

**Extended Abstract for AIMCAL Conference**  
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**Fine scratch detection and monitoring of coating properties for high-quality film production**

The constantly growing demand for high-quality coated films, its rising number of new applications and the continuing pursuit for excellence requires films and coatings to be 100% defect free. Typical irregularities like gels and scratches are already being detected reliably, but to cope with the increasing demands, manufacturers are searching for new solutions to optimize their production and to increase the saleable output. Larger scratches and defects do not pose a challenge to conventional inspection systems. However, the difficulty lies in detecting smaller and poorly contrasted flaws, slipping below the camera. These flaws have long been accepted, due to the lack of solutions to detect them, leading to customer claims and sometimes periodic defects and increased scrap. In this presentation, ISRA introduces a new, advanced technology to optimize production and yield and to push accepted quality standards. It achieves the best image contrast by combining high resolution line cameras and switchable pattern LEDs with an innovative illumination concept: The patented Cross Darkfield Technology enables the detection of the smallest defects down to micrometer range by shedding light on defects from the side. Scratches from Web handling or small marks originating from particles on rolls or in polluted nozzles are easily detected by the system. As scratches and other defects commonly form according to direction of web transportation, shedding light on the long side of a scratch or defect allows full extension for detection. Materials like hard coated optical films, release liner layers or prism films can therefore be checked for all light scattering and absorbing defects and inclusions.

A totally new application of this technology enables the system to evaluate the optical properties of the inspected material and expands the focus of inspection from defect detection to the inline control of material features which define the product's function. Taking adhesive film as an example, the system will support process optimization and production of defect free films and coatings. This is made possible through optical analysis of the coating's derived characteristics such as haze and gloss. In the same way, the technology is able to analyze every other optical aspect which leads to a deviation of optical properties. Using this extension, the system delivers comprehensive information on all quality aspects of coated film through surveillance directly at the line. Manufacturers can therefore easily provide the best of their products and achieve the target of 100% saleable production.

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