JMatPro
PRACTICAL SOFTWARE FOR MATERIALS PROPERTIES

VERSION 13.0 – December 2021
VERSION 13.1 – June 2022
VERSION 13.2 – August 2022
VERSION 13.3 – April 2023

VERSION 13.3 (April 2023)

BUG FIXES

- for General Steels, fixed an uncommon incomplete or failing export of TTT data to Transvalor software and COMSOL Multiphysics® when one phase (Ferrite, Pearlite, Bainite) does not appear at all
- fixed an uncommon error preventing phases to be found in TTT/CCT calculations for Ni superalloys

VERSION 13.2 (August 2022)

(Please note that the changes in version 13.2 only affect General Steels and Fe alloy users)

BUG FIXES

- fixed General Steels THERCAST export always using default phases transformation input data
- fixed General Steels Reaustenitisation properties calculation failing with user profile

VERSION 13.1 (June 2022)

NEW FEATURES

- improved Cu effect in Al alloys mechanical properties
- improved assessment of kinetics in Al alloys for some phases
- added pdf documentation for Al-T8 heat treatment
- added Austenitisation temperature input for THERCAST casting export in General Steels

BUG FIXES

- fixed solidification calculation in Al alloys containing Oxygen
- completed and corrected physical properties for TIM_B2 phase in Ti alloys
- fixed a possible failed export for DEFORM-HT
- fixed a possible bad calculation for Jominy Hardenability and Quench Properties calculations

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- fixed Simufact-Additive export preventing multiple calculations

VERSION 13.0 (December 2021)

NEW FEATURES

- extension of re-austenitisation (phases and properties) and TTA curves calculations to hypereutectoid steels
- extension of magnetic permeability calculations to hypereutectoid steels
- calculation of rupture strength of tempered power plant type steels - added to the "Simultaneous Precipitation" calculation for carbide-strengthened steels
- addition of CLUSTER phase to Metastable phases - TTT/CCT - isothermal calculations for Al alloys
- improved model for TTA calculations (revised T_ferrite calculation)
- improved model for Stainless Steel solidification
- remodelled contribution of particles at grain boundaries to rupture life in Ni alloys
- added T8 age hardening calculations for Al wrought alloys
- added T4, T5 and T6 age hardening calculations for Al cast alloys
- new modelling of TTT/CCT/isothermal/age hardening calculations for 6xxx Al alloys
- addition of calculation of RT strength of Al alloys after exposure to higher temperature at multiple isothermal temperatures instead of one at a time
- addition of user defined profiles to Ti cooling properties
- improved calculation of fracture toughness of steels with effect of nitrides and excessive Si
- improved calculation of the elastic limit (point of the stress-strain curve at 0 strain)
- variable number of significant figures show when a graph point is clicked and values are given (better precision for small values)
- allowed phase boundaries control in "Extended General physical properties" for difficult calculations
- improved tempering calculations: austenite can now be stable at the tempering temperature
- improved coarsening, stability model and new strength model in Simultaneous Precipitation calculations and added choice of phases
- improved martensite tempering model for plain carbon and alloyed steels
- improved Forming Limit Diagram model with consideration of anisotropy and order of yield surface
- re-assessed yield strength <-> tensile strength <-> hardness inter-conversions for steels
- labelled magnetic permeability as maximum in graphs when relevant.

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- added average expansion coefficient to properties displayed in general steels Quench Properties
- better implementation of number of points per decade in flow-stress analysis
- new printing mechanism
- new location of index files

DATABASE CHANGES

- new documentation on all thermodynamic databases
- added NiW and Ni6Si2B phase to Ni thermodynamic database
- adjusted MC phase in Ni and Co thermodynamic databases
- added Al12Mo to Al thermodynamic database
- added CLUSTER metastable phase to Al thermodynamic database
- adjusted MgRE12 phase in Mg thermodynamic database
- re-assessed thermal conductivity contribution for Cu and Si in FCC phase
- re-assessed thermal conductivity for Mg alloys with significant Al content

EXPORT CHANGES

- for Ti alloys, new export for Simufact Additive
- for general Steels, new export for DANTE® Heat Treatment Simulation software
- for general steels, extended COMSOL Multiphysics® export with transformation data
- added data for heating transformation in DEFORM-HT export and extended data exported to higher temperatures
- new and improved Sysweld and ProCast export format
- improved and corrected Ansys export (ENTH unit changed to J/m^3 and temperature unit can be chosen)

BUG FIXES

- fixed coarsening calculation at high temperatures for NiFe superalloys reporting overestimated coarsening rate for Gamma'
- fixed fracture toughness calculation failing because of secondary phases appearing
- fixed minor inaccuracies in permeability calculation

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- fixed failing calculation in cast-iron solidification when temperature unit is F
- fixed bug in quench properties calculations occurring with some user-defined profiles
- fixed missing phases details for Young's, bulk, shear moduli as well as thermal conductivity for white cast iron solidification
- fixed wrong fixed temperature information exported when exporting a flow stress analysis data at varying strain rate
- fixed inconsistency in welding cycle
- fixed possible problems from location of files in non-standard installation