



Optimizing Materials & Manufacturing Choices Across the Enterprise



Industrial relevance

- Make better, more consistent materials and process choices, enterprise-wide
- Meet strategic objectives such as avoiding cost, designing to comply with regulations, and enabling global manufacturing
- Improve business processes relating to materials, particularly in multi-site, multi-business enterprises
- The Materials Strategy Consortium offers further competitive advantage by developing software to meet your specific needs

-  Industrial & Consumer Equipment
-  Automotive & Transportation
-  High Technology
-  Materials Producers

The problem

To succeed, manufacturing enterprises need to do much more than simply deliver products that excel at their required function. They must meet wider product design objectives that allow them to address strategic drivers such as cost, environmental legislation, and global manufacturing. Materials and process choices are central to these objectives. Sustainable success requires strategies that ensure these decisions are optimized not just for individual designers but across the enterprise. The right materials strategy, effectively implemented, can be worth millions of dollars.

But defining and implementing such strategies can be very difficult for a typical manufacturing organization with products that use many different materials and support many applications, with operations split across many businesses or sites, and with life further complicated by the impact of new regulations in areas such as the environment, health, and safety.

First, there is simply the challenge of finding all of the necessary materials information within a large, diverse organization. Then you need to apply this information to make decisions in a systematic, repeatable manner. A particular challenge here is the lack of tools and approaches that combine consideration of the engineering performance of materials with their economic and environmental properties. Finally, you want to enable designers, enterprise-wide, to apply the approach easily and consistently.

Granta's solution

Granta has developed an innovative solution to address these challenges. It is based on the GRANTA MI materials information management system and draws on the rational materials selection methodology developed by Granta's founder, Professor Mike Ashby, to enable materials analysis and decision-making. You can:

- Assemble the necessary data - with **GRANTA MI™** you can capture, manage, and use data from testing, QA, production, and other sources in one place. This data can be combined with materials reference information - Granta's **MaterialUniverse** data module, for example, provides engineering, eco, and economic data for a comprehensive range of materials.

Answer questions such as: How do we assess materials and process alternatives? Can we optimize to a list of preferred suppliers and materials? How do we minimize the costs of compliance with regulations? Details overleaf >>

Granta's solution, continued ►►

- Apply this information using the Enterprise Materials Optimizer (**GRANTA MI:EMO**), a simple-to-use web-browser-based tool that ranks materials quantitatively for design objectives specified by the user through a simple 'wizard-style' interface. 'Cost per unit of function' principles allow engineering properties and cost (whether financial or environmental 'cost') to be combined in this ranking.
- GRANTA MI:EMO can be configured to include your organization's most common design objectives, and to apply your own 'business rules' when ranking materials. You can also classify materials, designating those that are 'preferred' by the business. In this way, you give designers a tool to aid their creativity, while also providing guidance in line with corporate strategy and helping to ensure consistency.

The development and application of this solution is supported by the **Materials Strategy Consortium**, a collaboration of leading manufacturing enterprises. Members are able to guide software development, ensuring that their needs are met, and receive added benefits of networking and training.

Questions answered!

Scenarios	Questions that Granta helps to answer
Material cost is a high proportion of our product cost and markets are volatile and inflationary. This threatens our profitability	How do we: assess material and process alternatives? ensure we use the most profitable? track trends? know when to switch?
We are experiencing materials failures in our products	How do we: determine what other material(s) we can substitute with minimal changes? find grades that offer similar characteristics without failure? assess their impact?
We manufacture in different countries	How do we: find local substitute materials? determine 'equivalence' to the existing material? evaluate impact on cost, quality, consumer experience, or regulatory compliance?
A vendor has offered us a new material	How do we: evaluate it systematically against existing options? determine which products will gain if we switch?
We use many different material suppliers and grades	Can we: optimize to a list of preferred suppliers and materials? apply more objective criteria to these decisions, taking into account both technical and economic factors?
Environmental legislation is imposing new requirements on us	How can we minimize compliance costs and maximize benefits from any changes in terms of product marketing, cost, and performance?

Further Information

GRANTA MI, including the Enterprise Materials Optimizer - www.grantadesign.com/products/mi/

MaterialUniverse reference data - www.grantadesign.com/products/data/universe.htm

The Materials Strategy Consortium - www.grantadesign.com/strategy/

White paper, "Optimizing Materials Strategy - can you afford not to?" - www.grantadesign.com/papers/



Solution features

- Assembles all necessary materials information in one place
- Analyzes this information using 'cost per unit of function' principles
- Captures expert analyses in easy-to-use browser-based tools for re-use by designers
- Enables better and more consistent decisions



The Materials Strategy Consortium is a collaborative project that drives the development of software for systematic materials selection, substitution, and cost optimization.



www.grantadesign.com
info@grantadesign.com
UK/Int'l +44 1233 518895
US 800 242 1546
France 08 00 76 12 90
Germany 0800 182 5026

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