

# MARLIS® - Evaluation Software for Tensile Tests



The demand for short product development, periods can only be met by using modern computer aided calculation methods. Therefore, simulation programs are increasingly used.

The quality of the calculated results highly depends on the reliability and significance of the used material properties.

However, nowadays this quality is not guaranteed. A round robin, with 91 accredited European material test laboratories participating, showed deviations from -47% up to +38% during the determination of the E-modulus. Nevertheless, by the adjustments of measuring technique and evaluation methods the deviations could be reduced significantly to +/-3%.

How reliable and reproducible tests are carried out is described in the "Test and Documentation Guideline for the Mechanical Properties of thin Sheet of Steel" published by the VDEh (Verein Deutscher Eisenhüttenleute).

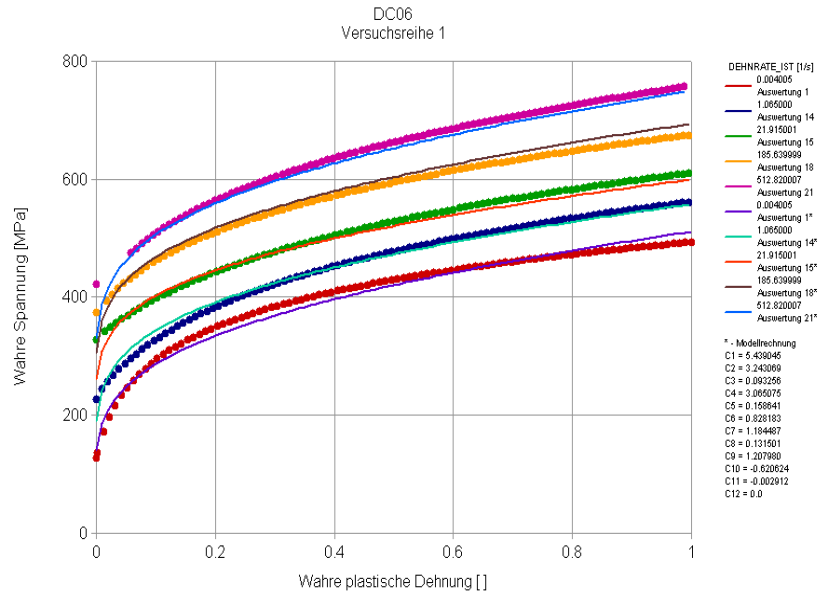
The tool for the reproducible and user-independent determination of required characteristic values is MARLIS, the evaluation software for tensile tests.

The software analyzes elastic, quasistatic and dynamic tensile tests and determines following characteristic values:

- E-modulus and elastic slope
- $R_{p0.2}$
- yield stress
- tensile strength
- uniform extension
- Breakage
- R-value
- N-value
- true Stress-Strain Diagrams

Single flowlines can be approximated and extrapolated beyond the measured area by means of the following models:

- Ludwik
- Gosh



Flowline Fit with MARLIS Evaluation Software

- Swift
- Hocket Sherby
- Voce
- Polynom
- Spline

Furthermore, it is possible to parameterize complete stress-strain diagrams by means of functional approaches.

MARLIS evaluation software is characterized by following features:

- high level of automation,
- comfortable, graphically interactive technique of visualization,
- quick and stable approximation tools,
- detailed documentation of evaluation steps,
- transparency of used methods,
- modulare structure.

Test results determined according to the test and documentation guideline can be directly read into the evaluation software. Results of different tests can be easily compared and overlaid. The used algorithms supply plausible and reproducible results, even with noisy or oscillating signals. At any time, comfortable graphical demonstrations support the user to receive

the impression of the results' stability and reliability.

Evaluations can be exported into a standardized XML-format and can be further processed in other programs such as the MARLIS CAE database. For this procedure, all results, which have been generated during the evaluation, and complete raw data are saved in the XML file. Thus, a complete documentation is guaranteed.

The MARLIS evaluation software is based on the results of the project "Evaluation of Material and Process Specific Properties for Sheets of Normal, High Strength and non Corrosive Steels" and was initialized by five German automotive manufacturers. It was developed for the evaluation of data measured during the project.

MARLIS runs under all common Windows operating systems. For a free demo version, please, contact M-Base.