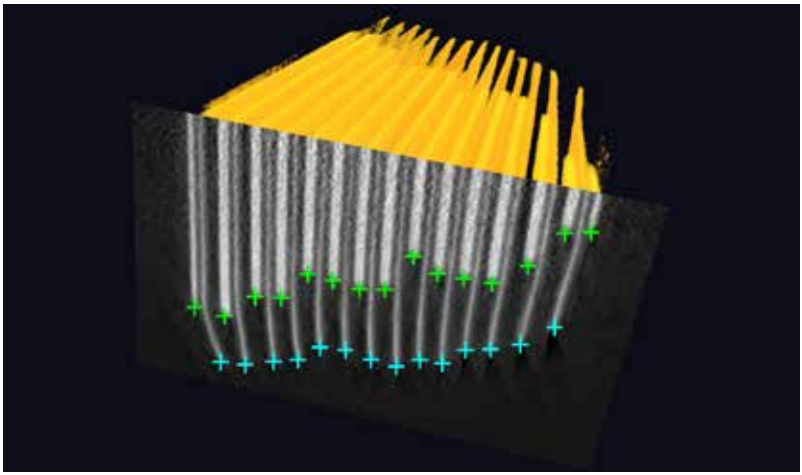
excillum

Inspect with micrometer resolution **in battery manufacturing**

Reliable energy storage and efficient renewable energy production are key to a sustainable future. But fast-changing global vehicle fleets and electrical production systems will require exponential growth in the number of battery cells produced. Excillum's MetalJet X-ray sources enable full inline CT scanning capabilities with micrometer resolution, giving manufacturers the high-speed, high-resolution 3D imaging they need to ensure product safety and quality at the highest throughputs.

Inline microCT of EV battery cells

Inline X-ray computed tomography (CT) is a powerful inspection technique that can further reduce the risk of defects and recalls, compared to today's 2D X-ray inspection techniques. However, to achieve the levels of inspection coverage, throughput and resolution necessary for high-volume battery production, a high-power X-ray source with a micrometer-sized X-ray spot is necessary. The Excillum MetalJet E1+ source makes this possible, achieving a full scan with micrometer resolution in just one second, or less.



An internal feature to be inspected during manufacturing of a battery is the anode overhang. The anode should be dimensioned to overlap the cathode. To produce this with repeatability puts high demands on the manufacturing and process precisions. To inspect this with precision in prismatic battery cells, X-ray CT is a pre-requisite. Furthermore, to have a 3D model of each produced battery cell can be very helpful for forensics in case a battery cell would fail in

the field – in order to minimize a recall to an as small volume as possible.

100% 3D X-ray inspection, or 3D complement to 2D inspection in unclear cases, is a promising path to satisfactory quality control. But, in order to achieve 100% 3D X-ray inspection, a high-power X-ray source with a micrometer-sized X-ray spot is needed – something previously not available on the market.

MetalJet E1+ for high-speed full inline CT scanning

With the MetalJet E1+, Excillum enables high-speed 3D X-ray inspection of batteries and other industrial parts.

Benefits include:

- **Kilowatt microfocus performance with submicron stability.**
  At 1000 watts, the Excillum MetalJet E1+ delivers 17 times more X-ray flux across a broad spectral range compared to a 30 W conventional tungsten-solid-anode microfocus source with the same 30 µm spot size.
- **Built for 24/7 continuous performance.**
  The MetalJet E1+ is designed for high-throughput, 100% duty-cycle operation with up to once-per-year preventive maintenance cycles.
- **Sub-µm positional stability.**
  Although running at a high thermal load of 1000 W, the MetalJet E1+ maintains a positional stability of below 1 µm during continuous long-term operation.

Watch video
1 second X-ray CT of an EV battery cell

Scan to view

About Excillum

Excillum is the global source for X-ray innovation. We develop, manufacture, and service the world's brightest and most advanced industrial and laboratory X-ray sources. In close collaboration with best-in-class scientific, industrial and system integration partners we enable new science, improve medicine and enhance manufacturing. Headquartered in Stockholm, Sweden, Excillum is pushing the limits of X-ray source technologies since 2007.

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Revision 2022-09-22