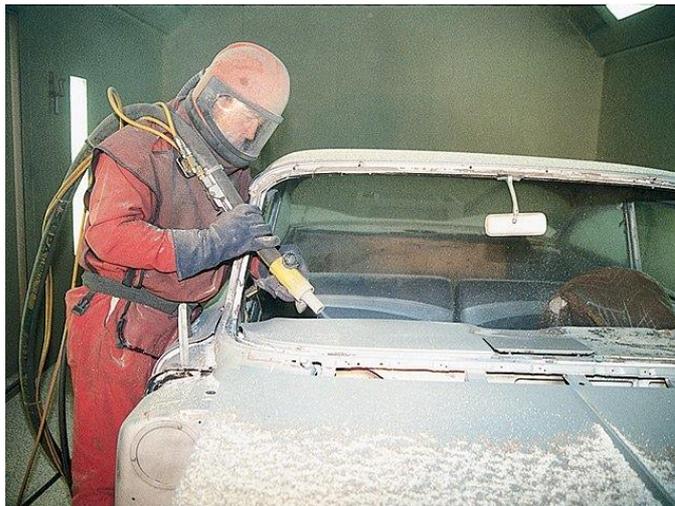
The suppliers of the moulding material, however, registered a reduction of turnover.

Some of them didn't seem to be pleased with that. At least, they have not been very euphoric about it.

(Nowadays the idea of recycling/mixing of the compound material is again under discussion but that is not subject of this lecture.)

For Volker Fischer, however, it meant that a new application for his product had to be developed.

It was a favourable factor that there was a sandblasting contractor right in the neighbourhood. Very soon there first blasting tests were made with PBM. These first tests, carried out at an oldtimer automobile, have been very encouraging. Very soon it became obvious, that there were quite a few typical application for this new kind of "soft", surface protecting blasting medium. On the other hand it was realized that for literally each application a tailormade product had to be chosen. That again required a diversification and improvement of the products. A considerable investment in new technologies and machinery became essential.



In the early 80ies it was decided to use strictly parts and waste of 100% hardened thermoset material with cellulose filler. No material with other fillers such as minerals, cotton or glassfiber has been used anymore.

For the worldwide introduction some 100 tons of PBM have been exported to the USA. The company U.S. Technology and the U.S. Air Force have tested application possibilities for this material in the defense sector.



In the year 1988 the plastic blast material of the Fischer GmbH has been registered by the Patent Office of Munich, Germany under the trademark Fischer JET plast®



At that time the Fischer JET plast® has already been produced in 3 different particle fractions such as:

Fine 0,2 – 0,6 mm, medium 0,6 – 1,0 mm and coarse 1,0 – 1,6 mm.

The next big step in terms of quality has been done in the early 90ies. The Fischer JET plast® has been divided in two basic types of PBM.

Type A for blast media made of UREA- and phenolresin moulding compounds.

Type B for blast media made of high quality melamin moulding compounds.

In the middle of the 90ies the type A has been extended by type A-UF. The Type A is the low cost alternative; it contains a certain percentage of not completely hardened material.

The type A-UF consists of 100% completely hardened material and features almost dustfree blasting and a high efficiency.

The production capacity had to be increased and new technologies have been implemented again. In order to completely avoid contamination by ferrous material an installation of extremely strong permanent magnets and of induction separator became necessary.

Around year 2000 it was observed that in some new application a problem with dust, sticking at the surface of the blasted objects, occurred. This happened especially in application 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 charge.

This antistaticum has to be, in a separate production process, sprayed onto the PBM and covers homogeneously the surface of each particle. This specially treated type of material is labelled "Fischer JET plast® Type A-UF BQ". (Meaning BQ for Best Quality).

The growing market for PBM required to set up one more production line in order offer finer and more taylor made products. This again required better laboratory facilities to continously test and document all production lots for quality and consistancy.

In the year 2003 the Fischer GmbH has been tested and certified by the TÜV-Rheinland and carries since then the label “Certified according to DIN-ISO 9001:2000”. This certification has to be renewed periodically.



Parallel to the continuous diversification and improvement of the plastic blast media for the industrial application the so called defense sector had to be observed. One reason for that was the fact that more and more customers requested us to offer blast media according to MIL- (P-85891A) specification. Upon closer studying of this specification it became clear that even such a “simple” product had to fullfill over 20 different technical criteria to be certified. It was a long and laborious (and expensive) procedure to get certified.

First it was tested which of the technical criteria have already be met by our standard product. (Here we talk about the UREA-type of material only) Than some changes in the production process hat to be implemented in order to meet the other technical criteria. As a next step, the improved material had to be tested by an independent certified laboratory. In our case the AERO-TECH COATINGS REMOVAL, INC of Baltimore Ohio has been chosen to carry out all required tests.



FIRST ARTICLE INSPECTION SUMMARY

Test Specification	MIL-P-85891A		
Media Designation:	Fischer Jet plast® Type II (Urea), 20-30 mesh size		
Lot Number:	061909		
Manufacturer:	Fischer GmbH Schelder Hütte 16 D-35687 Dillenburg		
Report Date:	August 12, 2006		
Characteristic	Requirement	Test Value	Meets MIL Specification
Material Type	Type II	Type II	Yes
Barcol Hardness (plastic stock)	54 to 62	56	Yes
Color	- - -	Multicolored	Yes
Infrared spectrogram material type	Type II	Type II	Yes
Chlorine (maximum)	Trace	Trace	Yes
Ash Content (Grade A, maximum % by weight)	2.00	1.10	Yes
Iron content (maximum % by weight)	0.1	0.00	Yes
Specific gravity	1.47 to 1.52	1.49	Yes
Extract content (minimum % by weight)	0.0 to 1.0	0.02	Yes
pH of water extract	4 to 8	6.3	Yes
Conductivity (maximum umho/cm)	100	26	Yes
Water absorption (maximum % by weight)	10.0	7.7	Yes
Heavy particulate (max. % by weight)	0.02	0.019	Yes
Light particulate (max. % by weight)	1.0	0.25	Yes
Particle size (20-30 mesh)			
16 mesh (max. percent retained)	0.1	0.0	Yes
20 mesh (max. percent retained)	15	3.1	Yes
30 mesh (max. percent passed)	20	15.3	Yes
40 mesh (max. percent passed)	5	0.0	Yes
100 mesh (max. percent passed)	2	0.0	Yes
Paint stripping rate (sq. ft/min, minimum)	0.15	0.56	Yes
Aggressiveness (mg/sq cm, maximum)	0.5	0.46	Yes
Product Consumption (% for four cycles)	52	42.4	Yes
Product consumption (avg. % per cycle, max.)	13	10.6	Yes
Surface residue	(1)	(1)	Yes
Anti-static behavior	(2)	(2)	Yes
Storage stability	(3)	(3)	Yes
Workmanship	(4)	(4)	Yes

Furthermore it had to be demonstrated that the production processes and the quality control carried out guarantee a continuous observance of all technical criteria.

It had further to be demonstrated and guaranteed that of all material delivered as MIL-P-85891 type samples and test reports are stored up for minimum two years time. For this reason the U.S. Air Force has delegated a team of specialists to our production plant in Dillenburg. All details in connection with consistency of the "raw material", the quality control and the documentation have thoroughly been checked.

In order to qualify for that substantial investments have been made. A completely separate production line has been built up for production of MIL-type material. The test and analysis facilities had to be improved as well.

Last but not least it was quite time consuming job to study all the rules and regulations connected to the test- and certification procedure to become a registered supplier for MIL P 85891A type plastic blast media.

We are since the year 2006 the only German supplier registered and certified by the U.S. Air Force and can supply material since then our material to customers in the aircraft industry and to the defense forces worldwide.

In such a way a comparatively "simple" product has since 1979 until today been developed and improved into a large variety of materials for blasting application. The plastic blast media Fischer JET plast® is nowadays offered in some 20 different types and is sold through a network of over 30 business partners worldwide.

By extensive exchange of experiences with dealers and endusers and continuous research and development we are confident that the range of interesting new application will further increase.



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