JMatPro
PRACTICAL SOFTWARE FOR MATERIALS PROPERTIES

**Version 15.1 – January 2025**
**Version 15.0 – November 2024**

## VERSION 15.1 (January 2025)

### BUG FIXES

- fixed missing enthalpy, specific heat and latent heat in solidification export for Titanium alloys
- fixed a heat treatment temperature initialisation issue in General Steels high/low temperature strength calculation when switching from tempered state back to the annealed state

## VERSION 15.0 (November 2024)

### NEW FEATURES

- added choice between martensitic, bainitic and pearlitic microstructure in the tempered hardness calculation for General Steels
- added secondary phases consideration in Advanced CCT and Hardenability calculations for General Steels
- added calculation of physical and mechanical properties under room temperature for all materials
- added calculation of magnetic permeability in General Steels Quench Properties
- added choice between annealed and tempered condition in High Temperature Strength for Stainless Steels
- added new variable Bar Radius in Grossmann hardenability of General Steels
- added display of weight fractions in back diffusion profile plot
- added an expert mode in options for user settings
- added Bainite and Martensite start temperature to calibration of General Steels TTT
- added a warning message about using high transformation fractions in General Steels Quick TTT/CCT
- more robust General Steels solidification calculation if only Ferrite is present in the mushy zone
- more robust General Steels and Stainless Steels solidification calculation
- more robust Heat Treatment calculation for Ni alloys
- improved axis labelling in General Steels hardenability plots
- improved label for High Temperature Strength plots
- improved strength conversion in input for High Temperature Strength calculation of Stainless Steels
- improved consistency in Ni Superalloys "Heat Treatment" calculation for alloys containing Boron
- improved appearance of list of properties when folding properties' groups
- improved stress-strain calculation for High Temperature Strength in tempered General Steels
- improved phases mapping in isopleth calculations
- improved cast strength calculation for Mg alloys

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## DATABASES CHANGES

- overall check and clean-up of all thermodynamic databases (Fe,Al,Mg,Ni,Co,Cu,Ti,Zr and Solder Alloys)
- new assessment of AlCuFeNi systems in Cu thermodynamic database
- addition of Si3N4 phase to Fe thermodynamic database (for SIMHEAT export use)
- addition of Nb to the Al thermodynamic database
- addition of Ti to the Cu thermodynamic database with phases Cu4Ti and CuNiTi
- adjusted (Fe,Ni)Al phase in Fe thermodynamic database

- adjusted Mo in LAVES phases in Ni and Co thermodynamic databases
- adjusted Ni and Co in FCC contribution to molar volume
- extended properties of SiC phase

## EXPORT CHANGES

- new AFDEX heat treatment export
- improved Transvalor-Steel and THERCAST export for hypereutectoid steels
- added hardness data to DEFORM-HT export
- improved SIMHEAT nitriding and carbo-nitriding export
- added option of non-treatable alloys in Sysweld export for Aluminium Alloys
- removed potential double point in Sysweld export for Aluminium Alloys
- changed the order in temperature of physical properties order in DEFORM-HT/DEFORM-Forming to avoid data interpolation issues
- corrected unit of electrical conductivity in export to COMSOL-Multiphysics
- extended phase transformations and magnetic permeability in COMSOL-Multiphysics export
- added an option to only export small strain points in General Steels export to Heat Treatment packages

## BUG FIXES

- fixed potential saving of un-calibrated data to a calibrated General Steels material file
- fixed calculation of Al cast strength T5 temper
- fixed Flow Limit Diagram calculations for Co alloys
- fixed a potential failure in High Temperature Strength calculation
- fixed export options not all shown under certain conditions
- fixed phases colours choice not respected in General Steels hardenability plot
- fixed potential failure in solidification calculation for heavily alloyed Ti alloys
- fixed ASTM grain size use in Austenite flow stress in General Steels
- fixed limit of graph to the maximum temperature chosen instead of the heat treatment temperature in High Temperature Strength and Flow Stress Analysis of Ni,Ti,Co alloys and Stainless Steels

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- fixed failing calculation of TTP for Stainless Steels and General Steels
- fixed wrong grain size indication in the results of room temperature strength of Ti alloys if only Beta is present
- fixed input window getting too large