



TORONTECH



METALLURGICAL MICROSCOPE TORONMM™-JM2

The ToronMM™-M2 Metallurgical Microscope is a professional-grade optical system designed for accurate microstructure evaluation in metallurgical labs, materials science research, and industrial inspection.

As part of our lineup of advanced metallurgical microscopes for industry, it combines robust construction, high-precision optics, and ergonomic design to deliver reliable performance in demanding environments.

Ideal as a metal surface inspection microscope, the ToronMM™-M2 offers sharp, high-contrast imaging for detecting surface defects, evaluating coatings, and analyzing material phases. Its optical clarity and stable platform also make it a trusted microscope for grain structure analysis, supporting critical tasks such as grain size measurement and inclusion rating in both research and production settings.

APPLICATIONS

Metallurgical & Materials Science Industry - Microstructure evaluation of metals and alloys, including grain size measurement, phase identification, and defect detection for metallographic studies.

Automotive & Transportation - Surface and coating inspection of engine parts, gears, and structural components to ensure durability, wear resistance, and manufacturing quality.

Aerospace & Defense - High-resolution imaging of advanced alloys, composites, and protective coatings to validate integrity under extreme operational conditions.

Electronics & Semiconductor Industry - Cross-sectional analysis of thin films, conductive layers, and microstructures for quality assurance in semiconductor fabrication and electronic component inspection.

Industrial Manufacturing & Welding - Detection of inclusions, cracks, and weld defects in machined parts, castings, and welded joints to ensure production reliability.

Research & Academic Institutions - Advanced metallographic research, training programs, and material development studies in engineering, physics, and applied sciences.

Petrochemical & Energy Industry - Evaluation of corrosion, microstructural changes, and failure analysis of pipelines, reactors, and energy system components.

Quality Assurance & Certification Labs - Standardized metallographic inspections and documentation in compliance with ASTM, ISO, and other international protocols.

FEATURES

Metallurgical Microscope ToronMM™-JM2 Features

1. Advanced Trinocular Viewing Head

The ToronMM-JM2 features a 45° inclined, compensation-free trinocular head for ergonomic, fatigue-free viewing and high-quality image capture—ideal for extended microscopy sessions in industrial and laboratory environments.

2. High-Quality Eyepieces

Comes with widefield WF10×/18mm eyepieces for clear observation. An optional eyepiece version with a 0.1mm crosshair reticle is available, perfect for precise measurement and calibration tasks.

3. Plan Metallurgical Objectives

Equipped with standard DIN Plan objectives that deliver sharp, flat-field images across various magnifications:

1. 4× (NA 0.10, 25mm Working Distance)
2. 10× (NA 0.25, 11mm W.D.)
3. 20× (NA 0.40, 9mm W.D.)

- 4. 40× (NA 0.60, 3.8mm W.D.)
Optional objectives up to 100× magnification are available for high-resolution material analysis.

4. Precision Mechanical Stage & Focusing System

The double-layer mechanical stage (172×142mm) with a 30×30mm movement range offers precise specimen positioning. Coaxial coarse and fine focusing knobs allow for micro-level adjustments with 0.002mm precision—essential for metallographic inspection and documentation.

5. Versatile Illumination System

Includes a built-in 12V/20W halogen lamp with adjustable brightness, field and aperture diaphragms. Comes with green, blue, and yellow filters to enhance image contrast under different sample conditions.

6. Integrated Polarizing System

The built-in polarizing system includes a 360° rotatable analyzer and a removable polarizer/analyzer pair, enabling advanced contrast techniques critical for material structure analysis and defect detection.

7. Optional Accessories for Enhanced Imaging

- 1. Metallurgical image analysis software
- 2. CMOS digital eyepiece cameras (1.3MP to 5.0MP)
- 3. Photography and CCD camera adapters
- 4. Basic darkfield observation kit
- 5. High-resolution CCD camera (520 TV lines)

TECHNICAL SPECIFICATIONS

Component	Specification
Viewing Head	Compensation Free Trinocular Head, Inclined at 45°
Eyepiece	WF10×/18mm

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WF10×/18mm, crosshair with reticule 0.1mm	
Objective	DIN Plan Metallurgical objectives: 4×/0.1 W.D.25mm, 10×/0.25 W.D.11mm, 20×/0.4 W.D.9mm, 40×/0.6 W.D.3.8mm
Stage	Double layer mechanical stage
	Stage Size: 172mm × 142mm
	Moving Range: 30mm × 30mm
Filter	Inserting type filter (green, blue, yellow)
Focusing	Coaxial coarse & fine focusing adjustment with rack and pinion mechanism. Fine focusing scale value 0.002mm
Light Source	With aperture iris diaphragm and Field diaphragm, Halogen lamp 12V/20W, AC85V-230V, Adjustable Brightness
Polarizing Device	Analyzer rotatable 360°, both Polarizer and Analyzer can be moved out of the light path
Checking Tool	0.01mm Micrometer
Optional Accessory	Professional metallurgical image analysis software
	1.3Mega, 2.0Mega, 3.0Mega, 5.0Mega Pixels CMOS Digital camera eyepiece
	DIN Plan Metallurgical objectives: 50×80×100×
	Photography attachment and CCD Adapter 0.5×, ×0.57×0.75×
	Simple Darkfield kit
	CCD Camera, colour 1/3"High resolution 520 TV lines



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