

# **GRANTA MI 3.1**

## **Release Notes**



## Introduction

GRANTA MI™ 3.1 from Granta Design Limited is the latest version of the leading materials information management software system for engineering enterprises. GRANTA MI meets the disparate needs of the materials experts, product designers, engineering analysts, data publishers, and other professionals who work with information related to metals, composites, ceramics, plastics, and other materials.

Granta is committed to maintaining GRANTA MI's leading position. Regular update releases deliver new features and performance improvements, guided by input from our customers, while keeping pace with changing systems requirements. This document provides a brief overview of changes to the system modules in the latest release, and details some known issues.

Version 3.1 follows close behind the release of GRANTA MI 3.0 and, together, these two versions contain dozens of new features and improvements. Many of these were implemented at the request of customers and partners, including the Material Data Management Consortium and the Materials Strategy Consortium – two collaborative projects of leading engineering organizations that help to guide GRANTA MI development. We recommend that you upgrade to version 3.1 as soon as possible.

To install GRANTA MI please read the installation instructions available in the download. You will also need the alphanumeric key from your license agreement (and used in the download). If you have any problems, questions or feedback, please contact us at Granta:

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## Overview

GRANTA MI has a range of system modules supporting the workflow of different roles in materials and related engineering disciplines.

- MI:Server – the core of the system. All GRANTA MI components are built around this.
- MI:Server Configuration – a Windows® application for configuring the GRANTA MI system.
- MI:Viewer – displayed in standard web-browsers, this is the main interface. ‘Read mode’ is for standard search, browsing, and use of the data. ‘Edit mode’ enables editing.
- MI:Admin – a Windows application for database schema construction and maintenance.
- MI:Toolbox – a Windows application for import, export, or transformation of data within the system (formerly known as MI:Lab).
- MI:Lab Analysis – a test data processing option that works alongside MI:Toolbox:
  - tensile, compression, creep, stress relaxation data analysis.
  - low and high cycle fatigue, fatigue crack growth, fracture toughness data analysis.
- MI:Enterprise Materials Optimizer (EMO) – helps organizations to make strategic decisions relating to materials selection or substitution, and to implement these decisions enterprise-wide by providing their engineers and designers with web-based materials selection tools customized to the organization’s business rules.

Comprehensive descriptions of these tools and the combined capabilities of the resulting materials information management system are addressed in the accompanying documentation. Please refer to the User’s Guide and the Administrator’s Guide in the download.

### The main enhancements in versions 3.0 and 3.1 of GRANTA MI are:

- GRANTA MI:Restricted Substances – a new system module enabling a comprehensive in-house restricted substances solution. See item (3) below.
- GRANTA MI:Enterprise Materials Optimizer – A major revision. See item (2) below.
- Advanced querying tools – The tools for querying a GRANTA MI database in MI:Viewer have been enhanced. Users can combine traditional text-string searches with materials selection criteria based on numerical property data. See items (12 and 31) below.
- Embedded equations and logic – The new embedded equations and logic feature allows data values to be determined automatically using underlying expressions or logical statements. See items (1, 19, 28, 29, 33, 35 and 37) below.
- Tabular data – The new tabular data feature allows associations between data values to be represented in the form of a table. See items (4, 20, 30, and 36) below.
- Comparing test data with design curves – A new data comparison chart feature allows users to quickly compare a curve with raw data from any part of the database. See item (13) below.
- MI:Toolbox improvements: A series of enhancements to ease the import of the full range of supported data types into the system via the text, Excel, and bulk data importers. See items (33 to 36) below.

- New and updated reference data – new version of the MMPDS aerospace reference data, a new Global Powder Metallurgy module, revised MaterialUniverse tree hierarchy, new data on plastics, copper, and stainless steels, and enhanced information on materials prices, durability, and eco properties. See the Reference Data section items (41 to 52) below.

These and other enhancements are detailed below. Descriptions are organized in sections according to GRANTA MI system modules. Customer support staff at Granta will be pleased to provide advice on optimizing the performance of your GRANTA MI installation.

## What is new in GRANTA MI?

This section details all enhancements in GRANTA MI versions 3.0 and 3.1, compared with the previous release, GRANTA MI 2.1. The changes from version 3.0 to 3.1 are also identified.

### GRANTA MI system

#### 1. Embedded equations and logic:

The new embedded equations and logic feature allows data values to be determined automatically using underlying expressions or logical statements. This capability enables the system to store and apply mathematical models and helps with the maintenance and use of materials data. Equations or logical operations can either be defined by an administrator within MI:Admin for use across the database, or else entered by individual users via MI:Viewer.

##### Benefits:

- You can now automatically generate property values using equations – e.g., calculate specific stiffness using the values for stiffness and density elsewhere in a record. This also enables automatic updates of data as related values change.
- Store complex materials models (or ‘math functional data’) and use them to plot materials performance – e.g., create a fatigue curve from the values of model coefficients stored on a datasheet and a fatigue model stored elsewhere in the database.
- Plot families of curves, quickly visualize changes due to varying parameters.
- Apply logic – e.g., to select the right fatigue model depending on material composition.

#### 2. GRANTA MI:Enterprise Material Optimizer (MI:EMO)

GRANTA MI 3.0 delivers a major revision of MI:EMO, including advanced cost models, an easy-to-use user interface to assist designers in applying the method, and new visualization tools for identification of cost-functionality trade-offs.

- A new advanced cost model, allowing the user to include consideration of: the base cost of the material, the cost of processing options, and any additional costs that may apply to particular material/process categories. This is a database feature.
  - New step 4 ‘Options that influence *<objective>*’ for setting parameters in the objective expression. A typical objective is the ‘cost’.
- A new ‘wizard’ interface making it easier for users to step through the process of specifying their requirements.
  - Graphical browser to choose the design type.
  - Tabbed pages for the optimization steps.
  - Ability to add text search terms to step 3 ‘Additional Criteria’.
  - The reference record is remembered across sessions.

- The ability to investigate materials options for a new design or, alternatively, to identify materials that may offer a cheaper replacement for an existing material – supporting both the designer and users in commodities/supply chain functions.
  - Set a reference design in step 2 ‘What do you know about the current design?’. You can set the material side or the design side of the equation. This is a database feature.
  - Set a filter on the optimization results in step 2. You can show all records, only those records that are equivalent to the reference design, or those records that are equivalent to or better than the reference design. This is a database feature.
- New reporting tools, for example, to highlight on a graph cheaper materials that can offer the same performance as a reference material.
  - If a reference design has been set (step 2), a line is shown on the XY chart corresponding to the reference design.
  - If showing only those records that are equivalent to the reference design, the XY chart only shows bubbles that the reference line intersects.
  - Embedded equations and logic attributes may be plotted on a chart (new in version 3.1).
  - Allows users to run the optimization and see a ranked results list, or go straight to a report (property table or chart).
  - Pass fail report only shows records that pass at least one criteria. Therefore, at least two criteria must be set at step 3 for a meaningful Pass fail report.

**Benefits:**

- Clearer user interface improves ease-of-use for designers.
- Extend MI:EMO capabilities to consider cost and processing issues.
- Easier to consider substitution, with tools to compare materials options to existing materials and designs.

**3. Restricted Substances (new in version 3.1):**

GRANTA MI:Restricted Substances enables a comprehensive in-house restricted substances solution.

- Restricted substances data module – the first commercial release of this module contains information on 52 different pieces of restricted substance legislation from around the world. It also includes extensive data for 4,400 restricted substances. The data will be updated quarterly.
- Input tools – new template tables allow companies to add their in-house substances, in-house regulations, and bought-in components to a GRANTA MI database. These can be linked to records in the Restricted Substances Data Module, making it easy to identify potential restricted substance problems.
- Reporting tools – Substance summary ratings can be shown automatically on records for materials and substances – for example, stating whether the material or substance is

'banned', 'to be phased out', or 'at risk of phase-out'. A new specialized report format shows all restricted substances contained in a specified list of materials. Users may apply a legislation profile, so that the reported data reflects their interests. For example, if working on a product for California, only relevant substance regulations for California would be included in the summary rating.

**Benefits:**

- A comprehensive reference source for restricted substance regulations, the substances themselves, and the materials that they impact.
- Assess business risk – answer questions such as “What is in my products?”, “Where might there be risk of undocumented change by suppliers?”.
- Design-out business risk – consider restricted substance status when selecting materials.

**4. Tabular data:**

The new tabular data feature allows associations between data values to be represented in the form of a table.

For tabular data in 'Table A':

- Links can be made from multiple values in a single attribute in Table A, to 'Table B' (and Table B to 'Table C').
- Data can be associated with each link, both from Table A and Table B.
- A 'rolled up' status value from Table B can be displayed and used in Table A.
- Multiple relationships can be handled by using one tabular data table per relationship.

**Benefits:**

- Improved ability to store and display complex, inter-related data.
- Enables the creation of new tools – for example, displaying a summary ('rolled up') restricted substance status for a material, with the ability to click through to the detail of all substances in the material.

**5. Access to the GRANTA MI system with custom authentication:**

- In consultation with Granta, authentication can be changed from Windows Active Directory to a custom implementation.
- The changes to authentication mean that MI:Server now uses two ports, default numbers 8737 and 8738, and these both need to be open in the server firewall.

**Benefits:**

- Increases the flexibility of the user access features in GRANTA MI, so that the system can identify a user based on any known user authentication system, and so that access is easier to administer for non-IT specialists.

## 6. .Net 3.5 Framework:

- The version of the .Net Framework required by the GRANTA MI system has been upgraded to 3.5.

### Benefits:

- Makes use of enhanced versions of operating system software.

## 7. Profiles:

- The ability for an administrator to save a database configuration with a name.
- The configuration is the current subset and layout of each table in the database.
- Profiles are stored in the database in order to allow them to be shared between GRANTA MI applications.
- Particular profiles can be selected in MI:Viewer.
- Custom reports and Database homepages can use the selected profiles.

### Benefits:

- Enables capture and easy use of standard scenarios that might otherwise require the setting of many parameters. For example, in a restricted substance database, profiles can be used to define the different combinations of legislation that apply in different territories. The user simply selects the right profile in order to customize a report on the restricted substance status of a product or material.

## 8. Auditable logs (new in version 3.1):

Audit logs allow an auditor to determine what data has been requested by users, and when, and what data was delivered to them.

- The following types of information are recorded in the audit log:
  - Security Information: Who the user is and what role membership they have.
  - Transaction Information: Which application the request has originated from, and what action they are undertaking to cause data to be accessed.
  - Permission Information: The type and ID of all objects in the database which are requested are logged, along with whether the user was denied or permitted access.
  - Location information: The IP address of the application making the request, and in the case of the IIS hosted applications, the IP address of the user.
- The logs do not record any data, only identities of data objects.
- A tool can be provided for auditors that will augment copies of the logs with data or links to data in order to facilitate the auditing process. The augmented log will be in a text format that can be read and processed by any commercially available log parser.

- As all read and write actions are recorded for all objects for all transactions, the audit logs will be large. It is possible to configure the 'rollover' behavior, which determines how often an audit log is ended and a new one is begun.

**Benefits:**

- Keep track of database usage and understand what data and options are required, by whom – helps the administrator to develop and maintain the system appropriately.
- Recording all significant actions provides complete traceability and additional security.

**9. FEA export (new in version 3.1):**

The following capabilities can be set in an FEA exporter configuration file.

- It is now possible to specify that an FEA exporter should retrieve all attributes from a table, rather than choosing individual attributes.
- Ability to set the exported file name and extension. The file name may be the name of the record on the tree, the full name, or the table name.

**Benefits:**

- More flexibility in exporting data for use in FEA software.

**10. Changes to parameter types (new in version 3.1):**

- There are now two types of parameter, Numeric and Discrete:
  - Numeric parameters remain unchanged from previous releases: they can take any numerical value and can take a unit. Specific values can be labeled (e.g. 73°F = Room Temperature). Interpolation between values can be disabled if required.
  - Discrete parameters are new to version 3.1. They behave in a similar manner to discrete attributes: they can only take a restricted set of text values (e.g. red, orange, green, blue), cannot be interpolated, and do not have units. They cannot be used for the x-axis of a chart. The parameter values can be ordered, and are referred to by name in expressions.
- The interpolation (linear/none) and scale (linear/logarithmic) settings are now independent of each other.
- Interpolation and scale settings are the default for the parameter, but can be overridden at the attribute and data level if required.

**Benefits:**

- Clearer definition of parameters.
- Interpolation and scale settings are appropriate to the attribute.

## 11. Speed optimization in GRANTA MI:

- Updated search engine (new in version 3.1).
- Improvements to datasheet performance (new version in 3.1).
- Improvements to the MI:Toolbox plug-ins that work with Microsoft Excel.

### Benefits:

- GRANTA MI 3.1 is faster than GRANTA MI 3.0 for key searching and display actions.

## GRANTA MI:Viewer

### 12. Improved **Search** functionality in MI:Viewer – combining the search and selection tools:

The Search and Select functions of previous versions of GRANTA MI have been combined into a single tool. Users can search the database using both text and qualitative criteria (numeric, logical, discrete), with the results being presented in a single list.

- Free text search and property search can be combined, or still performed separately.
- Add the attributes of interest to the page, by typing (the first few letters of) the attribute name or browsing.
- Meta-attributes can be added to a search in their own right.
- Search for whether data for an attribute 'exists' (or not).
- Search individual text attributes.
- The text of link notes can be searched.
- Improved interface for the advanced search.
  - Standard and Advanced search pages are tabbed.
  - Search masks allow a text search to be restricted to specific attributes.
  - Text search can be limited to a single table.
  - Text search has separate fields for entry of OR, phrase, AND, and NOT criteria.
  - Cross tabular search available through browsing for attribute.
- Details of a search can be saved in a search project.
- Search projects are run automatically after being loaded.
- The filter tool has been extended to work with non-version controlled tables, allowing users with grant or admin privileges to find records based on date criteria – e.g., find all records created after a particular date (new in version 3.1).
- Search results (from a property search) can be sent to a 'standard' or 'custom' (user defined) report.
- Improved presentation of text search results.

**Benefits:**

- Quick and easy to specify everything from simple Google-style searches to complex, subtle queries. Users can get the data they want, as quickly as possible.
- Rapidly combine traditional text-string searches with materials selection criteria based on numerical property data.
- Much easier to identify and understand the full range of attributes that can be searched in any given database.

**13. New report tool – Data Comparison Chart:**

A new report type that allows point data to be plotted on top of a master reference curve. The user can add many series of such data to the curve (the curve is any of the existing functional data types – series, grid, or embedded equations and logic); they can split and label the series and customize the marker used for each series.

- Comparison data can come from another table in the database.
- Show or hide data series from the legend.

**Benefits:**

- Compare raw test data with a design curve generated from a materials model.
- Compare in-house data with reference data.

**14. Trailing zeros:**

Point and range attributes can now store and display significant zeros on the end of the numerical value, allowing the correct representation of data where the precision is important.

- Significant digit shown by overbar in MI:Viewer.
- Visible on datasheets and compare reports.
- Can be stored on point and range attributes.
- If the unit system is changed, the value is displayed to the same number of significant figures, with a warning attached to the value.
- Overrides user's option for significant figures (up to the maximum allowed (6)).
- Significance indicated by use of decimal separator plus zeros.

For  $0.4\overline{00}$  type 0.400

For  $1230\overline{00}$  type 1.2300e5

For  $2\overline{7}$  type 27.

For  $27.\overline{0}$  type 27.0

**Benefits:**

- Ensures that the precision with which data is entered into the database is retained and displayed.

**15. Switch between read mode and edit mode** in MI:Viewer moved to the toolbar:

- The mode that you are in is highlighted.
- The mode is also indicated by a color change in the toolbar.

**Benefits:**

- Makes GRANTA MI more intuitive to use.

**16. Datasheet layout can be changed:**

- New 'Change Layout' menu item.
- Lists all the layouts, and identifies the current layout.
- Does not affect the current subset.

**Benefits:**

- User can easily change the datasheet view of the data.

**17. Larger graphs for use in other applications:**

- On single pages where a graph is displayed, there is a new item on the View menu 'Show High-Res Graph'.
- The higher resolution graph opens in a new window.
- The higher resolution graph can be printed directly, or copied to another application as an image (jpg).
- Legend and metadata will print on following pages.

**Benefits:**

- Improved support for reports and presentations using graph data.

**18. Current unit system can be changed from the page toolbar:**

- 'Units' menu available on the datasheet, data views, and reports.
- Applies across the application for the current database, not just the page.

**Benefits:**

- Quicker and easier to switch between unit systems.

**19. Embedded equations and logic data** in MI:Viewer:

- Embedded equations and logic attributes can be viewed on a datasheet.
- Embedded equations and logic attributes can be added to a compare report.

- Embedded equations and logic data can act as the reference curve for a data comparison chart.

**Benefits:**

- See item 1 – this feature implements these benefits in MI:Viewer.

**20. Tabular data (new in version 3.1) in MI:Viewer:**

- Tabular data can be displayed on a datasheet.
  - In summary mode, only the summary rows are visible initially.
  - A row is hidden if there is no linked data.
  - A summary row can be displayed as in-line text rather than a table.
- A tabular attribute can be added to a compare report. Users control the columns to be displayed. Only summary columns may be added.
- Tabular data associations in reverse, for a record, can be displayed using the 'View Related Records' menu item.

**Benefits:**

- See item 4 – this feature implements these benefits in MI:Viewer.

**21. Improvements to support material information publishing (new in version 3.1):**

- Navigation
  - New 'navigation' toolbar replaces Navigate menu.
    - Back/Go To/Return (depending on where you are).
    - Display the 'next' record in the tree node.
    - Display the 'previous' record in the tree node.
    - Locate in tree.
- Ability to change layout (see item 16).
- New always-visible 'Contents' tab (with collapse and refresh tools for the tree) replaces left Browse pane.
- Browse button removed from toolbar.
- Automatic sync to tree.
- Improved identification of search terms in PDFs (minimum requirement Adobe 9.1).
- Improved 'Change subset' tool.
- New help window.

**Benefits:**

- Changes make browsing and searching of data more intuitive, particularly for users browsing online information resources published using GRANTA MI.

**22. Miscellaneous improvements:**

Other improvements to the MI:Viewer application include:

- Contents
  - Click on a folder name in the contents tree to expand/contract the node.
  - Add to list icon in the contents tree in Edit mode (new in version 3.1).
  - The name of the current profile is displayed, and the profile can be changed (new in version 3.1).
- Datasheets
  - Datasheet header can be set on a per table basis.
  - Click on a record icon to display a datasheet (new in version 3.1).
- Report
  - Add to List now available for folders from the Record Properties page in Edit mode.
  - Series functional data on XY charts can be filtered on parameter value (new in version 3.1).
  - Access to custom reports via the MI:Service Layer (new in version 3.1).
  - Run a report based upon information in an uploaded XML file. The file upload functionality is provided by the MI:Service Layer (new in version 3.1).
- Editing
  - In edit mode, a datasheet display all attributes in the layout, even if they contain no data.
  - Page for editing attribute data is tabbed.
  - 'Add to List' item added to the Record Properties page.
  - Warning given if 'Not Applicable' box is checked (new in version 3.1).

- Administration
  - Useful links added to admin page under a 'Utilities' heading.
  - Switchboard Link Generator – a page where an user with admin privileges can construct a URL that configures MI:Viewer to a pre-defined state. The configuration can store:
    - Current settings: Subset and layout for each table (the current profile), user preferences, database preferences, parameter preferences.
    - The datasheet you just viewed, or
    - The search you just performed.
- Custom Authentication
  - Login/Logout pages for use with custom authentication.
  - Application homepage and login page can be accessed anonymously. You will only be required to login if you click a link that points 'inside' MI:Viewer.

**Benefits:**

- Browse changes make GRANTA MI more intuitive to use.
- Editing and Administration changes support customization of GRANTA MI to organizational / individual needs.

**23. New Ansys Workbench V12 exporter:**

- New Ansys Workbench V12 exporter included for exporting MaterialUniverse, MMPDS design data, CAMPUS, ESDU, and ASME data.

**Benefits:**

- Enhanced export capability to a leading CAD/CAM/CAE application.

**24. Improvements to the Ansys Classic exporter:**

- Ansys 5 exporter is renamed to "Ansys Classic".
- New plasticity model: BKIN (bilinear kinematic hardening model).
- Added capability for exporting MMPDS design data and (partial support for) CAMPUS data.

**Benefits:**

- Enhanced export capability to a leading CAD/CAM/CAE application.

**25. The interface for the MI:Viewer Configuration tool has been improved.**

- Simpler user interface.
- Advanced options may still be set manually.

**Benefits:**

- Ease-of-use.

**26. Parameter help pages (new in version 3.1).**

- Provide a description/definition of parameters in your database.

**Benefits:**

- You can provide improved help/direction to the users of your database.

## GRANTA MI:Admin

**27. The Schema tool has a number of new functionalities.**

- Paste a list of discrete values from the clipboard.
- Paste a discrete type from the clipboard.
- Paste button for the Attributes list.
  - Can use the relative temperature units of °C or °F.
- Paste headings and attributes into a layout from the clipboard (new in version 3.1).
- Set a datasheet header note on a per table basis.
- Set a table to 'Searchable' or not.
- Changes to procedure for creating a new attribute, choice of attribute data type now offered upfront.
- Where there is a list of attributes, ability to use Ctrl+click to select multiple attributes, or Shift+click to select a range of attributes.

**Benefits:**

- Makes it quicker and easier to specify a schema, and increases control over its attributes.

**28. New Embedded equations and logic attribute data type :**

A new data type that allows users to store mathematical models of data, from simple ratios of attributes up to complex multi-parametric expressions referencing attributes, meta-attributes, parameters, and constants. The standard library of functions includes (but is not limited to) arithmetic, trigonometric, conditional and logarithmic operators; users can also define their own library of arbitrarily complex functions in any .Net compliant language.

- An equations and logic data value is derived from (one of the) expressions assigned to the attribute.
- A data value may be derived from a compatible expression in the table.

- A data value may be derived from a valid user-defined expression (an anonymous expression).

**Benefits:**

- See item 1 – this feature is one of the changes that implements these benefits in MI:Admin.

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**29. Expressions** can be stored for each table:

- Mathematical expressions, can contain attributes, parameters, constants, or functions, combined using operators.
- Equations and logic data values are derived from expressions.
- An expression can have a unit.
- Access control can be applied to an expression in the Access Control Editor.
- Expressions can contain local variables – allows the expression to be broken into parts, and then the parts are referred to in the main expression (new in version 3.1).

**Benefits:**

- See item 1 – this feature completes the implementation of these benefits in MI:Admin.

**30. New Tabular attribute data type** (new in version 3.1):

- Data for a tabular attribute is displayed in a table. Each **column** is analogous to an attribute; each has a name, type, unit, and value. Each column can be thought of as a sub-attribute of the tabular attribute. Each **row** can be thought of as a record, or as a set of metadata for the tabular attribute.
- A tabular attribute can (optionally) be linked to another table.
- There are four types of tabular column, containing:
  - Data that is 'local' to that instance.
  - Data from an attribute in the linked table.
  - Data from a tabular column in a tabular attribute in the linked table.
  - Linked records in the linked table.
- The linked values in a cell can be 'rolled up' into a summary value e.g. Minimum, Maximum for numeric values.
- A tabular attribute can be set as a meta-attribute.
- The order of columns for display can be set on a layout.
- The data in a tabular column/cell can be of any data type except functional data (float functional, discrete functional, equations and logic) and tabular data itself.

**Benefits:**

- See item 4 – this feature implements these benefits in MI:Admin.

**31. Changes for the new Search functionality:**

- Search masks (previously known as search templates) limit a text search to the attributes listed in the mask.
- Search templates (previously known as selection templates) provide an initial set of attributes on the search page.
- Set an attribute to be searchable or not.
- Set a meta-attribute to be searchable or not.
- ‘Default selection type’ has been renamed for search to ‘Default threshold type’.
- The following settings have been added to ‘Default threshold type’: exists, does not exist, contains.
- All attributes now ‘May be searched’ and have a ‘Default threshold type’. Those that did not before are: Picture, Hyperlink, Long Text, Short Text, File.

**Benefits:**

- See item 12 – this feature implements these benefits in MI:Admin.

**32. Standard Names functionality:**

- A standard name is the name of a physical property e.g. Young’s Modulus. This standard name can be mapped to multiple attribute names in the database e.g. ‘Modulus, L’.
- Custom reports can use standard names.

**Benefits:**

- This helps users to overcome a very common problem – namely, that the same attribute may be described using different names or conventions.

**GRANTA MI:Toolbox****33. Importer (Excel, Text, and Bulk Data) plug-in improvements:**

- Import of pictures.
- Import of ‘equations and logic’ data.

**Benefits:**

- Improved support for picture data.

**34. Text Importer plug-in improvements:**

- Set a description and target for a hyperlink.

**Benefits:**

- Improved support for hyperlinks.

**35. Bulk Data Importer plug-in improvements:**

- Ability to deal with duplicate record names: options to Replace Record, Replace Data, Rename or Do Not Import.
- Import of files (embedded media).
- Import of 'equations and logic' data.
- When building a hierarchy from column values, the color of the new folders will reflect the imported record color.

**Benefits:**

- Improved support for file data.

**36. Excel Importer plug-in improvements:**

- Ability to create data links.
- Command line interface.
- Import of files (embedded media).
- Attribute can be set to 'Do not import' and used for autoplacement of records only.
- Import records in columns (new in version 3.1).
- Cancel / Pause / Resume of import process (new in version 3.1).
- Display of status information while import is in progress (new in version 3.1).
- Import of tabular data (new in version 3.1).

**Benefits:**

- Improved support for data links.
- Improved support for file data.

**37. Excel Exporter plug-in improvements (new in version 3.1):**

- Export of 'equations and logic' data.
- Export records to columns.
- Ability to overwrite existing file when you export to a filename that already exists.
- Export of tabular data.

**Benefits:**

- New data types are reflected in the Excel Exporter.

**38. New Record Manipulator plug-in:**

- Change record subsets and color on selected records (can select a folder and apply to descendant records).
- Ability for users with grant privileges to release version controlled records.
- Color (and release records) can apply to ancestor records.

**Benefits:**

- Improves ability to quickly change attributes for multiple records.

**39. Excel Importer, Excel Exporter and Bulk Data Importer – use third party Excel API ‘SpreadsheetGear’:**

- Removed the dependency on Microsoft libraries.

**Benefits:**

- Microsoft Excel no longer required to be installed.
- Plug-ins run faster.

**40. MI:Toolbox improvements:**

- Users with write privileges and above can create new folders on the tree.
  - The name and the color can be set by the user. The folder is created in the current subset.

**Benefits:**

- Can provide more control over the organization of data to users, if desired.

## Reference data modules

### 41. Material prices in the MaterialUniverse data modules have been updated.

- New estimated prices for over 3,000 materials have been generated using an improved and updated price model.

#### Benefits:

- For commonly used materials, pricing is both up-to-date and more accurate in absolute terms. For the less common materials, where 'real' pricing is hard to obtain, prices are predicted more reliably than before and give a much better indication of relative trends within a class of materials – for example, within cast irons or aluminum alloys or filled thermoplastics.
- An important resource for cost reduction initiatives.
- An important resource for trade-off studies, e.g. cost vs mass of components; plastic vs metal.

### 42. Environmental Data in the MaterialUniverse.

- Revised and updated environmental data.
- New *Heat of combustion (net)* and *Combustion CO2* attributes added for combustible materials.
- End of life attributes (recycle, downcycle, combust for energy recovery, and landfill) revised and updated.
- Environmental data for processing revised and updated.
- Attribute notes for environmental attributes revised.

#### Benefits:

- More extensive coverage of eco properties for reference and materials selection.

### 43. Updated tree structure and metal naming convention in the MaterialUniverse.

- Revised naming of material families: '*Ceramics and glasses*' folder subdivided into '*non-technical ceramics*' and '*glasses*' folders.
- Tree hierarchy for foams revised – now categorized by material type rather than density.
- New metal naming convention used. Names are more descriptive, including information such as processing method, heat treatments, and major alloying elements. Leads to metals being grouped by alloy type in search results.

**Benefits:**

- Simplifies browsing, searching, and identification of materials in results list.
- Enhanced usability.

**44. New attributes for copper and steel alloys** in the MaterialUniverse.

- New attributes for '*similar grades*' and '*standards*' for copper alloys. Standards organizations extended from EN (European) to include GOST (Russian), JIS (Japanese) and GB (Chinese) – Data available in the *All attributes* and *metals* layouts.
- New *Carbon equivalency* attribute added for steels – available in the '*All attributes*', '*metals*' and '*stainless alloys*' layouts. Indicates the weldability of the material.

**Benefits:**

- Simplifies identification of similar grades and standards for copper alloys.
- Carbon equivalency identifies weldability of steel grades.

**45. New rating scale for durability attributes** in the MaterialUniverse.

- New four point scale introduced for durability attributes: Unacceptable, Limited use, Acceptable, Excellent.
- Rating scale for *UV radiation (sunlight)* updated to: Poor, Fair, Good, Excellent.

**Benefits:**

- Simplifies setting of durability constraints in searches.

**46. New and revised polymer data** in the MaterialUniverse.

- New '*Polymer type full name*' attribute.
- Revised and updated '*tradenames*' and '*typical uses*' information.
- Minor restructuring of polymer folder structure in the MaterialUniverse.
  - Polyphthalamide (PPA) listed under PA(Polyamide/Nylon).
  - Copolyesters, Tritan now listed under one folder.

**Benefits:**

- Simplified browsing and searching of polymers.

**47. New polymer records**, especially relevant to medical devices.

- 38 new grades and 6 new polymer classes (COP, PA-MXD6, PC+PPC, PEI+PCE, PEEK- modified, PEKK) added.

**Benefits:**

- Comprehensive coverage of medical plastics and elastomers.

**48. MMPDS updated to version MMPDS-04.**

The MMPDS data module has been updated to version MMPDS-04 CN1 and includes the latest data and the following additional features:

- Five new materials: Ferrium S53 high alloy steel, 2050, 6156, and 7056 aluminum alloys and Toughmet 3 copper alloy.
- Updates to design and graphical data.

**Benefits:**

- On-line access to the latest MMPDS-04 (Change Note 1) data.
- Access to data for a wider range of material properties.

**49. Updated CAMPUS data module.**

The CAMPUS<sup>®</sup> Plastics data module has been updated with the latest CAMPUS ISO comparable standards information.

- Information on approx. 5,800 resins from 21 leading vendors.

**Benefits:**

- On-line access to the latest CAMPUS data.

**50. Updated IDES Plastics data module.**

The Granta IDES Plastics database has been updated with the latest information. Around 10% increase in number of grades and update to manufacturer details to account for mergers and acquisitions in polymer manufacturing.

- Approx. 77,000 datasheets for specific resin grades.
- Approx. 725 suppliers worldwide.
- Approx. 61,900 ASTM and 30,600 ISO datasheets.
- Hyperlinks to ASTM datasheets on IDES website.

**Benefits:**

- The latest IDES data.

## 51. Updated Moldflow data module.

### Benefits:

- The latest Moldflow data.

## 52. New Global Powder Metallurgy data module.

This data module makes available the Global Powder Metallurgy Database developed as joint project between the leading regional powder metallurgy (PM) trade associations in Europe (EPMA), North America (MPIF), and Japan (JPMA). The database is the world's most comprehensive and reliable PM data source.

Launched in 2004, the Database now contains around 3,500 lines. In the GRANTA MI data module, these are organized into 600 records, each covering a different heat treatment for over 300 materials of relevance to Powder Metallurgy and Metal Injection Molding.

The data is a compilation of manufacturers datasheets. When possible, graphs of mechanical properties versus densities are plotted. Where sufficient data is available, an interpolation series is included.

- The following data is included in the records:
  - Material Designation: ISO & MPIF designations.
  - Alloying Method.
  - Chemical Composition.
  - Manufacturing Conditions.
  - Physical Properties: Density, Hardenability, Porosity.
  - Electrical Properties: Conductivity, Resistivity.
  - Magnetic Properties: Coercive field, Iron loss, Maximum permeability, Residual induction.
  - Mechanical properties: Elastic, Strength, hardness and micro-indentation.
  - Mechanical Properties vs. Density: same as above but as graphs or tables vs. density.
  - Fatigue properties: Axial fatigue endurance (Ps 50%), Rotating beam fatigue endurance (Ps 50%).
  - Further information: Links to possible suppliers (US, Europe & Asia).
- Export to Abaqus, Ansys Workbench, Pro/ENGINEER Wildfire, and MatML.

### Benefits:

- Enables sharing of this data across groups and departments, provides 'live' data ready for analysis and use, and makes it easy to import this data directly to third party applications.
- Provides the necessary property and durability data to compare powder metallurgy and metal injection molded materials with other options, and to enable designers and engineers to make informed choices.

## Upgrading from GRANTA MI 2.x

### Backup

- It is strongly recommended that you backup any custom files to a different directory before performing the upgrade.

### Database

- It is strongly recommended that you backup your database before performing the upgrade. The database update is performed by the Installation Manager. In a few cases it may encounter some issues, if this happens, please contact Granta.
- If you are upgrading GRANTA MI 2.0 standard databases e.g. 'MI Starter Database', if these databases do not contain additional customer information that must be retained, Granta recommends that the new GRANTA MI 3.x versions of these databases are used instead.

### FE Exporters

- The GRANTA MI 3.x FE Exporters will not be available for use with the upgraded GRANTA MI 2.x standard databases e.g. 'MI Starter Database'. If these databases do not contain additional customer information that must be retained, Granta recommends that the new GRANTA MI 3.x versions of these databases are used instead, for which the FE Exporters will be available.

If you wish to use the upgraded v2.x databases with the v3.x FE Exporters, please contact Granta.

### Selection projects

- The GRANTA MI 2.x selection projects will not be available for use with the new search facility in MI:Viewer 3.x.