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Welcome to MSA *NewsWire* Issue 4

Welcome to our fourth edition of Newswire. How many times have you heard it said "Metalspray? Yes, I have heard of it. We used it once and it failed - the coating dropped off!" People just don't realise that they are surrounded by parts/components that are Metalsprayed and without it humanity would not be where it is today!

In this edition we will look at the Metalspray technology that has improved the performance of the vehicles we drive today. We will combine this with an interesting article on how automotive engines are being recycled.

We will also introduce you to a coating thickness measuring device for Austenitic Stainless Steel (non-magnetic).

In our product focus we will look at our product Dichtol which is a capillary sealer for Metal/Thermalspray coatings.

Interesting Facts

Did you know? There now exists a measuring instrument for determining the coating thickness of TSA (Thermal Spray Aluminium) on Austenitic Stainless Steel.

We have been asked on a number of occasions if such an instrument existed. Our normal response would

be “No” we would recommend the use of physical displacement methods i.e. Micrometer, Vernier calliper etc. or use a metal coupon that has been prepared the same as the original substrate and spray onto this at the same time of the main substrate and measure the thickness afterwards. The reason being up until now most instruments worked on the basis the coating was non- ferrous and the substrate steel and therefore magnetism was used.

Fischer Technology have now available the Phascope® PMP10 handheld coating measurement instrument. Please click this link for more details.

The instrument is not cheap however failure to achieve the required coating thickness can be expensive!

Feature Article - Automotive - Metal Spray Solutions

Since the inauguration of the motor vehicle in the late 1800’s, considerable change has been undertaken in the design and development of the motor vehicles we have today. The requirement for greater efficiency, speed and comfort whilst still being environmentally friendly is a key part of travel and requires materials which are lighter and more performance related. The Metal/Thermal spray process is used today to solve a lot of those issues not only at the manufacturing stage but also to reclaim worn parts

Exhaust system components

Exhaust system components in high performance vehicles have their surfaces coated with ceramics and anti–corrosive material to provide improved heat flow, increased power – through heat retention in turbos and exhausts, protects against local damage, elimination of the need for secondary heat shields.

Click this Link for the Press Release "Woof Develops Plasma Ceramic Coatings Range" . This article gives some examples of use of Plasma Ceramic Coatings in the high performance motor sport industry.

Piston rings

Piston rings have high wear resistance and less friction when coated with Molybdenum. Click this link for more information on the Metalspraying of Piston Rings

Cam and crank shafts

Cam and crank shafts are coated to give improved performance. Click here for more information on Metalpraying Crank Shafts

Aluminium Multi-Void Fin Tube

Aluminium multi-void fin tube for the cooling system allows the tube to be soldered when coated with Zinc. Click this link for more information on the Metalspraying of Multi-Void Aluminium Tubing

Gear Selector Forks, Clutch Disks and Synchronizer rings

Gear selector forks, clutch disks and synchroniser rings suffer from wear, so the application of a Molybdenum coating delivers high resistance to scuffing as well as constant friction coefficient for more precise gear selection.

Valves

EGR (exhaust gas recirculation) valves are extremely important components in modern exhaust systems, ensuring effective recirculation of a portion of the exhaust gas back to the combustion chamber and reducing temperature.

By using Metal/Thermal spray coatings, the life and efficiency of EGR valves can be greatly improved, thereby increasing overall engine efficiency and reducing mean time between failure.

Cylinder bores

Cylinder bores use plasma sprayed Molybdenum and Ferritic materials to eliminate the requirement of heavy cast iron linings.

Other Automotive Components

Examples of other components that are Metal/ Thermal sprayed include: Oxygen Sensors, Piston Crowns, Rear Axles, Valve stems, Valve Seat ring, Body panels (see video below), Clutch Diaphragm Springs (Link to Reclamation of Clutch Diaphragm Springs), Brake Discs, etc.

As you can see no other process could compete with the flexibility of coatings that can be applied combined with the ability to repair components in an environmentally friendly way.

Demonstration of Body Panel Repair, using Metal Spray

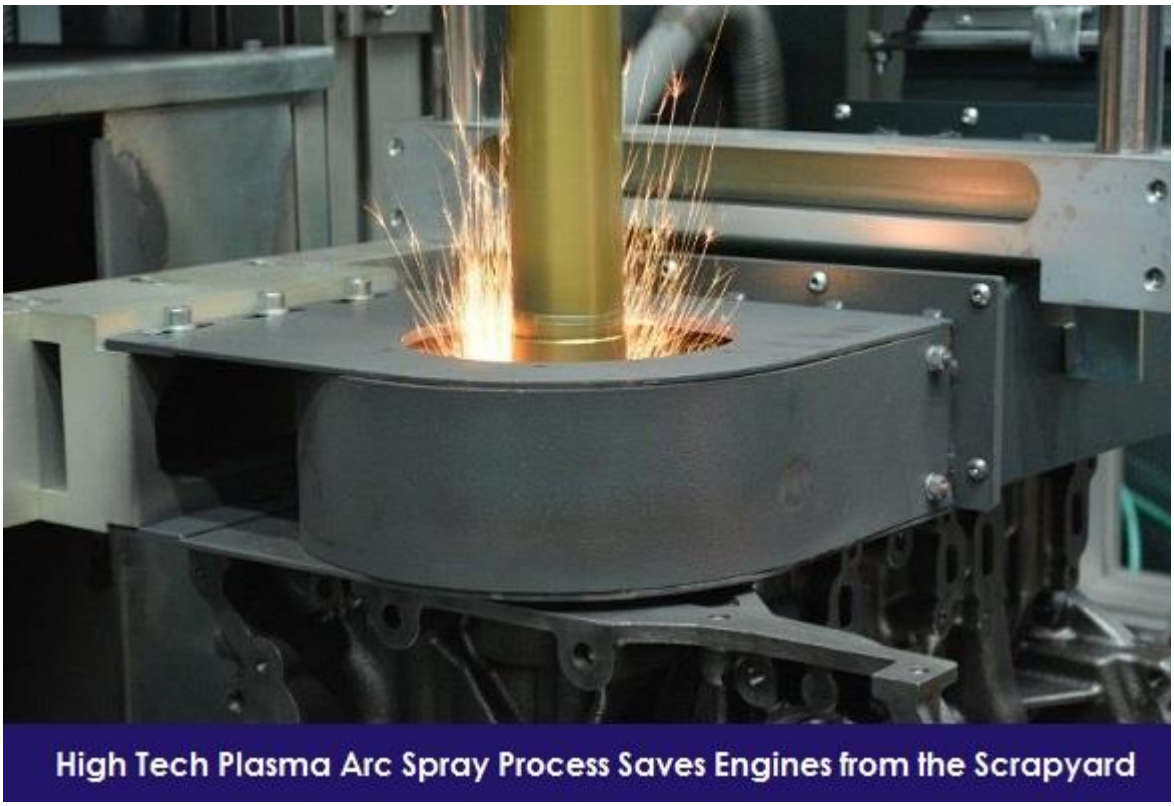
Did you know? - Ford use Metalspray to recycle old engines

The Ford Motor Company is recycling old engines, so they can be used again with the help of a special Ford-patented thermal spray coating technology. The process delivers a 50 per cent reduction in CO2 emissions compared with producing a new engine, requiring much less material.

“We have taken a process that was originally developed to enhance performance models such as the all-new Ford Mustang Shelby GT 350R and used it to remanufacture engines that might otherwise be scrapped. It is just one example of how Ford is looking to reduce its environmental footprint through a range of innovative measures,” said Juergen Wesemann, manager, Vehicle Technologies and Materials, Ford Research and Advanced Engineering.

The Plasma Transferred Wire Arc thermal spray process and other sustainability innovations are being researched and developed at Ford Research and Innovation Center in Aachen, Germany, and around the world. The use of lightweight materials such as aluminum, carbon fiber and high-strength steels also are being researched and developed for improved fuel efficiency.

This picture shows where a Plasma Transferred Wire Arc coating technology applied a spray inside a worn-out engine block to restore it to its original factory condition.



Furthermore, the research work also includes the use of renewable materials such as tomato fibers that are a by-product of Heinz Ketchup, bioplastics, and shrubs.

Engines today are designed to operate for many years and several hundred thousand kilometers in all imaginable conditions. However, in instances when an engine does fail, it is common practice that faulty units are simply replaced with a new engine, particularly when it is the engine interior that needs remanufacturing.

“Traditional engine remanufacturing techniques can be prohibitively expensive, and energy intensive, requiring iron-cast parts and intricate machining processes. The Plasma Transferred Wire Arc coating technology removes the need for additional heavy parts and the processed engine block has a new life as the base of a replacement engine,” said Mark Silk, supervisor, Powertrain Products, Ford Customer Services Division Europe.

Another car manufacturer is also using Metal/Thermal spray, click this link to find out which one?

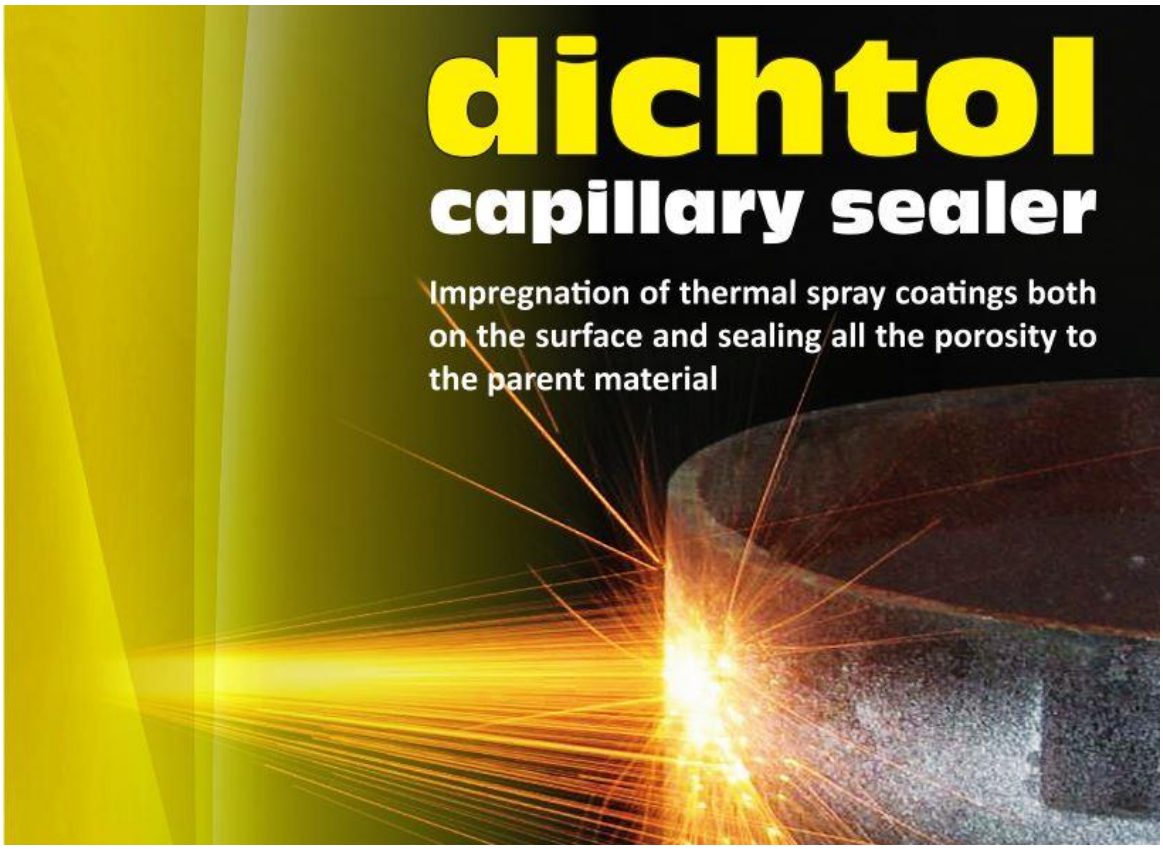
Interested in Automotive - Click Here for More Information

Product Focus - Dichtol "Metal Spray Coating Sealer"

In many cases there is no need to seal a metalsprayed coating, although dependent upon its area of application it can be a must. The use of metalsprayed coatings on hydraulic rods is one such area, where the coating is operating in hydraulic fluid under pressure. In this instance if the coating is not sealed there exists the possibility that the hydraulic fluid can penetrate the coating causing a blister and ultimately a coating failure.

Sealers can include paints as well as specially designed sealers. MSSA supply the Diamant Dichtol range of sealers which work based on capillary active impregnation (i.e. it penetrates into the coating).

Click Here: Technical Bulletin on Dichtol



MSSA Laboratory Testing Facilities - New Service

More and more Metalspray projects/contracts are requiring testing of coatings to prove that the coating has been applied to the correct specification. Although Laboratories in Australia exist the reading of the test results can be open to interpretation e.g. when checking a micrograph of a carbide-based coating how do you differentiate between porosity and pluck out during preparation of the sample?

MSSA can now offer the services of qualified personnel and laboratory through MEC (Metallizing Company of India).

MEC offer the following tests:
- Energy dispersive X-ray analysis (EDXA)
- Tensile test to measure bond adhesion strength
- Micro Hardness Test
- Porosity level test
- Micro structure analysis using Scanning Electron Microscope (SEM)
- Dry Abrasion Test in accordance with ASTM G-65
- Abrasive Jet Erosion in accordance with ASTM G-76

If this is of interest to you please contact our Sales Department who will assist you with your enquiry.

Feature Article in next issue of Newswire : **BIOMEDICAL**

Do you know about the different types of Spraying?

Metal Spraying	Flame Spraying	Arc Spraying
HVOF Spraying	Plasma Spraying	Masking

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