



**Smart converting using data from 100%  
inspection systems**



# 100% inspection system work flows

When manufacturing discrete items like boxes of biscuits, pharmaceutical products, cans and bottles there has always been the capability to inspect and reject. This has been taken for granted. When operating in a roll to roll environment the challenges are quite different. It is not always possible to stop the line so when a defect is detected it will continue to the rewind and become part of the product to be shipped.

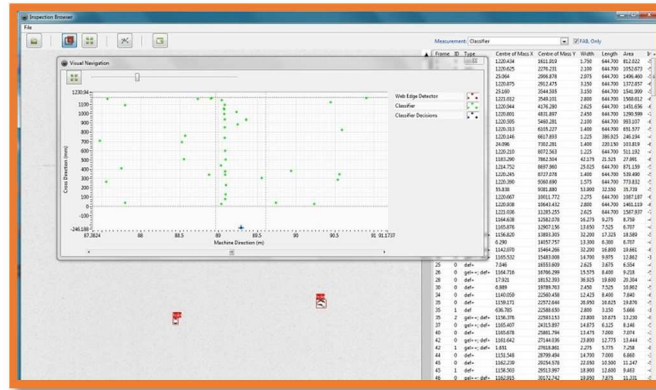
The common approach is to mark the edge of the web or apply a tag as shown below. This works well and an operator in a converting department can then stop and cut the waste out.



## 100% inspection system detect many defects

However if using a 100% automated inspection system, often the volume of defects detected is of an order of magnitude greater. The image below shows a graphical roll map of a plastic roll of material 1800mm in length and 1.4m wide. There were close to 2,300 issues with the roll. The user in this case only wanted to mark holes, so it was easy for the inspection system to classify the defect and automate the slitter to stop.

However there were over 200 instances of contamination. If a tag was to be inserted for each instance, the end result would be a telescoped roll that looked like a hedgehog with many tags.



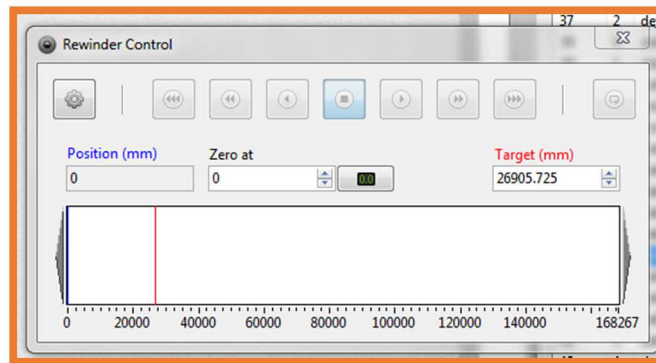
## Work flow for print and surface inspection systems

So if an inspection system is installed on a slitter to inspect material prior to shipping, then it can be considered a quality control device. If installed on the process that produces the defects then it can be considered a process control device providing early warning and allowing the operator to stop further issues. If you add the ability to track defects from the upstream process to the converting department you now have process control and a quality management system in place. This could also be referred to as smart converting. Machine vision systems enable this process.

### There are a number of requirements to smart converting:

- Storage of defect images and statistics to enable a review.
- Classification of defects.
- Software to filter defects.
- Synchronisation method so as to stop slitter at correct position.

The image below shows a simple control screen to allow an operator control a rewinder by selecting a defect and the software together with some simple hardware will move the roll and stop it at the correct location. Synchronization in this case is by zeroing out the position by using any event such as a splice on the roll, and then all defects are offset from that point. This is a simple and well tested method. Another more complex method is to add barcoded tags every say 300m on the roll, and read that tag and locate it in the database.



## Child rolls from a jumbo roll data file

It should also be possible to isolate defects according to the expected location by generating expected roll maps according to a slit strategy. So if the rejectable defects are to be found in the second child roll on slit 4, then that roll can be isolated and doctored and the rest shipped without concern.



# Summary

In summary there are a number of approaches to implementing smart converting processes using 100% inspection data. OneBoxVision's advice is to choose the approach that fits best to your process and resources. Feel free to [contact OneBoxVision](#) to get a free consult. Follow the link below to access our vision library to discover a range of whitepapers that will support your efforts in building or purchasing a vision system.



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