



Manufacturing, Supply Chain & Operations
Contracts, Compliance & Risk Management



REACH Update For EU Chemical Processors

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Nadcap Chemical Processing Meeting
June 5, 2019

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

REACH: Impacted Special Processes

Approved Process Sources - Process Code Index

- [Boeing Approved Process Sources - Home](#)
- [Nadcap Accreditation](#)
- [Notes & Exceptions](#)
- [Revision Summary](#)
- [User Instructions & Requirements](#)
- [Approved Sources Flow Chart](#)
- [Approved Processors](#)
- [Geographic APL](#)
- [Process Code Listing](#)
- [Specification Index Listing](#)
- [Limitation Index](#)
- [Boeing Contacts](#)
- [Authorized Distributors of Aircraft Bearings](#)
- [Authorized Distributors of Designated Fasteners](#)
- [Frequently Asked Questions](#)

Process Codes may include up to 5 characters. The number included in all Process Codes represent the following categories:

Process Code	Process Description
000 - 099	Quality System
✓ 100 - 199	Thermal Processes
✓ 200 - 299	Welding and Brazing
✓ 300 - 399	Finishes and Coatings
✓ 400 - 499	Nondestructive Test Processes
✓ 500 - 599	Fabrication
600 - 699	Metallic Raw Materials - Non USA & Titanium Ingot (All)
✓ 700 - 799	Composites
800 - 899	Support Testing
900 - 999	Division Unique Requirement
1000 - 1099	Raw Materials with Suppressed Purchaser Testing

D1-4426 Web Site [Content Owner](#)

[Link:](#)
[Doing Business with Boeing Approved Process Sources D1-4426](#)

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.*

Requirement	EU Chemical Processor	EU Manufacturer (component/assembly)	
Registration of new and existing substances	No likely requirements, if under <i>import</i> thresholds	No likely requirements, if under <i>import</i> thresholds	Responsibility typically lies with chemical importers and manufacturers
Communication of SVHCs in articles	Determine SVHC content <i>added</i> in processing and communicate safe use information (as needed)	Provide chemical composition and safe use information to customers of articles	Driving the need for industry chemical composition declarations
Notification to ECHA of SVHCs in articles	No likely requirements, if under production/importing thresholds		
Authorization to use Annex XIV "banned" substances	For substances banned from use in the EU: <ul style="list-style-type: none"> - Implement alternative chemicals; or - Ensure uses are covered by Applications for Authorisation; or - <i>Cease use/production in the EU (after the sunset date)</i> <i>* Example: chromates</i>		Risk to EU production from Authorisation requirements for chromated materials
Restriction on marketing and use of Annex XVII substances	For substances restricted from marketing/use (in the EU): <ul style="list-style-type: none"> - Implement alternative chemicals/technologies; or - Obtain safety exemption (prior to listing); or - Cease production/imports <i>* Examples: flame retardants, cadmium in plastics, phthalates, ...</i> <i>* Little impact to chemical <u>processors</u> from current Annex XVII substances</i>		Future restrictions may target occupational exposure limits

Substance bans and restrictions are primary risks to production

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




WG5 REACH Authorisation




REACH: Authorisation to Continue Using Chromates

Annex XIV Sunset Date	Substance	CAS #	Example Uses (not inclusive)
21-Sep-2017 (Latest application 21-Mar-2016)	Chromium trioxide	1333-82-0	•Conversion coating
			•Anodizing
			•Plating
			•Deoxidizing
	Acids from chromium trioxide: Chromic Acid, Dichromic Acid	7738-94-5 13530-68-2	•Chemical Milling
			•Stripping of Finishes
	Sodium dichromate	7789-12-0 10588-01-9	•Heat Treating
			•Mg Alloy Conversion Coating
			•Scale Conditioning
			•Passivating
•Plating sealing			
Potassium dichromate	7778-50-9	•Sealants	
		•Conversion coating	
		•Chrome Plating	
Sodium chromate	7775-11-3	•Deoxidizing	
		•Conversion Coating	
		•Heat Treating	
		•Stripping Organic materials	
Potassium chromate	7789-00-6	•Scale conditioning	
		•Alkaline cleaning/aqueous degreasing	
22-Jan-2019 (Latest application 22-Jul-2017)	Strontium chromate	7789-50-9	•Anodizing/plating sealing
			•Conversion coating
			•Anodize sealing
22-Jan-2019 (Latest application 22-Jul-2017)	Pentazinc chromate octahydroxide	49663-84-5	•Heat Treating (temp indicating chalk)
			•Priming
22-Jan-2019 (Latest application 22-Jul-2017)	Dichromium tris(chromate)	24613-89-6	•Priming
			•Conversion coating



IAEG
INTERNATIONAL AEROSPACE
ENVIRONMENTAL GROUP



REACH Authorisation and Hexavalent Chrome

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a European Union regulation. The following hexavalent chromium compounds (chromates) have been listed in the Authorisation List SVHCs (Annex XIV) of REACH:

Substance Name	CAS Number
Acids generated from chromium trioxide and their oligomers. Names of the acids and their oligomers: Chromic acid, Dichromic acid, Oligomers of chromic acid and dichromic acid.	7738-94-5 13530-68-2
Chromium trioxide	1333-82-0
Potassium dichromate	7778-50-9
Sodium chromate	7775-11-3
Sodium dichromate	7789-12-0 10588-01-9
Dichromium tris(chromate)	24613-89-6
Pentazinc chromate octahydroxide	49663-84-5
Potassium hydroxyoctaoxidizincatedichromate	11103-86-9
Strontium chromate	7789-06-2

*Mapping of chromates to consortium
Applications for Authorisation from IAEG website*

If you perform any of these processes in the EU, your attention is needed!

REACH: Authorisation Status for Chromium Trioxide (1 of 3)

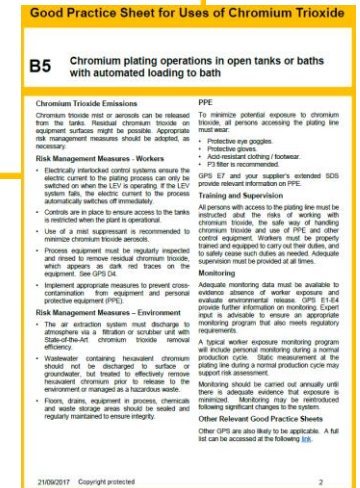
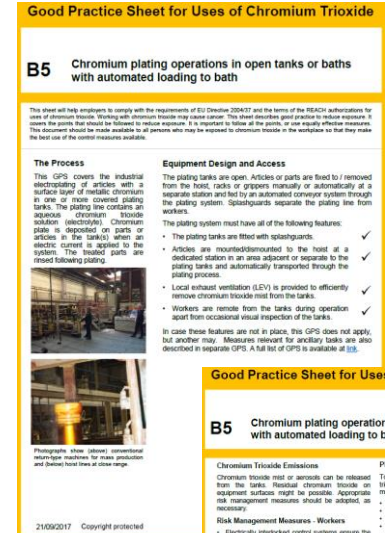
Chromium Trioxide Authorisation Committee Submission Consortium (CTACSub)

- 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)

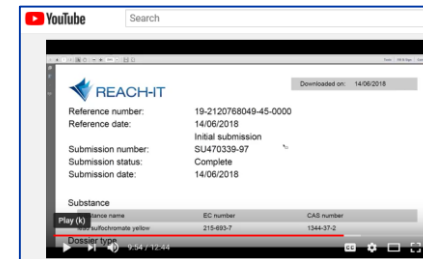
REACH: Authorisation Status for Chromium Trioxide (2 of 3)

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



REACH: Authorisation Status for Chromium Trioxide (3 of 3)

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)

Date ⁵	Action
July 15, 2019	Authorization decision notified to applicants (date estimated)
October 15, 2019	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)
October 15, 2019	Downstream users to notify uses to ECHA under Article 66 REACH
January 15, 2020	Downstream users to finish first exposure measurement campaigns
As of July 15, 2019	Downstream users to implement monitoring programs for Chromium (VI) emissions to wastewater and air from LEV
July 15, 2020	Downstream users to notify data from exposure measurements and air and waste water monitoring to ECHA

Table of exposure monitoring requirements from Jones Day website

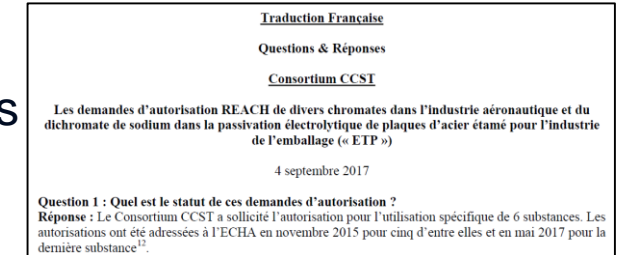
- Expect national enforcement to follow – will need to demonstrate:
 - Notification to ECHA (Article 66)
 - Activities fall within documented uses
 - Adherence to RMMs and OCs (*and existing national health and safety regulations*)
 - Exposure monitoring data has been submitted (1 year from final decision)

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](#)



CCST Q&A from Jones Day website

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.

Substance Name	CAS No / EC No	Use(s) Applied For	GCCA Applicant(s)	Consultation No
Dichromium (tris) chromate	24613-89-6 / 246-356-2	Use of dichromium (tris)chromate for chemical conversion coating applications by aerospace and defence companies and their associated supply chains	Wesco Aircraft EMEA Limited	0116-01
Strontium chromate	7789-06-2 / 232-142-6	Use of strontium chromate in primers applied by aerospace and defence companies and their associated supply chains	Wesco Aircraft EMEA Limited; PPG Central (UK) Ltd. In its legal capacity as Only Representative of PRC DeSoto International Inc. – ORS; and Cytac Engineered Materials Ltd. In its legal capacity as Only Representative of Cytac Industries Inc.	0117-01

Substance Name	CAS No / EC No	Use(s) Applied For	GCCA Applicant(s)	Consultation No
Chromium trioxide	1333-82-0 / 215-607-8	1. Use of chromium trioxide for chemical conversion and slurry coating applications by aerospace companies and their suppliers	Wesco Aircraft EMEA Limited	0096-01
Sodium chromate	7775-11-3 / 231-889-5	1. Formulation of Mixtures of sodium chromate for sealing after anodizing, chemical conversion coating, pickling and etching applications by aerospace companies and their suppliers 2. Use of sodium chromate for sealing after anodizing, chemical conversion coating, pickling and etching applications by aerospace companies and their suppliers	Aviall Services Inc. And Wesco Aircraft EMEA Limited	0099-01 0099-02
Potassium dichromate	7778-50-9 / 231-906-6	1. Use of potassium dichromate for sealing after anodizing applications by aerospace companies and their suppliers	Wesco Aircraft EMEA Limited	0098-01
Sodium dichromate	10588-01-9 / 7789-12-0 / 234-190-3	1. Use of sodium dichromate for sealing after anodizing applications by aerospace companies and their suppliers	Wesco Aircraft EMEA Limited	0097-01

Tables from GCCA Press Releases on Ramboll Environ website

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](#))

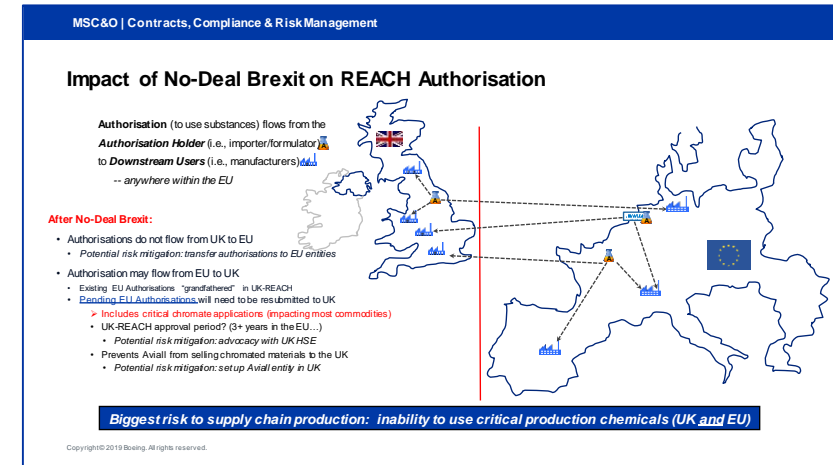


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BREXIT: Impact to REACH

- 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)

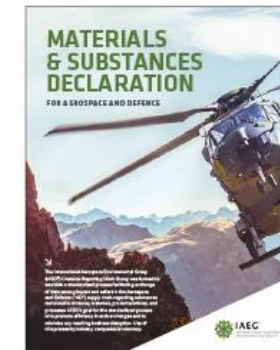


IAEG impact assessment of a no-deal BREXIT

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*



IPC-1754



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)

The screenshot shows the IAEG website header with the logo and navigation menu (Home, About Us, Membership, Resources, Members Only). Below the header is a banner image of an airplane wing with the text "INTERNATIONAL AEROSPACE ENVIRONMENTAL GROUP". Underneath are three main content blocks:

- MEMBERSHIP**: IAEG has 47 members with 3 levels of membership available to companies active in the aerospace industry.
- WHO IS IAEG?**: IAEG was formally incorporated in June 2011 as a non-profit trade association formed by major aerospace companies.
- NEWS & EVENTS**: Find out more about IAEG activities, press releases, future meetings and published articles.

A grid of work group icons with the following labels:

- WG1 Chemical Reporting
- WG2 Replacement Technologies
- WG3 GHG Management & Reporting
- WG4 IAEG Glossary
- WG5 REACH Process Authorisation
- WG6 Supply Chain Sustainability Survey Harmonization
- WG7 ISO 14001:2015 TRANSITION DOCUMENT
- WG8 REACH Registration 2018 Risk Management

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

