Hitachi High-Tech

Hitachi UHR FE-SEM

SU8040

Hitachi ultra high resolution FE-SEM setting the standard for image resolution and stage precision

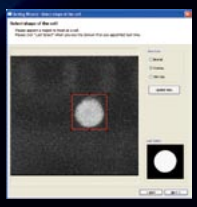
*image

Newly developed Regulus stage*1

Ultra high resolution from an FE-SEM requires ultra high stage performance. Hitachi's new Regulus stage was developed to meet the demands for today's applications requiring high magnification and a high precision stage. Smooth, jitter free, motion extends the capability for high throughput observation and cell counting of repeated patterns in DRAM/SRAM products. New pattern recognition software (optional) helps to locate the target cell, eliminating the tedious and time consuming task of manually counting the cells

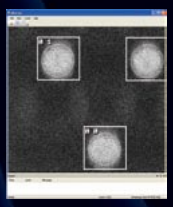
*1 Regulus : REGULated Ultra Stable

Automated cell counting work flow (option)



① Located and observe the cell starting point

② Select the cell pattern

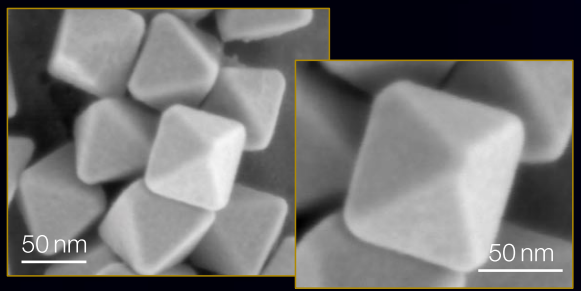


③ Start the cell counting routine

The cell counting function helps to locate the target cell with high accuracy and speed utilizing pattern recognition and Hitachi's new Regulus stage.
*Cell count assist software (option).

Higher image resolution at low landing voltage

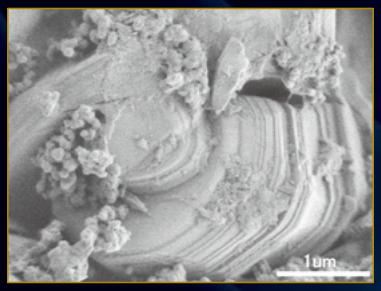
Stunning image performance is a result of Hitachi's unique triple Everhart Thornley detectors design, super E×B energy filter and improved beam deceleration function. Now, detailed surface observation is possible without specimen damage or charging contrast.



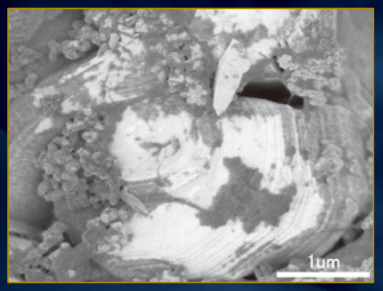
Sample : Single crystalline octahedral gold nanoparticle
Landing voltage : 1.0 kV
SE + BSE image (Upper detector)

Mag : 300 kx(Upper left)
: 500 kx(Lower right)

Courtesy of Department of Chemistry, Graduate School of Pure and Applied Sciences, University of Tsukuba Dr. Toshiharu Teranishi



Sample : Li ion battery
(Surface of negative electrode)
Landing voltage : 100 V



Left : Upper image
Right : Top image
Mag : 20 kx

HITACHI

Secondary Electron Image Resolution

1.0 nm (Vacc 15 kV, WD=4 mm)*1

1.3 nm (landing voltage 1 kV, WD=1.5 mm)*1

Magnification	Magnification on Photo*2	Magnification on display*3
Low mag mode	20–2,000x	60–25,000x
High mag mode	100–800,000x	300–2,000,000x

Electron Optics

Electron gun	Cold cathode field emission source
Accelerating voltage	0.5 kV to 30 kV(Standard mode)
Landing voltage	0.1 kV to 2.0 kV(Deceleration mode)
Objective lens aperture	Objective aperture(Heating type), 4 openings selectable from outside of vacuum Alignment memorized for each Acc voltage

Specimen Stage (Regulus Stage)

Stage Control		5-axis motor drive
Traverse range	X	0 to 110 mm
	Y	0 to 80 mm
	Z	1.5 to 40 mm
	T	-5 to 70°
	R	360°
Max. sample size		150 mm dia. (Maximum)
Stage repeatability		less than ±0.5 µm

Detector

Secondary electron detector (Top/Upper/Lower)

Semiconductor type BSED*4

YAG BSED*4

Energy dispersive X-ray spectrometer*4

STEM detector (for BF-STEM)*4

BF-STEM aperture*4

DF-STEM holder*4

Faraday cup*4

Electrical Image Shift

±12 µm (WD=8 mm)

SE/BSE Signal Mixing Function

SE/BSE Upper Detector

Anti-contamination

Anti-contamination trap

PC

PC/AT compatible, OS : Windows®*5

Monitor

24.1" type or the equivalent LCD (display screen image : 1,920 × 1,200)

Chamberscope*4

Digital Image Resolution

640 × 480 pixels, 1,280 × 960 pixels, 2,560 × 1,920 pixels, 5,120 × 3,840 pixels

Optional Software

CD-measurement*4

CD-measurement function for SEM Data Manager (for external PC)*4

Hi-Mouse (single keyboard, single mouse)*4

RS-232C Communication interface*4

DBC interface*4

Cell count assist software*4

Utility Requirement

Temperature	15 to 25℃
Humidity	less than 60%(RH) (non-condensing)
Power (SU8040)	AC100 V ±10%, 4kVA (Crimp contact for M5)
Power (W-5020Td)	AC100 V ±10%, 2kVA (Crimp contact for M6)*4
Grounding	100 Ω or less
Cooling water	Dedicated cooling water circulation system*4
Compressed air*6	350 to 500 kPa (RC1/4taper internal thread)*4
N2 purge*6	30 to 50 kPa (RC1/4taper internal thread)*4

Dimension & Weight*7

	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
Main unit	840	970	1,720	667
Display unit	1,000	1,010	1,200	205
Oil rotary pump	530	240	240	28
Air compressor	420	210	520	16
Weight	200	180	160	40
W-5020Td*4	400	450	670	73

*1 Based on the gap (point to point) method by using Hitachi standard sample for resolution measurement

*2 at 127 mm × 95 mm (4" × 5" Picture size)

*3 at 173 mm × 129 mm (640 × 480 pixels)
at 345 mm × 259 mm (1,280 × 960 pixels)

*4 Option

*5 Windows is a registered trademark of U.S. Microsoft Corp. in U.S.A. and other countries.

*6 In case of connection from the installation site facilities.

*7 Weight does not include options

NOTICE: For proper operation and safety, follow the instruction manual when using the instrument.

Specifications in this flyer are subject to change with or without notice, as Hitachi High-Technologies Corporation continues to develop the latest technologies and products for our customers.

Bringing the frontier to the forefront.

For further information, please contact your nearest sales representative.

Hitachi High-Technologies Corporation

Tokyo, Japan
http://www.hitachi-hitec.com/em/world/
24-14, Nishi-shimbashi,1-chome, Minato-ku Tokyo,105-8717, Japan

Printed in Japan (H) **HTD-E187** 2010.9