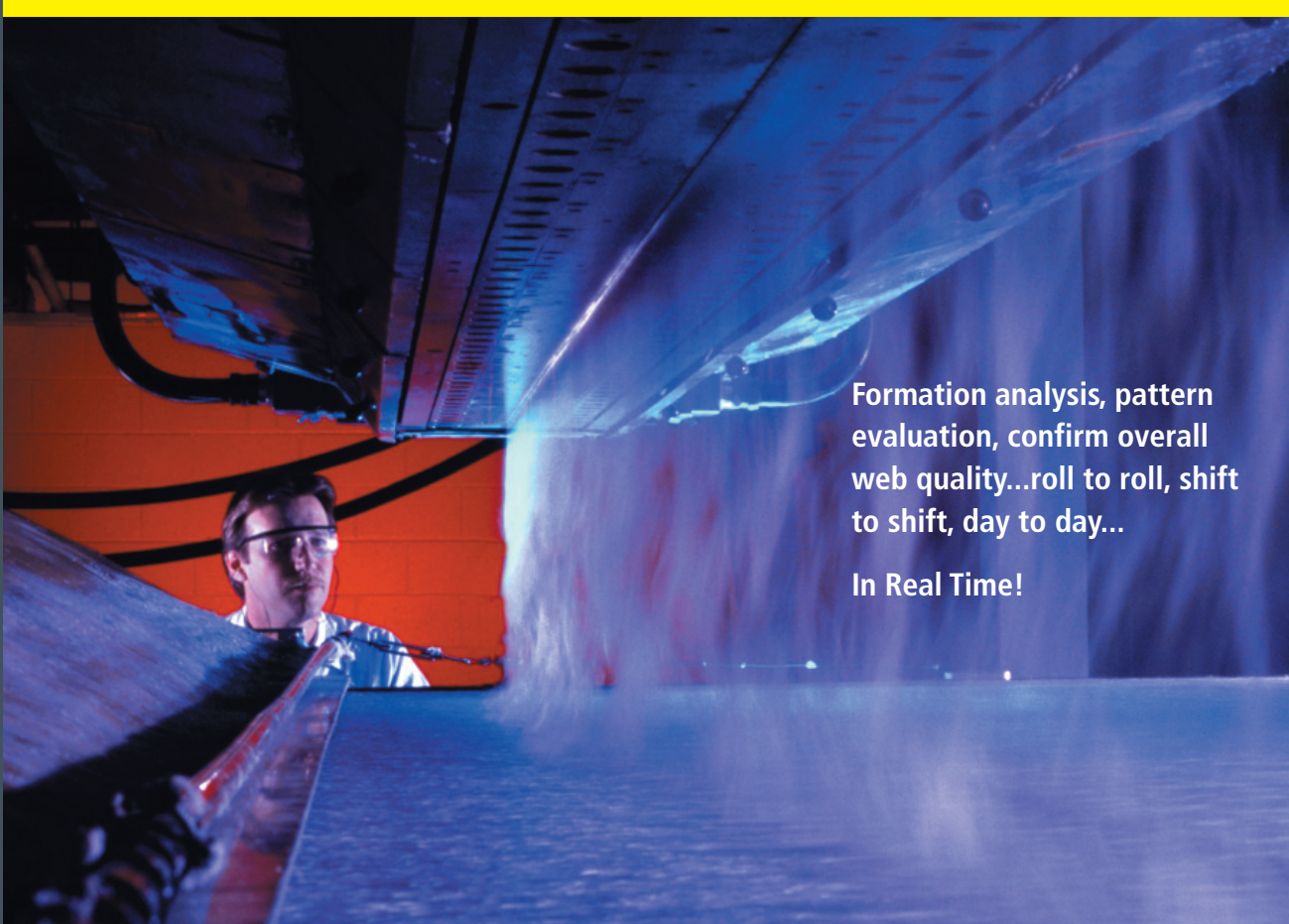# COGNEX

WEB QUALITY MONITORING

Formation analysis, pattern evaluation, confirm overall web quality...roll to roll, shift to shift, day to day...

In Real Time!

SMART VIEW®

NONWOVENS

SmartView® Nonwovens

SmartView Nonwovens has become the most trusted web inspection system worldwide. With more installations on nonwovens production lines than all competitors combined, SmartView is relied upon around the world by every major nonwoven roll goods producer. For many of them, SmartView is already the de facto standard in on-line defect detection and identification.
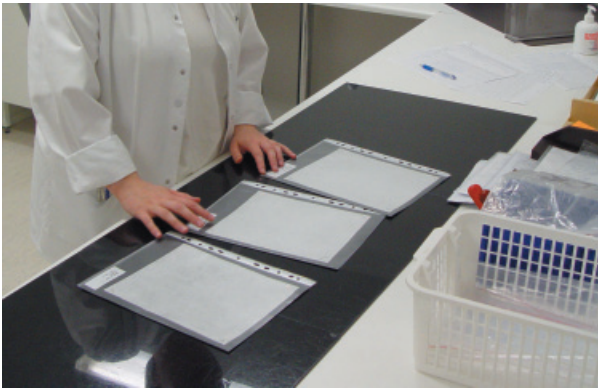
SmartView® WQM Adds New Value to SmartView Systems.

SmartView Web Quality Monitoring (WQM) is a powerful tool for automatically measuring the web quality and formation characteristics of any nonwoven material. This revolutionary technology uses previously recorded sample images of different web quality levels to determine the quality of the material as it is being produced. Actual quality values in the same terms as the mill uses for quality assessment are reported during on-line inspection in real time.

Web Quality Monitoring Benefits

For the first time you can have a real time evaluation of nonwoven web formation. This enables operators to make process changes that impact quality before large amounts of off-spec material are produced. In every nonwovens process, there are web quality properties that can vary from time to time. These processes have many variables that affect web appearance in different ways. Each process variable ultimately affects the price and cost of the end product. These web properties can be anything from web formation, flock uniformity, or surface texture to brightness, embossing, or print pattern uniformity. The SmartView WQM package allows the operators to know the overall web quality for the entire web in real time. It can even predict the post-processing properties of the product as it is being produced. These revolutionary web quality monitoring capabilities enable web producers to minimize cost and maximize price.

- Quality values or labels based on product-specific standards
- Accurate real time web quality measurement
- Easy system set-up and training using visual toolset
- Easy data access through simple user interface, OPC, or ODBC

SmartView WQM Thinks Like You Do!

When asked about good quality web formation, most operators say, "I know it when I see it". Until now, web formation analysis has been a difficult property to evaluate consistently. Traditionally, formula-based calculations and statistical measurements have been used to calculate a representative value that may or may not correlate with what is obvious to the eye. SmartView WQM looks at the surface in much the same way humans do. It looks at an area of the web and compares that area to what the web is supposed to look like or what it has looked like in the past. It then determines the quality of the currently produced material. SmartView sees it, knows what it sees, and reports it in terms you can understand and use.

SmartView WQM Speaks Your Language.

The SmartView user interface has always been available in a number of languages around the world. It has always provided information in terms that can be understood and used by operators and process control professionals. SmartView Web Quality Monitoring continues this advantage by providing Web Quality and formation results that are immediate and reported in terms that you use to describe the web quality on your line. For instance, if the material is characterized by the web formation and you label them Poor, Usable, Good, Better, and Outstanding, that is what SmartView SQM will report instantly as you are producing the material. Or if the same property is measured using any numerical scale (for example, from 1 to 10) that's the scale SmartView will report. However you refer to the quality of your material, SmartView WQM can be trained to report the results in these same terms. And all this information is available in real time as the material is being produced — not after a roll, shift, or day's-worth, of material has been produced.

Setting Up WQM Is As Easy As Using It!

All you need to set up SmartView WQM is to collect sample images of the various quality levels that you want reported. Once the system knows what an image of Poor, Usable, Good, Better, and Outstanding material looks like, it will report Good (material) when it sees Good material. It's that simple! Even SmartView WQM training is very easy. Sample images can be collected with the SmartView system as the line is running. Quality labels or values associated with the samples can be determined using any existing on-line, off-line, or manual method the mill already uses. The SmartView WQM training software automatically sorts the images into proper groups. The user then assigns quality labels or values to those groups. It's that simple!
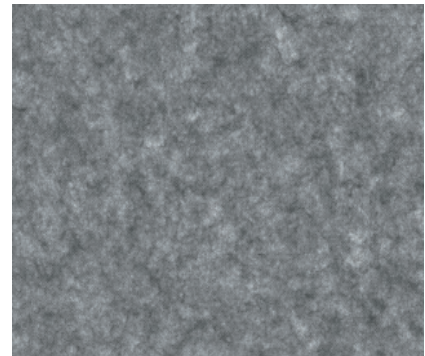
Automated Image Recognition Technology

Even though the use of SmartView WQM looks and actually is very simple, what is going on behind the scenes is far from simple. SmartView WQM automatically analyzes and groups the sample images of the material. It uses advanced image processing technology to automatically sort images into groups where like images are in the same group and unlike images are separated into different groups. This way the system learns and memorizes what different quality materials look like. These groups are then simply assigned labels or numeric values according to mills quality standards. This way the system learns what the user, not a theoretical formula, calls different quality levels. Through these two learning steps the system knows what an image of Poor, Usable, Good, Better, and Outstanding or quality 1 – 10 material looks like. All this knowledge is stored into the real time engine that analyzes the material on-line. The on-line system will then use the same advanced image processing technology to recognize the images it sees. Thus, it can automatically report Good (material) when it sees Good material or report quality value of 5 when it sees material having a quality value of 5.
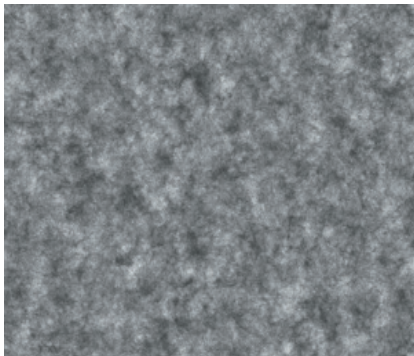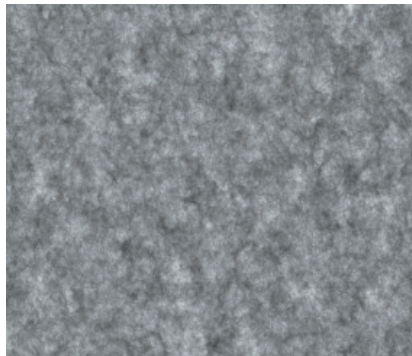
| POOR **1** VALUE | FAIR **5** VALUE | GOOD **10** VALUE |

Upgrading existing SmartView systems with WQM is easy. Existing SmartView systems can easily be upgraded to include WQM capability. In most cases, all that is required is additional software, which can be installed and set up in less than a day. The system can then be trained as it sees material with various web qualities.

Evaluate Almost Any Web Property!

SmartView WQM can evaluate almost any visual web property using overall image analysis. Formation, surface texture, brightness, embossing, pigmentation, or even pattern uniformity are easily evaluated and reported in real time. This enables the operator to make process changes than impact quality before large amounts of off-spec material are made.

If you can see it, SmartView WQM can objectively evaluate it!

An Easy Method to Solve Difficult Problems

SmartView WQM is used to determine the web quality of various materials. In nonwoven production, the quality of web formation is very important. The production process has many variables that affect web quality in different ways, but each process variable ultimately affects finished product properties such as strength, tear resistance, and absorbency. By using the sample images in WQM, all the surface variations can be separated into different quality levels. During system training, the quality assurance engineers in this case assigned a number (web formation) to each quality level.
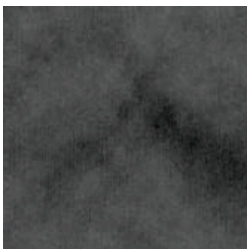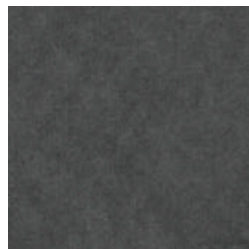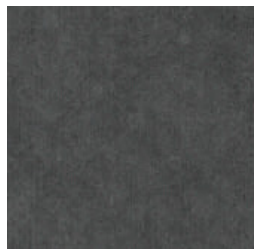

| Poor | Usable | Good | Better | Outstanding |

After downloading the training results to SmartView WQM, operators on the line can accurately monitor the web formation in real time. With OPC, process-control systems are alerted immediately to changes in web quality so that web formation and process changes can be correlated. Web formation data in the database enables business systems to track material quality. Overall, SmartView WQM standardized the process of measuring web quality. Now formation analysis measurements are 100% accurate, consistent, and performed continuously during production. WQM provides insights into identifying process problems, maximizing production of high-end goods, and lowering production cost.
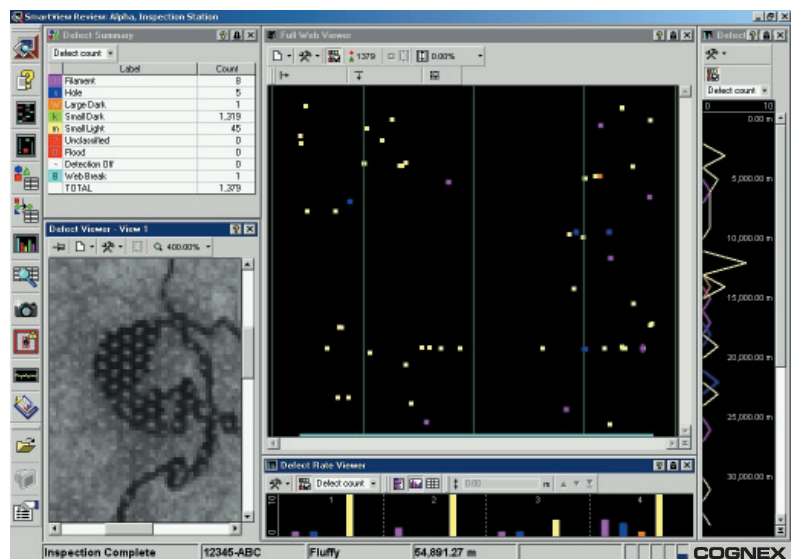
SmartView continues to find defects while reporting web formation

Since 1981, Cognex Corporation has achieved industry leadership by focusing its expertise exclusively on vision inspection technology. The success of our surface inspection division is enhanced by Cognex's financial stability and continued commitment to Research & Development, with more than 300 vision engineers worldwide. Our network of service and support professionals has made us the world's leading supplier of machine vision systems. Our goal is to exceed our customer's expectations by providing real, lasting value through innovative surface inspection solutions. Let Cognex ensure your success and guide you through your next generation of quality improvements.

Cognex Corporation designs, develops, manufactures, and markets machine vision sensors and systems, or devices that can "see". Cognex vision sensors are used in factories around the world to automate the manufacture of a wide range of items and to assure their quality. Cognex is the world's leader in the machine vision industry, having shipped more than 350,000 machine vision systems, representing over $2 billion in cumulative revenue, since the company's founding in 1981. In addition to its corporate headquarters in Natick, Massachusetts, Cognex also has regional offices and distributors located throughout North America, Japan, Europe, Asia, and Latin America. Visit Cognex on-line at http://www.cognex.com/.

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