

THE IMF'S **NEW WEBSITE**

The Institute of Materials Finishing is pleased to launch its new modern website which can be found at www.materialsfinishing.org.uk



After much hard work and much consultation with IMF committees and our developer, we have finally arrived at what we feel is a fresh modern look website which is capable of being used on a tablet and smartphone.

In this modern day world of technology, the importance of website technology is paramount and we hope that you will find the website useful.

We have taken away a lot of the "older material", archived it and are aiming to keep the new website very much up to date.

The "Breaking News" sector will inform you of new events that may be happening such as upcoming webinars and symposiums and the "Education and Training" sector will supply all the information that is required for all the courses that the IMF provide together with an online application form. All the webinars are recorded, and we are looking to upload these so that people who may have missed them have the opportunity to listen to them again. Obviously there have been a few teething troubles on the way but hopefully these are becoming a thing of the past.

Going forward we are looking to providing a "student membership area where students can log in in order to get any information that they would need for their courses.

I hope that you will find the website informative and useful and if you do find any technical glitches then please let me know.

John Burgess (FIMF) Chairman M&M committee JohnB IMF@btinternet.com



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NEXT ENROLMENT DATE FOR TRAINING COURSES IS 6th September 2019

Contact Karen Yates
Tel 0121 622 7387

Email: karen@materialsfinishing.org

Congratulations to the 28 Foundation and 6 Technician Students, who were award qualifications in August 2019.



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IMF DIARY

3RD OCTOBER 2019 "A Night With Ali" Symposium to be held at the Churchillian, Portsmouth, P06 3LS

30TH, 31ST OCTOBER 2019 Advanced Engineering at the NEC

28TH NOVEMBER 2019 AGM Cobden Hotel Birmingham

24TH JANUARY 2020 Enrolment for Distance Learning

18TH, 19TH MARCH 2020 Surface World Hall 11 NEC

WEBINAR

3RD SEPTEMBER 2019 "The use of Surface Coatings to Prevent Substrate Failure" Graham Armstrong, Indestructible Paints

9TH OCTOBER 2019 "The Hull Cell – What is it?, how do you use it?, how to interpret the results" John Burgess, IMF

7TH NOVEMBER 2019 "Pumps And Filters And All You Need To Know About Them" Robert Sawyer, Serfilco

SECRETARY GENERAL'S COLUMN AUGUST 2019



So we have a new Prime Minister, with a new grouping of Ministers, and what seems to be a plan to rush towards a "no-deal Brexit"! I'm sorry to mention the "B" word so early in this column, but at the time of writing it's about the only thing we keep hearing about!

If we do end up with a "no-deal", then I fear for what could happen. There are so many variables from issues of importing raw materials and other vital products, to massive tariff impositions on products we try to export. Additionally I've no idea where sterling will finally come to rest against the dollar and euro, as there's enough volatility at the moment!

You'll remember in my report from the last Cross Sector Meeting that DEFRA in conjunction with HSE, have been looking towards provision of a UK REACH, if we do exit the EU without a deal. This is now looking like a strong possibility, which would involve a total re-registration of all chemicals into UK REACH, never mind any thoughts of "SVHC" chemicals requiring authorisation?

Even so, if any of us want to sell coatings back into the EU, that contain an EU REACH SVHC or authorised chemical, then we will need to employ a European person or company to act as our "only representative" who would need to manage the EU paperwork, together with a EU based import company. This linked with any export tariffs the EU would wish to apply could result in a nightmare scenario!!

Sorry to be such a harbinger of nasty thoughts!!

On a brighter note, if that is possible, I have been involved in the last few days with the most recent gathering of the Surface Engineering Leadership Forum (SELF). The grouping is gaining some momentum, with exciting plans over the next few months to promote the materials finishing and surface engineering industries..

At this recent meeting, several key initiatives were discussed, to include the preparation and launch of new apprentice standards with an emphasis on materials finishing and surface engineering. Institute of Apprenticeships, and this will be launched during 2020. It is expected that the course will be offered through Cranfield University, and a successful completion would lead towards an MSc qualification.

Following on from this, SELF is now to start work on the assembly of an apprenticeship standard to level 3. I hope to be closely involved with this, along with other interested members of the group, and it is hoped to have a review completed early in 2020. An initial thought would be to offer the course through IMF training, as both our foundation and technician courses would be a good fit!

SELF is concerned not only about recruitment and training of young scientists in the surface engineering industries, but also in moving these industries towards the digital age, to become initially best in class then to achieve world class. To assist companies to achieve this, SELF, through university involvement are devising a programme on "Digitising Surface Engineering", and will be running a series of workshops and summits to involve all areas of the industry.

To continue from the launch of SELF earlier this year at the House of Lords, SELF has committed to a booth at the Materials Research Exchange, to be held at the Business Design Centre in February 2020. This is a conference and allied exhibition part organised by Innovate UK, and look to promote new initiatives and excellence across a wide range of industries.

I do hope we can look towards some better news for UK Plc over the next 2 months with a resolution to the stand off on Brexit, so that by the time of my next column the political and economic climate will be a little more settled!

Graham Armstrong

August 2019



A level 7 standard has been completed, and approved by the

Dr.Yuri N. Zhuk, Technical Director, Hardide Plc (UK) Web: www.hardide.com

Hardide plc has been an IMF member for several years now and we appreciate the opportunity to introduce our company and technology to the IMFormations readers.

The Hardide patented nanostructured Tungsten Carbide CVD coatings were developed to protect critical precision engineered parts of oil drilling tools, pumps, valves, aircraft components against wear, erosion, corrosion, chemically aggressive acids. The coatings are crystallised atom-by-atom from gas phase by chemical vapour deposition (CVD) technology. This process produces a uniform and pore-free coating layer, which can be applied on both internal and external surfaces of parts, including non-line-of-sight areas difficult to coat by traditional methods. Some examples of coated complex shaped parts are shown on Fig.I.

There are several types of Hardide coatings; each has a unique combination of properties and features which address the requirements of a specific industry sector. Hardide-T coating, with thickness of 50 microns and hardness IIOO – I6OO Hv (70-77 HRc), was developed for the oil and gas industry to reduce wear, erosion and corrosion mainly from sand-containing fluids. In the ASTM G65 wear resistance test, Hardide-T outperformed Hard Chrome plating by a factor of 24x, and Inconel 7I8 by a factor of 400x, demonstrating that Hardide-T can significantly extend the life of critical parts in abrasive environments. The pore-free coating is also an excellent barrier against corrosion and chemically aggressive acids.

Hardide-A coating, which is less hard than Hardide-T, was developed for the aerospace industry as a REACHcompliant replacement for Hard Chrome plating (HCP). Hardide-A matches the HCP thickness (50...100 microns) and hardness (800...1200 Hv); this significantly simplifies the switch from HCP to Hardide-A as there is no need to change the pre-coating drawings and dimensions or perform stress calculations and testing. This coating has enhanced resistance to corrosion and excellent fatigue properties (minimum fatigue debit) – which is important

Fig.I examples of complex shaped parts coated with CVD Tungsten Carbide Hardide coatings







for structural parts of an aircraft. Hardide-A type coating has been qualified by Airbus as a replacement for Hard Chrome plating and several other aerospace companies are at advanced stages of testing.

Hardide-T and A coatings are produced using a lowtemperature CVD process at ~500oC. To expand the range of materials which can be coated we have recently developed ultra-low temperature CVD coatings Hardide-LT and LA which are produced at 350oC. The Hardide-LA coating variant is currently being tested on a range of temperature-sensitive aircraft materials with the support of a NATEP grant.

The nanostructure of the CVD coatings enable the combination of high hardness with enhanced toughness; two properties normally incompatible in traditional materials. In applications involving impact, shock loads or parts deformation under high pressure enhanced toughness is as important as hardness to prevent brittle failure. The coatings' nanostructure makes them nonabrasive for seals, bearings and counter-bodies, as the coatings wear uniformly retaining a good surface finish which is free from sharp and abrasive asperities typical of WC micro-grains. This coating property can help prevent leaks from hydraulic actuators and gearboxes, making them more reliable. Hardide Coatings main production and R&D facilities are located in Bicester Oxfordshire. where we coat parts for customers from the UK, the EU and Norway. Our UK manufacturing is certified to ISO 900I, ISO 1400I, AS9100 and NADCAP requirements and has advanced laboratory and analytical facilities used to develop new applications. In 2016, we opened a coating factory in Virginia, USA, to serve the growing demand from North America.

The use of these nanostructured CVD coatings can improve the reliability and performance of industrial equipment, reduce down-time and cut production costs, all of which make the industrial products more competitive globally.

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Editorial Article NACE: Corrosion costs \$ 2.5 trillion annually¹

Every year, corrosion causes an economic damage of more than \$ 2.5 trillion worldwide. Therefore, the prevention of corrosion, is an issue that plays an important role in many areas. The new MMS® Inspection series that is optimized for corrosion protection reliably supports the inspector in assessing corrosion-exposed components and in jobs that involve checking of corrosion protection.

Corrosion is the deterioration of a metal as a result of chemical reactions between it and the surrounding environment. This leads to a functional impairment of the metallic component over time. Accordingly, rust formation on a railroad track is not harmful, since the function of the rail is not diminished. However, a pipe which has become leaky due to pitting corrosion is clearly defective, since the safe transport of liquids is no longer guaranteed. The same applies to the maritime sector, where material surfaces attacked by corrosion on ship walls can quickly become a safety risk. There are serious consequences caused by corrosion in engineering structures such as bridges. If the steel structure corrodes without any control, a bridge can guickly become a threat to those who move on it. Furthermore, there are economic advantages to implementing proper corrosion prevention methods.

In order to protect metallic materials against environmental influences and thus corrosion, in most cases coating with suitable corrosion protection material is sufficient. The expense for this - passive - corrosion protection is relatively low in relation to the costs caused by corrosion such as loss of value, downtime, dismantling, etc. For companies and institutions saving on corrosion protection, it usually becomes expensive to repair the damages afterwards. This is especially so for structures that are very difficult to access after installation, such as offshore wind turbines. Corrosion protection involves regular inspection and checks for proper functioning. This means that inspectors and service personnel need to use targeted measurements to inspect if the quality of the corrosion protection coatings still meet specified standards.

With regard to coating thickness gauges used here, both magnetic induction method and eddy-current testing have established themselves as standards worldwide.



Magnetic induction is the method of choice for measuring the thickness of non-magnetic layers on magnetic base materials, e.g. layers of paint, plastic, galvanized or hot-dip galvanized layers on steel and iron. The eddy current method is suitable for electrically non-conductive layers on non-ferrous metals, such as e.g. paint, lacquer or plastic on aluminium.

Depending on the version, modern gauges such as the newly developed MMS® Inspection series from Helmut Fischer offer both measuring methods.

Helmut Fischer has made every effort to ensure the convenience of the user. For this reason, international measurement standards such as SSPC PA2 (Level 1-5), IMO PSPC, ISO 19840, Australian AS 3894.3-2002 or Swedish IS 1841 60 are firmly integrated as pre-configured batches or measurement specifications via the software. The dew point measuring device MMS® Inspection DPM, which belongs to the same series, measures the dew point before the corrosion protection paint is applied. It this helps to ensure that the coating is applied under proper environmental conditions. If the conditions are not suitable, premature corrosion may occur or the paint may peel off as a result of poor adhesion.

¹⁾NACE International, impact.nace.org (2016)



The clock is ticking for nPB With less than a year to go until the use of nPB is banned, business are required to act now.



What is nPB?

Short for normal Propyl Bromide, nPB is also known as solvent 1-bromopropane. It is a solvent commonly used in the cleaning and degreasing process for the aerospace, precision engineering, medical, optical and electronic industries.

Why do I need to stop using nPB?

nPB is as a hazardous substance, which can damage fertility and harm unborn children; it is identified in the risk section of the MSDS sheet. As such, it has been registered as a Substance of Very High Concern (SVHC) under REACH which regulates the supply and use of chemicals in Europe. Any substance meeting the criteria for SVCH may be placed on the 'Candidate List' and/or the 'Authorisation List' (Annex XIV), which invites companies wishing to use these substances to seek

an 'authorisation' from the European Commission (EC).

nPB has been placed on Annex XIV, so a 'sunset date' of **4 July 2020** has been set. After this date, its use is banned, unless an authorisation has been granted for a specific use and no alternative is available.

In most cases, there are suitable, safer alternatives to nPB, so unless they have a permit, the majority of businesses will be prohibited from using the substance from July next year.

What do I need to do?

If you're still using nPB, now is the time to act as the process of selecting an alternative can take time. The first step is to find an alternative solvent. The good news is, there's a range of new generation solvents which are much safer, and also more environmentally friendly. For solvent cleaning, the Opteon[™] range from Chemours[™] is an extremely safe, ultra-low environmental impact and cost-effective option. The newest product in our portfolio is Opteon[™] SF80, which is a nonflammable, and environmentally friendly solvent with no ozone depletion potential, an ultra-low global warming potential (<2) and does not contain any products regulated under F-gas regulations. SF80 is an effective replacement for nPB, TCE, HCFCs, PFCs. HFCs and HFEs solvents, and is becoming known as the leader within a variety of cleaning applications.

Things to consider

- Don't replace one harmful substance with another
- Make sure you comply with F-gas regulations
- Allow plenty of time

For more information on how the nPB ban could affect you and your business please contact Fraser Technologies.

For more information please contact us: Tel: 01506 443058 | E-mail: sales@frasertech.co.uk | www.frasertech.co.uk

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TRANSACTIONS

The publication 'TRANSACTIONS OF THE IMF' is an international journal for surface engineering and coatings and is available to download worldwide and as a part of Science & Technology Library, (ST Library). In the first 5 months of 2019 there were over 9286 Full text downloads of the articles published, this is a record for recent years which demonstrates the growing success and popularity of this publication.

Transactions provides international peer-reviewed coverage of all aspects of surface finishing, surface engineering and surface functionalization, from fundamental research to inservice applications. Finishing processes include aqueous and ionic liquid electrodeposition and electroless plating, as well as coating processes involving polymer/paint, powder and of course all of the pre and post treatments necessary.

Following our history many of the technical articles to date have related to the electrochemical technology markets and many of these articles have been provided by some of the up and coming leading technicians and PhD students across the world as well as many established and recognised names already working in the industry and we thank them considerably for their continued work to develop and pioneer new technology. We would like to also receive articles from the polymer/paint and powder markets.

We would, therefore, like to send out an appeal to ALL our Sustaining Members to, please, also submit any articles in ANY branch of 'Materials Finishing', the TRANSACTIONS magazine is in 2 parts, the rear section is primarily for 'NEW' scientific or technological papers, and these can be related to any finishing techniques, such as new chemistry, additives, environmental...., and the front section is being developed for more day to day announcements regarding your business achievements or important news, so please consider sending us articles. This is our way of supporting YOU.

Contributions are very welcome on novel technologies to tailor surface profiles. Texture, opacity, contact integrity, tribology etc; the scope is endless.

For information and guidance on how to submit please see www.tandfonline.com/ytim

Articles and news for consideration should be sent direct to the institute at www.materialsfinishing.org Email: karen@materialsfinishing.org

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SOUTHERN BRANCH MEETING | A NIGHT WITH "ALI"

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All you need to know about Aluminium

The Institute of Materials Finishing in conjunction with The Welding Institute, Southern Counties Branch will be holding a seminar entitled:

A Night with "Ali" Date: Thursday 3rd October 2019 commencing at 17-00

Venue: The Churchillian Portsdown Hill Road Portsmouth PO6 3LS

Presentations:

TWI contribution

- Industrial Gases for Aluminium Industry
- Aluminium Welding

Directions:



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- Aluminium Federation Aluminium, Aluminium Alloys and the Growth of Aluminium Products in the UK
- The electroplating of Aluminium and its alloys

Exhibitors: There will be space for 4 - 5 exhibitors. A charge of £50 to include 1 buffet. If you are interested, please contact: **JohnB_IMF@btinternet.com**

Attendees will be charged £10 to cover catering expenses and if you wish to reserve a place please email to John Burgess: **JohnB_IMF@btinternet.com**

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For Sale Hanna Auto Titrator HI-90ICI-02 sn III82303 and Accessories

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All items I year old and in barely used condition, it didn't suit us so we have reverted back to manual titrations.

Original box, contents as listed in photo, with 25ml Burette worth £3570 + VAT

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