

REACH and its Impact

NASA & US Aerospace Communities

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REACH Considerations in the U.S.

- U.S. Manufacturers who export to European Union (EU)
 - Notification
 - Compliance
- U.S. End Users who use substances, mixtures or articles that are made, marketed or used in EU
 - Availability of raw materials
 - Availability of formulated products and articles
 - Unannounced changes to formulations or articles
 - Uncertainty due to limited familiarity with changing requirements

Potentials for direct impact (REACH influence)

- Congress
 - U.S. Congress could incorporate similar approach into revisions of the Toxic Substances Control Act (TSCA), which is currently under discussion
- EPA
 - U.S. Environmental Protection Agency could build on EU's momentum to develop more stringent domestic requirements

REACH - Supply Chain Impacts

- Supply chain impacts result from
 - Direct limitations
 - Listing in Annex XIV, Authorization
 - Listing in Annex XVII, Restriction
 - Risk due to anticipated future limitations
 - Listing as a Substance of Very High Concern (SVHC)
 - Listing on NGO ChemSec's Substitute It Now (SIN) List
- Some producers will voluntarily manage risk by reducing or eliminating use of substances on the SIN list, well in advance of any legal limitations
- This strategy may:
 - Reduce the producers' future risk of marketing SVHC-containing materials in the EU
 - Increase end-users' risk of formulation changes to flight-qualified materials

Annex XIV - Authorization

- Feb 2011 – first substances added to Authorization List:
 - ❖ 4,4'- Diaminodiphenylmethane (MDA) ← curing agent, antioxidant, etc
 - ❖ Benzyl butyl phthalate (BBP)
 - ❖ Bis (2-ethylhexyl)phthalate (DEHP)
 - ❖ Dibutyl phthalate (DBP)
 - ❖ Hexabromocyclododecane (HBCDD) ← brominated flame retardant & major diastereoisomers
 - ❖ 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)
- Of these 6 substances, 5 (in black above) have industrial uses with possible supply chain impacts

Annex XVII - Restriction

- Now includes substances formerly restricted under dangerous substance directives, as well as new additions under the requirements of REACH
- Many restrictions are either
 - Specific to certain activities, such as children's products, or
 - Exempt certain applications, such as aerospace or defense
- Concerns:
 - Future expansion of applicability
 - Restrictions from certain applications may sufficiently limit market for the product to eliminate availability even for exempted applications



Examples of Potential Issues Related to Current Restrictions

- Asbestos fibers – energetics and high temperature aerospace applications
- Brominated flame retardants
- Organostannic compounds – components of certain space vehicle RTV materials
- Cadmium – limits on Cd content in zinc-rich coatings; also concern that limits on cad plating could be expanded to include aerospace applications
- Nonylphenol ethoxylates – component of numerous cleaners qualified for space and aerospace systems
- Ammonium nitrate – concern limit on agricultural uses could be expanded to industrial or energetics uses
- Phthalates – concern limits on child-related applications could be expanded to industrial materials

Substances of Very High Concern

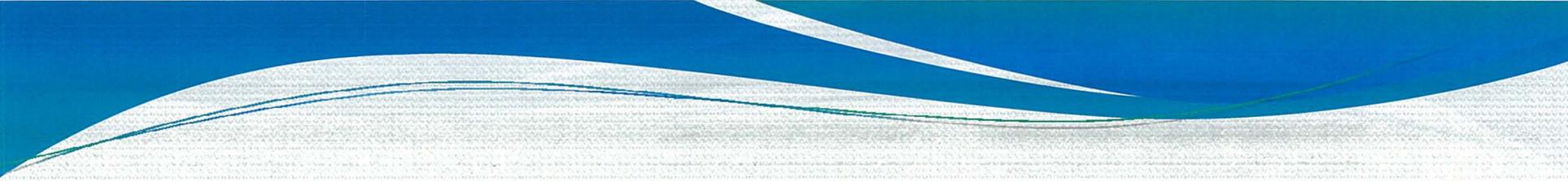
- Substances designated as SVHCs are considered “candidates” being evaluated for Authorization requirements under Annex XIV in the future
- Substances included on the “SIN List” (published by ChemSec, an NGO) will likely be considered for addition to the official SVHC list
 - The SIN List now includes 378 substances
 - Many of those substances are significant for aerospace applications
- E.U. expects to add approximately 90 substances to the Candidate List of SVHCs by the end of 2012
- Industry is concerned that inclusion on the Candidate List will result in obsolescence of substances, even if never added to the Authorization List or if aerospace applications are exempted from authorization requirements

Breaking News – 7 New SVHCs

- 31 May 2011 – 7 New SVHCs announced:
 - 2-ethoxyethylacetate
 - strontium chromate
 - 1,2-Benzenedicarboxylic acid, di-C7-11 branched and linear alkyl esters (DHNUP)
 - hydrazine
 - 1-methyl-2-pyrrolidone
 - 1,2,3-trichloropropane
 - 1,2-benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)

General Concerns Related to SVHCs

- Chromates – numerous chromates on the candidate list are used as corrosion inhibitors in coatings and metal finishing
- Refractory ceramic fibers – high temperature insulation and thermal protection systems
- Brominated flame retardants
- Phthalate plasticizers
- Trichloroethylene – LOX-compatible solvent, may be needed more as other LOX-compatible solvents are reduced or eliminated (ozone depleting substances and high global warming potential solvents)
- Cobalt compounds – anticorrosives
- Hydrazine -- propellant



Backup Slides



FG 4

- Mitigating Options
 - Programs should review list to be aware of future obsolescence risks
 - Strengthen communication pathways with suppliers of critical materials
 - Consider fingerprinting critical materials that could be at risk of unannounced reformulation.