

# Surface Inspection for Films



## Independent R&D

Self-developed machine learning algorithm, can accurately classify defects and present three-dimensional effect, reducing the false defect detection rate.



## High Precision And Speed

The highest detection accuracy of current products can reach 20 μm/pixel, and the fastest speed can reach 500m/min.



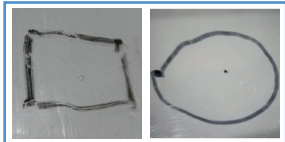
## Data reporting, real-time detection

LEAPER product inspection system can view product testing data reports at any time to provide data support for process improvement.

LEAPER Surface Inspection for Films adopts self-developed machine vision technology to provide customized light source and optical solutions for optical film and special industry needs. It can intelligently identify and detect surface defects on continuously running rolls, strips or sheets of materials, accurately record the location information of defects, and provide closed-loop quality feedback and process control with cloud storage and cloud computing technology to improve the productivity and competitiveness of enterprises and contribute to the realization of technological innovation and transformation and upgrading of enterprises.

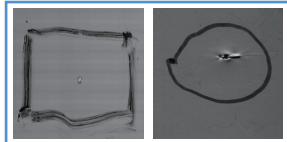
## Technical Advantages

### Inspection solutions that display 3D effects



General Floor Solution

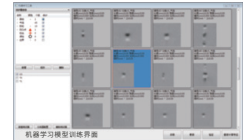
VS



Leaper Stereo Solution

### Advanced AI classification algorithms

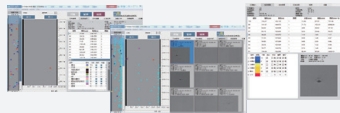
- Uses machine learning models and artificial intelligence classification algorithm technology
- Updateable iterative sample library to reduce debugging time and learning costs
- Accurate identification of defect types, reducing false defect false detection rate



## System Functions

### Online Inspection

The in-line inspection function allows for real-time monitoring of product quality. When running, the defect navigation bar allows you to visually view the distribution of defects and detailed information about each defect, including the appearance, location, length, width and area of the defect.



### Work order management system

The work order system facilitates the electronic management of production tasks. Operators can create, modify, run, pause, and end work orders. The entire work order module is logically clear, easy to operate and learn, and easy to maintain, which greatly reduces labor costs.



### Control of Abnormal Processes

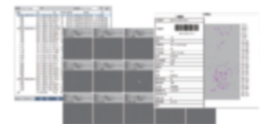
The system provides an I/O interface for manufacturers to alarm, mark and shut down equipment to process defects found in the production process to control abnormal processes, reduce product losses, control product quality, and save costs for enterprises.

- ❗ **Alarm**  
When defects or abnormalities are found, the device will make an audible and visual alarm
- ❗ **Marking**  
I/O interface can be used with inkjet or labeling machine for precise marking of defect location
- ❗ **Shutdown**  
Production equipment can be connected to the I/O interface to send a shutdown signal when a defect is detected



### Reporting system

The data report management system can store all the inspection information to MySQL databases and generate electronic reports, so that manufacturers can check the historical data (including the type, generation time, and distribution of defects during the production process) at any time.



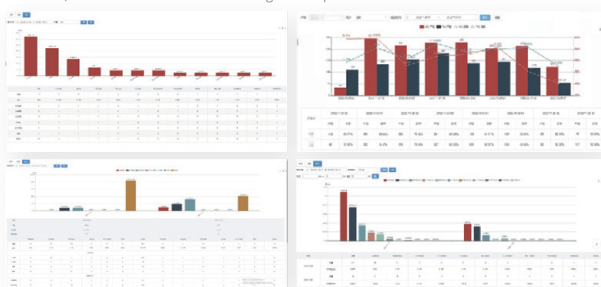
### Data Analysis System

The report analysis function will use the information of time, type, quantity, spatial distribution and other dimensions in the report data to analyze and present the data to help enterprises improve their production process and competitiveness.



### Data analysis based on Big-Data

Analyze excess and insufficient detection data in terms of the defect category, time, mode and cause based on the Big-Data of production line.

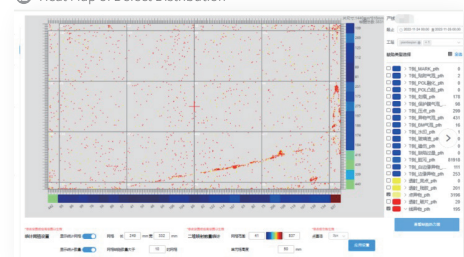


### AOI Data Presentation Process

#### Precision Cpk

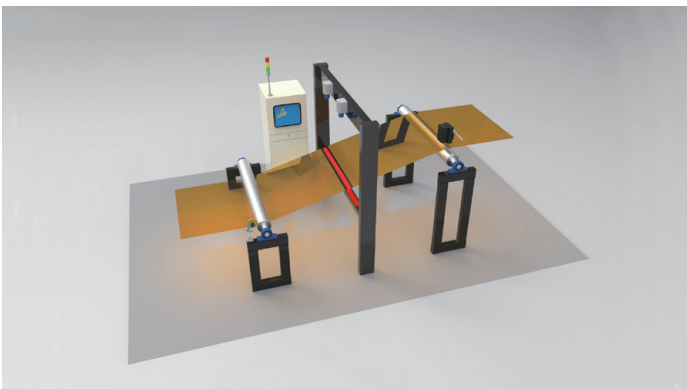
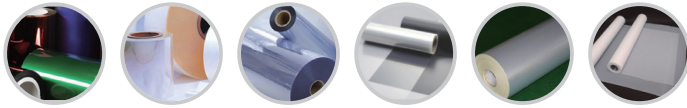


#### Heat Map of Defect Distribution



# Surface Inspection for Planar Materials

This equipment adopts self-developed machine vision technologies and aluminum alloy frame, which can intelligently identify dozens of defects such as abnormal spots, particles, dents, breaks, stripes, uneven coating, scratches, cracks, etc. that exist in flat materials, accurately record the location information of defects on the surface of flat materials, present and print the size and location of the recorded defects in the form of reports, and realize the online flat material automation and intelligence of inspection, forming a unified standard for product quality inspection of enterprises.



## Inspection Content

- ☑ Spot defects: Black spots, white spots, crystal spots, abnormal spots, particles, dents, holes, impurities, greasy dirt, etc.
- ☑ Linear defects: Fine lines, scratches, folds, cracks, flaws, scratches, etc.
- ☑ Surface defects: stripes, uneven coating, film surface piebaldness, flow lines, peeling, roll marks, etc.

## Applications

- ☑ Optical films: Suitable for diffusion films, brightening (prism) films, polarizing films (polarizers), DOP, POP, QD, fenestrated membranes and other materials;
- ☑ Functional films: Suitable for solar backsheet, PVDF, EVA, PE/PET, PP, BOPP/BOPET, PVC, hard coat films and other materials;
- ☑ Metal strip: Suitable for aluminum foil, copper clad laminates, copper foil, metal coating and other materials;
- ☑ Other film materials: Suitable for lithium-ion battery separators, textile fabrics and other materials.

## Parameter Performance

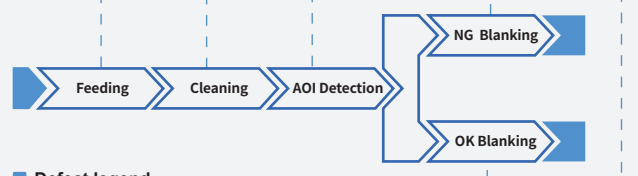
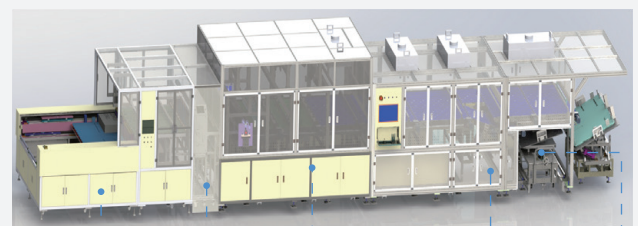
Equipment Name	Surface defect detector for planar material
Inspection Precision	20µm/pixel Min
Inspection Speed	500m/min Max
Inspection Range	6000mm Min
Repeat Inspection Rate	>99.9%
Size of Control Cabinets	700mm*700mm*1700mm
Installation Process Sections	Tape casting, precise coating, laminating, slitting, etc.

# Sheet Sorting Machine

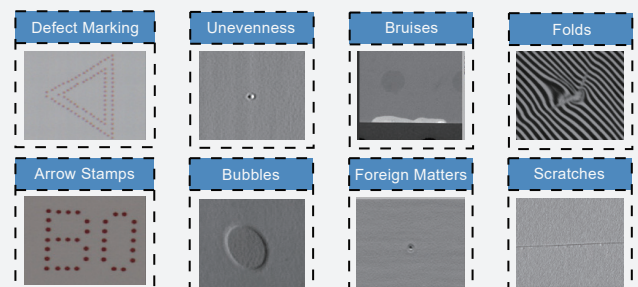
This equipment is used for polaroid detection, and equipped with the automatic loading and unloading device, special conveyor and self-developed AOI detection software, to accurately detect defects such as arrow stamps, defect marks, abnormal matters, bubbles, scratches, unevenness, creases, bumps, residual glue and dirt, separate OK/NG products and thus control the quality of shipped products.

## Technical Parameters

Item	Specification		
Materials to Be Inspected	Sheet Polarizer		
Cover Size	4 - 8 inches	7 - 15.6 inches	15.6 - 86 inches
Production Capacity	About 9K sheets/hour	1K-4K sheets/hour	850-3K sheets/hour, Dual channels are supported for some diaphragms
Inspection Content	1. Defect marking 2. Vector stamp inspection and mixed film inspection 3. Unevenness / Bruises / White corner / Scratches / Bubbles / Creases / Residual glue / Foreign matters, etc.		
Features	1. Automatic continuous loading/unloading 2. Fool-proof / anti-collision function 3. AOI full-width defect detection 4. Connection with logistics AGV 5. Connection with factory's MES system		

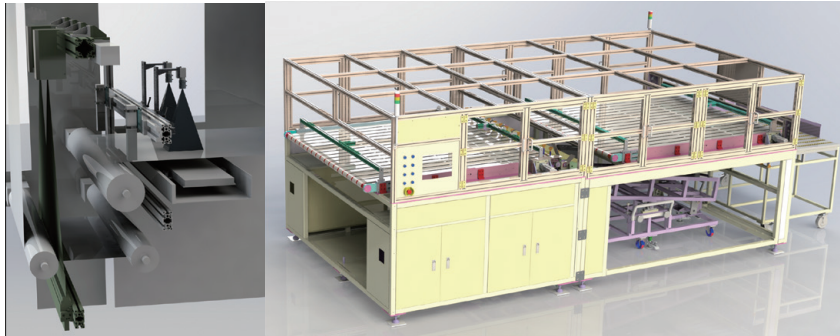


## Defect legend



## RTS-AOI Sorter

The sorter with AOI can be installed on the rear section of the RTS cutter to detect rolls with defect markings, accurately separate OK/NG sheets after cutting, and collect corresponding products.

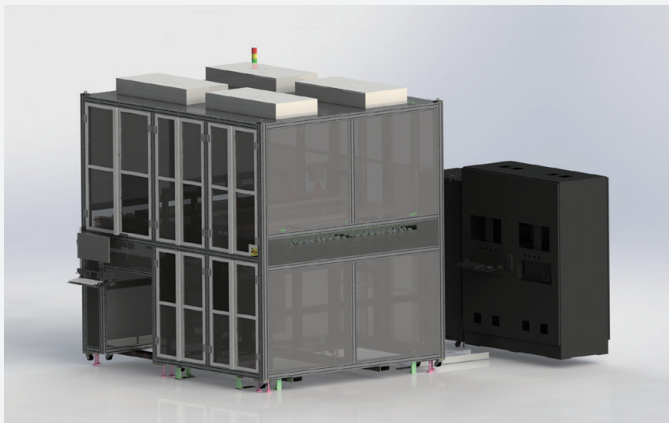


### Technical Parameters

Item	Specification
Materials to Be Inspected	Polarizer
Detection Width	300~2600mm
Detection Type	Defect Mark
Production Line Speed	80m/min
Split Beat	0.2S/sheets
Omission Rate	0%
Matching	Optional vector printing code and spray immediately check function

## RTP- Pre/Post-Offset Tester

This device is applied to detect defects before and after panel attaching on the RTP production line, such as angle breakage, cracks and glass slag before attaching, as well as Pol bulgs, bumps and Pol residual glue after attaching. After testing, the output of OK/NG results is provided by the PLC, and defect information is transmitted to the visual inspection station.



### Technical Parameters

Item	Specification	
Equipment	Prepasting	Offset post
Materials to Be Inspected	Attach the front panel	Attached to the rear panel
Detection Width	32~100inches	32~100inches
Detection Type	Collapse Angle, crack, glass slag, etc	Pol bulge , unevenness , Pol residual glue , etc.
Production Line Speed	MAX:36m/min	MAX:36m/min
Split Beat	10~13S	10~13S
Omission Rate	0.1%	0.2%

## Other Products

