

MatCalc documentations overview

MatCalc is a tool for simulations of “material microstructure and properties” with different capabilities. As this topic is in general quite complex, MatCalc might give an impression of complexity. Although each implemented model may have its own subtleties, working with MatCalc can remain a rather straightforward activity.

To give you an overview of the MatCalc documentations, support team has provided the following text. It helps you to get the necessary information to solve your thermo-mechanical problems more easily and efficiently.

- **Tutorials**
- **Introducing typical simulation problems**
- **Graphical user interface (GUI) and Script**
- **GUI dialog and scripting language features**
- **General checklist for correct MatCalc simulation**
- **MatCalc architecture, linking with third-party software**
- **Implemented models in MatCalc**
- **Frequently asked questions**
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Tutorials

Tutorials will provide a solid knowledge on working with MatCalc. You will learn about general topics such as graphical interface usage, console and scripting environment, data import and export. On the other hand, material simulation relevant topics such as performance of the thermodynamic analysis and kinetic simulation of microstructure evolution are covered.

We recommend every person beginning to work with MatCalc to go through all the tutorials. Every tutorial-example can be performed on MatCalc, for both licensed or demonstration version. They are available at the MatCalc website.

<http://matcalc.tuwien.ac.at/index.php/documentation/tutorials>

We offer the same text as a “.pdf”-document at:

https://www.matcalc-Engineering.com/downloads/pdf/User_Manual_Dec2017.pdf

By completing the tutorials section, you will get the knowledge of where the various features in MatCalc can be found and what can be expected as an outcome of their application. It will be a foundation for your further work with the software. ↑

Introducing typical simulation problems

Here, the focus laid on how to use the stuffs learned in Tutorials in order to setup the simulation so that to gain reasonable result. Generally, it is based on the published results for various alloys, including the industrial multicomponent ones. In case of dealing with complex problems, examples are divided in to “sub-examples”, with each subunit considering a single stage of the simulation process. Examples are gathered at:

<http://matcalc.tuwien.ac.at/index.php/documentation/examples>

The examples show you the approach on how to perform your desired calculations with MatCalc. ↑

GUI dialog and scripting language features

To realize what exactly various settings in the MatCalc dialogs do and which consequences modification of parameters has, you can click on the following link.

<http://matcalc.tuwien.ac.at/index.php/documentation/reference-book>

Here you can find various MatCalc GUI dialog contents and scripting language features like loops, conditions and MatCalc built-in functions. Additionally, description of some MatCalc variables is also included. ↑

Graphical user interface (GUI) and Script

MatCalc has a graphical user interface (GUI) allowing for the convenient working environment, appreciated especially by the beginner users.

It is a common experience coming with the MatCalc practice that working with MatCalc scripts becomes more and more efficient when the repetitious tasks are to be solved. The scripts give also a transparent documentation of all settings used for the simulation. To become acquainted with script usage, some script examples are provided in the software itself. These are gathered in the “scripts/frame_scripts” and “scripts/script_menu” subdirectories located in your MatCalc installation directory. In “frame_scripts”, the scripts producing the new GUI-windows are given. In “script_menu”, the template scripts for various applications can be found. These are grouped in the further subdirectories, depending on the simulation type (e.g. “equilibrium”, “precipitate”).

Some further script examples can be found also at:

<http://matcalc.tuwien.ac.at/index.php/documentation/scripts> ↑

General checklist for correct MatCalc simulation

A general checklist for your MatCalc simulations can be found at the “how-to” section of MatCalc documentation

<http://matcalc.tuwien.ac.at/index.php/documentation/how-to-manual>

It contains information on the necessary steps to be taken for a meaningful MatCalc simulation. Various aspects of the applied settings are given together with good advices. ↑

MatCalc architecture, linking with third-party software

Information about programming environment, software architecture and capability to link with other software can be found by clicking on sub menu “**Software architecture, algorithms and background**” using the following link

<http://matcalc.tuwien.ac.at/index.php/documentation/technical-papers>

- Software architecture, algorithms and background ↑

Implemented models in MatCalc

Models used in the software are documented in various technical papers of MatCalc documentation. These documents confront you with the ideas, assumptions and formulas behind each approach. The constraints on application ranges are also discussed.

<http://matcalc.tuwien.ac.at/index.php/documentation/technical-papers>

- Equilibrium simulations
- Precipitation kinetics

- Multi-component nucleation
- Microstructure - property relationship

The models used in MatCalc have been visualized in a simple way by presentations located at:

<http://matcalc.tuwien.ac.at/index.php/documentation/presentations>

Presentations show a summary of model description and depiction of the input fields for various model parameters. ↑

Frequently asked questions

If you cannot find the answer for your question in the available documentation, have a look at the collection of the frequently asked questions at:

<https://www.matcalc-engineering.com/index.php/matcalc-software/support-link/faq>

A useful hint: in various MatCalc documentation sections, you will find a search box located at the top right. By writing a phrase related to your problem, you should be able to find a relevant document in a fast and efficient manner. ↑

Support

If you still miss some information on MatCalc, feel free to contact MatCalc support at

<https://support.matcalc-engineering.com/>

Alternatively, you might just send an email at support@mceng.at. Once you share your problem with us, one of our team members will contact you and provide you with the required answers or propose a relevant problem solution. Naturally, you can attach any scripts, workspaces, screenshots, console contents, etc. about your question, as this has been proved to be a very efficient way in processing the inquiries of our customers. ↑

Your MatCalc support team

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