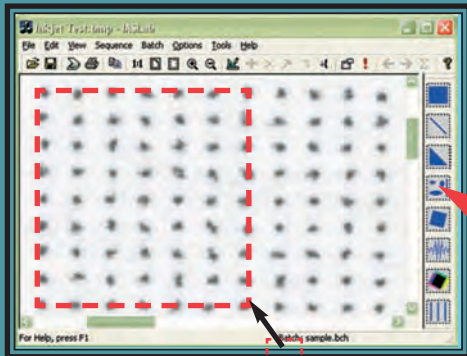


## Image Analysis System Laboratory

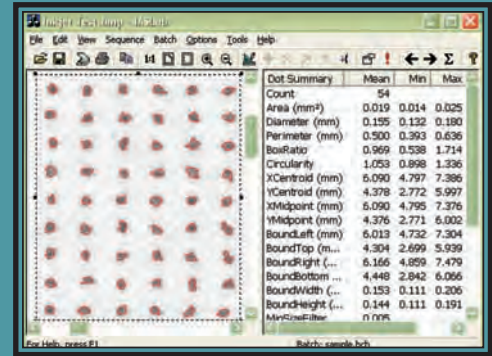
IASLab is an advanced software product for objective, automated evaluation of image quality. Bundled with the PIAS®-II, Scanner IAS® and other QEA image quality analysis tools, IASLab is also available as a standalone software package. IASLab offers a comprehensive toolkit for measuring dots, lines, large areas, NPS, and many other salient image quality features. The software can be used in interactive mode to analyze a particular image element or in automated mode for sequential or repetitive analyses. Automated scan results are stored in an Access database for convenient analysis and reporting.

## Easy PQ measurements from 1 to 1,000,000

### 1 Have a few quick measurements to make? Use Interactive Mode



1) Drag an ROI (region of interest)

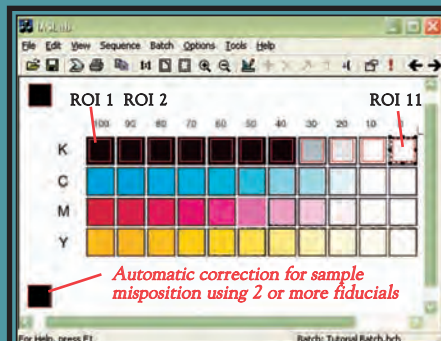


3) View instantaneous results on screen

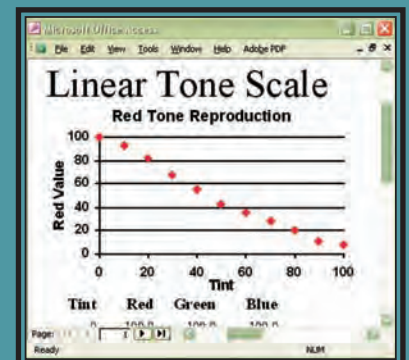
### >1,000,000 Have a lot of measurements to make? Use Automated Mode



1) Load the documents into a scanner with ADF



2) Run an automated sequence that measures as many ROIs as you want



3) Report results from Access or export to Excel or other software



Quality Engineering Associates, Inc.

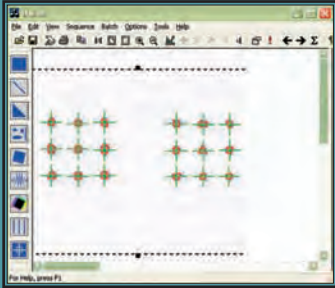
755 Middlesex Turnpike, Unit 3, Billerica, MA 01821 USA

Tel: +1 (978) 528 2034 • Fax: +1 (978) 528 2033

Email: [info@qea.com](mailto:info@qea.com) • URL: [www.qea.com](http://www.qea.com)

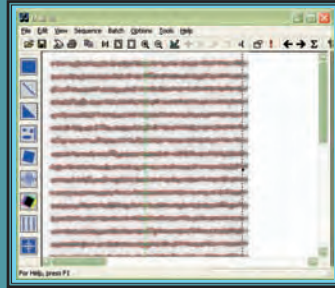
# THE TOOLS

## Basic



Dot Tool

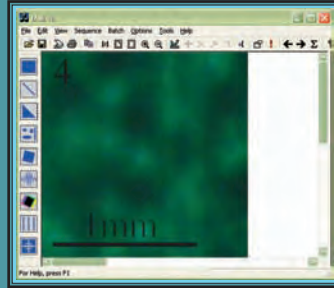
Diameter, position, shape...



Line Tool

Width, raggedness,  
spacing...

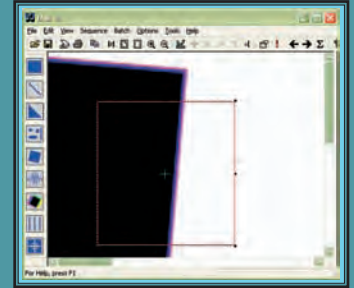
ISO13660



Area Tool

Density, mottle,  
graininess...

ISO13660



Color Registration

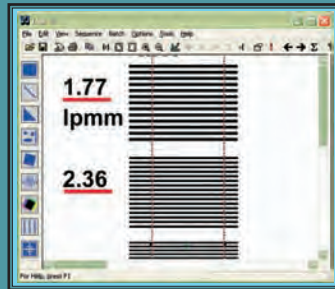
Alignment of colors...

## Advanced



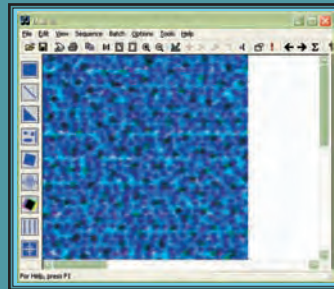
OCR Tool

Can be used for sample ID...



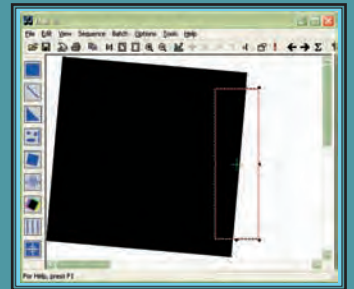
NPS Tool

Noise power spectrum...



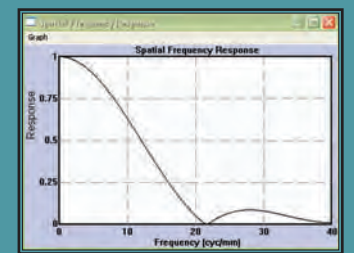
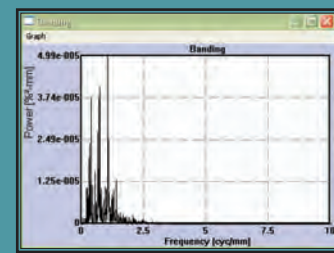
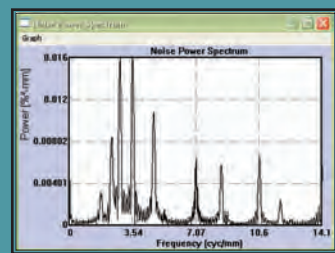
Banding Tool

Including VTF analysis...



SFR Tool

Spatial frequency response...



## WHY DO PQ MEASUREMENTS?

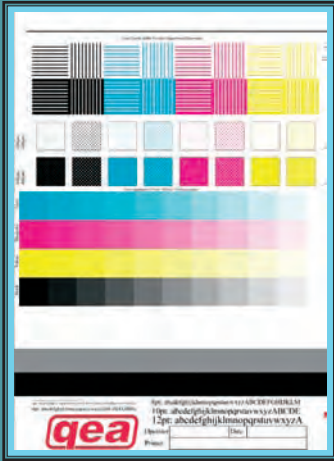
PQ measurements are essential during development, manufacturing, and marketing of printing systems. These measurements determine whether the printer and components are working as expected.

### Examples

- 1) An inkjet head manufacturer measures a pattern of dots and lines to see if the print head is working properly.
- 2) An inkjet ink or media manufacturer measures blocks of colors and colored lines to check for mottle and bleed.
- 3) A laser printer manufacturer measures patterns of lines to check laser scanner and paper feeder performance.

We invite you to contact QEA's application engineers to discuss your PQ measurement needs.

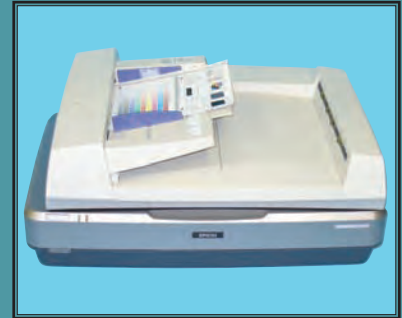
# THE PROCESS



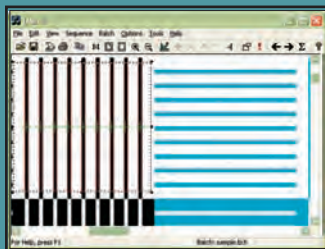
1) Select an appropriate test target for the problem of interest



2) Print the target using the printer, cartridge, ink, and / or media to be analyzed

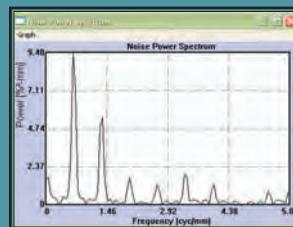


3) Digitize the printed sample using a scanner or digital microscope



4) Analyze automatically in IASLab

Line Summary	Mean	Min	Max	Stdv
Count	9			
Lead Blur (mm)	0.090	0.068	0.098	0.008
Trail Blur (mm)	0.118	0.096	0.133	0.010
Lead Raggedness (mm)	0.014	0.010	0.018	0.003
Trail Raggedness (mm)	0.014	0.011	0.016	0.002
Width (mm)	0.120	0.114	0.127	0.004
Min Width (mm)	0.075	0.048	0.091	0.014
Max Width (mm)	0.169	0.150	0.198	0.014
Std Dev Width (mm)	0.017	0.013	0.021	0.003
Breaks	0.000	0.000	0.000	0.000
Lead Angle [deg]	-0.193	-0.365	0.018	0.123
Trail Angle [deg]	0.102	0.000	0.200	0.080



5) Review results on screen and...

Seq	Sum	Count	Line Width	LE Row	TE Row	Distance
1	1	4	1.804211	0.030561	0.0395771	4.18437
2	2	4	1.89845	0.033561	0.0395771	4.18444
3	3	4	1.804211	0.034041	0.0395771	4.18437
4	4	4	1.89845	0.034073	0.0395771	4.18417
5	5	4	1.804211	0.034041	0.0395771	4.18437
6	6	4	1.89845	0.033561	0.0395771	4.18444
7	7	4	1.804211	0.034041	0.0395771	4.18437
8	8	4	1.89845	0.034073	0.0395771	4.18417
9	9	4	1.804211	0.034041	0.0395771	4.18437
10	10	4	1.89845	0.033561	0.0395771	4.18444
11	11	4	1.804211	0.034041	0.0395771	4.18437
12	12	4	1.89845	0.034073	0.0395771	4.18417
13	13	4	1.804211	0.034041	0.0395771	4.18437

6) in Access for further data analysis and report generation

## QEA IAS Products for Print Quality Evaluation

PIAS®-II portable image analysis system

Scanner IAS® scanner-based image analysis system

IAS®-1000 automated camera-based image analysis



## System Specifications\*\*

### Description

- Advanced software product for objective, automated evaluation of image quality

### Image Sources

- TWAIN-compliant scanner (for scanner-based option)
- DirectX-compliant camera (for camera-based option)
- Stored file (BMP, JPEG, PDF (option), and many more)
- QEA's IAS®-1000 automated PQ measurement system
- QEA's PIAS®-II portable PQ measurement system

### Analysis Tools

- Dot and halftone
- Line and edge quality analysis
- Area attribute measurement
- Noise Power Spectrum (NPS)
- Banding analysis
- Spatial Frequency Response (SFR)
- Color registration
- Colorant coverage (option)
- OCR, Optical Character Recognition (option)
- Plug-in SDK for new tools and functions (option)

### Operating Modes

- Interactive mode: interactively analyzes a single ROI (region of interest).
- Sequence (automated) mode: automatically analyzes multiple ROIs using a pre-defined sequence. The software's Design Mode allows easy creation of sequences for any test target.
- Batch (automated) mode: analyzes a batch of images in automated mode. Analyses can be performed on saved image files or on images captured by an input device (such as a scanner or camera) under software control. Analysis results are displayed instantly. Data is entered in an Access database and can be exported to Excel or other applications.

### Reporting

- Comprehensive results appear instantaneously
- Summary results are user-customizable
- Automated mode sends data to an Access database or text file; output data is user-selectable
- Data tables can be copied from IASLab or Access to Excel or other applications

- Graphical overlays are generated for contour boundaries
- Graphs are generated for many analyses – banding, SFR, NPS, etc.
- Images can be saved, with or without graphical overlays

### Applicable Standards

- ISO-13660 PQ standard for line and area results
- ISO-12233 for SFR analysis

### Productivity Tools

- Automated document feeder (ADF) support
- Double-sided print support (contact QEA for models)
- Automatic adjustment for sample misposition
- OCR for automatic reading of sample labels (option)

### Other Tools

- Image and data copying
- Saving and printing images, summary data, or detailed data
- Image manipulation – zoom in and out, flip and rotate
- Color channel selection for display
- Results selection
- Font size selection

### Documentation

- User's Guide supplied on CD
- Tutorial supplied on CD
- Sample test target supplied on CD

### Computer Configuration

- High-performance PC
- RAM: 4 GB or more
- Available USB port
- Microsoft Windows® 7
- Microsoft Excel® and Access® 2007
- Scanner-based option: TWAIN-compliant high quality scanner (ADF optional)
- Camera-based option: DirectX-compliant digital camera or similar output device