TESCAN VEGA

Analytical SEM for routine materials characterization, quality control and research applications at the micron scale.

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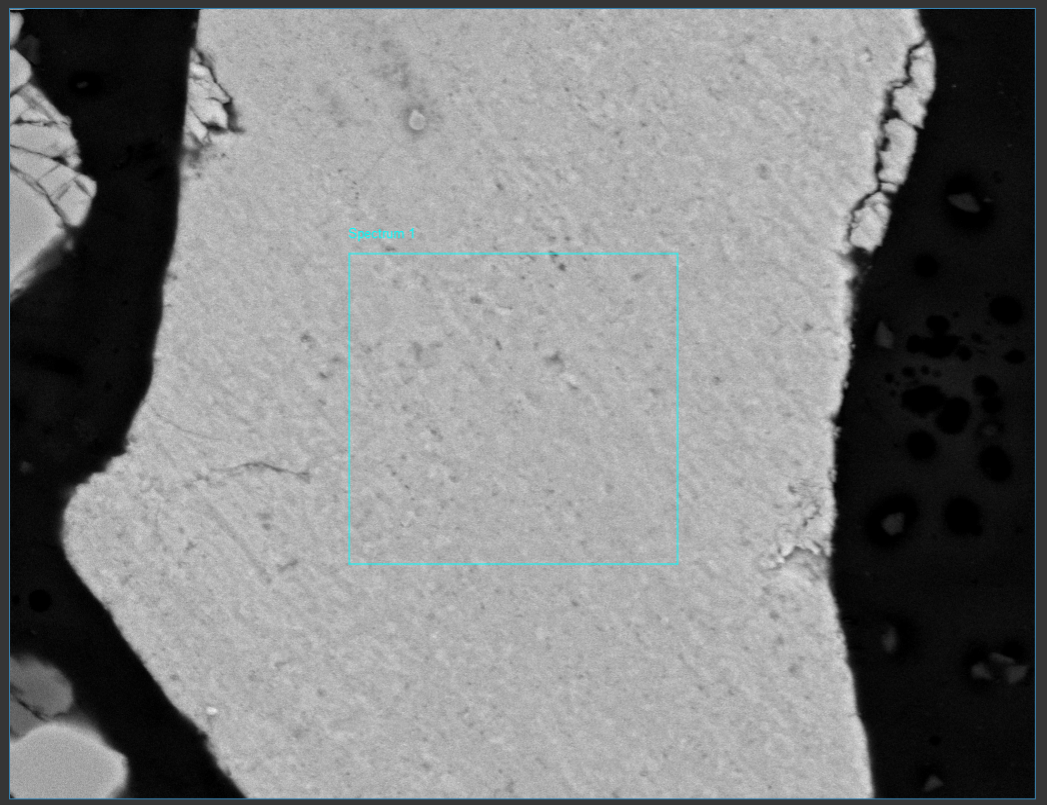
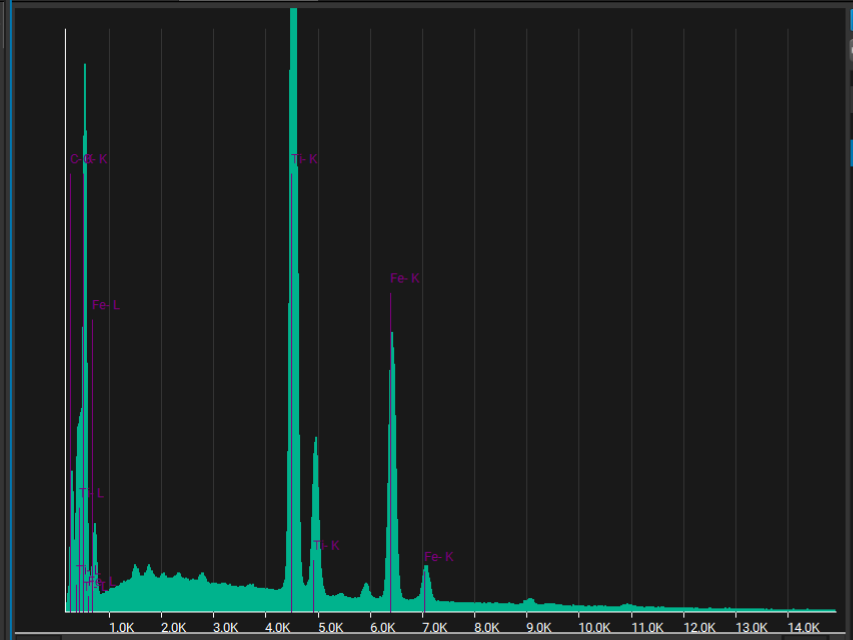
- ✓ Analytical platform which efficiently combines SEM imaging with elemental composition analysis in single GUI using Fully integrated **Essence™ EDS**
- ✓ Optimum **imaging and analytical conditions immediately available** thanks to In-flight Beam Tracing™.
- ✓ Effortless and precise SEM navigation on the sample at very low magnifications thanks to the unique **Wide Field Optics™ design**
- ✓ Intuitive and modular **Essence™ software**
- ✓ Ultimate safety of the chamber mounted detectors when moving with the detectors - **Essence™ 3D Collision model**.
- ✓ **SingleVac™** as a standard feature for observation of charging and beam-sensitive samples.
- ✓ **Ecological and economic in use** thanks to vacuum buffer which significantly reduce of vacuum rotary pump run-time

Essence™ EDS Spectrum from region and point

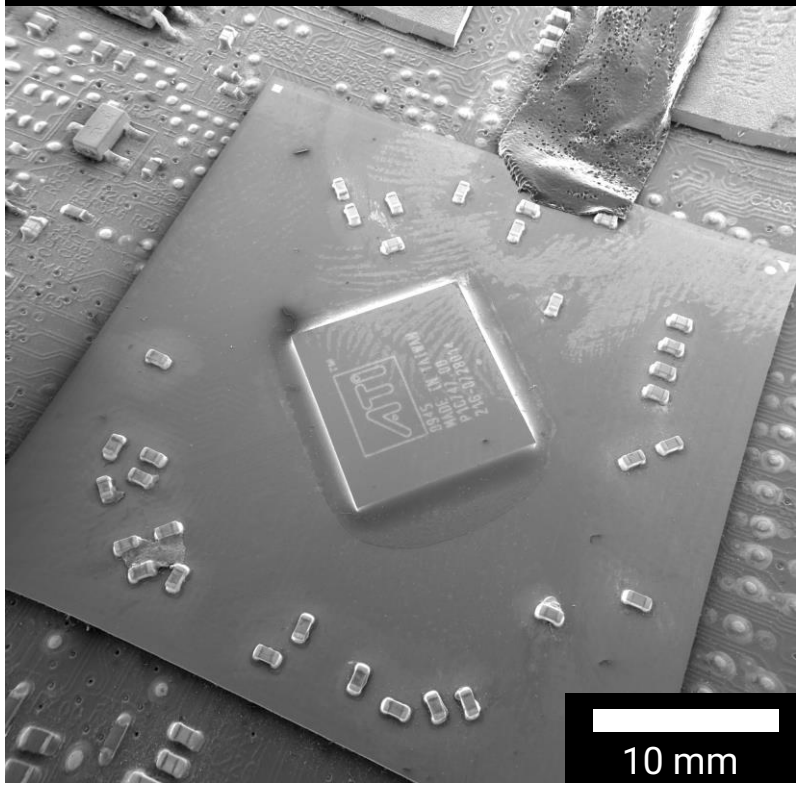




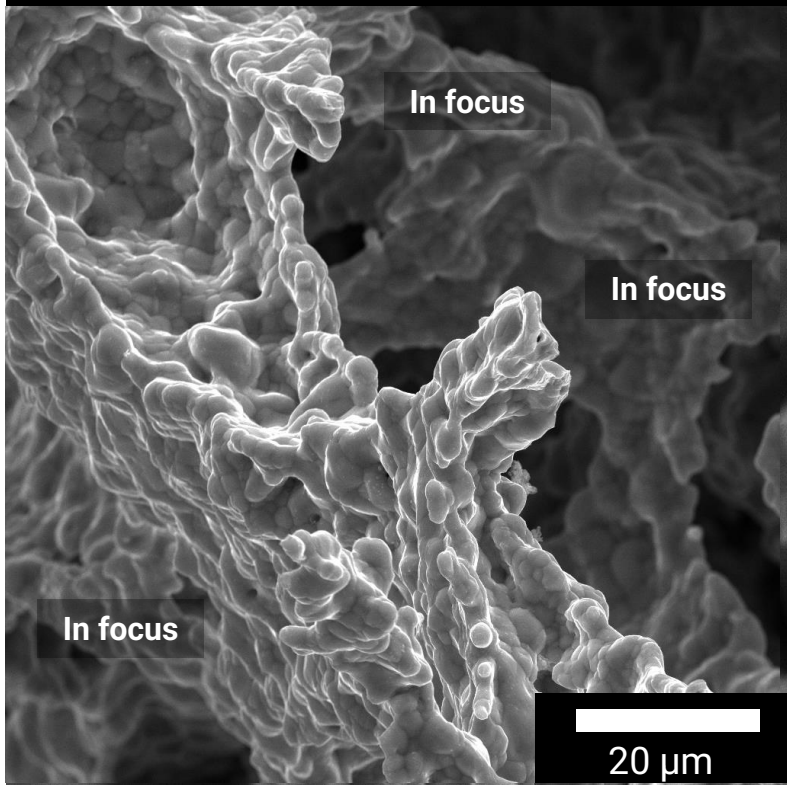
Element	Atomic %	Weight %
Carbon	36.1%	19.84%
Iron	5.22%	13.33%
Oxygen	42.31%	30.97%
Titanium	16.38%	35.86%

Unique Optics Design – Intermediate Lens™

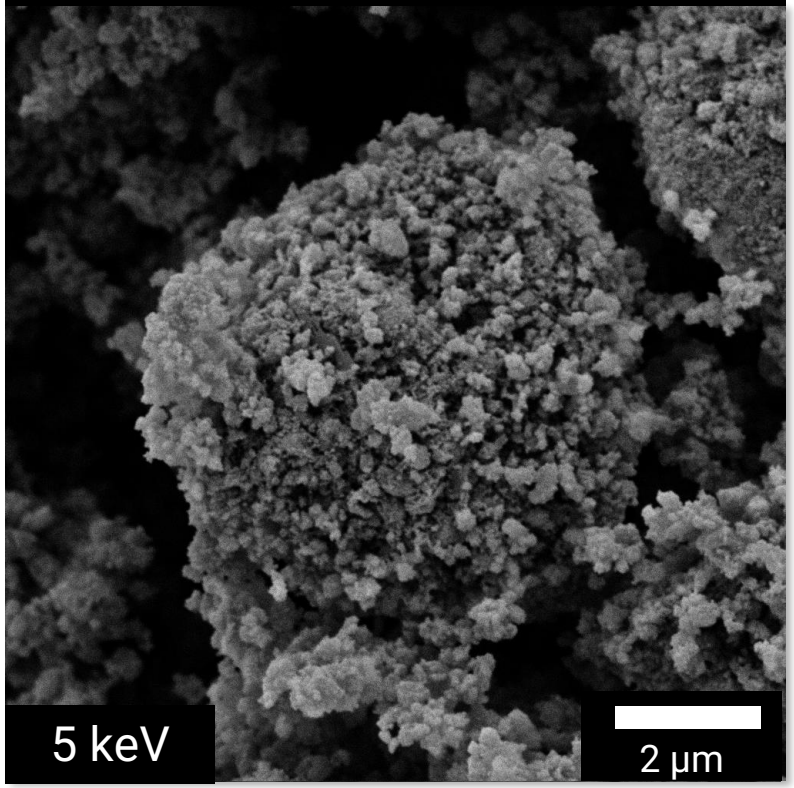
Wide Field Mode™

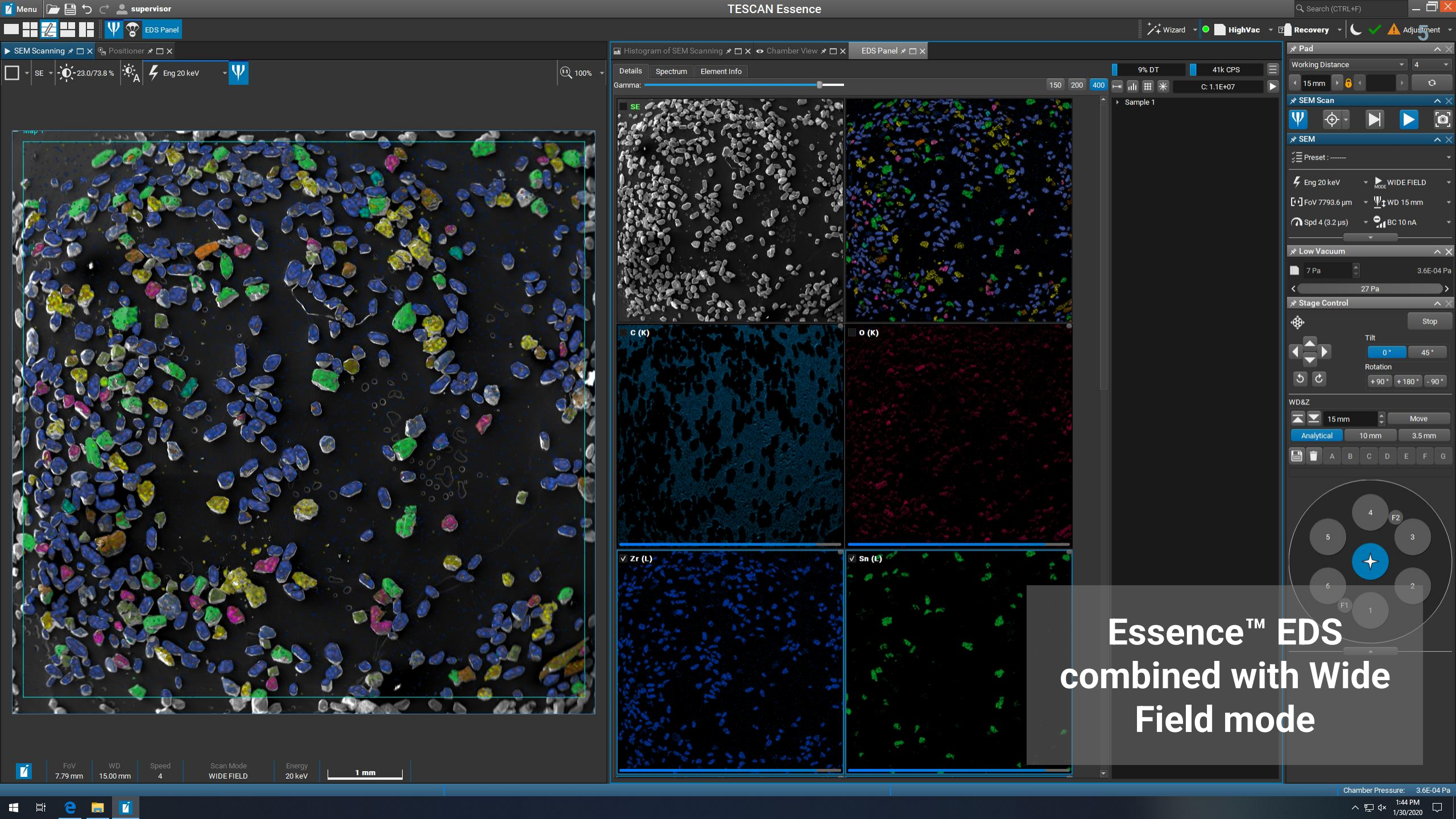


RESOLUTION and DEPTH Mode



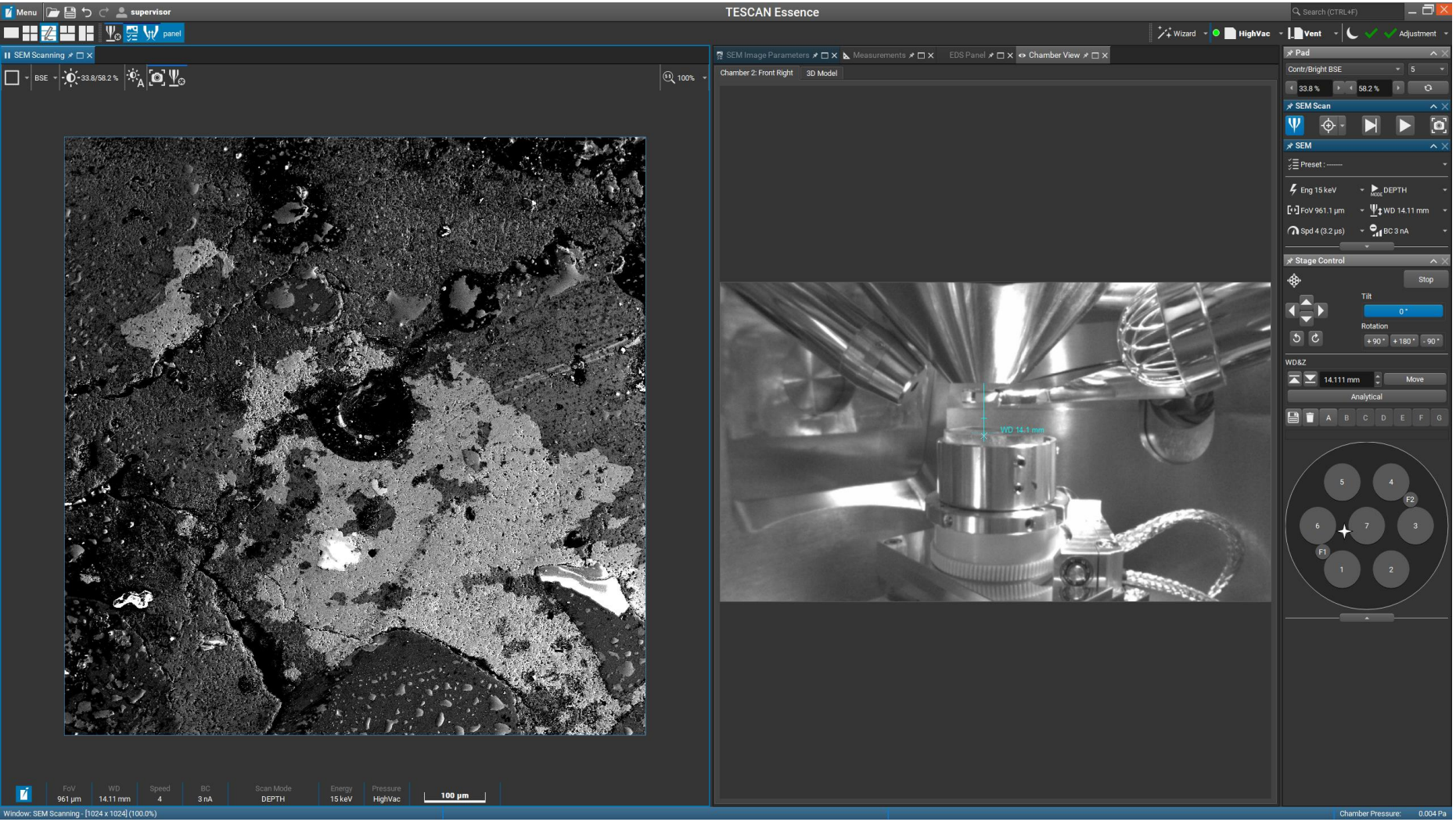
Fast setup of imaging conditions





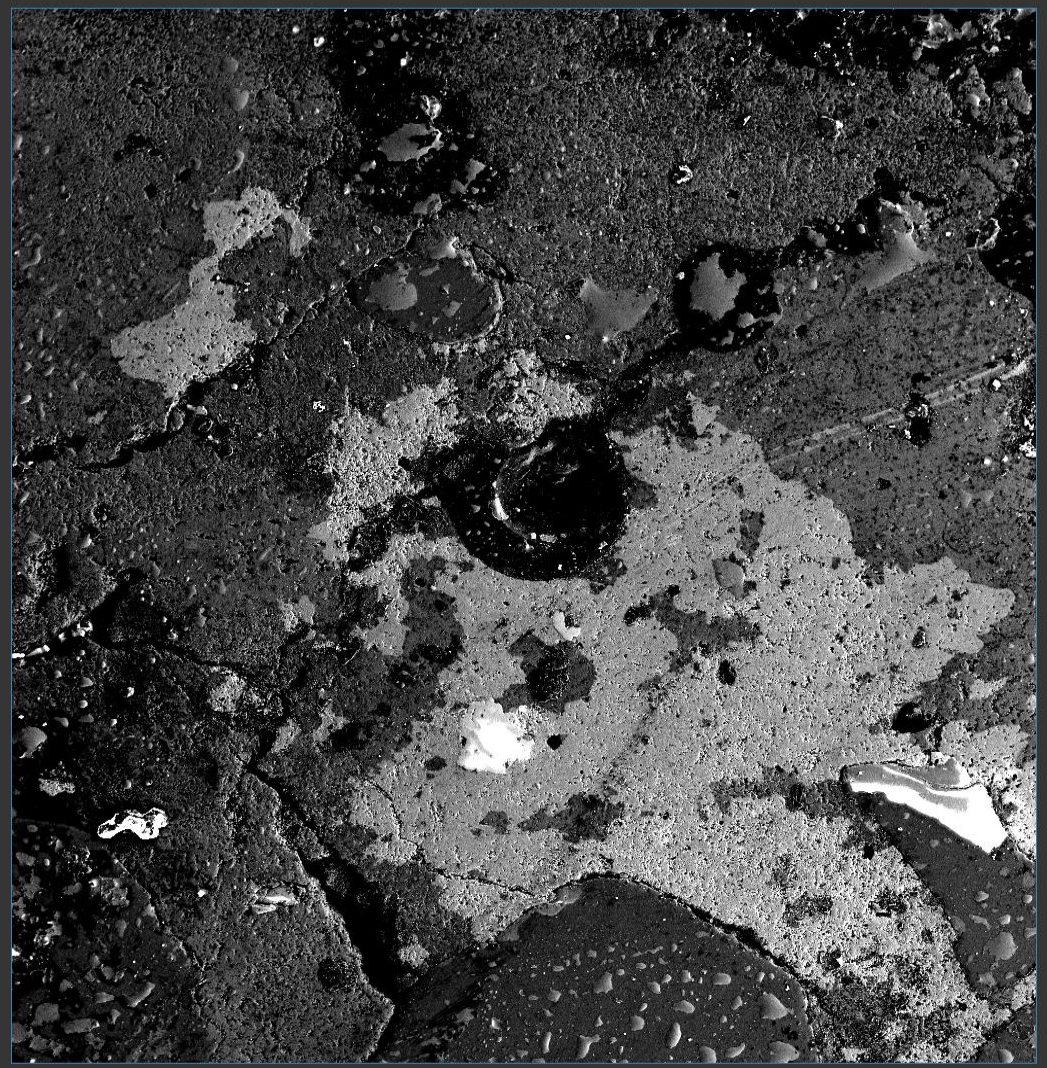
Essence™ EDS combined with Wide Field mode

TESCAN Essence™ Software



- Multiuser modular GUI
- Application specific layout
- Layout manager for image windows
- Workflow-oriented wizards
- 3D collision model
- Quick search box
- SEM undo commands

TESCAN Essence™ software



TESCAN VEGA

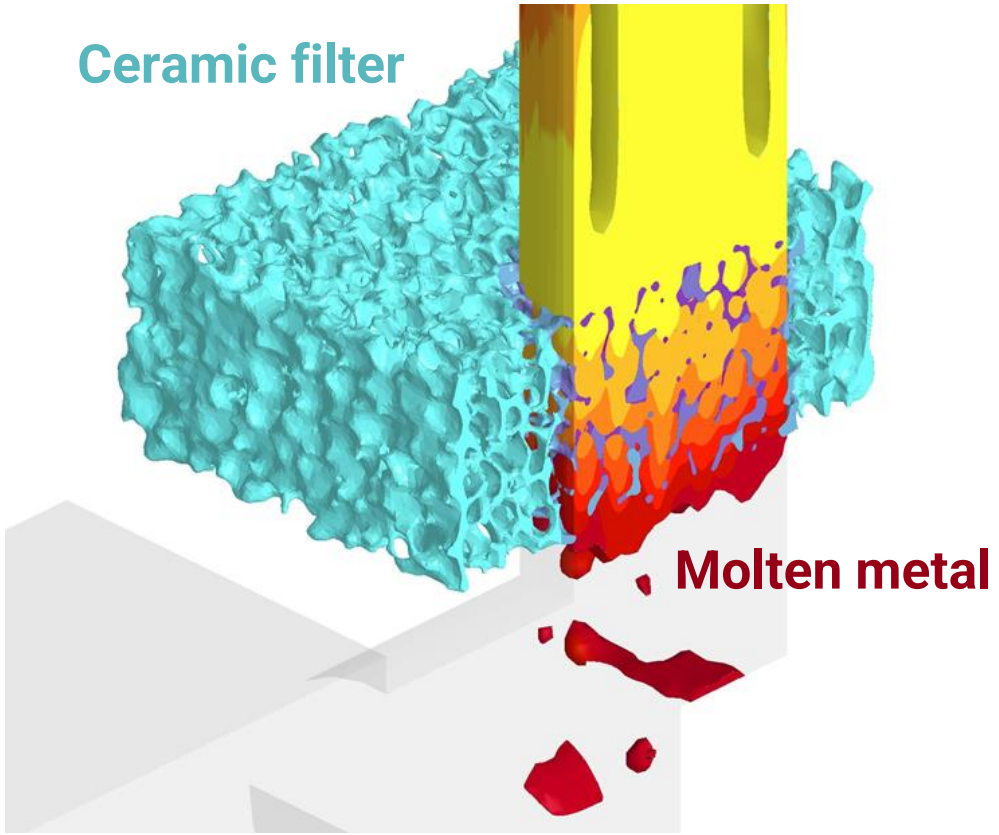
All these features makes your SEM imaging routine

- ✓ **Faster** using Wide Field Mode™ and In-Flight Beam Tracing™
- ✓ **More Efficient** using integrated Essence™ EDS in live scanning window
- ✓ **More Intuitive** using Essence™ modular software

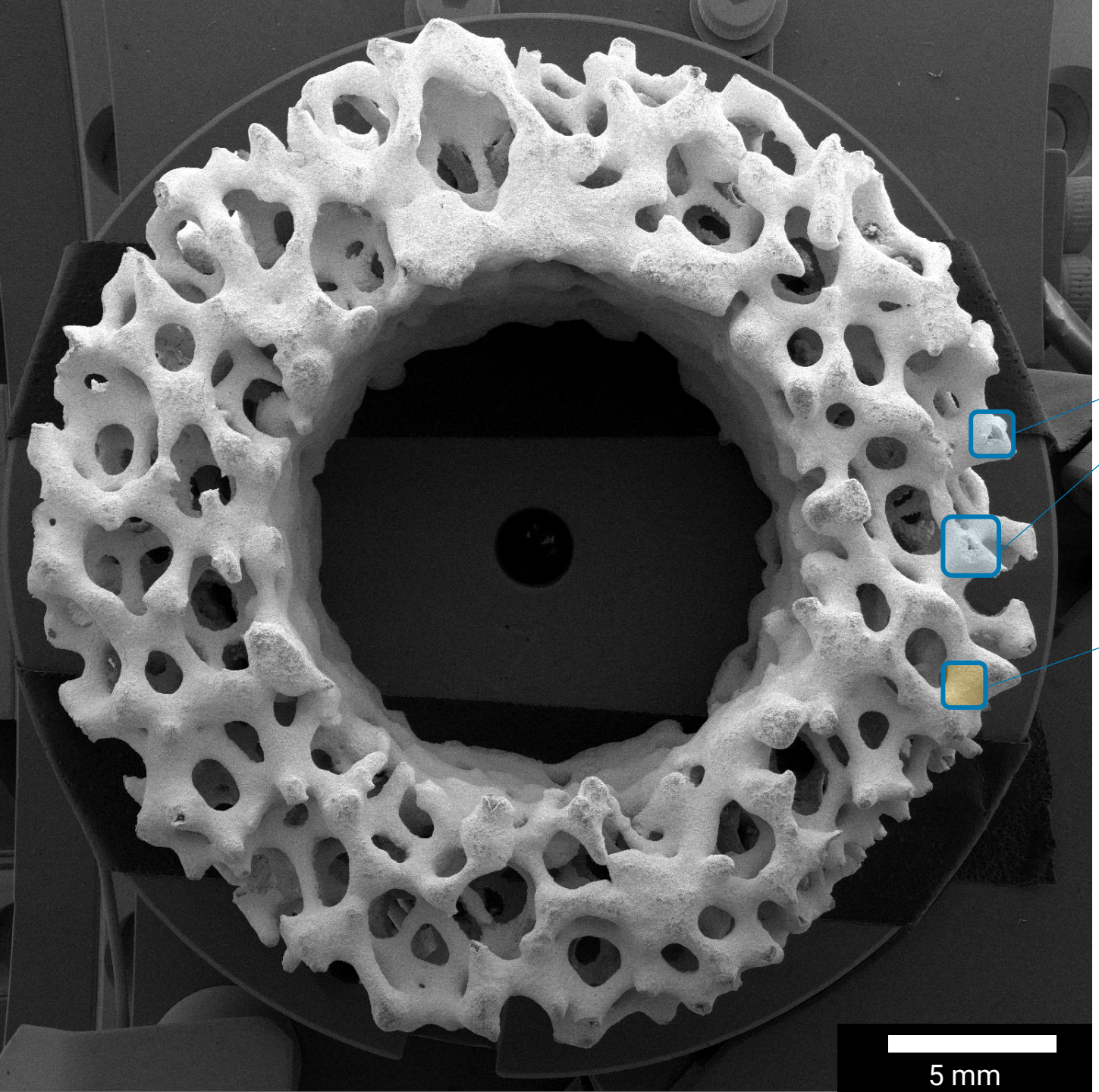
Evaluation of the Ceramic foam

- Ceramic foams have two principal applications
  - **As a ceramic filter** remove impurities from molten metal in the casting process at foundries.
  - **As a ceramic core** for castings from steel alloys and super alloys

- While produced mainly these factors are evaluated
  - Porosity
  - Cracks and adhesion of coatings
  - Overall morphology



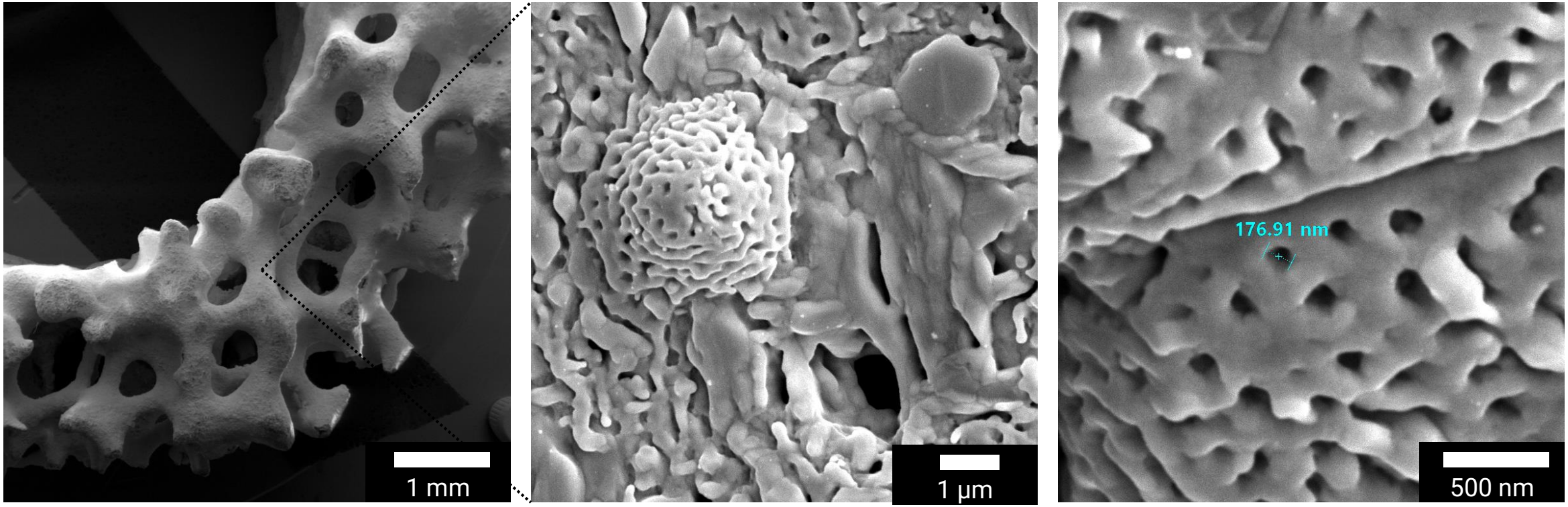
https://www.novacast.se/news/article-simulating-castings-real-foam-filters/



Locations where porosity may be evaluated
Locations where coating thickness and adherence can be analyzed

Locations where cracks in coating and coating adherence can be analyzed (all the surface)

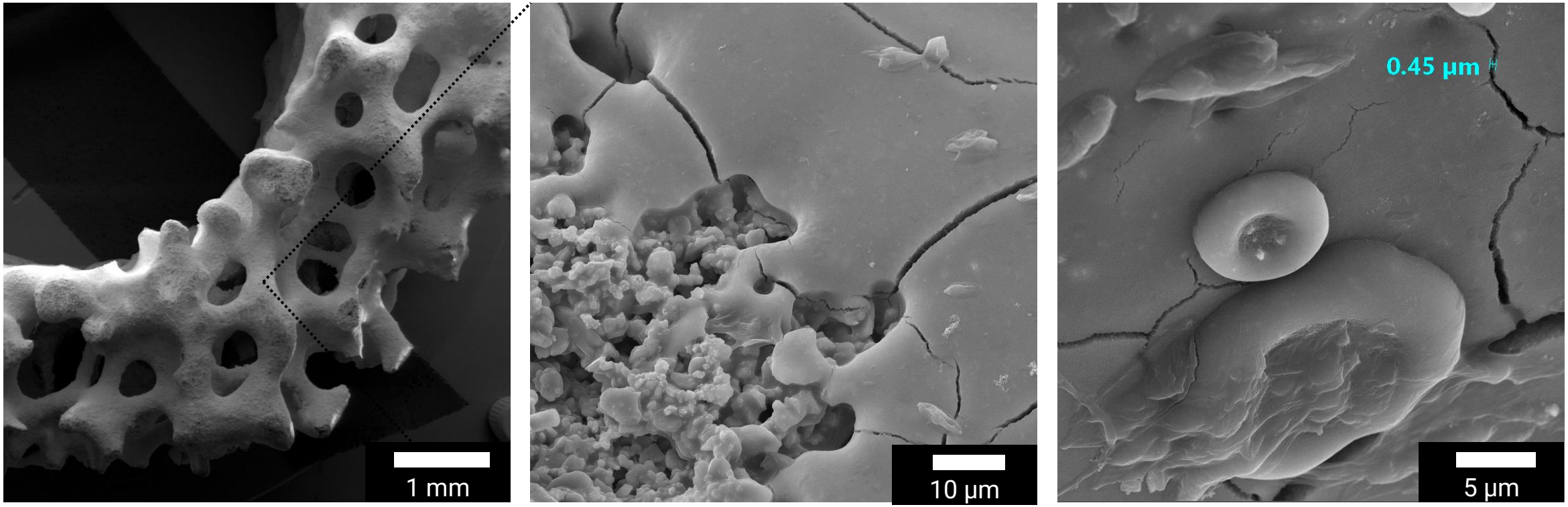
Ceramic foam was sputter coated



Analysis of pore size

Imaged at 15 keV with SE (left, middle) and BSE (right) detector

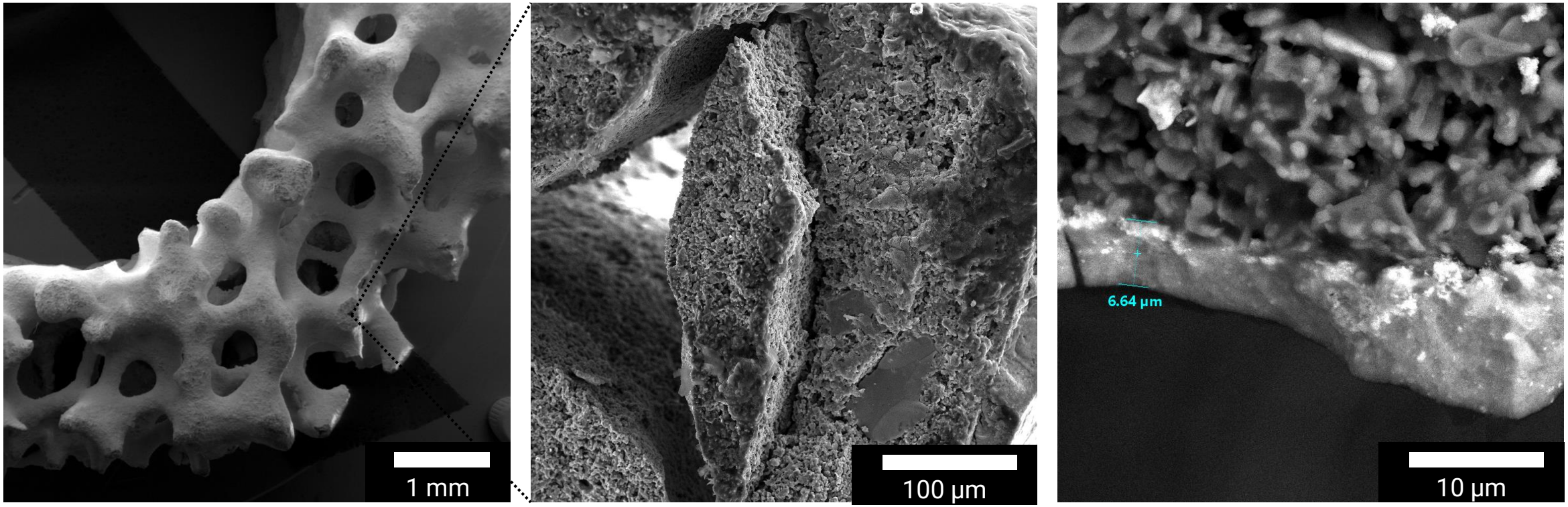
Ceramic foam was sputter coated



Analysis of Ti layer adherence and cracks

Imaged at 10 keV with SE detector

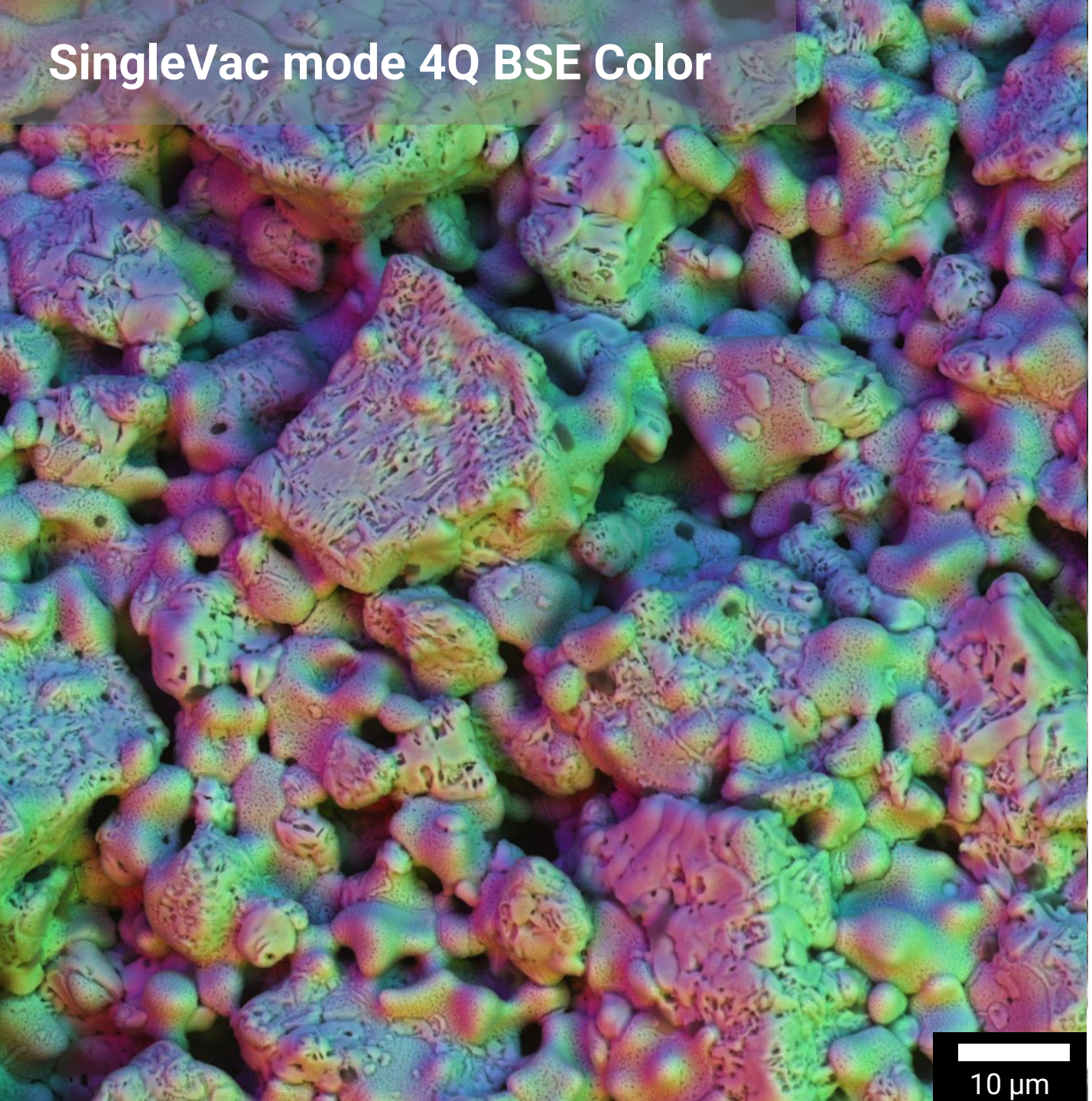
Ceramic foam was sputter coated



Ti Layer adherence and its thickness

Imaged at 15 keV with SE(left, middle) and BSE (right) detector

Ceramic foam was sputter coated

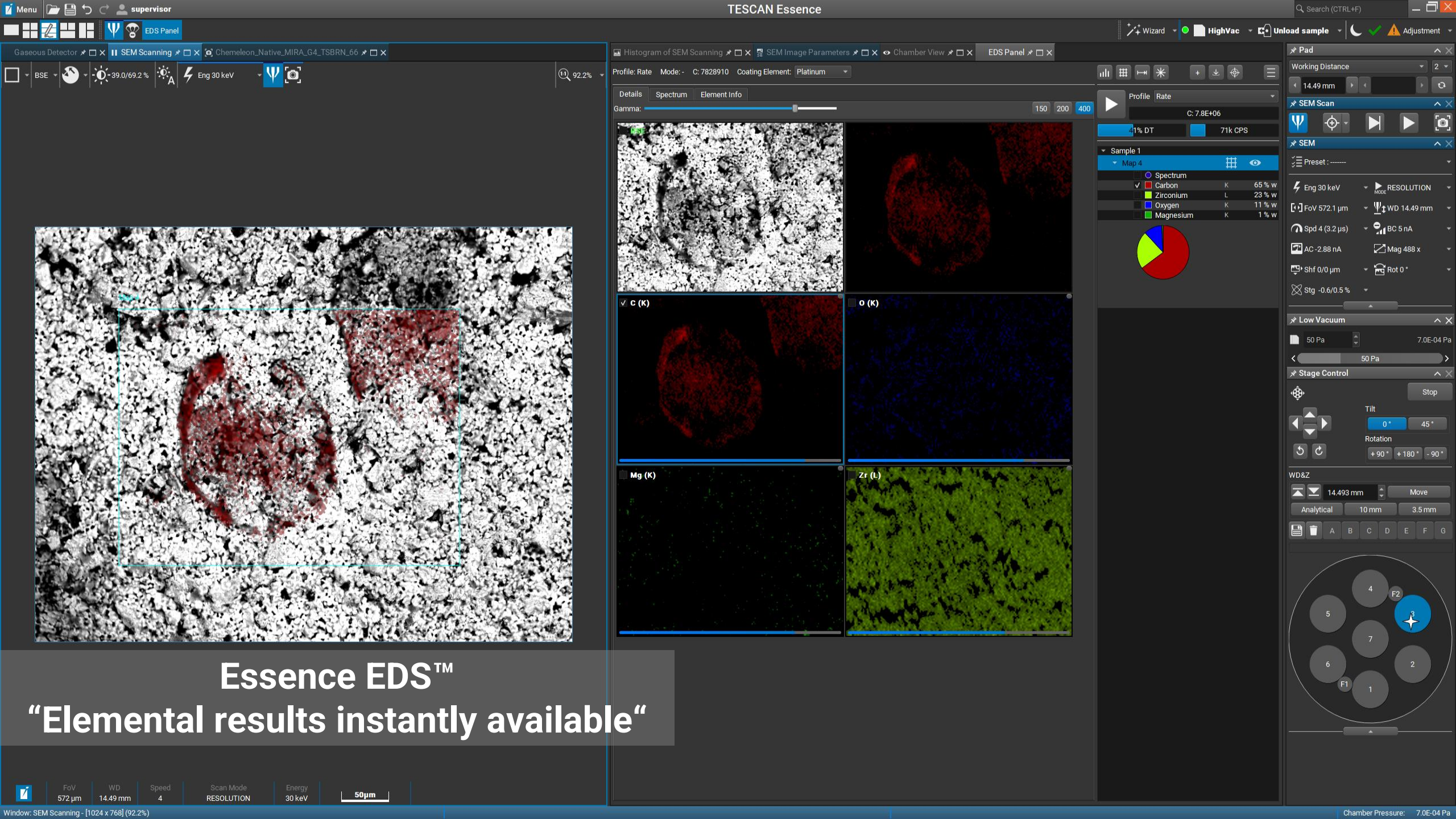


SingleVac mode

„single click to charge free imaging”

Ceramic foam

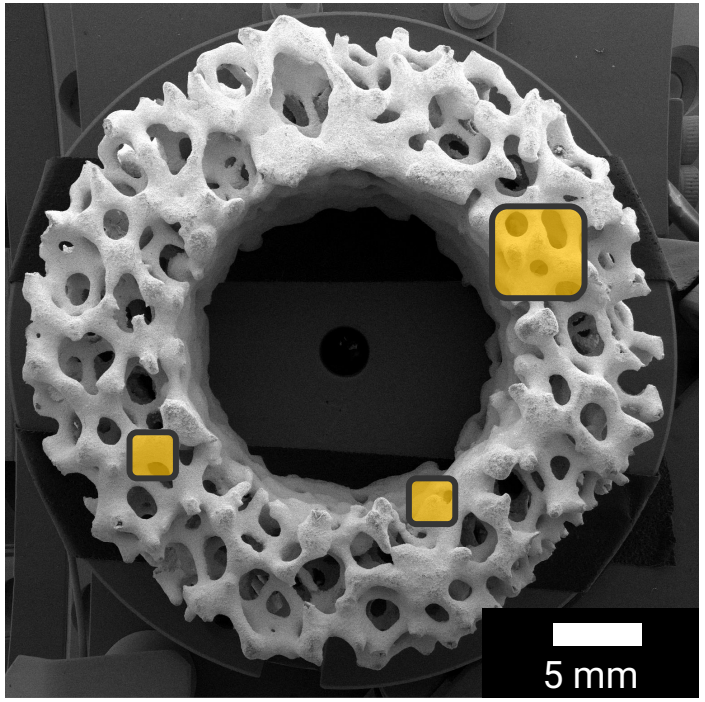
Imaged at 20 keV


TESCAN Essence
Histogram of SEM Scanning
SEM Image Parameters
Chamber View
EDS Panel
Profile: Rate
Mode: -
C: 7828910
Coating Element: Platinum
Details
Spectrum
Element Info
Gamma:
C (K)
O (K)
Mg (K)
Zr (L)
Sample 1
Map 4
Spectrum
Carbon K 65 % w
Zirconium L 23 % w
Oxygen K 11 % w
Magnesium K 1 % w
Pad
SEM Scan
SEM
Low Vacuum
Stage Control
Essence EDS™
“Elemental results instantly available“

Market leading ease of use got even better

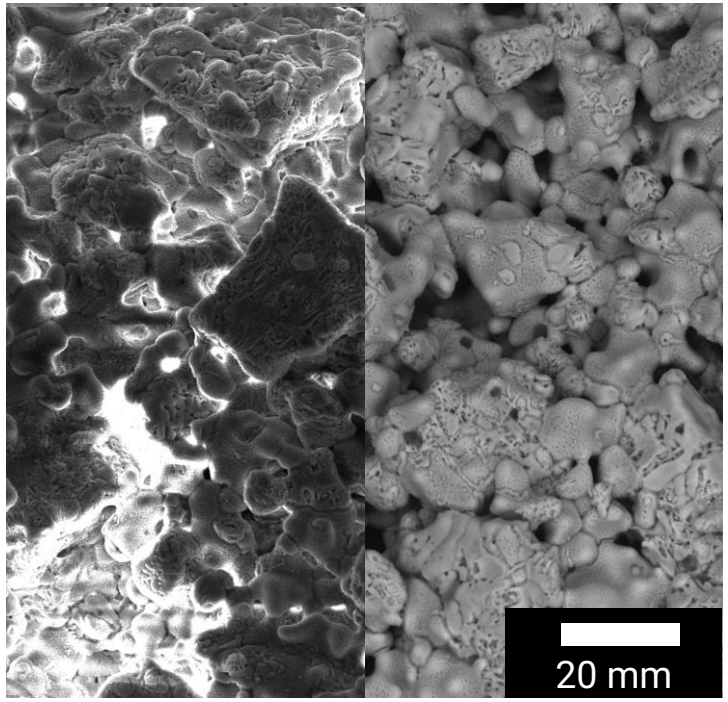
Wide Field Mode

„single click to locate right features of interest”



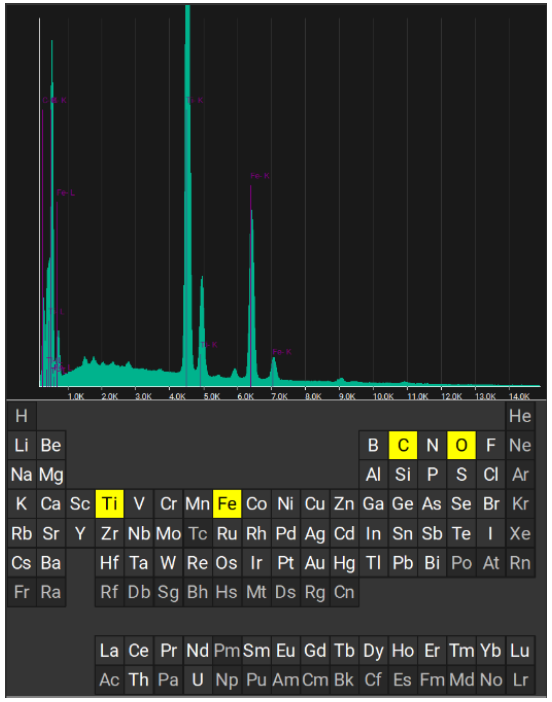
SingleVac

„single click to charge free imaging”



Essence™ EDS

„single click to elemental results”

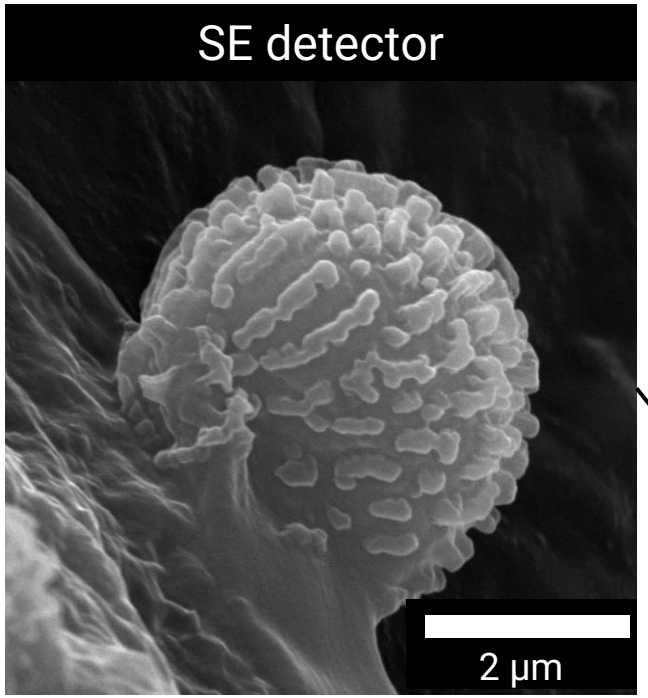


VEGA

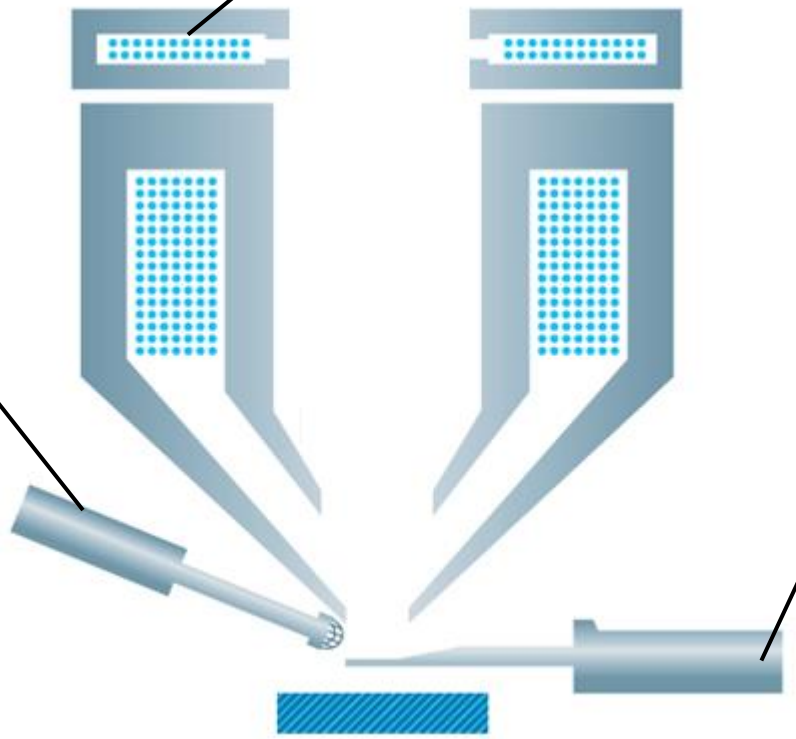
Intermediate Lens™

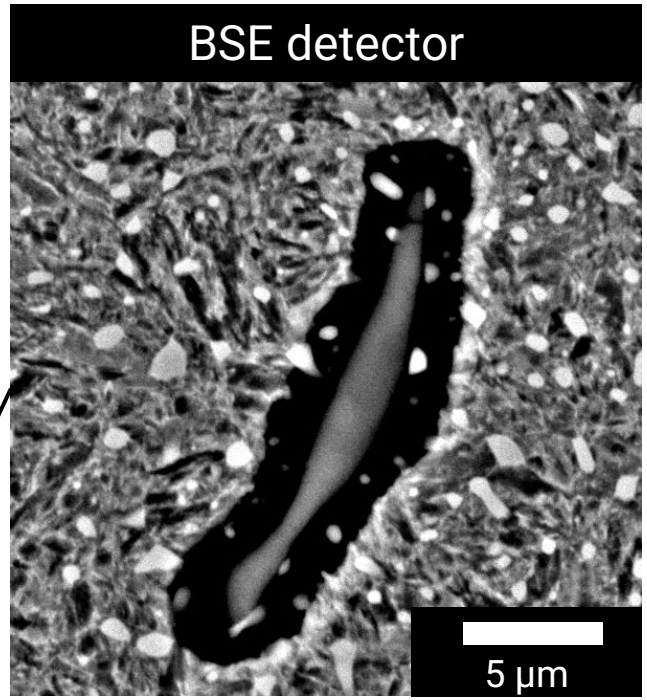
Provide access to the unique observation modes (WIDE FIELD, DEPTH and FIELD)

Used for fast setup of the beam - „Magnetic aperture “



Topographical contrast



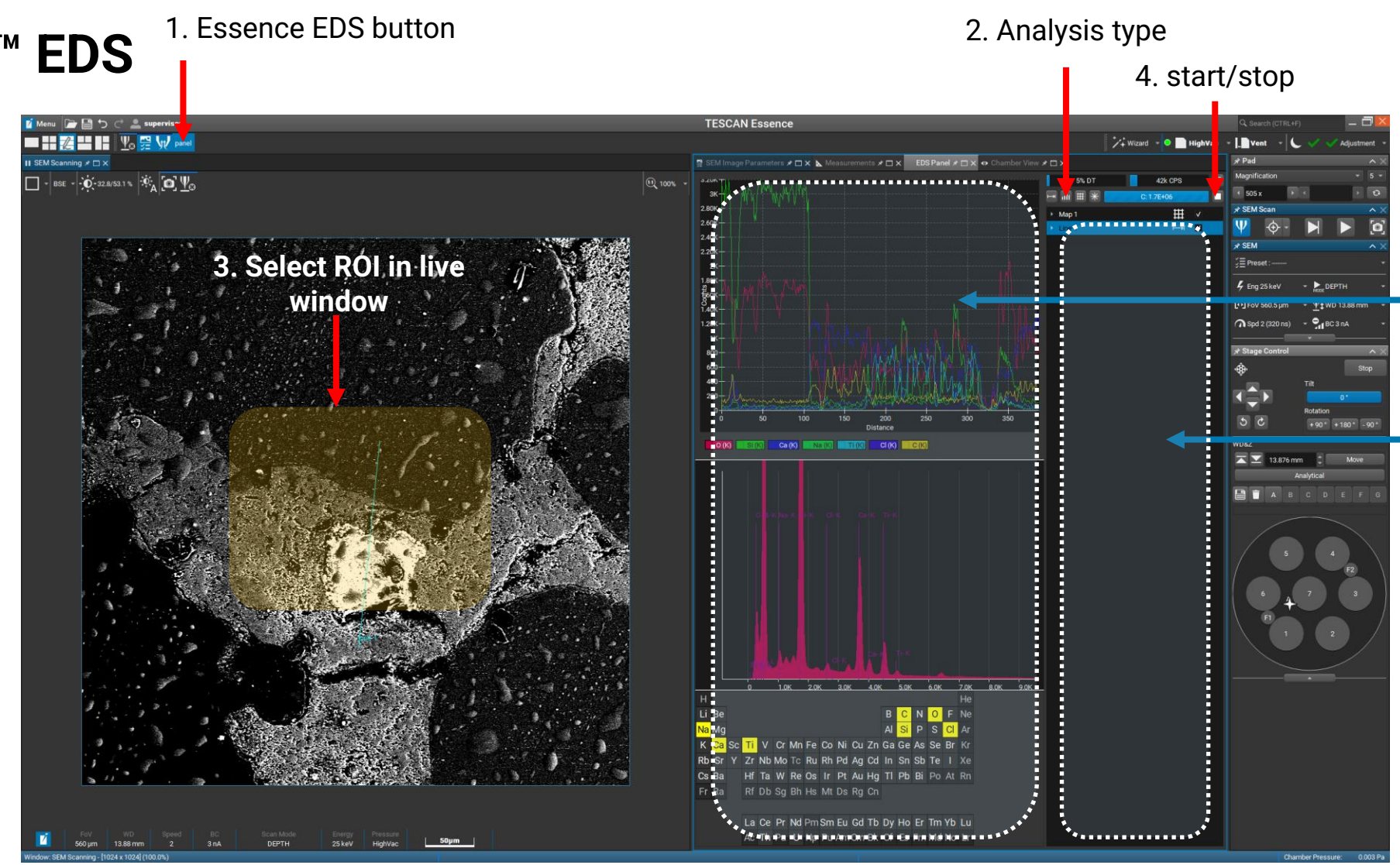


Material contrast

Essence™ EDS

Essence™ EDS	
Acquisition modes:	Spectrum from region, point & ID, line scan and elemental mapping
EDS detector chip/widnow size	30 mm2
Chip/window material	Si_3N_4 window
Resolution	129 eV resolution @ Mn Kα
Number of puls processing setings	3
Maximum input count rate:	up to 1 000 000 CPS
Maximum output count rate:	up to 300 000 CPS
Quantification:	standardless, ZAF corrected
Report function	YES

Essence™ EDS


1. Essence EDS button
2. Analysis type
4. start/stop
3. Select ROI in live window
TESCAN Essence
Data visualization
Data storage in data tree
All data can be reported or batch exported in *.PNG and *.CSV formate