Scientific / Metrology Instruments

CROSS SECTION POLISHER™

Solutions for Innovation

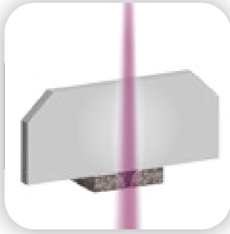
CROSS SECTION POLISHER™

IB-10500HMS
High Throughput Milling System

IB-19520CCP

IB-19530CP

JEOL Ltd.



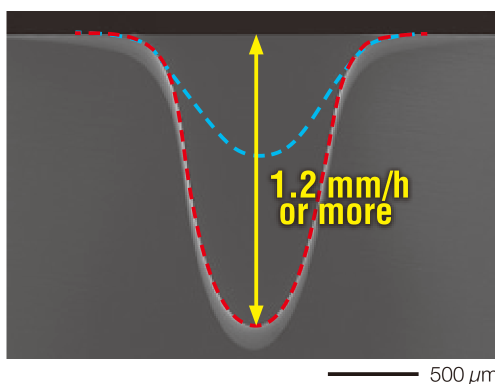
High Throughput Milling*1

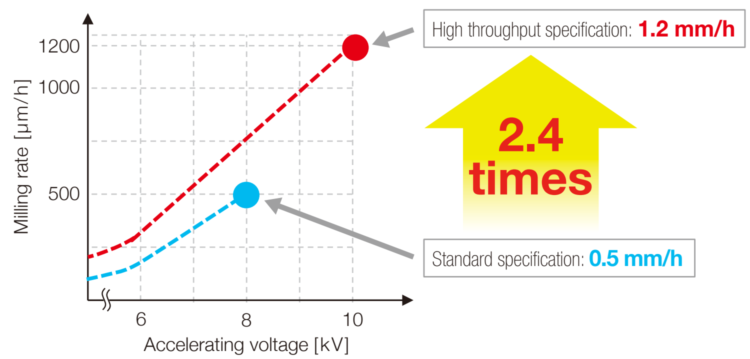
High milling rate of cross-section achieved by the new ion source: **1.2 mm/h or more***2
(**2.4 times** than the previous milling rate.)

The high throughput milling system optimizes the ion source electrodes and enables higher accelerating voltages, thus improving the ion-beam current density. Our newly developed ion source achieves a high milling rate of cross-section of 1.2 mm/h or more (2.4 times than the previous milling rate.)

Cross-section milling rate of the new ion source

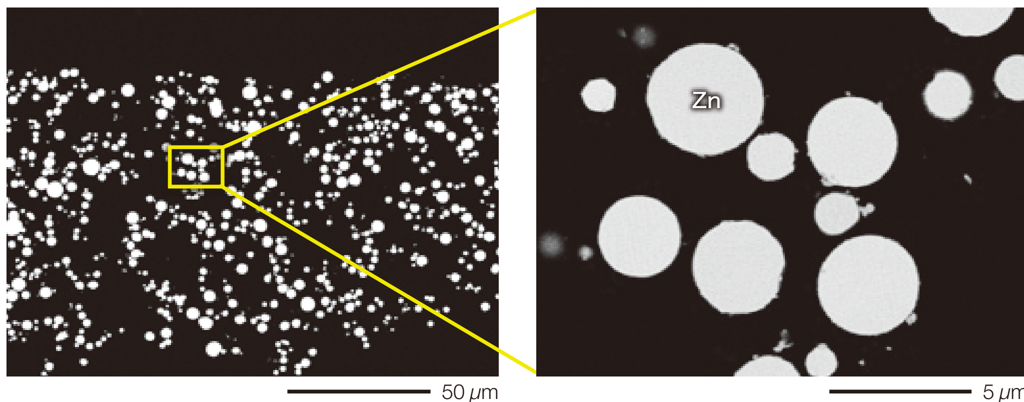
Specimen: Silicon wafer, Accelerating voltage: 10 kV, Milling time: 1 h





Cross-section milling of powders

Accelerating voltage: 10 kV, Milling time: 10 min

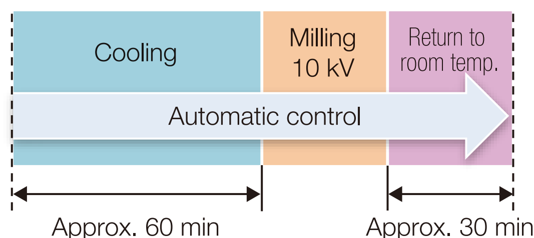


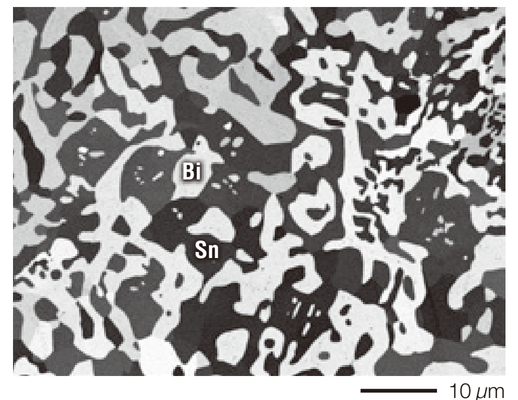
The specimen can be processed in a short time. This leads to enhancement of work efficiency.

Cross-section milling of a low melting-point alloy (cooling)

Accelerating voltage: 10 kV, Milling time: 30 min

The right SEM image shows an Sn-Bi alloy with a melting point of 150 °C. A low melting-point metal can be melted due to the processing heat; therefore, cooling of the metal is required before milling. High throughput milling is applied to the heat-sensitive specimen while the specimen is kept cooled *3. Then, a cross-section specimen with a reduced heat damage is obtained in a short time.





Large Area Milling*1, *4

Planar Surface Milling of **Larger Area**

The new high throughput milling system has enabled the irradiation of an ion beam onto a larger area of the specimen. Planar surface milling is effective to remove scratches generated on the specimen surface or crystalline strains, which are caused by mechanical polishing.

Planar surface milling of a concrete

Accelerating voltage: 10 kV, Milling time: 20 min

Large-area planar surface milling was applied to a concrete with a width of 20 mm. After milling, polish scratches and contamination were removed, allowing for clear observation of particles of stone and cement contained in a concrete.

20 mm

Before milling

Polish scratch

50 μm

Polish scratch

100 μm

Contamination

100 μm

After milling

50 μm

100 μm

100 μm

*1 This function is included in IB-19530CP or IB-19520CCP which incorporates the optional high throughput specification. *2 Milling of 1 h, Si equivalent, Edge distance: 100 μm
*3 This function is included in IB-19520CCP. *4 Large Specimen Rotation Holder, IB-11550LSRH, is required.

Specifications

	Standard specification		High throughput specification *1 *2	
	IB-19530CP	IB-19520CCP	IB-19530CP + IB-10500HMS	IB-19520CCP + IB-10500HMS
Ion accelerating voltage	2 to 8 kV		2 to 10 kV	
Milling speed	500 μm/h or more (accelerating voltage 8 kV) *3		1200 μm/h or more (accelerating voltage 10 kV) *4	
Specimen swing function *5	Auto specimen swing by ± 30°		Auto specimen swing by ± 30°, Angle setting swing	
Auto milling start mode	○	○	○	○
Auto cooling milling start mode / Auto return to room temperature mode	-	○	-	○
Specimen stage ultimate cooling temperature	-	–120 °C or less	-	–120 °C or less
Cooling temperature settable range	-	–120 to 0 °C	-	–120 to 0 °C
Specimen cooling time to reach –100 °C	-	Within 60 min	-	Within 60 min
Specimen cooling retention time	-	8 h or more *6	-	8 h or more *6
Air isolation function	-	○	-	-
Intermittent milling mode	Ion beam irradiation time and stop time are settable (ON: 1 to 999 s, OFF: 1 to 999 s)			
Fine milling mode	Milling conditions automatically switched			
Large-area cross-section milling mode *7	Maximum milling width: 8 mm (with optional Large Area Milling Holder IB-11730LMH)			
Large-area planar surface milling mode	-	-	○ *8	○ *8
Maximum specimen size: Cross-section milling	11 mm (W) × 10 mm (L) × 2 mm (T) (with standard holder for IB-19530CP) 11 mm (W) × 8 mm (L) × 3 mm (T) (with standard holder for IB-19520CCP) 25 mm (W) × 15 mm (L) × 10 mm (T) (with optional Large Area Milling Holder IB-11730LMH)			
Maximum specimen size: Planar surface milling	40 mm (diameter) × 15 mm (T) (with optional Large Specimen Rotation Holder IB-11550LSRH)			
Specimen movements	X-axis: ± 6 mm, Y-axis: ± 2.5 mm			
Operation	Touch panel, 6.5-inch display			
Positioning for milling	Monitor from above the specimen stage with a camera *9. Milling position is adjustable with an optical microscope.			
Positioning camera (magnification)	Approx. ×70 (on 6.5-inch display)			
Monitoring camera (magnification)	Approx. ×20 to 100 (on 6.5-inch display) *Note: When used with IB-19530CP + IB-14510MCAM *10 or IB-19520CCP.			
External monitor output	Positioning camera and Monitoring camera can be switched for displaying one on the external monitor. *Note: When used with IB-19530CP + IB-14510MCAM *10 or IB-19520CCP + EC-10020VST *11.			
Preset function	4 sets of milling conditions (accelerating voltage, Ar gas flow, milling time, intermittent milling)			
Dimensions and weights: Basic unit	545 mm (W) × 550 mm (D) × 420 mm (H), Approx. 66 kg (with IB-19530CP + IB-14510MCAM attached) 690 mm (W) × 720 mm (D) × 530 mm (H), Approx. 75 kg (with IB-19520CCP attached)			
Dimensions and weights: Rotary pump	150 mm (W) × 427 mm (D) × 230 mm (H), Approx. 16 kg			

Installation Requirements

Power supply	Single phase 100 to 120 V AC, 50/60 Hz, Allowable input voltage fluctuation: less than 10%, Rating: 15 A or more
Maximum power consumption	650 VA
Grounding	100 Ω or less
Argon gas *12	Dry argon, Purity: 99.9999% or more. Pressure: 0.1 to 0.2 MPa (1.0 to 2.0 kgf/cm^2), Hose joint: ISO 7/1 Rc 1/4
Room temperature	15 to 25 °C
Room humidity	60% or less (no condensation)

*1 This is optional, which is added at the time of shipment from factory.
*2 An ion source and an ion-current detection unit are different for the standard specification and the high throughput specification.
*3 Average over 2 h, Si equivalent, Edge distance 100 μm
*4 Milling of 1 h, Si equivalent, Edge distance 100 μm
*5 Patent No. (Japan): 4557130
*6 As the set temperature is higher, the cooling retention time is longer.
*7 This mode can be used in combination with the cooling function of IB-19520CCP.
*8 When used with IB-11550LSRH.
*9 Patent No. (Japan): 4208658
*10 With IB-14510MCAM attached, the specimen can be monitored in real time.
The status of the specimen can be observed while milling is in progress.
The external monitor must be prepared by the customer.
*11 With EC-10020VST attached, the camera image can be displayed on the external monitor.
The external monitor must be prepared by the customer.
*12 The argon gas, gas cylinders and regulator must be prepared by the customer.

*The screen images in the catalog include items that are still under development, and are subject to change without notice.
*The specifications and appearance of the instrument are subject to change without notice.

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