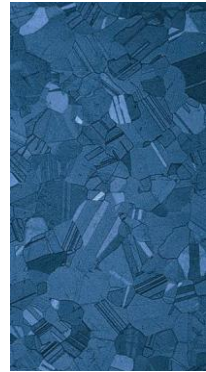
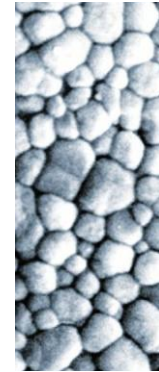
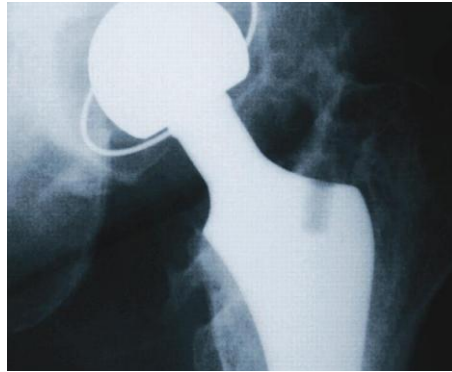


GRANTA

MATERIAL INTELLIGENCE



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

Will Martin

28th August 2012

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 28 AUG 2012	2. REPORT TYPE	3. DATES COVERED 00-00-2012 to 00-00-2012			
4. TITLE AND SUBTITLE Using Surface Treatment Specification Databases to Anticipate and Accelerate Response to Regulatory Changes		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Granta Design,9639 Kinsman Road ,Materials Park,OH,44073-0002		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES ASETSDdefense 2012: Sustainable Surface Engineering for Aerospace and Defense Workshop, August 27-30, 2012, San Diego, CA. Sponsored by SERDP/ESTCP.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 15	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

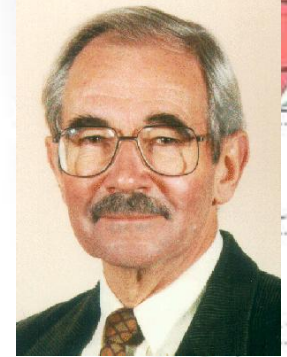
Overview

- **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 - Introduction

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



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



Boeing
EADS Astrium Satellites
Emerson Electric
Eurocopter
Honeywell

Lockheed Martin
NASA
NPL
Rolls-Royce
Thales
US Army Res. Labs



Baker Hughes
DePuy
Emerson Electric
Ethicon Endosurgery

Moen Inc. (Fortune Brands)
NASA
Rhodia
Sulzer
TRW Automotive

Drivers for managing restricted substances

Regulatory compliance



Environmental risk

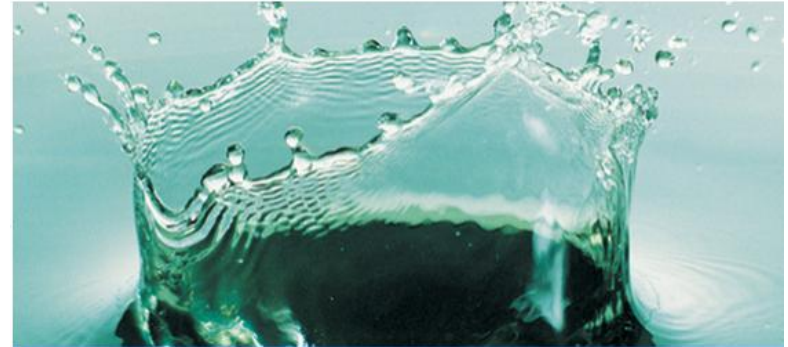
Brand image

Marketing / Market share /
Customer requirements

Security of supply

Cost

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.

guardian.co.uk

Tesco and C
with danger
European Environ
being exposed to c

Rebecca Smithers
guardian.co.uk, Friday 22 Oct

China Still Bans Rare Earth to Japan

The New York Times



David Gray/Reuters

The rare earth metal lanthanum is poured into molds at the Jinyuan smelting workshop near the town of Damao in China.

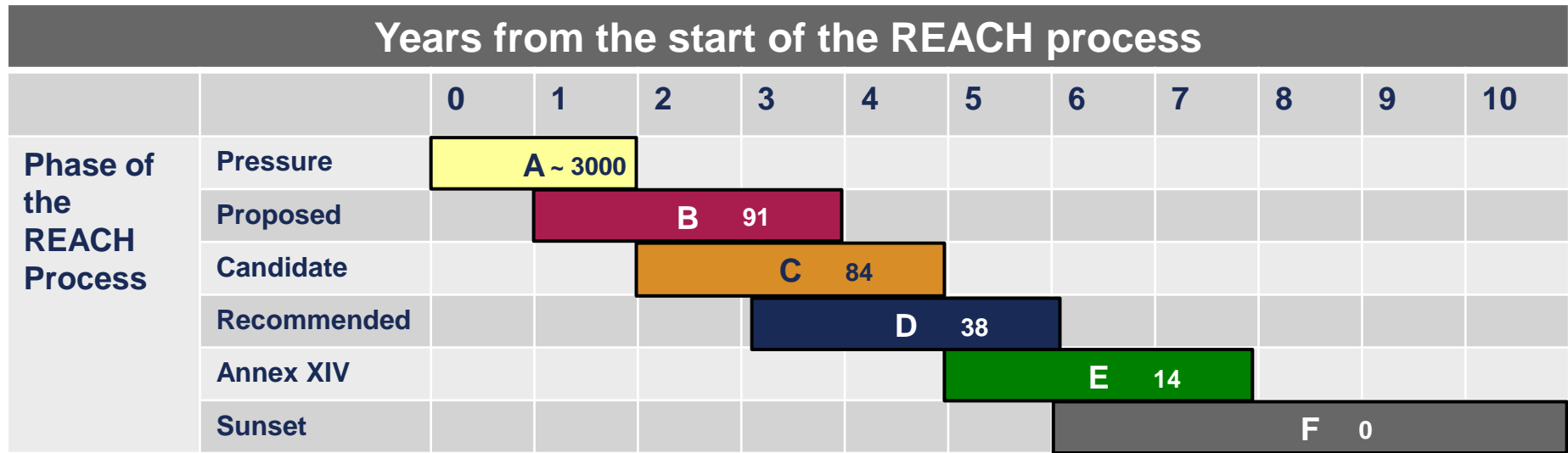
By KEITH BRADSHER
Published: November 10, 2010

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.



Tin Whisker Growth on Pure Tin

Focus on REACH – driving substitution



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 .

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

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).

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.

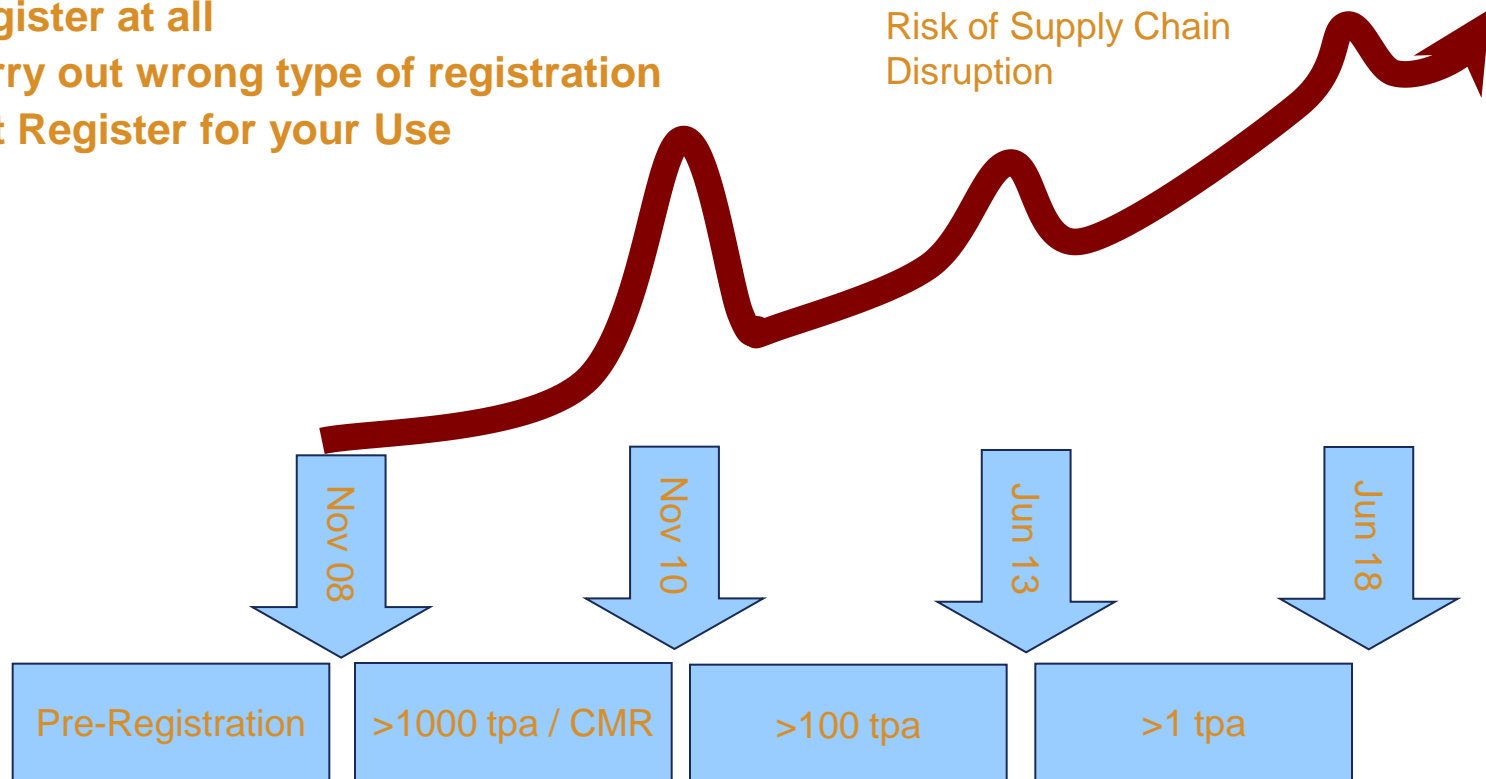
Registration Risks

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



Restricted substances risk cycle

Compliance

Industry activity

Horizon issues

Customer reqs.

Assess
environmental
risk

E.g.

- Where are substances used?
- Are there alternatives?

Maintain

E.g.

- Update system as legislation changes

Develop
strategies

E.g.

- Fight for business critical substances
- Develop obsolescence plan for impacted product

Deploy

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

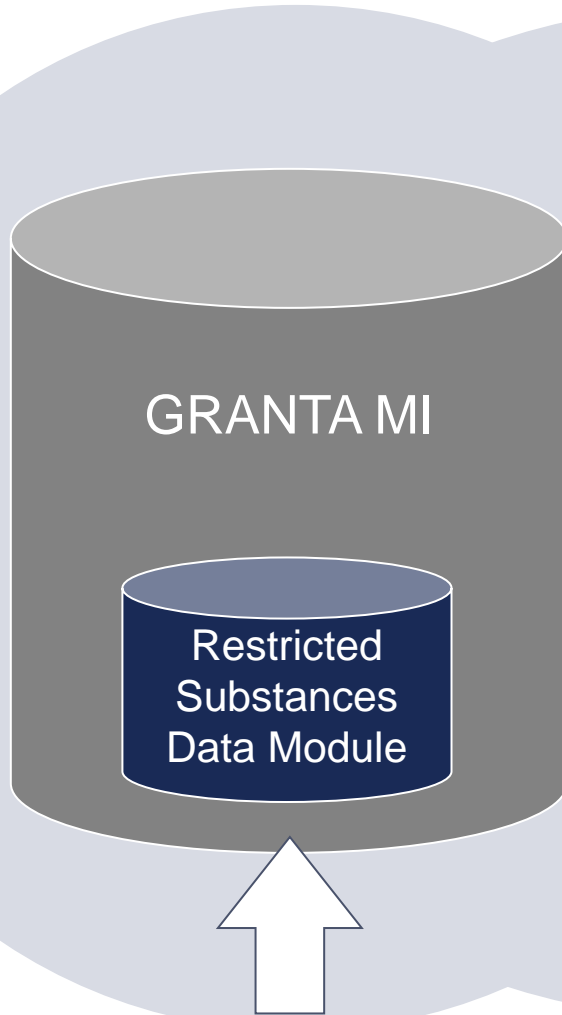


GRANTA MI: Restricted Substances

1. Materials information management system

2. Restricted Substances Data Module

3. Tools



Quarterly update

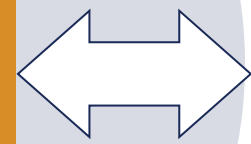
REPORT
Substances in article, Article 33 ...

SUBSTITUTION
Find material alternatives

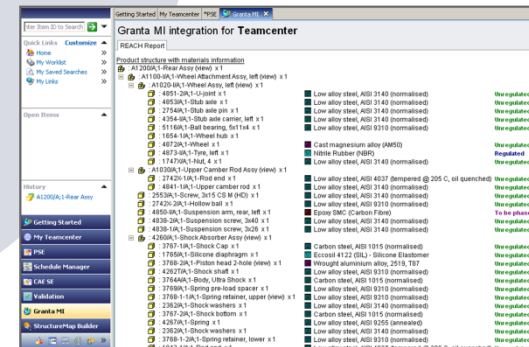
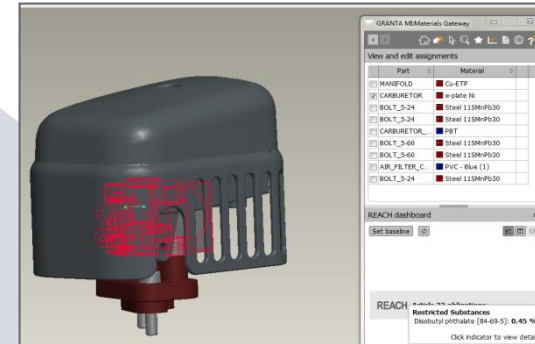
SELECTION
Design to avoid restrictions (SVHC free...)

RISK ASSESSMENT
'Where Used' Data

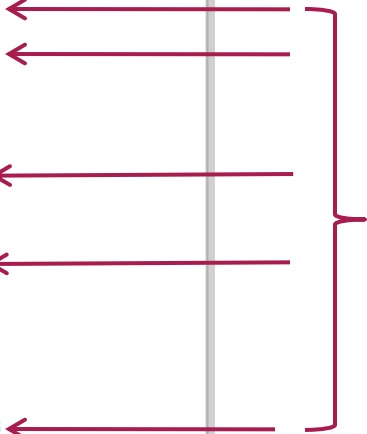
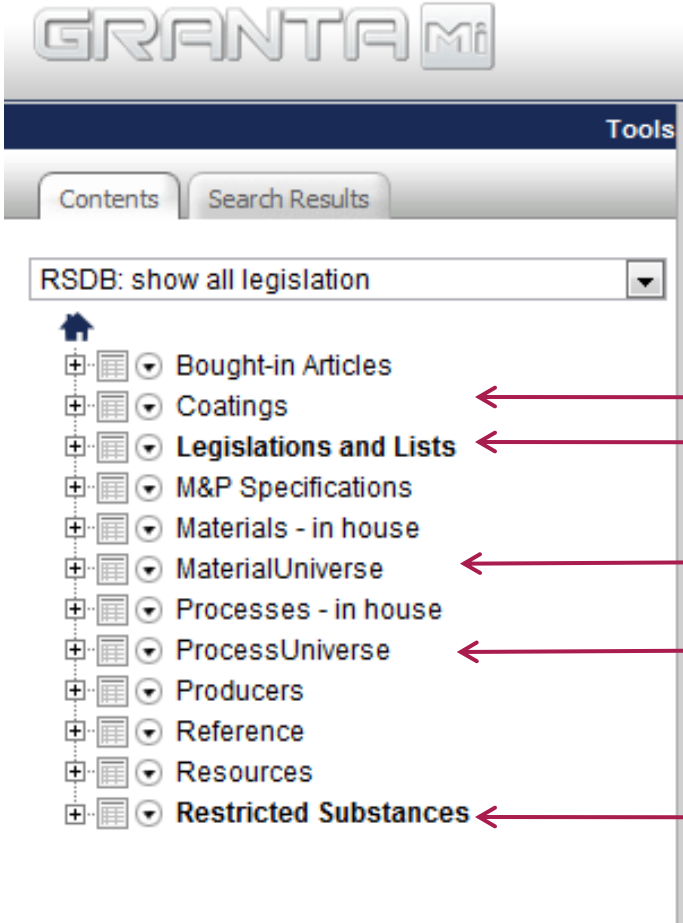
INPUT
Substance declarations, MSDS data, specifications



INTEGRATE, ACCESS from:
PLM, CAD, ERP



Inside the Restricted Substances Data Module

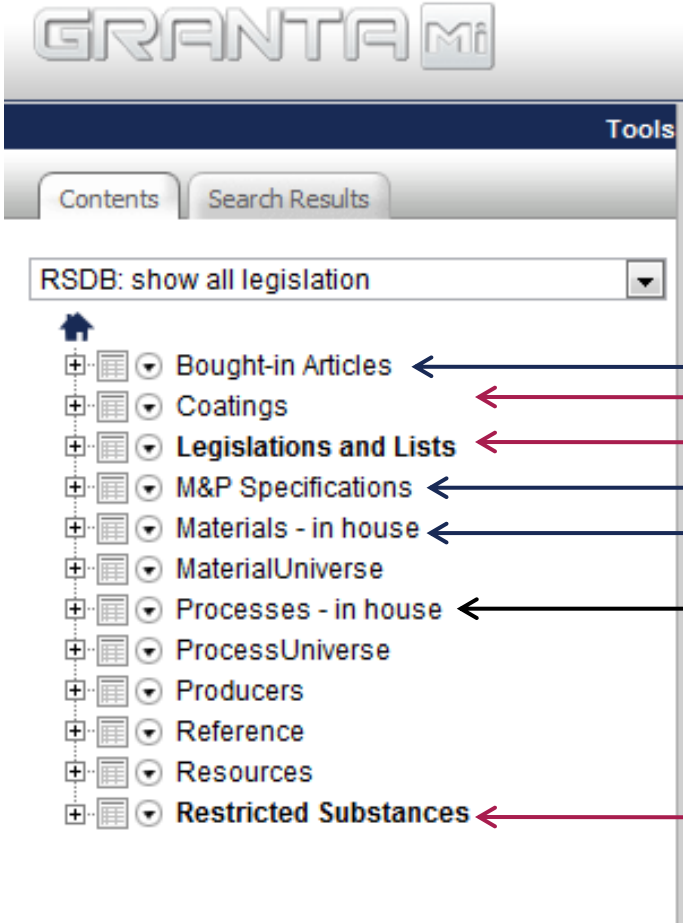


Expert Reference Data Provided by Granta

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

Core use cases

The screenshot shows the GRANTA MI software interface for Restricted Substances. The left sidebar contains a tree view of the Restricted Substances database, with 'Legislations and Lists' expanded to show various regulatory requirements. The main panel has tabs for 'Search & Update', 'Risk & Obsolescence', and 'BoM Assessment & Reporting'. Below the tabs, there is a search bar and a 'Materials Management' section. The 'Materials Management' section includes a 'Show materials at risk of being reformulated by suppliers' search button. Below this, there are three search filters: 'Find Materials impacted by:', 'Find Materials not impacted by:', and 'Find Materials that are not:'. Each filter has a list of regulatory requirements and a 'Search' button. The 'Find Materials impacted by:' filter is currently selected, showing a list of requirements including REACH Pre-registration, REACH Recommendation for Authorisation, REACH Registry of intentions, Severely restricted pesticides, The Prior Informed Consent (PIC), Stockholm Convention on Persistent Organic Pollutants (POPs), The Emergency Planning and Community Right-to-Know Act (EPCRA), The EPA's List of Lists (LoL), The Phaseout of Ozone-Depleting Substances, and The SIN List 2.0 (Substitute it now).

Use the first three groups of searches below to assess and manage the legislative impact on your in-house materials, bought-in articles, and material & process specifications. To understand where restricted substances may be found within your organization for risk assessment purposes, and for filling holes in your own data, the options under 'REACH Risk Assessment' provide standard searches of Granta's MaterialUniverse, ProcessUniverse, and Coatings data.

▼ Materials Management

Show materials at risk of being reformulated by suppliers

Find Materials impacted by:

- REACH Pre-registration
- REACH Recommendation for Authorisation
- REACH Registry of intentions
- Severely restricted pesticides, The Prior Informed Consent (PIC)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- The Emergency Planning and Community Right-to-Know Act (EPCRA)
- The EPA's List of Lists (LoL)
- The Phaseout of Ozone-Depleting Substances
- The SIN List 2.0 (Substitute it now)

Find Materials not impacted by:

- AFSSET
- AFSSET 2
- ASD-STAN Declarable Substances List
- California Green Chemistry Initiative
- California RoHS
- Canadian Chemical Challenge
- CERCLA hazardous substances
- China REACH
- China RoHS

Include records with empty attributes

Find Materials that are not:

- Banned
- Banned with conditions
- To be phased-out
- Very high risk of phase-out
- High risk of phase-out
- Risk of phase-out
- Caution
- Superseded
- n.a.

Include records with empty attributes

► Bought-in Articles Management

► Specification Management

► REACH Risk Assessment

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

Conclusions

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?