

Efficient Analysis and Unattended Workflows



ZEISS GeminiSEM 460

Field Emission SEM

zeiss.com/geminiSEM



Seeing beyond

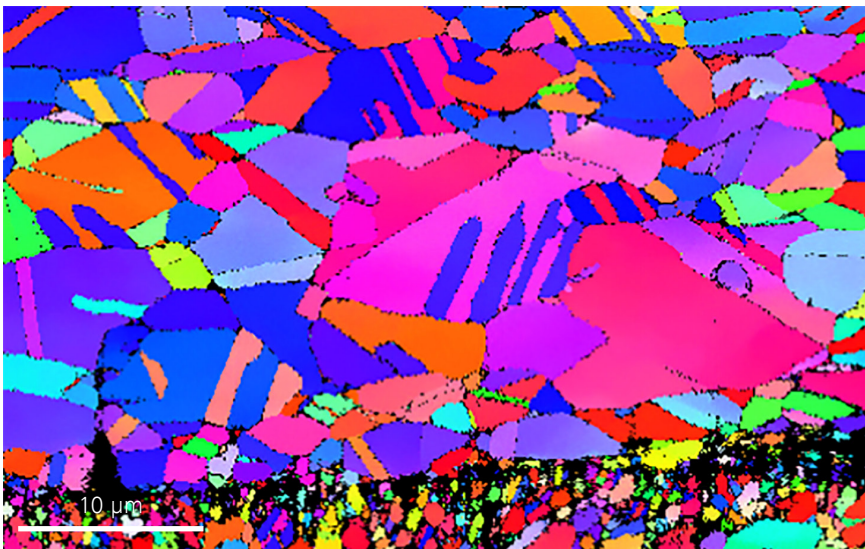
ZEISS GeminiSEM 460

Your Field Emission SEM for Efficient Analysis and Unattended Workflows.

Discover how to image with sub-nanometer resolution effortlessly with a field emission SEM that is your tool for efficient analysis and unattended workflows. Use it for your most demanding projects in materials and life science. Innovations in electron optics and a new chamber design let you benefit from better image quality, usability and flexibility.

ZEISS GeminiSEM 460 and its Gemini 2 column serve the most challenging tasks in analytical microscopy. Switch seamlessly between imaging and analytical conditions over a wide range of probe currents. Combine excellence in imaging and analytics.

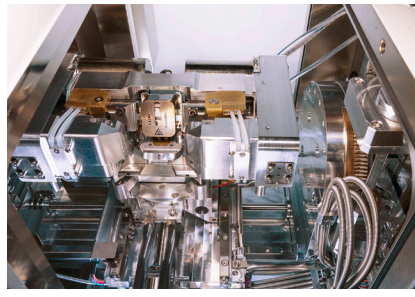
- Utilize both high resolution and high current
- Customize and automate your workflows
- Your pathway to even more possibilities



EBSD map of a metal alloy captured in only 20 minutes, collecting signals from 185 thousand points at 20 kV and 5 nA



Configure your instrument tailored to your needs thanks to the versatile chamber.



Turn your GeminiSEM 460 into an *in situ* lab.

Utilize High Resolution and High Current

- GeminiSEM 460 is made for your most exacting analytical tasks and enables efficient analysis and unattended workflows.
- Perform high-resolution imaging and analytics rapidly: switch seamlessly from low current-low kV work to high current-high kV work, and back again utilizing the Gemini 2 column.
- Characterize any specimen comprehensively by using multiple detectors in parallel.
- For efficient analysis exploit the versatile chamber and choose appropriate analytical detectors.
- Use the new VP mode and turn up the current to obtain EBSD maps with indexing rates of 4000 patterns/s.
- Investigate chemical composition and crystal orientation with two diametrically opposite EDS ports and a coplanar EDS/EBSD configuration. Count on high speed, shadow-free mapping.

Customized, Automated Workflows

- With such powerful analytics at hand workflow automation becomes key. Create and configure automated experiments of your own with the Python scripting API from ZEISS.
- Modify experiments and customize the outcome to your own requirements.
- Make the most of STEM tomography: combine automated tilting and rotation with patented feature tracking. Produce 3D tomograms with nanometer-scale resolution after all aligned images are then sent to a proprietary 3D reconstruction software.
- When you need to test materials to their engineering limits, ZEISS puts an automated *in situ* heating and tension experimental lab at your disposal: it lets you observe materials under heat and tension automatically while plotting stress-strain curves on the fly.

Your Pathway to Even More Possibilities

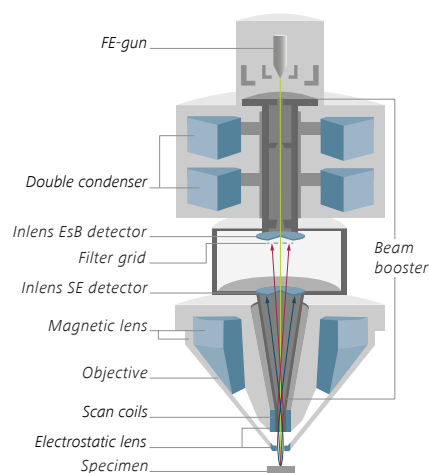
- Expand your analytical capabilities across materials and life sciences with exceptionally high, tunable current resolution, even at low kV – based on the Gemini 2 design.
- Take advantage of being able to adapt the system with a wide variety of accessories. The versatile chamber can be configured not only with analytical equipment but also with devices for *in situ* experiments, cryo-imaging and nanoprobng.
- This lets you benefit from the ability to accommodate many configurations and upgrades at any point during the lifetime of your instrument.
- All GeminiSEMs are plugged into the ZEISS ZEN core ecosystem giving you access to ZEN Connect, ZEN Intellesis and ZEN's analytical modules providing reporting and GxP workflows.

Technical Data

ZEISS GeminiSEM 460

ZEISS GeminiSEM 460 offers:

Essential Specifications	ZEISS GeminiSEM 460
Electron Emitter	Thermal field emission type
Resolution	0.7 nm @ 15 kV 1.1 nm @ 500 V and 1 kV
Acceleration Voltage	0.02 – 30 kV
Probe Current	3 pA – 40 nA (100 nA or 300 nA configuration also available)
Maximum field of view in high resolution mode	5 mm @ 5 kV and WD = 8.5 mm
Store Resolution	Up to 32k × 24k pixels
Chamber Size	360 mm inner diameter 270 mm height
Specimen Stage	X = 130 mm; Y = 130 mm Z = 50 mm T = -4° to 70° R = 360° (continuous)



ZEISS GeminiSEM 460: Gemini 2 column with double condenser, two Inlens detectors and NanoVP or local charge compensation.

Capitalize on Gemini 2 Optics

ZEISS GeminiSEM 460 is equipped with Gemini 2 optics. Its double condenser enables continuous beam current adjustment simultaneously with optimized beam spot size. This ensures the highest beam current density for high resolution imaging and analysis at both low and high beam current, independently of which beam energy you select. Switch seamlessly between different imaging modes or change imaging parameters. It's fast and effortless because there's no need to realign the beam after changing imaging parameters and the SEM alignment remains reliably stable. The Gemini 2 column is ideal for high resolution imaging at high beam current and for fast analytics. It builds on all the advantages of previous Gemini optics. Your specimen won't be exposed to a magnetic field so you will achieve a distortion-free EBSD pattern and high resolution imaging over a large field of view. You can also tilt the specimen without influencing the electron-optical performance. Even magnetic samples can be imaged easily. GeminiSEM 460 offers the best overall flexibility for a range of different applications.