# MATERIALS KNOWLEDGE MANAGEMENT
## – FOR ENGINEERING, COST, AND SUSTAINABILITY – FOR PTC CREO AND PTC WINDCHILL

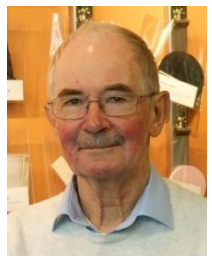
Dr Arthur H Fairfull, Granta Design
Product Director, Materials Strategy & PLM Integration

Tuesday, June 7

# AGENDA

- Brief introduction to Granta Design
- Typical materials challenges
- Materials applications for Creo and Windchill
- Summary

# GRANTA DESIGN—INNOVATING SINCE 1994



UNIVERSITY OF CAMBRIDGE

ASM INTERNATIONAL

**Software** +

**Information**

...related to engineering materials and their properties

# OUR PARTNERS AND COLLABORATIONS

## Owners

University of Cambridge

ASM International

## Data

ASME – Setting the Standard

CAMPUS

Global Powder Metallurgy Property Database

IHS

M-Base Engineering + Software

MI-21 Metals Information For the 21st Century

MMPDS

NCAMP

NIMS

Stahl

UL

## Computation

CMD Network

## Collaborations

ADS

AMAZE

Ac Ce Le Ra Te D
Me Ta L Lu Rg Y

Ellen MacArthur Foundation – The Circular Economy 100

## Education

SEFI

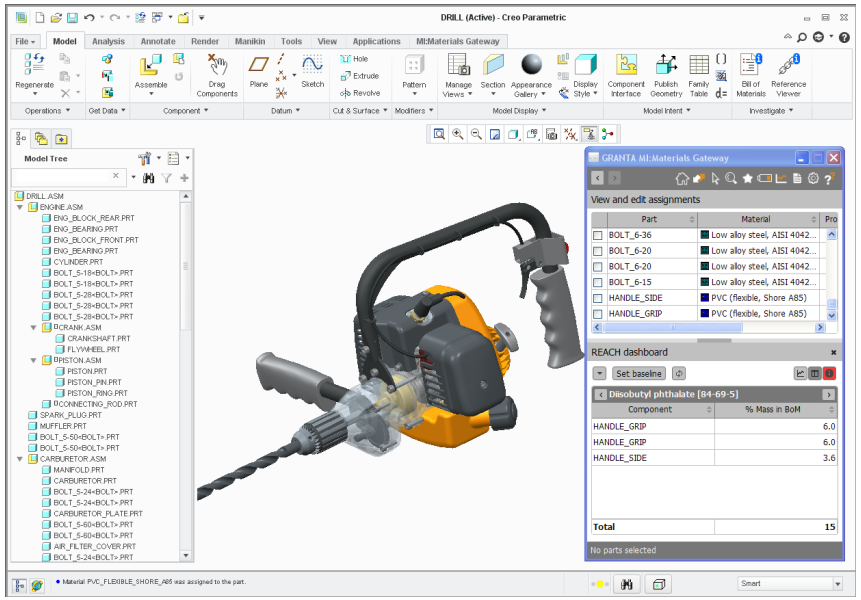
FEMS

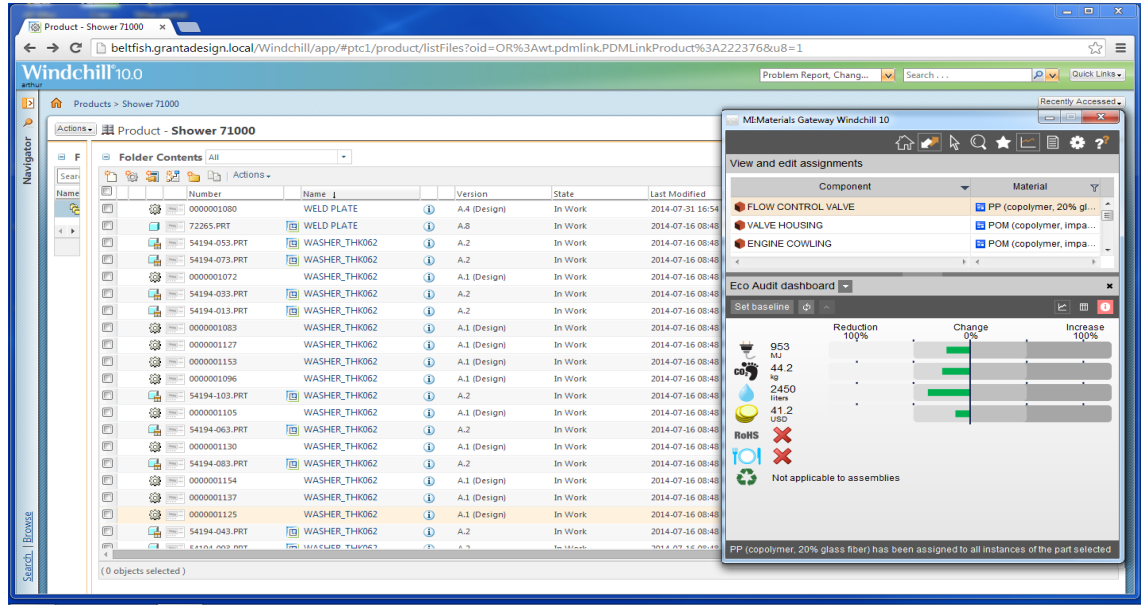
# PARTNERSHIP WITH PTC

PTC®

GRANTA MATERIAL INTELLIGENCE

- Gold member of PTC's Partner Advantage Program since 2007



# OUR CUSTOMERS: MANUFACTURERS WORLDWIDE

## Consortia

- Material Data Management Consortium
- EMIT Consortium
- AutoMatIC

Airbus
Airbus Helicopters
Airbus Defence & Space
AWE
ASCO Industries
Baker Hughes
Boeing
Bombardier Aerospace
Bosch
Constellium
DePuy
Donaldson
Doosan Babcock
Embraer
Emerson Electric
ESA
Ethicon Surgical Care
GE
General Motors
GKN Aerospace
Honeywell
Huntsman
Hutchinson
IHI
Jaguar Land Rover
KSPG
Lab 126 (Kindle)
LL Products
Lockheed Martin
MASCO
MBDA Group
MTU
NASA
Northrop Grumman
Novo Nordisk
NPL
Philips Technologie
Parker Aerospace
Perkins Engines
Pratt & Whitney
PSA Peugeot Citroën
Raytheon
Rheinmetall (KSPG Auto)
Rhodia
Rolls-Royce
RUAG Space
Suzlon
Sulzer
Thales
Thyssen Krupp Steels
TRW Automotive
United Technologies Corp
Vestas

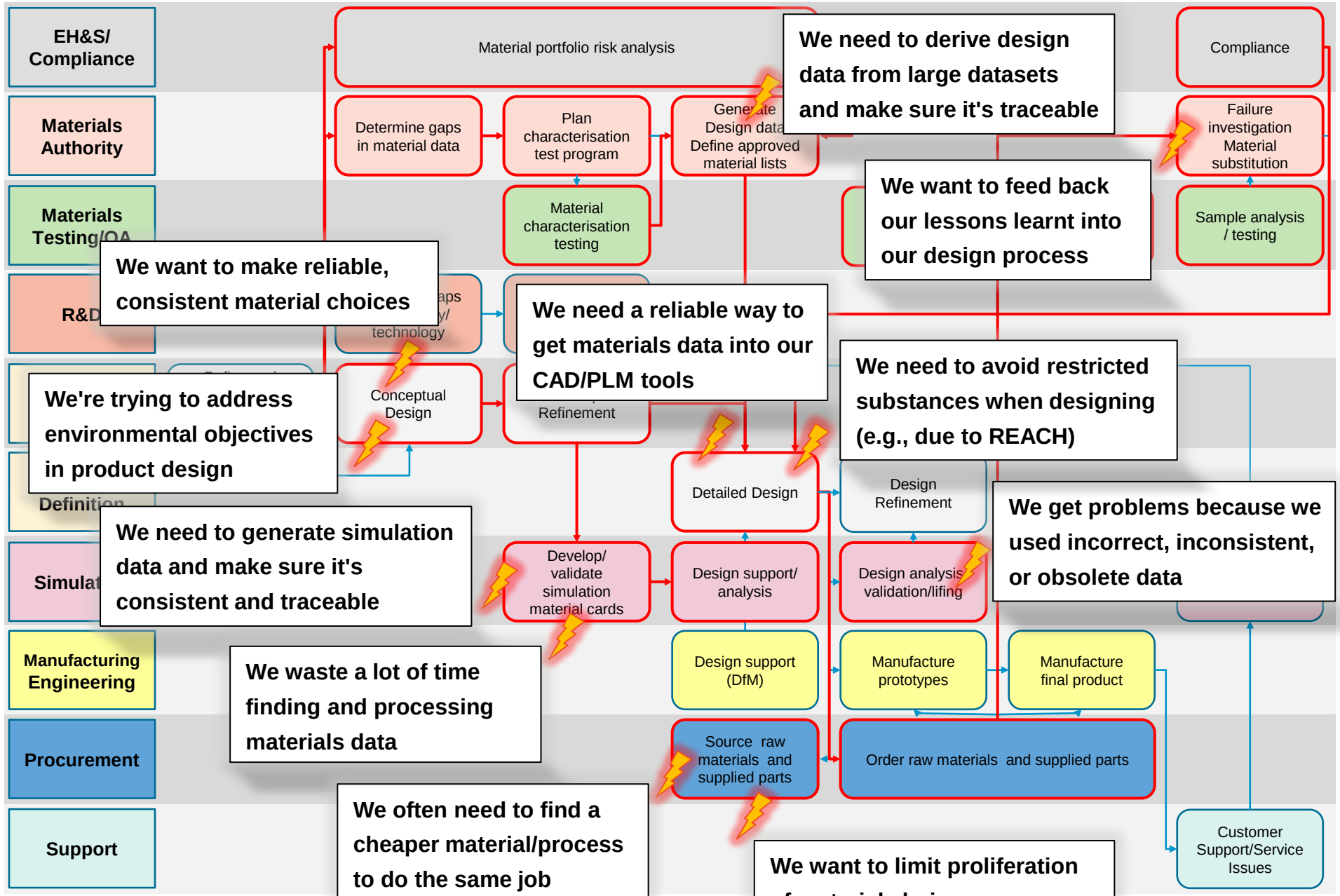




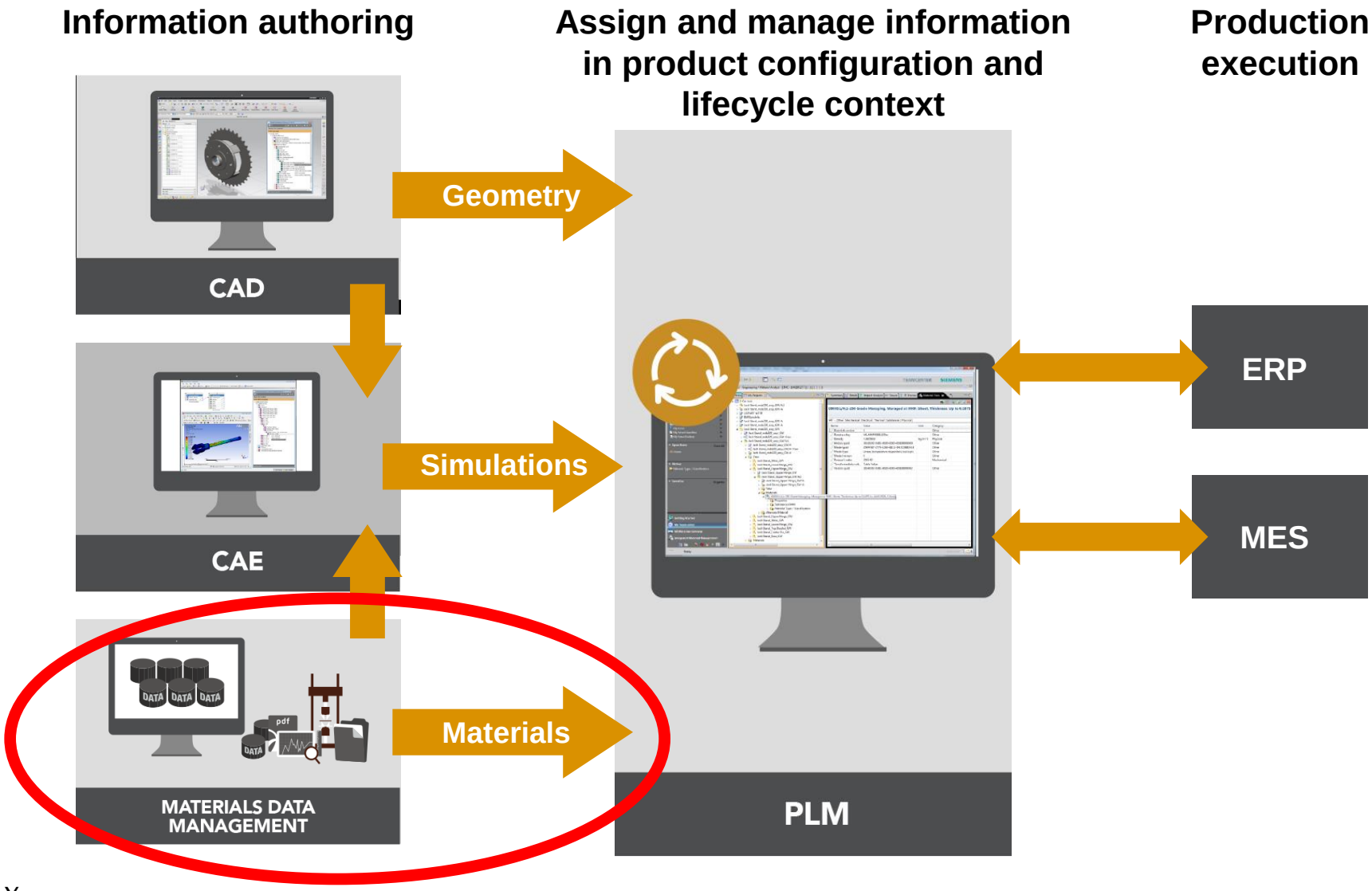
# THE TYPICAL MATERIALS KNOWLEDGE ENVIRONMENT


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

# AND TYPICAL MATERIALS CHALLENGES



# MATERIALS INFORMATION AUTHORING IN PLM CONTEXT

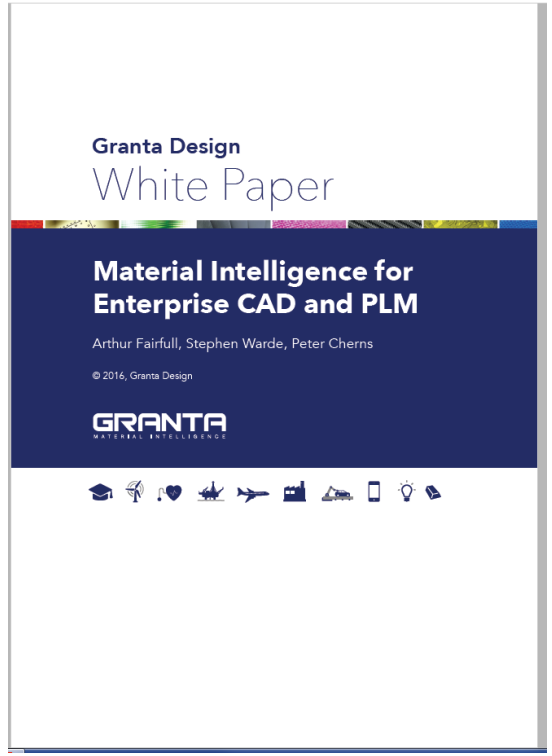


# CATEGORIES OF VALUE

1. Derivation of approved, traceable, materials information subset published for enterprise-wide use

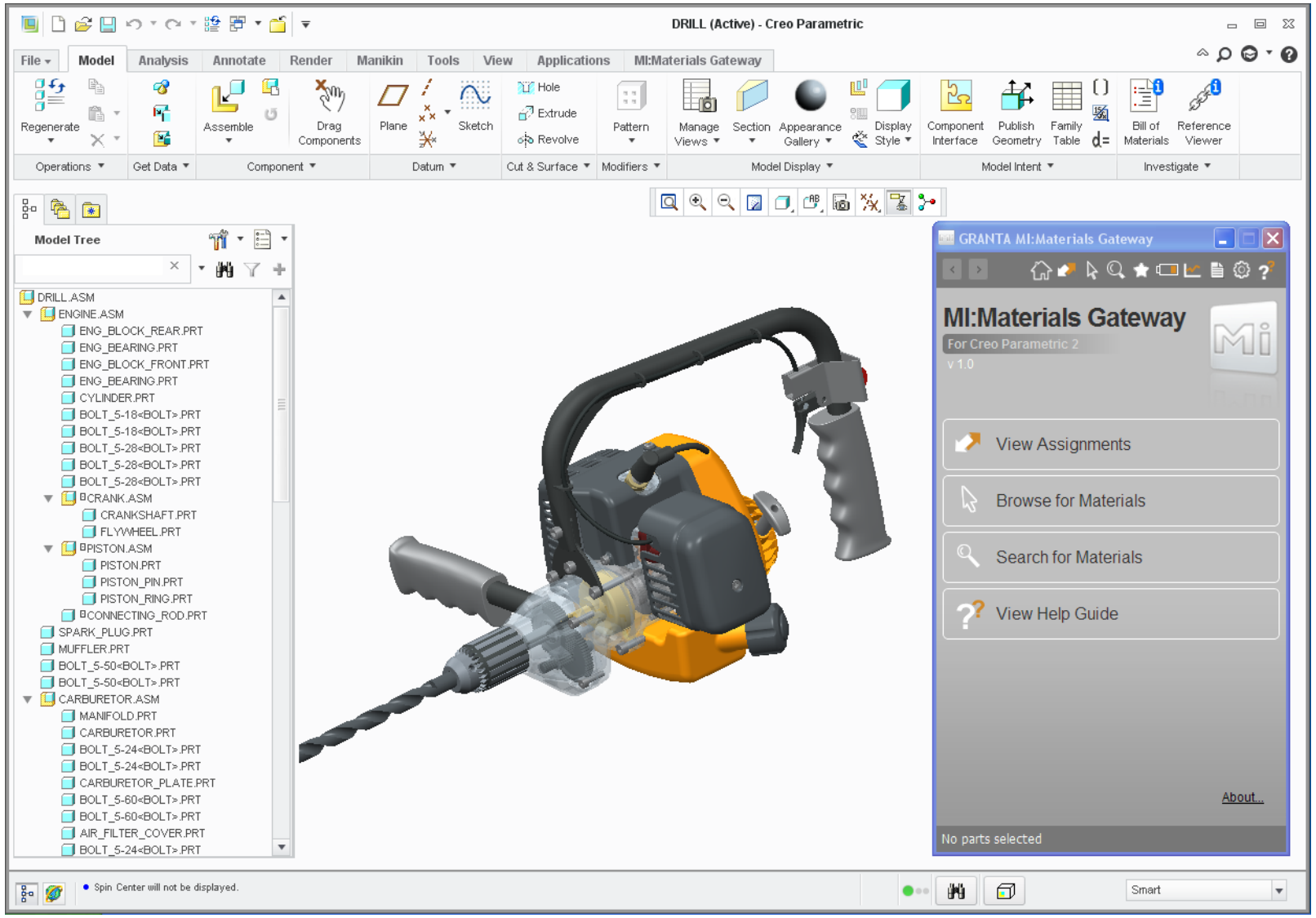
2. Assignment of relevant materials from that subset to the design or product structure, building out the engineering bills of materials (EBoMs)

3. Analytics and reporting on these assignments, enabling design optimization and risk avoidance re cost, weight, legislation, … implications

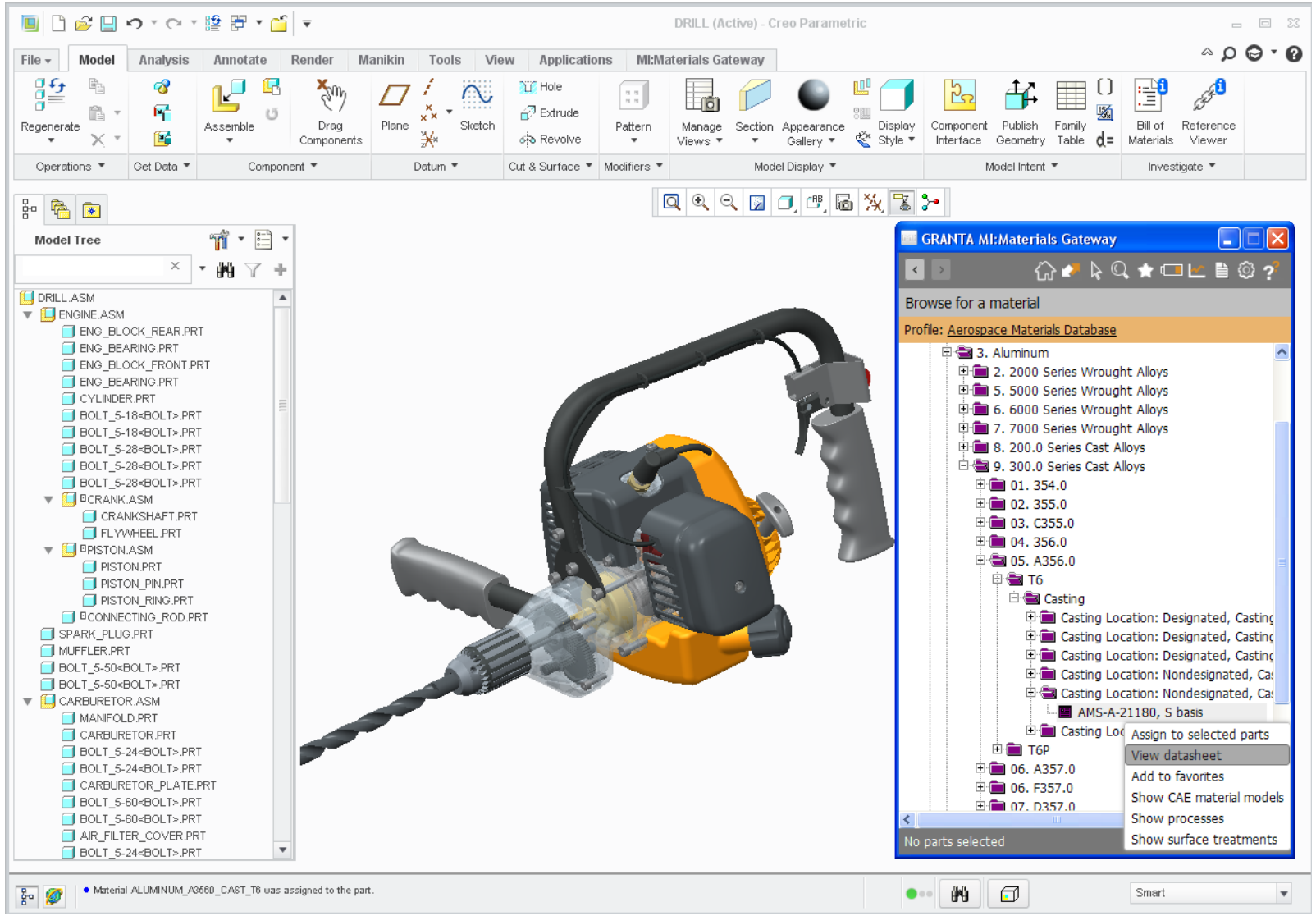



Materials authoring

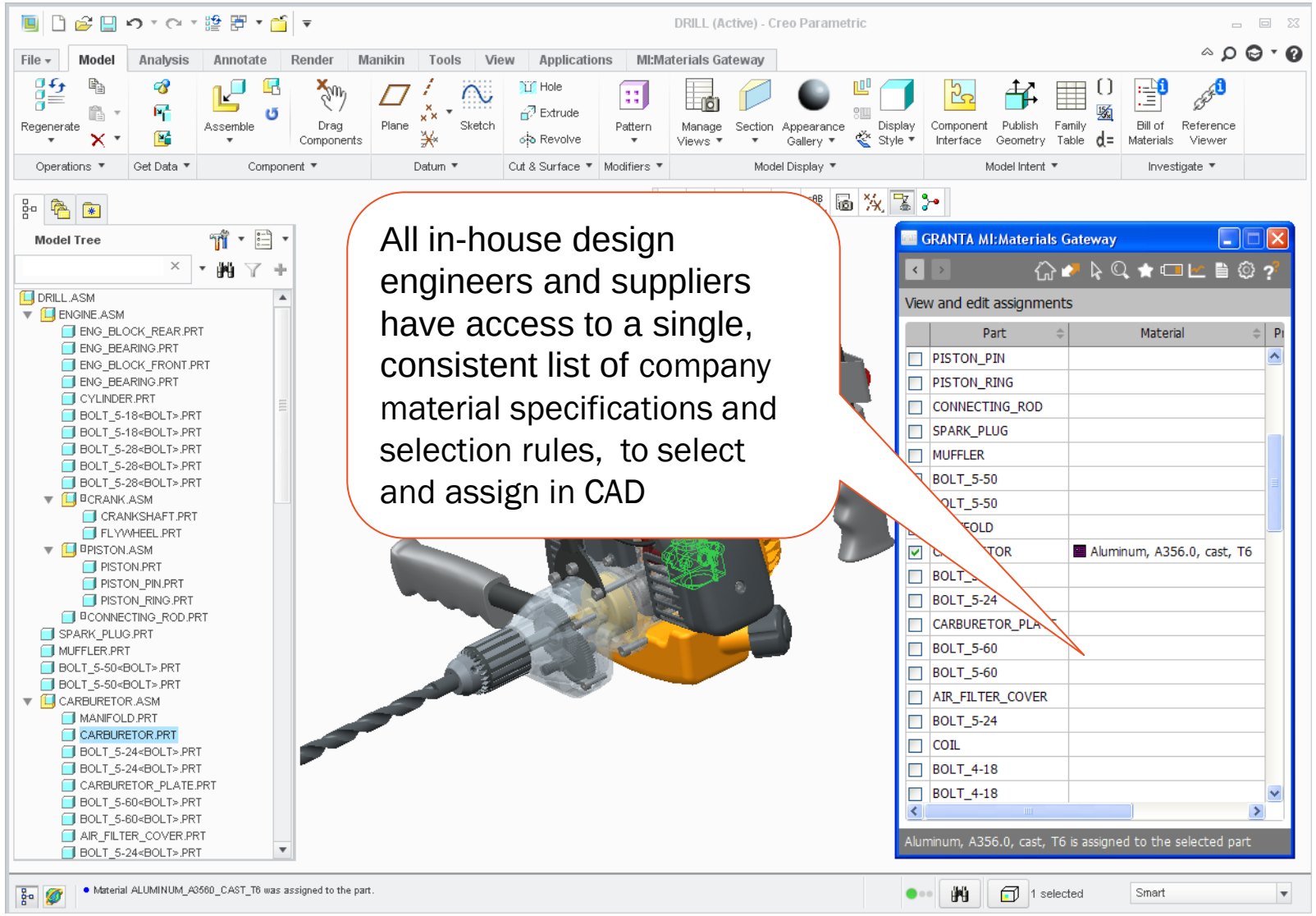
# GRANTA MI:MATERIALS GATEWAY FOR CREO



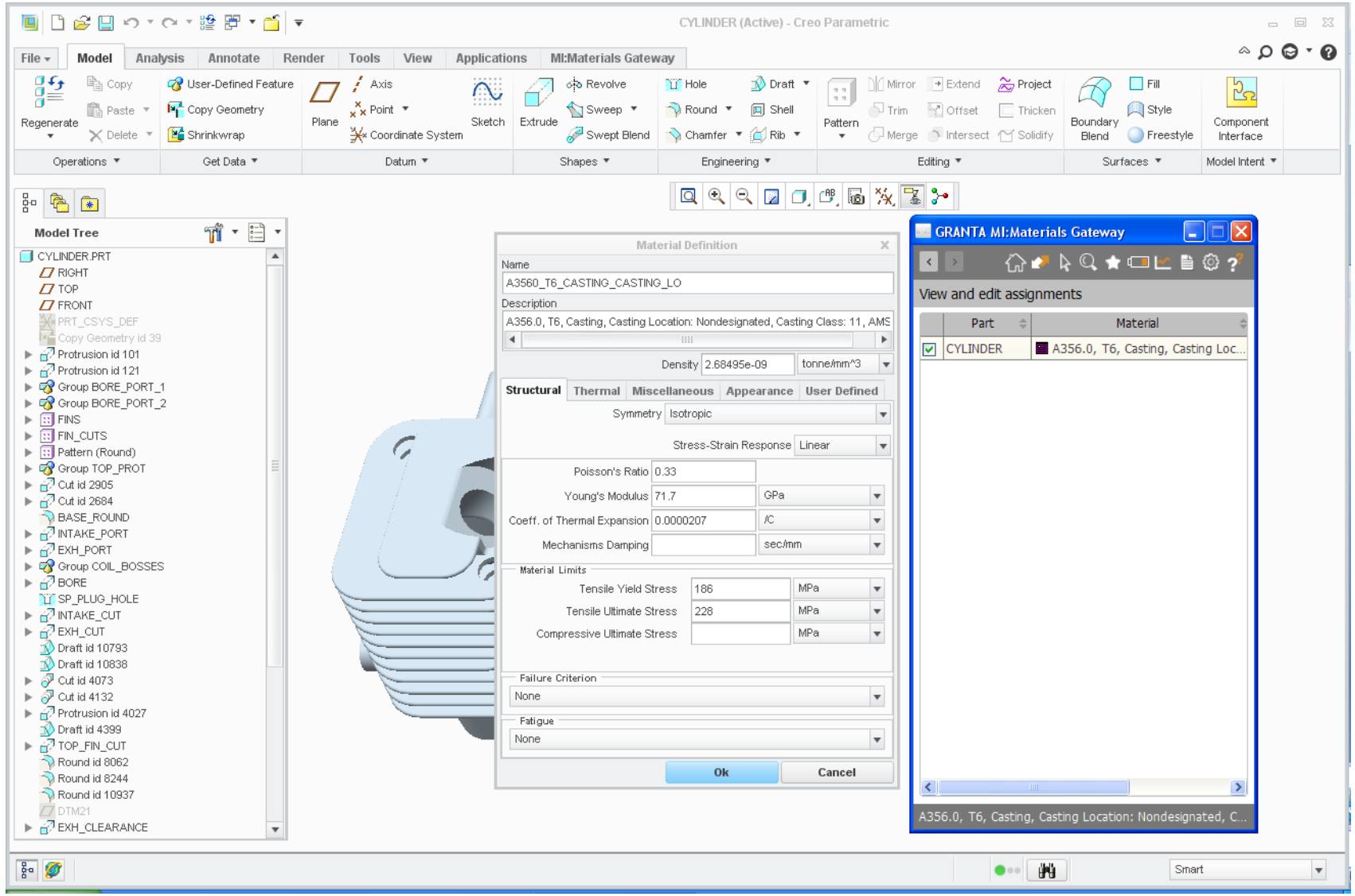
# OPTIONS FOR EACH MATERIAL



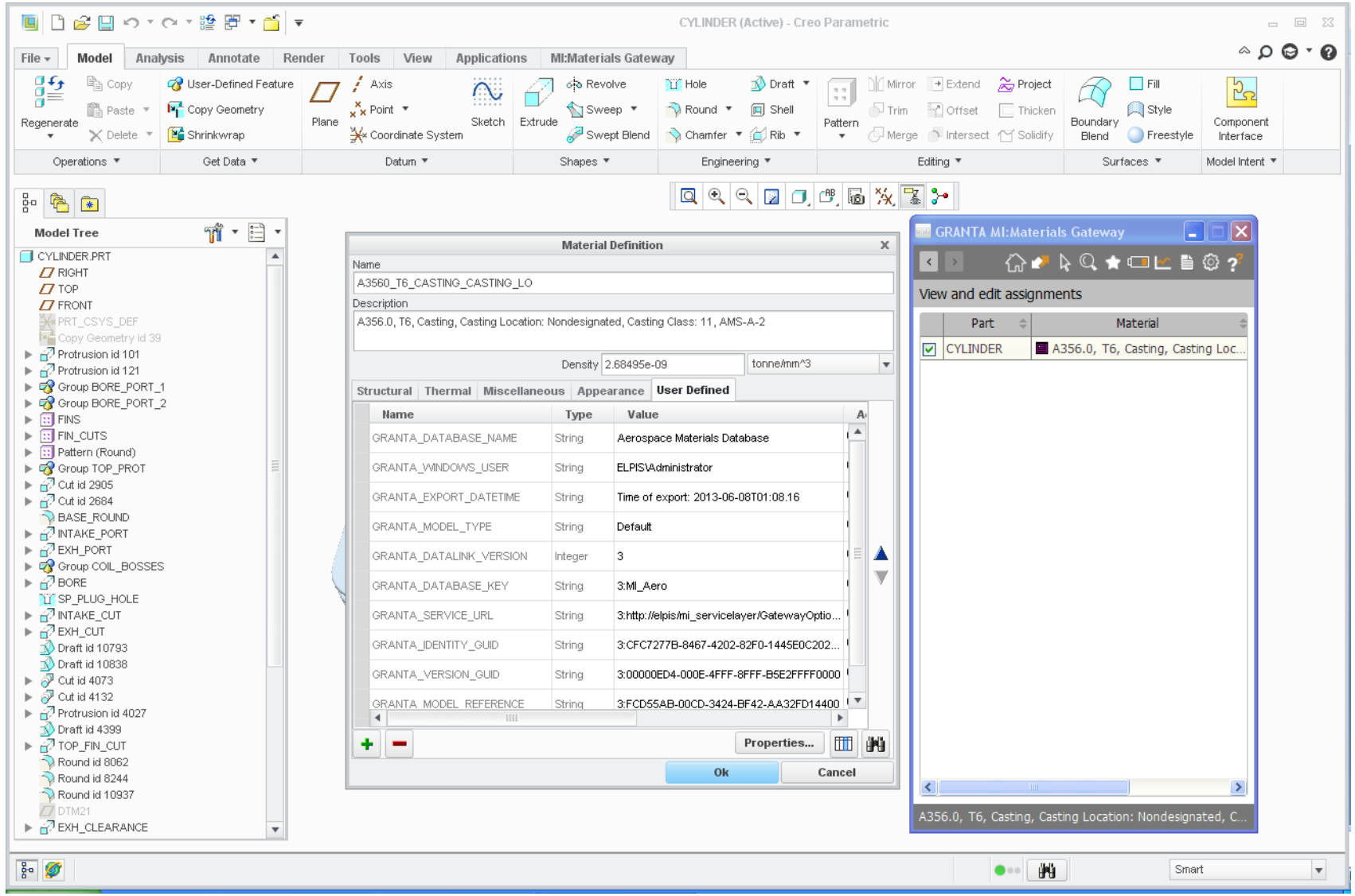
# ASSIGNING MATERIAL TO A PART



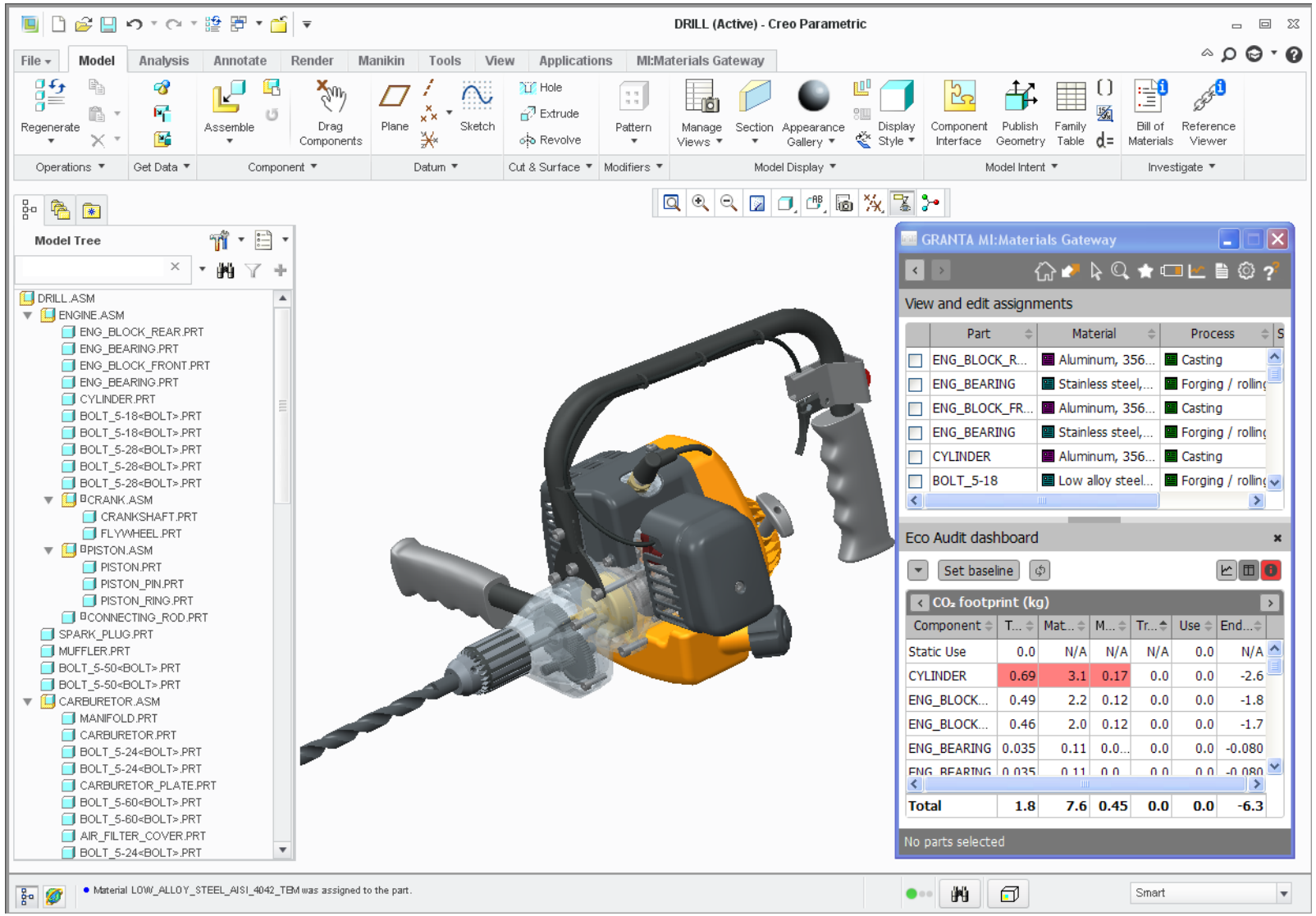
# RESULTING PROPERTIES IN CREO MODEL



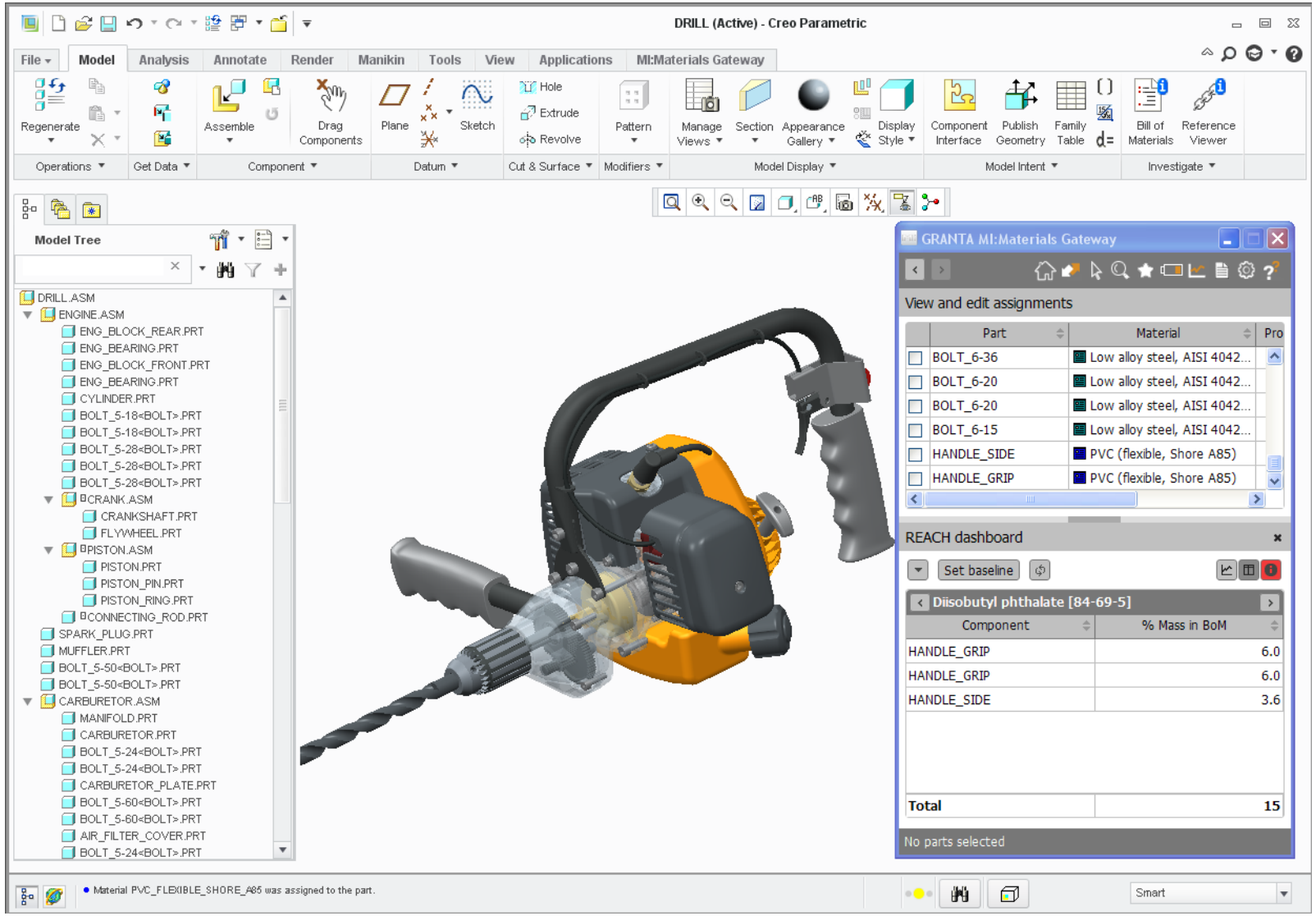
# TRACEABILITY – “PEDIGREE” ATTRIBUTES



# DASHBOARD HIGHLIGHTING ECO IMPLICATIONS

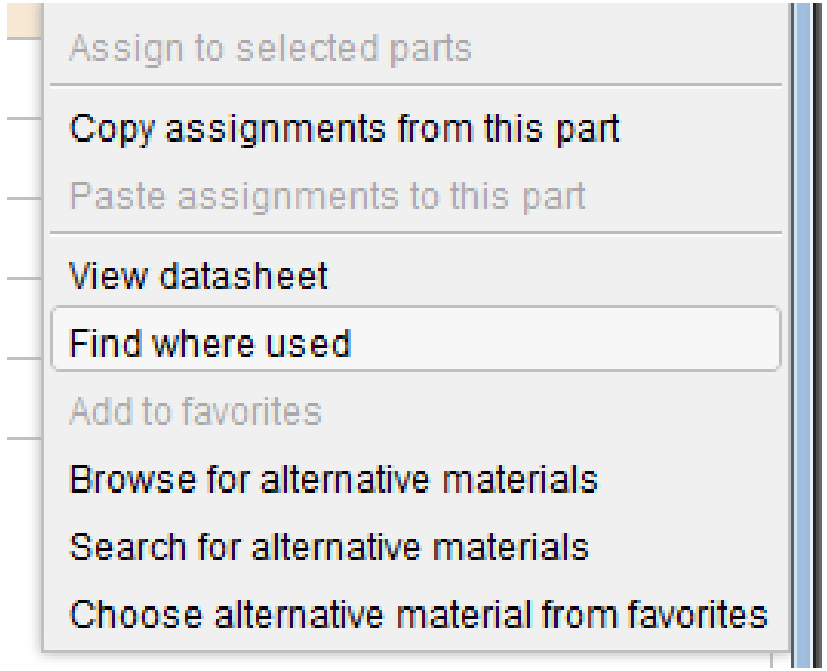


# DASHBOARD HIGHLIGHTING REACH IMPLICATIONS



# BEYOND SINGLE ASSEMBLIES – GATEWAY FOR WINDCHILL

- Analogous functionality to Creo Gateway, in formal managed, product-revisioned Windchill environment
- ‘Low footprint’ materials assignment in product structure, always with ‘live link’ back to in-depth materials knowledge
- Insight from analytics tools early in product design
- Where used?  Risk assessment across multiple products
  - Just what is the extent of that materials problem?



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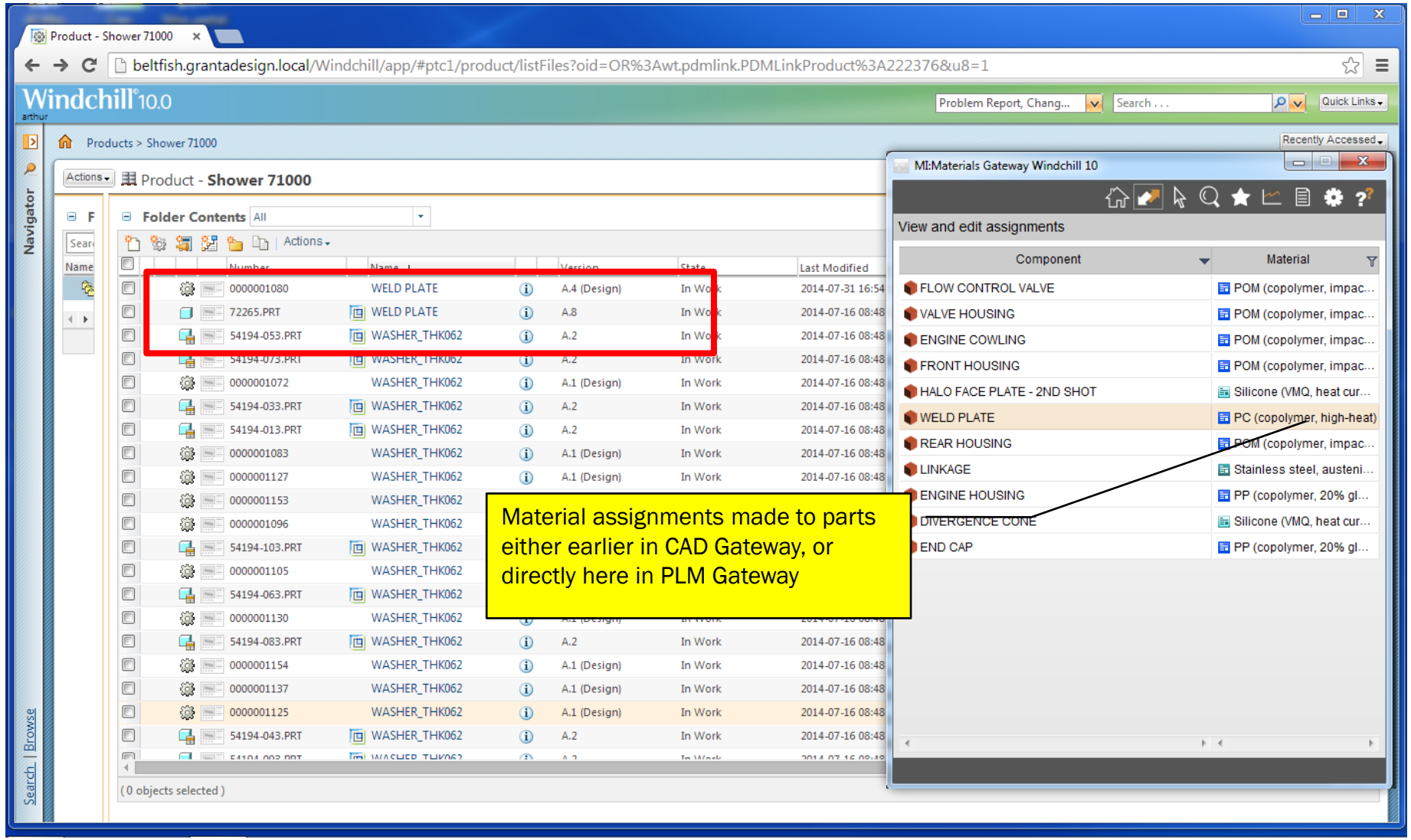
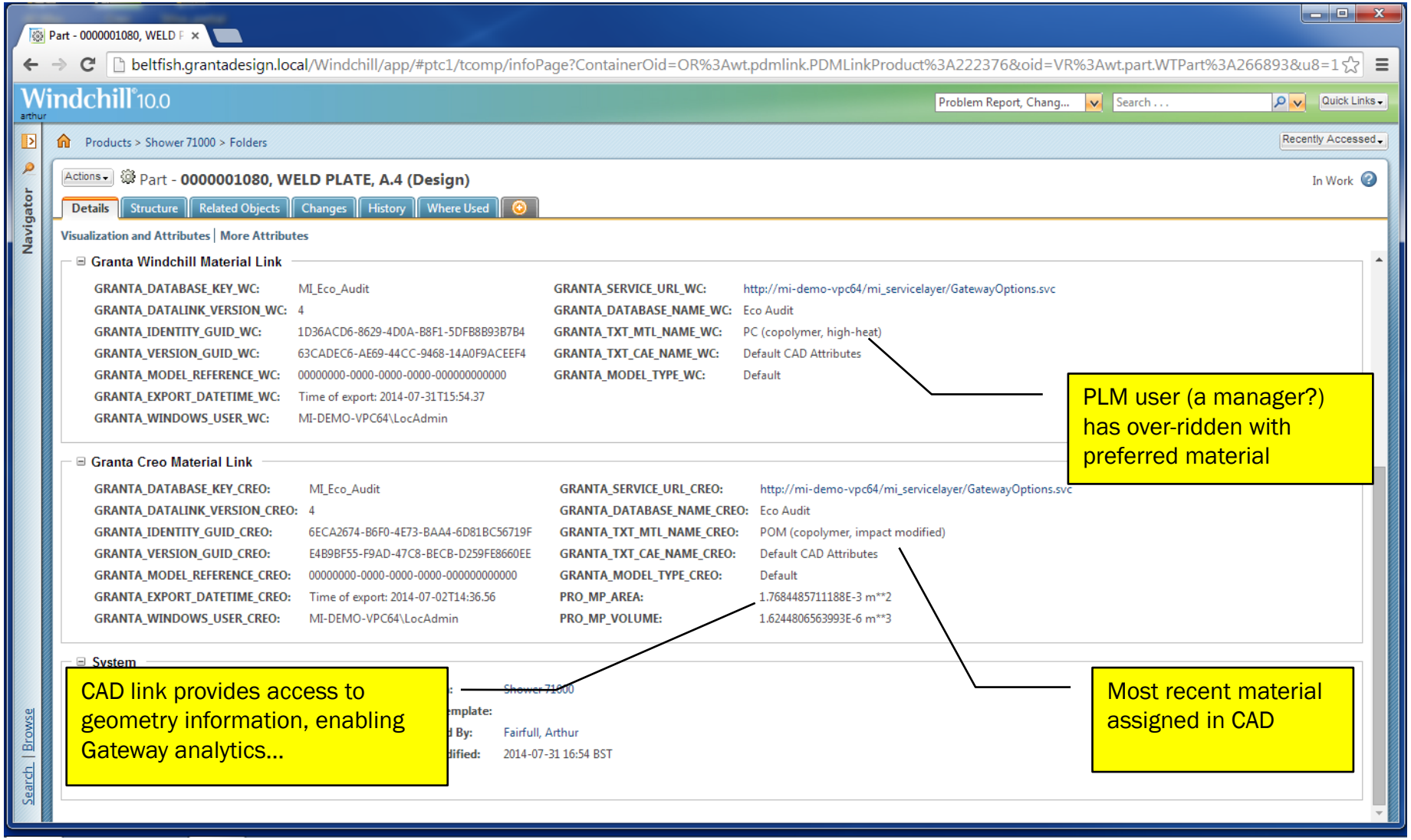
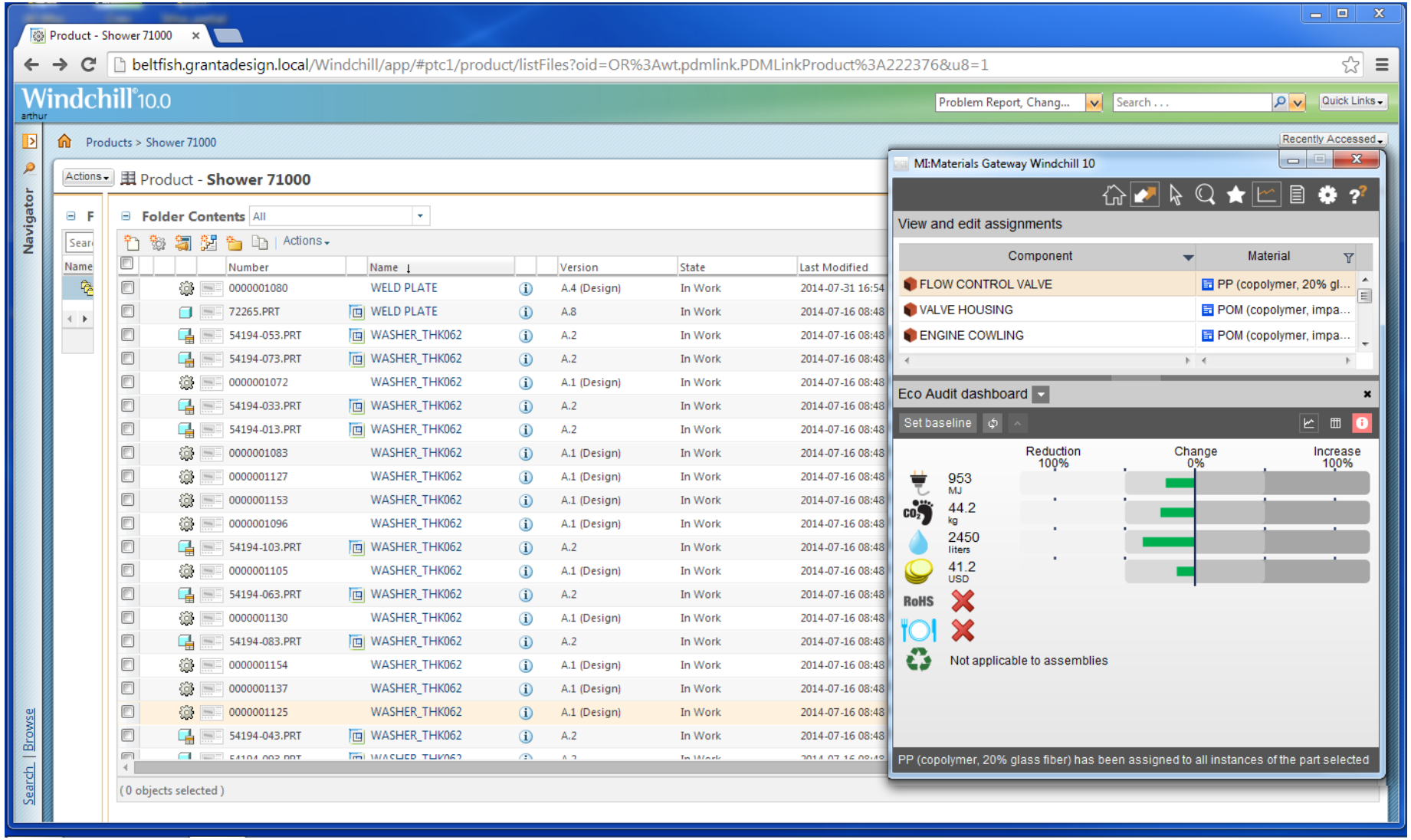


# MATERIAL DATA LINKS FROM REVISIONED OBJECTS



# GATEWAY DASHBOARD DRIVEN FROM PLM



# SUMMARY

- Enable enterprise access to materials knowledge, from Creo and Windchill
- 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, …

# THANK YOU!

## Visit us on Booth B16

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