

Release Notes: MaterialUniverse Data Module for GRANTA MI

October 2017 Release

The Granta **MaterialUniverse** data module provides engineering, economic, and environmental property profiles designed for like-to-like comparisons across the whole spectrum of material and processing possibilities. It contains over 3,900 records providing physical, cost, mechanical, thermal, electrical, optical, durability, environmental data on virtually all purchasable engineering materials, plus extensive data on over 240 processes.

What's new in this release?

This updated version of the MaterialUniverse includes:

- 10 new combined properties, such as specific strength, thermal shock resistance and warmth to touch added for all materials
 - Weldability added for all metals
 - Updated price and environmental data
 - New data on human bone and soft tissue
1. **10 new combined properties** added to all material datasheets in the **MaterialUniverse**—Covers commonly specified requirements, such as specific strength and thermal shock resistance, as well as 'softer' properties, such as warmth/ softness to touch and acoustic velocity. The calculations used are quoted in the attribute help, accessed by clicking on the attribute name link. The full set of properties, listed by datasheet header, are:
- Mechanical properties
 - Specific stiffness
 - Specific strength
 - Elastic stored energy
 - Impact and fracture properties
 - Toughness (G)

- Thermal properties
 - Thermal shock resistance
 - Thermal distortion resistance
- Electrical properties
 - Electrical conductivity
- Optical, aesthetic and acoustic properties
 - Softness to touch
 - Warmth to touch
 - Acoustic velocity

Benefits:

- Select, filter and compare materials based on these commonly specified properties, which are not typically quoted on material datasheets.

2. **New weldability attribute added for metals**—Rates the weldability of a metal on a four-point scale between excellent and unsuitable, and includes information on what pre and post treatment may be required to achieve a satisfactory weld.

Benefits:

- Consider this important manufacturing requirement alongside machinability and other critical quality requirements.

3. **Fiber type added to carbon fiber composite record names**—For carbon fiber reinforced composites, the type of fiber has been added to the record name (HS = High Strength, IM = Intermediate Modulus, and HM = High Modulus).

Benefits

- Makes it easier to differentiate between the standard high strength (HS) carbon fiber and more specialist intermediate (IM) and high modulus (HM) grades.

4. **New magnetic materials folder** added to browse tree—Categorized into hard and soft grades. Previously, these grades were dispersed throughout the tree and listed under their respective material class.

Benefits

- Raises profile of this important class of functional material.
- Easier to differentiate between permanent (hard) and electromagnetic (soft) grades.

5. Updated **Material prices**. New prices are available for all 4,000+ materials in MaterialUniverse. These have been generated using Granta's price model, based on data from the world commodity markets.

Benefits:

- Use up-to-date prices, reflecting current differences between material types and classes.
- Accurate cost reduction initiatives.

6. Revised and **updated environmental data**. The following routine updates have been made:

- Data values and sources for **Energy usage** and **CO₂ Footprint** have been updated for polymers, polyurethane foams, paper and cardboard.
- The **REACH Candidate list** and **SIN list** (Substitute It Now) Restricted Substances Risk Indicators have been updated to reflect the latest restrictions.

Benefits:

- Use up-to-date data, based on the latest sources, to inform and guide environmental design.

7. New **Austempered ductile iron, cobalt-based superalloys and copper-nickel alloys added**. The following metal alloys have been added to the MaterialUniverse:

- Austempered ductile iron
 - ADI 800, ADI 900, ADI 1050, ADI 1200, ADI 1400, and ADI 1600
- Cobalt-based superalloys
 - CCM- high carbon and low carbon) - annealed
 - CCM (high carbon and low carbon) - hot worked
 - CCM (low carbon) - warm worked
- Copper-nickel alloys
 - C64700 (98/2 copper-nickel) – hard and soft
 - C72650(87.5/7.5 copper-nickel), hard/spinodal and soft

Benefits:

- Consider austempered high strength ductile cast irons in applications requiring high wear resistance and strength, such as timing gears, steering knuckles, rollers, wear plates, wheel hubs, crankshafts etc.
- Consider cobalt based superalloys for surgical implants, such as bone fixation, heart valves, joint replacement and spinal devices
- Consider Copper-nickel alloys for high temperature electrical connectors, switches, relays and springs, etc.

8. **Coverage of paper increased** to include datasheets for bond/copier paper, glazed art paper, newsprint, paper board and tissue paper.

Benefits:

- Provides data on the main types of paper and board.

9. Datasheets for **Human bone and tissue** added—Listed under ‘Natural materials’ in the ‘Hybrids’ folder of the MaterialUniverse table.

- Includes data for trabecular and cortical bone.
- Due to the nature of these materials, the data quoted is limited to mechanical and physical properties for bone, and mechanical, thermal and physical properties for soft tissue.

Benefits:

- Supports the development of medical devices that come into contact with the human body, enabling synthetic materials to be screened based on their similarity to the properties of the bone or tissue they come into contact with.
- Aids the development of surgical tools that need to cut bone or tissue.

10. New **Healthcare applications** attribute—a new discrete attribute (replacing the *Medical applications* long text attribute) allows users to select from a list of 27 different healthcare applications such as *Bone fixation and repair*, *Surgical instruments*, or *Wound and tissue closure*.

Benefits:

- Enables data to be readily filtered by Healthcare application

How can accessing or installing this release help you?

- Get access to the latest version of this comprehensive source of material property data
- Increased ability to assess potential risk associated with materials during the early selection stages
- Access this data alongside your company's in-house materials data and other Granta reference databases

System requirements

This release of **MaterialUniverse** (including the Standard, Medical, and Polymer Editions) is compatible with GRANTA MI Version 9 or above.

For detailed system requirements and instructions on installing the database, see the installation documentation for your GRANTA MI release.

IMPORTANT

If you have a previous version of this data module installed, please note the following **before** installing the new version:

- If you have added or modified any of the FE exporters for this data module, and you have not stored the modified exporter in a `__User_Exporters__` subfolder, you will need to export a copy of these using MI:Admin **before** installing the new database, and then import the exporters into the new version of the database. Refer to the *GRANTA MI Administrators Guide* for additional information.
- If you have added or modified any of the unit systems for this data module, you will need to replicate these changes in MI:Admin for the new version.
- If you have added or modified any layouts for this data module for use with MI:Explore, you will need to replicate these changes in MI:Admin for the new version.

Further information and contact details

Additional information about this data module is available on the Granta Design website here: www.grantadesign.com/products/data/materialuniverse.htm

If you have further questions, contact us: www.grantadesign.com/contact/