



Ferroglyph Microscope



STANDARDS

ASTM D7684

ASTM D7690

ISO 14830

Ferrograph Microscope - QualiFG™ Micro

Ferrograph Microscope QualiFG™ Micro is a dedicated microscope-based Ferrograph inspection platform designed for ferrogram observation, wear-debris identification, and image-based reporting in oil analysis workflows. QualiFG™ Micro is a metallographic microscope system built specifically for brightfield and darkfield ferrogram inspection, particle morphology evaluation, and documented reporting after ferrogram preparation.

QualiFG™ Micro is built around an infinite optical system with a total magnification range of 50X to 1000X, giving analysts a practical range for screening larger debris and then moving into finer particle inspection. This ferrograph microscope is for reflected and transmitted illumination, which helps the user evaluate metallic, translucent, and non-metallic debris under different lighting conditions.

This Ferrograph microscope is a strong fit for laboratories that need a purpose-built optical platform for ferrography rather than a general-use microscope. This instrument also supports camera-based capture, image annotation, measurement, stitching, extended depth of field, and report creation, which makes it useful for both daily diagnostics and traceable wear-debris documentation.

APPLICATIONS

Ferrograph Microscope - QualiFG™ Micro Applications

- Wear-debris identification for predictive maintenance: QualiFG™ Micro is suitable for identifying wear particles on ferrograms as part of predictive maintenance programs. Its use for evaluating particle type, size, reflectivity, color, and morphology to help indicate rubbing wear, cutting wear, fatigue wear, corrosion, and contamination trends.
- Hydraulic and lubricating oil condition monitoring: this Ferrograph microscope supports routine inspection of ferrograms from lubricating and hydraulic oils used in gearboxes, turbines, compressors, engines, pumps, and industrial hydraulic systems. It is intended for workflows where wear-debris analysis is part of a broader oil condition monitoring program.
- Failure investigation and maintenance planning: QualiFG™ Micro is also well suited for failure analysis and maintenance planning. Its role in documenting debris characteristics and comparing them against historical baselines to support root-cause investigation and reduce unplanned downtime.
- Standardized lab reporting: the platform supports repeatable laboratory reporting through image capture, measurement, annotation, Excel export, and Word-template reporting. That makes it useful for labs that need more consistent inspection records and clearer communication of ferrogram findings.

Standards

- ASTM D7690 - Microscopic characterization of particles from in-service lubricants by analytical ferrography (commonly used for ferrogram preparation + microscopy-based identification).
- ASTM D7684 - Guide for microscopic characterization/classification and reporting of particulate debris from in-service lubricants (useful for consistent terminology and reporting).
- ISO 14830 (series) - Tribology-based condition monitoring and diagnostics guidance, including lubricant sampling and analysis approaches (supports condition monitoring frameworks).

FEATURES

Ferrograph Microscope - QualiFG™ Micro Key Features

- Infinite optical system with broad magnification range: QualiFG™ Micro uses an infinite optical system and offers total magnification from 50X to 1000X. This gives the analyst enough flexibility to move from rapid slide scanning to more detailed particle inspection in the same Ferrograph workflow.
- Wide-field eyepieces for faster scanning: the system uses EW10X/22 wide-field eyepieces with a 22 mm field of view. This wider viewing area helps speed initial scanning across the ferrogram while improving overall visibility.
- Brightfield and darkfield metallographic objectives: the microscope is equipped with metallographic brightfield/darkfield objectives that allow contrast-mode switching without changing the basic workflow. The objective set includes 5X, 10X, 20X, 50X, and 100X dry options, supporting both broader inspection and fine particle review.
- Reflected and transmitted illumination: QualiFG™ Micro includes both reflected and transmitted illumination using 24V/100W halogen light sources with Köhler illumination. This combination helps the user evaluate metallic particles, translucent contaminants, and non-metallic debris more effectively.
- Quick upper/lower light-source switching: quick switching between upper and lower light sources. This helps streamline inspection when the analyst needs to compare how a particle appears under reflected versus transmitted light.
- Precision focusing and stable stage movement: the microscope includes a precision focusing system and a mechanical XY stage with removable slide and glass components for ferrogram handling.
- Practical ferrogram handling format: the system supports a maximum specimen height of 50 mm, which helps accommodate common ferrogram slide and fixture setups used in wear-debris analysis workflows.
- Optional high-resolution camera and software workflow: QualiFG™ Micro supports an optional high-resolution camera module and image software for capture, annotation, measurement, Excel export, stitching, extended depth of field, and Word-based report creation. This makes the Ferrograph microscope more useful for standardized diagnostics and reporting.

Theory and Method

A Ferrograph microscope is used after a ferrogram has already been prepared by magnetic and flow-based separation of wear particles from an oil sample. Once the particles are deposited on the ferrogram slide, the microscope is used to inspect particle morphology, size, distribution, surface texture, and optical behavior so the analyst can connect what is seen on the slide with likely wear modes and machine condition.

QualiFG™ Micro uses both brightfield and darkfield metallographic objectives together with reflected and transmitted illumination. This combination allows the user to examine reflective metallic particles, translucent debris, non-metallic contamination, and surface features under different lighting conditions, which improves interpretation of mixed particle populations on the ferrogram.

The system also supports digital documentation. Captured images can be measured, annotated, stitched, extended through depth-of-field tools, and exported into Excel or Word-based reporting templates, which helps turn visual ferrogram observations into consistent lab records.

TECHNICAL SPECIFICATIONS

Ferrograph Microscope - QualiFG™ Micro Technical Specification

Parameter	QualiFG™ Micro
Product Type	Ferrograph Microscope / Ferrograph Microscope
Optical System	Infinite optical system
Total Magnification	50X-1000X
Eyepiece	EW10X/22

Parameter	QualiFG™ Micro
Field of View	22 mm
Maximum Specimen Height	50 mm
Objectives (BF/DF shared)	5X/0.12, WD 12 mm
	10X/0.25, WD 10.0 mm
	20X/0.40, WD 4.30 mm
	50X/0.75, WD 0.32 mm
	100X/0.80 dry, WD 2 mm
Reflected Illumination	24V/100W halogen, Köhler illumination, adjustable brightness, blue/green/yellow filters
Transmitted Illumination	24V/100W halogen, Köhler illumination, blue filter
BF/DF Switching	Built-in lever switching
Condenser	NA 0.9/0.25 with blue filter
Nosepiece	5-position, inward facing, DIC slot
Mechanical Stage Size	186 × 138 mm
Mechanical Stage Travel	74 × 50 mm
Optional Camera	1/2.3" color CCD, up to 16 MP, USB 3.0
Software Functions	Capture, annotation, measurement, Excel export, stitching, EFI, Word-template reports



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