磁畴观测克尔显微镜

当一束线偏振光照被磁性介质反射后，反射光的偏振面相对于入射光的偏振面有一个小的角度偏转（克尔旋转角），这一现象被称为磁光克尔效应。磁畴观测克尔显微镜是通过纵向/极向磁光克尔效应来测量磁畴结构。磁畴的存在导致了内部磁化强度的区域分布不同，由于磁光克尔效应的影响，导致了反射光光斑内与材料内部磁化区域相对应的反射区域偏振态不同，偏振光经过检偏器后光斑的强度分布不同，从而得到磁畴结构。

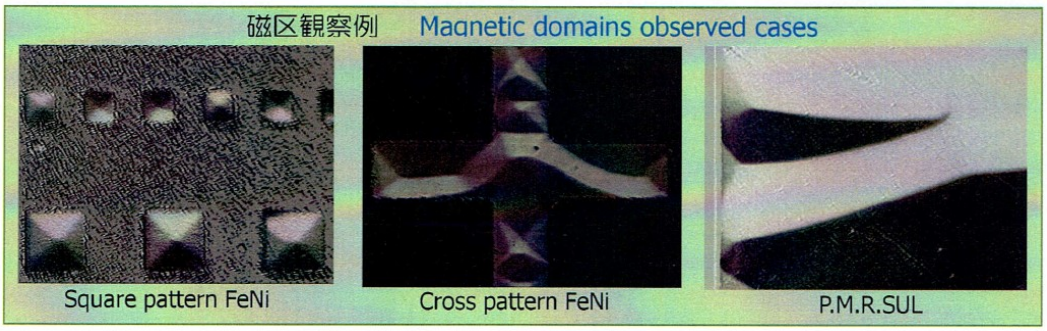
磁畴观测显微镜采用 100W 的汞灯做为光源，经过起偏器产生线偏振光作用于磁性材料，结合偏振显微镜观测，观测空间分辨率可达到 1μm。在实际的测量中分辨率甚至可达到 1μm 以下，这非常有利于对微小区域磁性的观察。因此该磁畴观测系统成为磁性微结构的理想观测系统。

磁畴观测克尔显微镜还可以观测动态磁畴的变化。MOKE 磁畴观测显微镜装配基础观测软件和 Flame movie 软件可以实现连续的可选择的磁场变化下磁畴图像的连续观测。采用双极电磁铁，可以提供的外加磁场强度高达 10KOe。此外可以选配多种电磁体：四极磁体、偶极磁体以及螺线管磁体。外加磁场可以实现任意的磁场波形控制，能够轻松地在样品表面产生各种复杂的磁场。

上海昊量光电设备有限公司的磁畴观测显微镜可分为两类：

①常规条件的磁畴观测系统

该类型的磁畴观测克尔显微镜主要包含 BH-786 系列和 BH-785iPWF6。该系列使用的光源为汞灯，可以从极向和纵向对磁畴进行观测，并可以随意切换观测方向。采用白光观测，使得标准产品的空间分辨率可到达 1μm（×50 倍物镜）.



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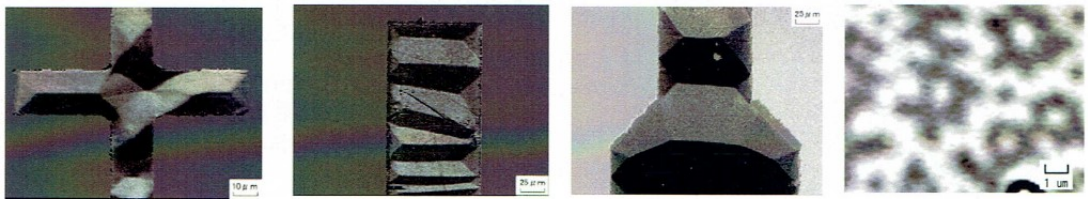

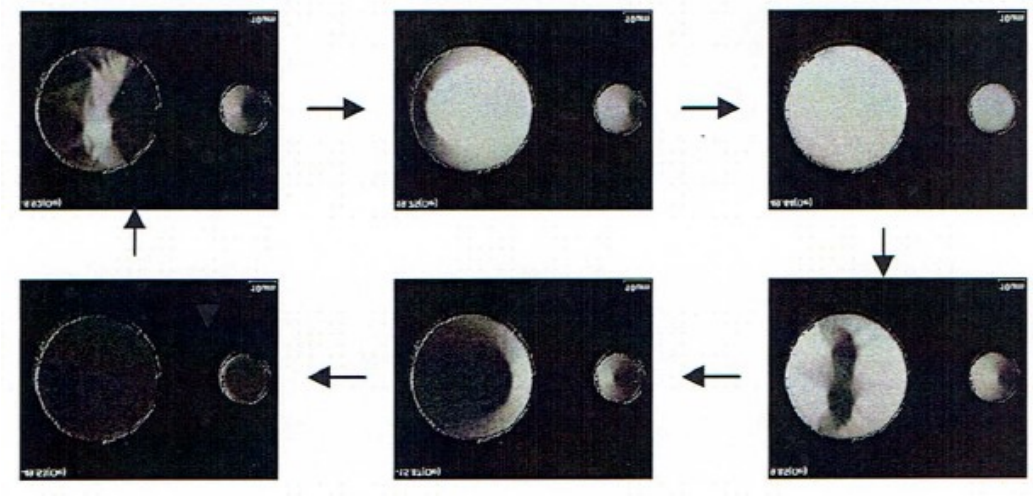

②极端条件的磁畴观测设备（低温高温下）

该设备是用于变温条件下磁畴的观察。主要包含 BH-7850 系列。该克尔显微镜可以从极向/纵向两个方向进行观测。可以实现在极低温度条件下的磁畴观测，测试温度范围可达到 2.2-500K。

◆ **主要特点**

- 高分辨率（1μm）
- 高外加磁场
- 高灵敏度
- 高稳定性
- 可选配电磁体

◆ **产品主要参数**

产品型号 主要参数	BH-786IP	BH-786IWF8	BH-786iP-12	BH-785iPWF6	BH-7850 series（极端条件）
光源	汞灯				
空间分辨率	×20 倍物镜 2.5μm	面内 1μm	面内 1.5μm	面内 1.5μm	×20 倍物镜 2.5μm
	×50 倍物镜 1.0μm		极向 0.9μm		
观测面积	×20 倍物镜 250×175μm		×20 倍物镜 250×200μm	×20 倍物镜 250×200μm	×20 倍物镜 250×200μm
	×50 倍物镜 100×70μm	×50 倍物镜 100×75μm			
可产生磁场	>±10kOe=1T	>±0.2T		>±0.2T	>±0.2T
可测样品大小	5×5×1tmm ~10×10×1tmm	8 英寸 wafer	5×5~20×20mm 1mmt	6 英寸 wafer	
工作温度	20℃~25℃				2.2~500K

◆ **主要应用**

磁性材料、磁性薄膜磁畴的动态静态观测等。

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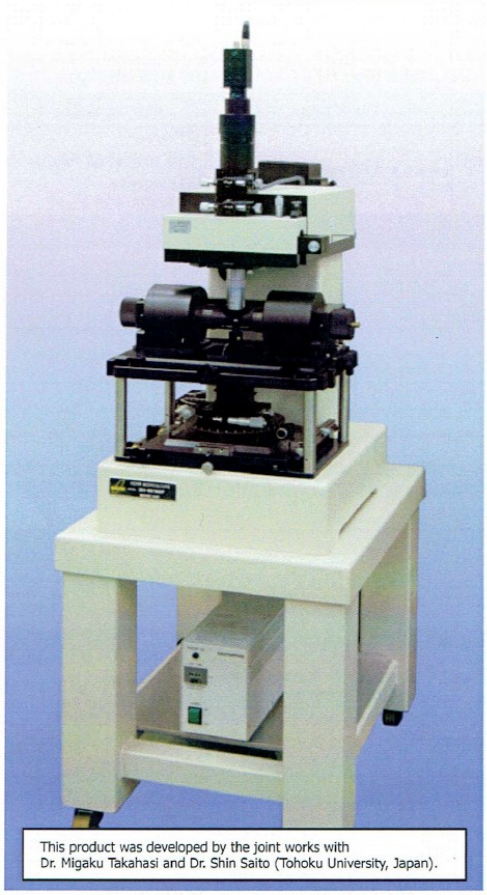
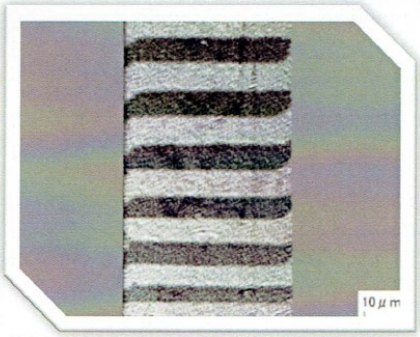
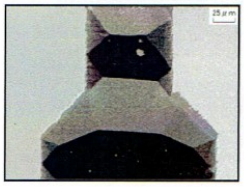
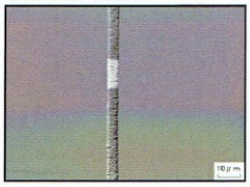


*The appearance of the product may change without prior notice.







Feature

Magnetic Domain Observation Microscope is optical equipment for surface observation of various kinds of magnetic materials by utilizing polarization state change based on Longitudinal Kerr Effect (Effect caused by In-Plane Magnetization) and Polar Kerr Effect (Effect caused by Perpendicular Magnetization).

The product is equipped with Basic Observation Software and Flame Movie Software for obtaining continuous images with selected Magnetic Field change.

Target Sample

Soft Magnetic Material

- Silicide Steel
- Permalloy
- Amorphous Sample

Permanent Magnet

Others

Main Performance

1) **Observation Direction**
   In-plane (One Axis) Direction (Longitudinal)
   Polar Direction
2) **Electromagnet**

In-plane Electromagnet	> ±10 kOe
Polar Electromagnet	> ±10 kOe

3) **Spatial Resolution**

x20 Objective Lens	2.5 μm
x50 Objective Lens	1.0 μm

4) **Observation Area**

x20 Objective Lens	250 x 175 μm
x50 Objective Lens	100 x 70 μm

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Magnetic Domain Observation Microscope BH-786IP Series Specification Sheet

Observation Part				
Light Source	100 W Mercury Lamp			
Observation Direction	In-Plane - Longitudinal (one axis only)			
	Polar			
Objective Lens	**Magnification**	**Spatial Resolution**	**Total Magnification** *With 17 Inch Monitor	**Observation Area**
	x 20 Objective Lens	2.5 μm (Typ.)	x 1000 (Typ.)	250 x 175 μm (Typ.)
	x 50 Objective Lens	1.0 μm (Typ.)	x 2500 (Typ.)	100 x 70 μm (Typ.)
Observation CCD Camera	**CCD camera**	**Pixel**	**Pixel size**	**Frame rate**
	1/3 Inch Monochrome	Approx. 0.8 Mega Pixel (1024 x 768)	4.65 x 4.65 μm	15 Frame/s (@ 1024x768 Pixel) 30 Frame/s (@ 800x600 Pixel)
Electromagnet Part				
In-Plane Electromagnet	Generating Magnetic Field	> ±10 kOe		
Sample Holder for In-Plane Electromagnet	Acceptable Sample Size	5 x 5 x 1t mm ~ 10 x 10 x 1t mm (Depend on Magnetic Field)		
	Sample Stage	Manual X Y Z θ Stage		
Polar Electromagnet	Generating Magnetic Field	> ±10 kOe		
Sample Holder for Polar Electromagnet	Acceptable Sample Size	5 x 5 x 1t mm ~ 10 x 10 x 1t mm (Depend on Samples)		
	Sample Stage	Manual X Y Z Stage		
Bi-Polar Power Supply	Output Current	± 15 A		
	Output Voltage	± 45 V		
PC, OS, Monitor				
PC	IBM PC/AT Compatible PC			
OS	Windows 7			
Monitor	17 Inch Monitor			
Accessories	Keyboard, Mouse Cables, Others			
Software				
Basic Observation Software	Magnetic Field Control, Image Processing, Still Image Acquisition & Storage, Image Averaging, Differential Image Processing, Position Correction, Scale Display, and others.			
Frame Movie Software	Magnetic Field Control, Image Processing, Continuous Still Image Acquisition with Controlled Magnetic Field, Image Averaging, Differential Image Processing, Position Correction, Movie Making, Scale Display, and others.			
Dimension and Weight				
Main Unit	Dimension	810(W) x 600(D) x 1550(H) mm * Protruding parts are not included		
	Weight	Approx. 300 kg		
Rack (For PC and Others)	Dimension	570(W) x 700(D) x 1250(H) mm * Protruding parts are not included		
	Weight	Approx. 100 kg		
Utility and Operating Environment				
Power Source	Single-Phase AC100 V, 20 A (Two Lines, 50 / 60 Hz) *Acceptable Voltage Fluctuation Range: Within ± 3 %			
Air Pressure for Vibration Isolation Table	0.3kgf/cm^2 (Air Hose Diameter: Inner 4 mm / Outer 6 mm) *Air Compressor is not included to the product.			
Temperature Range	20 ℃ ~ 25 ℃			
Humidity Range	30 %~60 % * No condensation is required.			
Precaution	This product is a sensitive optical equipment. Please avoid shocks or/and vibrations to the product. The product is susceptible to harsh environment, especially weak to dusts or other fine particles. Please be noted to install and operate the product in environment with stable Temperature and Humidity.			

*This document is subject to changes at any time without notice.
*Actual Shape, Size and Color of the product may change during manufacturing period.
*Contents in this catalog is for a reference. Actual specifications will be decided in consultation.

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