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<td>Lockheed Martin Aeronautics, F-35 Materials and Processes, Pinellas Park, FL, 33782</td>
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**Standard Form 298 (Rev. 8-98)**
Proscribed by ANSI Std Z39-18
REACH

• **Registration, Evaluation, and Authorization (Notification and Communication) for Chemicals**
  • Will impact all suppliers even those who don’t directly sell to Europe
    - i.e. upstream users obligated to inform their suppliers of hazardous usages of chemicals
  • Intent was to change obligation from Government to Industry to evaluate ESH-impact of chemicals
  • Industry anticipates that REACH will eliminate multi-source suppliers and products from market
    - Suppliers will evaluate financial obligations of REACH versus product profit
• New Enforcement Agency: European Chemicals Agency (ECHA)
• While **Many** Assume This European Regulations Will Not Impact Their Supply Chain……Consider the Following
REACH Covers Virtually All EU Chemicals

**Registration**
- 150,000 Registered Substances

**Evaluation**
- 3-6,000 Potential Carcinogenic, Mutagenic, or Reproductive Toxics (CMR) + PBT, vPvB

**Candidate List**
- Currently 50 chemicals on Registry of Intent, 84 chemicals on Candidate List, and 13 chemicals proposed for Authorization

**Authorization List**
- 14 chemicals on Authorization List

**Sunset Date**
- Sunset dates starting February 2013 for first 14 chemicals

We think we know CMRs

**Communication Obligations**
The CLP Parallel Regulation
Classification, Labelling, and Packaging (CLP) Regulation EC 1272 of 2008

– Harmonized classification system, labels, warning pictograms, risk phrases
– Establishes these items as a part of the regulation – legally enforceable

<table>
<thead>
<tr>
<th>Index No</th>
<th>International Chemical Identification</th>
<th>EC No</th>
<th>CAS No</th>
<th>Classification</th>
<th>Labelling</th>
<th>Specific Conc. Limits, M-factors</th>
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The Curious Case of Di-isobutyl Phthalate

- OR -

How ECHA Can Greatly Accelerate Phase-Out

• In 2008, Di-isobutyl Phthalate (DIBP) was not a CMR but was a suspected endocrine disruptor
• CLP 1st Adaptation to Technical Progress (ATP) reclassified as Reproductive Category 1B - 10 August 2009
• Added as Candidate SVHC - 13 January 2010
• Added to Authorization list - 18 August 2011
• Sunset Date - 21 February 2015

Typical 6-8 Year Process

DIBP 5 Year Process
Impact of DIBP Re-Classification

January 2010

US Manufacturer
Eastman Chemical
Already Has Alternative – Future Production Uncertain

Akzo Nobel
Informs Lord that Supplies End in 24 months

Lord
Primary Adhesive Supplier to Click Bond – Has to Reformulate

Click Bond
Formulator of CB200

Secondary EU DIBP Manufacturer
Lyondell Italy

Lyondell Steps in to Register DIBP BUT only as a Chemical Intermediate

Primary EU DIBP Manufacturer
BASF Germany

DIBP Proposed as SVHC=BASF
Stops Production

April 2012

LM Re-qualifies and Implements New CB200

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Risk to our Chemical Products

Chemical Company A
1000 Tons per year Of SVHC Chemical P

Chemical Q
Reaction R
Product S

Chemical Company A Decides to Register Chemical P as an “Intermediate” Chemical only Used to React Other Chemicals - Minimal Human Exposure

Chemical Company A
Sells 2 Tons per year Of SVHC to Adhesive Manufacturer B

Chemical Q
Reaction R
Product S

Company A Employee Exposure

Company B Employee Exposure

Company C Employee Exposure

Adhesive S

Is the Market Profitable Enough for Company A to Register Chemical P as an Adhesive for Manufacturer B – Or Does Manufacturer B Register Chemical P for Product S – Extensive Human Exposure

Safety Data Sheet Must Reflect All Use Scenarios
MSDS Assumptions

• Major Large Suppliers Analyze Products to Generate MSDS
• Many Suppliers Approach to MSDS:
  
  Chemical A  
  Chemical B  
  Chemical C  

  Chemical D  
  Chemical E  
  Chemical F  

Are These Present??

• BUT, What Has Happened Upstream of Their Suppliers:

  Chemical 1  
  Chemical 2  
  Chemical 3  

  Chemical 4  
  Chemical 5  
  Chemical 6  

  Chemical A  
  Chemical B  
  Chemical C  

Are These SVHC?? A commonly used adhesive contains an organo-tin compound

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The 800 Pound Elephant in the Room

Sodium Chromate and Dichromate

Potassium Chromate and Dichromate

Strontium Chromate

Chromium Trioxide

Dichromic Acid

Sunset estimated 2016

Where is Zinc Chromate? It wasn’t Registered so is already “Restricted”
Other 100 Pound Problems

• Phthalates – Used to make stuff flexible
  • Aerospace Uses – sleeving, wire sheath, plastic panels, adhesives, etc, etc
  • Out of 30 most common, 11 are already in SVHC stages
  • EU intends to restrict all

• Organic Nickel Compounds – Platings
  • Aerospace Uses – Plating, conductive sealants, catalysts
  • REACH CLP ATP #1 Reclassified Over 100 compounds as Category 1 Carcinogens
    • REACH is required to restrict
    • Nickel Institute Fighting
  • EPA IRIS Risk Assessment Due in 2013
Are We Heading Towards a Brick Wall?

- Can we rely on our suppliers to Register, Authorize, and submit Dossiers to support continued use?
  - Do they receive sufficient economic return to offset cost
  - Apparently not for zinc chromate
- Will the criticality of Aerospace products convince ECHA to exempt Hex Chrome or only Restrict (Annex XVII) at the last minute?
  - Will an exemption even keep the material available?