

# EV BATTERY ELECTRODE MANUFACTURING

Safeguard electrode coating while reducing inspection times

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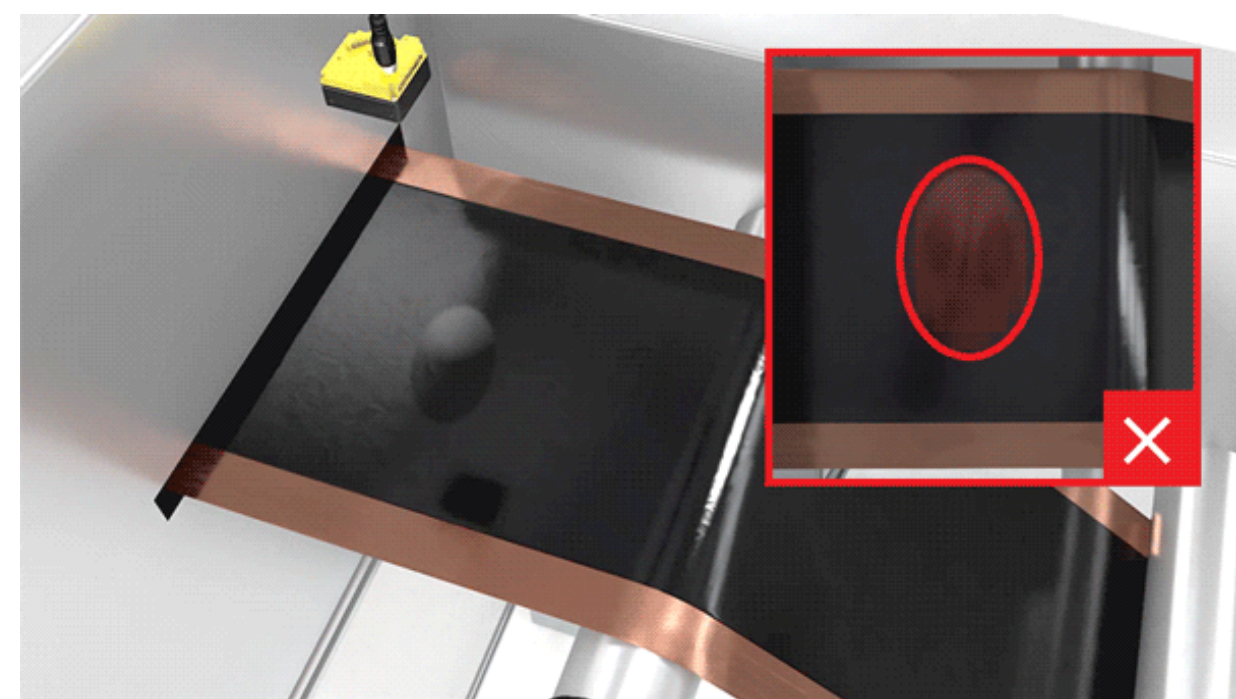
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The most common form of electrode coating in electric vehicle (EV) battery manufacturing is called "wet coating." Wet coating entails mixing a slurry of carbon, graphite, a binding agent, and other elements and pouring the mixture on anodes and cathodes.

Inspecting electrode coating for bubbles, scratches, holes, and other defects is critical to EV battery safety. These flaws can degrade battery performance and longevity, and at worst could cause an electrical shortage or fire.

Machine vision is essential for inspecting electrode coatings; identifying flaws helps preserve battery quality and efficiency. The defect detection process is tedious, and the most effective solution must identify subtle flaws in the slurry while it's being applied and processed at high speeds.



Cognex line-scan machine vision systems and AI-based image analysis software accurately identify and classify subtle flaws during EV electrode coating.

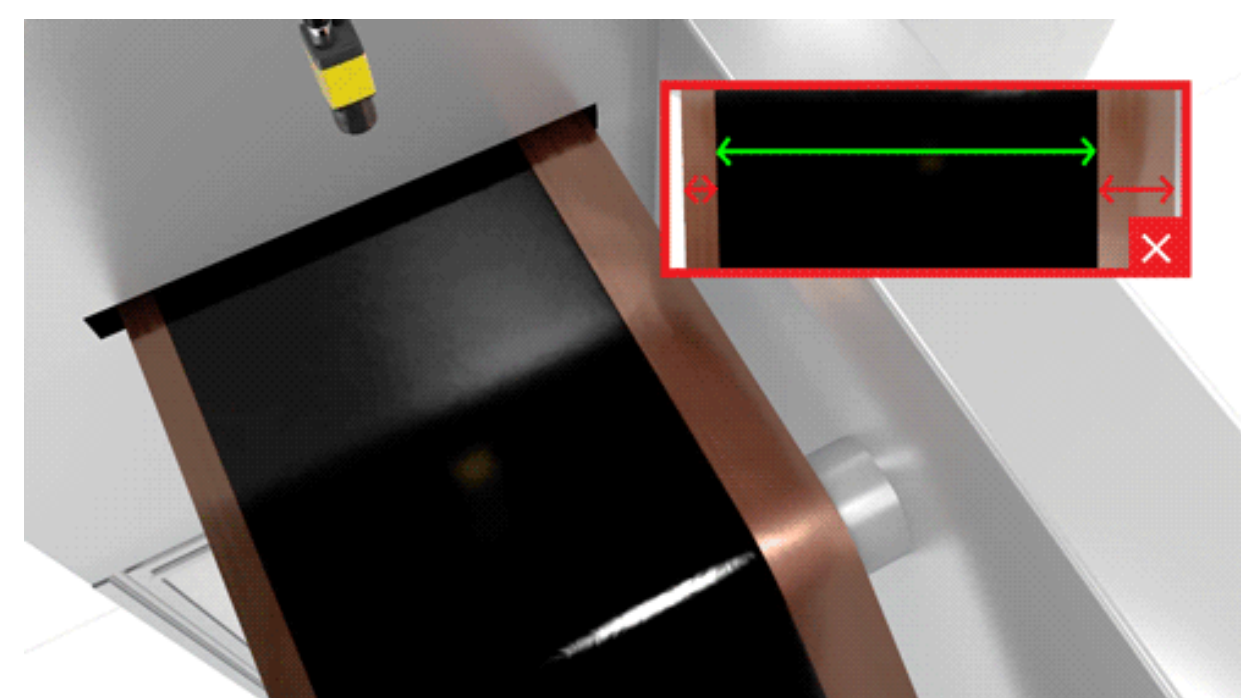
### Electrode Coating Inspection

EV battery electrode slurry is thin, black, and highly reflective, therefore identifying subtle flaws in these low-contrast settings is extremely difficult. Variable, complex defects make rule-based machine vision inspections inadequate; the technology cannot reliably account for every type of flaw.

Line-scan Cognex Industrial Cameras (CIC) have a short exposure time ideal for high-speed, continuous operations like electrode coating inspection. Combined with VisionPro Deep Learning software, the solution can isolate subtle defects in poor contrast environments like matte-black electrode coating.

### Electrode Coating Width Gauging

After electrode coating, battery manufacturers measure the widths of anodes, cathodes, and insulator material. Uneven EV battery electrode coating can expose electrically conductive materials, causing irreparable damage to the electrode sheet and potentially causing an electrical short or fire.



Cognex machine vision systems quickly gauge the widths of EV battery electrode coatings in real time.

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In-line machine vision inspections allow electrode manufacturers to identify upstream production issues, such as the rate the slurry is applied or the position of the metal substrate. Area-scan Cognex Industrial Cameras (CICs) equipped with VisionPro software gauge the dimensions of the electrode, separator, and aluminum or copper coating. The software analyzes the images of electrode coating to ensure it meets exact requirements in real-time, eliminating the need for offline inspections, identifying errors earlier in production, and reducing changeover times.

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