SURFACEVISION

Surface Inspection of Coated Separators

DELIVERED THROUGH

SMARTVIEW® — Online detection, classification and visualization of surface defects

SMARTADVISOR® — Synchronized real-time process monitoring and inspection

AMETEK Surface Vision's machine vision system has been created to detect and classify separator defects, ensuring battery producers can distinguish non-quality-related optical effects from genuine defects. SmartView's detection technology reduces the need for manual intervention and can adapt to the huge variety of separator membrane types.

SURFACEVISION

BATTERY SEPARATOR

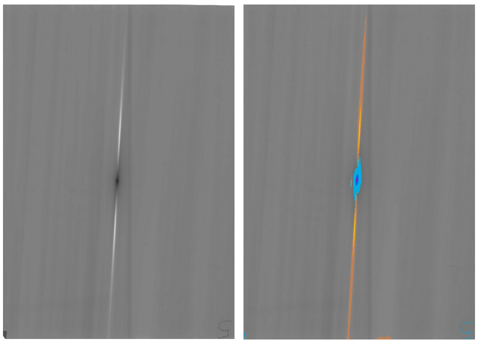
- 100% defect detection and classification
- Modular Camera Option optimized for wet and dry processes
- Transmission & Reflection Inspection with defect correlation
- Adaptive illumination concepts. Optimized for single and multi layer demand
- Typical Web Speed 30 – 250 m/min
- Typical web width 1000 – < 6000 mm
- Typical System Resolution = 50µm - 100µm
- Repeating defect detection
- Self Learning Classifier
- Low contrast detection algorithm
- Real time output for marker / labeler etc.
- Data communication to customer
- Long term trends
- Advanced Winder Advisor of post processing yield optimization

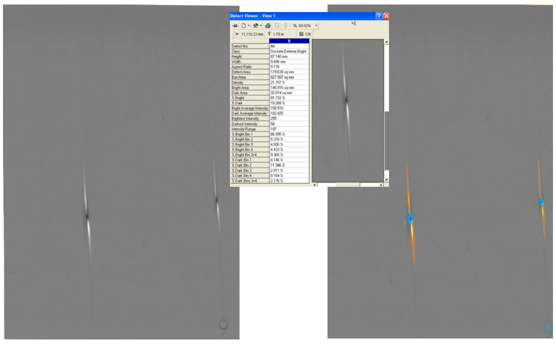
DEFECT TYPES

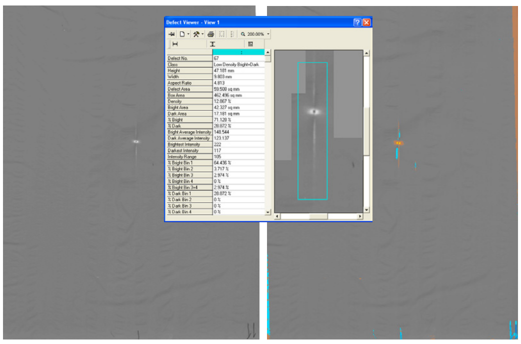
- Gel particle
- Thin spots
- Pinholes
- Coating skip
- Foreign material
- Oil stain
- Streak defects
- Inclusions
- Fisheye
- Bubbles
- Scratches
- Wrinkles
- and more

EXAMPLES OF DEFECT TYPES

Defect Gel

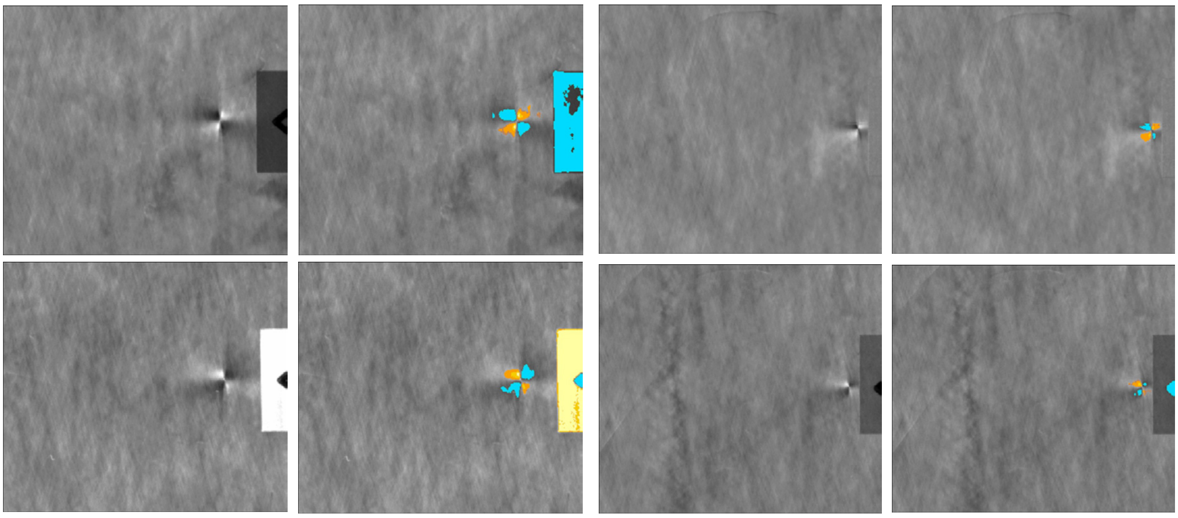






EXAMPLES OF DEFECT TYPES

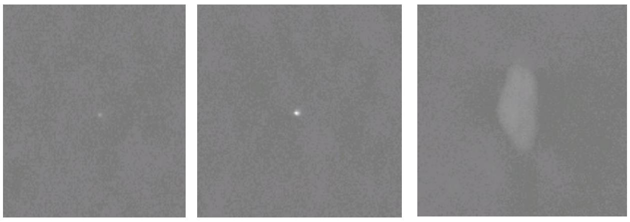
Multi Layer Gel



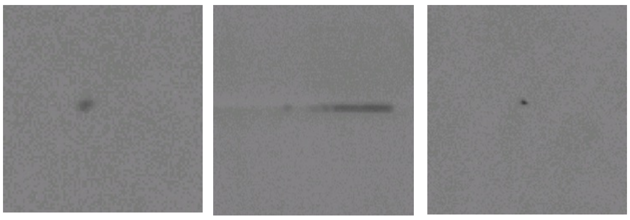
Wet-process Separator Film

Transmission

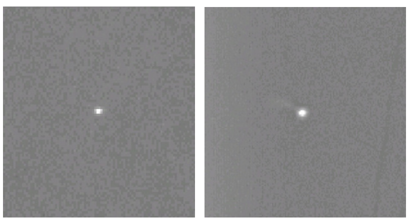
Bright Spot



Dark Spot

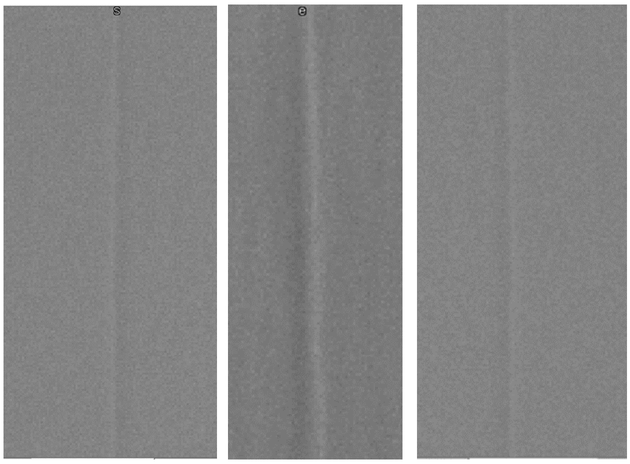


Hole

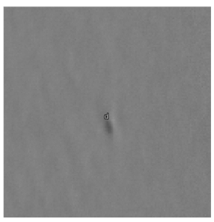


Reflection

Bright Line (Streak)

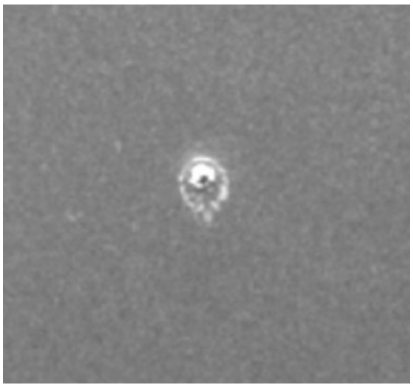


Pit

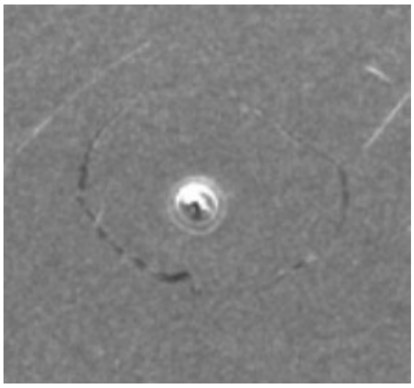


OPTICAL CONFIGURATIONS

Transmission



Transmission (foreign object)



Transmission (bubble)

Cost Overview of a Battery Cell

- With a material cost share of 17%, the separator has a significant impact on total costs.
- With up to 50% of the total cost, the battery is the most expensive component of an electric vehicle. Therefore, the success of electric mobility is essentially determined by the price of the battery.
- In the manufacturing of lithium-ion battery cells, material costs account for the majority of battery costs.
- One way of making the battery more powerful and energetic, and therefore more successful, is to use high-quality component materials.
- With 44% of material costs, the cathode material is the most expensive component of the battery cell.