REACH Update
For EU Chemical Processors

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Supply Chain Chemical Risk Management,
The Boeing Company
Agenda

• REACH Introduction

• Compliance Requirements for Chemical Processors

• Regulatory Update: Substance Activity

• Authorisation to Continue Using Chromates
  • Status of Applications for Authorisation
  • Resources

• BREXIT

• Supply Chain Chemical Composition Declarations

• Summary: Key Obligations for EU Chemical Processors

• Additional Resources
  • IAEG
  • Aviall
  • Technical Support for Boeing Hardware
REACH: Introduction

Registration, Evaluation, Authorisation, and Restriction of Chemicals

- European Union chemical management regulation (2007)
  - Compliance applies within the EU

- Covers manufacturing, import, and use of substances:
  - By themselves (e.g., strontium chromate)
  - In mixtures (e.g., paints, sealants)
  - In “articles” (e.g., landing gear assembly)
    - Emphasis on Substances of Very High Concern (SVHCs)

- Substance use bans/restrictions in the EU are biggest threat to production
  - Includes aerospace-critical chromates
    - Banned on sunset dates unless “Authorised” for continued use
  - Impact of obsolete materials is felt globally

Requires understanding chemical composition of materials used
Any process using chemicals in the EU is subject to REACH
### REACH: Compliance Requirements for EU Chemical Processors

Not all REACH requirements are explicitly stated here. This summary is not intended to be guidance or legal advice.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>EU Chemical Processor</th>
<th>EU Manufacturer (component/assembly)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Registration of new and existing substances</strong></td>
<td>No likely requirements, if under import thresholds</td>
<td>No likely requirements, if under import thresholds</td>
</tr>
<tr>
<td><strong>Communication of SVHCs in articles</strong></td>
<td>Determine SVHC content added in processing and communicate safe use information (as needed)</td>
<td>Provide chemical composition and safe use information to customers of articles</td>
</tr>
<tr>
<td><strong>Notification to ECHA of SVHCs in articles</strong></td>
<td>No likely requirements, if under production/importing thresholds</td>
<td></td>
</tr>
</tbody>
</table>
| **Authorization to use Annex XIV “banned” substances** | For substances banned from use in the EU:  
- Implement alternative chemicals; or  
- Ensure uses are covered by Applications for Authorisation; or  
- Cease use/production in the EU (after the sunset date)  
  * Example: chromates |                                                                                                |
| **Restriction on marketing and use of Annex XVII substances** | For substances restricted from marketing/use (in the EU):  
- Implement alternative chemicals/technologies; or  
- Obtain safety exemption (prior to listing); or  
- Cease production/imports  
  * Examples: flame retardants, cadmium in plastics, phthalates, ...  
  * Little impact to chemical processors from current Annex XVII substances |                                                                                                |

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**Substance bans and restrictions are primary risks to production**

Responsibility typically lies with chemical importers and manufacturers.

Driving the need for industry chemical composition declarations.

Risk to EU production from Authorisation requirements for chromated materials.

Future restrictions may target occupational exposure limits.
REACH Update: Substance Activity

• SVHC List (Candidate List of SVHCs for Authorisation)
  • 197 substances as of 16-May-2019
    – Pace is slowing. SVHC Roadmap to 2020 has become the Integrated Regulatory Strategy
  • IAEG WG5 supply chain mapping (surveys!) of aerospace substances
  • Recent list 16-Jan-2019 of 6 new substances: no Aerospace comments submitted

• Annex XIV “Authorisation List”
  • 43 substances as of 1-May-2019
  • Most recent addition: ethoxylates (contained in some Aerospace sealants)
    – EAAC Application for Authorisation being filed
  • More proposed (e.g., BPA, anhydrides): expected vote June-2019

• Annex XVII List of Restrictions
  • Recent additions impact manufacturers more than chemical processors
    – Phthalates, PFOA and salts, Bis(pentabromophenyl) ether (DecaBDE)
    – DecaBDE exemption for production of aircraft/spares until Mar-2027
  • Proposed: cobalt salts (exposure limits), formaldehyde
# REACH: Authorisation to Continue Using Chromates

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS #</th>
<th>Example Uses (not inclusive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide</td>
<td>1333-82-0</td>
<td>• Conversion coating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Anodizing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Deoxidizing</td>
</tr>
<tr>
<td>Acids from chromium trioxide:</td>
<td>7738-94-5</td>
<td>• Chemical Milling</td>
</tr>
<tr>
<td>Chromic Acid, Dichromic Acid</td>
<td>13530-68-2</td>
<td>• Stripping of Finishes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Heat Treating</td>
</tr>
<tr>
<td>Sodium dichromate</td>
<td>7789-12-0</td>
<td>• Mg Alloy Conversion Coating</td>
</tr>
<tr>
<td></td>
<td>10588-01-9</td>
<td>• Scale Conditioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Passivating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plating sealing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sealants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Conversion coating</td>
</tr>
<tr>
<td>Potassium dichromate</td>
<td>7778-50-9</td>
<td>• Chrome Plating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Deoxidizing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Conversion Coating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Heat Treating</td>
</tr>
<tr>
<td>Sodium chromate</td>
<td>7775-11-3</td>
<td>• Stripping Organic materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Scale conditioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alkaline cleaning/aqueous degreasing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Anodizing/plating sealing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Conversion coating</td>
</tr>
<tr>
<td>Potassium chromate</td>
<td>7789-00-6</td>
<td>• Anodize sealing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Heat Treating (temp indicating chalk)</td>
</tr>
<tr>
<td>Strontium chromate</td>
<td>7789-50-9</td>
<td>• Priming</td>
</tr>
<tr>
<td>Pentazines chromate octahydroxide</td>
<td>49663-84-5</td>
<td>• Priming</td>
</tr>
<tr>
<td>Dichromium tris(chromate)</td>
<td>24613-89-6</td>
<td>• Conversion coating</td>
</tr>
</tbody>
</table>

If you perform any of these processes in the EU, your attention is needed!
REACH: Authorisation Status for Chromium Trioxide (1 of 3)

Chromium Trioxide Authorisation Committee Submission Consortium (CTACSub)

- Broad coverage for chromium trioxide (use cases and details in CTACSub press releases)
  - Examples: surface treatment in aerospace (chromic acid), chrome plating, etc.

- Applications filed; ECHA opinions adopted Sep-2016
  - 7 years continued use recommended for most uses
  - Example opinion: surface treatment in aerospace

  ➢ Updated CTAC Q&A, April-2019

- European Commission REACH Committee approved CTACSub Authorisation decision Feb-2019

- European Commission expected to issue final ruling Q3-2019
  - Has been delayed many times, most recently due to Court Case T-837/16 and a European Parliament request for the EC to withdraw the CTACSub Authorisation Decision
  - REACH Committee meeting again in July; decision expected to follow

  ➢ Meanwhile…. if your uses are in your upstream supply chain’s applications for Authorisation (filed on-time), you can continue uses until the final EC decision

  ➢ Materials must be purchased from Authorised sellers (e.g., Aviall, etc.)
  - SDS should have Authorisation number and conditions of Authorisation (exposure scenarios)
**Downstream User Obligations**

- **Upon EC decision (if approved), Downstream Users must** fulfill obligations
  - Notify ECHA of your use of Authorised substances
  - After final decision, inform ECHA within 3 months of substance delivered to you (via webform, requires REACH-IT account)
  - YouTube instructions!
  - Comply with Risk Management Measures (RMMs) and Operating Conditions (OCs)
    - Examples: bio-monitoring, personal protective equipment, improved exposures, restrictions on releases to the environment, etc.
  - CTACSub [Good Practice Sheets](#) for Downstream Users (consistent with exposure scenarios in SDSs)
    - [Overview table](#) of Good Practice Sheets and Applied for Uses
    - [Example](#) for chromium surface treatment in open tanks or baths

*Example Good Practice Sheet from Jones Day website*
Downstream User Obligations: Exposure Monitoring

- Exposure monitoring requirements detailed in CTAC Q&A
  - Results will need to be uploaded in Article 66 Notification (via REACH-IT account)
  - CTACSub recommending to wait to upload initial monitoring data until after:
    - the consortium issues reporting format (July, 2019)
    - First exposure monitoring campaigns are completed (6 months after authorisation decision)

- Expect national enforcement to follow – will need to demonstrate:
  - Notification to ECHA (Article 66)
  - Activities fall within documented uses
  - Adherence to RMMs and OCs (and existing national health and safety regulations)
  - Exposure monitoring data has been submitted (1 year from final decision)

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 15, 2019</td>
<td>Authorization decision notified to applicants (date estimated)</td>
</tr>
<tr>
<td>October 15, 2019</td>
<td>Downstream users to scrutinize new specific exposure scenarios for representative processes, operations and individual tasks to be drawn up by suppliers (as annexes to safety data sheets)</td>
</tr>
<tr>
<td>October 15, 2019</td>
<td>Downstream users to notify uses to ECHA under Article 66 REACH</td>
</tr>
<tr>
<td>January 15, 2020</td>
<td>Downstream users to finish first exposure measurement campaigns</td>
</tr>
<tr>
<td>As of July 15, 2019</td>
<td>Downstream users to implement monitoring programs for Chromium (VI) emissions to wastewater and air from LEV</td>
</tr>
<tr>
<td>July 15, 2020</td>
<td>Downstream users to notify data from exposure measurements and air and waste water monitoring to ECHA</td>
</tr>
</tbody>
</table>

Table of exposure monitoring requirements from Jones Day website

Compliance trends are requiring more exposure monitoring data
REACH: Authorisation Status for CCST

Chromium Compounds for Surface Treatment Consortium (CCST)

- Coverage for certain metal finishing operations and uses of paints and primers
  - Use cases and details in press release
  - Examples: dichromates in surface finishing, strontium chromate in paints/primers
- Applications filed; ECHA opinions adopted Dec-2016
  - 7 years continued use recommended for most uses
  - Example opinion: potassium hydroxyoctaoxodizincatedichromate in paints, in primer, sealants, and coatings
  - CCST Q&A September-2017
- European Commission expected to issue final decision after CTACSub ruling (~Q3, 2019)

  ➢ Meanwhile… if your uses are in your upstream supply chain’s applications for Authorisation (filed on-time), you can continue uses until the final EC decision
    ➢ Materials must be purchased from Authorised sellers (e.g., Aviall, etc.)
      - SDS should have Authorisation number and conditions of Authorisation (exposure scenarios)
  ➢ Upon EC decision (approval anticipated), Downstream Users must fulfill obligations
    - Notify ECHA of your use of Authorised substances
    - Comply with Risk Management Measures (RMMs) and Operating Conditions (OCs)
      - Includes monitoring programs
    - CCST Good Practice Sheets for Downstream Users to follow
REACH: Authorisation Status for GCCA

- Not all aerospace uses of chromates are covered by CTAC and CCST
  - International Aerospace Environmental Group (IAEG) formed to evaluate gaps
  - Global Chromates Consortium for Aerospace (GCCA) formed, applications submitted
    - chromium trioxide, sodium chromate, potassium dichromate, sodium dichromate (sunset date Sep-21-2017) [here](#)
    - dichromium (tris) chromate and strontium chromate (sunset date Jan-22-2019) [here](#)
  - ECHA opinions adopted 11-2017, 6-2019, 9-2018: recommending 7 years for all
  - European Commission expected to issue final decision after CTACSub ruling (~Q3, 2019)

- **Downstream user data (re: exposure scenarios) may be needed to justify Authorisations**

- **Meanwhile…. if your uses are in your upstream supply chain’s applications for Authorisation (filed on-time), you can continue uses until the final EC decision**
  - Materials must be purchased from Authorised sellers (e.g., Aviall, etc.)
    - SDS should have Authorisation number and conditions of Authorisation (exposure scenarios)

- Upon EC decision (approval anticipated), Downstream Users must **fulfill obligations**
  - Notify ECHA of your use of Authorised substances
  - Comply with Risk Management Measures (RMMs) and Operating Conditions (OCs)
    - Includes monitoring programs.

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Table from GCCA Press Releases on Ramboll Environ website

### Substance Name, CAS No., Use(s) Applied For, GCCA Applicant(s), Consultation No.

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS No. / EC-No.</th>
<th>Use(s) Applied For</th>
<th>GCCA Applicant(s)</th>
<th>Consultation No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dichromium (tris) chromate</td>
<td>2463-39-4 / 246-558-2</td>
<td>Use of dichromium dichromate for chemical conversion coating applications by aerospace and defence companies and their associated supply chains</td>
<td>Wesco Aircraft SHEA Limited</td>
<td>014/01</td>
</tr>
<tr>
<td>Strontium chromate</td>
<td>7784-06-2 / 231-145-8</td>
<td>Use of strontium chromate in primer applied by aerospace and defence companies and their associated supply chains</td>
<td>Wesco Aircraft SHEA Limited, PRG Chemical Ltd. In its legal capacity as Only Representative of PRG, Deloitte International Inc. - DECO, and Ciba Engineered Materials Ltd. In its legal capacity as Only Representative of Ciba Industries Inc.</td>
<td>017/01</td>
</tr>
</tbody>
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### Substance Name, CAS No. / EC-No., MoQ/Applied For, GCCA Applicant(s), Consultation No.

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<th>GCCA Applicant(s)</th>
<th>Consultation No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium chromate</td>
<td>7789-11-7</td>
<td>221-809-S</td>
<td>Use of sodium chromate for casting after cleaning, painting and varnishing applications for aerospace companies and their suppliers</td>
<td>Wesco Aircraft SHEA Limited, Aviall Services Inc.</td>
</tr>
<tr>
<td>Use of sodium chromate for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Aviall Services Inc.</td>
<td>0002-01</td>
</tr>
<tr>
<td>Use of sodium chromate for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Wesco Aircraft SHEA Limited</td>
<td>0001-02</td>
</tr>
<tr>
<td>Use of sodium chromate for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Wesco Aircraft SHEA Limited</td>
<td>0001-03</td>
</tr>
</tbody>
</table>

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### Substance Name, CAS No. / EC-No., MoQ/Applied For, GCCA Applicant(s), Consultation No.

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<th>MoQ/Applied For</th>
<th>GCCA Applicant(s)</th>
<th>Consultation No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persulfate chromates</td>
<td>7789-53-1</td>
<td>221-809-S</td>
<td>Use of persulfate chromates for casting after cleaning, painting and varnishing, then applying chemical, and then supplied</td>
<td>Wesco Aircraft SHEA Limited, Aviall Services Inc.</td>
</tr>
<tr>
<td>Use of persulfate chromates for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Aviall Services Inc.</td>
<td>0002-01</td>
</tr>
<tr>
<td>Use of persulfate chromates for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Wesco Aircraft SHEA Limited</td>
<td>0001-02</td>
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<tr>
<td>Use of persulfate chromates for casting after cleaning, painting and varnishing</td>
<td></td>
<td></td>
<td>Wesco Aircraft SHEA Limited</td>
<td>0001-03</td>
</tr>
</tbody>
</table>
REACH: Authorisation Resources

- **ECHA links**
  - Opinions on Authorisation applications: [here](#). For each application (by use/substance):
    - Opinions of the Risk Assessment Committee (RAC) and Socio-economic Analysis Committee (SEAC)
    - Section 9 and 10 of the Chemical Safety Report (CSR)
  - ECHA guidance on Authorisation, including fulfilling obligations

- **Your chemical supplier/distributor**
  - Should understand availability of chemicals
  - Should provide Safety Data Sheets, indicating Authorisation status, etc.

- **Authorisation holder (applicant, as listed on ECHA site)**
  - Example: Aviall (for several chromates)

- **Original Equipment Manufacturer**
  - Example: Boeing (REACH Q&A and contacts: [here](#))

- **Industry/Trade associations**
  - Example: IAEG: [WG5 REACH Process Authorisation](#)
  - Example: AeroSpace and Defence Industries Association of Europe (ASD): [Authorisation Updates](#)
  - Example: Surface Engineering Association – (SEA)
  - Example: European Committee for Surface Treatment – (CETS)

- **Chromate Authorisation Consortia**
  - Chromium Trioxide Authorisation Committee Submission Consortium (CTACSub)
  - Chromium Compounds for Surface Treatment Consortium (CCST)
  - Global Chromates Consortium for Aerospace (GCCA)
BREXIT: Impact to REACH

• BREXIT delayed until 31-Oct-2019
  • Withdrawal agreement uncertain
  • Political situation remains fluid

• Risks of a “Hard BREXIT”
  • Primary risk: applicability of Authorisations (UK ↔ EU)
    – Legal maneuvering may be required for chromate authorisations
  • Secondary risk: applicability of Registration

• BREXIT resources
  • International Aerospace Environmental Group (IAEG) assessment
  • UK Aerospace, Defence, Security, and Space (ADS) BREXIT Hub
  • UK Government guidance
    – Chemical regulations (UK Health & Safety Executive) guidance
  • The Guardian (BREXIT news, politics)

Even with an “orderly” Brexit, continued risk mitigation and industry coordination is required
Supply Chain Chemical Composition Declarations

• Global regulations driving the need for product transparency
  • REACH Communication requirements
  • Waste Framework Directive ("ECHA SVHC Database")
    – Development in progress: database and tools available in 2020?
    – Data to be added for articles placed on the market from Jan 5, 2021
  • Emerging global regulations

• Aerospace industry driving declaration standards
  • IAEG Work Group 1 “Materials and Substances Declaration”
    – IPC-1754 data exchange standard
    – Aerospace and Defense Declarable Substances List (AD-DSL)
  • OEMs at various levels of maturity
    – Systems, processes, supply chain requirements

➤ Anticipate more declaration requests flowing through supply chain
Summary: Key REACH Obligations for EU Chemical Processors

- All chemical operations are regulated by REACH
  - Know where you use chemical substances in materials and processes

- Annex XIV “Authorisation list” is primary risk to production
  - Authorisations will be required for continued uses of chromated materials
    - European Commission decisions are expected to approve Authorisations
  - **Downstream users will then need to fulfill obligations of Authorisations -- as soon as this summer**
    - Continue buying only from Authorised sources
    - Notify ECHA of your use of Authorised substances (requires REACH-IT account)
    - Comply with Risk Management Measures (RMMs) and Operating Conditions (OCs)
      - As found in Safety Data Sheets, Good Practice Sheets for Downstream Users
    - **Comply with exposure monitoring requirements** (including filing reports)
  - Prepare for national enforcement to follow

- Resources are available for assistance
  - Industry associations, chromate consortia, chemical suppliers, OEMs

*This summary is not intended to be guidance or legal advice*
International Aerospace Environmental Group (IAEG)

www.iaeg.com

A non-profit organization of global aerospace companies created to collaborate on and share innovative environmental solutions for the industry

WG1 Chemical Reporting
WG2 Replacement Technologies
WG5 REACH Process Authorisation
WG8 REACH Registration 2018 Risk Management
Chemical Support: Aviall

Aviall Amsterdam is an upstream Authorisation holder covering downstream European customers.

Aviall (a Boeing Company) is a member of REACH Authorisation Consortia for:

• chromium trioxide (chromic acid)
• strontium chromate
• pentazinc chromate octahydroxide
• sodium chromate
• potassium hydroxyoctaoxodizincatedichromate

40 Global Locations, 1,500 Employees, Over 240 OEM Suppliers

If your company is anticipating, or currently experiencing, material shortages due to chemical restriction/obsolescence, contact Aviall, we may be able to help

Europe: +0031(0) 252 413035
Maria Eugenia Lopez
melopez@aviall.com

USA: REACH@Aviall.com
Technical Support for Boeing Hardware

- Information on materials and processes
  - Check engineering drawings, substitution drawings, qualified products lists, etc. for qualified alternatives
  - Request further information on REACH: impacted materials and processes, available substitutes, technology updates, substance Authorisation status, etc.
  - Submit supplier request for change – eELR (external Engineering Liaison Requests)

- Points of Contact:
  - Direct suppliers → Boeing Procurement Agent
  - Special Processors → Boeing Supplier Quality representative
  - Indirect supplier → your customer (i.e., flow up to Boeing direct supplier)
  - All → Boeing REACH contact as listed in Boeing’s REACH Q&A
    - Supply chain: paul.r.hogben@boeing.com
  - Aviall → for chemical sales and support, including Authorised chromates

Boeing, FAA, and EASA don’t consider new products as alternatives until they are developed, qualified, certified AND implemented