EDAX APEX Software for EBSD

APEX Software for EBSD

EDAX APEX™ EBSD enables the characterization of electron backscatter diffraction (EBSD) patterns within the user-friendly APEX software platform. Combining powerful pattern analysis and an intuitive interface allows you to collect and report high-quality data quickly, easily, and reliably. Paired with EDAX hardware, APEX increases user productivity and offers the best solution for microstructural characterization.

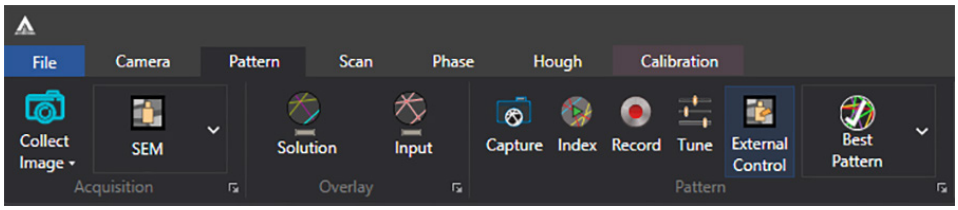

Figure 1. APEX EBSD ribbon bar.

- Intuitive software interface
- Customizable layouts and color schemes
- Powerful Triplet Indexing for EBSD
- Montage large area mapping and Batch Scan capability
- Automatic detector optimization
- Integrated EDS-EBSD
- ChI-Scan™ compatible
- Advanced reporting
- PRIAS™ compatible

Ease of use

- Intuitive operation for novice and expert users
- Graphical ribbon bar enables quick access to features and functions
- Analysis modes are organized into application tabs with relevant functions arranged in logical groups in each tab
- Automatic optimization of EBSD detector and data collection parameters

Adjustable layouts

- Multiple layouts are available for each application tab that show relevant view windows for the desired operation
- Ability to resize and arrange data view windows according to user requirements
- Save and reuse custom layouts
- Selectable color schemes to match the scanning electron microscope (SEM) interface or user preferences

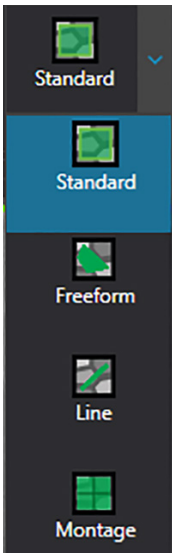

Figure 2. Context-sensitive layout selection.

User customization

- Single or multi-user modes
- Option to use Windows® Authentication for login
- Individual settings saved for each user

Triplet Indexing engine

- Minimize sensitivity to rogue band detection with the unique three-bands (triplets) indexing approach
- Achieve high indexing success rates with Triplet Indexing at the highest available speeds of the Velocity™ EBSD detectors
- Patented Confidence Index value provides a quantitative quality measurement for the crystallographic indexing solution
- Optimize band detection settings on the dedicated Hough page to allow for successful indexing of all crystal structures
- Produce high-quality, indexing results on real-world samples

Comprehensive EBSD data collection

- Easily collect individual EBSD patterns or a full scan
- Multiple scan modes are available
- Hexagonal grid sampling for enhanced data sampling
- Line scan acquisition
- Automatic step size recommendations for efficient scanning
- Automatic detector optimization for application-specific EBSD data collection

Dynamic scanning

- Observe and assess data collection in real-time with visual and numeric feedback during each scan
- Grayscale maps include Image Quality, SEM signal, and PRIAS (optional)
- Color maps include IPF, Confidence Index, phase, and energy dispersive spectroscopy (EDS) elements
- Combine grayscale and color maps for a better understanding of the results
- Data statistics summary
- EBSD pattern and indexing display
- Crystal Unit Cell display
- Hough band detection
- Feedback provides users with information on collection quality

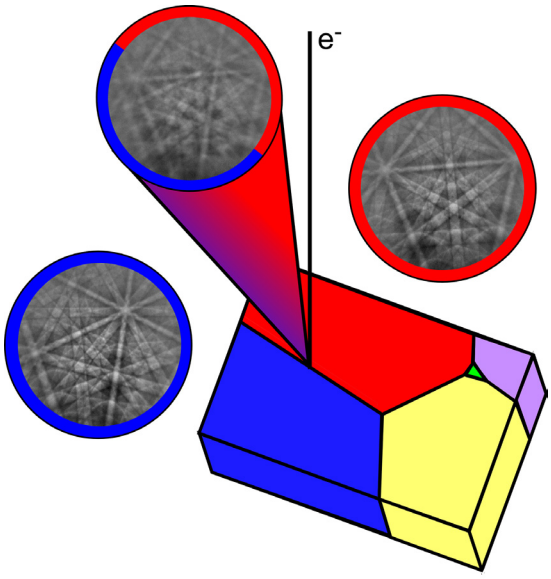

Figure 3. Triplet Indexing resolves overlapping patterns for better indexing.

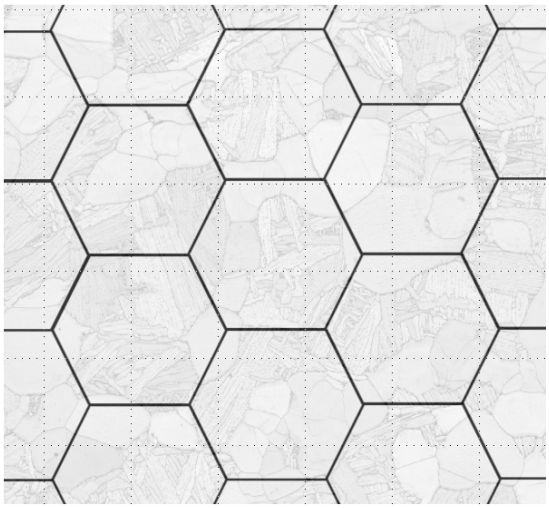

Figure 4. Hexagonal sampling grid for enhanced data sampling.

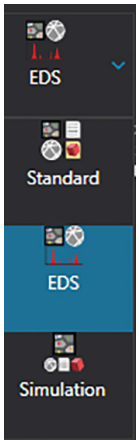

Figure 5. Multiple scanning modes are available.

Montage large area mapping

- Scan large areas using stage movements to collect multiple fields of analysis
- Automatically stitch data into a single file for comprehensive analysis
- Oversampling is available to improve matching between fields

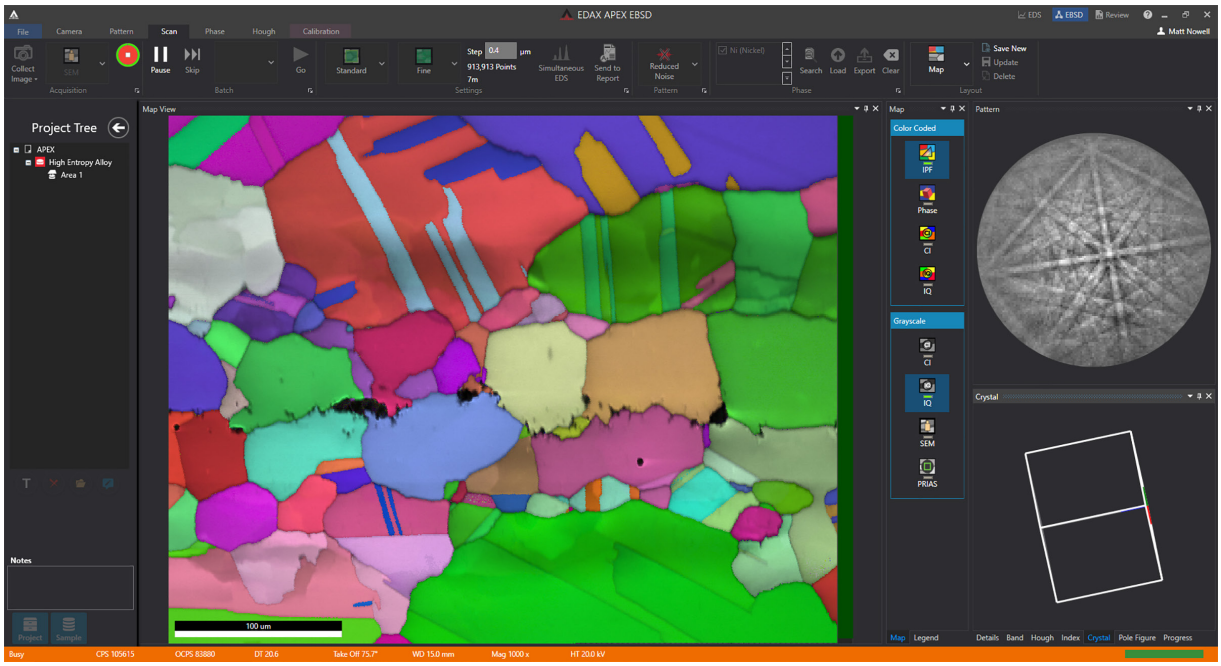

Figure 6. EBSD mapping example from a high entropy alloy weld.

Batch Scanning

- Collect a series of scans as a single batch process
- Define standard free-form, montage, and line scans within a batch
- Define the magnification, scan area, step size, simultaneous EDS, and stage location within the batch
- Enable efficient use of SEM for analyzing multiple areas or samples

Data management

- Project tree structure for the seamless organization of data
- 64-bit software architecture for handling big data
- HDF file format for data management and portability
- Single file for both EDS and EBSD collection
- Ability to specify file name and location to meet user needs
- Default names within the project tree for quick collection with the option to rename if desired
- HDF file compatible with APEX Review for EDS analysis and OIM Analysis™ for EBSD analysis

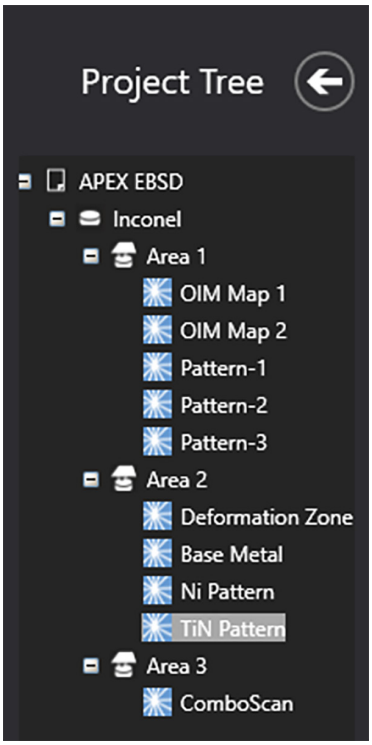

Figure 7. Project tree data organization.

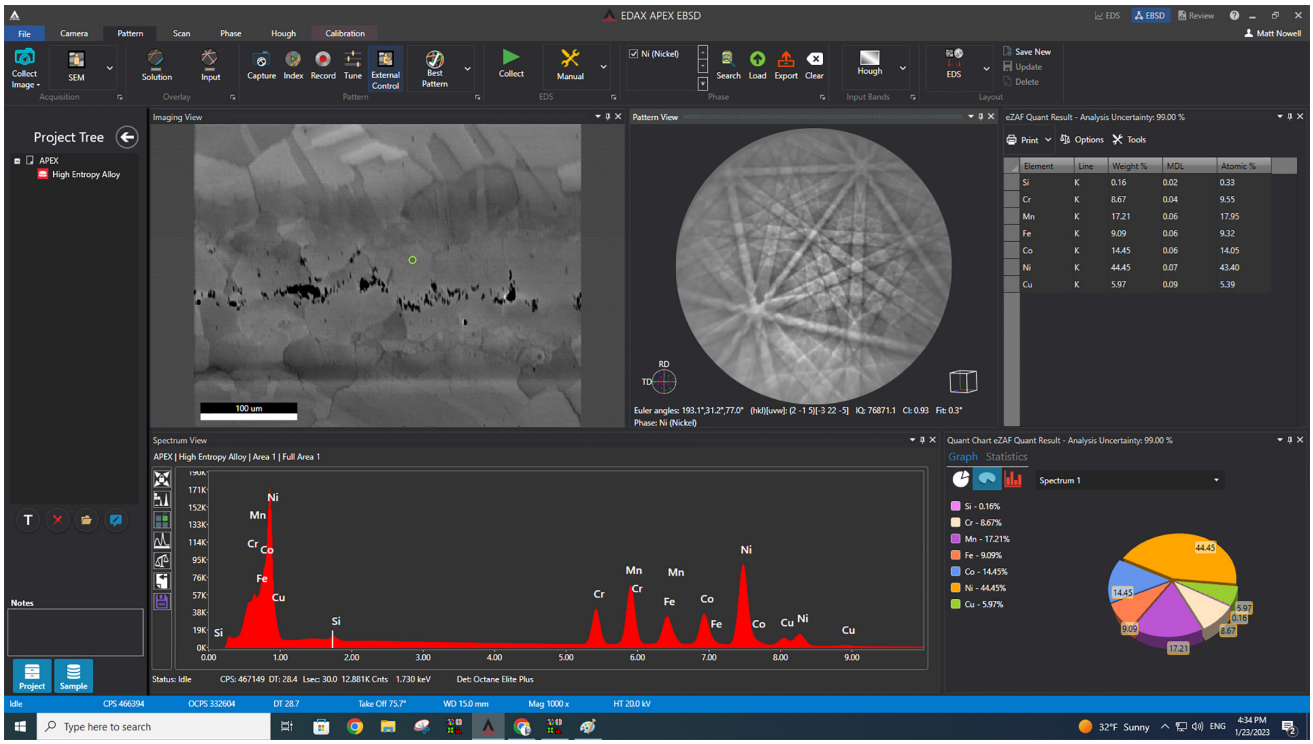

Figure 8. Simultaneous EDS-EBSD collection in APEX EBSD.

Integrated EDS-EBSD

- Full integration of EDS and EBSD for comprehensive materials characterization
- Combine EDS spectrum with EBSD pattern collection for correlation of chemical and structural information
- Utilize advanced EDS quant engine with optimization for high-tilt EBSD geometries
- Simultaneous EDS-EBSD scanning compatible with Chl-Scan processing for enhanced multi-phase analysis

Advanced Reporting

- Customizable report generation based on OIM Analysis user templates
- Tailored report layout with the Report Designer tool
- User-defined report content in template files with default design templates available
- Generate reports from APEX EBSD or OIM Analysis software
- Use reporting with batch scanning capability

Conclusion

APEX EBSD brings crystallographic microstructural characterization to the next level. When combined with APEX EDS, it provides a complete structural and chemical characterization of materials. APEX gives users an easy-to-use, customizable platform with advanced analytical capabilities for fast and accurate results.

APEX EBSD software options

Feature	
Triplet Indexing engine	●
Confidence Index value for each indexed pattern	●
Standard, Freeform, and Linescan acquisitions	●
Automated camera optimization	●
Advanced Hough Transform band detection	●
Advanced reporting via OIM Analysis templates	●
Batch Scanning	●
Multi-user capability	●
Slide control for motorized slides	●
EDAX EBSD structure file data-base	●
American Mineralogist crystal structure database	●
Project-based data management with HDF5 files	●
Montage large area mapping	Option