



National Award for
Outstanding Entrepreneurship - 2010



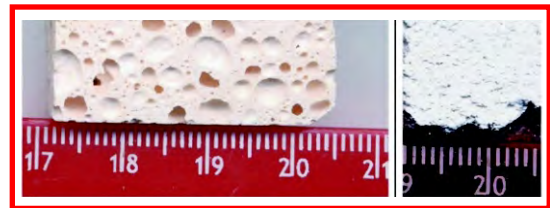
National Award for
Quality Products in Instrumentation - 2002

ROLE OF CALIBRATION & LIGHTING IN MATERIAL MICROSTRUCTURE ANALYSIS

What is Optical Calibration ?

Calibration is an exercise to determine the accuracy of an optical component for any number of optical applications. Calibration Standards are very precise measuring devices that allow optical components to be accurately evaluated after multiple uses to ensure continued effectiveness or determine when recalibration is required.

Glass Disc Micrometer Stage is one such calibration standard which is used to check the correctness of optical magnification of eyepieces and objectives. Vaiseshika supplies its microscopes duly checked and calibrated on all magnification sections.

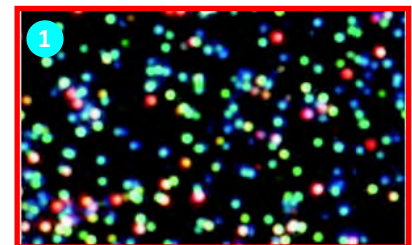


These photographs of micro structures are measured with calibrated object micrometer disc

1. What is Bright Field / Dark Field Microscopy ?

Darkfield microscopy creates contrast in transparent unstained specimens such as living cells. It depends on controlling specimen illumination so that central light which normally passes through and around the specimen is blocked. Rather than light illuminating the sample with a full cone of light (as in brightfield microscopy) the condenser forms a hollow cone with light travelling around the cone rather than through it.

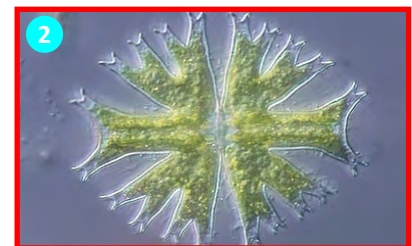
This form of illumination allows only oblique rays of light to strike the specimen on the microscope stage and the image is formed by rays of light scattered by the sample and captured in the objective lens. When there is no sample on the microscope stage the view is completely dark. In general, thin specimens are better because the possibility of diffraction artefacts is reduced.



Silver nano particles under dark field

2. What is Differential Interference Contrast (DIC) Microscopy ?

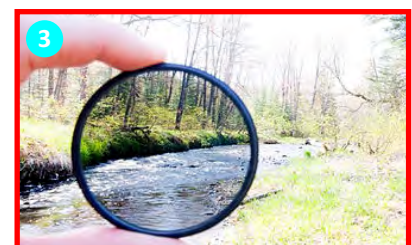
Differential Interference Contrast microscopy is an optical microscopy illumination technique used to enhance the contrast in unstained, transparent samples. DIC works on the principle of interferometry where differences in the light refraction by different parts of the specimen allow them to become visible during microscopic evaluation. This lighting scheme produces an image with the object appearing black to white on a gray background.



Transparent specimen visible under DIC

3. Neutral Density Filters (ND)

These filters allow to reduce or modify intensity of all wavelengths or color of light equally giving no change in hue of color rendition. The purpose of a standard photographic neutral density filter is to reduce the amount of light entering the lens.



Contrast difference with ND filter

UPRIGHT METALLURGICAL MICROSCOPES : UMS 7001C/D

FEATURES

- **Infinity Corrected, Plan,** Achromatic objectives with bright field features and high point eyepieces, for clear pictures and wide field view
- Excellent UIS optical system to achieve **Polarization, Dark Field** observation
- Compact and sturdy main frame body is embodiment for shock resistance
- Spiring loaded objectives at higher magnification to avoid damage to optics or specimen
- Stage speedy movement by hand to get observation point immediately.
- Ideal ergonomic design is adopted & has easier operation & wider space
- Universal anti reflected coated optic ensuring full contrast, flat field image with Natural color reproduction
- Kohlar illumination system



UMS 7001C/D

SPECIFICATION : UMS 7001C/D

Magnification	50X to 800X with standard Eyepiece & Objectives 12.5X to 2000X with optional Eyepieces & Objectives	
Standard Eyepieces	High Point, extra WF 10X/Ø22mm	
Optional Eyepieces	.5X, 12.5X, 16X, & 20X. Micrometer 10X/Ø22mm, with least count =0.1mm. Filar Micrometer 10X . Grain size measurement WF 10X (08 grain engraved). Objective Micrometer Stage Disc with least count =0.01mm	
Standard Objectives (Infinity Plan Achromatic)	7001C	5X/0.12, 10X/0.25, 20X/0.40, 50X/0.70 & 80X/0.80 (only Bright Field)
	7001D	5X/0.12BD, 10X/0.25BD, 20X/0.40BD, 50X/0.70BD & 80X/0.80BD
Optional Objectives (Infinity Plan Achromatic)	7001C	40X, 60X, 100X dry (only Bright Field)
	7001D	40X, 60X, 100X (Bright and Dark Field - BD)
Viewing Head(Inclined at 30°)	Sidentop, Trinocular, Interpupillary distance: 55mm to 75mm, adjustable angle for eyepieces	
Light Distribution	100:0%, between camera port and binocular eyepieces	
Color Filter	Yellow, Blue, Green & Ground	
Focusing System	Coaxial coarse & fine focus with tension adjustable & up stop, fine focusing : 0.7µm	
Nose Piece	Quintuple (Backward ball bearing inner locating)	
Polarizer Attachment	Available	
Mechanical Stage	Double/three layer & three axis moveable Size:280X270mm, Travel : 204mmX204mm coaxial X Y movement	
Epi-Illumination System	7001C	6V/30W, 220V AC/50Hz, Halogen lamp, adjustable brightness
	7001D	12V/50W, 220V AC/50Hz, Halogen lamp, adjustable brightness
	Integrated field diaphragm, aperture diaphragm and filters switching device. Push Pull Analyzer and Polarizer	

UPRIGHT METALLURGICAL MICROSCOPE : UMS 7001E

FEATURES : UMS 7001E

- **Infinity Corrected, Plan,** Achromatic objectives with **Bright/Dark Field** features and high point eyepieces, for clear pictures and wide field view
- Equipped with excellent UIS optical system to provide observation in reflected or transmitted and mixed illumination polarising observation and dark field observation
- Spring loaded objectives at higher magnification to avoid damage to optics or specimen
- Having beautiful sculpt, convenient control and clear image
- Suitable for surface observation of opaque and transparent objects
- Universal anti reflected coated optic ensuring full contrast, flat field image with Natural color reproduction
- Kohlar illumination system



UMS 7001E

SPECIFICATION : UMS 7001E

Magnification	50X to 400X with standard Eyepiece & Objectives 12.5X to 2000X with optional Eyepieces & Objectives
Standard Eyepieces	High Point, extra WF 10X/Ø22mm
Optional Eyepieces	5X, 12.5X, 16X, & 20X. Micrometer 10X/Ø22mm, with least count =0.1mm. Filar Micrometer 10X . Grain size measurement WF 10X (08 grain engraved). Objective Micrometer Disc with least count =0.01mm
Standard Objectives	Bright & Dark Field, Infinity, Plan, Achromatic 5X/0.12, 10X/0.25, 20X/0.40, 40X/0.60
Optional Objectives	Bright & Dark Field, Infinity, Plan, Achromatic 2.5X, 50X/0.70, 60X/0.75, 80X/0.80 & 100X/0.9 (Oil/Dry)
Viewing Head(Inclined at 30°)	Sidentop, Trinocular, Interpupillary distance: 55mm to 75mm, adjustable angle for eyepieces
Light Distribution	100:0%, between camera port and binocular eyepieces
Color Filters	Yellow, Blue, Green & Ground (for Epi-Illumination) B filter & frosted glass (for Transmitted Illumination)
Focusing System	Coaxial coarse & fine focus with tension adjustable & up stop, fine focusing resolution : 2µm
Nose Piece	Quintuple (Backward ball bearing inner locating)
Polarizer Attachment	Available
Condenser	Abbe Condenser NA 1.25 adjustable through Rack & Pinion
Mechanical Stage	Double/three layer & three axis moveable Size:210x140mm, Travel : 75mmx50mm
Epi-Illumination	12V/50W, 220V AC/50Hz, Halogen lamp, adjustable brightness. Integrated field, aperture diaphragm & filter switching device. Push Pull type Polarizer and Analyzer
Transmitted illumination	12V/30W, 220V AC/50Hz, Halogen lamp, adjustable brightness. Abbe condenser NA 1.25 rack & pinion adjustable. Collector for halogen lamp illumination and integrated field diaphragm

UPRIGHT METALLURGICAL MICROSCOPE : UMS 7001F

FEATURES : UMS 7001F

- High quality optical system, equipped with **Infinity, Plan, long working distance**, Achromatic objectives
- Microstructure study and photography with transmitted illumination and reflected **Differential Interface Contrast (DIC)** with Polarizer device
- High point eyepieces (HP) for easy viewing without touching eyes to the eyepieces. Very useful for users using spectacles
- Spining loaded objectives at higher magnification to avoid damage to optics or specimen
- Provides clear and 3D image
- Ideal instrument in research work in biology, metallography, electronics etc.



UMS 7001F

SPECIFICATION : UMS 7001F

Magnification	50X to 800X with standard Eyepiece & Objectives 12.5X to 2000X with optional Eyepieces & Objectives
Standard Eyepieces	High Point WF 10X/Ø22mm
Optional Eyepieces	5X, 12.5X, 16X, & 20X Micrometer 10X/Ø22mm, with least count =0.1mm Filar Micrometer 10X Objective Micrometer Disc with least count =0.01mm
Standard Objectives	Infinity, Plan, long working distance , Achromatic PL5X/0.12, PL10X/0.25, PL20X/0.40, PL40X/0.60 (spring), PL80X/0.8 (spring), No Cover Glass
Optional Objectives	Infinity, Plan, long working distance , Achromatic PL2.5X, PL50X/0.70, PL60X/0.75, PL80X/0.80 & PL100X/0.9 (Oil/Dry), NO Cover Glass
Viewing Head(Inclined at 30°)	Sidentop, Trinocular, Interpupillary distance: 55mm to 75mm, adjustable angle for eyepieces
Light Distribution	100:0%, between camera port and binocular eyepieces
Color Filters	Yellow, Blue, Green & Ground
Focusing System	Coaxial coarse & fine focus with tension adjustable & up stop, fine focusing resolution : 0.7µm
Nose Piece	Quintuple(Backward ball bearing inner locating)
Polarizer Attachment	Available
Mechanical Stage	Double/ three layer & three axis moveable with coaxial X-Y movement Size : 280x270 mm, Travel : 204x204 mm
Epi-Illumination	12V/50W, 220V AC/50Hz, Halogen lamp, adjustable brightness. Integrated field, aperture diaphragm & filter switching device. Push Pull type Polarizer and Analyzer
Transmitted illumination	High brightness white LED
DIC Observation System	10X DIC Push-Pull Group 20X DIC Push-Pull Group

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