Materials Data Management in ITP (Industria de Turbo Propulsores)

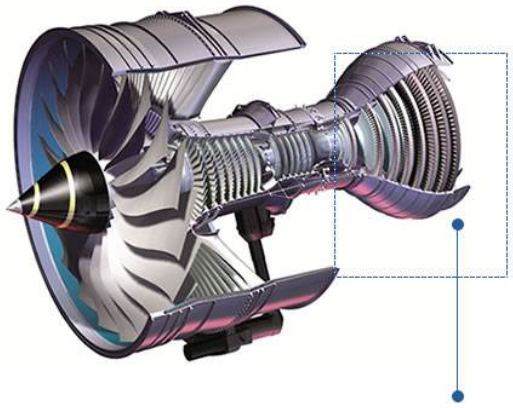
At a web seminar hosted by Granta, Sergio Torregrosa, Materials Laboratory Manager at ITP in Bilbao, Spain, described how GRANTA MI has provided full traceability and efficiency in the materials information they use in their product design. The project has focused on the consolidation of test data obtained both internally and externally, which is later used in the design and manufacturing of ITP's engine components. GRANTA MI has improved confidence in the data used and reduced time and cost in design.

How ITP is using GRANTA MI to ensure materials data traceability and efficiency in product design

ITP's challenges in materials information management

ITP is a leading company in the aerospace sector, providing high-tech products and services to the aerospace and industrial engines markets. Based in Bilbao, it was founded in 1989 as a technology partner of Rolls-Royce, but later became independent. ITP began to develop its own technology, and that's when materials test data became of vital importance.

The materials used by ITP are mainly high-temperature nickel- or cobalt-based alloys, followed by steel, aluminium and titanium. These materials are essential in the manufacturing of low-pressure turbines (pictured), the part of the engine that is exposed to higher temperatures. In order to understand, improve, and validate performance, ITP undertakes long materials testing campaigns—both in its own laboratories and in external laboratories. This results in a vast amount of different data formats, versions, reference names, testing methods, analyses, and standards. In short, this information is diverse and scattered, resulting in inefficiencies when engineering teams try to find, analyze, and apply it.



Turbina de Baja Presión (Diseño, Fabricación y Montaje): NGV1-6, Discos 1-6, carcasa, sellos, TBH y RBS.

As well as efficiency, *traceability* (having an effective 'audit trail' for data) is essential in the aerospace sector, which is subjected to the highest regulatory standards, and where each of the designed and manufactured components has to offer an absolute guarantee.

In summary, according to Mr Torregrosa, the biggest challenges faced in managing materials information are:

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- **Obsolescence risk of the materials test data** due to long testing campaigns. Full version control of the values applied during design is indispensable in order to ensure that the most up-to-date available data is used.
- **Data traceability,** which is difficult to manage when the information comes from different sources.
- **Materials information efficiency**, which becomes more complex as databases grow in the number of materials used, and their corresponding test results.

Selecting GRANTA MI for effective materials information management

Having Rolls-Royce as a partner was crucial in the choice of GRANTA MI in ITP, as Rolls-Royce uses this material information management system. GRANTA MI captures all of the company's materials data in one place, manages it so that it is accurate, secure, and traceable, and shares it in the format in which is needed. It facilitates, for example, materials engineering teams in analyzing test data to derive statistically valid 'design allowable' data, and then publishing that data for use by design teams. It can also integrate access to useful data from third party reference sources.

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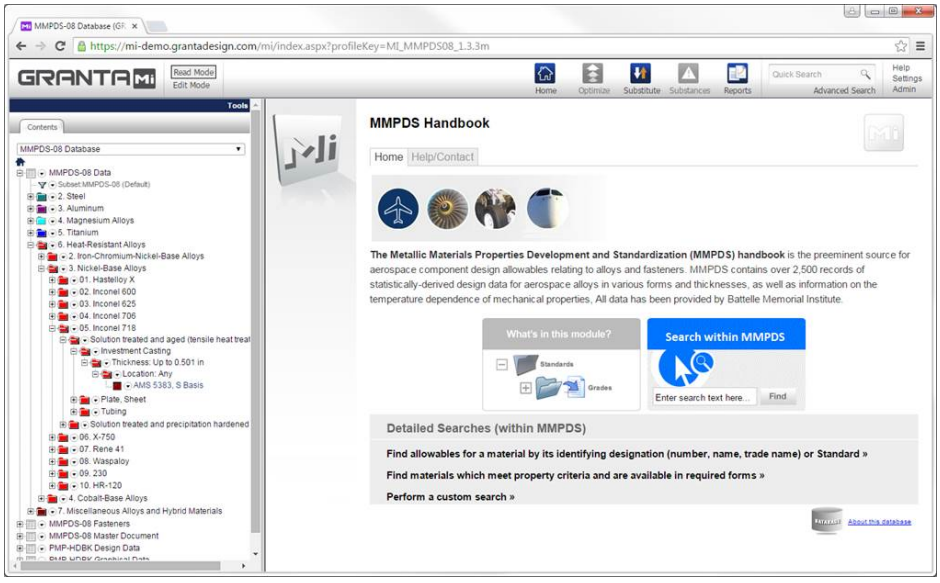


GRANTA MI allows access to the MMPDS database (Metallic Materials Properties Development and Standardization) in the same format used by ITP for its own internal database.

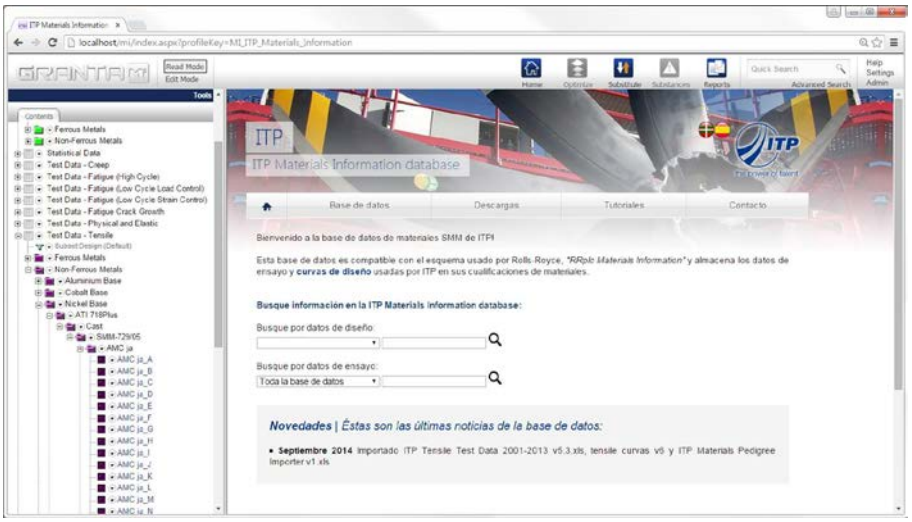
It is also important to think about how information is going to be *used*. At ITP, for example, the design data derived from materials testing is made available to design engineers who work with CAD, CAE and PLM systems. GRANTA MI currently enables access to this data through the MI:Viewer web application for data browsing, searching and comparison. Version control ensures that users get the latest version of the consolidated data in the database. The next steps of a GRANTA MI implementation would include closer integration with the design community and in-house tools, either through a material card text export, MI:API integration, or the MI:Materials Gateway plug-in for the commercial software used by ITP.

The implementation process

"The implementation of a data management system like GRANTA MI requires effective involvement and coordination between the two companies," says Mr Torregrosa. "Granta has worked closely with ITP in order to implement all the specific functionalities that we needed."

Important work has been carried out importing historic data, unifying formats of test results coming from different laboratories, as well as incorporating additional information relevant to ITP's design engineers in product development, such as norms, standards and regulations followed to measure the part, geometry, heat treatments, dimensions, defects, and more.

Combined with full traceability and version control, this ultimately ensures accurate design and reliability of the final product.



GRANTA MI homepage customized for ITP.

Advantages of using GRANTA MI

Mr Torregrosa pointed out the following advantages arising from the implementation of GRANTA MI:

- **Easy access** to the database through a web browser (pictured above). ITP has centralized access to three different databases: in addition to the Rolls-Royce and ITP databases, users can access the authoritative MMPDS handbook data on aerospace alloys. All these databases are in the same place and format, with full data traceability.
- **Easy import** of new testing data, usually stress-strain curves at different temperatures, along with additional information, ensuring version control and traceability.
- **Customized system and functionalities**, worked out hand in hand with Granta's experts.
- The use of a **consistent methodology** for the management of materials information.

Conclusions and future implementations

Mr Torregrosa concluded that consolidating the materials information use in design and manufacturing, in a structured way and according to the company's needs, requires great effort, time and organization. GRANTA MI offers the methodology and infrastructure that ITP needs for the effective management of this materials information.

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ITP and Granta continue their work together to increase the capabilities of ITP's GRANTA MI system for future implementations, to allow access to even more types of data related to metallography and corrosion, among others. GRANTA MI brings ITP all the benefits of a centralized and customized materials management system.