

Advantages of the Automation Industries Series 5600/5700 Internal Defect Detectors as compared to the Trienco Model 506

Executive Summary

The Trienco, Inc. 506 Internal Defect Detector, commonly known as a "blow detector", is a good old workhorse machine and is the first effective air coupled nondestructive testing system ever developed. The original machine was placed in service in 1973 and provided continued service for 23 years after that. The 506 was developed by us and continues to be supported by us with no intended discontinuance in the future. There are many of these machines in 24/7 use today that are in excess of 25 years old.

The Automation Industries 5600/5700 Series systems represent a culmination of the knowledge gained over 33 years of experience with this technology and its application in industry.

- The 5600/5700 transmitter transducers now produce energy levels that are 8-10 times that of the 506, substantially greater than any other known device. This is very important because the ability to penetrate thick and/or attenuative materials is a direct function of the energy level the transmitter is able to produce. A second factor is the internal temperature of the product being inspected. Hot wood fiber based panels can attenuate ultrasonic energy passing through them by up to 60% compared to the same panel at 150 degrees F. At elevated temperatures, the cellulose takes on a "plastic" characteristic which results in an attenuation of the energy

passing through in a manner which we have assigned the term "viscous loss". These additional losses can cause spontaneous loss of signal in defect detectors with less energy output, causing erroneous identification of a panel as being defective. The 506 will normally function correctly on products up to 1" thick that have even a minimal amount of cooling after being pressed, although this maximum thickness can vary somewhat with the type of product. The 5600 unit has proven to be effective on product thicknesses up to and including 3 1/2 " and we expect slightly greater advantages with the 5700 System. Today's markets have often resulted in a trend towards thicker products, often requiring the utilization of lower grade raw material, which also is more attenuative to signals passing through the product. Automation Industries is the developer of these transmitter transducers and they are available only for use in product manufactured by Automation Industries Corporation.

- Signal to noise ratio is also an important factor in these systems due to the attenuation of signal in the product and the ambient conditions in the plant which produce varying levels of noise interference that can affect these detectors. The exceptional transmitter power of the 5600/5700 systems is a factor in improved signal to noise ratio. These systems also feature a very sophisticated signal processing technique which provides the net result of a signal to noise ratio that is around 50 times that of the 506 system. This results in accurate identification of defects, even under adverse conditions that the 506 will not tolerate at all.

- Over the years, production lines have become faster and faster. The 5600/5700 Series systems sample 38% faster than the 506 to offset these faster line speeds.
- The 5600/5700 Series uses an encoder to detect the actual speed of the product and can therefore more accurately determine the actual size of a defect even with varying line speeds, and, if a marker is employed, place the defect marks accurately over the defect. The defect marker can be placed separately past the detector, thereby eliminating back spray into the system sensors.
- The 506 operates on a single frequency, the 5600/5700 systems operate on a frequency band, keyboard tunable by the user. This can be very important when very thick or very hard to penetrate materials are involved.
- The 5600/5700 Series systems incorporate a PC platform. The 506 came into existence long before PCs existed. With the PC comes the following capabilities: Plant and System Diagnostics, Local and remote displays, Various alarm functions, Interface ability with plant networks, Interfaces with our thickness gauges to provide automated grading and sorting. The computer is recipe driven and password protected at multiple levels.