

Release 2022 R1 Highlights
Ansys Granta MI, Granta Selector,
MDS, EduPack



Ansys Material Intelligence for Ansys Electromagnetic Simulation



Bring Material Intelligence to Ansys Electromagnetic Simulation

- ✓ Save time, add traceability and improve EM simulation accuracy.
- ✓ Access a new range of 7,200+ EM material records in native AEDT solvers.
- ✓ Manage, protect and access control your company's own EM material data.

Machine Learning for Intelligent Additive Manufacturing

- ✓ Easy-to-use machine learning application embedded in Granta MI™ for Additive.
- ✓ Process parameter optimization to reduce the need for 'trial & error' approach.
- ✓ Curve fitting for functional data in Granta's MatAnalyzer tool.

The Latest Material Data for Any Application

- ✓ All-new Advanced EM Material: PCB laminates, magnets and EM shielding/absorbing material.
- ✓ Enhanced range of 105,000 polymer material records, including non-linear properties.
- ✓ Latest versions of Senvol and ecoinvent for sustainability updates to MaterialUniverse™

EM = Electromagnetic
AEDT = Ansys Electronics Desktop



/ Granta 2022 R1 in numbers

NEW
Electromagnetic
Material Data

7,200+

Material records for low and high frequency electromagnetic applications.

Total Polymers
Available

105,000

Polymer material records now available, including additional non-linear materials

Ansys Electronics
Desktop tools with
Material Intelligence

5 of 5

Granta products now integrate with Ansys Maxwell, HFSS, SIWave, IcePak and Twin Builder

2022 R1: Product Release Detail



Ansys Granta MI – Core & Integrations

- **Granta MI Core functionality**

- ✓ New OneMI Export App – replacement for Toolbox
- ✓ Conditional logic (AND/OR) searching in Viewer – highly requested feature
- ✓ Added support in Explore for curve data in tabular data – another highly requested feature for easy access by end users

- **Granta MI Integrations**

- ✓ Ansys Electronics Desktop support
- ✓ Enhanced Python STK support – providing analytics support
- ✓ New version support - Creo 8, Enterprise connect for TC13 plus

group 1

Match: ANY

Young's modulus
is at least 5 GPa
(0.00000732 to 1210)

Flexural modulus
is at least 5 GPa
(0.00000477 to 1210)

AND

group 2

Match: ALL

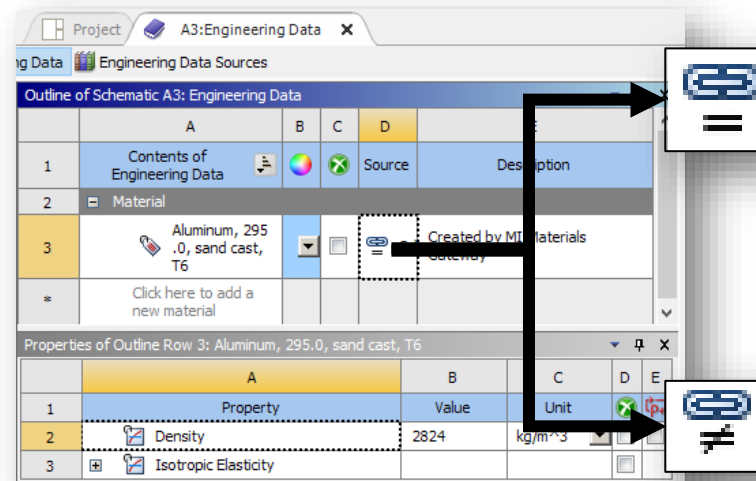
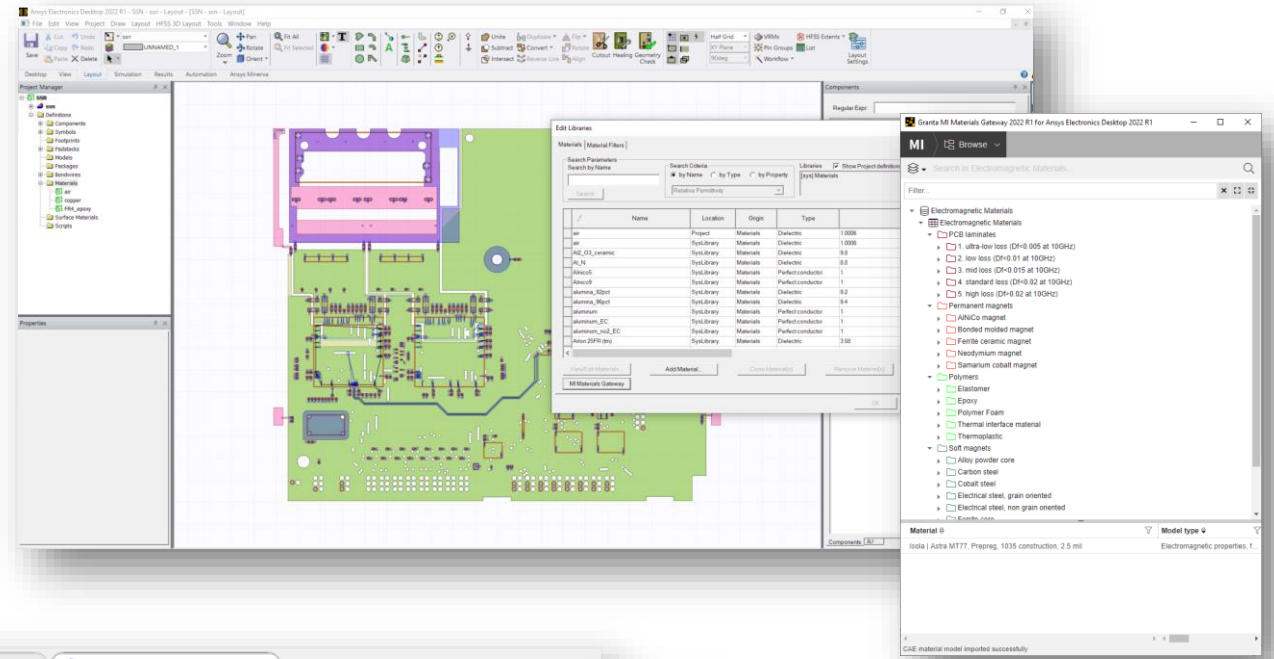
Price
is at most 1.8 USD/kg
(0.01 to 622000)

Fracture toughness
is between 3.03 and 3.18 MPa.m^{0.5}
(0.000533 to 456)



Granta MI Integrations

- **Ansys Electronics Desktop (AEDT) support**
 - ✓ Direct integration to Ansys Electronics Desktop started from the Edit Libraries menu
- **Enhanced Python STK support – providing analytics support with examples for:**
 - ✓ Data comparison
 - ✓ Test data analysis
 - ✓ Static calculation
- **New version support**
 - ✓ Creo 8
 - ✓ NX 1980
 - ✓ ANSA 22
 - ✓ TC with NX Gateway for TC 13 and NX version 1926, 1953, or 1980
 - ✓ WB Gateway – traceability feature
 - ✓ EC for TC 13

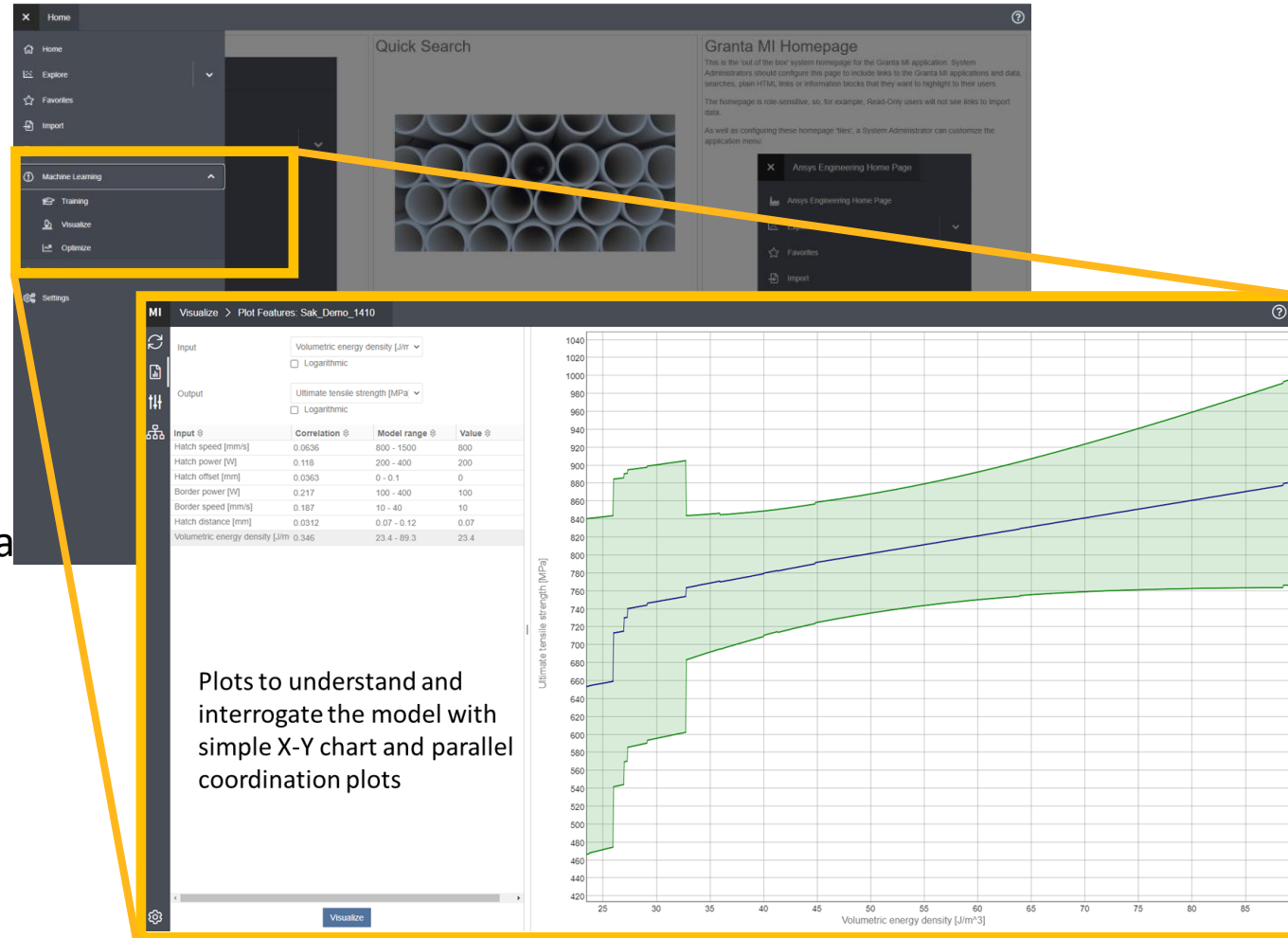


Material is the same as the imported source from Granta MI

Material has changed with respect to the imported source

Granta MI for Additive Manufacturing and Restricted Substances

- **Additive Manufacturing (AM)**
 - ✓ Machine Learning (easy to use) for AM
 - ✓ Curve fitting for functional data in MatAnalyzer
 - ✓ Enhanced AM machine log importers
- **Restricted Substances & Sustainability**
 - ✓ Update to latest regulatory legislation
 - ✓ Extended Python STK for large BoM analysis
 - ✓ Broad sustainability data update for all main material types in MaterialUniverse™



• Granta MI Pro functionality

- ✓ Added support for electromagnetics fast start data management
- ✓ Schema & data update for HFSS and Maxwell for improved high frequency and magnetic simulation

View / Edit Material

Material Name
PCB laminate, Epoxy/Glass fiber, FR-4

Properties of the Material

Name	Type	Value	Units
Relative Permittivity	Simple	$\text{pw}(\text{\$Dielectric_constant_with_frequency_1.Freq})$	
Relative Permeability	Simple	1	
Bulk Conductivity	Simple	0	siemens/m
Dielectric Loss Tangent	Simple	$\text{pw}(\text{\$Dielectric_loss_tangent_with_frequency_1.Freq})$	
Magnetic Loss Tangent	Simple	0	
Electric Coercivity	Vector		
- Magnitude	Vector Mag	0	
Magnetic Coercivity	Vector		
- Magnitude	Vector Mag	0	A_per_meter
Thermal Conductivity	Simple	0.38	W/m-C
Magnetic Saturation	Simple	0	tesla
Lande G Factor	Simple	2	
Delta H	Simple	0	A_per_meter
- Measured Frequency	Simple	9.4e+09	Hz
Core Loss Model		None	W/m^3
Mass Density	Simple	1900	kg/m^3
Composition		Solid	
Specific Heat	Simple	1103	J/kg-C
Young's Modulus	Simple	24600000000	N/m^2
Poisson's Ratio	Simple	0.136	
Thermal Expansion Coefficient	Simple	1.55e-05	1/C
Magnetostriction	Custom	Edit...	
Inverse Magnetostriction	Custom	Edit...	
Thermal Material Type		Solid	
Solar Behavior	Simple	0	

Notes: Materials data from Ansys Granta MI Pro FR-4, Epoxy (EP) matrix, Glass fiber woven fabric prepreg, PC

Set Frequency Dependency... Calculate Properties for: ▼

Reset OK Cancel

View/Edit Material for

☐ Active Design

☐ Active Project

☒ All Properties

Physics:

☒ Electromagnetic

☒ Thermal

☒ Structural

View/Edit Modifier for

☐ Thermal Modifier

☐ Spatial Modifier

Material Appearance

☒ Use Material Appearance

Color:

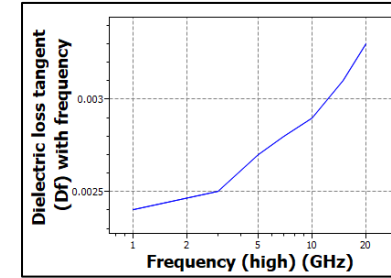
Transparency:

[Validate Material](#)

/ Core Data & Advanced Data Bundles (covers Granta Selector)

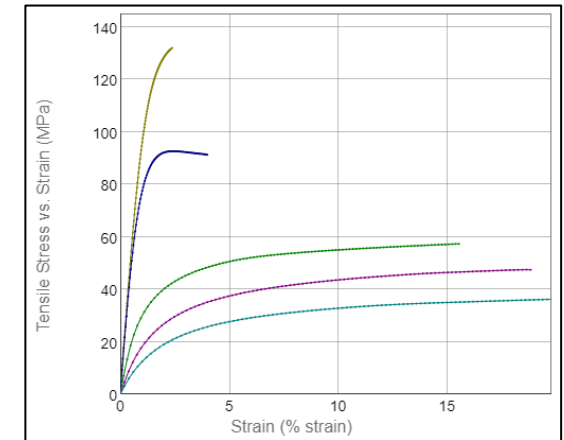
- **Electromagnetics**

- ✓ Release of the new **Electromagnetics** product for **Granta Selector** and **Granta MI**
- ✓ Data for PCBs, soft magnets, hard magnets and EM-absorbing materials
- ✓ Available for searching, selection and export of key material properties to **Ansys Electronics Desktop**, **Workbench** and **Motor CAD**.



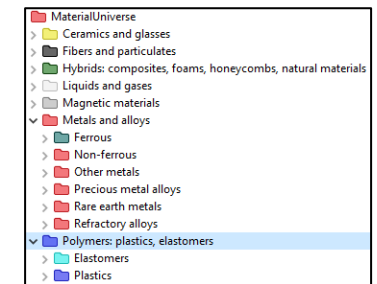
- **Polymers**

- ✓ Updated with the most recent data, now bringing total polymers to >105,000 and total additives to >15,600 (data and polymer grades from MOCOM)
- ✓ Includes simulation ready data for true stress (transformed from plastic stress-strain) and creep model parameters. +1000 records have true stress-strain data for viewing and export
- ✓ New “Nonlinear simulation” subset enables users to easily find records populated simulation-ready attributes

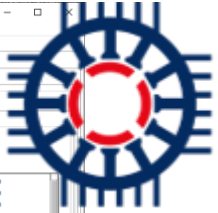


- **Data**

- ✓ MaterialUniverse™ – Updated price data. Significant update to sustainability and eco data incorporating the latest values from ecoinvent 3.7.1. Links included to Electromagnetic materials
- ✓ Additive Manufacturing – Latest version of Senvol™ data, including >200 new materials processed by AM and >100 new AM machines. Data updates to existing records.

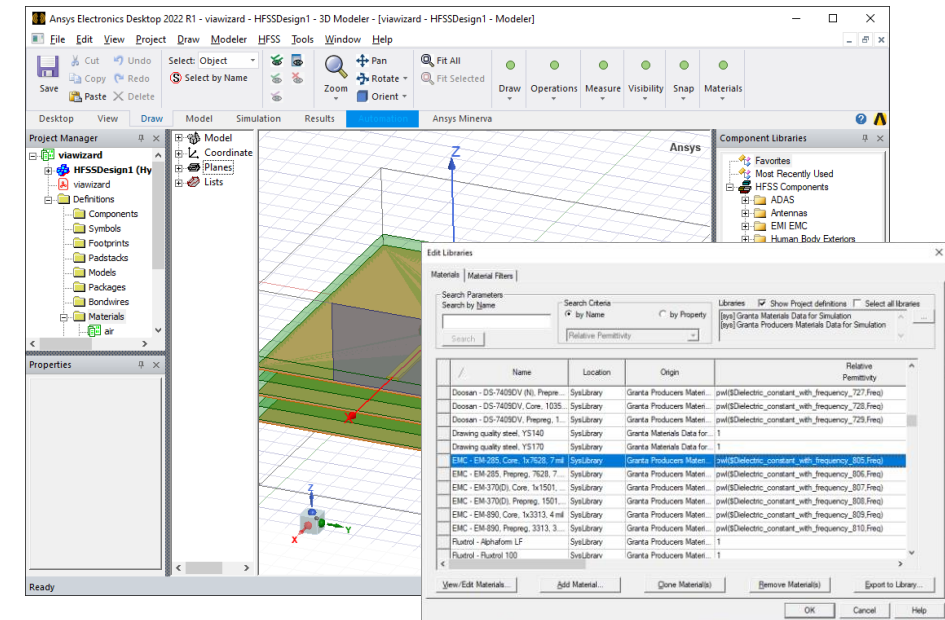
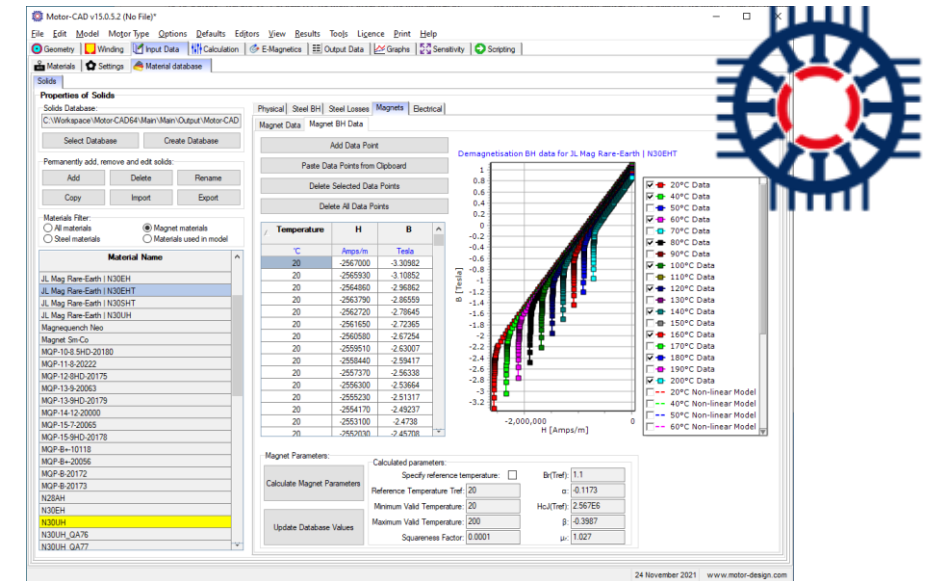


Material Data for Simulation (MDS)



- **MDS now included in Motor-CAD**
 - ✓ 1400+ simulation-ready soft and hard magnetic materials now available in Motor-CAD
- **MDS Producers library (PCB data)***
 - ✓ Addition of 47 new PCB material records, including Df and Dk vs frequency curves.
 - ✓ Supplementing 72 existing PCB records with additional property data
- **MDS Materials Library (updated properties)**
 - ✓ New molar mass data for 15 fluid materials in Discovery
 - ✓ Dielectric constant and dielectric loss tangent vs frequency added for generic PCB laminate material*
 - ✓ Update of .amat format, including changing core loss format to single line per curve and reordering of properties*

*available in Ansys Electronics Desktop (AEDT)



- **Refreshed database for introductory Built Environment teaching**
 - ✓ Previous *Architecture* database has been updated with additional materials and properties, plus refreshed material images to engage students
- **Updates to data across all databases**
 - ✓ Embodied energy and carbon footprint for all main material families updated across all databases, using ecoinvent 3.7.1
 - ✓ The Level 3 Polymer database has been updated with the most recent data in the Global Polymers-Plastics table, also with new simulation-ready data for true stress-strain and creep model parameters
- **Updates to resources for students and academics**
 - ✓ Updated tutorial videos for students
 - ✓ Updated teaching resources on the new Ansys Education Resources site for educators
 - ✓ New 'Introduction to Materials' free Ansys Innovation Course

