



# Metso Process and Quality Vision, tailored to papermakers needs

[www.metso.com/machinevision](http://www.metso.com/machinevision)

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# Fully integrated Quality and Process Vision system

## From base sheet producers to converting operation



# Important steps for a successful project

- Discussing objective of PQV implementation during pre-sales
- Checking available space, tail treading, etc.
- Sample Analysis in Laboratory
- Selecting the right geometry and system options (e.g. lifter, marker)
- Careful testing in Finland before shipment (FAT)
- Experienced start-up personnel with papermaking knowhow
- Performance verification
- Tools to optimize usability of the system (filtering for operator essentials, use of external triggers, formation analysis, repeated defects, winder control)

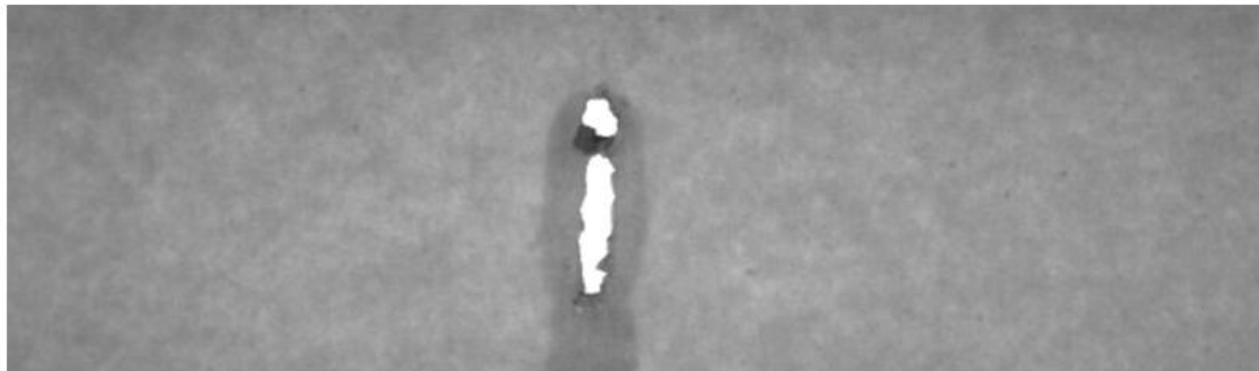
# Laboratory Sample Analysis

## Sample 2 (Big hole)

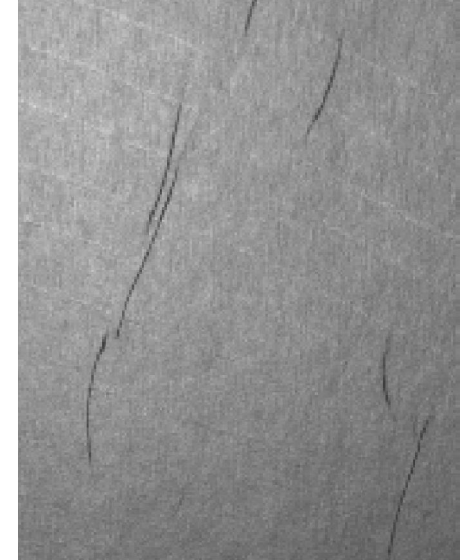
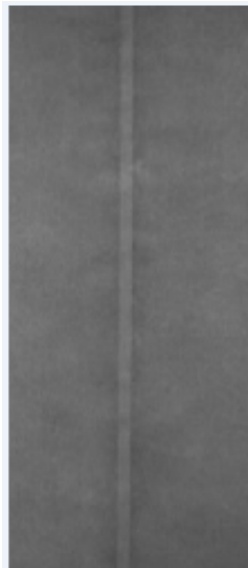
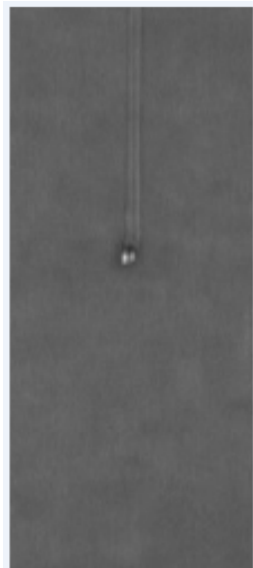
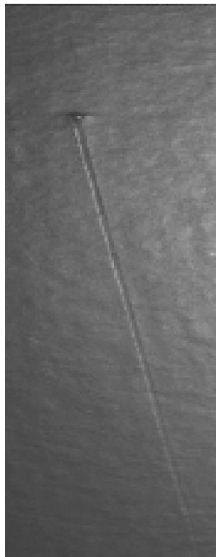
- Low Angle reflection (0,13mm x 0,44mm) camera 17°, light 17°



- Transmission (0,34mm x 0,34mm)

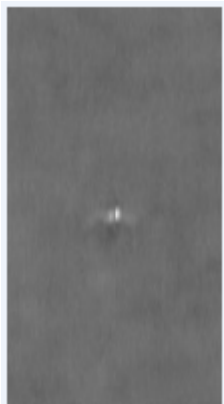


# Defect examples, online and offline

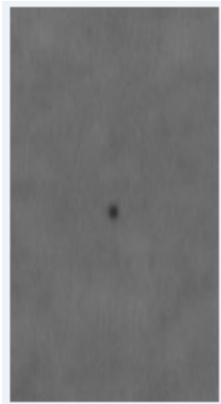


streaks

wrinkles



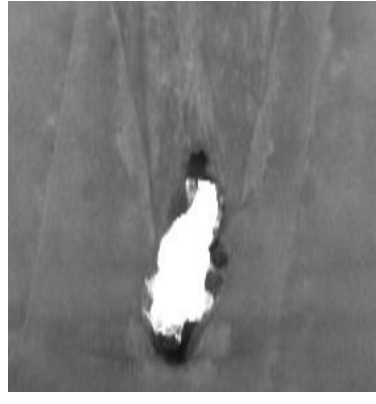
Small hole



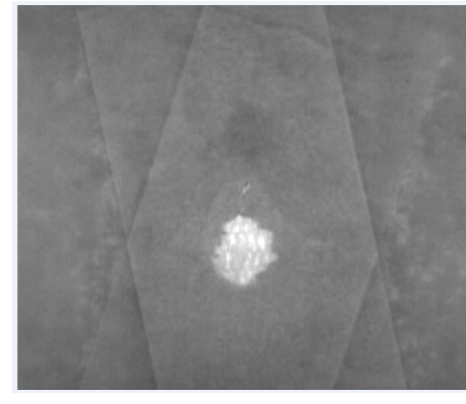
Dark spot



hole



big hole



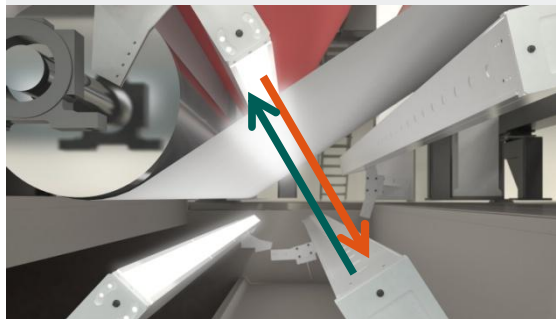
patched hole

# Metso PQV system structure

## WIS beam geometries

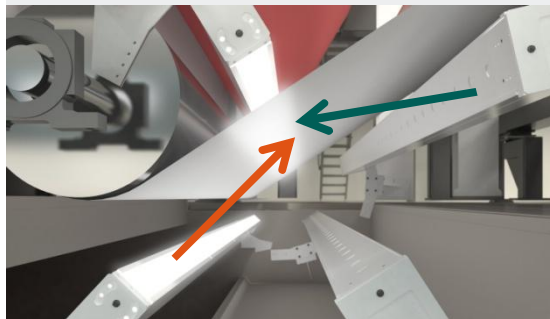
### Transmission beam:

- Typical resolution 0.40 – 0.80 mm
- Detection achieved:
  - Holes, pinholes, slime holes, dirt, thin areas, forming defects, felt hair, shives, slime spots, edge cuts, wrinkles
  - Full MD&CD formation analysis



### Low angle reflection beam:

- Typical resolution 0.20 – 0.40 mm
- Beams in 15 degree angle
- Produces 3D image of the surface
- Detection achieved:
  - Coating defects: indents, missing coating, streaks, etc



### High angle reflection beam:

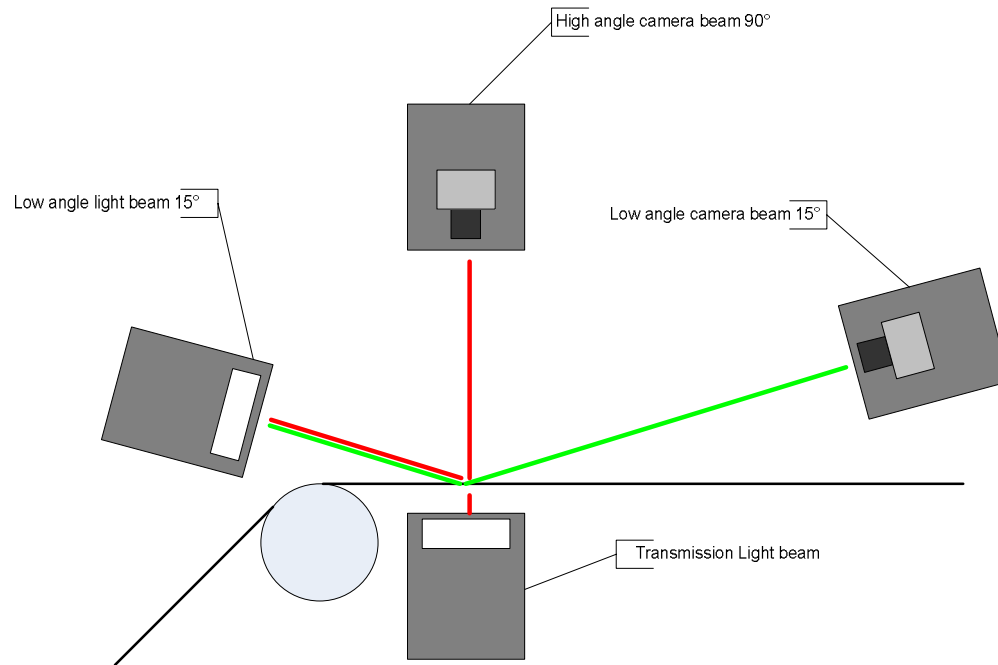
- Typical resolution 0.50 – 1.00 mm
- One beam includes both led lights and cameras or separate camera and light beam with high angle
  - Easy to install
  - Optimal on calender stain & splash detection
- Detection achieved: Oil, dirt, shives



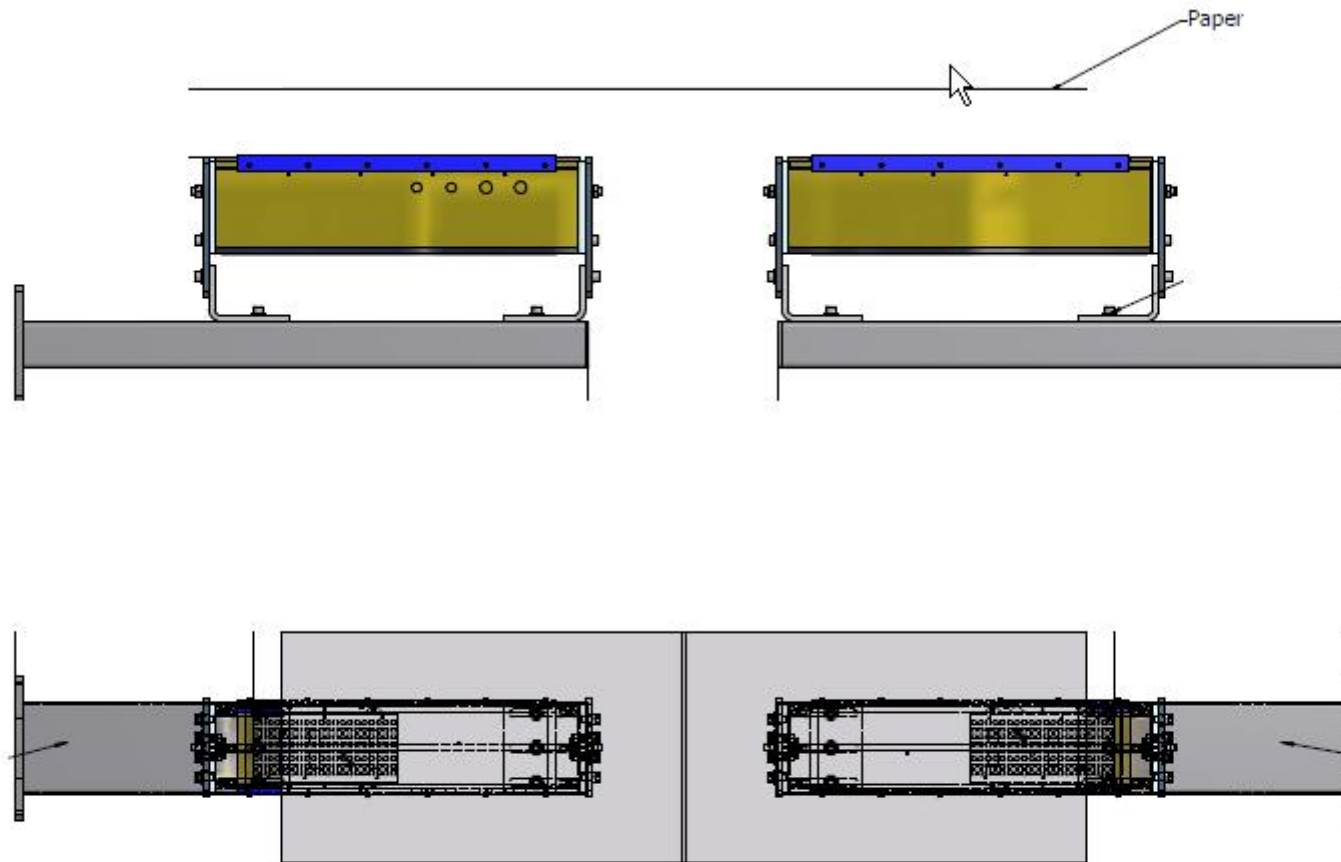


# Different geometries - "revolver"

## Combined low angle, high angle and transmission



## Edge WIS



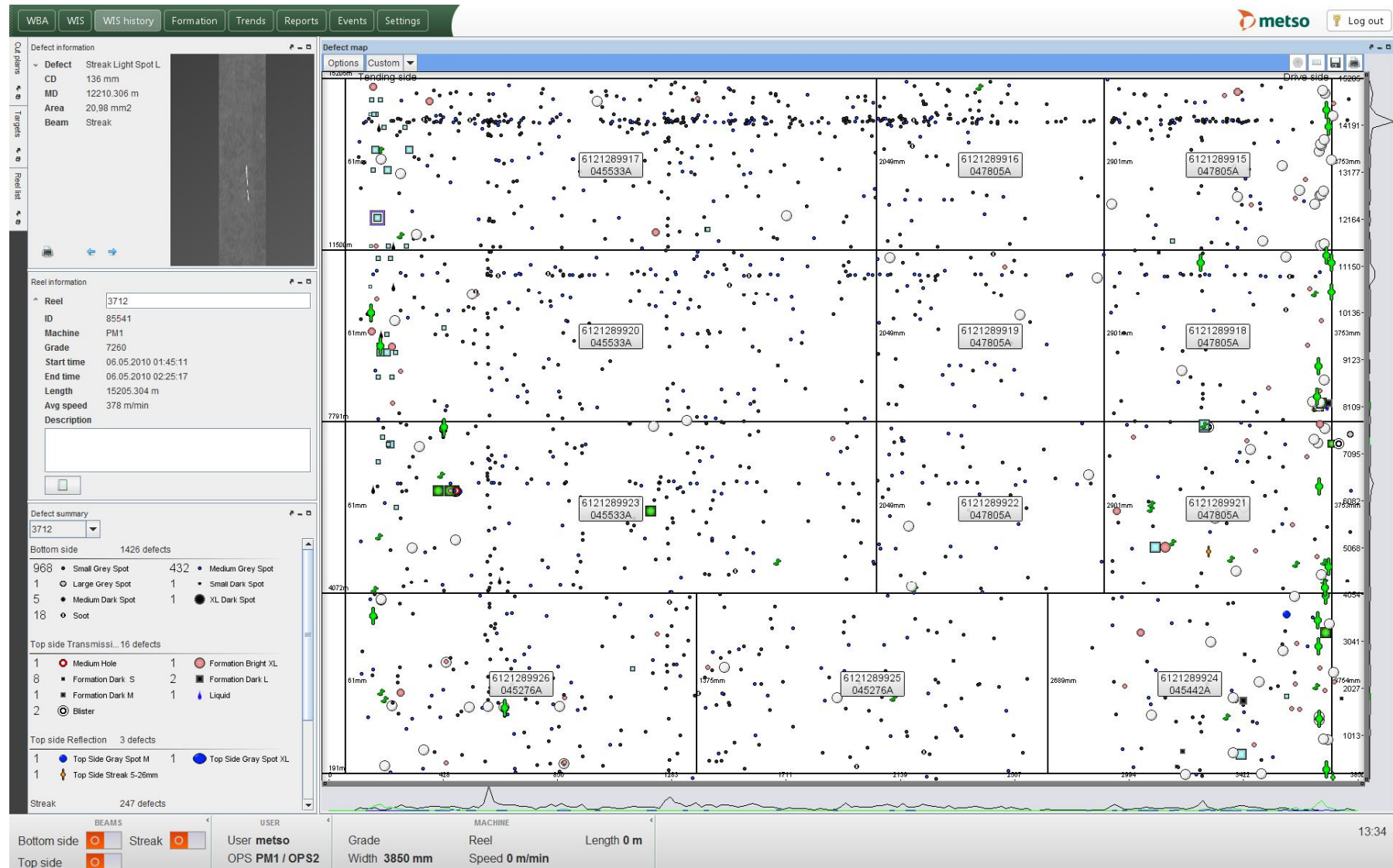


# Defect and length code marking

- 1 to 3 color, defect and length code marking.
- Ultrafast, edge tracking available
- Digital barcode, (absolute position), code includes web direction
- Defects are in data base using same MD coordinates
- Code readers on Winders / Re reellers

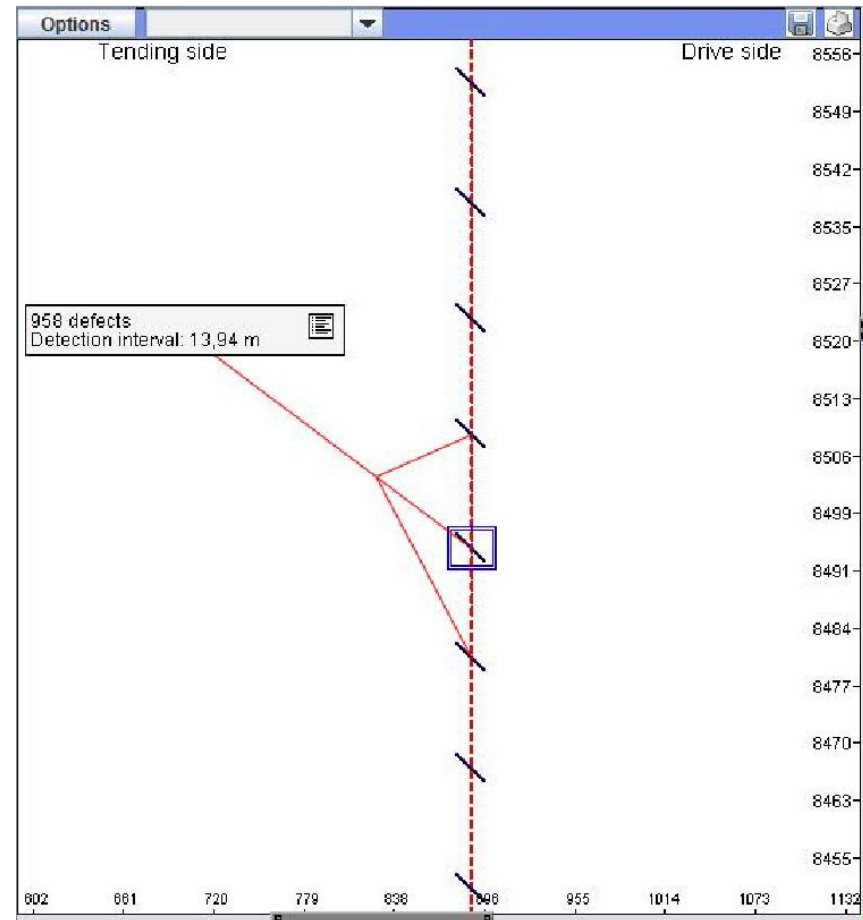


# Modern user interface



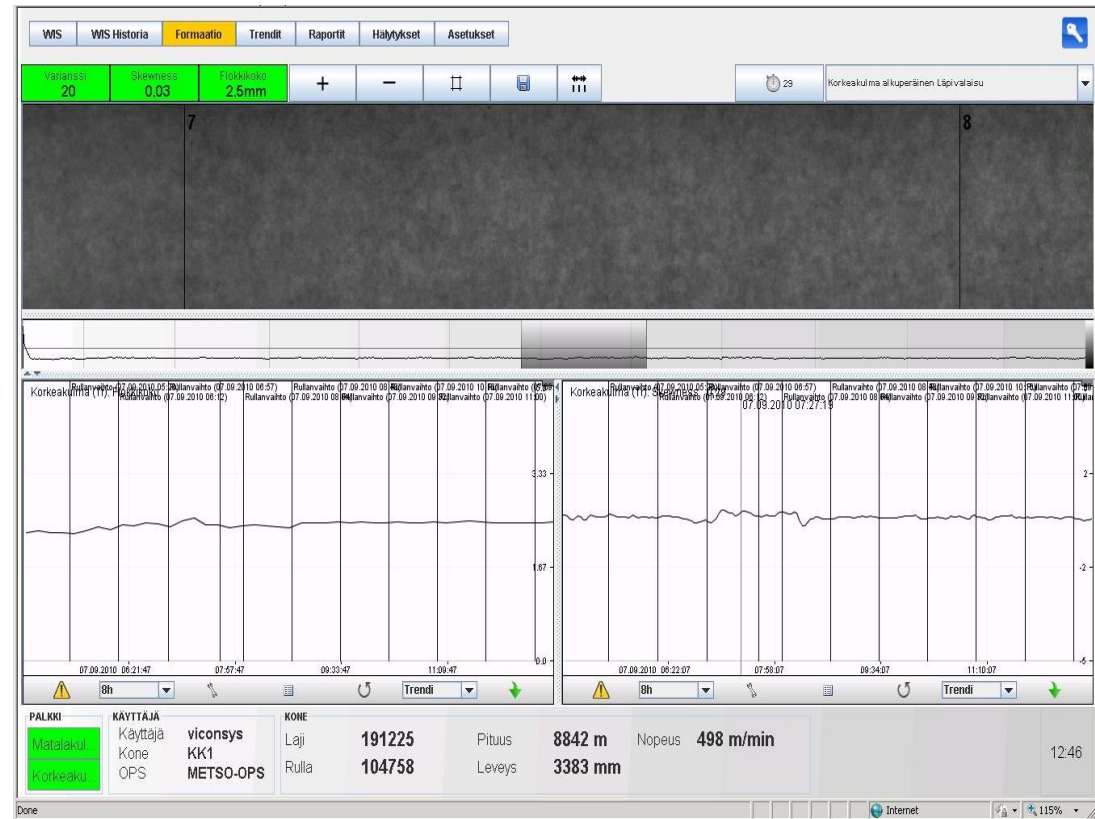
# Periodical defect analysis

- On user interface screen periodical defects are connected with red dashed line
- information box showing distance between defects and amount of defects
- If there is same periodical defect distance interval (machine part length or diameter) in database, then system will show that machine part name in the information box.

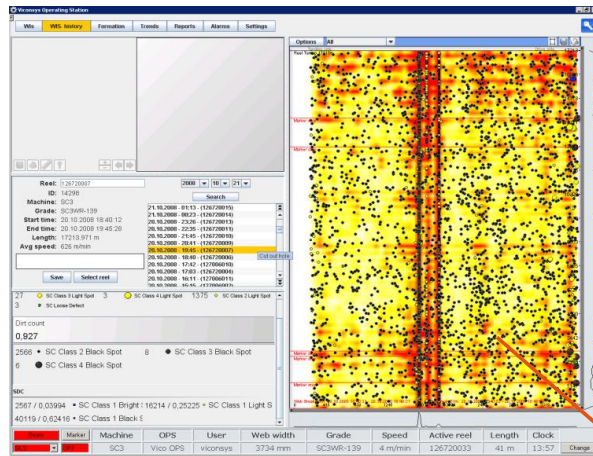


# Formation analysis

- Formation variables
  - Skewness
  - Variation
  - Flock size
- MD formation profiles
- CD formation profiles
- Light table tool
  - Full web width formation image



# Statistical dirt count

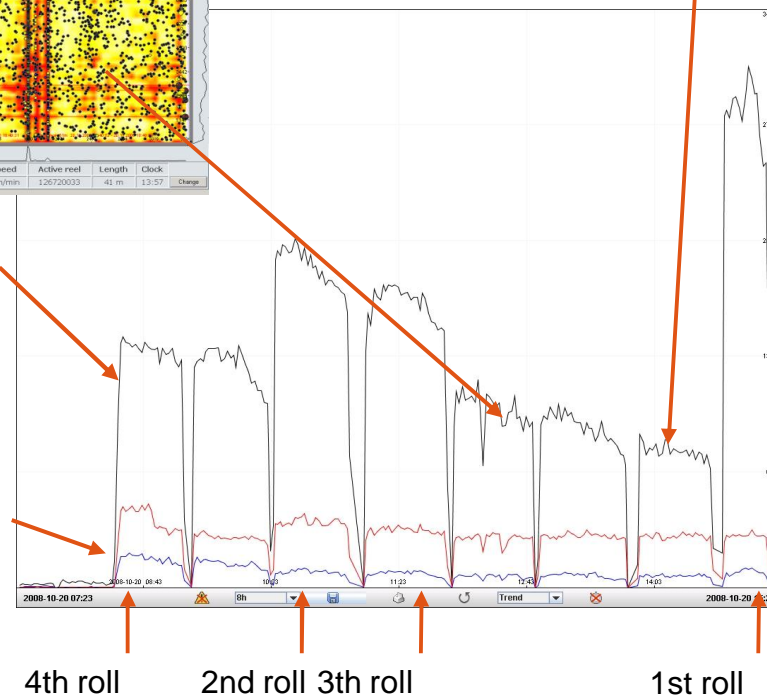


Red color: dirt count exceed the user defined limit. Not good to end customer.

After six rolls dirt quality is good. Now user can make the cutplan and select good end customer Rolls.

Note: huge correlation on small dirt. You can say the roll order from paper machine

Note: no correlation on normal defects

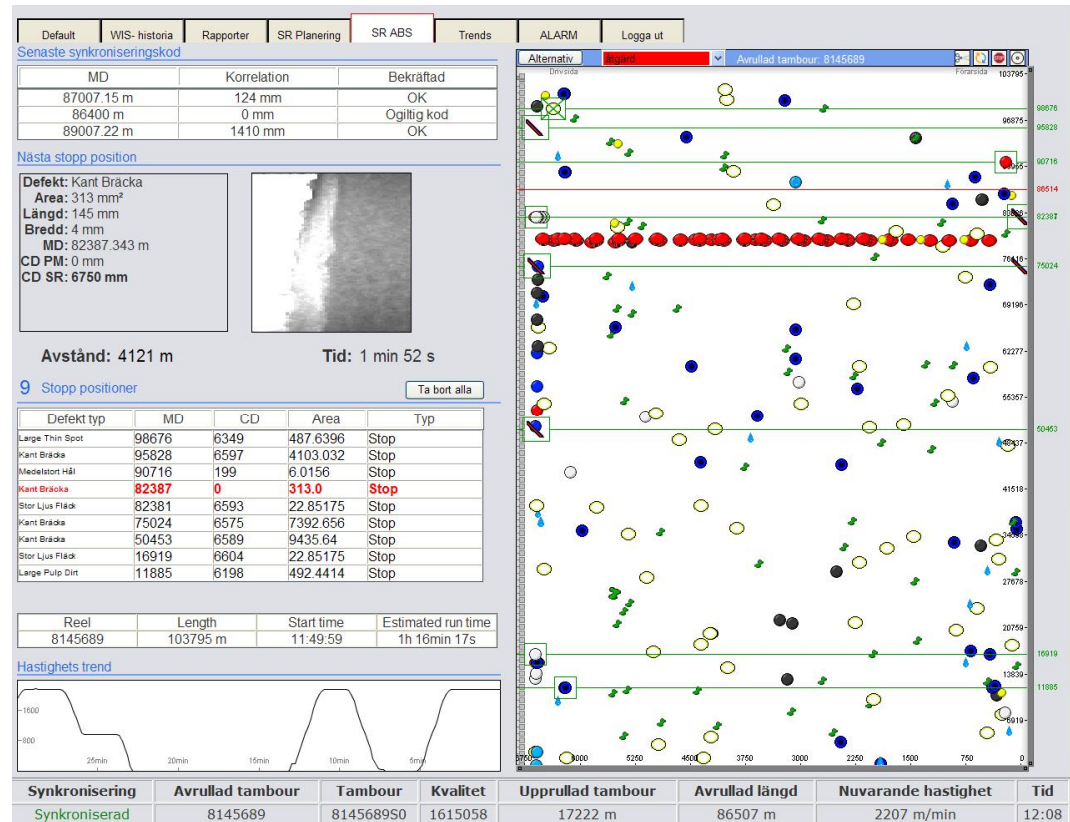


1st roll from paper machine after washing has lots of dirt.



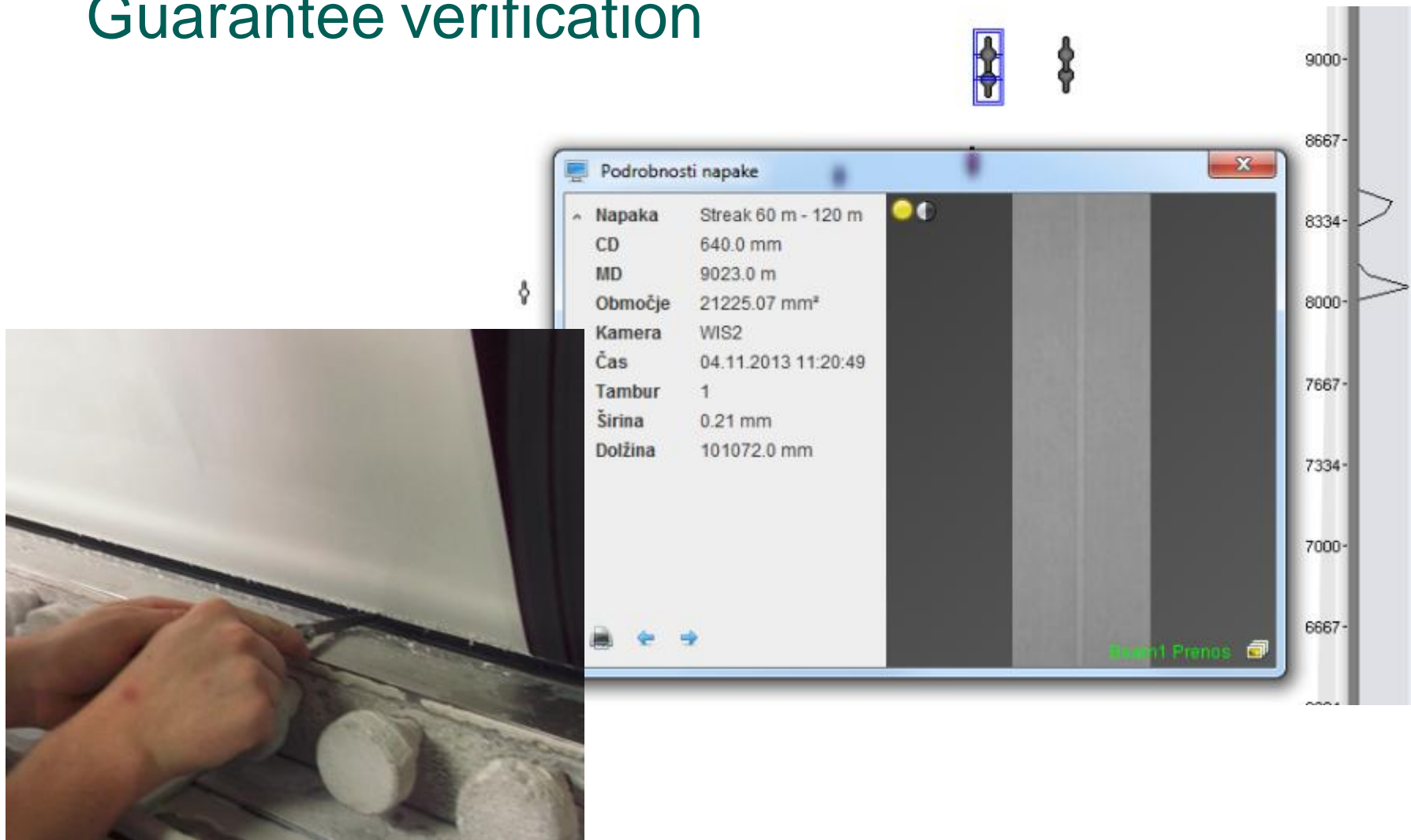
# Winder-/ Re reeler control

- Runnability optimization with synchronized defect map
- Target stop and synchronization are very accurate
- Trim plan tool available for winders
- Operators are given automatic run plan plus chance to program additional stops
- Slabb off on the reels is automatically identified and taken into account. Amount of slabb off can be reported too. Web breaks are automatically identified and taken into MD length account.





# Guarantee verification



# PQV as part of Metso's life cycle management



- Metso's local service
  - Service contract available
- Spare parts availability
  - Standard cameras
  - Standard servers
- Paper manufacturing oriented product development
- Metso's expert help available via VPN connection 24/7

