

PART 302 - Accessing corporate materials knowledge

– for engineering, cost, and sustainability – within PTC Windchill and PTC Creo

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10th June 2015



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MATERIAL INTELLIGENCE
www.grantadesign.com

Agenda

- Brief intro to Granta Design
- Materials applications for Creo and Windchill
- Summary

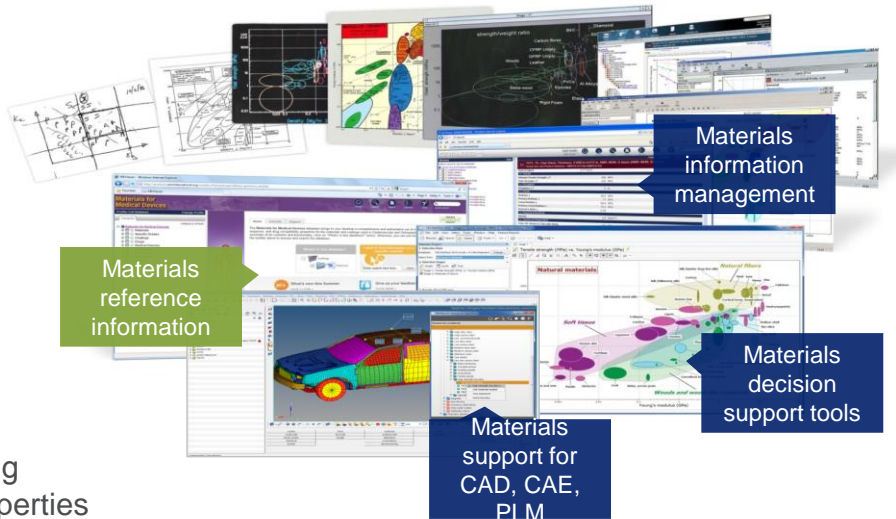
Granta Design—innovating since 1994



Materials information technology is...

Software + Information

...related to engineering materials and their properties



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Our partners and collaborations

	Owners UNIVERSITY OF CAMBRIDGE ASM INTERNATIONAL					
Data	ASME <small>SETTING THE STANDARD</small>	CAMPUS	Global Powder Metallurgy Property Database	IHS	M-Base <small>Engineering + Software</small>	MI-21 <small>Metals Information For the 21st Century</small>
	MMPDS	NEAMP	NIMS	Stahl	UL	Computation CMD Network
Collaborations	ADS	AMAZE	THE CIRCULAR ECONOMY	100	Education SEFI	FEMS

PTC®

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Our customers: Manufacturers worldwide

Consortia

● Material Data Management Consortium

● EMIT Consortium

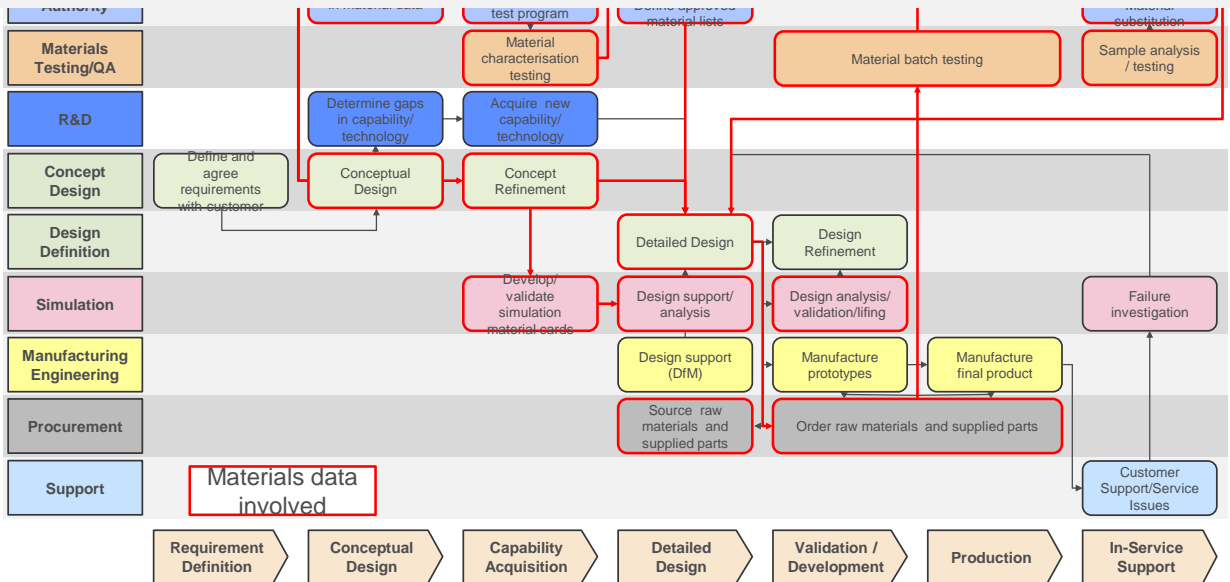


- | | |
|--------------------------|-----------------------|
| Airbus | DePuy |
| Airbus Helicopters ● ● | Donaldson |
| Airbus Defence & Space ● | Doosan Babcock ● |
| AWE ● | Embraer ● |
| ASCO Industries | Emerson Electric ● |
| Baker Hughes ● | ESA |
| Boeing ● ● | Ethicon Surgical Care |
| Bombardier Aerospace | GE ● |
| Bosch | General Motors ● |

- | | |
|---------------------|-------------------------|
| Honeywell ● ● ● | Parker Aerospace |
| Huntsman | Perkins Engines |
| Hutchinson | Pratt & Whitney ● |
| IHI | PSA Peugeot Citroën ● |
| Jaguar Land Rover ● | Raytheon ● |
| KSPG ● | Rheinmetall (KSPG Auto) |
| Lab 126 (Kindle) | Rhodia |
| LL Products | Rolls-Royce ● ● |
| Lockheed Martin ● | RUAG Space |
| MASCO | Suzlon |
| MBDA Group | Sulzer ● |
| MTU | Thales ● |
| NASA ● | Thyssen Krupp Steels |
| Northrop Grumman ● | TRW Automotive |



Role of materials in manufacturing

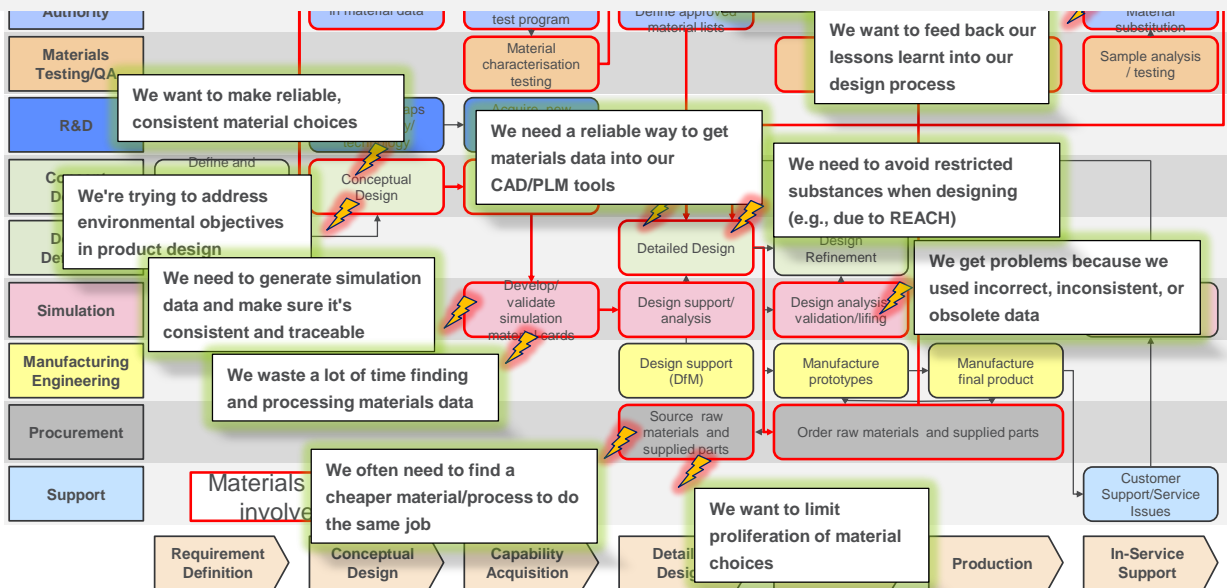


The typical materials knowledge environment

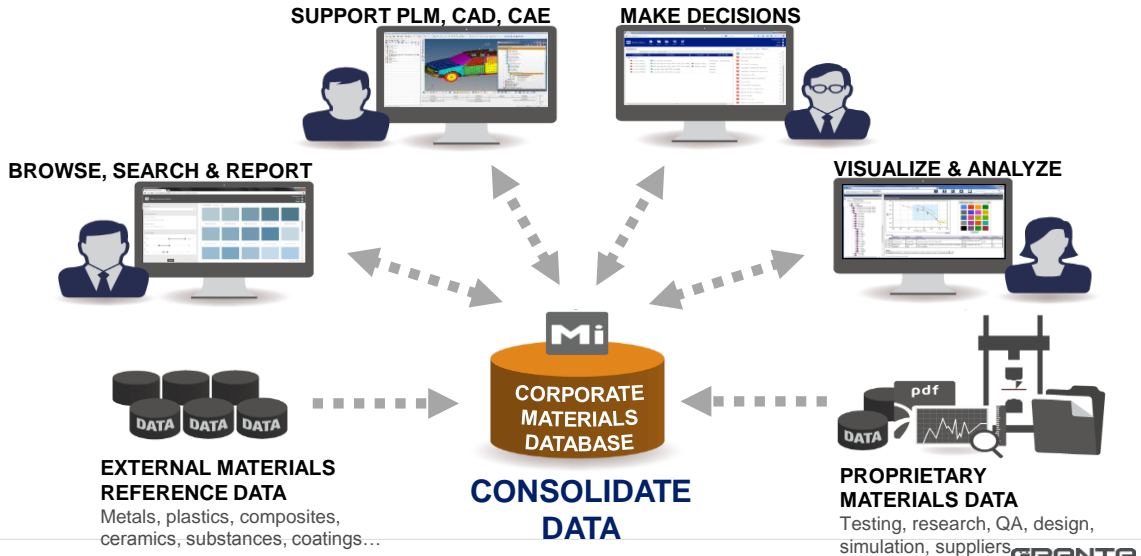


- Data scattered in spreadsheets, databases, hard copy, file systems...
- Islands of information
- No systematic access control, security, versioning

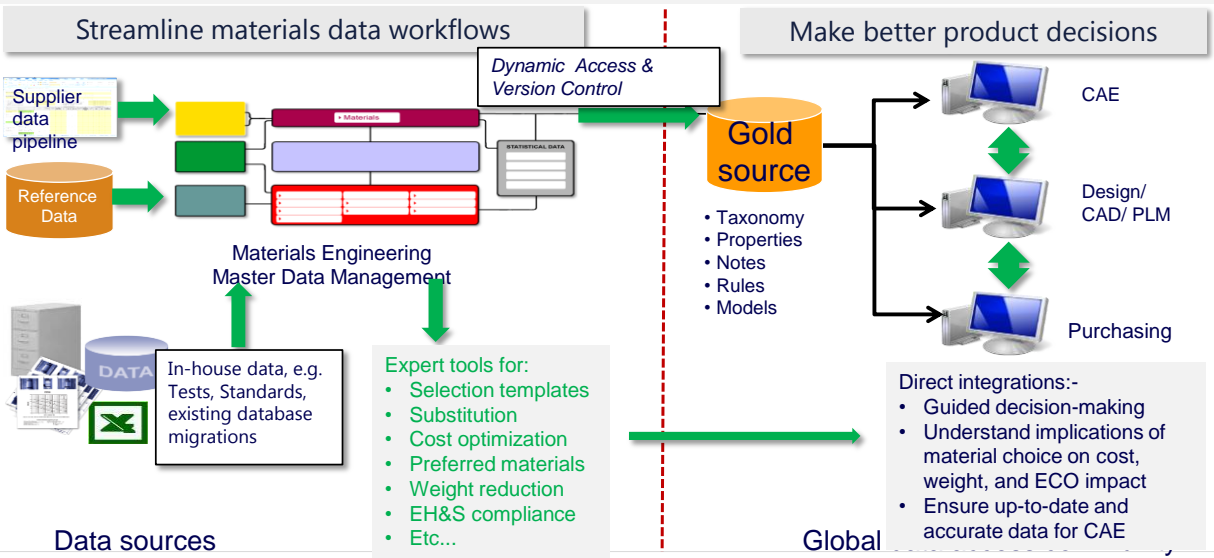
Solving materials problems is challenging



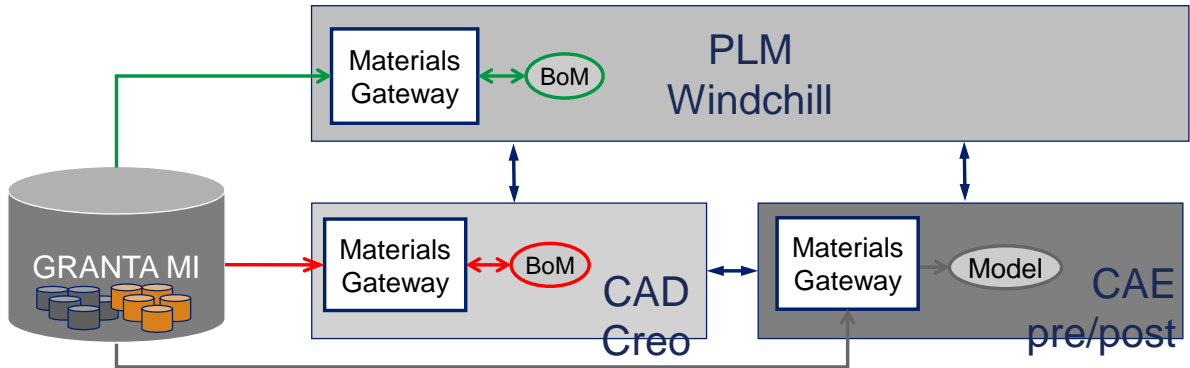
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Overall integrated approach

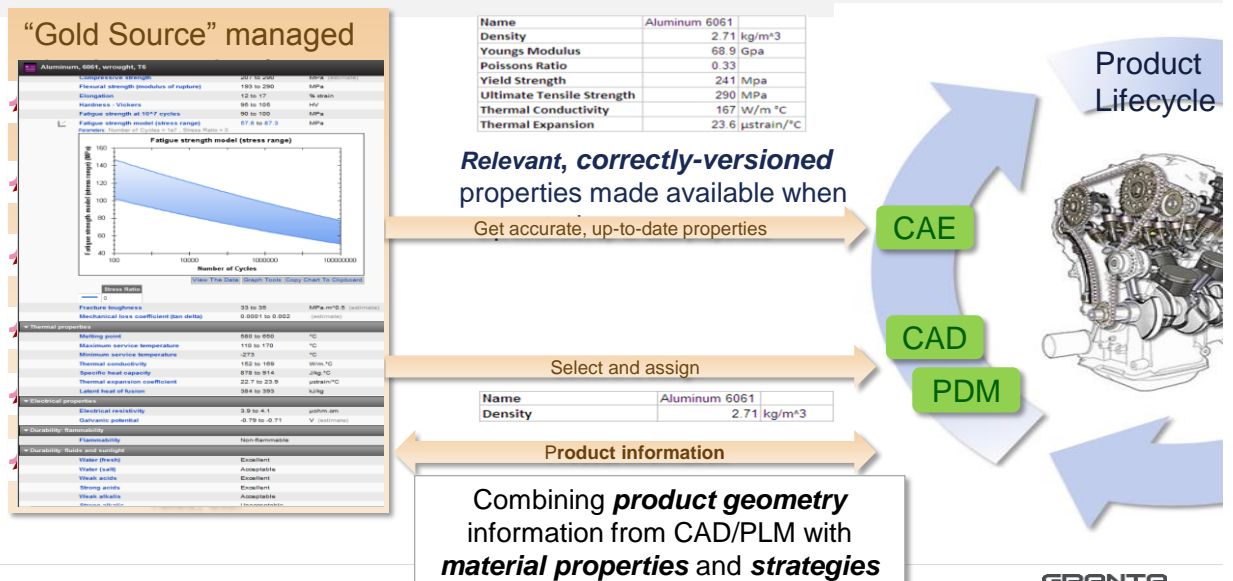


MI Gateways: Accessing materials knowledge in PLM



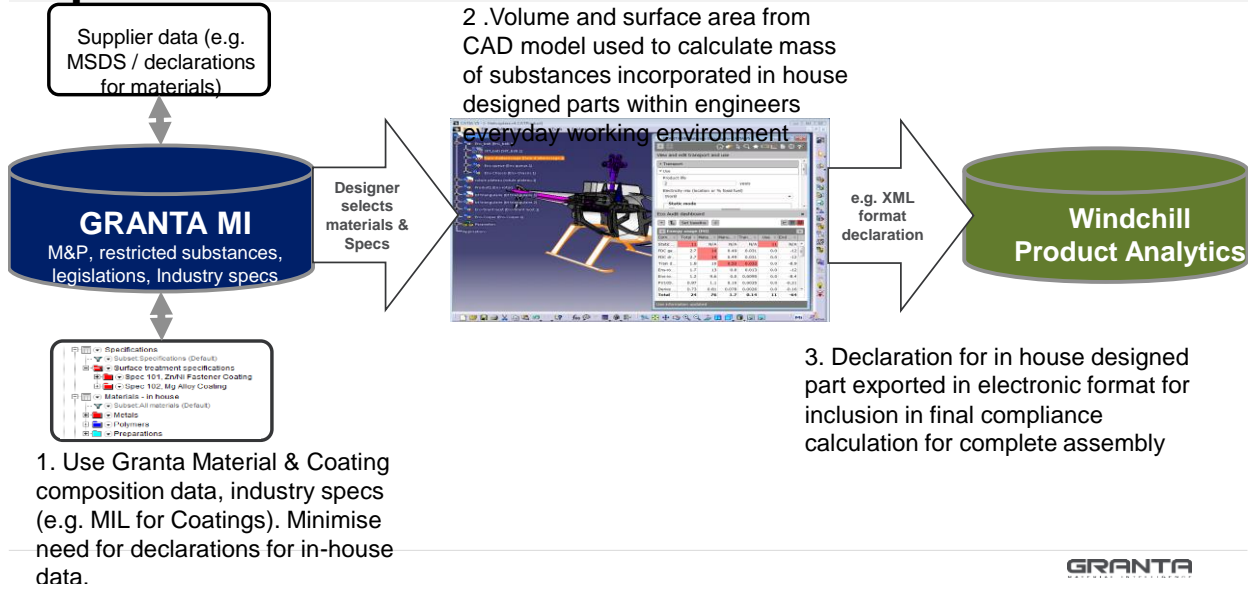
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Role within broader PLM context



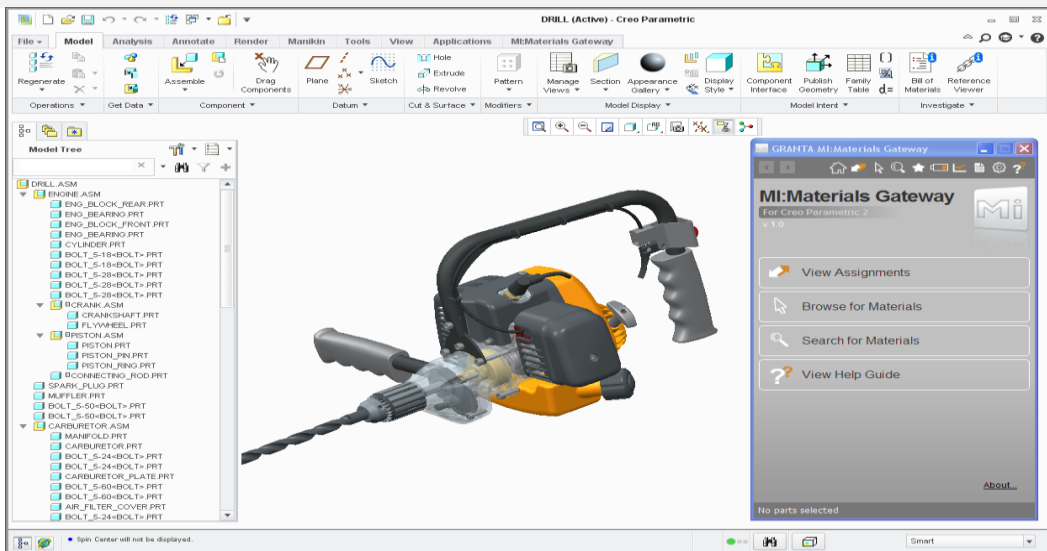
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Applying in-house material and process data in design process



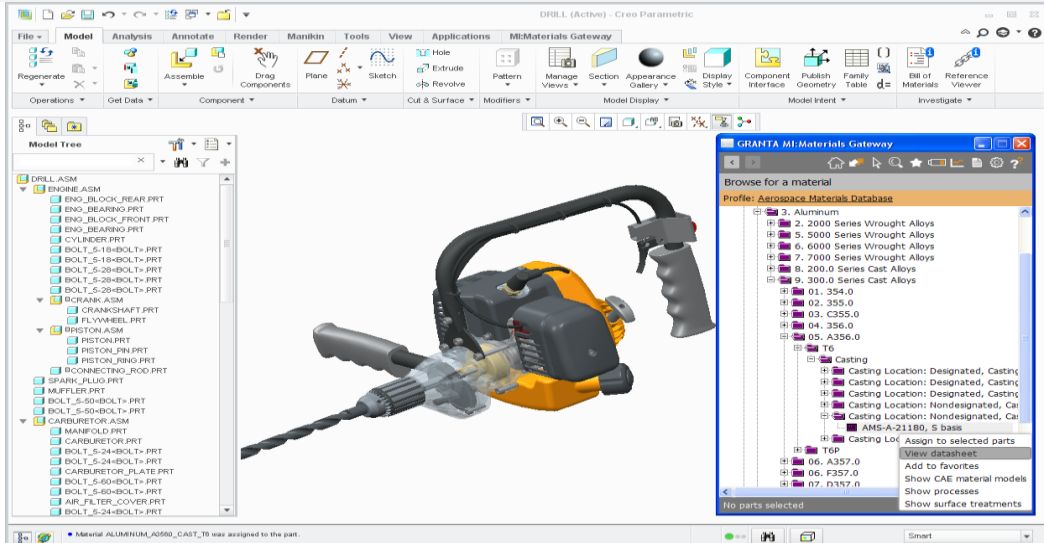
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MI:Materials Gateway for Creo



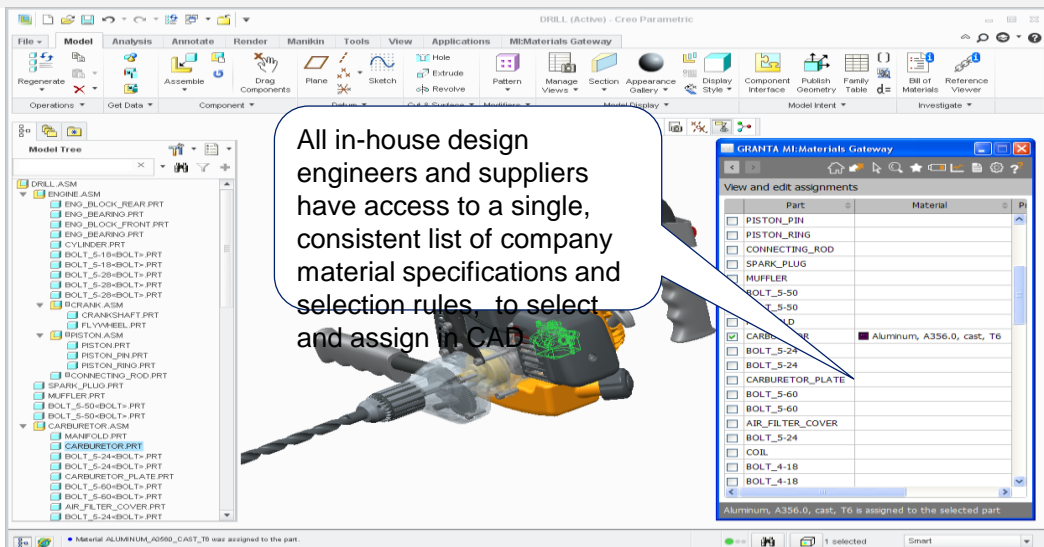
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Options for each material



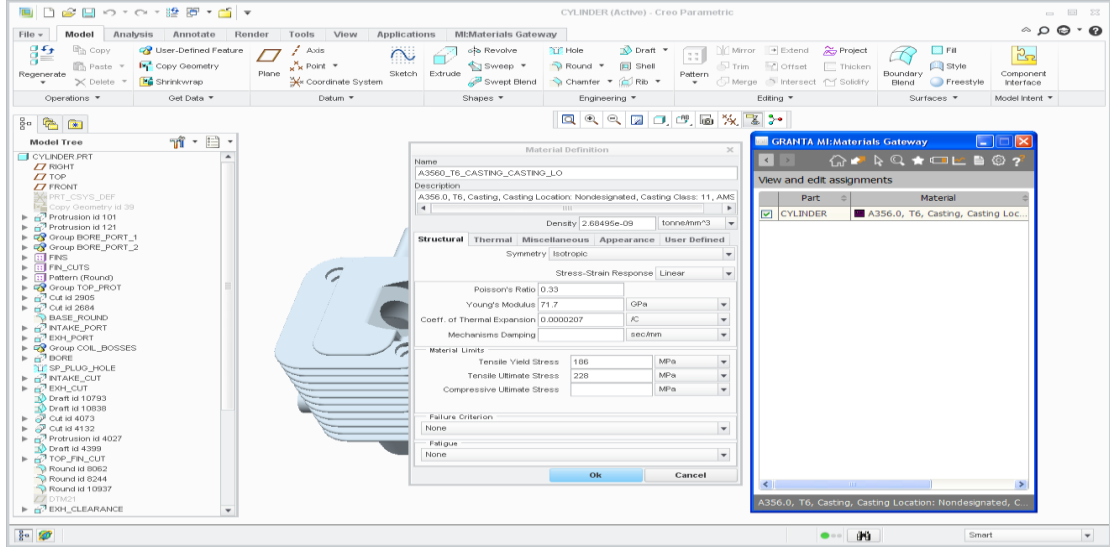
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Assigning material to a part



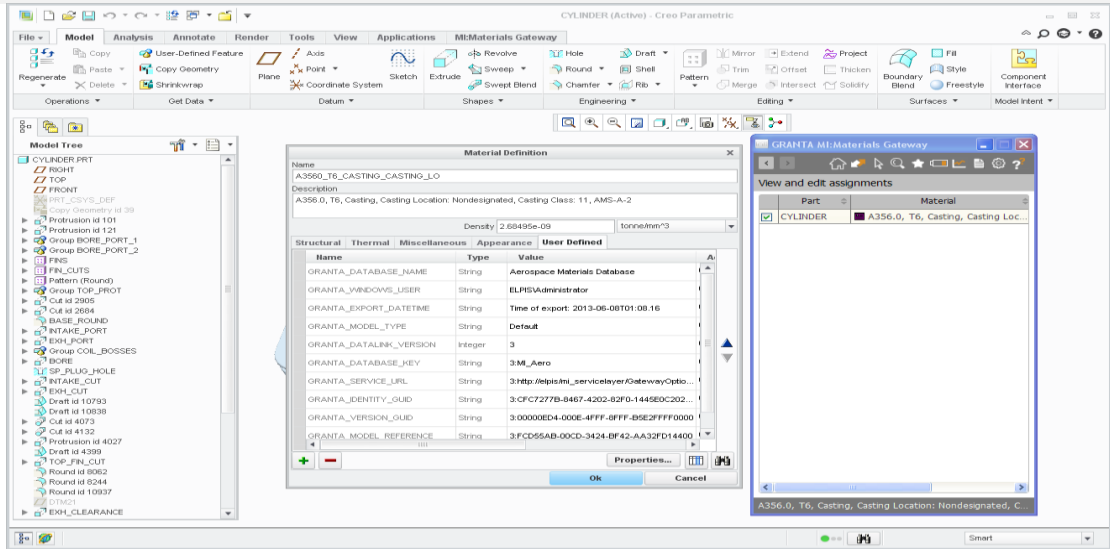
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Resulting properties in Creo model



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Traceability – “pedigree” attributes



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Dashboard highlighting Eco implications

The screenshot shows the GRANTA MI Materials Gateway interface. The main window displays a 3D model of a drill assembly. On the right, the 'Eco Audit dashboard' is open, showing a table of CO2 footprint data. The table has columns for Component, T, Mat., M., Tr., Use, and End... The data is as follows:

Component	T	Mat.	M.	Tr.	Use	End...
Static Use	0.0	N/A	N/A	N/A	0.0	N/A
CYLINDER	0.69	3.1	0.17	0.0	0.0	-2.6
ENG_BLOCK...	0.49	2.2	0.12	0.0	0.0	-1.8
ENG_BLOCK...	0.46	2.0	0.12	0.0	0.0	-1.7
ENG_BEARING	0.035	0.11	0.0	0.0	0.0	-0.080
ENG_BEARING	0.014	0.0	0.0	0.0	0.0	0.0
Total	1.8	7.6	0.45	0.0	0.0	-6.3

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Dashboard highlighting REACH implications

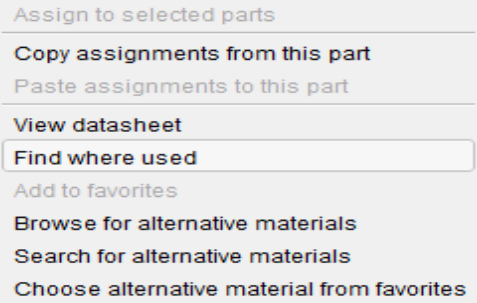
The screenshot shows the GRANTA MI Materials Gateway interface. The main window displays a 3D model of a drill assembly. On the right, the 'REACH dashboard' is open, showing a table of mass in RoHS data for selected components. The table has columns for Component and % Mass in RoHS. The data is as follows:

Component	% Mass in RoHS
HANDLE_GRIP	6.0
HANDLE_GRIP	6.0
HANDLE_SIDE	3.6
Total	15

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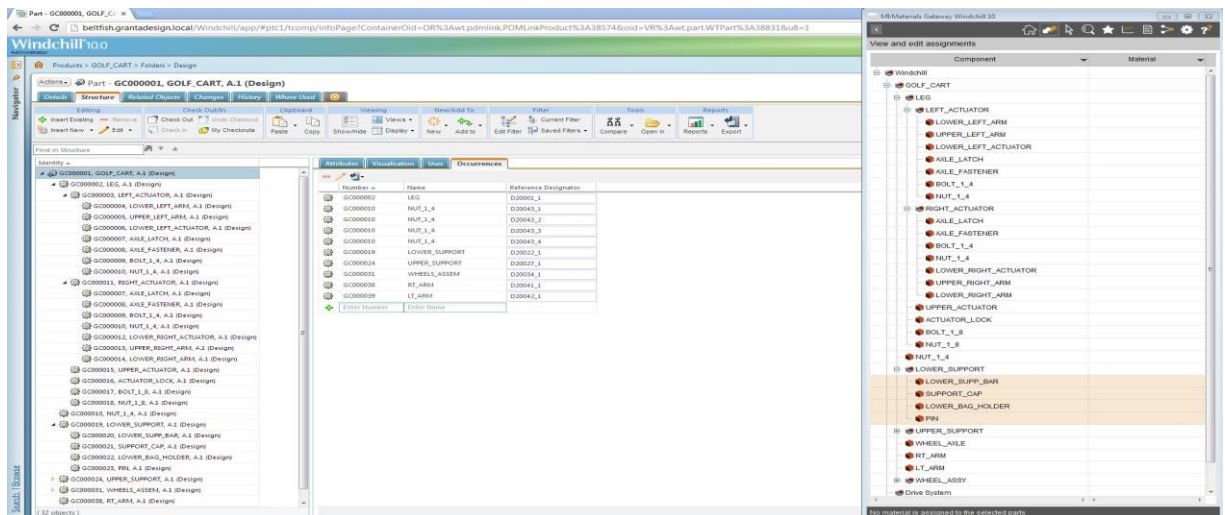
Beyond single assemblies – Gateways for PLM

- Analogous functionality to CAD Gateways, in formal managed, product-revised PLM environment
- ‘Low footprint’ materials assignment in product structure, always from ‘analytics’ tool steady in product design
 - Managers and other specialists consulting PLM can assess designs for compliance with materials strategy
- Where used? Risk assessment across multiple products



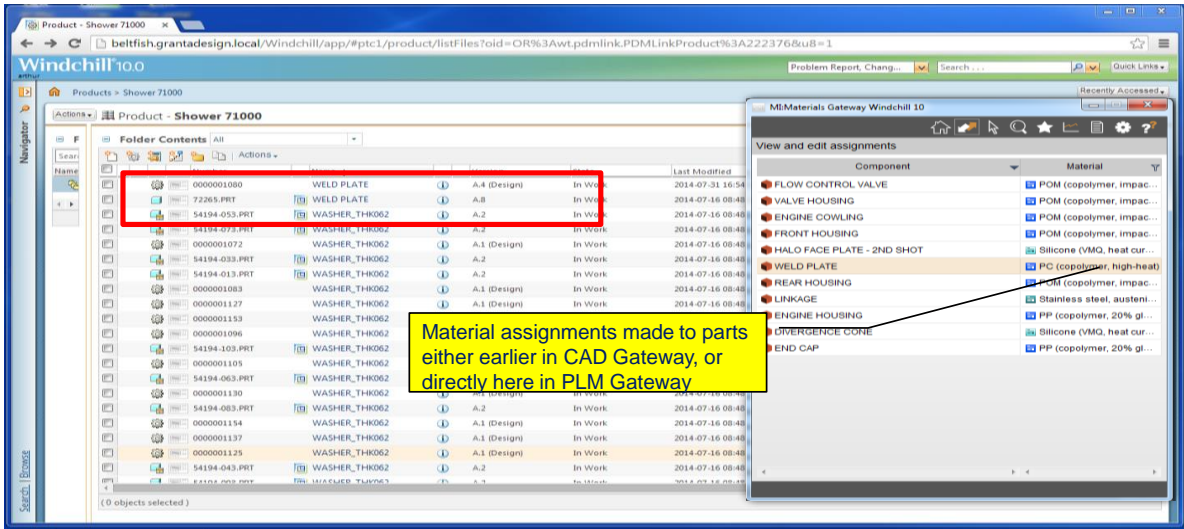
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MI: Materials Gateway for Windchill

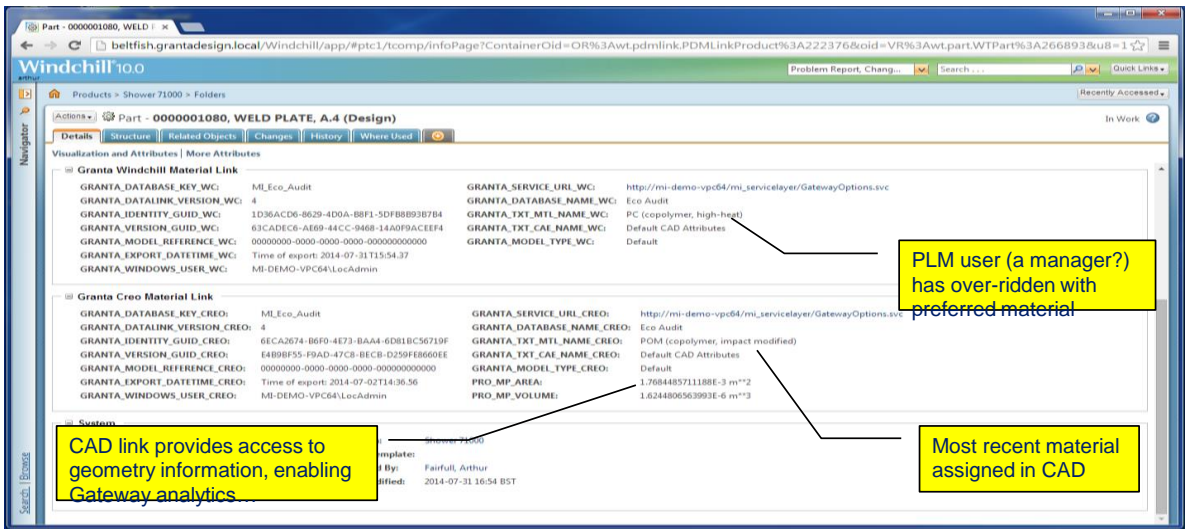


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Making/viewing assignments



Material data links from revisioned objects



Gateway dashboard driven from PLM

Name	Number	Name	Version	State	Last Modified
WELD PLATE	000001080	WELD PLATE	A.4 (Design)	In Work	2014-07-31 16:54
WELD PLATE	72265.PRT	WELD PLATE	A.8	In Work	2014-07-16 08:48
WASHER_THK062	54194-053.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	54194-073.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	000001072	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	54194-035.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	54194-013.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	000001083	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	000001127	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	000001153	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	000001096	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	54194-103.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	000001105	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	54194-063.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	000001130	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	54194-083.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	000001154	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	000001137	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	000001125	WASHER_THK062	A.1 (Design)	In Work	2014-07-16 08:48
WASHER_THK062	54194-043.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48
WASHER_THK062	54194-023.PRT	WASHER_THK062	A.2	In Work	2014-07-16 08:48

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In Gateway 3.0 – Emphasis on configuration flexibility

- Compatible with evolving PLM data models, while also supporting your chosen CAE tools
- Configurable with CAD or PLM as “assignment master”, or with synchronisation
- Configurable if custom Items/Objects have already been created in PLM, and material need to be assigned to them
- Option to assign and report on Processes and Surface Treatment Specifications, as well as Materials

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Summary

- Enable enterprise access to value of materials knowledge, via CAD, CAE, and PLM environments
- Deploy
 - Approved corporate materials knowledge and Granta's authoritative reference data
 - Rapid access for users
 - Control, consistency, and traceability of data
- Embed
 - Product analytics, risk assessment, and materials guidance tools
 - Early in product design process
- Support wider corporate strategies of material standardization, supply risk reduction, lightweighting, ...

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Translate materials knowledge into business value



Helps to meet engineering challenges...

- Functional specifications
- Time-to-market
- Cost
- Design-for-compliance
- Lightweighting
- Equivalent materials
- Materials obsolescence
- Reliability
- Data security

...which come from business drivers

- Economic & cost pressures
- Shareholder value
- Consumer requirements
- Market share
- Regulation (REACH, ITAR...)
- Legal liability (Health, safety...)
- Global supply & manufacturing
- Brand / reputation

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• Thank You

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