



&

IN-CORE Systèmes

LineaVision

by





Chemin du Lortaret
69800 SAINT PRIEST
FRANCE

Andreas Krispin

Tel. + 49 - 172 - 6349315

akrispin@incore-systemes.fr

www.incore-systemes.com



Specialist for Surface Inspection

- Founded 1985
- Fully automatic inspection systems
- Inline processes at highest speed
- Complex surfaces
- Turnkey installations
- Customized solutions
- Defect classification
- Defect management
- > 1.800 Systems worldwide



IN-CORE Background: Experts in Machine Vision

- Highly improved inspection & quality management solutions
 - camera based equipment for in-line inspection of a wide range of complex surfaces (woven, carbon, plastic, foil, glass, paper, non woven, ...)
 - inspection adapted to any process, web speed & width and defect size
 - turnkey global inspection solution with flexible defect management according to individual quality requirements



Multi Surface Experience



Plain

- Textile
- Fabric
- Fibre
- Carbon
- Film
- Foil
- Glass
- Paper
- etc.



Printed/Metallized

- Security printing
- Security features
- Hologram foil
- "Electronic Printing"
- OLED's
- etc.

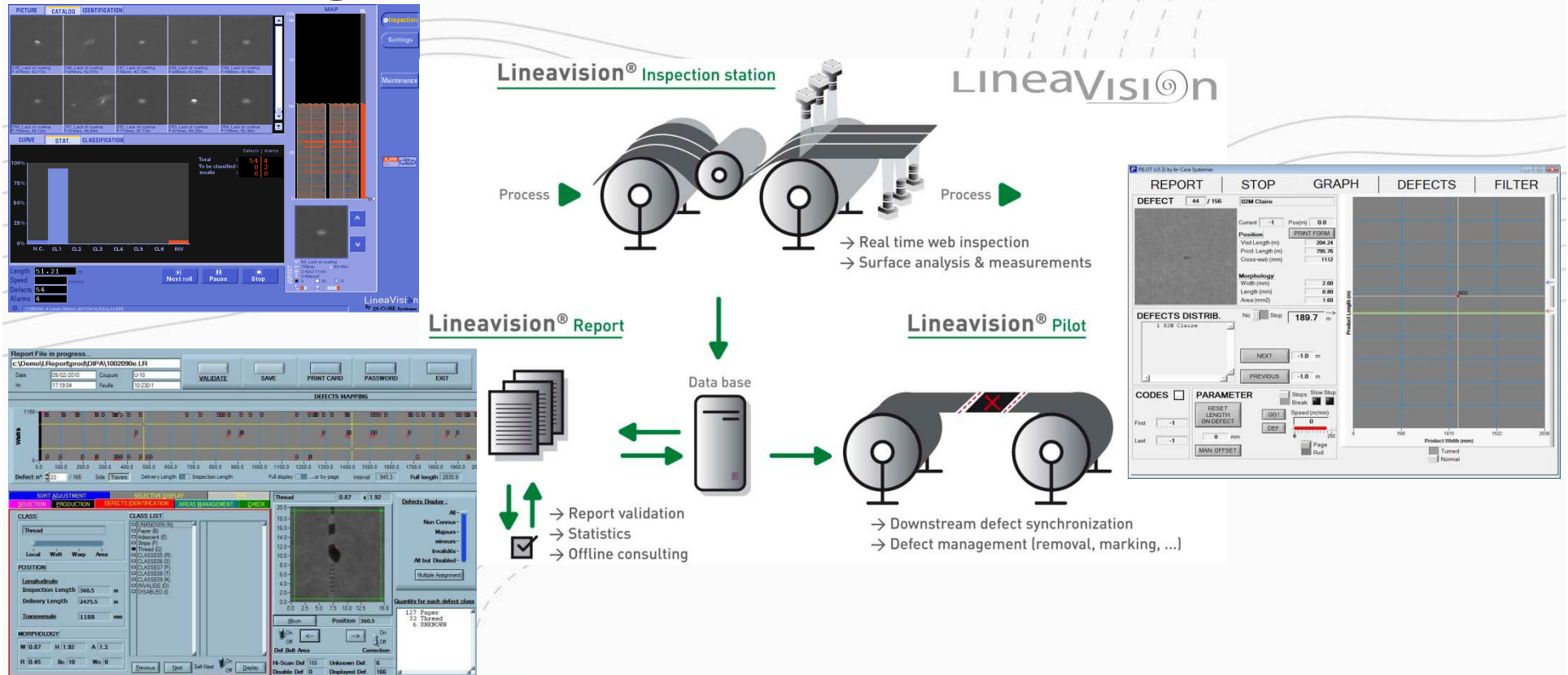


Coated/"Prepreg's"

- Batteries
- Automotive textiles
- Automotive structural
- Interior
- Airplane components
- etc.



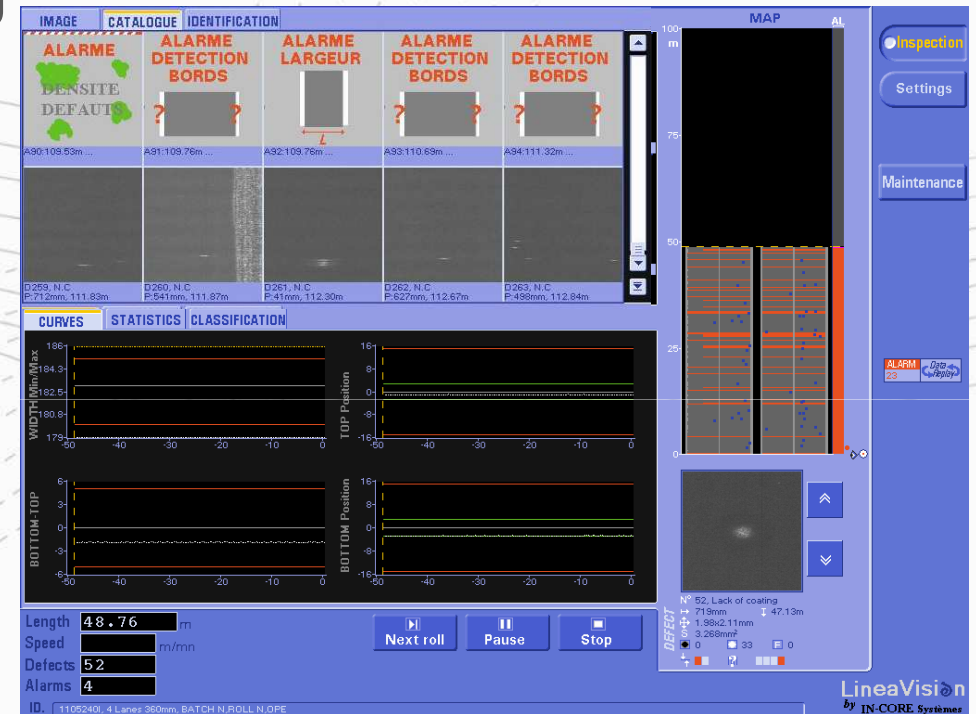
Automatic Quality Control, Defect Analysis, Tracking and Removal



GUI: Real Time Assistance for Line Operation

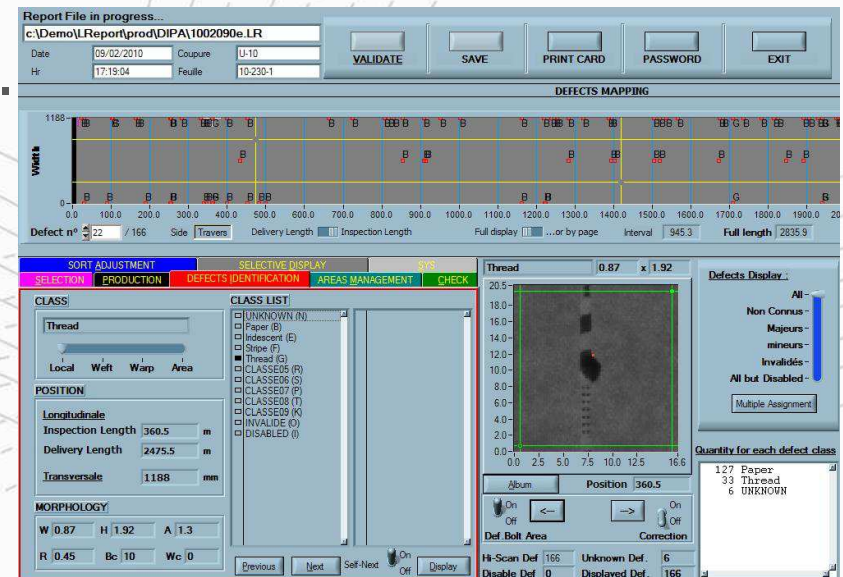
- Production quality monitoring and immediate warning of any quality changes:

- Real time defects carpet display with position size and class
- Measurements: dimensional control, and real time trends indication
- Output actions (marking, alarm...)



Offline Inspection Report and Defect Analysis

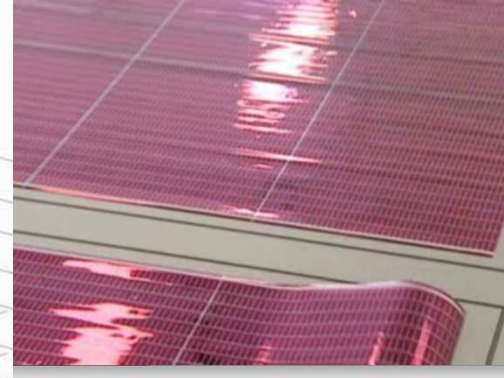
- Production analysis per roll, per production period or/and batch, ..
- Production statistics
- From a selected item, all detected defects and measurements are displayed
- Keeping track of each production, before and after it's been sent to the customer



Target Markets : Technology for the Future



○ Li-ion batteries



○ Printed electronic (OPVCs, OLEDs)



○ High value-added paper

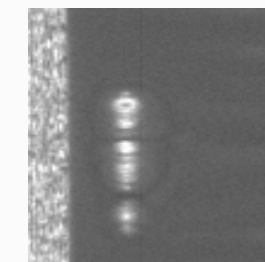
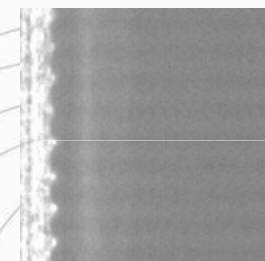


○ Composites



Li-ion Battery Quality Control

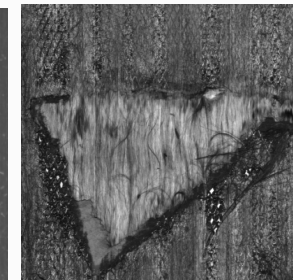
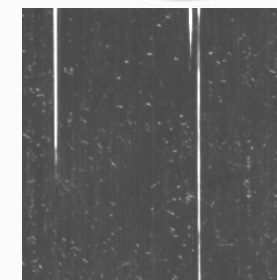
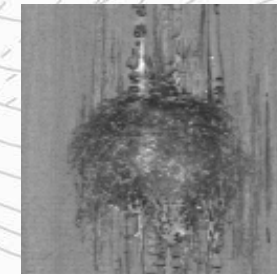
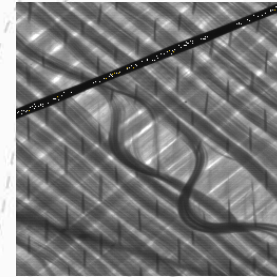
- Electrode surface quality inspection:
 - raw material (foil defect, surface cleanliness)
 - coating defects as: bubbles, agglomerates, coating free area (pinhole, ...), scratches, streaks, ...
 - dimensional control of coated patterns



- Separator and electrolyte inspection:
 - inclusions ($\sim 20\mu\text{m}$ size)
 - foreign particles (contamination)

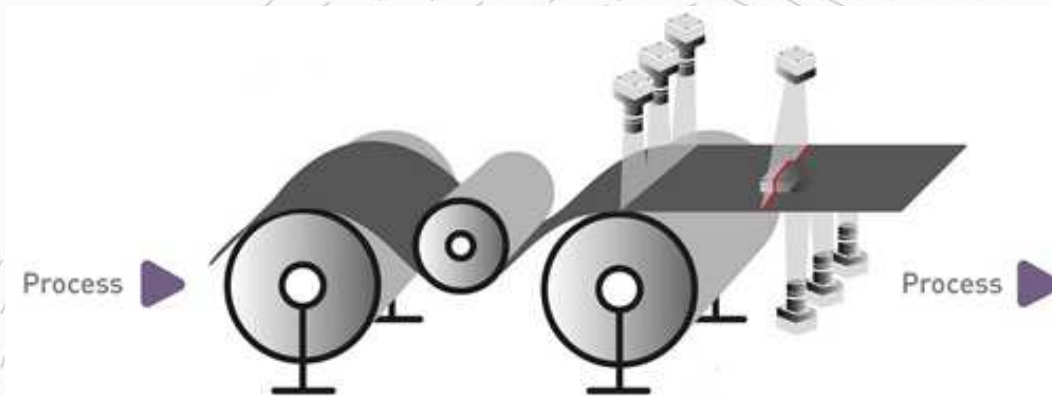
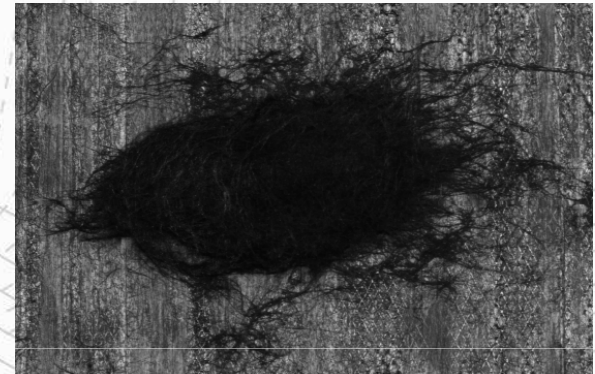
Composite Inspection

- Complex surfaces due to fibers irregularities and resin brightness
- Composite material for aerospace structural parts requiring very high quality demands
- Types of inspected surfaces:
 - raw material: tow, ...
 - pre-impregnated surface
 - laminated



Surface Inspection & 3D Detection

- Measurement in single lines
 - 3D camera covers the whole width
 - very high resolution in Z direction
- Merging with surface inspection in order to provide single report



Banknote & Security Paper Inspection

Hologram Foil

- Quality & Microtext
- Transfer printing

Water marks

- Position, quality

Metallic Threads

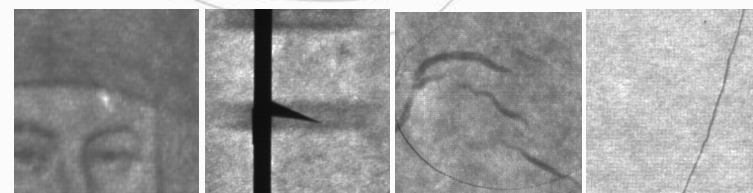
- Position, quality

Steel Engraving

- Quality

Perl Effect & optically variable Inks

- Position, quality
- Screen printing



Textiles Inspection

Textile Fabrics

- Weaving defects
- Weft-/warp distortion

Knitted Material

- Knitting defects

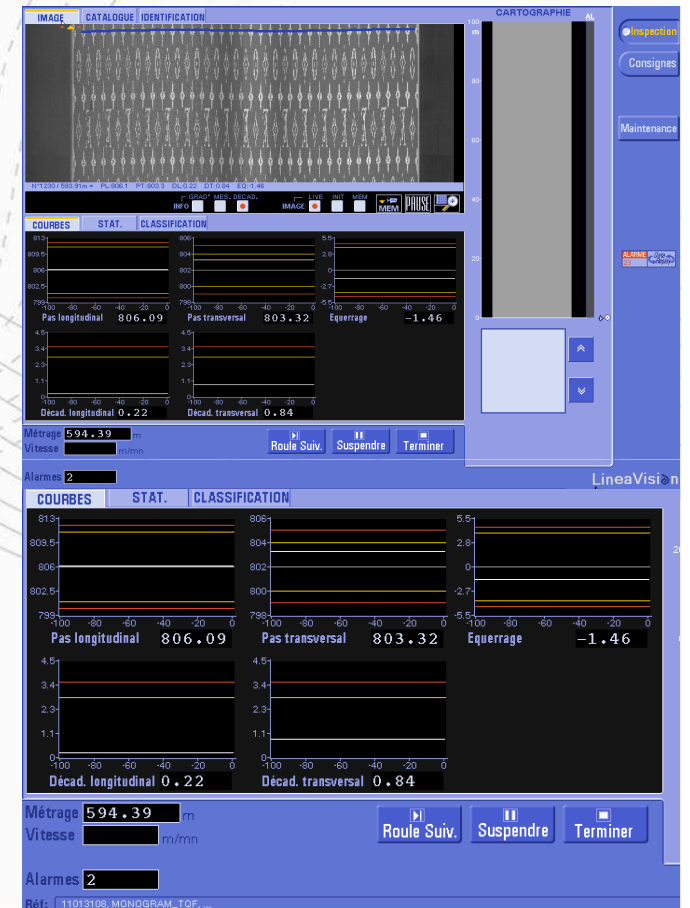
Coated Material

- Foam defects
- Knitting defects
- Coating defects



Pattern Inspection

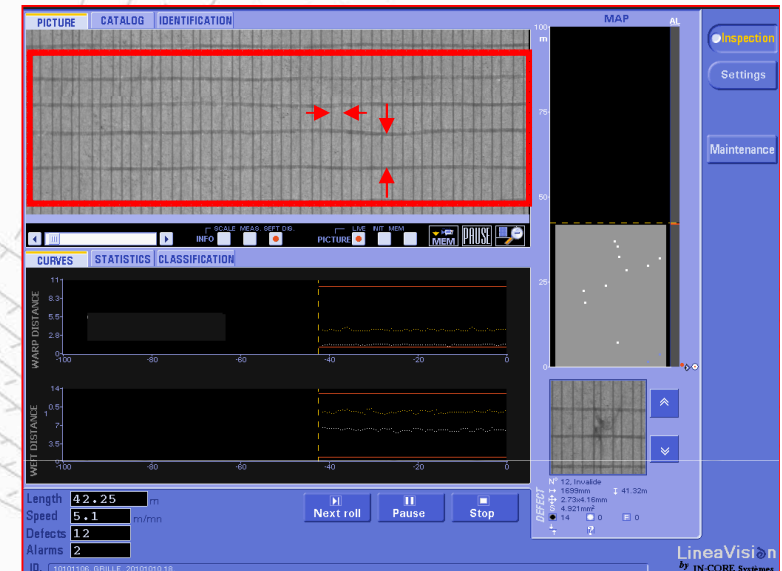
- Pattern display
- Live defect display
- Live defect map
- Geometry measurement
- Trends of all critical parameter
- Interaction with process



Distortion Measurement

Weft- & Warp Distortion

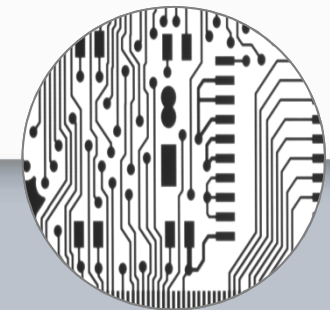
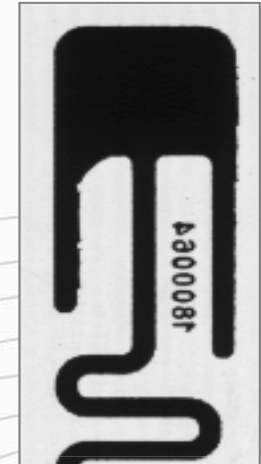
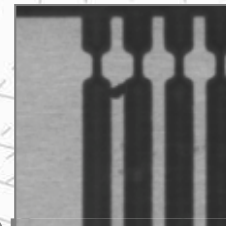
- Measurement distance weft/warp
- Measurement of defined distances
- Measurement edge deviation
- Measurement angle
- Display absolute value
- Graphic display optional
- Definition of thresholds



Inspection of Printed Electronics

100% Surface Inspection

- Substrate surface
- Process verification
- Quality
 - Roll to roll
 - Pattern uniformity
 - Distance, short circuits, disconnection
 - Edge accuracy
 - Background smearing



IN-CORE Knowledge Catalogue

- High Specification Projects
- Multi Camera Solutions
- Multi View Layout
- Highest Resolution
- High Speed
- Wide Width
- Complex Applications
 - Hologram, Watermarks,
 - Optically Variable Objects
 - Etc.



**Thank you very much
for your attention!**

