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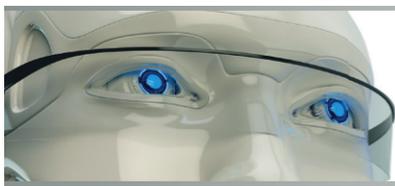
Industry proven inspection technology provides new level of high accuracy quality control through innovative illumination concept

All-in-one inspection for optical films including monitoring of material properties

The request to have slim and flexible designs for displays in electronic devices drives the demand for optical films. Large brands and companies for consumer electronics offer major orders but are buying only best in class products. This pushes the quality standards on the entire global market. An inspection system using exclusive illumination technology now allows manufacturers to achieve and maintain a whole new level of accuracy in quality surveillance – reducing production costs, and maximizing competitiveness and customer satisfaction.

For most inspection systems, it is not challenging to detect typical defects like gels, black specs and contaminations. But if optical film manufacturers aim to achieve a higher level of quality, they have to consider more aspects of their products: small and/or poorly contrasted defects and scratches as well as inhomogenities in the material. Even the most thorough manual quality control can miss defects and quite often low level camera based inspection will as well.

While automatic inspection offers high speed, it is not able to change the perspective of incident light like workers do during manual inspection – and so naturally cannot avoid missing certain defects. Manual inspection on the other hand is time consuming and will not provide the accuracy of an automated system, due to the limitations of the human eye. Eventually, both types of inspection are not able to avoid every kind of defects, simply because of their limited ability to reliably detect them – leading to customer claims and a waste of time and material.



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Innovative illumination discovers micro defects and material inhomogenities

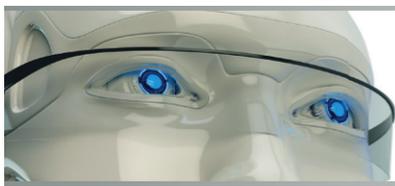
Now, manufacturers of optical films can raise the quality of their products through an all-in-one system: an innovative illumination concept leveraging the SMART LINE LED light source makes all defect types visible. The so called “pattern LED illumination”, patented by ISRA VISION, enables the detection of point defects, low contrasted scratches, inclusions and other defects, regardless of their position.

Even scratches extending in the direction of web transportation mean no challenge. The new approach simulates varying angles of light incidence through various illumination patterns – just like manual inspection, but with micro-accuracy and highest speed. This allows the detection of most defect types as well as monitoring optical material properties like coating thickness, for example with one system set up.

Taking hard coating or prism film as an example, the system will inform manufacturers about defects, inhomogenities e.g. defects in the coating layer, and how well the coating was applied. Coating thickness may reach down to micro- and nanometer range and will still be monitored with most reliable results. Furthermore, the system gathers specific data on haze and gloss, transparency and reflectivity. With its self-learning detection software, it is ready to automatically detect and classify relevant defects within shortest processing time.

Beyond-inspection features: Powerful data processing helps to make faster decisions

100% inline defect inspection and monitoring of optical properties will not only avoid unnecessary scrap costs. It builds strong customer satisfaction and thus offers the chance to address new market potentials. In order to ensure highest product quality, ISRA VISION's inspection system “SMASH” allows a variety of features to further optimize production process and quality level. Additional inspection and illumination channels, refinement of the inspection recipe even during operation and an intelligent use of the gathered inspection data are only some



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examples. As quality surveillance systems generate a lot of product data, they support decision making on various company levels. Starting right on the shop floor, the data can be used to monitor the occurrence of a certain defect type, while it also will provide plant or regional managers with information on production lines or even whole plant operations. The system allows to draw data from all deployed inspection systems and to store it in the same database or company network – providing full transparency of production processes. Immediate actions can be taken to prevent a loss of product quality.

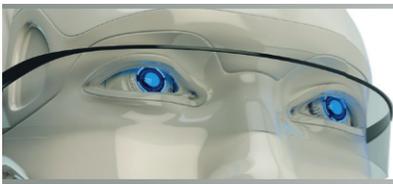
With ISRA's SMASH, only one system is needed for a large variety of inspection tasks. By validating inspection parameters and creating individualized reports, the system supports the highest quality standards of production results and shows potential for process optimization. Furthermore, it is an easy to handle tool supporting producers of optical films in passing customer audits and documenting product quality.

Images



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ISRA's SMASH combines high resolution cameras with innovative illumination



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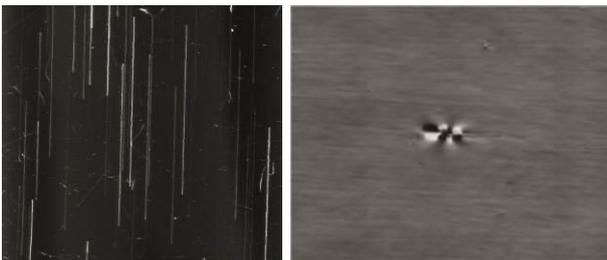
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The pattern LED technology allows for inspecting the film for defects as well as supervising its optical features



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Examples for micro defects – reliably detectable with ISRA VISION's inspection system "SMASH".