Using Surface Treatment Specification Databases to Anticipate and Accelerate Response to Regulatory Changes

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Overview

• Introduction to Granta & EMIT

• Drivers for Managing Restricted Substances

• GRANTA MI: Restricted Substances

• Assessing compliance and obsolescence Risk of STS in CAD

• Summary & Conclusions
Granta Design – history

- Founded in 1994 from the University of Cambridge
  - Professors Mike Ashby & David Cebon
  - Owners: Cambridge Univ, ASM International, Founders, Employees
- Technology firsts include:
  - Materials selection (Ashby charts, performance indices…)
  - Integrated materials data management
  - Software-based teaching of materials engineering

The materials information technology experts

- Software – manage materials information, selection…
- Data products – specialist materials data libraries
- Services – implement, configure, apply…

Customers

- Boeing, Emerson Electric, EADS Astrium, Eurocopter, GE, Honeywell, IHI, Moen, NASA, Raytheon, JLR, TRW Automotive…
- 800+ universities and colleges worldwide
## Consortia

### MDMC.net

- AWE
- Boeing
- Honeywell Aerospace
- GE - Aviation
- GE - Energy
- Lockheed Martin
- Los Alamos Nat Labs
- NASA
- Northrop Grumman
- Oak Ridge Nat Labs
- Raytheon
- Rolls-Royce
- Sandia Nat Labs
- US Navy
- US Army Research Labs

### MIT Consortium

- Boeing
- EADS Astrium Satellites
- Emerson Electric
- Eurocopter
- Honeywell
- Lockheed Martin
- NASA
- NPL
- Rolls-Royce
- Thales
- US Army Res. Labs

### Materials Strategy Software Consortium

- Baker Hughes
- DePuy
- Emerson Electric
- Ethicon Endosurgery
- Moen Inc. (Fortune Brands)
- NASA
- Rhodia
- Sulzer
- TRW Automotive
Drivers for managing restricted substances

Regulatory compliance  REACH
Environmental risk
Brand image
Marketing / Market share / Customer requirements
Security of supply

Cost

China Still Bans Rare Earth to Japan

Guardian.co.uk

Tesco and China clash over rare earths

European environment and consumer being exposed to danger

HONG KONG — The Chinese government is continuing to block shipments of crucial strategic minerals to Japan, according to industry executives, analysts and a Japanese official.

Chemical management

With our longstanding belief in the precautionary principle, eliminating and minimizing the use of hazardous substances in our products and production processes has been one of our priorities since the start of our environmental activities more than three decades ago. It’s also an important part of our EcoDesign process.
### Focus on REACH – driving substitution

#### Years from the start of the REACH process

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#### A: Pressure groups lobby for particular substances: substance starts to feel regulatory and/or supply chain pressure. E.g. SIN List, ETUC.

#### B: List of proposed ‘Candidate List substances’ is issued. Substance manufacturers may decide to withdraw from market.

#### C: Substances added to Candidate List. Legal obligations apply if any of these substances are present in products > 0.1 wt% (Article 33, Article 7).

#### D: Recommendation for substances to move from Candidate List to Annex XIV list. Users need to lobby hard for continued use of the substance.

#### E: Substances on Annex XIV list. Users must apply for authorisation to continue use. This will be application specific and for a defined sunset period (usually < 4 years).

#### F: End of Sunset period for substance. Substance cannot be placed on market within EU.
Registration Risks

Registration Fees (up to €31k)

- Cost of admin, Cost of analysis, Chemical Safety Report, MSDS.

→ Risk that supplier may not:
  - Register at all
  - Carry out wrong type of registration
  - Not Register for your Use

Risk of Supply Chain Disruption

Pre-Registration

>1000 tpa / CMR

>100 tpa

>1 tpa
Restricted substances risk cycle

- **Compliance**
- **Industry activity**
- **Horizon issues**
- **Customer reqs.**

**Assess environmental risk**
- E.g. Where are substances used?
- E.g. Are there alternatives?

**Deploy**
- E.g. Fight for business critical substances
- Develop obsolescence plan for impacted product

**Maintain**
- E.g. Update system as legislation changes

- Control material selection to avoid problems
- Incorporate compliance & risk assessment workflows into design process (e.g., Gate assessments in CAD)
GRANTA MI: Restricted Substances

1. Materials information management system

2. Restricted Substances Data Module

- REPORT
  Substances in article, Article 33 …

- SUBSTITUTION
  Find material alternatives

- SELECTION
  Design to avoid restrictions (SVHC free…)

- RISK ASSESSMENT
  ‘Where Used’ Data

- INPUT
  Substance declarations, MSDS data, specifications

3. Tools

INTEGRATE, ACCESS from: PLM, CAD, ERP

Quarterly update
Inside the Restricted Substances Data Module

Expert Reference Data Provided by Granta
Inside the Restricted Substances Data Module

Populate System with:

- Supplier declarations
- Other substance data (MSDS)
- Customer / Internal Lists
- Material & Process Specifications

Database container for customer data...

...including augmenting Granta data
Use ‘Predictive Lists’ to prioritise resource on high risk materials.

Target resource to:
• Mitigate undocumented reformulation risk
• Initiate substitution plans with suppliers
• Gain assurance of continuity of supply
Demonstration

Assigning STS in CAD environment

Carrying out Compliance & Risk Assessments
A manual, reactive approach to REACH & similar regulation driving change is unsustainable long term

Granta & EMIT are building tools to:

- Enable proactive risk assessment of specifications, materials & processes for regulatory impact & obsolescence risk
- Use existing infrastructure (e.g. CAD, PLM) to deploy strategy into engineers everyday workflows
- Apply datasets built in collaboration with leading experts. E.g. Rowan Technology Group to address engineering problems
- Capture ‘horizon issues’: rare earth metals, geo-political risk factors, nano materials etc
Questions?