Thermo-Calc is a powerful software package for the calculation of thermodynamic and phase equilibria. In conjunction with suitable thermodynamic databases, assessed using the CALPHAD approach, Thermo-Calc can be used for a wide variety of applications.

Evolution
Originally developed at the Royal Institute of Technology in Stockholm, Sweden, in the early 1980s, Thermo-Calc has been a trusted resource for customers around the world in industry, government and academia for more than 30 years. Today Thermo-Calc is used by more than 1300 organizations in over 70 countries. With more than 14,000 journal citations and cited in over 100 patents, Thermo-Calc has consistently been one of the most widely used software products in the field of computational materials science and engineering and is a leader in the field.

Consistently Maintained and Updated
Thermo-Calc has been consistently updated and improved over its 30 years to satisfy the evolving needs of our user-base. Thermo-Calc is now on a two-times-per-year release cycle and customers with a maintenance and support subscription receive these updates for free.

Technical Support and Training
Thermo-Calc is backed by a dedicated customer technical support team. We also have agents around the world, as well as a subsidiary in the USA, who provide local customer support. Training courses are offered twice a year in Stockholm, Sweden, and Pittsburgh, PA, USA, as well as other locations around the world. We also provide training videos, available on our website.

High Quality Thermodynamic Databases
Over 30 thermodynamic databases, developed based on the CALPHAD approach, are available for use with Thermo-Calc. The databases cover a broad range of materials, systems and applications, including:

- Steel/Fe alloys
- Minerals
- Semi-conductors
- TBC, SOFC
- Ti-Based alloys
- Mg-based alloys
- Zr-based alloys
- Molten salts
- and many more...

- Solders
- Nobel metals
- Super-conductors
- Gases
- Aqueous solutions
- Al-based alloys
- Nuclear materials
- and many more...

EASY TO USE
Thermo-Calc makes thermodynamic and phase equilibria predictions easy and accessible, so you don’t need to be an expert in thermodynamics to use it. Yet the software offers sophisticated and flexible functions, so it’s applicable for even the most advanced users.

CALCULATE
- Stable and meta-stable heterogeneous phase equilibria
- Amounts of phases and their compositions as a function of temperature and chemistry
- Phase transformation temperatures, such as liquidus, solidus and solvus
- Phase diagrams, binary, ternary and isoplethal and isothermal sections for higher order systems
- Thermochemical data such as enthalpies, heat capacity and activities
- Driving force for phase transformations
- Solidification applying the Scheil-Gulliver model
- Thermodynamic properties of chemical reactions
- Pourbaix diagrams and other calculations involving aqueous solutions

PLATFORM
Windows, Linux and Mac OS

LICENSES
Single machine or network install
Annual or perpetual options
License fees depend on several factors, i.e., database selection
**APPLICATIONS**

Thermo-Calc can be used to understand many different phases in the life-cycle of a material, such as:

- Alloy and materials development
- Metallurgical extraction and refining
- Casting
- Forging/Hot rolling
- Heat treatment
- Joining/Welding/Soldering
- Quality control
- Materials selection
- Corrosion
- Underlying causes of failure
- Waste and recycling

**BENEFITS**

Reduce costly, time-consuming experiments and testing

Increase the value of experiments through better pre-screening and interpretation of the results

Optimise and define safe processing windows

Base decisions on scientifically supported data and models

Shorten development time and bring products to market faster

Build and safeguard intellectual knowledge

Improve the quality and consistency of products through deeper understanding

Make predictions that are difficult or even impossible with an experimental approach

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**Binary and Ternary Phase Diagrams**

- Phase boundary
- 2nd-order transition

**Phase Diagrams for multicomponent systems**

**Property Diagrams for multicomponent systems**

**Pourbaix Diagrams for aqueous systems**

**Advanced SCHEIL Module**

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