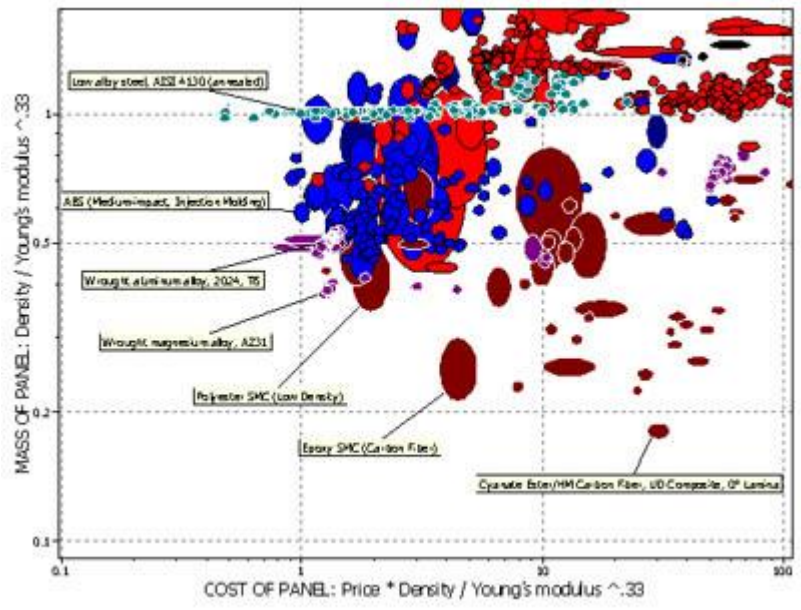
Fortune Brands Leads Milwaukee Materials Strategy Discussions

Milwaukee—May 7, 2008 Granta's latest Materials Strategy Open Seminar took place in Milwaukee on May 7th, alongside the Society of Plastics Engineers Annual Technical Conference. A dozen leading manufacturing organizations were represented, with product-lines ranging from spacecraft to razor blades, and automotive parts to office furniture. The keynote presentation was given by Dr Tim O'Brien, Vice President for Technical Innovation at Fortune Brands Home & Hardware.

The seminar began with an orientation to the latest materials information technology from Dr Patrick Coulter, Granta's Chief Operating Officer. Dr Coulter explained a typical best practice approach to materials information in which all of an organization's in-house data is consolidated, together with relevant external reference data, in a single materials database, enabling its analysis and use. He showed tools to search and query data, to compare materials, and to deliver up-to-date and approved materials data for analysis in Excel or use in CAE software. Dr Coulter then went on to demonstrate advanced capabilities that aid, for example, minimum cost design or substitution of obsolete materials.



An example of the use of materials information—here we plot two indices that quantify weight and cost per unit of stiffness. This example is taken from a project to select a material for the screen-support panel in a laptop, in which maximizing stiffness is a key design objective. The plot allows a designer to study trade-offs and make optimal materials decisions

Dr Arthur Fairfull then introduced the day's main discussion topic, with an overview presentation showing how engineering enterprises use materials data to improve their materials strategies. Dr Fairfull first covered the foundations for an effective materials strategy—getting all materials data in one place, managing and analyzing data as it changes, and deploying approved information to the people that need it. He then introduced a range of 'materials strategy' tools that aim to use this information in making better business decisions. The key characteristics of these tools are that they combine engineering, economic, and environmental considerations, and that they aim to help decision-making across the business, rather than simply to improve individual decisions. Examples included software to audit the eco-impact of a product at different phases in its lifecycle, tools to aid design in the context of restricted substances legislation, and the use of the Enterprise Materials Optimizer software to save cost and guide designers using a 'preferred materials' approach.

Fortune Brands Home & Hardware Case Study

Dr Tim O'Brien of Fortune Brands Home & Hardware then provided a practical, industry-insider view of such issues. 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 online 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.