analySIS®

Materials Research Lab

The complete product line/assortment of digital materials-analytical evaluation methods!

analySIS® Materials Research Lab takes widely-used materials-analytical evaluation methods and combines them into one single software solution. The analyses and documentation conducted using this software are compliant with national and/or international norms.

What does **analySIS® Materials Research Lab** offer? Among many other things, it contains solutions for the following: automatic analysis of grain sizes; determining graphite content in cast iron; evaluating microhardness indents; measuring layer thickness; determining surface roughness; digital chart comparison; automatic metallographic particle analysis and classification; class analysis; and phase analysis. Furthermore, this package offers intelligent image acquisition, well-structured data storage and automatic report generation.

analySIS® Materials Research Lab is part of Soft Imaging System's series of materials-science software packages.

Digital Solutions for Imaging and Microscopy
Soft Imaging System

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Equipped for dealing with all queries i

Research and development department labs in the manufacturing industry as well as those responsible for quality control and process control, require automated all-around solutions to successfully confront a wide range of materials-analytical issues. For example, take the wide variety of materials required for products such as motor vehicles, machines, etc. These are all refined by the manufacturing industry. And each material has its own specific analytical procedures. This is where the **analySIS® Materials Research Lab** package comes into play. This software solution provides an integrated approach in dealing with all measurement and analytical tasks. Reassuringly, you do not need to change the way you work. The workflow(s) everyone is used to working with remain the same.

Versatile and innovative

Microscopes, motor stages, cameras and other accessories can all be operated via **analySIS® Materials Research Lab**. Top-quality acquisitions can be made by all users via the IntX automatic exposure control (Intelligent eXposure). The extensive technical background usually required for doing so is not necessary. For labeling and marking the (live) images, an extensive library of functions for editing and inserting text and graphics is available. Furthermore, there are numerous integrated filtering functions.

Automatic grain-size analysis

analySIS® Materials Research Lab analyzes and documents grain size according to the intercept and/or planimetric measurement methods – and all in a manner compliant with the relevant standards. The intercept method works using all accepted line patterns and determines grain size based on the average intercept length. The planimetric measurement method determines grain size via the area of the grains. It contains a powerful algorithm for reconstructing grain boundaries and offers numerous options for more extensive analysis – such as: eg, determining bimodality or g values of sandwich layers. It is also easy to define process sequences of analytical tasks which are used again and again. When using motor stages, multiple samples can be analyzed automatically. All in one operation.

Graphite analysis and classification

Integrated into **analySIS® Materials Research Lab** is the evaluation of graphite content in cast iron. Each graphite particle is automatically detected, analyzed and then shown in a sheet and diagram representing its size and shape distribution. Classificaitons according to various national and international standards such as VDG P 441, EN ISO 945 or ASTM A 247 are available. In addition, determining the carbon-corrected ferrite/pearlite ratio is supported.

Particle analysis

Using the analytical functions offered by **analySIS® Materials Research Lab**, thousands of image objects can be quantitatively detected and analyzed within seconds. The analyses can be applied either to the entire image or to image segments. Particle detection supports the analysis of multi-phase objects. The selection of measurement criteria on offer in this software is practically unlimited. Conducting evaluations according to multiple criteria can be carried out in a single operation. It is easy to verify the analytical data because the data is linked to the particle within the image.

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in the materials analysis field...

Comparison
Digital reference image comparison is simple with **analySIS® Materials Research Lab**. The chart images included can be compared directly with the live image within the software. It is possible for each reference image to have characteristic data (numerical and text) assigned - eg, grain sizes and type classifications. When a comparison is positive, it is automatically inserted into a results sheet. Various EN ISO, DIN and ASTM charts are available as extensions. Users also have the option of defining their own user-defined charts.

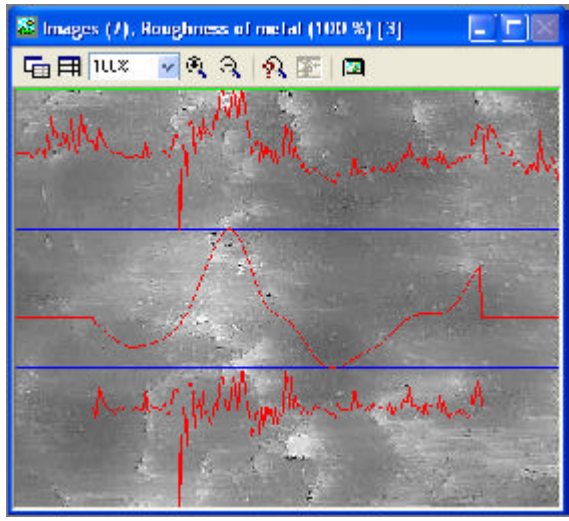
Measuring layer thickness
Layer thickness measurement is integrated into **analySIS® Materials Research Lab**. Single and multiple layers can be measured in one operation. Current values for the average layer thickness and the layer-thickness statistical data are displayed during measurement.

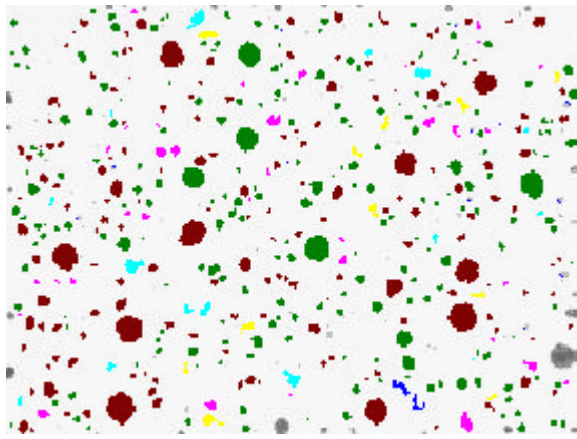
Surface roughness
analySIS® Materials Research Lab offers the calculation of roughness parameters using height-coded images. This includes 1-D and 2-D measurements according to the various, supported norms.

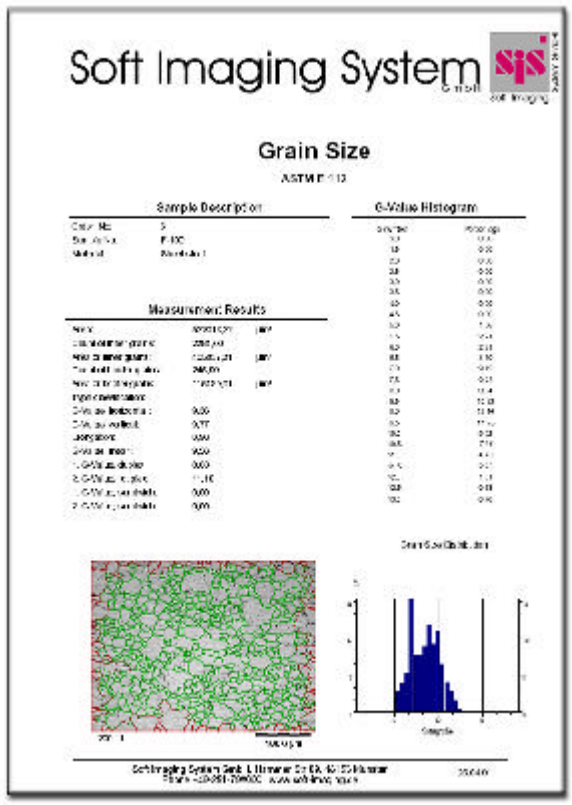
Determining hardness
analySIS® Materials Research Lab provides the Knoop and Vickers methods for determining hardness. Hardness is calculated based on evaluation of the indent diagonals. This provides the hardness values and the hardness profile. In addition, interfaces to the usual hardness testing devices are integrated.

Structures clear as crystal
The integrated database archives images, spectra, analytical data, reports and associated documents. This is done in a well-structured, easy-to-navigate and easy-to-access manner. The structure of the database is easy to adapt to suit the respective workflow. The user decides which criteria are the most important for classifying data. This means that all documents and data can be classified according to order number, batch number, customer, experiment, and so on and so forth. User input helps (such as picklists or text prompts for selected database fields) significantly minimize user effort. They also minimize the possibility of mistakes being made. The database has been designed to make data access fast. Its network capacity requirements are also low.

Get your reports – the easy way
analySIS® Materials Research Lab has an integrated report generator for producing standards-compliant reports conveniently, quickly and easily. The report generator supports graphical elements such as images, sheets and diagrams. It also offers easy text input. Report text fields are automatically filled out with the contents of database records or results sheets. Simply dragging & dropping images, sheets and database content is all that is necessary to generate a report within seconds. And what makes it all even more convenient are the pre-defined, standards-compliant report templates included.







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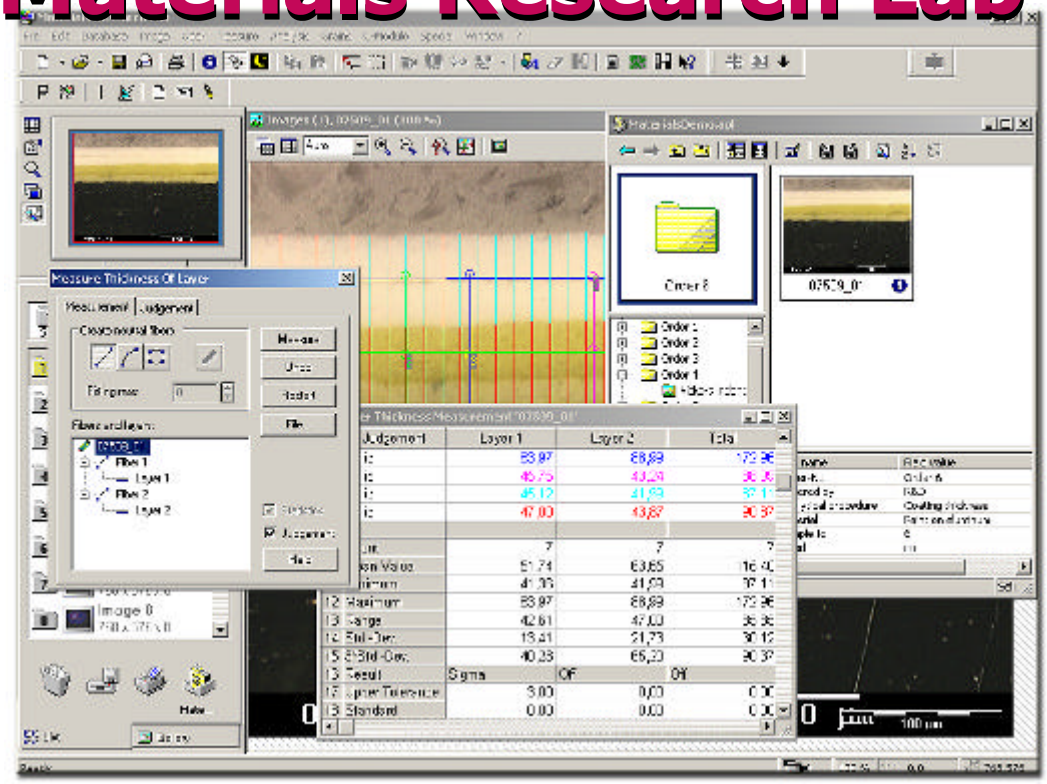

Key features

- **grain size analysis via intercept and planimetric methods**
  planimetric measurement based on: grain-boundary reconstrucion
  types of measurement lines for intercept method: horizontal, vertical, diagonal, circular, combinations thereof
  grain boundaries: light, dark or etched grain surfaces
  results: g values and statistics, sandwich layer analysis, duplex grain analysis, histograms of grain sizes, detailed single-grain analysis, elongation,
  norms supported: ASTM E 112; DIN 50601; JIS G 0551; JIS G 0552; EN ISO 643
- **analysis of graphite content in cast iron**
  automatic and manual analysis of globular, dendritic and lamellar graphite in cast iron
  classification according to shape and size
  norms supported: ASTM A 247; EN ISO 945; JIS G 5502; GB 9441-88
- **chart comparison**
  onscreen chart comparison with live image
  user-defined extension of charts
- **layer-thickness measurement**
- **1-D and 2-D roughness analysis**
- **microhardness determination according to Knoop and Vickers**
- **automatic particle analysis and classification, phase analysis**
  Over 100 pre-defined particle parameters: eg, size, area, density, distribution, etc.
  user-defined extension of particle parameters
  classification and filtering according to selected particle parameters
- **well-structured data storage (archiving)**
- **automatic and standards-compliant report generation**
- **operation of external devices such as motor stages, microscopes, etc.**
- **and much more**

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