

SpeckCheck 2

Paper Inspection System

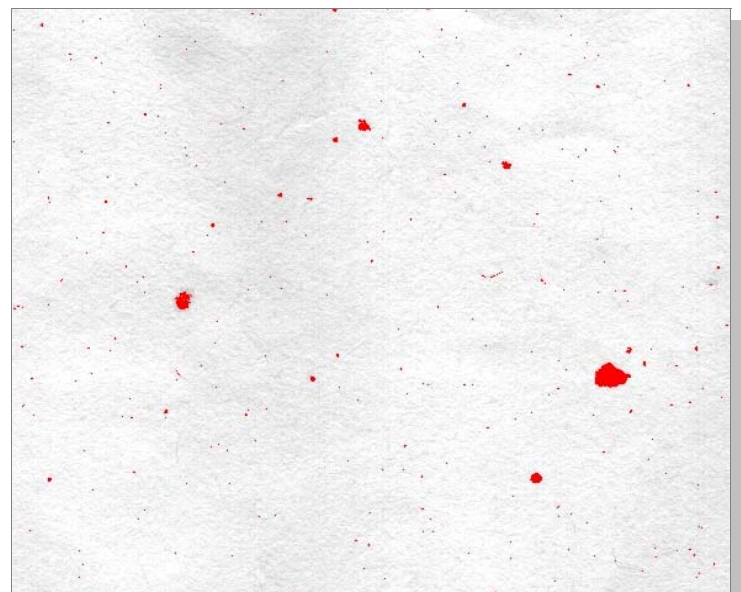
Features:

- ◆ Handsheets or finished product samples are analyzed for Dirt / Ink content at optical resolutions up to 600 dpi.
- ◆ Software conforms to the TAPPI T 563 pm-97 provisional method for measurement of: Equivalent Black Area (EBA) and count of visible dirt in pulp, paper and paperboard by image analysis.
- ◆ An Image window with Zoom facility allows for visual inspection of Dirt / Ink, anywhere on the sample.
- ◆ A new detection algorithm provides accurate measurement of specks having different intensities within the same sample.
- ◆ Automatic sheet brightness tracking.
- ◆ Specks and Shives can be separated by shape.
- ◆ Video invert mode for Stickies measurement.
- ◆ Multiple measurement configurations can be saved for different applications.
- ◆ Password protection and locked software menus can be set for routine operation.
- ◆ User definable Results and Summary screens.
- ◆ Additional *SpeckCheck 2* applications include:
 - Stickies (TAPPI T277 method)
 - Printability
 - Particle Sizing
 - Mottle.

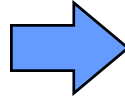
SpeckCheck 2 combines high-resolution flat bed scanner technology and windows based programming for rapid optical inspection of Pulp & Paper.



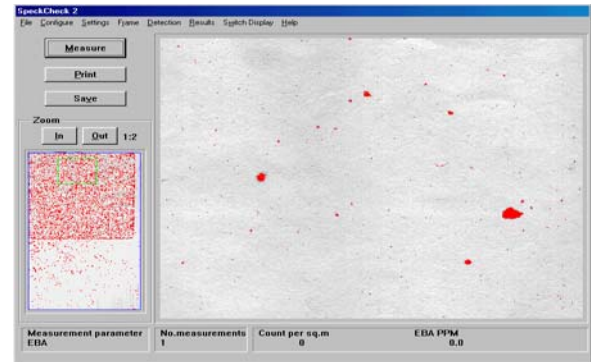
SpeckCheck 2



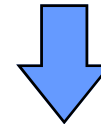
Paper surface showing detected Dirt / Ink



Flat bed scanner



Program screen



Lower limit	Upper limit	Count	PPM
Less than	0.02	0.00	0.00
0.02	0.03	89.00	156.96
0.03	0.04	31.00	71.38
0.04	0.05	26.00	78.68
0.05	0.06	11.00	37.85
0.06	0.07	12.00	57.32
0.07	0.08	10.00	50.43
0.08	0.09	3.00	14.74
0.09	0.1	5.00	32.18
0.1	0.15	14.00	101.53
.15	0.2	8.00	93.69
0.2	0.25	1.00	9.73
0.25	0.3	2.00	40.96
0.3	0.4	5.00	162.50
0.4	0.6	3.00	107.61
0.6	0.8	1.00	53.54
0.8	1	0.00	0.00
1	1.5	1.00	93.55
1.5	2	0.00	0.00

Distribution table

Routine operation of SpeckCheck 2

- A sample to be inspected is placed on the scanner and a single key press or mouse click starts the measurement cycle.
- After scanning, measured speck data are displayed in a Distribution table.
- Print out includes Distribution and Summary tables.

Configuring SpeckCheck 2

SpeckCheck 2 can be configured to scan samples having different format and measurement requirements.

Configurations setup for different sample types are saved for future use.

A mouse click launches an existing configuration with correct program settings for a particular sample type.

Adjustable settings include:

- Sample Size, Shape and Brightness.
- Measurement frame size and position
- Gray level sensitivity
- Speck Size or Shape distribution range.
- Single sample scan or accumulated sample data.
- ppm or EBA ppm measurement.
- Summary Statistics.
- Measured data can be linked to a Microsoft Excel Spreadsheet so that additional Calculations, Statistics and Plotting routines can be run.

Sample types include:

- 6" or 8" handsheets containing dirt and / or ink.
- Dyed handsheets for Stickies measurement.
- Large finished product such as Fine paper or Unbleached liner board.

Equivalent Black Area (EBA)

EBA measurement allows for dirt speck classification by physical size and contrast with the background.

The measurement routine mimics the human observer who sees a small dark speck as having the same visual impact as a large pale speck on the same sheet.

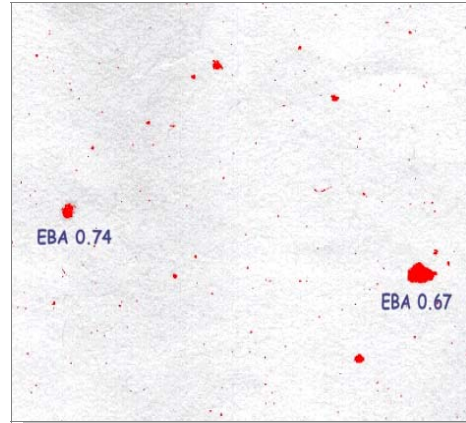
The EBA of a dirt speck is typically less than its physical area.

Before making EBA measurements, instrument calibration is necessary using the TAPPI T563 pm- 97 calibration plate set.

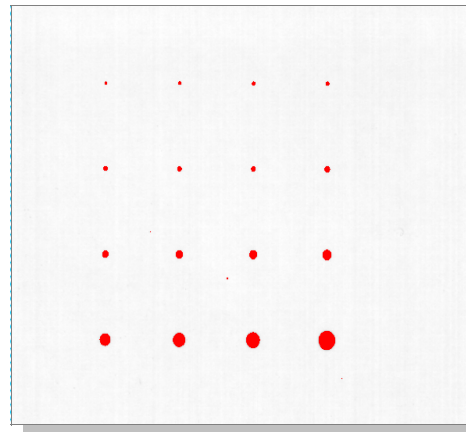
The procedure consists of two parts and entails scanning the four different calibration plates that constitute the set.

Part 1. A *contrast threshold* is established using a black plate and a white plate (each with no dots).

Part 2. A *calibration constant k* is established using two white plates each with an array of 16 gray dots. These two plates have different dot / background reflectivity values.



Detected dirt specks



16 dot calibration plate

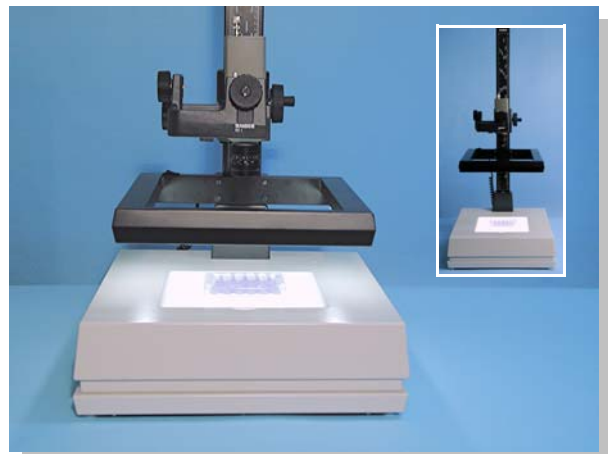
Sorcerer Image Analyzer

For sub-visible dirt counts or particle sizing, the Sorcerer Image Analyzer is available.

This video camera based system can be linked to a macro-viewer light box to measure particulate matter down to approximately 10 μm .

Alternatively Sorcerer can link to a light microscope to measure down to approximately 2 μm .

An optional automatic sample stage can be programmed to scan a large number of fields of view in order to generate statistically valid measurement data.



SpeckCheck 2 Specifications

<i>Scanning method</i>	Flat bed scanner with 600-dpi optical resolution.
<i>Detection system</i>	Center-surround filter, or Binary mode.
<i>Image window</i>	Zoom, Pan & Scroll facility for visual observation of paper surface, with digital detected Dirt / Ink overlay.
<i>Video mode</i>	True for Dirt / Ink, Invert for Stickies.
<i>Sample illumination</i>	Reflected illumination standard. Transmitted illumination optional.
<i>Measurement Parameters</i>	Equivalent Black Area (EBA) PPM, Dirt count / sq. m, Count precision. Size distribution by Speck number or PPM (up to 50 classes). Additional measurements include Area, Diameter, Fiber length, Fiber Width, Aspect Ratio, Circularity. Object discrimination by Shape or Size.
<i>Minimum detectable speck size</i>	0.002 sq. mm at 600 dpi.
<i>Measurement frames</i>	Circular & Rectangular
<i>Maximum sample size</i>	8.5" x 14"
<i>Approximate Measurement times for 6" circular handsheet</i>	12 seconds at 600 dpi 12 seconds at 400 dpi 8 seconds at 150 dpi
<i>Spreadsheet</i>	Measured data can be linked to Microsoft Excel for further data processing, graphics display and report generation.
<i>Operating system</i>	Microsoft Windows 98 / NT4 / 2000 / XP
<i>Computer</i>	733 MHz Pentium, 128 MB RAM, 1.6 GB / 1.44 MB drives, SVGA 800 x 600 Graphics, Mouse.
<i>Year 2000 compliance</i>	SpeckCheck 2 is Y2K compliant.
All trademarks acknowledged.	Specifications subject to change.

For information concerning equipment demonstrations or free sample testing service, contact:

Optomax

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