

The Material Data Management Consortium



The Material Data Management Consortium (MDMC) is a collaborative project that brings together an international group of leading engineering enterprises with the mission of developing and applying materials information technology to maximize the value of materials engineering. The MDMC is open to new members.

Making the best use of materials such as alloys, composites, and ceramics, often under extreme conditions, is critical to enterprises in sectors including aerospace, defense, energy, automotive, oil and gas, and industrial equipment. The management and application of associated information is vital to projects and processes. Yet best practice in this area is often elusive due to the complexity and specialist nature of the data involved, and the organizational and technical environments in which it must be applied.

The Material Data Management Consortium helps to guide development of an industry-standard system (GRANTA MI™) that enables engineering enterprises to develop, optimize, and control their corporate materials information, and to integrate this information, securely and traceably, with simulation and product engineering.

The first three phases of the MDMC (2002-2013) helped to deliver a robust, mature system, now in routine use at MDMC member organizations and many other engineering enterprises to control, analyze, and apply materials data. The MDMC process has ensured that GRANTA MI meets high standards in areas including security, data traceability, and providing targeted tools to support key materials engineering workflows.

MDMC Phase IV

The Theme for Phase IV, which began in 2014, is "Managing data at various levels of scale for maximum impact in material and product research and development". The project will focus on improving the efficiency of materials data management and helping it to have a greater impact on the wider engineering activities of our members.

Within this in mind, priorities for Phase IV include:

- Continued optimization of usability for members' workflows
- Further improvements to best practice approaches and technology for composites; extending such approaches to areas such as corrosion, tribology and wear, joining, and additive manufacturing
- Creating and deploying data for virtual product development
- Support for integrated computational materials engineering (ICME)

Phase IV is open to new members. Benefits of joining include the use of an evolving and maintained materials information management system, designed to meet members' needs, at a fraction of the cost required to develop a similar system through an in-house project.

Such technology has been shown to yield multi-million dollar returns, including: improved productivity in materials engineering, avoiding data loss and duplication of tests, reduction of risk in the engineering and design process, time-savings in design and development, and improved compliance with critical regulations.

MDMC.net

MDMC overview

- Apply best practice to manage all aspects of the materials data lifecycle
- Increase the quality, integrity and traceability of materials data
- Benefit from shared experience and investment; a cost-effective, low-risk solution
- Apply tools to aid materials engineering productivity: save time and cost, increase competitiveness
- Maximize returns on materials data: deploy it where it is needed

Members

Airbus Helicopters
ASM International
AWE
Baker Hughes
Boeing
Doosan Power Systems
Embraer
GE - Aviation
GE - Energy
GKN Aerospace
Granta Design
Honeywell Aerospace
Lawrence Livermore National Lab.
Lockheed Martin
Los Alamos National Laboratory
NASA Glenn Research Center
NASA Marshall Space Flight Ctr
Northrop Grumman
Oak Ridge National Laboratory
Raytheon
Rolls-Royce
Sandia National Laboratories
Sulzer
United Technologies Corp.
US Air Force Research Lab.
US Army Research Laboratory

Consortium Details

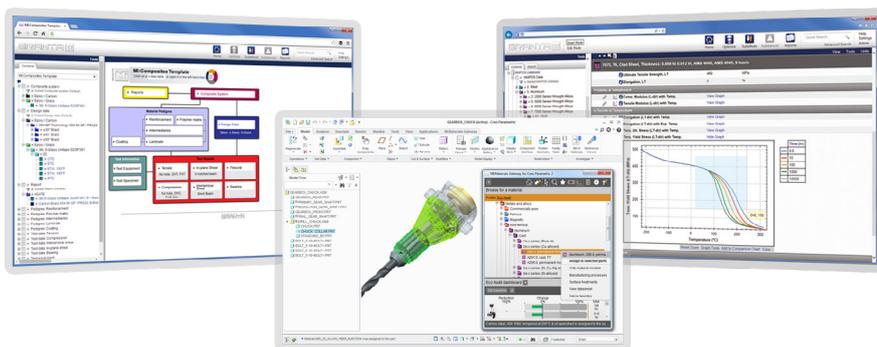
Consortium structure

The MDMC is managed by ASM International, with a Steering Committee chaired by Dr Steven Arnold of the Life Prediction Branch at NASA Glenn Research Center. Each member is represented on the Steering Committee, which sets the general directions of the project, prioritizes and reviews the development activities, and sets the system delivery milestones. Granta Design services the Consortium by developing, maintaining, and supporting the GRANTA MI™ system.

Software system: GRANTA MI

GRANTA MI enables you to manage the lifecycle of corporate materials data, capturing it, managing it, deploying it for use (e.g. in design or simulation) and ensuring that it is maintained. User organizations create a single, secure, traceable source for their valuable proprietary data, information, and experience. Within the same resource, they can access trusted reference information (e.g., authoritative alloy reference data such as MMPDS, or composite data from leading projects such as NCAMP). As a result, they save time, reduce risk, avoid wasted effort, and make the most of investments in materials engineering and related technologies.

Materials professionals use GRANTA MI to manage, analyze, certify, and maintain materials data and information, making it available for use across the enterprise in a secure and controlled manner. Engineers, designers, analysts, EH&S professionals, managers, and others use GRANTA MI to access and apply approved, up-to-date, traceable materials information within their routine workflows.



Outputs from previous MDMC phases: Accessing aerospace alloy data through GRANTA MI; Database schema for managing composites data; Accessing materials data in a CAD system.

Membership and benefits

Organizations are eligible for membership by purchasing a qualifying software package. Members receive new software as it is developed during the project, sharing in the results of a \$7m+ three-year software development program. Other benefits include:

- Participation in all Consortium Meetings and conference calls
- A formal vote in the process to prioritize developments, ensuring that your specific needs are met at a fraction of the cost of developing in-house solutions
- Regular networking with other members, helping you to identify and implement best practice
- Privileged and early access to selected new software and data developed during the project
- Dedicated training and support from the MDMC technical team
- The rights to observer status in the Environmental Materials Information Technology Consortium and the Automotive Material Intelligence Consortium.

Case studies

Darren Green, Chief of Materials Design Services at **Rolls-Royce**, spoke at a Granta seminar about how the technology developed by the MDMC supports the drive towards continuous improvement in materials data quality in his organization. His talk discussed the challenges of moving from a situation where Rolls-Royce was able to re-use 60% of its materials data towards 'zero data loss'.

At another seminar, Doug Hall, from the Life Methods group at **Honeywell** explained the time savings when extracting a mathematical model for design work, explaining: "it used to take a group 3 to 4 hours worth of work to assemble the necessary data, then another hour doing the curve fitting, running the spreadsheet, documenting the work. Now it takes about three or four minutes... cutting about 80% of the time it used to take to generate the new model that people can use."

At a web seminar, Nicolas Capelle of **Airbus Helicopters** discussed how to manage effectively the complexities of composites materials (e.g., anisotropy / multi-stage processing). He focused on a project to manage raw data, verify test coefficients, and determine statistical values and design data to deliver traceability, avoid "private" storage, and facilitate multi-site harmonization of methods.

These and other examples at: grantadesign.com/casestudies

Further information

A Proposal document is available for any organization considering membership. This provides more information on the Consortium plan for Phase IV and on the benefits of membership. Contact ASM International or Granta Design to request a copy. You can find latest news at the Consortium website:

www.mdmc.net



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