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Nonwoven Inspection

Nonwoven materials can be a challenge to inspect due to formation noise which can interfere with detection of actual defects. As the actual material fibers get larger in size, and the material unit weight decreases, the effect of formation noise can increase. Another inspection impact can be speed—many nonwoven materials are made at web speeds exceeding 3,000 feet per minute (FPM).

Nonwoven inspection generally concerns holes; inclusions such as strings, hard spots, eyebrows, insects, and blobs; and stains. The small size of many of these defects combined with the high speed of the web and the formation dictates that careful consideration be given to lighting and defect detection.

Nonwoven inspection is typically done as close to windup as possible, to allow viewing of the product after it has passed through most of the production line. Other areas upstream can be suitable, but then defects which are introduced on the web downstream of the station will, of course, not be detected.

In most cases, transmitted light will serve to detect these defects in webs that allow some percentage of the illumination to be seen on the opposite side. Lighting needs to be very bright to account for the fact that the cameras used in such inspection must operate at very fast scan rates to keep down web resolution high. The high scan rate means that each individual exposure must be very short. Certain nonwovens, such as those that are hole-punched, can create problems when trying to distinguish defects from the punched holes. Innovative use of lighting, such as practiced by Webview, can reduce the effect of these holes while still allowing for excellent detection.

Because many nonwovens are streaky in nature, an inspection system needs to be able to deal with the streaks, which are considered normal, while still allowing adequate detection of defects. Webview systems offer both web following and pixel compensation which can completely eliminate the effects of most continuous streaks.

Depending upon the type of nonwoven, it may be necessary instead to view the material in reflected light. This can be necessary if the material is too thick or too dark to allow enough light transmission. To fully inspect nonwovens in reflected light, a separate light and set of cameras is required for each side of the material. Most of the same defects detected in transmitted light can be seen in reflected light, but detection method and thresholds may need to be changed.

Because the web moves so rapidly, some form of marking is usually desired to locate defects after the roll is created. Both ink jet and flag-type markers have been utilized with good success, although the flag offers the distinct advantage of being able to be observed on the rolled-up material. Webview systems are capable of operating alarms or markers, and Webview can also supply these items with a system.

Formation analysis can be very useful in nonwoven inspection. Webview offers an optional formation analysis module which can report variance in the nature of the web due to formation.

Webview offers inspection systems based on both cameras and lasers. We invite you to view our website at:

www.webinspection.com

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