



## DIRECT READING FERROGRAPH

## Direct Reading Ferrograph - ToronFG™ DR

Ferrograph testing gives a fast, quantitative picture of ferromagnetic wear debris in used oils. Direct Reading Ferrograph - ToronFG™ DR is designed to measure wear intensity trends in minutes, helping maintenance teams flag abnormal wear early and decide when follow-up microscopy or deeper oil analysis is needed. The system uses magnetic-gradient separation and optical reading to quantify debris deposition from a small, controlled oil sample.

ToronFG™ DR is a direct-reading ferrograph built for routine condition monitoring of machines that rely on lubricating oil, hydraulic oil, coolant, or fuel. It automatically injects a measured sample, deposits ferromagnetic particles in a controlled magnetic field, and converts deposition intensity into numeric wear trend indicators. The workflow supports quick screening of equipment health across fleets and production assets, especially when trending results over time matters more than one single reading.

This instrument is commonly used as a screening tool to identify rising wear rates and to trigger additional diagnostics. When direct-reading trends increase sharply, analytical ferrography and particle microscopy are often used to classify particle type and wear mode.

### APPLICATIONS

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## Direct Reading Ferrograph - ToronFG™ DR Application

- Machinery system wear monitoring: Direct reading ferrography helps establish baselines and track changes in wear intensity over time. Trending supports faster decisions on inspection windows, filtration issues, and maintenance timing.
- Lubricating oil evaluation for machine systems: Quantitative readings provide a quick check after oil changes, repairs, or operating-condition shifts. Data can support routine health reporting without requiring advanced microscopy skills for

every sample.

- Gearbox ferromagnetic abrasive wear evaluation: Gearboxes often generate ferrous debris during abnormal tooth or bearing wear. Direct reading values can highlight increasing wear severity and support a decision to run deeper particle classification.
- Residual assessment of bearing and gearbox oils: Residual wear debris after corrective actions can be verified through repeat sampling. This supports confirmation that wear trends are stabilizing after maintenance.



## FEATURES

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### **Direct Reading Ferrograph - ToronFG™ DR Key Features**

- Automatic analysis sequence after sample insertion to support routine lab or field workflows.
- Fast cycle time, with single analysis typically completed in under 10 minutes.
- Quantitative measurement of ferromagnetic wear particle concentration for trend-based condition monitoring.
- Adjustable sampling and monitoring frequency supports early-wear detection and escalation rules.
- Magnetic-gradient design helps keep deposition organized for stable readings and easier repeatability checks.
- Built-in positioning structure helps keep the oil path aligned to the sensing zone for measurement stability.
- Designed for portable use cases, including onsite sampling environments when needed.
- Low-power electronics and anti-interference design intent for stable operation in industrial settings.

### **Connectivity and data handling**

- USB interface and RJ45 network connection for data transfer and integration into reporting workflows.
- Windows-based operating environment (as listed in the brochure) to support basic data review and export.





## THEORY & METHOD

### Theory and Method

Direct reading ferrography magnetically separates ferrous wear particles from an oil sample and measures deposition optically at defined locations along the deposit track. The readings are used to quantify wear particle concentration and trend severity, which supports fast screening for abnormal wear. This approach is widely used to monitor changes in wear rate and to decide when analytical ferrography should be performed for particle identification.

ToronFG™ DR automates injection and cleaning steps so sample-to-sample preparation stays consistent. Results are best used as a trend tool, comparing today's readings to baseline values for the same machine and lubricant family.

## TECHNICAL SPECIFICATIONS

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### Direct Reading Ferrograph - ToronFG™ DR Technical Specification

| Item                      | ToronFG™ DR                                         |
|---------------------------|-----------------------------------------------------|
| Single sampling volume    | 1 mL                                                |
| Single analysis time      | < 10 minutes                                        |
| Display                   | High-sensitivity touch screen; 7-inch touch display |
| USB interface             | USB (brochure lists "USB interface: 4")             |
| Network connection        | RJ45                                                |
| Operating system          | Windows 7 (as listed)                               |
| Cleaning agent            | Tetrachloroethylene                                 |
| Magnetic field gradient   | > 5.0 T/cm                                          |
| Max magnetic flux density | > 1.5 T                                             |
| Test resolution           | 0.1                                                 |

| Item             | ToronFG™ DR                                                                 |
|------------------|-----------------------------------------------------------------------------|
| Injection method | Automatic injection                                                         |
| Voltage          | 220 VAC ±10% (110V is also available), 50 Hz; uses 12 VDC 5 A power adapter |



**Torontech Inc.**

251 Consumers Road, Suite 1200  
Toronto, Ontario, M2J 4R3, Canada 🇨🇦

Phone: +1 416 368 2721 | Fax: +1 416 981 7652  
Email: [info@torontech.com](mailto:info@torontech.com)

**Torontech, LLC**

601 Brickell Key Drive, Suite 700  
Miami, FL 33131, USA 🇺🇸

Toll-Free: 1-866-383-7919  
Email: [sales@torontech.com](mailto:sales@torontech.com)

**Torontech ME FZE**

Meydan Grandstand, 6th Floor,  
Meydan Road, Nad Al Sheba,  
Dubai-261440, UAE 🇦🇪

Phone: +971 488 19252  
Email: [me@torontech.com](mailto:me@torontech.com)

