ELDICO *ED-1*

Automated High-Throughput
Electron Diffraction

ELDICO SCIENTIFIC
THE ELECTRON DIFFRACTION COMPANY

24/7 Electron Diffraction

Unlock Structures, Secure Patents
Precise structure determination from nanocrystals, strengthening IP for novel polymorphs of APIs.

Fast Results, Minimal Sample
Solve crystal structures from nano-grams of crystalline material.

Automation-Ready for High Throughput
Synergistic hardware-software integration enables intelligent automation, unlocking new levels of productivity and novel applications.

Lab-Friendly Design
Small footprint fits any lab - horizontal layout requires no high ceilings.

Low-Maintenance
Robust, stable performance, and minimal hands-on upkeep allow your resources to focus on productive work, not hardware troubleshooting.

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The Electron Diffraction Company

ELDICO Scientific AG – the Electron Diffraction Company – is a Swiss instruments company founded 2019.

ELDICO develops, produces and sells electron diffractometers for the analysis of solid compounds enabling industrial and scientific researchers to characterize hitherto unmeasurable nanocrystalline systems.

For us, shaping the future of crystallography means we support academic and industrial scientists in their quest to obtain relevant structural information faster, with better quality and at lower cost.

The ELDICO *ED-1*

The ELDICO *ED-1* is the world's first dedicated horizontal electron diffractometer. Developed with flexibility in mind, it features a cutting-edge goniometer, dedicated electron source and hybrid pixel detector. Paired with the reduced distortion due to the streamlined optics of the setup, this makes it a perfect device for advanced automation. The ELDICO *ED-1* is set to revolutionize electron diffraction for diverse industrial scientific applications.

A look inside: *ED-1*'s core layout combines high-stability hardware, a patented goniometer, and flexible modular components.

Applications

Due to its unique design ELDICO *ED-1*'s data quality is higher:

- Enabling reliable ab initio structure determination
- Allowing for easier absolute configuration determination.

Automation brings new applications:

- Detect micro-crystallinity in amorphous materials
- Detect and indentify crystalline impurities in powder materials
- 24/7 ED
- Many more

From Pharma to Materials

This versatility enables applications across diverse industries:

- Pharmaceutical industry
- Agro-chemical industry
- Battery industry
- Metal-Organic Frameworks (MOFs)
- and much more…

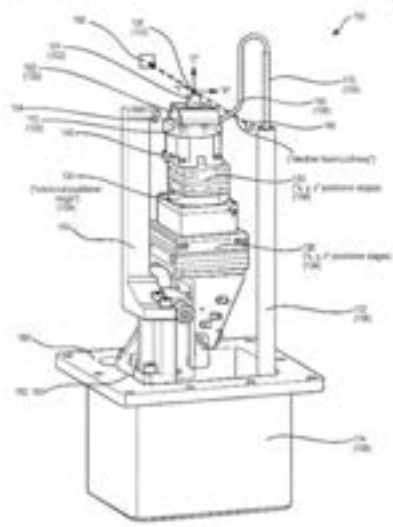
Learn more about applications

State of the Art Goniometer

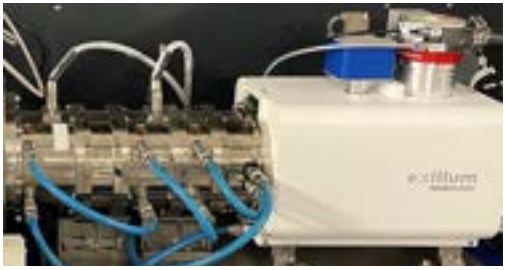
The patented goniometer in the ELDICO *ED-1* delivers unmatched flexibility and control, enabling automation even at low temperatures.

This goniometer possesses several exceptional features:

- Four independent translation axes
- Large range of motion
- One precise rotation axis
- Precise alignment capabilities
- Large rotation angle
- Small sphere of confusion
- Active low temperature cooling



Learn more about the goniometer



Optimized for Beam Sensitive materials

E-beam source and optical column from Excillum is optimized to reduce beam damage as it uses STEM mode for imaging and has a very small parallel diffraction beam. Neighbouring particles are not damaged in imaging and diffraction mode.

E-beam Source and Optical Column

The ELDICO *ED-1* has a radically simplified electron beam and optical column, developed in collaboration with our esteemed partner, Excillum. This electron beam exhibits several remarkable characteristics:

- Optimized for low dose
- Seamless mode switching
- Parallel diffraction beam
- Fixed position for diffraction
- STEM imaging
- Very stable set-up
- Requires low maintenance

The inert transfer system is ideal for materials that are highly sensitive to air or moisture, such as reactive compounds or unstable crystalline materials. By maintaining an inert atmosphere, the device ensures that the samples are not exposed to oxygen or water vapor, preserving their original state for accurate analysis.

Learn more about the inert transfer system

ELDICO *ED-1* Inert Sample Transfer device

The dedicated inert sample transfer device for the ELDICO *ED-1* is specifically engineered to address the challenges of transferring sensitive samples, ensuring their integrity throughout the process.

The transfer device boasts exceptional practical features:

- Robust and easy to operate
- Secure transfer chamber for easy transportation
- Optimized for handling low-temperature samples
- Designed for air-sensitive samples

Unique System Geometry of the ELDICO *ED-1*

The ELDICO *ED-1* has a unique design that sets it apart from traditional electron diffraction systems by eliminating lenses between the sample and the detector. This innovative geometry delivers several critical advantages:

- No distortion of the diffraction pattern
- Fixed sample-to-detector distance
- Superior accuracy compared to TEM-based systems

The consistent and precise distance between the sample and the detector contributes to exceptionally accurate unit cell determinations compared to other electron diffractometers build on a TEM platform .

Multi-grid (6) holder allows 24/7 high-throughput ED measurements without manual intervention.

Learn more about the versatile design.

Versatile in its Design

The ELDICO *ED-1* is designed for fundamental versatility, making it an ideal solution for a wide range of electron diffraction workflows — from academic research to industrial high-throughput screening.

At the heart of its flexible architecture lie several key innovations:

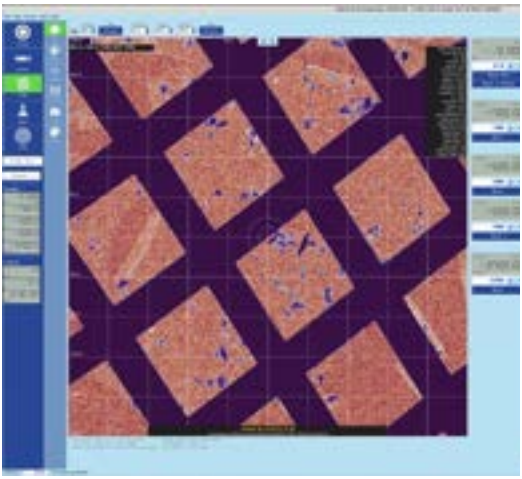
- Spacious sample chamber, allowing easy access and accommodation of various sample types and holders.
- High-precision goniometer, uniquely optimized for electron diffraction, ensuring accurate and reproducible data.
- Modular software, providing intuitive customization and seamless integration into automated or bespoke workflows.

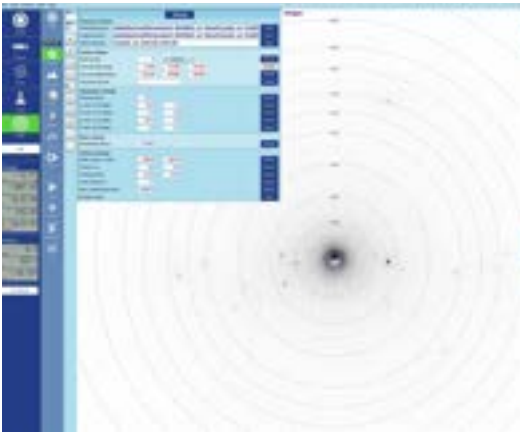
A key example of the *ED-1*'s versatility is the multi-sample holder, enabling automated, high-throughput data collection with minimal manual handling — ideal for polymorph screening or materials research.

Dual EDS probe compatibility further enhances the system, allowing simultaneous structural and elemental analysis. Together, these features offer unmatched flexibility for tackling complex samples and diverse crystallographic challenges.

ELDIX: Software Control, Intuitive for All Users

The ELDIX software suite is the intuitive user interface controlling the *ED-1.*
ELDIX utilizes DIALS software for its data evaluation processes. DIALS is a state-of-the-art software suite designed by several collaborators to provide advanced tools for data evaluation, ensuring high precision and reliability in results. ELDIX includes some advance features to already unlock new novel applications.





Key Software Features

- 24/7 automated ED
- Operating system compatibility
- Versatile data output
- Ready-to-go automated workflows
- Integrated AI tools
- Automated electron diffraction measurements
- Precise alignment
- SerialED

For more info

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