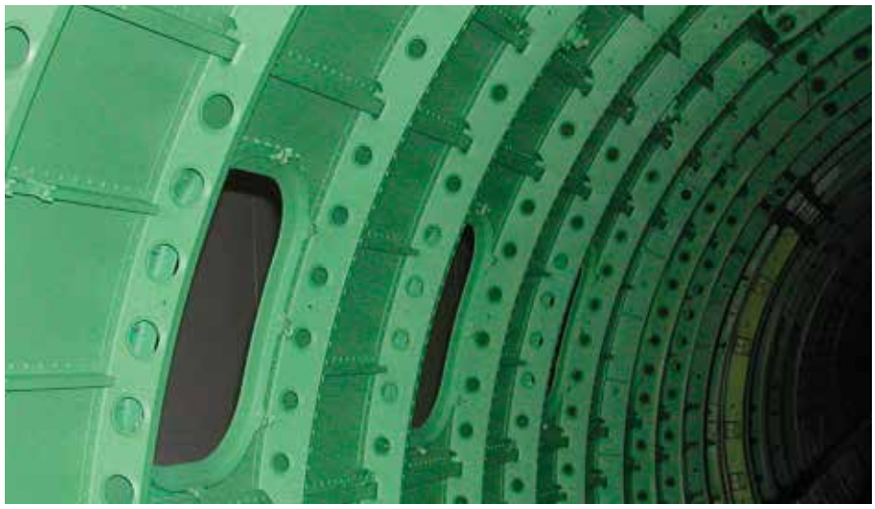
*Jim Rowbotham*, Chairman, BCF Aerospace and Defence Coatings Group and *Trevor Fielding*, Regulatory Affairs Manager, BCF, discuss the challenges facing the aerospace and defence coatings sector as a result of REACH

# Intended and unintended consequences of REACH

All sectors of the paints and coatings world are experiencing challenges as a result of the EU chemicals legislation REACH, Regulation (EC) No 1907/2006. Some have seen only a modest impact, whereas other sectors, such as aerospace and defence coatings, are preparing for major changes on the horizon. These include restrictions on key chemical substances (that have been used for corrosion protection for more than 50 years), as well as revision of the framework of aerospace standards.



## SUBSTANCES IN THE SPOTLIGHT

Readers may be aware of the key impact of REACH so far on the aerospace sector, namely the classification of chromium (VI) compounds as Substances of Very High Concern (SVHCs) and the subsequent Applications for Authorisation (AfA) under way for these substances. There are three consortia currently operating in this field, preparing and submitting AfAs for surface treatment chemicals for metals, as well as for pigments used in protective coatings. The CCST consortium of aerospace paint manufacturers and users has submitted several AfAs for the key chromate pigments (strontium and zinc chromates) requesting a 12-year authorisation. Favourable opinions on chromium trioxide for surface treatment uses were confirmed by the two European Chemicals Agency (ECHA) review committees in June 2016, however only supporting periods of four or seven years, depending on use. Industry is, therefore, optimistic that the requested AfAs will be granted soon and that the use of these hexavalent chromates can continue after their REACH 'sunset' dates (January 2019 for strontium chromate).

There are an estimated three million components in each of the 20,000+ aircraft currently flying. The demanding nature of aerospace applications and potentially serious consequences, if just one of these should fail, means that great care is being taken to develop and qualify chromate alternatives. Paint manufacturers are working with aircraft manufacturers and operators to develop chromate-free primers, which are finding increasing use, particularly for exterior applications. However, the absolute performance of these new primers has not been validated when compared with established data for chromate primers and, thus, they are not yet in use for primary structures. The wide-scale commercialisation of chromate-replacement technologies in the short or even medium term, does not look promising, according to the conclusions from the recent HITEA (Highly Innovative Technology Enablers for Aerospace) project – only limited information from this project has been published, due to issues of intellectual property and potentially patentable technologies.

Other substance-related issues are now entering into the spotlight. Isocyanate-based / urethane technology is essential for providing outdoor-resistant topcoats for aircraft – no other technology comes close to meeting the requirements to protect aircraft fuselages. A dossier proposing restrictions to the use of isocyanates (which are respiratory sensitisers) is currently being prepared and, if supported by the EU authorities, will undoubtedly have a profound impact on current practice in the aerospace industry. All spray applicators of 2-pack urethane coatings could be required to attend a formal training programme and hold a certificate of competence, to ensure that their exposure to isocyanates is kept to a minimum, through best practice, extraction provision and the correct use of personal protective equipment. The catalyst Dibutyl tin dilaurate is also coming under the spotlight due to REACH and many other substances are still to be reviewed. Another unintended consequence caused by the REACH authorisation process is the potential to destabilise the market, through the loss of a level playing field. This can arise through the granting of an authorisation to a single manufacturer, creating a monopoly situation, as has been seen with one range of pigments recently.

## REACH 2018

There is a further issue of great concern that appears to be outside of anyone's control – the loss of substances as a result of the final REACH registration stage, mainly on economic grounds. By June 2018 all substances used in quantities greater than one tonne/yr within the EU must be registered with ECHA. The problem is that substance manufacturers and suppliers are not legally obliged to reveal their intentions with regard to the future of their products. Coating manufacturers are often three or more links down the supply chain from the

base chemical substance (identified by a CAS number) supplier. The information currently being provided to BCF members by their suppliers is understandably very limited, as there are commercial interests and business relationships at stake. The outlook is not good, as confirmed by ECHA – it announced in May that less than 10% (5700) registrations, of the expected 60,000, have been submitted so far, which equates to only ca 3000 substances of the anticipated 25,000.

A typical aerospace coating formulation contains 10-20 components (chemical intermediates, such as binders, crosslinking hardeners, additives), however many of these require perhaps five to 10 or more chemical substances for their production, resulting in a single coating formulation potentially relying on the successful REACH registration of anywhere between 50 and 150 substances. With the loss of just one substance through lack of registration, coating manufacturers may potentially be legally forced to withdraw key coatings from the market, leaving a void in the sector's capability to provide comprehensive protection for all aerospace requirements. It is like a house of cards – removing one card could bring the whole house down.

## STANDARDS AND SPECIFICATIONS

Another significant consequence of the REACH activity related to chromates is the need to review and update standards used within the aerospace and defence industry. These include a mix of long standing British Standards (eg BS 2X33:1998, BS

2X32:1998), standards created specifically by the Ministry of Defence for its purposes (eg Def-Stan 80-series) and European Standards (managed by ASD-Stan). The national standards have been somewhat neglected in recent years, whilst aircraft manufacturers, such as Airbus and Boeing have continued to develop their own engineering standards, to allow the use of chromate-free technologies on airframes.

With regard to the national standards, there are two issues: the necessary approach to use standards as an integral part of procurement and the problem that many of these standards refer specifically to technologies and chemistries, rather than coating performance. For example, for a supplier to strictly meet BS 2X33, it would have to supply a chromate-containing 2-pack epoxy primer coating; chromate-free alternatives do not meet the description of the standard, so theoretically could not be procured.

The sector needs very stringent and well-established performance parameters to ensure the continued protection of aircraft. Many current standards are no longer appropriate in this new era of REACH legislation. The challenge is that review and revision of standards costs time and money, and there are very limited resources within the appropriate organisations to attend to such activity. A new joint Working Group on Standards has now been set up between the BCF and the MoD and industry is also actively engaging with the BSI with regard to specific British Standards that need urgent attention.

## CONCLUSION

The aerospace and defence coatings sector faces a broad range of challenges, as a result of REACH. To maintain a sufficient level of stability and control, in terms of assuring product performance and, ultimately, aircraft safety, will require a great deal of effort, expertise and resource for the foreseeable future, on the part of substance suppliers, coating manufacturers, aircraft component manufacturers, government departments (such as the MoD) and Standards bodies.

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# Airbus approval for Indestructible Paint

Indestructible Paint is delighted to announce that it has been approved by Airbus for key fire protection coating systems. The accreditation marks the latest in some 20 years of approval from many of the leading aerospace manufacturers in the world and reflects, in particular, on the Birmingham-based company's commitment to research and development.

"This latest achievement refers to our specialist IP9189A/B+IP3-0000 coating system, which meets the requirements of the Airbus ABS 5941A standard", says Brian Norton, Indestructible Paint's Managing Director. "It will provide fire protection on the latest Airbus aircraft and is part of our recent development of intumescent paints that provide a high thermal barrier. Their performance is centred on the provision of extended fire resistance."

The achievement is a culmination of a focused project that has seen Indestructible Paint's Research and Development laboratory work closely with Airbus technicians in Germany and adaptors in the UK. The development process included multiple specimen testing that involved factors, such as leech assessment and humidity resistance.

"The aerospace sector has been at the heart of our success since our formation and, as a result, we have developed a

comprehensive understanding of protective coating performance requirements", adds Brian Norton. "In many cases, this is built round safety critical objectives and this latest achievement, of which we are very proud, is a clear reflection of our knowledge and commitment in the field."

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