AeroSpace and Defence Industries Association of Europe

Attachment to 4th Annex XIV Web-site responses 19 September 2012

ASD General Comments on Annex XIV Consultations for Chrome (VI) Substances

Use of Chromates and Alternatives Development

In the aerospace and defence industry, Chromates are used in chemical processes and paint systems, primarily for corrosion protection of metal components, where the chromate ion is typically converted chemically in the manufacturing process. Many Chromate based processes and products are also used in other industries, and the Aerospace and Defence sector are minority users of these chemicals. However, the technical requirements of the aerospace and defence industry are usually much more demanding.

The industry has been trying for many years to identify and qualify suitable replacements for chemical products that rely on Chromates for their production. Major aerospace and defence manufacturers have invested in alternatives development for decades to resolve the issue. To date, suitable replacements have been identified for some but not all applications.

Even if they are successful, existing research and development programmes mean that alternatives cannot be in place before 2017 or 2018 at best, and most of this work is focused on the chemicals in the 3rd Annex XIV recommendations. Based on experience to date, it is highly unlikely Chromates can be substituted in all applications, particularly in the maintenance of existing products. The aerospace and industry has no alternative to continuing to use Chromates for the foreseeable future.

Compatibility of alternatives with existing products for repair and overhaul purposes over the product life is a significant concern. Without such compatibility, product or sub-system replacement becomes the only viable alternative. This has environmental consequences (resource efficiency) as well as substantial issues with commercial viability.

Anti-corrosion protection is a system issue, where multiple layers and treatments are involved. Alternatives are in research as a result of Annex XIV 3rd recommendations. Where the 4th recommendations affect the same systems, the addition of these substances extends the challenge further; since testing is dependent upon the outcome of existing programmes, where success is not assured. This creates substantial uncertainty, since development of alternatives for 4th recommendation substances are dependent upon already uncertain outcomes.

Resources for alternatives development are specialist in nature, and limited. They are already wholly focused on the 3rd Annex XIV proposals, with little opportunity for further stretch.

Once alternatives are identified and validated as fit for purpose, substitution in existing product and maintenance use is expected to take significant time to accomplish, of the order of 2 years. This is a result of the substantial work required to update specifications and drawings, their deployment across the supply chain, and adaption of existing manufacturing facilities and the substance/mixture supply chain to meet the need.

A summary of current uses are as follows:

Substance	**CAS n°**	**Use**
Strontium chromate	7789-06-2	Adhesive bonding primers, Anti-corrosion interlay sealing compounds, Epoxy primers, Paint primers
Potassium hydroxyoctaoxodizincatedichromate	11103-86-9	Anticorrosive primer paints, wash primers and jointing compounds (sealants) for aluminum, steel or anodized aluminum substrates.
Pentazinc chromate octahydroxide	49663-84-5	Wash primers and jointing compounds (sealants) for aluminum, steel or anodized aluminum substrates
Dichromium tris(chromate)	24613-89-6	In “ready-to-use” stick used in chemical conversion treatment of aluminum alloys against corrosion. Preparation before painting and refinishing after treatment of corrosion, local corrosion protection in aircraft maintenance

Chromate – Chromate Substitution Potential

A concern has been raised that if the sunset date for the Chromates in the 4th Annex XIV proposals are not synchronised with those in the 3rd set of proposals, then the industry will simply move from one chromate to another.

Different chromate compounds have different characteristics, such as solubility, or the functional impact of the positive ions in a given salt. For example, Strontium Chromate is used in many corrosion preventative primers, whereas Chromium Trioxide tends to be used in aqueous solution for its electrolytic properties. Different elements of corrosion systems therefore use the different characteristics of the various chromates.

The Aerospace and Defence industry requires substantive validation evidence relating to any such changes to key materials, and the process of substitution is non-trivial. We do not therefore view such tactical chemical substitution to manage different sunset dates as a viable outcome.

Challenges Resulting from Annex XIV Inclusion

Much of the Aerospace industry has highly complex supply chains, with thousands of companies and at least six layers between chemical manufacturer/importer and the manufacturer of the final product. These include parts suppliers, assemblers, processing companies, formulators and distributors in addition to the manufacturers and importers of the substances themselves. This creates substantial complexity in the process of Authorisation, which is expected to take a substantial period of time to accomplish.

This problem results in a significant conflict with Authorisation under provisions of the REACH regulation should the typical last application date of publication +3 years be adopted. Typical timescales documented in Annex XIV to date are significantly in conflict with the timescale that the industry needs in order to engage the supply chain in preparing the necessary Authorisation dossiers, ensure continuity of supply and ensure compliance to the legislation. The Aerospace and defence industries have no choice but to apply for authorisation to continue the use of Chromates, to support the entire product lifecycle.

The process of Authorisation is untested and complex, particularly in the context of highly complex supply chains, where the needs of many downstream user companies must be considered, many of which are Small or Medium Enterprises with insufficient experience or capacity to understand or manage the process. Recent experience in the Chromium Trioxide Authorisation Consortium brings out other challenges:

1. In industries producing very complex products, an Authorisation must flow from the upstream supplier of the chemical to ensure it covers our complex multi-layer supply chain.
2. Such ‘top-down’ Authorisations add significant complexity since these chemicals may be used by a very wide range of industries. The process of developing Authorisation dossiers that support continued use in such a diverse range of industries is far from clear, with no precedents.
3. Authorisations are supported by socio-economic impact assessments, analysis of alternatives and substitution plans if relevant. It is unclear how these elements, which are end-product specific, can be managed through an Authorisation application made by companies many layers up the supply chain, serving multiple industry sectors.
4. A consortium approach is necessary to manage the above effort. The first consortium of this nature, which is acting as a pilot for other Authorisations, has over 170 member companies, has taken over a year to set up, and is still exploring how to manage this complex and inefficient task.
5. The legislation does not allow a rejected application for Authorisation to be revisited, since there are no appeal mechanisms, and a second attempt would miss the latest application date. The consequences of failure would stop our industry.

In the case of the 4th consultation, there is further complexity due to interaction with substances already proposed in the same corrosion protection systems, and due to a substantially increased number of formulators involved.

Proposed Solution

1. Delay the entry of chromates into Annex XIV

No purpose is served by prematurely placing a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. ASD considers it to be essential that the timescale to replace Chromates and the timescale imposed by the regulation are aligned. Once Chromates are in Annex XIV that timescale is fixed, the only flexibility lies in the selection of the date that it enters Annex XIV.

These are expensive and resource-intensive processes, to the extent that many companies have a policy of starting the alternative development and substitution process as soon as the substance is added to the Candidate List rather than waiting until it is in Annex XIV. The global aerospace and defence industry is anxious to replace these substances as soon as possible.

2. Have an extended sunset period for the substances

A minimum of 60 months between publication and the latest application date is requested, and should be set well after the chromates in the 3rd recommendation in any case. This maximises the potential to deploy alternatives from existing development programmes, accounts for the results of alternative developments in other parts of the corrosion protection system, and ensures sufficient time to manage any Authorisations in our complex supply chain context where alternatives development is unsuccessful. This also accounts for any learning from Authorisations resulting from the 3rd recommendations.

Industry will only want to start the process of applying for authorisation once it knows for certain that it cannot qualify a replacement chemical product in time.

Conclusion

We are in a situation where a new, complex and untried process is critical for our industry, and which will be implemented without industry having yet found a solution to this issue, despite substantial efforts applied. Industry needs time to develop its approach, to ensure that successful applications can be assured.

A minimum of 60 months between publication and the latest application date is requested, resulting in a sunset date in 2020 or later. This has the following benefits:

1. To ensure a route can be found through the Authorisation application process in the difficult and unclear context described above;
2. To increase the potential for alternatives to be found and substituted, thereby reducing the need for such Authorisation;
3. To avoid unnecessary diversion of resources from the development and substitution of alternatives onto Authorisation activities.
4. To allow for learning from Authorisation and substitute development relating to the 3rd Annex XIV recommendations.

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