

MatCalc 6

The Materials Calculator

MatCalc 6 is a software toolbox for computational materials engineering that covers the areas of multi-component phase equilibria and thermodynamics as well as multi-phase precipitation kinetics and multi-grain microstructure evolution in solid-state systems. MatCalc 6 combines all these features within a single software code, giving the user huge flexibility and power in setting up and running various types of simulations with high computational efficiency.

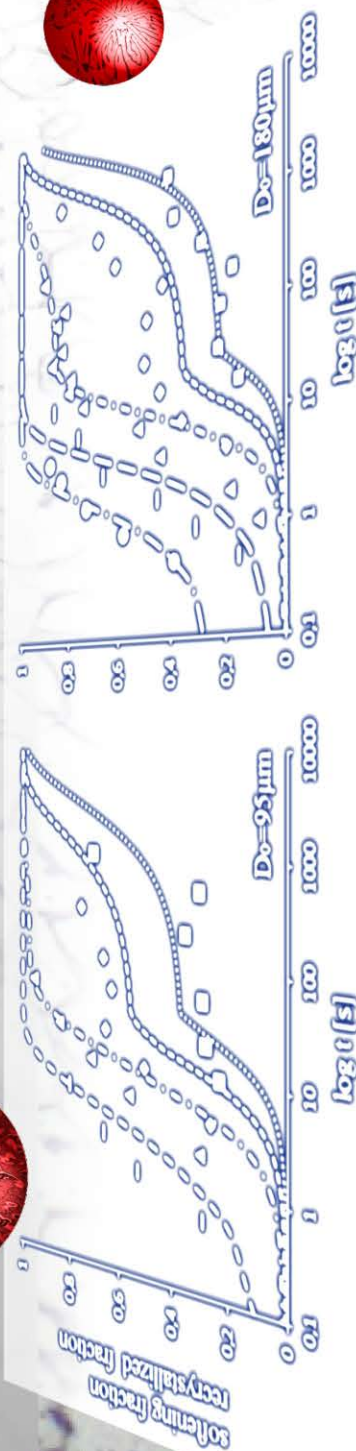
MatCalc software development has a continuous history of more than 20 years, starting in 1993 at the TU Graz in Austria, and continuing at the TU Wien since 2008. The MatCalc development and support team consists of a dedicated group of people specialized in materials science, mechanical engineering, physics, chemistry and IT.

MatCalc utilizes standard CALPHAD-type databases for thermodynamics, diffusion and thermo-physical properties. The comprehensive MatCalc proprietary databases for Fe, Al and Ni-base alloys contain data for both, stable and metastable, phases that are especially optimized for kinetic simulations.

With its portfolio, MatCalc is aimed at supporting you in the fields of materials development, simulation and optimization of materials processing and analysis and interpretation of metallurgical problems. MatCalc is already successfully utilized in teaching and research and it is used likewise by academia, research organizations and industry.

Features:

- Constrained and unconstrained phase equilibria
- Precipitation kinetics
- Long-range diffusion
- Simultaneous diffusion and precipitation
- Lattice Metropolis and kinetic Monte Carlo
- Microsegregation and primary precipitate formation
- Microstructure evolution (dislocation density, grain size, ...)
- Excess vacancies and vacancy trapping
- Dynamic and static yield strength modeling
- Thermophysical properties (density, thermal expansion ...)
- Recrystallization, recovery and grain growth



Background:

MatCalc 6 is the new generation of materials simulation software that represents a most comprehensive and powerful tool for materials engineering and follows after the successful MatCalc versions 5.x. The software package contains numerous metallurgical models and simulation approaches that are developed within the MatCalc modeling team. The physical background of these models is documented in 150+ scientific publications and books, thus making MatCalc simulations fully transparent to the user. Visit our web site (<http://matcalc.at>) for further information.

Typical applications:

- Heat treatments for precipitation engineering
- Thermo-mechanical processing
- Through-process metallurgical simulation
- Microstructural stability prediction
- State parameter-based flow curve modeling

Licensing:

- MatCalc can be used free of charge, with full functionality and databases for Fe, Ni and Al alloys for a maximum of three elements. Simply download and try it out.
- Single user and network perpetual licenses: With a commercial MatCalc license, you have full access to all MatCalc modules and our advanced databases that are included in your license. Maintenance (upgrade to latest versions) and technical support are included for the first year after purchase and can be prolonged yearly.

Platforms and interfaces:

- Windows, MacOS and Linux with 32- and 64-bit support.
- State-of-the-art GUI and command-line version.
- Libraries with powerful API for incorporation of MatCalc into your own code.
- Advanced scripting capability.
- Data export/import functionality.

Sales and support:

With the release of MatCalc 6, customer interaction, sales, training and technical support are handled by MatCalc Engineering GmbH (<http://matcalc-engineering.at>) and its international partners.

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