



FERROGRAPH ANALYSIS SOFTWARE

Ferrograph Analysis Software - ToronFG™ AS

Ferrograph analysis software helps you capture, classify, and report wear debris from ferrograms with consistent workflows. ToronFG™ AS is built for wear particle image acquisition and intelligent analysis, designed to work with dual-analysis ferrographs, dual-rotary ferrographs, and thistle-tube ferrograph systems as one connected process.

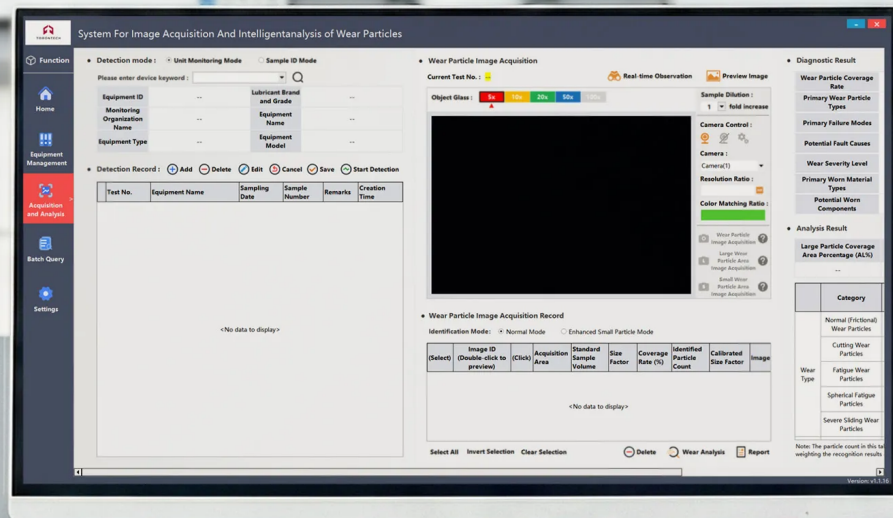
The platform combines microscope-camera imaging, deep-learning recognition trained on large industrial used-oil image datasets, and standards-aligned wear analysis to support condition monitoring and root-cause investigation.

Its architecture is designed for scalability, so the software can be tailored to your lab's reporting needs and integrated with your existing data or LIMS ecosystem.

APPLICATIONS

Ferrograph Analysis Software - ToronFG™ AS Applications

- Used oil condition monitoring programs: The software supports routine ferrograph workflows so maintenance teams can track wear trends and detect changes early. Image-based classification helps you separate normal wear from abnormal wear patterns and keep the review consistent across operators.
- Wear-mode identification and maintenance decisions: Microscope image capture plus particle-type recognition supports faster interpretation of wear mechanisms such as cutting, sliding, fatigue, oxides, and other common particle classes. That helps correlate debris morphology with likely machine conditions and maintenance actions.
- Standardized reporting for QC and reliability teams: Built-in reporting and data interaction features help you generate repeatable records, share results across teams, and support internal documentation requirements.
- Multi-instrument laboratories: ToronFG™ AS is positioned for labs running multiple ferrograph platforms, supporting collaborative, end-to-end operation across compatible ferrograph instruments and cameras.



System For Image Acquisition And Intelligent Analysis of Wear Particles

Function

Home

Equipment Management

Acquisition and Analysis

Batch Query

Settings

Detection mode : Unit Monitoring Mode Sample ID Mode

Please enter device keyword :

Equipment ID	...	Lubricant Brand and Grade	...
Monitoring Organization Name	...	Equipment Name	...
Equipment Type	...	Equipment Model	...

Detection Record : Add Delete Edit Cancel Save Start Detection

Test No.	Equipment Name	Sampling Date	Sample Number	Remarks	Creation Time
<No data to display>					

Wear Particle Image Acquisition

Current Test No. :

Real-time Observation

Preview Image

Object Glass : 10x 20x 40x 100x

Sample Dilution : 1 fold increase

Camera Control : Camera(1)

Resolution Ratio : 1.0

Color Matching Ratio : 1.0

Wear Particle Image Acquisition

Large Wear Particle Area Image Acquisition

Small Wear Particle Area Image Acquisition

Wear Particle Image Acquisition Record

Identification Mode : Normal Mode Enhanced Small Particle Mode

Image ID (Select) Image ID (Double click to preview) Click Acquisition Area Standard Sample Volume Size Factor Coverage Rate (%) Identified Particle Count Calibrated Size Factor Image

<No data to display>

Select All Invert Selection Clear Selection Delete Wear Analysis Report

Diagnostic Result

Wear Particle Coverage Rate

Primary Wear Particle Types

Primary Failure Modes

Potential Fault Causes

Wear Severity Level

Primary Worn Material Types

Potential Worn Components

Analysis Result

Large Particle Coverage Area Percentage (ALN)

Category

Normal (Frictional) Wear Particles

Cutting Wear Particles

Fatigue Wear Particles

Spherical Fatigue Particles

Severe Sliding Wear Particles

Note: The particle count in this table weighting the recognition results

Version: v1.0.0

Standards

- ASTM D7690 – Microscopic characterization of wear and contaminant particles deposited on ferrograms.
- ASTM D7684 – Terminology and description guidance for particle morphology used in microscopic particle identification workflows.

FEATURES

Ferrograph Analysis Software – ToronFG™ AS Key Features

- Three-in-one workflow: image acquisition, wear particle recognition, and wear analysis in one system.
- Real-time microscope image capture using supported high-quality microscope cameras for clear imaging and accurate color rendering.
- Deep-learning particle recognition model trained from large industrial used-oil image datasets to support robust classification across real-world samples.
- Wide recognition range (0–1200 µm) to cover common ferrograph particle sizes used in condition monitoring.
- 12 particle recognition categories for practical wear-mode screening (examples include normal wear, fatigue, cutting, severe sliding, spherical, copper, oxide, and more).
- Fast reporting and review tools to standardize outputs across operators and reduce manual sorting work.
- Convenient data interaction to share results across teams and support integration into lab information workflows.
- High expandability and customization for customer-specific templates, fields, and deeper integration with the lab's data ecosystem.

THEORY & METHOD

Theory and Method

ToronFG™ AS follows a practical analytical ferrograph workflow from image capture through interpretation. First, a microscope camera captures high-clarity ferrogram images with strong color reproduction for reliable particle contrast.

Next, a deep-learning recognition model classifies wear particles based on patterns learned from industrial used-oil image samples, supporting consistent categorization at scale.

Then, the software organizes results into an analysis and reporting layer aligned with analytical ferrography practice, so you can review particle types, document findings, and export data for maintenance trending.

TECHNICAL SPECIFICATIONS

Ferrograph Analysis Software - ToronFG™ AS Technical Specification

Item	Specification
Design / reference standard	SH/T 0573 (Analytical Ferrography method reference)
Compatible ferrograph platforms	Dual-analysis ferrograph, dual-rotary ferrograph, thistle-tube ferrograph (system workflow support)
Recommended computer	10th Gen Intel® Core™ i5-10500, 8 GB RAM (or higher)
Camera (example)	E3ISPM2000KPA (other models supported)
Transmission line	E301195 UL AWM style 2725 (compatible alternatives supported)
Microscope calibration ruler	1 DIV = 0.01 mm
Wear particle recognition range	0–1200 μm
Acquisition type	Real-time acquisition

Item	Specification
Image resolution	5480 × 3648 / 2736 × 1824
Recognition categories	12 types



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