Austrian Airlines is part of the of the Lufthansa group. At Austrian Airlines we provide excellent MRO (maintenance repair organisation) services to our customers and at the same time we guarantee a whole raft of our requirements ranging from safeguarding air safety, properly managing aircraft operation, and minimizing costs while keeping a healthy working environment.

Austrian Airlines is member of the Association of European Airlines (AEA) and works closely together on relevant technical issues if necessary.

The comments in this document are made in close cooperation with several other AEA members and with ASD (Aerospace and Defence Industries Association of Europe) the national trade organizations and with the Original Equipment Manufactures (OEMs) within and outside Europe.

Therefore the following statement is identical for several AEA members.

General Comments

In the Aerospace and Defence industry, chromates are the basis for corrosion protection throughout the aircraft in safety critical applications. Dichromium tris(chromate)'s use for corrosion protection in these applications is due to the substance's ability to prevent corrosion on products that experience a wide range of atmospheric and usage conditions through normal and required use.
Aerospace products must perform throughout a range of conditions including temperature, humidity, elevations or pressure. Aluminum alloys and other metal alloys used in aerospace construction are susceptible to corrosion which is a potential for condensation of moisture on metal surfaces. Therefore elimination of chrome containing materials, that are an important part of the corrosion control system used to meet the European Aviation Safety Agency (EASA) and U.S. Federal Aviation Administration (FAA) requirements, could increase instances of failure due to stress corrosion cracking when there is no substitute with equivalent performance identified and qualified. Given the complex geometry of aerospace construction, such cracking may not be apparent through routine inspection and maintenance before reaching failure point.

Based on their ability for corrosion protection the industry uses a wide variety of chromates in various products and applications.
Any alternatives must be compatible with systems on existing and in-production fleets.

The listing of chromates under REACH means a business critical concern for all companies out of the aviation industry. This is why the overall industry concern is also stated e.g. by the ASD and comments are handed in for all these substances (looking at the 4th consultation e.g. also for Strontium chromate).

Use of Dichromium tris(chromate)

Dichromium tris (chromate) is used in the aerospace sectors through the application of conversion coatings which allow the industry to make use of the self-healing corrosion protection properties in

safety critical applications as well as in painting preparations and refinishing after treatment of corrosion.
Conversion coatings are used on aircraft construction parts within the aircraft to repair Chromic acid anodizing coatings where anodizing cannot be carried out. The Chromic acid anodizing process provides self-healing corrosion protection and is typically used on load bearing parts or parts subject to fatigue. It is regularly used in safety critical environments where any corrosion would be considered to have deleterious impacts and would not be easily observed.
This process is used on structural components with expected life cycles in excess of 30 years eg military and civilian airlines and space equipment.

Many areas of the products needing these kind of treatments are inaccessible and hard to inspect for damage following product delivery. These product areas are expected to last for the anticipated product lifespan which can range from 30 to 90 years. Detailed inspections, repairs and maintenance procedures occur only during major maintenance intervals and overhaul operations

Research efforts
All European and Non-European OEMs are committed and actively working towards reducing the use of all hexavalent chromium compounds throughout the aircraft. Several airlines and Maintenance, Repair and Overhaul (MRO) companies have been active in close cooperation with the OEMs and chemical suppliers to test new alternatives and to monitor results over many years of testing under various circumstances. Although significant research efforts are still ongoing, suitable replacements could be found just for few applications. Many alternatives have been tested, but have not passed the performance requirements identified in the applicable specifications. For those applications where an alternative is successfully tested, validated and meets the safety requirements, the aviation industry has implemented these already. But more often no drop-in alternatives exist today or should be expected for a majority of aerospace uses in the near future. As chromates are unique looking at their corrosion protection characteristics it will likely take several substances to fulfill all of the requirements for the numerous materials and processes that currently rely on chromated materials for critical aerospace applications.
Due to the absence of drop in replacements in most applications, it's not possible today to set a sunset date for Dichromium tris(chromate). Alternatives must be a suitable replacement not just for new aircraft developments but for our industry must also be compatible with maintenance and overhaul processes for existing fleets (which will be in-production and in operation for the next decades). From the point at which a viable alternative becomes available, extensive empirical data will be required to establish airworthiness.This means extended tests during flight circumstances for many years (maintenance cycles usually over 5 years) before results are visible and certification requirements might be met.

Challenges
The inclusion of Dichromium tris(chromate)in Annex XIV for authorization - along with the other chromate containing material - would put the European Aviation industry under significant safety and business risk fostering supply disruptions and obsolescence and competitive disadvantage. The aviation industry, which conducts maintenance repair and overhaul, depends on the processes prescribed by OEMs (original equipment manufacturers). Therefore our industry is forced to carry out these prescribed processes and meet the safety requirements set by EASA and FAA to gain airworthiness.

As the authorization procedure is unknown and inexperienced it does not mean a guarantee for ongoing product availability and safe production and operation conditions.

This is why AEA strongly believes that it would be very problematic to test the yet unknown and immature authorization process on such a complex industry vitally relying on the use of the currently only available substance to meet its safety requirements. The related risks are impossible to be assessed completely, to discard, nor to manage safely. If authorization is not granted, there are no chances foreseen to repeat an authorization application which means a complete stop for aviation business in Europe.

Transitional arrangements

Currently, no alternatives have been identified for most aerospace uses of Dichromium tris(chromate) used in chemical conversion treatment and preparations before painting and refinishing.

Even if an alternative is identified in the laboratory in the very near future, the subsequent testing, qualification, certification and implementation would require a minimum of 15 - 20 years, with airworthiness certification dependent on demonstration of equivalent level of safety to the Dichromium tris(chromate)materials. This is why AEA strongly support the Aerospace and Defence industry's view with regard to the delay of the entry of Chromates into Annex XIV at this time until suitable exemptions are in place which recognizes the need to sustain the supply chain.

Thus, if an exemption (see our next comment under "Comments on uses that should be exempted, including reasons for that" within this form) is not possible for aerospace uses, AEA urgently recommends an extended sunset dates of 2030 for the addressed safety critical and aerospace specific uses for all process types. This is necessary for the industry to continue research development and testing for alternatives instead of putting all efforts into the authorization process.

Exemptions

Due to its substance's properties Dichromium tris(chromate)will be necessary in products for several decades to maintain operability of all existing and in-production fleets of civil and military aerospace. Even though chromate based processes and products are also used in other industries, the process of authorization especially threatened the Aerospace and Defence sector. The aviation industry as an 'downstream user' is a minority user of these chemicals, where in parallel the technical requirements out of airworthiness requirements are usually much more demanding than in other industry applications. So the low volume used by the aerospace industry (even if chromates are authorized) and uncertainty whether authorization will be granted would threaten the availability of aerospace specific products. The uncertainty to be able to use or even buy Dichromium tris(chromate)and other chromate containing materials and its products in the EU would be disruptive to the complex aerospace supply chain. An uncertain supply of products containing Dichromium tris(chromate)or other chromate containing materials would mean that all actors out of the European Aerospace sector would face a high business risk as it won't be assured anymore that they could work in compliance with international given airworthiness requirements which in turn are the basis for ongoing and safe operation of existing fleet throughout their whole life cycle. So the inclusion of Dichromium tris(chromate)in Annex XIV for authorization will put the European aviation industry (suppliers and operators) under significant safety and business risk fostering supply disruptions, obsolescence and competitive disadvantage.

Furthermore as anti-corrosion protection of aircraft (parts) is a system with different corresponding layers and treatments, several substances – now proposed for Annex XIV inclusion – are necessary in parallel. So the addition of more and more substances in Annex XIV, which are relevant for aviation applications, increases substantially the needed effort to research for alternatives. The decision if an alternative is suitable depends on the results out of another extremely difficult alternative research program. This creates substantial uncertainty, since development of alternatives for these substances are dependent upon already uncertain outcomes.
Taking into account the aspects described above as well as the fact that strict control measures of the aerospace manufacturing, maintenance and repair processes guarantee a safe working environment for workers and the absence of a release to the environment of hexavalent chromium, it makes no sense to prematurely place a substance that has no replacement into Annex XIV and then spending large resources making and approving applications for its continued use. Especially as research and development measures have been in place since decades and are strengthened simply by addition of a substance to the Candidate list.

Thus, considering all the aspects mentioned above AEA highly recommends an exemption for all uses of Dichromium tris(chromate)from the authorization process.

Review periods
For the reasons outlined above, if extended application and sunset dates are not possible, AEA suggest a review period of 15 years for any authorizations granted for aerospace uses. If the extended application and sunset dates are possible, AEA believes a review period of 5 - 10 years would be appropriate.