NREL patents method for continuous monitoring of materials during manufacturing

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The Energy Department's National Renewable Energy Laboratory (NREL) was recently issued a patent for a novel method that rapidly characterizes specialized materials during the manufacturing process. This approach significantly improves on standard quality control techniques by allowing for complete monitoring of materials without interrupting workflow.

"This technique enables materials manufacturers to detect potential problems early without slowing or stopping the manufacturing process," said Bhushan Sopori, an NREL materials performance scientist and inventor of the On-line Monitoring in Solar Cell and Fuel Cell Manufacturing technology.

Mike Ulsh, manufacturing R&D project lead for NREL, sees the commercial benefits of implementing this invention in a number of industries including manufacturing of fuel cell components, semiconductor wafers, glass, and coatings. "Introduction of this technique has the potential to help decrease the cost of producing materials in a variety of industries," said Ulsh. "It would likely have the largest impact on reducing cost in high-throughput environments, such as roll-to-roll processing facilities, because it can characterize materials at a speed of tens of feet per minute."

Characterization of materials using this method is accomplished via wide-

angular illumination on the conveyor belt or roll-to-roll processing platform. Spectral imaging and reciprocal optics are then utilized to assess a number of material features including thickness, surface conditions, and uniformity. The novel method was demonstrated on a roll-to-roll processing pilot plant at NREL's Energy Systems Integration Facility (ESIF).

Provided by National Renewable Energy Laboratory