

Solutions for the standard-compliant
**Technical
Cleanliness Analysis**

High-quality optical components, modern camera systems and professional image analysis –
for precise and user friendly evaluation of filters and particle traps

DHS-CLEANANALYZER®

Discovery

Device with simple operation and **fully automatic POL**. Standard-compliant **measurement from 5 µm**. Incl. Zeiss stereomicroscope, Märzhäuser control technology and high-resolution dhs-MicroCam®.



Professional

Fully automatic system with **zoom optics** (from 5µm and 15µm) and **fixed optics** (from 35µm) for higher volume of samples. With motorised Z axis and autofocus in the 5µm variant. Stable design with granite slab, aluminium profile column, adjustable LED lighting and automatic polarisation.



Scan

High-quality flatbed scanner in combination with the cleanliness analysis software from dhs – including anodized aluminium plate with matching section **to insert the slide frames** (1 times, optional 6 times).

Also suitably for the evaluation of **particle traps**.

In addition for this, we offer an **special adapter**.

For evaluating particles from 50 µm.

Inexpensive entry-level system that can be easily upgraded later with other optical components.



Freely configurable Cleanliness-Systems - with already available microscopes!

Fully automatic **example system** consisting of: ZEISS microscope Axiomager, cross table with motorized x-/y-axis, tango-steering, adjustable LED lightning, automatic polarisation and dhs-MicroCam® 2213.

- Standard-compliant analyses to **particle sizes from 5µm**
- High-quality **microscope** suitable for **varied standard-compliant and analytical settings of tasks** (e.g. steel inclusions) - **upgradeable with all dhs-software-modules**, according to the application

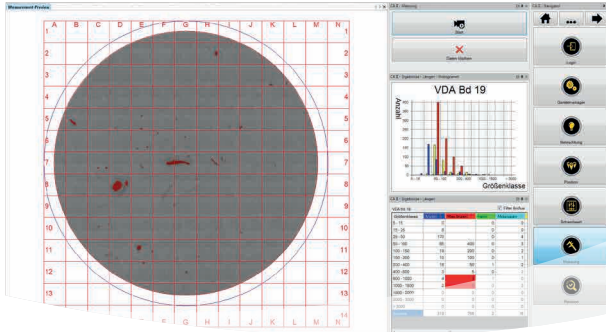


Cleanliness Analysis Software

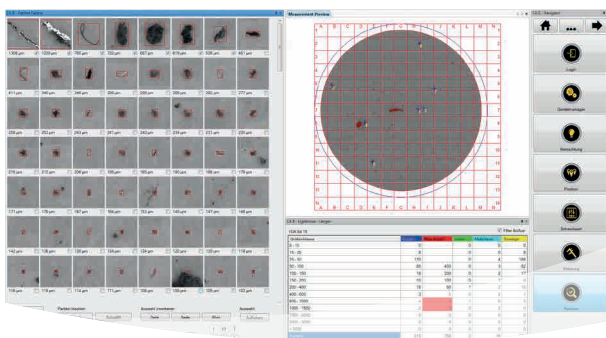
Intuitively operated analysis software, standard for all dhs-Cleanalyzer variants (**English / German**).
Easy to learn operating routines arranged in logical sequences, detailed measured value presentation in tables and diagrams.

Comprehensive **preclassifiers** can be **adjusted**

- Calculation of the standardised fibre criterion (developed length / maximum inscribed circle)
- Calculation of the coverage density as a percentage
- Option of combining incorrectly separated particles through erosion/dilation (useful for devices without polarisation)
- Determination of colour features for further characterisation of residual contaminants
- Clone assistant – tool for automated reproducible microscopy (option of recreating measuring conditions/device settings)
- Support for multi-filter analysis (fully automated analysis of multiple filters within a measuring cycle)
- Supports different filter shapes (circular, rectangular)



- Visualisation of all particles by means of a gallery view



Features

- Systems especially developed for Cleanliness Analysis for different requirements and budgets
- Supports all current national and international standards, such as **VDA Vol. 19**, **EN ISO 16232**, **EN ISO 4406**, **SAE AS4059** etc.
- Users can integrate more standards with very little effort (= cost saving)
- Standard-compliant **measurements to particle sizes as low as 5µm** (= optical resolution 0.5µm)
- Simple operation with automatic sequences in managed routines, quick and flexible (= easy to learn)
- **Short throughput times**, with automatic systems without tying up employees
- Use of extremely precise measuring optics and high-resolution digital cameras
- Complete systems, **freely configurable**
- Adaption of already available microscopes for Cleanliness Analysis
- **Evaluations can always be followed live**
= immediate control of the results, you can go directly to particles that are detected and cancel the evaluation in case of outliers
- No maximum particle size
- **Determination of geometric and reflection parameters to specify particles**, such as **metallic /non-metallic, fibres, etc.**
- **Z measurement** (determining the particle height)
- Results are presented in tables and diagrams
- System and measuring parameters are saved for reproducible analysis results
- dhs Particle standard with unique quality, incl. DKD-certification if required
- Direct connection to high-quality imaging package **dhs Image Data Base** (= structured long-term archiving and generation of reports at the press of a button)
- Project-related **trend analyses with long-term evaluations** possible
- Calculating the **Illig value for analysing particle traps** and professional **hall monitoring** (assembly cleanliness)
- **QDAS-surface**

Base set for cleaning and extraction of components

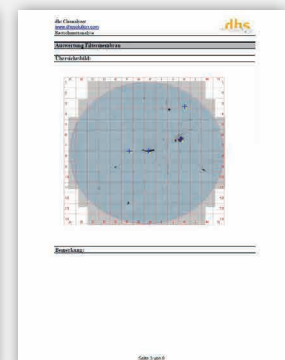
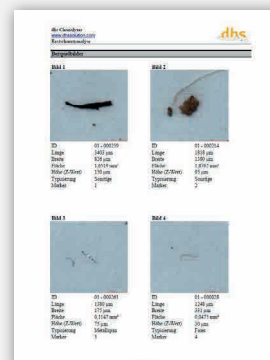
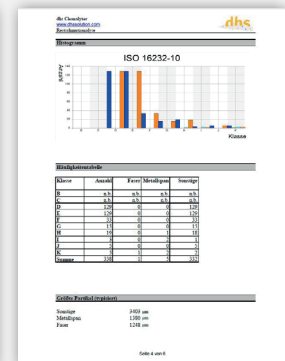
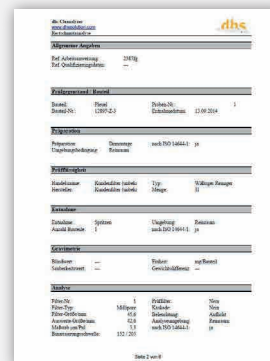


Basic equipment to the cleaning and extraction of components to VDA Bd. 19. Optionally ultrasonic trays and drying devices are offered, according to component size. We like to advice you individually.

Adequate reports at the end of the workflow

All data, images, analysis values and statistics can be exported to the dhs Image Data Base with a mouse click for long-term archiving and for reporting. Our dhs-Service contract includes annual equipment maintenance and calibration as well as software-updates!

Example report with dhs Image Data base



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