JMatPro

PRACTICAL SOFTWARE FOR MATERIALS PROPERTIES

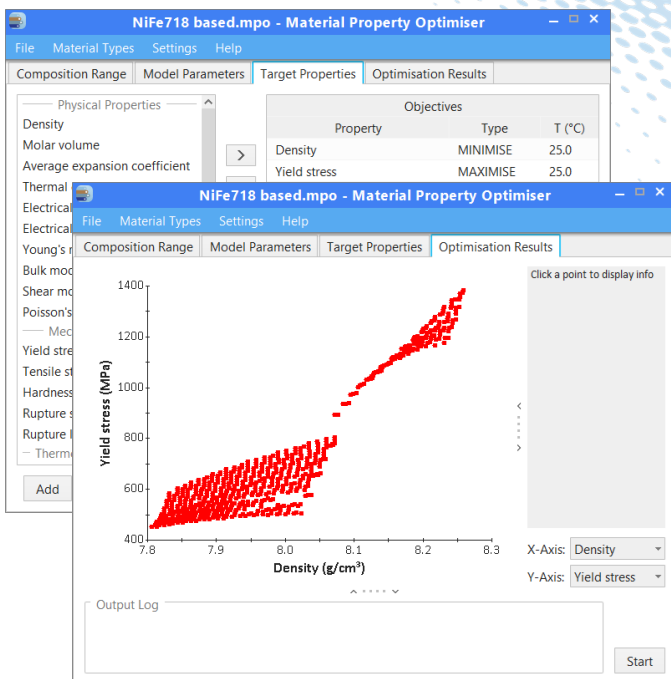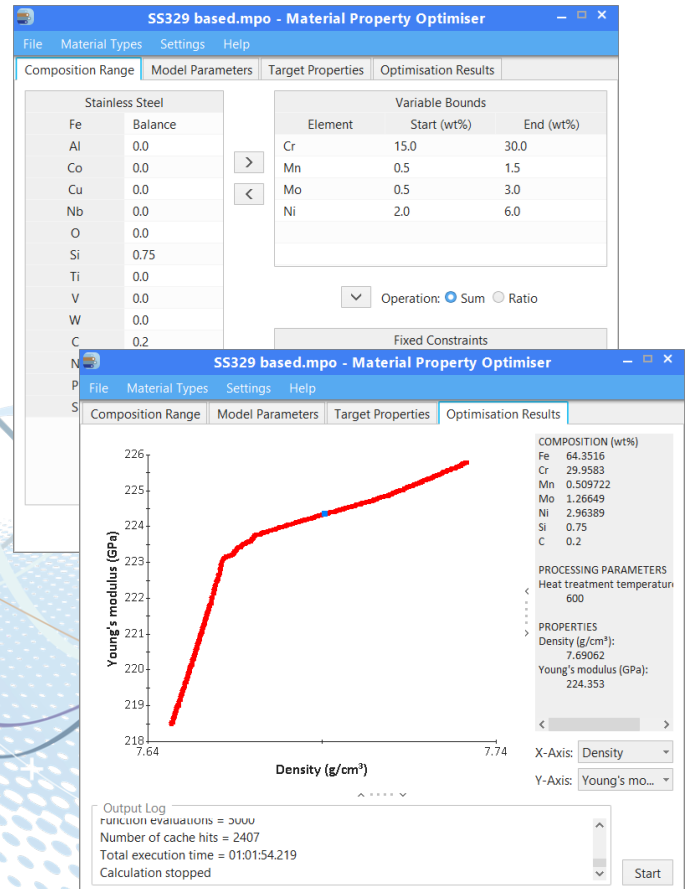## Overview of Material Property Optimiser

The **Material Property Optimiser** is a powerful optimisation tool for the design of multicomponent alloys. It builds upon the calculation engine behind **JMatPro®** by combining it with a multi-objective optimisation method. It allows you to perform calculations aimed at identifying optimal values of decision variables that lead to desired material properties.

Capabilities of Material Property Optimiser

Design space: *alloy composition* and *processing parameters* (heat treatment temperature, cooling rate, holding temperature and time, …)

Objective space: properties from **JMatPro®** calculations along with *alloy cost*, *average bond order* and *orbital energy level*

- Phase amounts and boundaries, heat treatment window, solidification range, hot cracking susceptibility, growth restriction factor
- Density, molar volume, average expansion coefficient, thermal conductivity, electrical conductivity and resistivity, Young's, bulk and shear moduli, Poisson's ratio, single crystal stiffness coefficients
- Yield stress, tensile stress, hardness, rupture stress, rupture life
- User-defined properties

Benefits of Material Property Optimiser

- Extensively validated **JMatPro®** calculations ensure reliable, robust and consistent material property predictions
- Efficient exploration of design space allows you to identify trade-offs and focus on the most promising alloy compositions
- Intuitive and user-friendly interface ensures you can get results quickly
- Powerful tool to accelerate development of new or improved alloys, whilst reducing the need for costly experiments

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