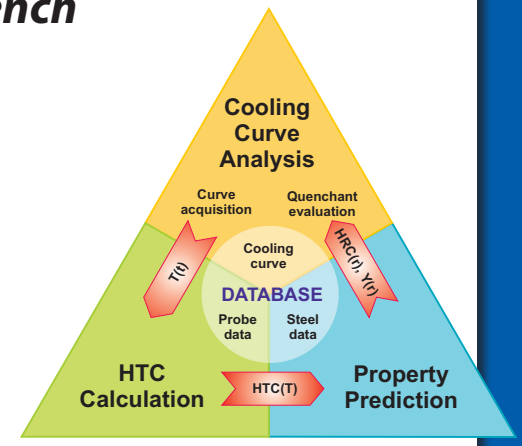
ivf smart Quench
SQ integra

SQintegra –

a powerful user-friendly software for advanced evaluation of quenchant data from *ivf SmartQuench*

- **Calculation of heat transfer coefficients (HTC)**
- **Prediction of hardness and microstructure distribution in cylindrical specimens**



SQintegra is an expansion of the *ivf SmartQuench* software, allowing the user to make advanced evaluations. It contains two new modules: HTC, for heat transfer coefficient calculations, and Property Prediction, for calculation of hardening capacity.

SQintegra has been developed by Mongoose-Technologies Inc. in conjunction with IVF.

Examples of heat transfer coefficient calculation:

The HTC module calculates the temperature-dependent heat transfer coefficient using an iterative, inverse routine that starts with an initial guess. After a few iterations, the proposed HTC values are presented to the user. Calculations can be made both from measurements with the ISO 9950 standard test probe and from measurements with probes of other materials and in other dimensions.

The calculated heat transfer coefficient is shown in diagrams as a function either of temperature or of time. Values can also be saved as a table.

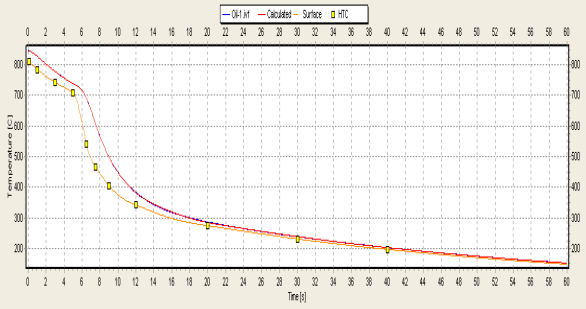


Diagram showing the measured (blue) and calculated (red) temperature versus time at the probe centre, and the calculated surface temperature versus time (orange) for a fast-quenching oil.

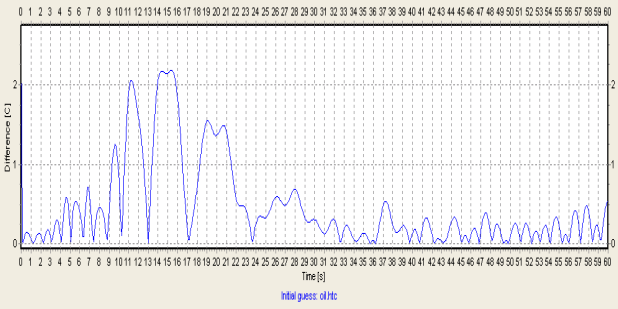


Diagram showing the difference between calculated and measured temperature at the probe centre. This is a tool for evaluating the accuracy of the calculation.

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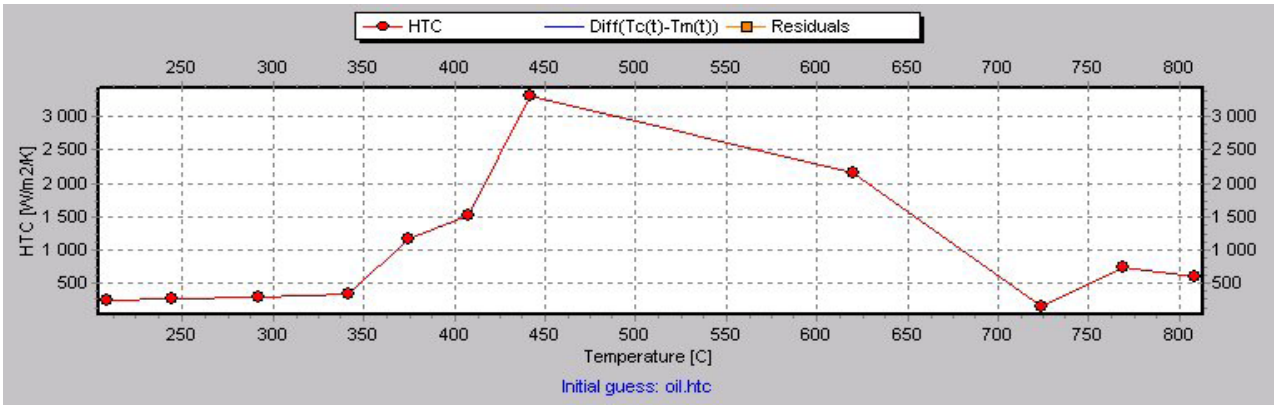
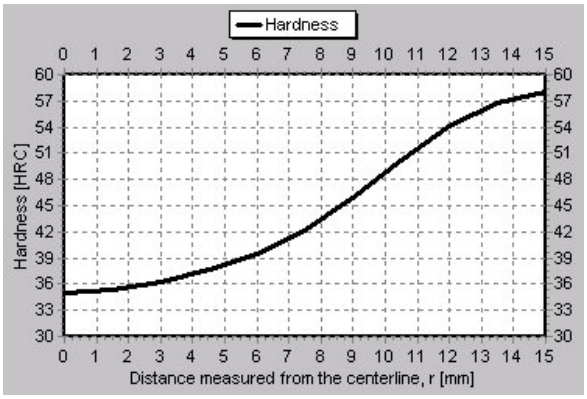
Examples of property prediction:

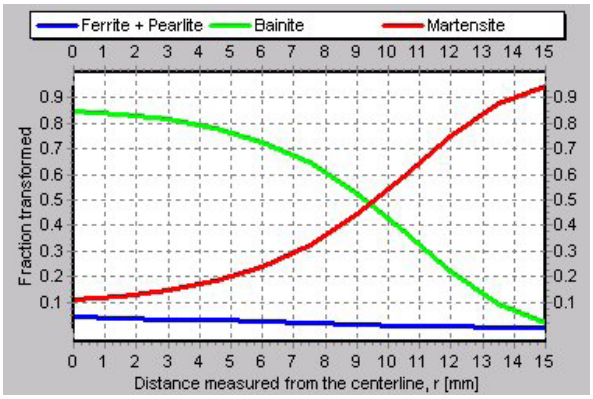
The resulting HTC values can then be used for performing hardening capacity calculations in the Property Prediction module. These calculations are based on an IT approach. The database included with the software includes data for some common steel grades. Data for new grades can be added by the user.



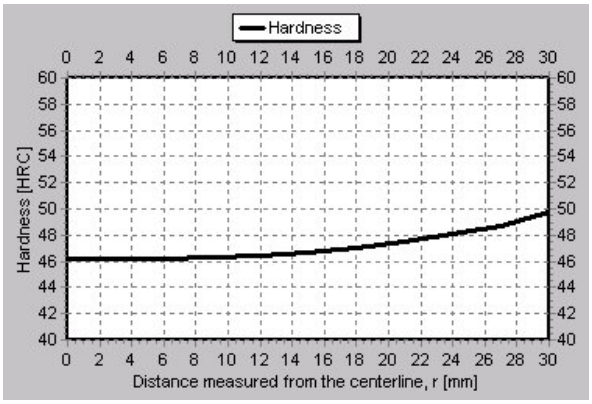
Calculated heat transfer coefficient versus surface temperature of an ISO 9950 standard test probe (12.5 mm dia. x 60 mm, made of Inconel 600), quenched in a fast quenching oil.



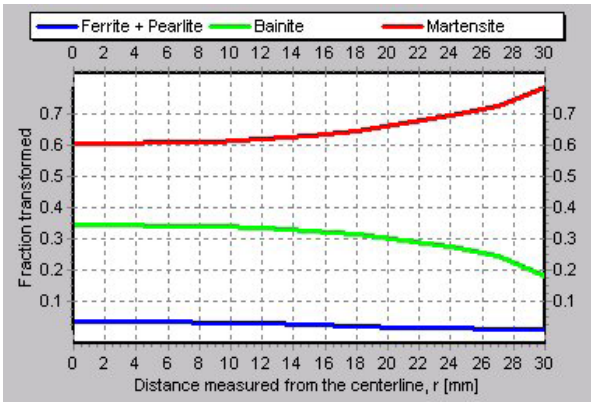
Calculated hardness distribution in a 30 mm dia. C45 steel specimen, quenched in a polymer quenchant at 28 °C.



Calculated microstructure distribution in a cross-section of the steel specimen to the left.



Calculated hardness distribution in a 60 mm dia. 34Cr4 steel specimen, quenched in a fast oil at 70 °C.



Calculated microstructure distribution in a cross-section of the steel specimen to the left.

For further information, please contact:

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