



Industrial & Consumer Equipment

- Apply materials information to optimize materials strategy - for example, improving cost, performance, or environmental impact
- Implement strategies - for example, managing preferred suppliers programs or deploying approved data to designers
- Ensure regulatory compliance - for example, with EuP, RoHS, REACH, and WEEE legislation
- Control and manage testing and quality assurance data to increase efficiency and protect corporate knowledge

The right materials and processing choices make a big difference to manufacturers of industrial and consumer equipment – products such as white goods, automotive parts, air conditioning, heating systems, plumbing, tools, pumps, motors, valves, and actuators. Such products contain many components and a wide variety of materials – metals, plastics, ceramics, and composites. The engineering properties of these materials (mechanical, thermal, and electrical) determine product performance. But organizations also need to consider cost and environmental impact. Designers must not only meet functional requirements, they must also take into account the practicalities of procurement, the supply chain, and global manufacturing. And they must satisfy regulations and quality standards.

Achieving these multiple, often conflicting, objectives requires the right information on materials, their properties, and their processing. And it requires practical tools to manage, access, and apply that information in design. Granta can help.



Example solutions for equipment manufacturers

For more information, see the relevant 'Example Solution' and Product datasheets.

Relevant products & services:

- GRANTA MI (MI:EMO)
- Materials Reference Data
- CES Selector
- Granta Services

Materials decision support for enterprise

Granta works with the Materials Strategy Consortium to help manufacturing organizations optimize materials decisions enterprise-wide. Our software enables you to consolidate and control all relevant materials information. CES Selector and the GRANTA MI Enterprise Materials Optimizer (MI:EMO) are tools that apply this data to materials and process selection. With MI:EMO you can share materials strategies and provide selection tools to every designer in your organization via a simple browser interface. The result is better, more consistent materials decisions, leading to lower costs, reduced risk, and fewer manufacturing problems.

Example customers:

- Emerson Electric
- Fortune Brands
- Indesit
- Pella Corporation
- Timken
- Whirlpool

Eco design and eco regulations

Every engineering enterprise must now design for environmental regulations such as REACH. Eco objectives, such as lowering carbon footprint or energy usage, are becoming a high priority. Materials are central to these issues, because regulation constrains what materials can be used, and because materials properties often determine eco impact. Granta and the Environmental Materials Information Technology (EMIT) Consortium develop information resources and practical software tools that address environmental constraints during design – when changes have the lowest cost and greatest effect.

Support for engineering design and analysis

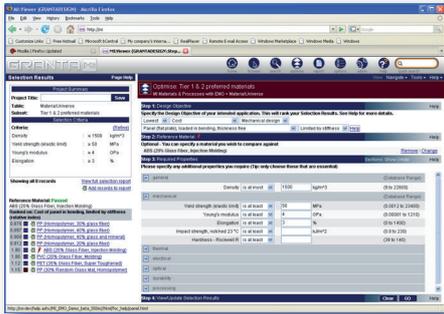
You need accurate, up-to-date materials property information as input to your CAE, FEA or other engineering software. Granta provides reference data, helps you to manage and control vital information, and enables access from directly within these third-party applications.

Other solutions

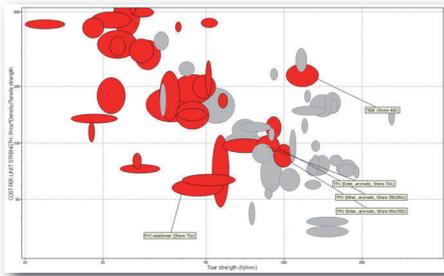
We can address almost any problem relating to materials information. Further examples include managing materials test data. Contact us with your problem.



Industry overview



GRANTA MI:EMO provides a simple web browser interface within which any designer can enter design objectives and constraints, and generate a quantitative ranking of materials. You can set the system up with your own business rules, helping to roll out materials strategies enterprise-wide and ensure quality and consistency in materials decision-making.



CES Selector - trading off economic and technical factors. Here, a rubber part needs to have adequate recovery after deformation and softness. Materials failing these criteria are greyed out. Then the part must be as cheap as possible for a given strength and be resistant to tearing. The chart analyses the trade-off between these factors.

Further information

For complete information on Granta's solutions for industrial and consumer equipment manufacturers see:

www.grantadesign.com/solutions/equipment/

Case Study – Fortune Brands

Dr Tim O'Brien, Vice President, Technical Innovation, at Fortune Brands Home & Hardware spoke at a Granta seminar in 2008. The following is extracted from the meeting report. Fortune Brands (Moen) are members of the Materials Strategy Consortium.

Fortune Brands is a world leader in the home and hardware sector, with sales in this area exceeding \$4 billion last year. Materials decisions can have multi-million dollar implications. And making these decisions requires consideration of engineering properties - mechanical and thermal behavior, corrosion-resistance, etc. - to be combined with economic considerations (e.g., raw materials cost, tooling cost, labor cost for different manufacturing scenarios) and, increasingly, environmental considerations.

Dr O'Brien highlighted why an effective materials strategy is becoming more important. For over sixty years, the sector's service environment has been well understood and only moderately challenging from a materials perspective. The 'palette' of materials options has been relatively stable and described by ample, high quality data. Raw materials costs (or at least trends in those costs) have also been relatively stable. Manufacturers have managed with an informal approach to materials data (e.g., looking it up in handbooks or on-line when necessary, storing it in hard copy or spreadsheets, and relying on expert knowledge).

This environment is changing rapidly. Raw materials costs are both increasing and volatile. Energy costs are rising. Global eco activism is changing consumer attitudes and increasing the focus on the toxicity and potential environmental impact of materials. Legislative responses to similar issues are imposing new constraints. From December 31, 2010, for example, the leaded free machining brass alloy that has been the core material in plumbing products for over 150 years will effectively be obsolete in California. Added to this, a "phase change" in the Chinese economy is shifting manufacturing, supply, and customer-bases.

There will be a greater need for 'scenario planning' - considering alternative product designs and materials and planning for changes in materials costs. New materials will, in some cases, become mandated - data describing these materials will often be less freely available. All of these changes, argued Dr O'Brien, are driving a shift from informal to formal materials data management.

They also demand tools to help us explore key manufacturing questions. Dr O'Brien demonstrated the use of analysis software to explore changes in the relative costs of different manufacturing techniques as the volume of the component being made increases. He is a long-standing user of Granta's materials selection software, CES Selector. He commented that, whenever he approaches a materials problem, he always has a few materials options in mind, but CES Selector usually suggests additional options. Past applications have included a component redesign that cut production costs in half and doubled performance on an important product line.

Dr O'Brien outlined a vision for how such software should develop to support enterprise materials strategies. He sees cost as a critical focus, with a need to develop models that can combine materials and process costs and consider factory costs in different global regions. Such a knowledge base should also include different scenarios for future materials costs. If such an information resource could be easily enriched and refined by an individual company using its proprietary data, then it would provide the basis for a powerful tool that could enable rapid searches for "similar-to" materials - i.e., aiding the preparation of alternative materials strategies to meet different cost scenarios. Work in this area is one focus of the Materials Strategy Consortium.