Erhardt+Leimer

ELSIS II

Surface inspection system

Material inspection on moving webs

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ELSIS camera, Generation IV

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Erhardt+Leimer
Global solutions for production of the future

Intelligent technologies and products in the highest quality designed to optimize the production processes of our customers all around the world. This is our claim as the internationally expanding Erhardt+Leimer group of companies.

With our global presence – from development to production and on to service – we are always close to the customer. We develop customer-specific solutions and provide our customers with excellent products either in digital or intelligent versions depending on their preference. Not only this, but we also set new standards for the production of tomorrow. In the process, it is not just our products that are increasingly becoming smart – our entire company is currently undergoing a digital transformation. One visible indication of this is the E+L online shop, which enables our customers to order products and spare parts quickly and easily from our website.

With more than 1,600 employees at sites across Europe, Asia, and America we deliver cutting-edge technology on-time to any location in the world.

In everything we do, we aim to use all company resources responsibly to protect the environment and demonstrate our commitment to increased sustainability.

ELSIS surface inspection systems safeguard your quality

Without inspection, no production

Surface inspection systems are now part of the "standard equipment" for production machinery and machines for further processing. The material and the type of processing or the industry are barely significant. Irrespective of whether paper or film/foil, production or processing, for the food, pharmaceutical, battery or hygiene industry, quality requirements have increased everywhere. Often driven by the expectations and requirements of clients and their customers. This drive has made inspection systems a must in every processing machine. Nowadays, camera systems are the only way to ensure 100% inspection to detect and address defects at an early stage and thus minimize material waste.

ELSIS inspection systems master this task. Highly sensitive line scan cameras detect any deviation and alert the operator without delay if there is a defect. The automated control of signaling devices such as lamps, horns, marking units and even complete machine control systems can be implemented using the flexible ELSIS I/O control system.

Find out also about our other products such as pivoting frames, sensors, metal detectors or our inline basis weight and thickness measuring system ELTIM, which perfectly complement ELSIS.

Example of the surface inspection of aluminum foil using ELSIS

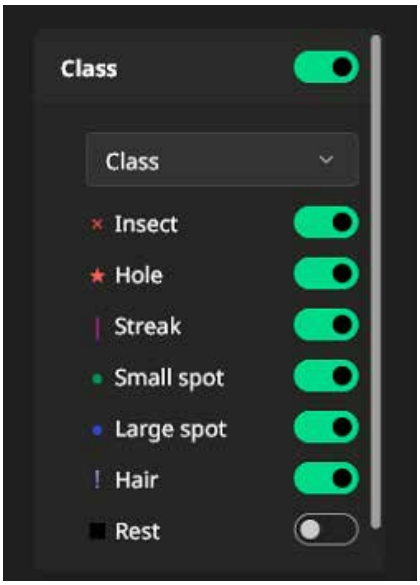
Reliable defect inspection – matched to your project

Recipes and defect classes

Every industry has its own individual defect classes that need to be reliably detected and classified accordingly. Simple recipe templates provide the operator with industry-typical inspection presets that can be expanded and optimized as required.

Our E+L technician will determine the right settings on site together with you and provide you with everything you need to know in a training session. Even after commissioning, our experts are ready to help you on site or via remote maintenance.

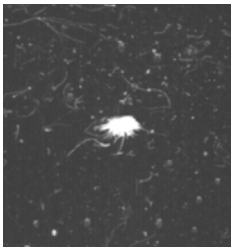
Visualization of defect frequencies



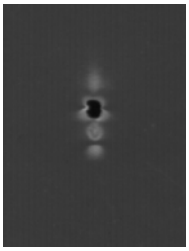
Typical defect classes

Examples of typical defects

- Soiling
- Damage
- Inclusions
- Insects
- Holes
- Bubbles
- Specks
- Chatter marks
- Creases lengthways and crossways
- Doctor blade and streak defects
- Missing coatings



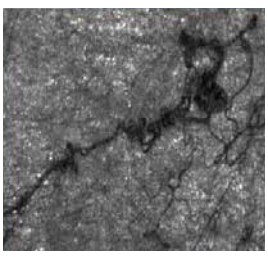
Defect example: hole



Defect example: speck

Defect example: insect

Defect example: crease



Defect example: concentration of threads

Defect example: missing coating

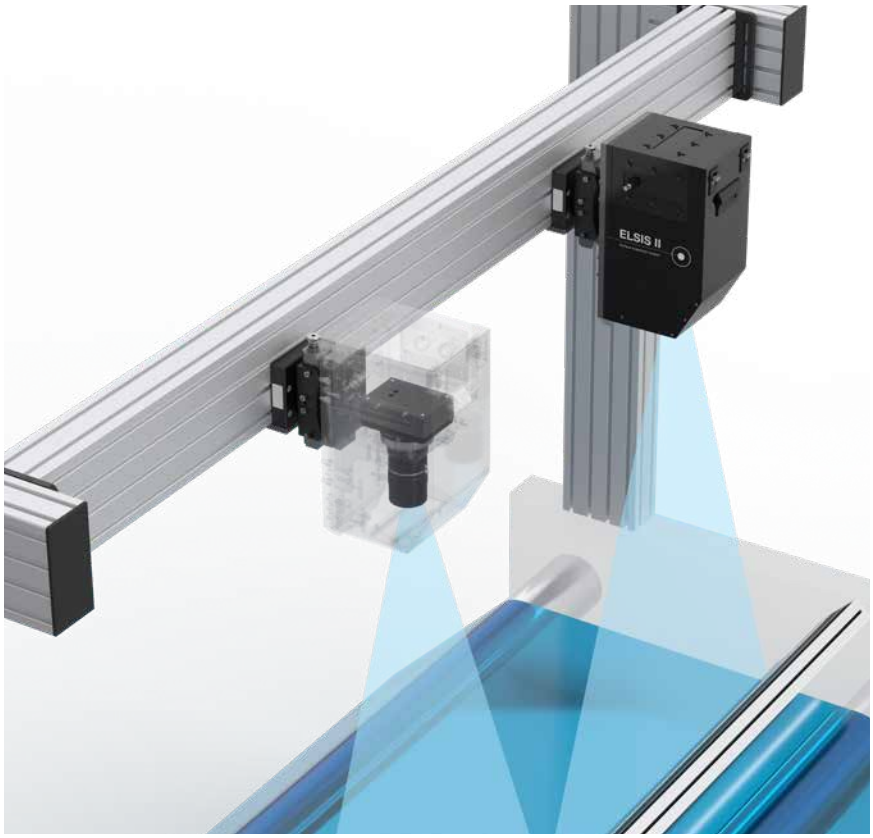
Individual project planning for your application

Individual project planning for your application

Erhardt+Leimer has been offering systems for the inspection of surfaces on moving webs since 1990. Every single ELSIS system is specifically planned and designed to meet your individual requirements. We always draw on comprehensive expert knowledge and support you throughout the process: from the initial contact, through consultation, planning and complete integration, to training and aftercare. We also offer sample examination in our test laboratories to find the optimum solution for your application.

If, after commissioning, it is determined that the resolution is actually not sufficient, retrofitting is quick and easy. The system can be expanded straightforwardly at any time by adding one or more cameras to increase the resolution. This means that you are always on the safe side, even during retrofitting, and do not have to worry about high costs resulting from undersizing.

High-resolution multi-camera scanning



ELSIS systems are matched precisely to your application and requirements

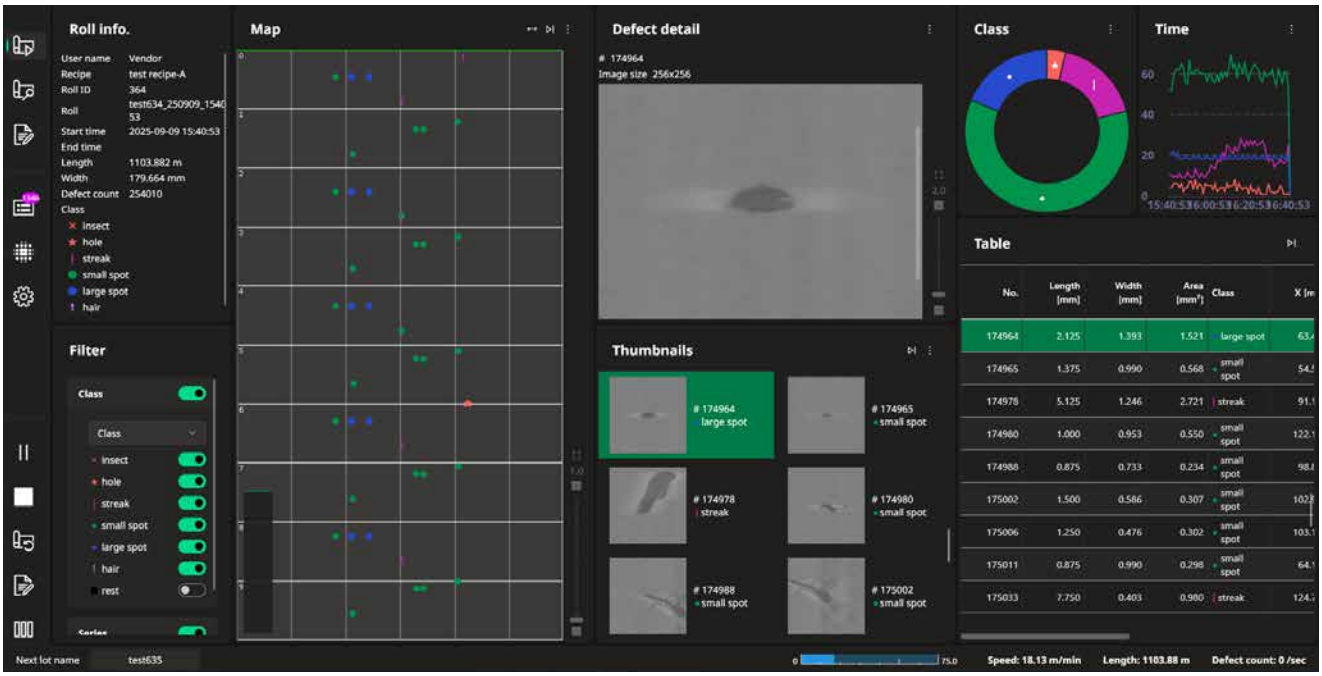
We also offer sample examination. Your specific defect samples are checked and a feasibility report is prepared. This examination allows us to show you the efficiency of defect inspection in your production process before you place an order.

User interface

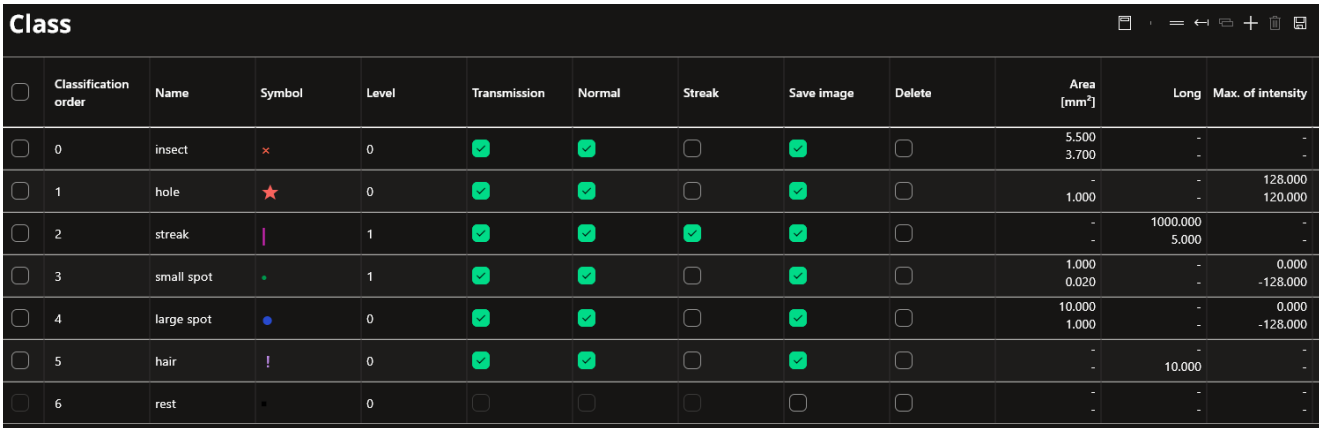
Inspection page
- Current production data
- Current inspection status
- Reel log with defect overview
- Defect images and defect information
- Classification information
- Production archive in tree structure

Recipe page and defect classes
- Easy setup of custom defect classes
- Trigger thresholds for the straightforward detection of fluctuations in the material and defects
- Filter settings offer specific defect detection

Configurable log view for the straightforward identification of the
- Defect distribution
- Defect frequency
- Type of defect
- Defect classes
- Defect information



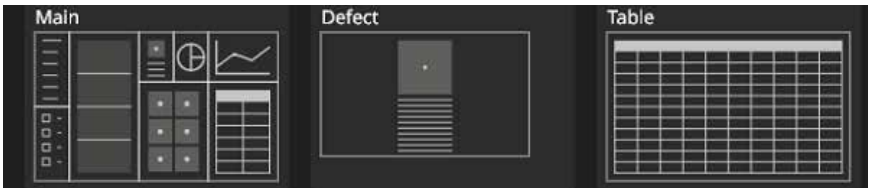
Inspection page



Classification order	Name	Symbol	Level	Transmission	Normal	Streak	Save image	Delete	Area [mm²]	Long	Max. of intensity
0	insect	×	0	☑	☑	☐	☑	☐	5.500 3.700	- -	- -
1	hole	★	0	☑	☑	☐	☑	☐	- 1.000	- -	128.000 120.000
2	streak	|	1	☑	☑	☑	☑	☐	- -	1000.000 5.000	- -
3	small spot	•	1	☑	☑	☐	☑	☐	1.000 0.020	- -	0.000 -128.000
4	large spot	●	0	☑	☑	☐	☑	☐	10.000 1.000	- -	0.000 -128.000
5	hair	!	0	☑	☑	☐	☑	☐	- -	- 10.000	- -
6	rest	▪	0	☐	☐	☐	☐	☐	- -	- -	- -

Recipe page and defect classes

Individual user view
- User-specific layout of the user interface
- Quick switching between different views
- Extension to a second monitor
- Easy setup and customization



Inspection of films

Growth through quality

Surface inspection is an important element in the process chain for packaging film production. Many functions in the ELSIS system are therefore specially tailored to the film market.

Worldwide approx. 50 % of all film packaging is intended to be used for direct contact with food. ELSIS offers user-friendly solutions for this sensitive sector in particular to meet the strict market requirements.

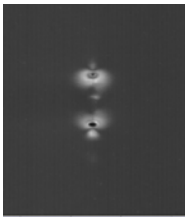
Application examples

- Composite films and monofilms for food
- Films for flexo printing
- Industrial films and industrial packaging
- Coated and laminated films

Inspection of blown film

Examples of typical defects

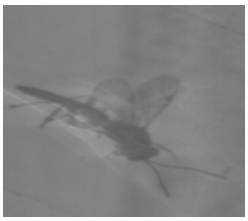
- Specks
- Insects
- Inclusions
- Chatter marks
- Holes
- Crossways creases
- Lengthways creases
- Soiling



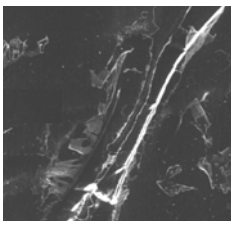
Defect example: speck

Defect example: particles

Overhead blown film extruder with ELSIS surface inspection



Defect example: insect



Defect example: crease

Inspection of pharmaceutical packaging/aluminum

100 % inspection – 100 % traceability

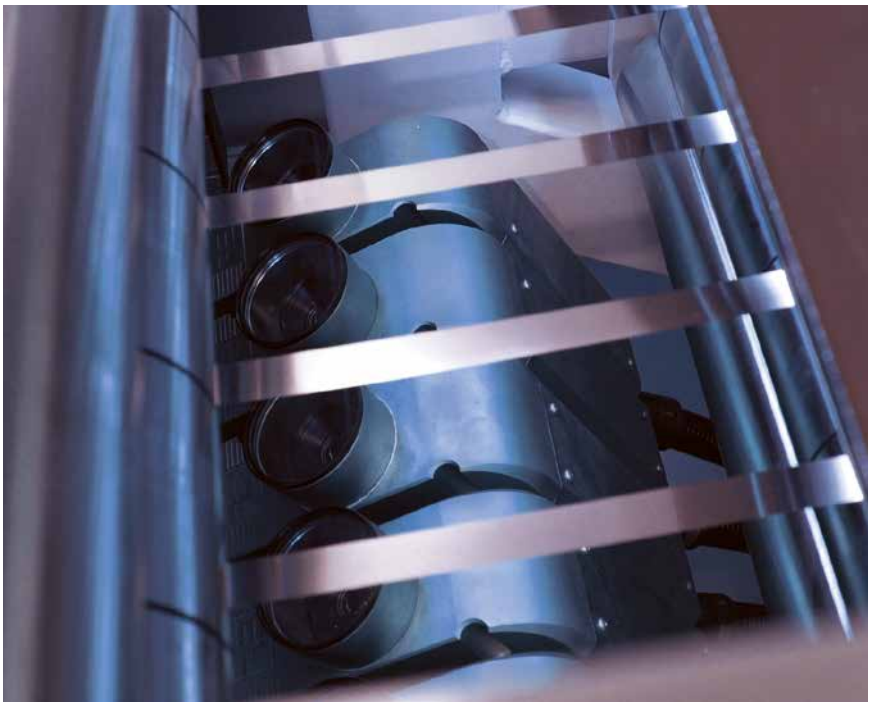
The pharmaceutical industry can no longer operate without 100 % surface inspection due to the high hygiene requirements placed on their packaging.

The materials to be inspected are mostly aluminum foils and plastic films that are inspected for inclusions, holes, foreign objects, soiling, creases and insects.

Due to its high resolution and sensitivity, ELSIS is predestined for this market. This is because the 100 % logging of all defects and all process interventions, whether automated or by the operator, can be analyzed and traced at any time, also if there are subsequent complaints.

Application examples

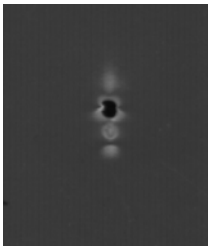
- Drug production
- Pharmaceutical production
- Sanitary articles



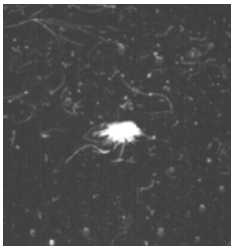
Inspection of aluminum webs for blister packaging

Examples of typical defects

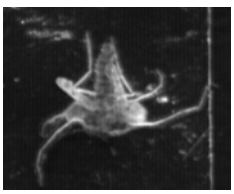
- Specks
- Insects
- Inclusions
- Chatter marks
- Holes
- Crossways creases
- Lengthways creases
- Soiling



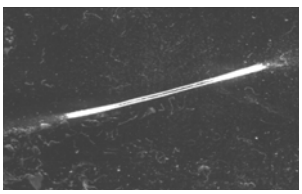
Defect example: particles



Defect example: hole



Defect example: insect



Defect example: crease

Coating systems/battery manufacture/metal processing

Quality inspection for the highest requirements

Coated webs are used in a very wide range of industries. Mostly these are very demanding products that must satisfy extremely high quality standards and can be extremely expensive.

During the production of lithographic plates or in battery manufacture, for instance, even the smallest coating defect and soiling must be reliably detected and ejected. The reliable chip alignment process on the ELSIS cameras permits extremely precise calibration of the individual devices on an inspection line and is the guarantor for the highest sensitivity.

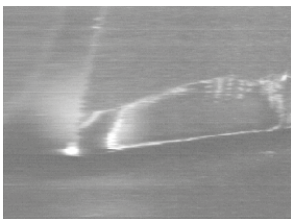
Application examples

- Printing plates
- Adhesive films
- Coated aluminum foils
- Composite materials for food packaging
- Coated anodes and cathodes for lithium ion rechargeable batteries

Inspection of surface coated aluminum foil

Examples of typical defects

- Particles of dirt and soiling
- Missing coating
- Spots
- Bubbles
- Doctor blade and streak defects



Defect example: missing coating

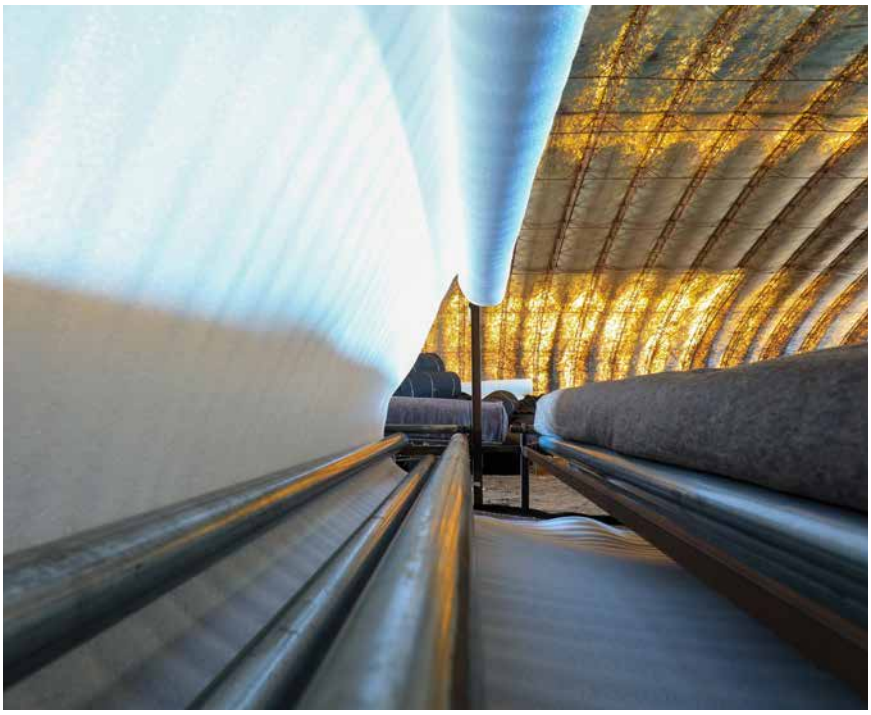
Defect example: doctor blade and streak defects

Inspection for the non-woven fabric sector

Flexible solutions for a market that continues to grow

Non-woven products can be found in more and more areas of everyday life and are becoming increasingly important. This situation is also increasing the demands on the quality of the materials produced in medical, hygiene and textile manufacturing.

Surface inspection has in the meantime become firmly established in the market for non-woven fabrics. ELSIS offers a whole series of functions and filters/recipes that are specially orientated on this market.



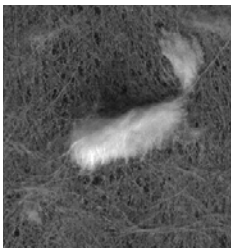
Inspection of non-woven fabrics and similar materials

Application examples

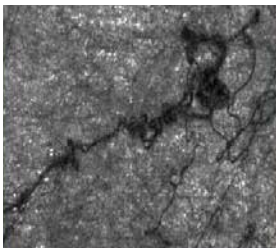
- Baby/adult diapers
- Feminine hygiene
- Wipes
- Petrol, oil and air filters
- Water, coffee and tea filters
- Dressing materials
- Medical/thermal blankets
- Soil stabilization
- Frost protection
- Non-woven fabrics for agriculture
- Insulating materials
- Carpet backing/water barriers
- Laminate for sails

Examples of typical defects

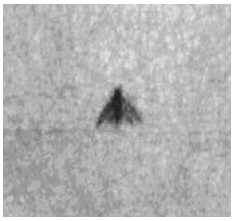
- Thin spots
- Thick spots
- Marks
- Holes
- Crossways creases
- Lengthways creases
- Soiling
- Unspun threads
- Thread concentrations



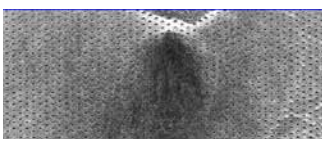
Defect example: tangle



Defect example: concentration of threads



Defect example: insect



Defect example: thin spot

Inspection for paper manufacture

Complete solutions for comprehensive production chains

Manufacturers are using ever higher portions of recycled material in paper production. Surface inspection is therefore indispensable in the production of high quality papers. Only in this way can the quality required by the further processing industry be ensured.

With ELSIS, E+L offers the paper factory a complete solution that covers the entire production chain from the paper machine, through the calender, to the slitter rewinder.

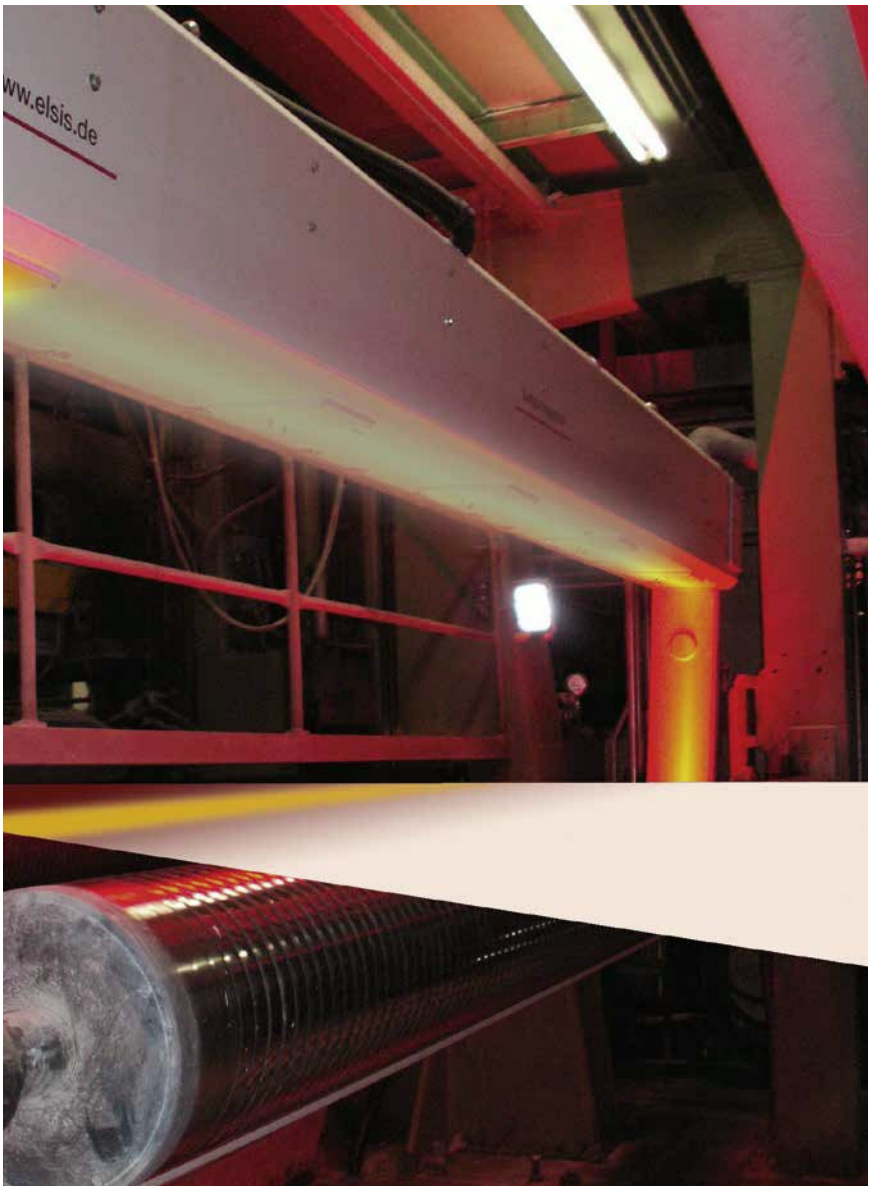
The inspection data recorded are forwarded from process to process and made available – appropriately processed – to control the reel cutter.

Meaningful defect logs and statistical evaluations support the paper manufacturer during day-to-day work and make a vital contribution to increasing quality in the paper factory.

Paper manufacturers, quality assurance, or the senior management can directly access, from anywhere, current or historical inspection results using the "remote client software" and obtain live information about the state of the entire production chain.

Industry

- Graphics paper
- Paper, cardboard and card for packaging purposes
- Tissue paper
- Paper and card for industrial and special purposes

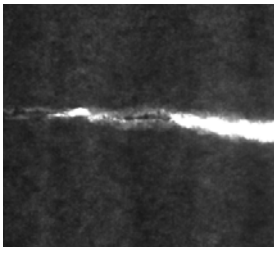


A protection rating up to IP 54 also makes it possible to integrate inspection in harsh environments

Examples of typical defects

- Holes
- Dirt/soiling
- Water/oil droplets
- Stripe
- Scratches
- Edge tears
- Edge defects
- Thin spots
- Crossways creases
- Lengthways creases

Defect example: hole



Defect example: tear

Lighting

The significance of the light source

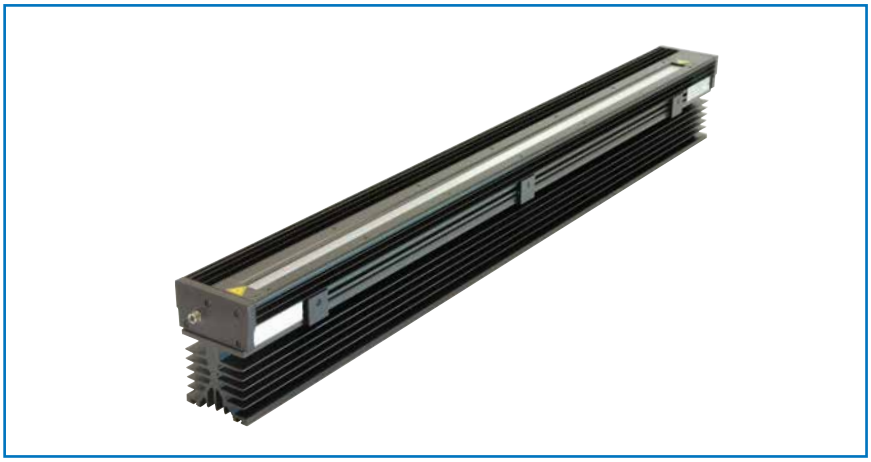
The correct lighting is at the heart of every surface inspection system. The type of lighting, lighting color, intensity and lighting angle often determine whether a defect is visible or remains hidden. In some situations, defects are only detected using transmitted light or combinations of light.

Our experienced team members will help you configure your optimum inspection system. In addition, we offer sample examination during which your individual defect samples are checked; you then receive a feasibility report tailored to your needs.

LED light transmitter

- High illuminance
- Different LED colors
- Narrowband spectrum
- Spectrum with long term stability
- Extremely bright
- Modular length
- Can be focused
- Exact, homogeneous line
- Lighting profile can be adjusted via Ethernet
- Long service life
- Constant temperature
- Temperature monitoring
- Robust housing
- Easy assembly

ELSIS light transmitter



ELSIS light transmitter

ELSIS light transmitter

Technical data

ELSIS	
Camera type	Line camera
Chip type	CCD array, monochromatic
Lighting	High-performance LEDs (adjustable brightness)
Web speeds	Up to 1000 m/min
Ambient temperature	+10 °C to +50 °C

Accessories

Optional enhancements

- Defect marking units
- Indicators and audible signaling devices
- Different housings (console housings, full integration, etc.)
- Monitor extensions
- Interfaces to calibration templates
- Printer for log output

ELSIS offers even more

- Logging of all inspection processes for 100 % traceability if there is a complaint
- Comprehensive statistical functions with graphical output
- Integration into the customer's network with system access for other team members (e.g. quality assurance, production management)
- Remote maintenance connection
- Online manual integrated into the software
- Comprehensive language package for the user interface
- Configurable software layout (user interface)
- Numerous other functions that make your processes easier

ELSIS – the intelligent surface inspection system from Erhardt+Leimer

Questionnaire

General data			
Customer			
Street			
Zip code		**City/town**	
Country		**Website**	
Contact person			
Phone		**E-mail**	
Project			

Technical data					
Type of machine	❑ Coating system		❑ Laminating system	❑ Blown film extruder	❑ Calender
	❑ Non-woven fabric line		❑ Paper machine	❑ Press	❑ Other
Material type	❑ Paper	❑ Aluminum	❑ Film/foil	❑ Non-woven	❑ _____
Feasibility study	❑ Yes	❑ No			
Production data	Max. web width: _____				
	Max. inspection width: _____				
	Max. machine speed: _____				
	Resolution: _____		Smallest defect: _____		
Marking system	❑ Yes	❑ No			

Comments / project description

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