Ansys GRANTA MI 2021 R1

CAE Exporters for Granta Reference Data

Contents

1 Exporters summary

Table 1 lists the standard exporters available for each Granta reference data module.

Table 2 lists the exporters available by product.

Table 3 summarises what type of data can be exported with each package. For more detail, see Section *2, Data exported for each CAD or CAE package*.

Refer to the *GRANTA MI FEA Exporter Author Guide* for information on how to create exporters for CAD, CAE and PLM data.

Table 1 Standard exporters included in Granta reference data modules

	ASME BPVC	ESDU MMDH	JAHM Curves	Material Universe	Global Metals	Global Polymers	MMPDS	ASM Medical	HBM	Template databases
Abaqus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Altair Inspire				✓		✓				
ANSYS MAPDL (ANSYS Classic)	✓			✓		✓	✓			
ANSYS Workbench	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CATIA	✓	✓		✓			✓			✓
Creo Parametric (Pro/ENGINEER)	✓	✓		✓		✓	✓	✓	✓	✓
Nastran	✓			✓		✓	✓			
NX (MatML)	✓			✓		✓	✓			
SolidWorks	✓	✓		✓	✓	✓	✓	✓		✓

Table 2 Supported exporters by product

	GRANTA MI (Explore, MI:Viewer)	GRANTA MI:Materials Gateway	GRANTA Selector
Abaqus	✓	✓	✓
Altair Inspire	✓		✓
ANSYS MAPDL (ANSYS Classic)	✓		✓
ANSYS Workbench	✓	✓	✓
CATIA	✓	✓	
Creo Parametric (Pro/ENGINEER)	✓	✓	✓
Nastran	✓	✓	✓
NX (MatML)		✓	✓
SolidWorks	✓		✓

Table 3 Summary of properties exported by standard exporter packages

	Density	Elastic	Simple failure	Stress-strain	Thermal	Electrical	Temperature-dependent
Abaqus	✓	✓	✓	✓	✓	✓	✓
Altair Inspire	✓	✓	✓		✓		
ANSYS MAPDL (ANSYS Classic)	✓	✓			✓	✓	✓
ANSYS Workbench	✓	✓	✓	✓	✓	✓	✓
CATIA	✓	✓	✓		✓		
Creo Parametric (Pro/ENGINEER)	✓	✓	✓		✓		
Nastran	✓	✓	✓	✓	✓		✓
NX (MatML)	✓	✓	✓		✓		✓
SolidWorks	✓	✓	✓		✓		

For more detail about the data exported for each supported package, see Section *2, Data exported for each CAD or CAE package*. Note that where temperature-independent data is exported, the temperature value can be revised from room temperature in the **Parameter Values** page during export for databases such as MMPDS, ESDU MMDH, and ASME BPVC.

2 Data exported for each CAD or CAE package

More detailed information about the data exported from each Granta data module is given in the sections below, organized by CAD or CAE package.

2.1 Abaqus

Linear, isotropic, thermal, plastic, temperature-independent, and temperature-dependent data may be exported to the following properties in Abaqus version 6 simulation software.

Abaqus Property	Granta Standard Names
CONDUCTIVITY	Thermal conductivity Thermal conductivity with temperature
DENSITY	Density Density with temperature
DIELECTRIC	Dielectric constant
ELASTIC	Tensile modulus Tensile modulus with temperature Poisson's ratio Poisson's ratio with temperature
ELECTRICAL CONDUCTIVITY	Electrical conductivity Electrical conductivity with temperature Electrical resistivity
EXPANSION	Thermal expansion coefficient Thermal expansion coefficient with temperature Reference temperature, CTE
PLASTIC	Tensile stress with strain True stress with strain Tensile strength, yield Tensile strength, yield with temperature
SPECIFIC HEAT	Specific heat capacity Specific heat capacity with temperature

2.2 ANSYS MAPDL (Classic)

Linear, elastic, and isotropic data may be exported to the following properties in ANSYS® Mechanical™ APDL (ANSYS Parametric Design Language).

MAPDL Property	Granta Standard Names
ALPX	Thermal expansion coefficient Thermal expansion coefficient with temperature
C	Specific heat capacity Specific heat capacity with temperature
DENS	Density
EX	Tensile modulus Tensile modulus with temperature
GXY	Shear modulus Shear modulus with temperature
KXX	Thermal conductivity Thermal conductivity with temperature
PRXY	Poisson's ratio
RSVX	Electrical resistivity Electrical conductivity

2.3 ANSYS Workbench

Linear, temperature-dependent, isotropic, thermal, and plastic data may be exported to the following properties in ANSYS® Workbench.

ANSYS Property	Granta Standard Names
Coefficient of Thermal Expansion	Thermal expansion coefficient Thermal expansion coefficient with temperature Reference temperature, CTE
Density	Density Density with temperature
Isotropic Hardening	Tensile stress with strain True stress with strain
Poisson's Ratio	Poisson's ratio Poisson's ratio with temperature
Resistivity	Electrical resistivity Electrical conductivity
Specific Heat	Specific heat capacity Specific heat capacity with temperature
Tensile Ultimate Strength	Tensile strength, ultimate Tensile strength, ultimate with temperature
Tensile Yield Strength	Tensile strength, yield Tensile strength, yield with temperature
Thermal Conductivity	Thermal conductivity Thermal conductivity with temperature
Young's Modulus	Tensile modulus Tensile modulus with temperature

2.4 CATIA V5

Isotropic data may be exported to the following properties in CATIA® version 5.

CATIA Property	Granta Standard Name
SAMCompressiveStressLimit	Compressive strength
SAMDensity	Density
SAMPoissonRatio	Poisson's ratio
SAMShearModulus	Shear modulus
SAMShearStressLimit	Shear strength, yield
SAMTensileStressLimit	Tensile strength, yield
SAMThermalExpansion	Thermal expansion coefficient
SAMYoungModulus	Tensile modulus

Note that an additional macro is required to complete the export of data from MI to CATIA v5.

The exporters that are bundled with the databases listed above create an XML “neutral format” of the CATIA material definition (GCIF file). A CATIA user who receives these files from a GRANTA MI user needs to install a macro in their local CATIA installation, to convert the GCIF file into the binary CATmaterial format that CATIA requires.

Information about writing a macro for this purpose, and full details of requirements are included in a Technical Note, *CATIA V5 Macro Requirements for Importing GRANTA MI Data*, which can be obtained from Granta Technical support.

2.5 Creo Parametric (Pro/ENGINEER)

Linear, isotropic, temperature-independent, and age-dependent data may be exported to the following properties in Creo Parametric software.

Creo/ProE Property	Granta Standard Name
PTC_COMPR_ULTIMATE_STRESS	Compressive strength
PTC_MASS_DENSITY	Density
PTC_POISSON_RATIO	Poisson's ratio
PTC_SPECIFIC_HEAT	Specific heat capacity
PTC_TENSILE_ULTIMATE_STRESS	Tensile strength, ultimate
PTC_TENSILE_YIELD_STRESS	Tensile strength, yield
PTC_THERMAL_CONDUCTIVITY	Thermal conductivity
PTC_THERMAL_EXPANSION_COEF	Thermal expansion coefficient
PTC_YOUNG_MODULUS	Tensile modulus

2.6 MatML and NX

Linear, isotropic, and basic data may be exported to the following properties in the MatML format.

MatML Property	Granta Standard Names
MassDensity	Density
PoissonsRatio	Poisson's ratio
SpecificHeat	Specific heat capacity
ThermalConductivity	Thermal conductivity
ThermalExpansion	Thermal expansion coefficient
UltTensile	Tensile strength, ultimate
Yield	Tensile strength, yield
YoungsModulus	Tensile modulus Tensile modulus with temperature

2.7 Nastran

Linear, elastic, isotropic temperature-dependent data may be exported to the following properties in Nastran®.

Nastran Property	Granta Standard Names
A	Thermal expansion coefficient Thermal expansion coefficient with temperature
E	Tensile modulus Tensile modulus with temperature
G	Shear modulus Shear modulus with temperature
GE	Structural damping coefficient Structural damping coefficient with temperature
MATS1	Tensile stress with strain
NU	Poisson's ratio Poisson's ratio with temperature
RHO	Density Density with temperature
SC	Compressive strength Compressive strength with temperature
SS	Shear strength, yield Shear strength, yield with temperature
ST	Tensile strength, yield Tensile strength, yield with temperature

2.8 SolidWorks (incorporates COSMOS/M)

Linear, elastic, and isotropic data may be exported to the following properties in SolidWorks®.

SolidWorks Property	Granta Standard Name
ALPX	Thermal expansion coefficient
C	Specific heat capacity
DENS	Density
EX	Tensile modulus
GXY	Shear modulus
KX	Thermal conductivity
NUXY	Poisson's ratio
SIGXC	Compressive strength
SIGXT	Tensile strength, ultimate
SIGYLD	Tensile strength, yield