Optical Inline Inspection System
for Meshed Fabrics

GridInspector

OSIF
GmbH
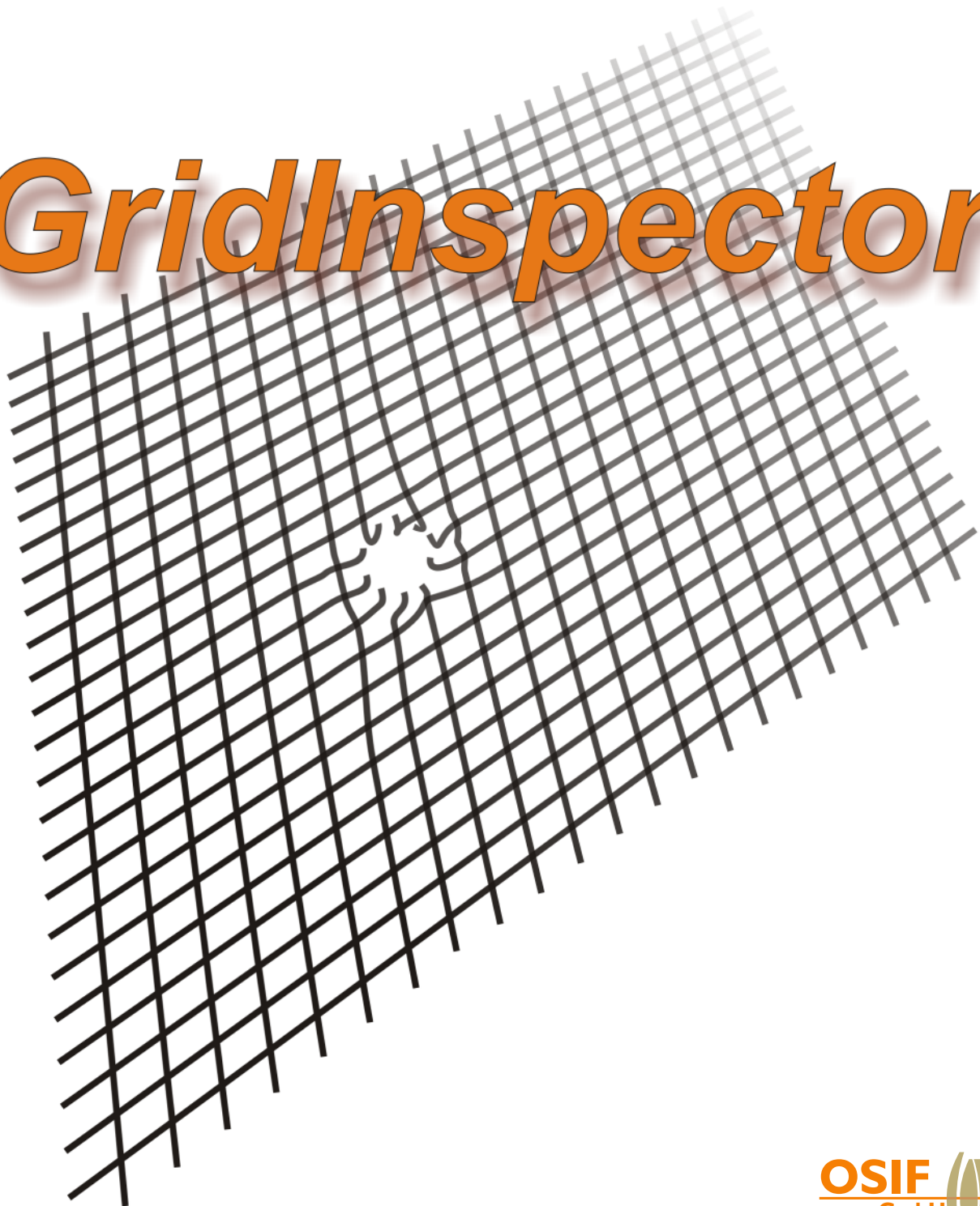
**O**ptical **S**ensor Technologies
for **I**nspection and **F**orm Recognition
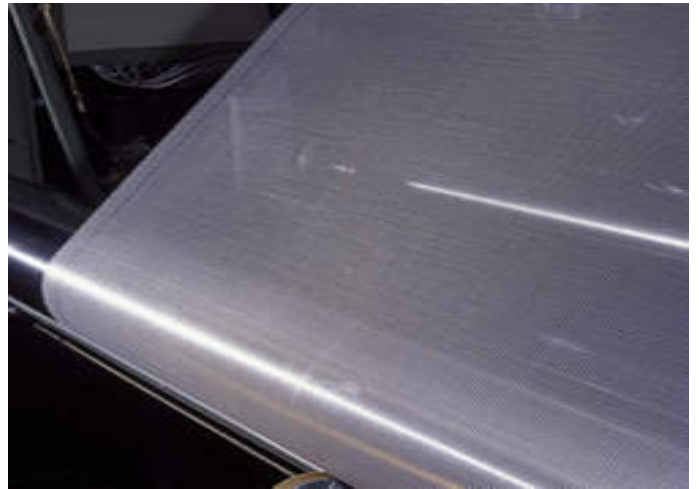
GridInspector –
Application Areas and Key Advantages

The GridInspector is used for optical, contact-free inspection of coarsely meshed endless fabric. Typical items for inspection are reinforcement fabrics and wire-screens or filters but also punched and stretched metal. The adaptation to different materials is very easy to carry out by the operator.

The spectrum of recognized defects ranges from holes in the material, missing weft and warp filaments to frayed edges, foreign objects and fluff balls on the fabric. Due to the high inspection speed and the small installation space that is needed, the GridInspector can be used for inline quality control during the production process and for the finished products as well as for quality checks on incoming materials.

The system can also be used at a central inspection table where materials from different production lines are checked. You can easily switch between the inspection of different products by loading the appropriate, saved inspection recipe, which contains all the necessary material and inspection parameters.
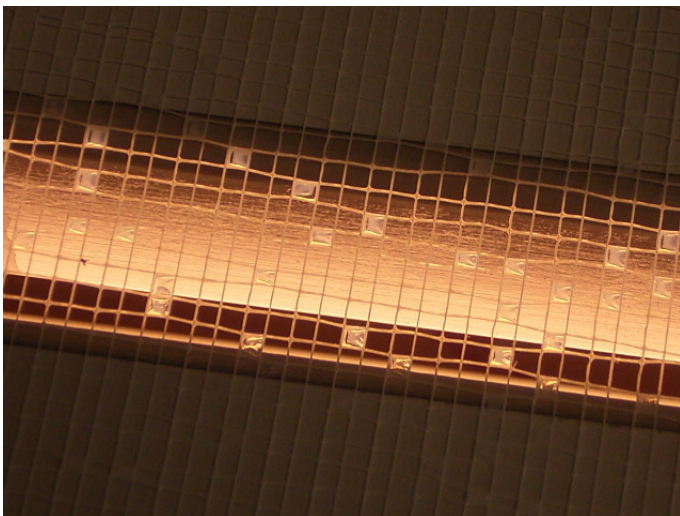
Faulty meshes, clogged with adhesive
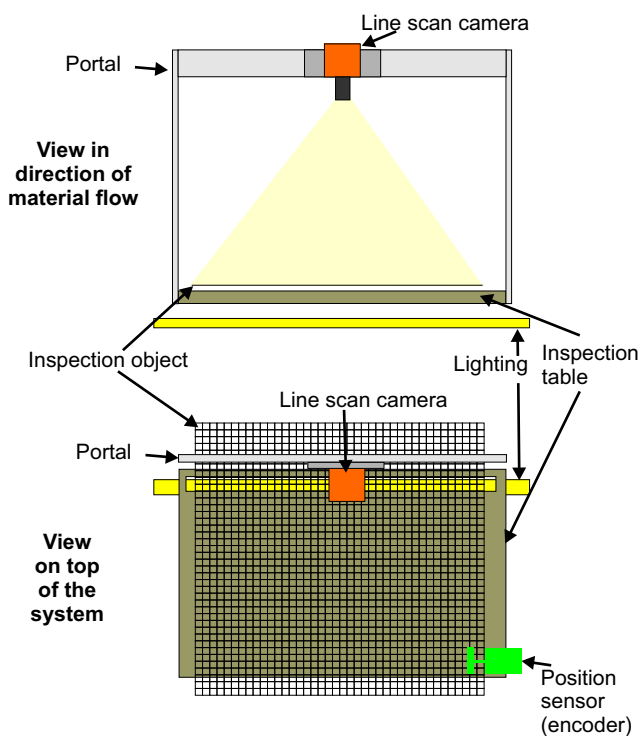
The GridInspector's key advantages are:

- Continuous, complete and objective inspection of the production material
- High inspection speed
- Display and highlighting in colour of detected defects on the PC monitor; coloured classification of equivalent defect types
- Automatic documentation of defects with separate logs for left and right lane (if the material is later cut into two lanes)
- Proof of quality for the final customer
- Effectiveness of changes in production can be immediately verified
- Non-destructive and contact free
- Minimum time effort and low expenses for maintenance
- Easy integration into the production line
- Optional: Defect marking directly on the material, e.g. using an inkjet printer
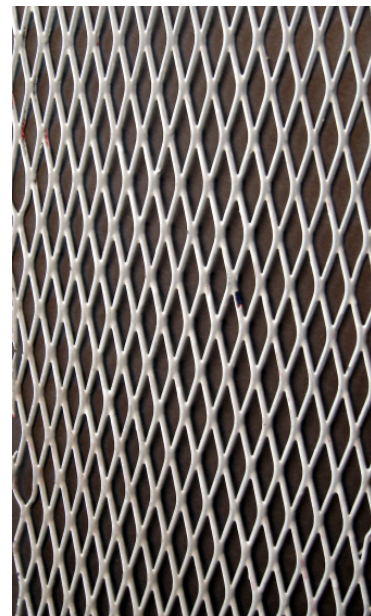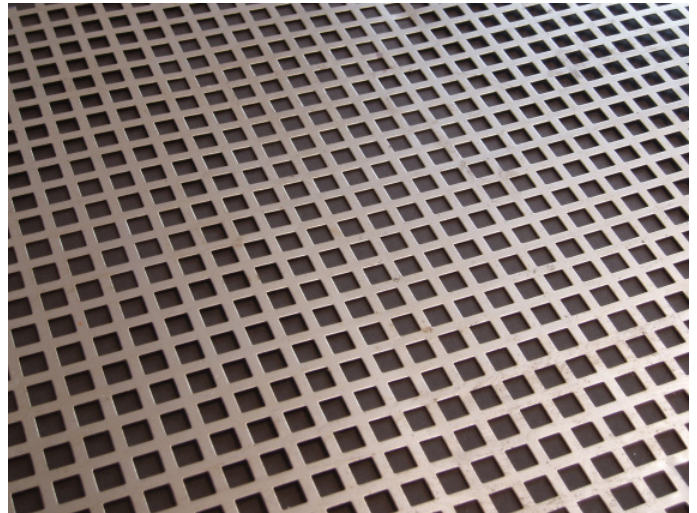- Optional: Software module for comprehensive analysis and statistics

System Setup and Mode of Operation

The main components of the system are the high resolution camera(s), the lighting system, the encoder for position measurements and an industrial PC with a monitor.

The material moves beneath a line scan camera (e.g. over an inspection table). The camera captures the images of the material using either transmitted or reflected light, depending on the material parameters. The advantage of transmitted light is the indifference to material colour or gloss level. The image capture is triggered by the encoder, which makes the system largely independent of the material speed on the production line.

Line scan camera

Portal

View in direction of material flow

Inspection object

Lighting

Inspection table

Line scan camera

Portal

View on top of the system

Position sensor (encoder)

The GridInspector can also be used for the inspection of punched or stretched metal.

Groups of captured scan lines are joined together to form complete pictures of the inspected material. The pictures are then analysed for material defects using several different detection algorithms. Detected defects and measured values are displayed on the PC monitor and are written to an inspection log. A picture of each defect can be saved on disk for later assessment and the defect can be optionally marked directly on to the material. Defects can also trigger a signal to alert the operator or for machine-to-machine communication.

GridInspector –
# Performance Features and Defect Spectrum

Performance

The maximum inspection width which can be inspected with one camera depends on the smallest structure which needs to be detected (typically this are the weft or warp filaments). On a material with a width of 1000 mm, structures down to 0.25 mm can reliably be detected. At this optical resolution the maximum inspection speed that can be achieved with the standard system is 45 m/min. If higher inspection speeds are required, a high-speed version of the system can be provided.
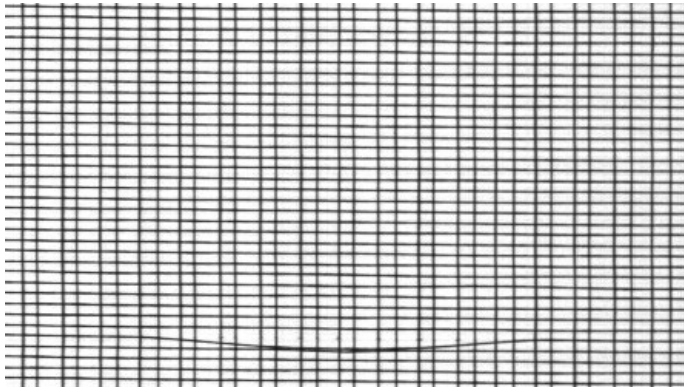
Weft defect

An encoder is used to measure the position of the material. This makes the system largely independent of the material speed. In addition, it allows the correct physical position to be determined for each defect.

All systems are equipped with a remote support software interface. On request, the engineers from OSIF can help the customer to adjust and diagnose the system without needing an expensive and time consuming visit.
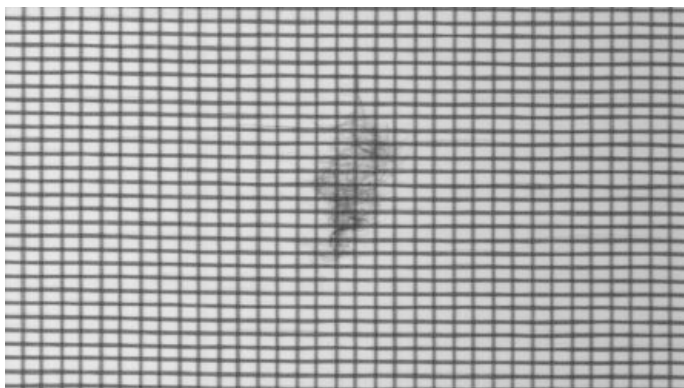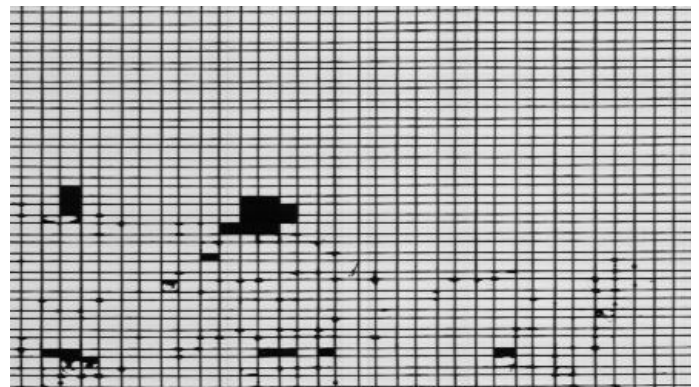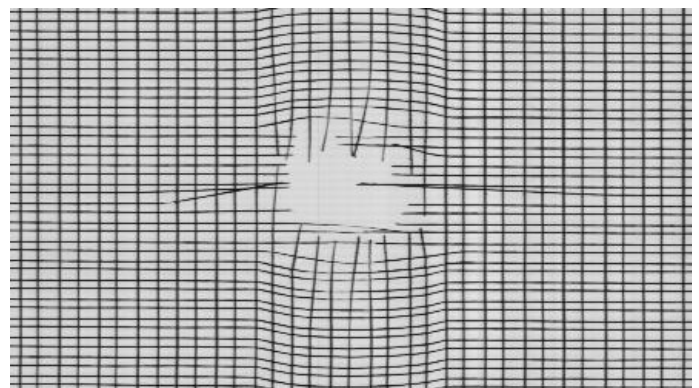

Fluff ball

Defect Spectrum

The GridInspector is able to detect weft and warp defects, holes, adhesive residues, foreign objects, defective edges (frayed or skewed) as well as incorrect material width and fabric residues (fluff balls).
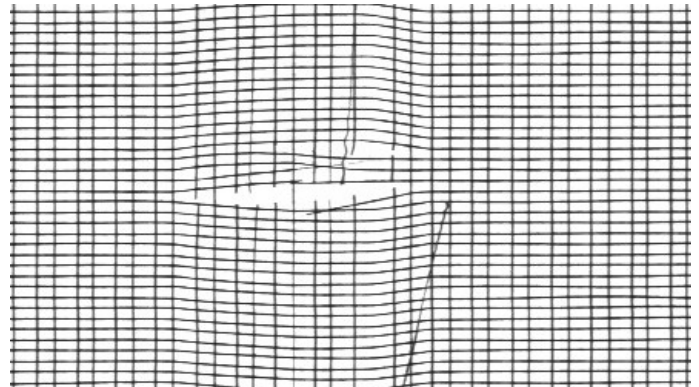
Warp defect and hole

Adhesive residues and foreign bodies

Hole

User Interface

During the design of the user interface for the GridInspector, much emphasis was placed on the intuitive operation of the software. All of the steps are easy to accomplish, from entering the grid and inspection parameters to starting a new inspection job, displaying the detected defects and printing and saving the inspection log.
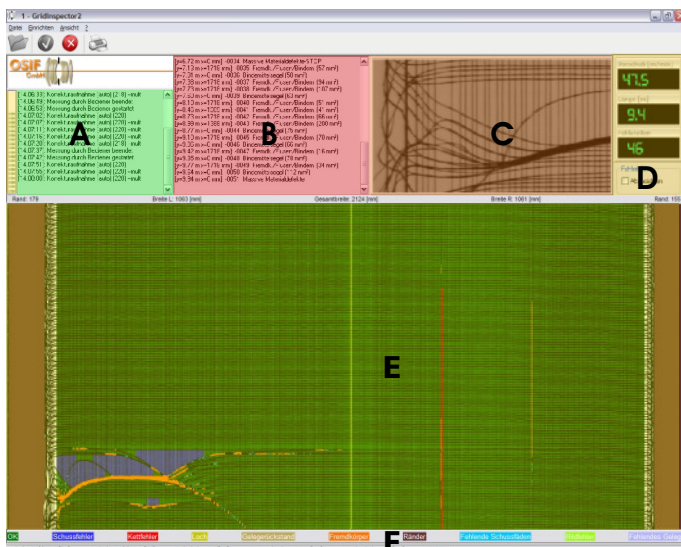
The parameters of the grid material, the required grid dimensions and the inspection tolerances etc. are saved in an internal database as so-called inspection recipes. They only need to be specified once, prior to the inspection of a new grid material type. After that, they can be loaded again to carry out further inspections with the same grid material.

Dialog box for the inspection parameters

The main screen is divided into six areas as follows (see picture above):

A Area for system messages

B Log of the detected defects

C Detailed view of the last detected defect. The defect picture can be stored on disk.

D Information area (material speed, present position, number of detected defects)

E View of the entire width of the material; detected defects are marked in colour.

F Status bar

The inspection logs make it easy to assess the quality of the grid, thus avoiding the shipment of sub-standard material. The logs can be archived on the PC and can be opened again later on any office PC, for instance in case of a customer complaint, using the offline log file browser OfflineView. This tool provides various functions for the analysis and evaluation of the detected defects.

Another possibility for production quality control is individual statistical analysis using the MS Excel® export function, which saves the measured values in an MS Excel® readable form. This allows each user to generate his or her own analyses, such as time series, material series or trend analysis .

Add-ons and Enhancements

- Provision of customer-specific I/O signals, e.g. for system status or detected defects.
- Comprehensive statistical analysis tools.

OSIF GmbH –
Location

OSIF GmbH

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für Inspektion und Formerfassung

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Train

From main train station by metro or by foot (3 min. walk, following the "Bahnhof-strasse" direction city centre) to "Kröpcke". Then take line 4 direction "Garbsen" to station "Marienwerder/ Wissenschaftspark". For about 500 m walk on the "Hollerithallee".

Car

Exit the A2 at "Hannover-Herrenhausen". Drive on the B6 towards "Hannover". After crossing the „Mittellandkanal", leave B6, turning left at the following traffic light.

Hanover Airport

We will pick you up from the airport (approx. 20 min).

We are looking forward to your visit!