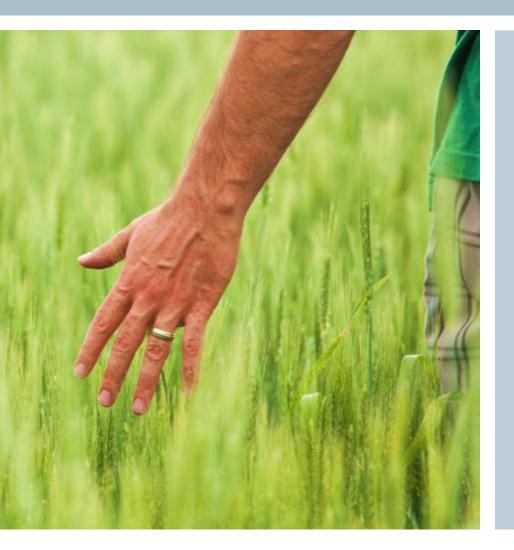


#### A framework for sustainability

Teamcenter Substance Compliance and Integrated Material Management



## Agenda



- Teamcenter substance compliance overview
- Teamcenter integrated material management overview
- Summary



#### **Teamcenter** Substance Compliance



In the past, the term sustainability tended to be simply a marketing ploy. Now, the integration of 'green' products and business processes has positioned sustainability as a decisive element in global competition. Looking forward, another shift in mentality will push sustainability into the heart of strategies for the development and survival of organisations. The ability for an organisation to successfully transform current business models into sustainable practice will determine their continued existence.

http://www.eea.europa.eu/events/sustainability-2.0-from-green-to-blue





#### **Sustainability and Compliance Considerations**



More Regulations

- Energy use in Products
- Carbon Emissions
- End of Life
- Data Center Energy Management
- Scarce Exotic Chemicals and Substances
- Design for Environment (DfE)
- Sustainable Manufacturing
- Lifecycle Extension
- Consolidated Sustainability and Financial Reporting
- Competitive Advantage

Restricted © Siemens AG 2014 All rights reserved.



- **Product Recycling**
- Customer Safety
- **Occupational Health and Safety**
- **Environmental Protection**

#### SIEMENS

# **Teamcenter Substance Compliance** Compliance process

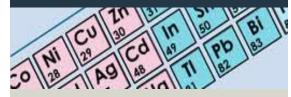
#### TEAMCENTER Designer - 8 Q B B B B B G TEAMCENTER SIEMENS BOM My Teamcenter (co(co) - Engineering / Designer - - [IMC--2053134605]) Sulfur Nickel Iron 😕 Summary 🌋 Impact Analysis 🔤 Viewer 🗖 Substance Compla · \* \* \* \* der/A;2-... 🗂 🛍 Flight\_Recorder/A;2-ECU (View) BOM Line 2g 3g 2g Part 1 Cooling Fan/A:1-SubAssy (Vie Substance Compliance Check Date PASS Count FAIL Count Unapproved PASS Count Unapproved FAIL Court Fan\_Screen/A;1-Mesh Blade/A;1-Set (View) Status Conflict Minerals: 1.1.0 Unapproved FAIL Mon Apr 15 08:14:24 EDT 2013 1g 1g 6g Part 2 9 Blad2111/A;2-2111-S ( Biectric/A;1-Motor RoHS:1.1.0 oved FAIL Mon Apr 15 08:14:24 EDT 2013 Disk Drive/A:1-SubAssy (Vie Wire\_Harness/A;1-I/O (Vie Motherboard\_cds\_routed\_J8s/ .04g 4a Part 3 REACH:1.1.0 Unapproved FAIL Mon Apr 15 08:14:24 EDT 2013 3 Total 7g 4.04g 8g Materials & Substances Compliance Officer · X √4-Compliance Grading IPC IPC )JE PE INTERNATIONA IMDS IMDS **Supplier Declarations CPM checker Compliance Reports Supplier** XML (IPC 1752, IPC1755 Industry standard reports RoHS, REACH, Conflict Minerals support) Others... Company standard reports XLS (spreadsheets), ... etc.

# **Teamcenter Substance Compliance** Key components



## Full product traceability and transparency to reduce risk

#### Material and Substance Management



- Holistic materials management
- Aggregate material and substance amounts across a product structure
- Integrate with 3<sup>rd</sup> party material sources
- DfE framework

Supplier Disclosure Automation



- Automate process to gather supplier material and substance declarations
- Supplier data managed along with product structure
- Industry standard support (IPC-1752, IPC-1755)

#### Compliance Grading and Reporting



- Compliance grading
- Pre-configured rule sets
- Rules editor for custom regulations
- Dashboard views
- Expertise in sustainability and materials management with PE INTERNATIONAL partnership

# Material and Substance Management Capabilities

#### Holistic material management throughout the product lifecycle

- Manage a product structure down to its materials and substances
- Roll up material and substance amounts across a structure
- Support material engineering property data management to enable design, analysis/simulation, manufacturing and core engineering work processes
- Provide a single source of material information uniting the applications across the SPLM portfolio
- Import of material data from 3rd Party Systems

Material and Substance Dashboard 🕄		Termoniter Vaualization Modeup 00.0 - 10134434-50MATC_PC Variant (Vers)	Materia Tables:	Materials Chart:
Cooling_Fan/A;1-SubAssy (Vie	ew)	S File Edit View Navigation Actions Tools Visual Report Web Concept Window Help	- 12 X	Confy common tables Ultimate Tensile Strength_12
RubAssy		· · · · · · · · · · · · · · · · · · ·	Possions Ratio (RU)_8	
Materials Mass (g)		GekHHBRDOOTIS Delas Bak	- 152 Thermal Conductivity(0_2	603030 -
wire mesh 160.05		ATX HO WALL OT IN DUE NO WA	- 12 Thermal Expansion (A)_5	
Iron 3-pentafluoropropane 0.02			Utrnate Tensie Strength_12	
Lead Material 10.0		Ben Name Has PM	- 100 Trield Strength_11	503030 -
pentafluoropropane Naterial REACH 260.0			Vourge Modulus (E), 7	C a conservation
for Wre 25.0		E=CNOBE E=CF701344x158407C1. Mercury	E	S
2.00		A A STOLERA I SHALL	AISI_Steel_3005/A	8 40000 - Contraction of the second s
			ALL DEC LOOK	
Substances	CAS Number Mass In Range (g)			
STAINLESS STEEL	12597-68-1 160.05	- IP 001385A1-	🗄 💰 Akrinan, 2014A	200000 -
1,1-Dichloro-1,2,2,3,3-pentafluoropropane(HCFC-225cc		- 31701391A5- Aluniran Alloy		
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225c		- 3H 01132A1	🗄 🎻 Aluminum_6061/A	
2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225b		- 3 17 001393A.1		1000 - 1 - 1
1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225b		- 77013044.1- Steel Friday		A A
1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225e		- 7 H 011364A.1-		10000
Iron	7439-89-6 0.016	- ) 17 01368/1		
2,2-Dichloro-1,1,1,3,3-pentafluoropropane(HCFC-225aa		- 1701197A5. Plastic State State State		
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225c			A	
.2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225d				0 200 400 600 800
.ead stearate	1072-35-1 3.5	- 17014019.1-		Ultimate Tensile Strength_12 (kPa)
ead	7439-92-1 6.5	- 3F701442A-5-		
Copper_Wire	7440-50-8 25.0	- 17/014041-		- Alumnum 6061/A
		- 1701405A(1		
Fotal Material Mass: 455.07000000000005 g		- 77001367A(1-		
otal Substance Mass: 455.0699999999999 g		- 177014079(1-		OK AB

#### Automate the exchange of declaration forms with suppliers

- Route industry standard (IPC-1752) declaration forms to suppliers to request material and substance disclosure
- Automatic processing of material substance declaration data from suppliers
- Archive supplier declarations and relate directly to the product structure
- Process templates to support supplier collaboration

			On Declaration with lo Illinois. All rights reserved under engine	cument is a declaration of the substance wer level parts, the declaration encor ering responsibility. Adobe Read	State terminators fearmosters Re: Est Vee Took Accors Window Help   너 글 글 N ( 박 속 수 있 ) Ell 는 역 기 다. ③ • ④ • My Teamcenter ( co(co) - Engineering / Completers Officer [16(~2053)34665])	TEAMCENTER SIEMENS
	1752-2 1.1	IPC Web Site for Information on http://www.ipc.org/IPC-175x	IPC-1752 Standard	Form Type * Declara Reguest/Reply • Class 6	Summary * more relations     Summary * more relations     Summary * summary * more relations	<b>≷</b> * ∉ 6°*0
	Requester Informatio				G \u03c6 \	
	Company Name *	Company Unique ID	Unique ID Authority	Request Date*	Serier Substance C     Reven Kateria Substance Declaration Form     Tack     Ta	
	Siemens			2013-01-13	No Material Name Material Mass Unit Of Measure	_
	Contact Name *	Contact Title	Contact Phone *	Contact Email *	2 000022-Lead Material SGram	
	tcscadmin		555-555-5555	tcscadmin@tc10eap	Meteoral(s) Used	
Substance Declaration 1 Request substance declar			IE mahesh.todla	il Id(s) ar@siemens.com ig@@siemens.com iwe *	Substance(c) present in Weinres(c) Approx/Metrics(c) (approx.  Nexuel NexuelNampford(c) (approx.  Nexuel NexuelNampford(c) (approx.	2
					Commette: Clar	
	Requester Item Numbe 000758	r Mfr Item Number VP56	Mfr Item Name VP56	Effective Date Version Manufa		\$
	Alternate Recommend		VF50	Alternate Item Co		
	Manufacturing Proces			Peternale nem co	Done: @ Complete	
	Terminal Plating / Grid Array		nal Base Alloy J-STD-020 MSI	Rating Peak Process Body Temper		Save
	Comments		In our and	C	[?" ₩ Roay	morene   🔽 3   e 🖿

# **Compliance Grading and Reporting** Capabilities

#### Grading and reporting to demonstrate compliance or non-compliance

- Compliance grading with preconfigured rule sets address standard industry regulations such as REACH, RoHS and Conflict Minerals
- Configurable rules editor for customer specific regulations
- Compliance dashboards, dynamic queries and reporting for compliant and non-compliant parts

dt Veer Took Window Hep ★ 등 G H X 및 No H 와 C L D C A G T I C	③ * ○ * Lifecycle Viewer (Tort(tort)))		🔋 🔁 Summary 😭 Details 🔤 Viewer 🎦 Material	🎐 ASM 1/a;1
thoard x	Bern Nome Has PM		×	
Matrics KPT Report	B *CMedels (=+CEPSIM-001389/941-SIMAT_  - □ □ SIM-001389/941-SIMAT_	Steel	ASM 1/a;1 (View)	Regulation
date Remove Refresh Page	5 5 67 594-901380 41 -ma 5 5 67 594-901380 41 -ma 5 5 7 594-901380 41 -ma	PVC	ASM 1	Conflict Minerals:1.1.0
Subscription Name	10 3 17 504-002 300 A2 46.		Materials Mass (g)	
Articles_serted_by_ComplexceStatus_081	Results Legend	IRON	BEHP 0.5	REACH:1.1.0
Articles (pass / fail) Regulation	Report: Hedenal, Report Rule: Steel Scope:	Aluminum	PbCrO4 0.5	T DellCrit 1.0
0 <u>2</u>	(Teancenterski, per, yturs), seektoteral = "Steel	11100		RoHS:1.1.0
Pa I		Unnatched	Boric Acid 0.1	
	Name Coun		Substances CAS Number M	OK Canad
	( Material, Report (	A CONTRACTOR OF A	Bis(2-ethylhexylphthalate) 85-68-7 0	OK Cancel
CountFassed CountFaled CountFaled	- 3 SM-001342/4(1-cf.yk2 - 3 SM-001350/4(1-s5e fr		Lead(II) chromate 7758-97-6 0	
	- 3 SM-001351/41-45e,fs., - 3 SM-001305/41-ps.hal., - 3 SM-001301/41-ps.hal.,		iron 7439-89-6 1	
KPI_Articles_sorted_by_ComplianceStatus_DB11	L 3104-0001374/A(1-ps_out PVC 0 PCN 0		Boric Acid 11113-50-1 0	1
Parts_and_sorted_Complance_081	Auminum 7 H Ummatched 40		Total Material Mass: 1103.1 g	
	v v v v v v v v v v v v v v v v v v v	A7	Total Substance Mass: 1103.1 g	
RoHS Compliance Status REACH Compliance Status	5 Assently Level Coloring			
• PASS = 6 (11%)	Based on parts only			
Unapproved FAIL = 3 (5%)     S     NA = 29 (52%)	Sec as default			
e PASS(2) = 4 (7%) • Unapproved FAIL(2) = 5 (9%)			Substance Compliance Dashboard	h Results 🕄 👘 🥐 🥐 🔹 🚹 🚍 🌝 🖉 🔍 🔍 🖓 🗖
• NA = 29 (52%) • PASS(2) = 4 (7%)	iet ni defait	2		

## **Teamcenter Substance Compliance** Demonstration

Link to Compliance MSD Nanobox.mp4 (this shows supplier material disclosure) and compliance\_grd1.avi (this shows grading and reporting)

Restricted © Siemens AG 2014 All rights reserved.

# **Teamcenter Substance Compliance**

What's new and what's coming

#### What's New

- IMDS Integration
- Rules editor
- Enhanced supplier MSD automation
- Additional pre-configured regulatory rule sets
- Integrated material management

#### What's Coming

- Conflict minerals
- Active workspace
- Enhanced support for multi-sourcing



Restricted © Siemens AG 2014 All rights reserved.

# International Material Data System (IMDS)

Automotive standard for supplier material disclosure

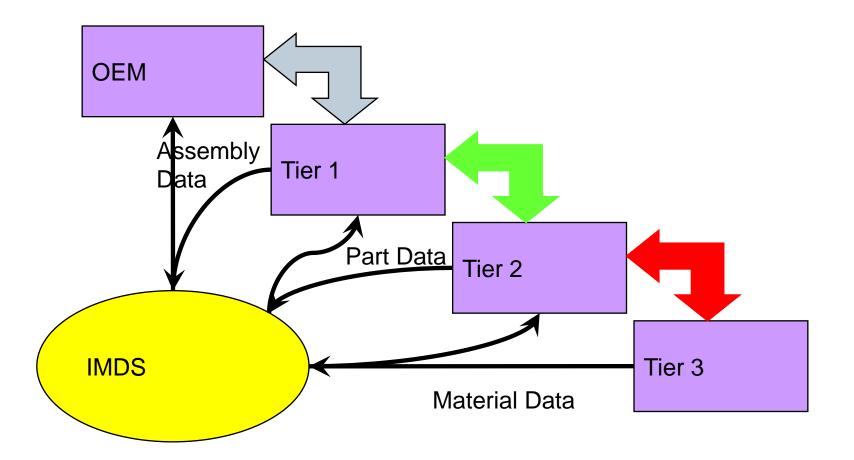
- Registered Companies ~124,000
- Registered Users ~320,000
- Active Users ~90,000
- Material Data Sheets ~48,317,000

-January 2014





#### **Gathering Data from your suppliers in IMDS**



#### **IMDS Integration**

Allows companies using Teamcenter to aggregate material disclosure data to their product structure from IMDS and push material disclosure data to IMDS using a single user interface

- Aggregate material and substance disclosure information into Teamcenter from the IMDS
- Submit Teamcenter MDS to the IMDS
- Single intuitive user interface to manage the MDS process

Functions + Administration + Help +	· 2   8 8   2 + 2 + 10 6 % 6 4	0 0 x	8 8 B	10 2816402/8;1-MD5102
	Data Recipient data Analysis HUSTERNEED	1	Ö hopertes	
Filter GADSL   Q		1	<ul> <li>3405 Then Revision Hagae Organit</li> </ul>	
Ф енналади Ф оканаларена ца) Ф оканаларена ца Ф оканаларена сама С	Exclame Indexendents Tyre: Groupware (see 1900) D. ("week WINDON") 1 Multiple WINDON" WINDON" WINDON" WINDON" WINDON" Development (Percent Net Development (Percent Net Development (Percent Net Conference (See 1997) Conference (See 1997) C		Mill Clauder High parts in Mill Shared High parts in Mill Shared High parts Mill Shared Hig	ų.
	t: Amende and Winglish Hearing of organization (HLB g Taligners 4-1-21%) Coldador and gate per term (HZ g Doubles 125%)		Provide and the second se	· OK Analy Curce



## **Teamcenter Substance Compliance** Demonstration

Link to IMDS\_to\_Tc.mp4

Tc\_to\_IMDS.mp4

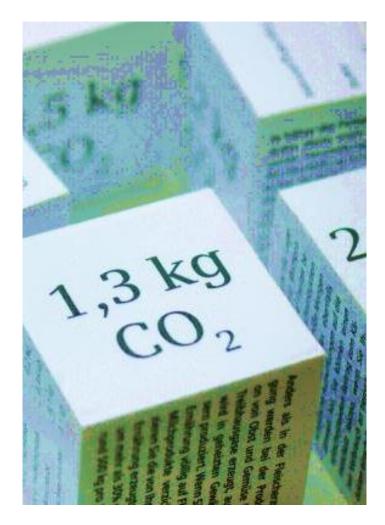
Restricted © Siemens AG 2014 All rights reserved.



### **Rules Editor**

Create custom specifications to meet business objectives and future directives

- Build, edit, and test regulations
- Adapt quickly to changing and future regulations
- Complete visibility and control of how products are graded for compliance
- Easily transfer rules to Teamcenter and CPM





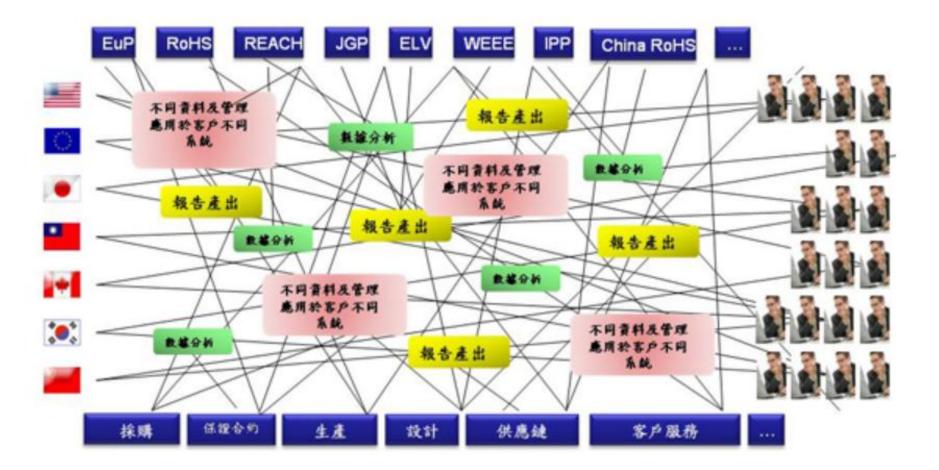
- Create rule sets that work just like the rule sets built by PE INTERNATIONAL
- Build, edit, and test rule sets by specifying: Substances, Thresholds, Compliance results, Exemptions
- Rules Editor works independent of Teamcenter and CPM

Here Back Delet	te 🛃 Edit										
Rule Set											
Name:	Conflict Minerals	onflict Minerals									
Version:	2.0.0	2.0.0									
Identifier:	com.pe-international.cpm.regulation.conflictminerals										
Structure:	Structure:										
Substance Group	Checks:										
Requirement	Threshold	Result									
No Conflict Min	0 %	Unapproved Fail									

Rules Editor Exemption	s Grading Substance Groups Administration
Substances	
Import Substances:	Select substances file.
Import 🗣 Export	
Rulesets	
Export Rule Set:	Select rule set
Import Rule Set:	Conflict Minerals
	Conflict Minerals Europe
Import	Radioactive materials ban
	REACH RoHS



#### **Enterprise is Facing Many Rules**



Restricted © Siemens AG 2014 All rights reserved.

Page 25



#### **Pre-configured Rule Sets**

- Several rule sets added since initial release
- PE INTERNATIONAL will continue to create / update rule sets as regulations and directives change or are created



- **REACH** Authorisation
- REACH Candidate
  - **REACH** Restriction
- EU RoHS

•

•

- China RoHS
- Korea RoHS
- Conflict Minerals
- IEC 62474
- GADSL
- EU Battery Directive
- EU Packaging

# Active Workspace Catalyst coming Q3 FY15



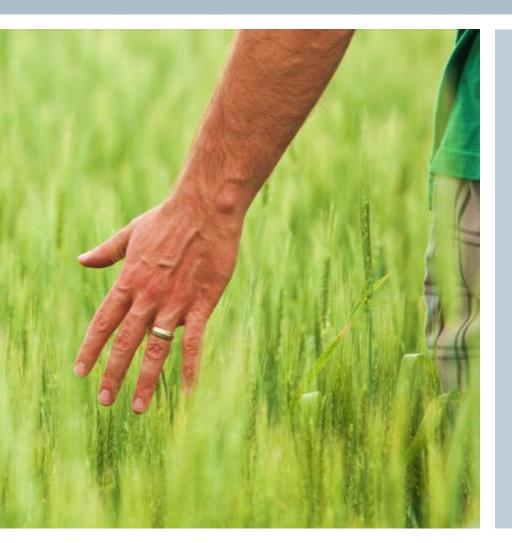
#### Intuitive user experience

Ē	ñ 0				SIEMI	INS					11 0				
۲	Dan Designer ( dan ) - Mobile Computing / Designer - Latest Working			Select Owner	Select Type	0							ly		Select Owner Select Type
		A 0										SIEMENS	sec	d Attachments History Relations	Vendor Parts Compliance Materials
		Mo <sup>™</sup> Mo <sup>™</sup>	tor Asse							Select O		Q	8	Overview Exemptions	
		Overv	iew Viewer	Where Used At	tachments	History I	Relations	Vendor P	arts Co	ompliance	Materials	r 7	0	Properties	
												r 1 L J	(i)	Regulation: REACH 3.1 Status: FAIL	
	CHANGES HOME FOLDER	Mater											A	Check Date: 25-Oct-2013 20:26 Failure Reason: Mercury	
	CHARGES FROME POLICIA	Water v										$\oplus$			
			OBJECT	SUBSTANCE	DETAILS	STATUS		MASS (G)				0	∆ <sup>+</sup>		
		30	Gold Alloy	Gold[7440-57 Formaldehyd	7-5]90%, le[9003-36-5]10%	Approved		10						Exemptions	
	SEARCH INBOX	(*)	Gold Mix	Gold[7440-57	7-5]80%, 0000-00-0]20%	Approved		9					C		
		1	Unknown		0000-00-0]100%	Approved		5					D	REACHRestrictions18a.Mercury Status: Approved Date Applied 27-Oct-2013 2026 Date Expiring: 27-Oct-2013 2026	REACHRestriction62PhenyImercur yacetate
		Subst	ances										D	Date Expiring: 27-Oct-2017	Status: Approved Date Applicat: 27-Oct-2013 20:26 Date Expiring: 27-Oct-2017
			OBJECT		CAS NUMBER			,	MASS (G)		COMPOSITION 9	6			
			Gold		7440-57-5			1	.8.24		76				
-		Û	Formaldehyde, o with 1 - chloro - 2,3	ligomeric reaction products -epoxypropane and phenol	9003-36-5			C	).72		3				
		Ê	Unknown		0000-00-0			5	5		20.833				

- IT friendly platform providing identical experience on any device with no client or plugin installation
- Web-intuitive, touch-enabled, configurable interface
- Embeddable components within familiar applications



## Agenda



- Teamcenter substance compliance overview
- Teamcenter integrated material management overview
- Summary

Restricted  $\ensuremath{\mathbb{C}}$  Siemens AG 2014 All rights reserved.

SIEMENS

Together with our OEM partner PE International, we introduce Teamcenter Integrated Material Management (internally referred to as IMM)

PE International has acquired the MDS solution from HD Solutions. MDS is the product that was re-branded into Integrated Material Management

The HD Solutions team (now PE team) has many years of experience implementing Teamcenter. MDS (now Teamcenter integrated material management) offers fully integrated material management with Teamcenter, NX and other CAD and 3<sup>rd</sup> party systems (LS-Dyna)



#### **Release information**

Currently compatible TC9.1.x and TC10.1.x and beyond

We can start selling this solution NOW

 Available on GTAC Teamcenter or Teamcenter Rapid Start / Windows 64 / Integrations\_and\_Solutions / IntegratedMaterialManagement
 Available in price book

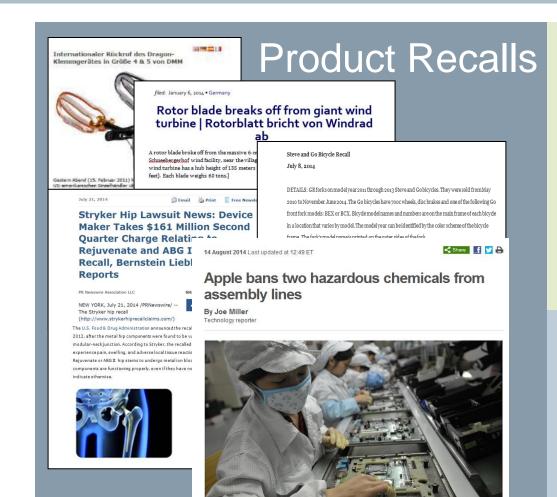
TC030505 TC Integrated Material Management (IMM)

Our original Teamcenter materials management solution will no longer be sold.

Existing customers will be grandfathered into new solution.



#### Why Do We Care About Material Management?



Hundreds of factories in China are linked to Apple's supply chain

or *http://www.recalls.gov* or

www.news.google.com

http://www.cpsc.gov

Many products fail because of misusage or mistreatment of **materials** 

# **Business Drivers** Automotive example

Track and manage **vehicle weight** against targets to meet new fuel efficiency standards

Streamline tracking and reporting of regulated substances, conflict materials and recyclable content of parts Proactively manage direct and indirect material **costs** to improve profitability

Manage product variety, material **variability** and associated complexity

> Improve material data interoperability with suppliers

Improve manufacturing process and quality

Improve material data **integrity** of parts and reduce **errors** in handling of parts with multiple materials

**Reduce time** to prepare material data for structural, crash, thermal, aesthetics and acoustic analysis





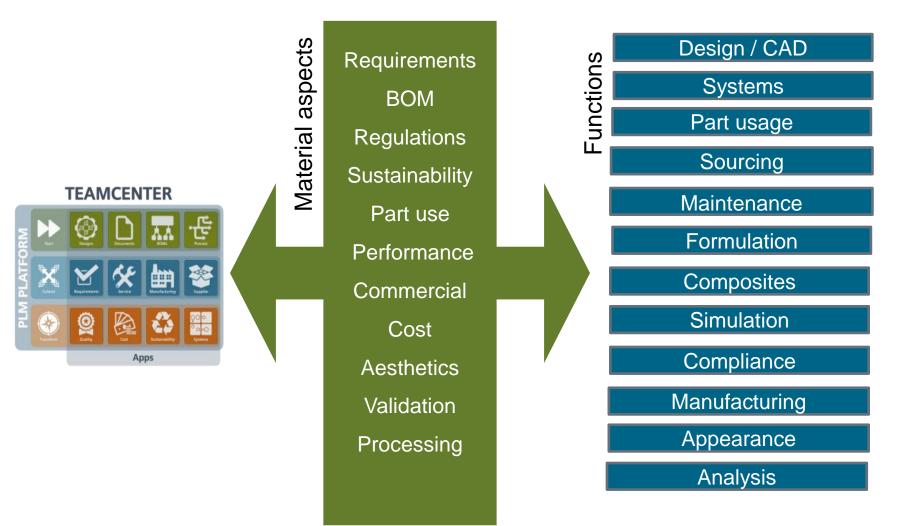
# **Current Situation** Material management as we know it today





#### SIEMENS

## Integrated Material Management Span multiple material aspects and functions



# Integrated Material Management Target roles

#### SIEMENS

Understand impact of my material selections on the product **Product Designer** 

#### **Materials Engineer**

Select the right material to meet new program requirements

#### **System Architect**

Leverage new composite material to improve the system performance Know if I am within the mass target limits of my new program

#### **Program Manager**



#### **Manufacturing Engineer**

Understand the impact of new material on current manufacturing process

Know which material model to use for my crash analysis Simulation Specialist

#### **Sourcing Manager**

Ability to reduce material costs through supplier consolidation

#### **Environmental Specialist**

Have the required data to assess the impact of changes for regulations on the new program

# Integrated Material Management Demonstration



#### Link to imm\_search\_compare\_nx.wmv

# Integrated Material Management

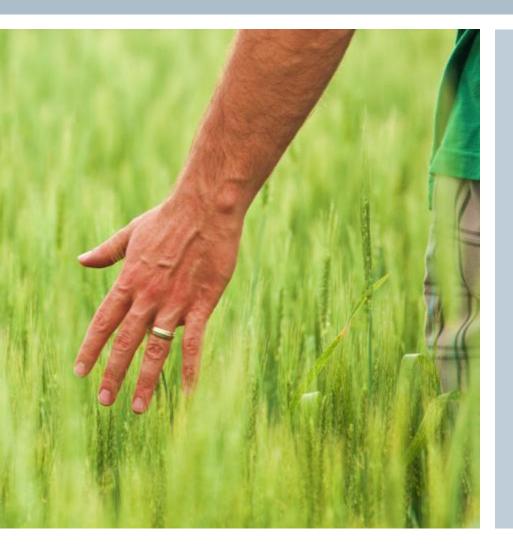
Validate and optimize product design

- Provide a single source of material properties and substances
- Compare material on scalar and table values
- Show multiple curves in one plot
- Data interoperability across SPLM applications
- Material usage is tracked through selections, assignments, refinements and declarations
- Streamline rollup of material data driven product strategic parameters such as mass, cost, and environmental impact





# Agenda



- Teamcenter substance compliance overview
- Teamcenter integrated material management overview
- Summary

How Material Management Fits with Sustainability IMM + TcSC

#### Sustainable products a top priority for most corporate leaders



**Restricted © Siemens AG 2014 All rights reserved.** 

# **Teamcenter Substance Compliance and Integrated Material Management**

#### Framework for sustainable product design

- Reduce risk of noncompliance by tracking and reporting substances of concern that are used in a product
- Minimize errors and rework costs by automating the material and substance declaration request process with suppliers
- Support Design for Environment (DfE) initiatives by providing a sustainability framework with holistic material management





#### Why should we start selling these solutions?

- Extend Teamcenter footprint
  - Integrated environment
  - Keep competition out
- Bringing product compliance team into the fold
  - Quality products
  - Consistent across domains
- Domain expertise
  - Ably supported by domain experts (PE)

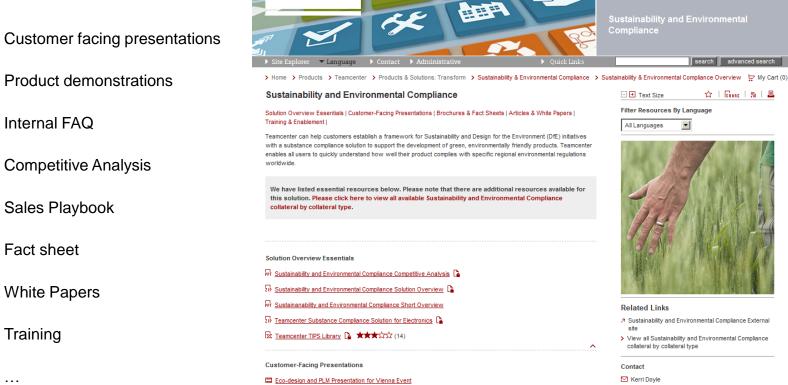




# Where To Find Collateral Substance compliance

#### https://sales.industrysoftware.automation.siemens.com/sell/teamcenter/products/sustainability/

SIEMENS



Key Substance Compliance Use Cases

Roadmap for Teamcenter Substance Compliance - Customer Facing 🔓

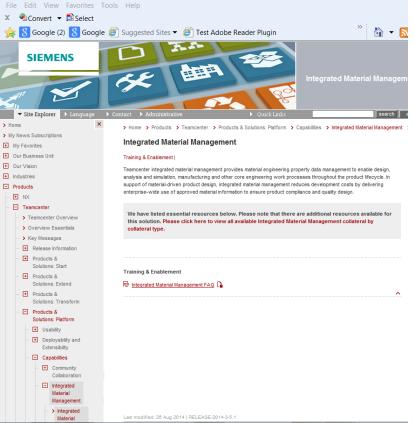
Kerri Doyle
 Teamcenter Product Marketing
 Tedie West
 Teamcenter Product Management

Restricted © Siemens AG 2014 All rights reserved.

# Where To Find Collateral Integrated material management

#### https://sales.industrysoftware.automation.siemens.com/sell/teamcenter/products/integrated/

l



Restricted © Siemens AG 2014 All rights reserved.



# A framework for sustainability

# Thank You!