Ansys

Using Ansys Granta Selector to Help Resolve Materials Shortages

As of May 2021, raw material prices, from steel to plastics, have surged due to growing market demand as economies ramp back up post-pandemic. This follows worldwide shutdowns in early 2021 of raw material processing plants because of the COVID-19 pandemic's impact on demand and various country-specific lockdowns. Supply chain shocks are also strongly affecting prices — from irregular winter weather impacting plastics production to container ships blocking the Suez Canal.

/ THE CHALLENGE

This surge in demand for various raw materials and chemicals and has put strain on some supply chains, and according to a recent survey by the Institute of Supply Management, is anticipated to get worse. They anticipate that disruptions could last for longer than 12 months .

When dealing with a world-wide supply shortage or increase in prices, an alternative suitable raw material must be found. But, when seeking an alternative, the necessary material properties (which are applicationdependent) must be maintained or even improved upon.

Trading-off performance requirements such as cost, supplier availability and sustainability, among many other factors, leads to the selection of true alternative materials. The sooner this can be done in the product development process, the lower the cost of change to the overall design.



Raw material prices are steadily increasing

Ansys has the right tool for engineers facing this dilemma: Ansys Granta Selector.



/ SOLUTION

Granta Selector enables engineers to make the right material decisions based on a series of sophisticated tools combined with access to an unrivalled materials data library. Key tools include visualization and comparison of materials properties, performance indices, export of key materials data for simulation or use in CAE/CAD programs and many more. Engineers have the right tools and data to make an informed decision, and can even assess the environmental impact of their products or predicted properties of new hybrid materials.



Ansys Granta Selector - Advanced selection tools

Granta Selector's interface enables quick access to relevant materials classes and datasets.

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PA66 (30% long carbon fiber)	269 - 302	includes a table with data on ge	eneric battery cells. Particularly useful for e	early stage screening and	l cross-class material con	nparison.	
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Ansys Granta Selector - primary user interface

If there is a shortage of a particular material, an engineer might look for an alternative. Let's consider a case in which there is a shortage of PA66 with 30% glass fiber. We can search for this material and view its MaterialUniverse[™] datasheet, then set it as a reference for comparison.

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PA66 (30-33% glass fiber)											t us refere
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Material properties from an example datasheet



MaterialUniverse contains over 4,000 engineering materials with technical, economic and environmental data, linked to specialized datasets with many thousands more specific grades, standards, and test and design data. Data is available for polymers, metals, composites, aerospace materials, additive manufacturing materials and many more. Curve data and temperature-dependent data is included in many datasets.



Find similar function in Granta Selector

Typically, there will be constraints on the key engineering properties for the material according to product design and application. Using intelligent materials selection in Granta Selector, these constraints can be applied to filter available materials on any combination of properties:

Filter on specific requirements:

- Physical
- Mechanical
- Impact and fracture
- Electrical
- Magnetic
- Optical, aesthetic and acoustic



Inputting criteria for comparison



Selection Project..

Visual comparison and trade-offs between competing requirements are easy using selection graphs. The hundreds of candidate materials are quickly reduced to a small subset of alternatives with the right material properties to act as a suitable replacement.



Identification of optimal replacement candidates

Finally, an alternative material can be identified. Any larger differences in performance are clearly highlighted to facilitate engineering judgment on whether they are significant for this application. Key material properties can be exported into Ansys products to aid simulation and modeling.

With this alternative material, Selector can help you locate suppliers or specific grades, and help you to start sourcing discussions with in-house procurement or purchasing departments.

Make smarter materials decisions with Granta Selector.



Comparing replacement material side-by-side

ANSYS, Inc.

Southpointe 2600 Ansys Drive Canonsburg, PA 15317 U.S.A. 724.746.3304 ansysinfo@ansys.com If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge or put on wearable technology, chances are you've used a product where Ansys software played a critical role in its creation. Ansys is the global leader in engineering simulation. We help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and engineer products limited only by imagination.

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