



Leica Steel Expert

Analysis Software for the Advanced
Automatic Steel Inclusion Rating

Leica
MICROSYSTEMS

The Expert for Quality Assurance

Automatic Steel Inclusion Rating

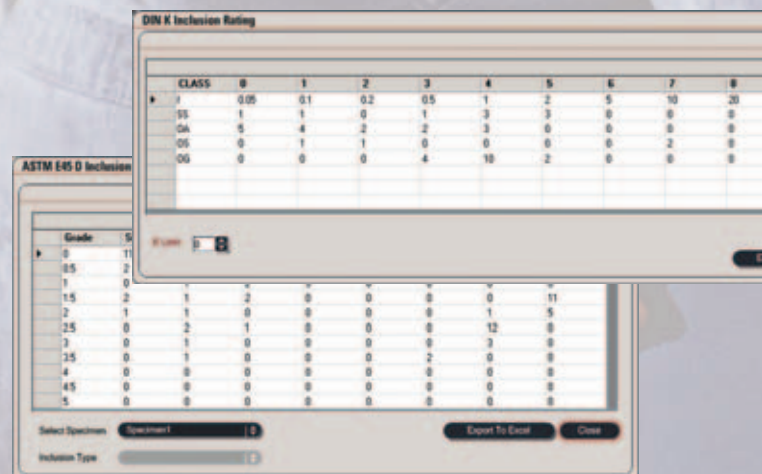
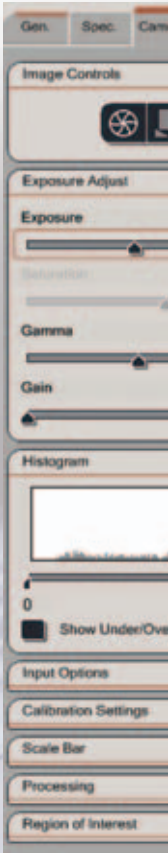
Leica Steel Expert is a highly specialised software programme for automatic steel inclusion rating running in the established Leica Application Suite (LAS) environment. The quality of steel is highly dependent on the content of non-metallic inclusions generated during steel alloying and production. Traditional methods of characterising steel inclusions manually using comparison charts that refer to internationally defined rating standards have proved to be very time consuming and inaccurate due to the ambiguous nature of these standards, which meant that were open to subjective application. Leica Steel Expert, bridges these gaps by providing a powerful software solution that brings fast, reproducible and accurate results to the process of automated inclusion rating for stainless steel alloys.

Critical Quality Factors

As steel manufacturers have to certify the quality of their steels to be competitive in the international market, Leica Steel Expert allows the verification of up to six different types of non-metallic inclusions in steel alloys. Sulfides, globular oxides, silicates, aluminium oxide and heterogeneous inclusions can be detected along with the ability to recognise coloured TIN inclusions. Furthermore, as global networking forces manufacturers to communicate their results set to established international standards so that steel quality can be compared, Leica Steel Expert provides full compatibility with most established industrial standards including ASTM E45, DIN 50 602 with K and M methods, JIS G0555 and is prepared for the anticipated new EN10247, a release that is expected in the near future. The comprehensive nature of Leica Steel Expert means that all standard results can be displayed at the same time for easy comparison. Furthermore, these comparable results can now be generated in different laboratories all over the world. The automated image analysis provided by Steel Expert means that all conditions are highly reproducible and objective.

Feature Highlights:

- An easy to use solution operating in the modern Leica Application Suite environment
- Complete control of all imaging conditions such as microscope and camera settings for highly reproducible measurements
- Full integration of modern fully automated Leica DM series compound microscopes and Leica DFC digital cameras
- Classified inclusions in up to six different types
- Data accessible in raw, processed and histogram format
- Fully compatible with International standards such as ASTM 45, DIN 50602 M and K, JK and JIS 555
- Prepared for the anticipated new European standard EN 10247
- Measurement results can be viewed independently from magnification and all standard results can be displayed simultaneously for easy comparison
- Complete control over measurement results with worst inclusion and worst field finder with editing options



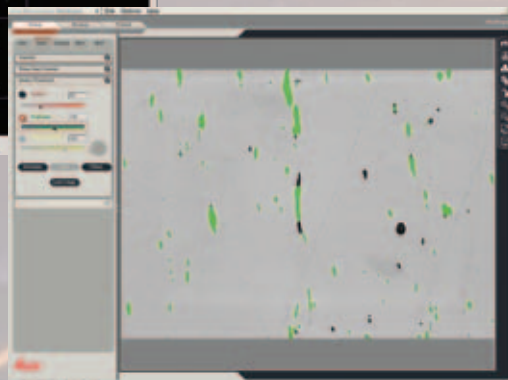
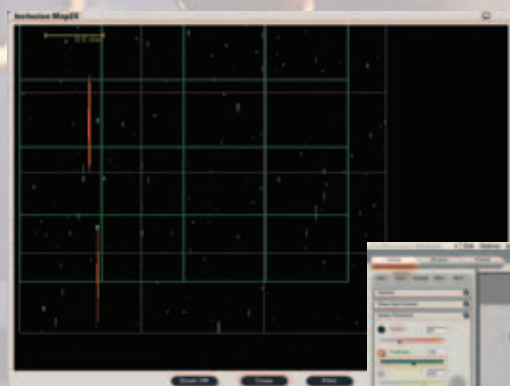
Automated for Simplicity, Speed and Accuracy

Automatic Steel Inclusion Rating

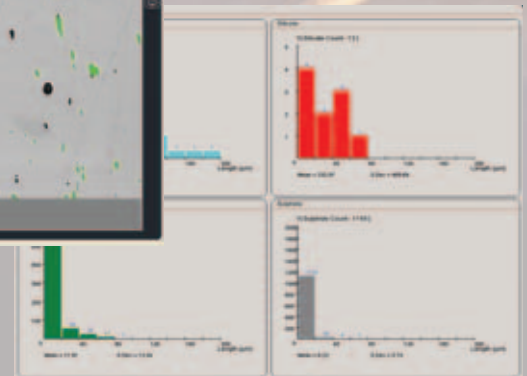
The Leica automated upright or inverted light microscopes enable polished steel samples to be easily inspected with bright field illumination. When combined with Leica Steel Expert, fields of arbitrary size on either single or multiple samples, which are mounted on the motorised scanning stage, can be automatically scanned and measured. The predicted focus option ensures that the sample or samples remain at the correct focal point during each automated measurement. Furthermore, Leica Steel Expert provides a unique display mode allowing the user to monitor the measurement and check that the different inclusion types are being correctly identified.

Non-metallic inclusions are detected and classified by grey value (differentiation between sulfide and oxide inclusions) and by size, shape and arrangement (differentiation between globular, silicate and aluminate inclusion types). Depending on the amount and size of these different inclusions, a rating is generated for steel that defines its quality in relation to international standards. The results can be stored and printed. To check the validity of results, particularly of the worst fields or largest inclusions (which have the most influence on the final grading), these fields can be reviewed in live image mode and artefacts can be removed.

The workstation for steel inclusion rating can be individually combined from different system components. For the high-end segment, Leica Steel Expert can be used together with the fully automated compound microscope Leica DM6000 M and the inverted light microscope Leica DMI5000 M.



50	K0	
0	3.05	
0	5.05	
0	20.30	
0	16.00	
Sulfur Sulfide 3.05		
Sulfur Oxide K 41.35		
Sulfur Values 51.00		



System Specification Options

We are able to offer system options to fit your specific requirements in terms of sample throughput, automation and budget

Hardware

- Leica DM6000 M upright compound microscope with incident optics, 5×, 10× and 20× lenses, brightfield illumination, optional darkfield with 4×4 Merzhaeuser scanning stage and stage control board
- Or Leica DMI5000 M inverted compound microscope with incident optics, 5×, 10× and 20× lenses, brightfield illumination, optional darkfield, with scanning stage and motorised focus and a stage control board
- Leica DFC280 digital camera
- Leica Application Suite (LAS) with Leica Steel Expert application software
- 0.63× or 0.70× C-mount adapter
- Calibration slide for length calibration

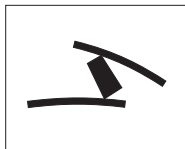
Software

The software can be used in two modes with differing authorisation levels in relation to the special requirements in Quality Assurance:

- Super user – Authority to define measurement parameters and inclusion types to be measured, limit values for chart field grading, as well as all the functions included in Standard user
- Standard user – Authority to change the samples, input measurement specific data, set up the image, focus, start the measurement, store and print data, check validity of results with worst field and worst inclusion finder option.

For further information, please contact your local Leica representative:

Winner 2005



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