

CONTROL THE WASHBOARD EFFECT

CORRCHECK – NEW MEASUREMENT TECHNOLOGY FOR CORRUGATED BY DIPL.ING. LUKAS PESCOLLER OF PERET GMBH

The success of any package is linked closely to its appearance. A global market leads to stronger competition with similar products offered to potential buyers. The appearance of the packaging is the only possibility to make a product stand out from others. Plastics, metal, glass, wood, cartonboard and corrugated are suitable materials and lamination, printing and labelling can give additional value to packaging.

Corrugated offers several unique advantages compared to other materials-it's high in strength while low in weight. High volumetric efficiency is achieved through good stacking strength. It is flexible in box design, low cost (even in small volumes) and environmentally friendly. Corrugated offers excellent protection for the product whether used as simple shipping containers or as consumer presentation packages. Unfortunately, corrugated does not always exhibit a flat top surface-resulting in printing issues such as dot gain variations, density variations, trapping variations and varnish variations.

During the corrugating process, starch is applied to the peaks of the flutes and bonds them to the liner. As the starch dries it shrinks, stretching the liner into the valley between the flutes. The more starch applied, the more water has to evaporate, the more the liner will be stretched, the more starch applied, the more water has to evaporate, the more the liner will be stretched, the more washboarding will appear. There is a relationship between the amount of starch used and washboarding.

The moisture content of the air, the paper and the starch influences the quality of the finished product. High atmospheric humidity, high moisture content in the paper fibre and high moisture content in the starch will swell the board and reduce the amount of starch applied. There is a linear relationship between water content and washboard effect-the higher the water content, the lower the washboarding effect is. However, there is a limit in applying water to the process. The water needs to evaporate during drying, thus slowing down the process and occasionally damaging the board surface. Side effects like cockling or honeycomb may appear when the water content is too high. Because every corrugator differs in size, age, components, format, and many other parameters, it is essential to find the optimal settings to control the process and to keep the process

constant. Process variations and the washboard effect can lead to high costs because of waste, idle machine time, discussions with customers, additional bad quality rebates and loss of image.

A simple number, quantifying the washboard effect in a repeatable, easy to understand manner is needed. As in other applications such as colour or density control, this number can be used in customer contracts. Agreements about the quality can be easily defined.

To meet this requirement PERET has developed the CORRCHECK-Corrugated Checker. It's a carriage based, hand-held tool that measures the surface of corrugated in a non-contact manner. In a few seconds, the microscopic undulating surface is analysed over approximately 40mm taking more than 6,000 depth measurements. The resulting



Washboard effect and fluting defects on packaging could be seen as a message about the quality of the product itself.



Relationship between amount of starch and washboard effect



Cockling and Honeycomb effect due to excessive moisture

washboard effect number-WBE-is displayed with a resolution of 1 µm.

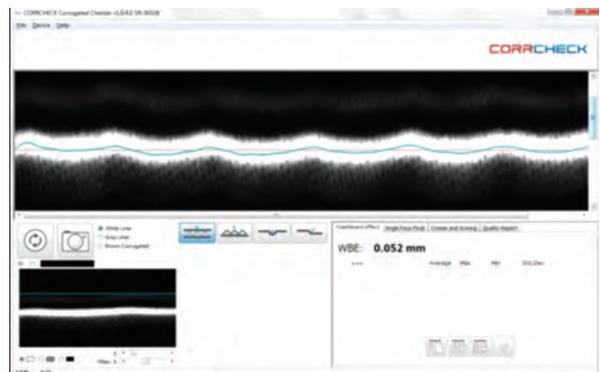
The CORRCHECK enables you to measure your board directly as it comes off of the corrugator. There is no need to prepare samples for measurement. Simply place the device onto the surface and start to measure. If the resulting WBE is higher than allowed corrective actions can be taken immediately. Preliminary testing in real world applications are showing an excellent correlation with the visual appearance of the board. Depending on the application and the corrugated composition, different tager WBE numbers are typically used. An objective measurement tool for the washboard effect will allow you to define your quality parameters upfront, as it done for most other production parameters.

The CORRCHECK offers new parameters for the corrugated industry. It is now possible to offer consistant, high quality products to packaging buyers. As in any other production environment, there is but one simple truth-quality means measure, measure and measure.

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CORRCHECK-the ideal measurement tool for corrugated board



High end application: WBE>0.007 is visible

SMS C300 is a modified tapioca starch product, applied in a corrugated board adhesive formulations. SMS C300 is suitable for use on single facer and double backer for all types of corrugated board and glue kitchen



Easily Dissolved
 character as peak viscosity during dissolution is low

Stable Viscosity
 gives a more consistant operate on the machine and a better board quality

Good Water Retention
 which leads to better bonding strength

Less Consumption
 Less Consumption of glue due to better distribution allowing good bond strength with less glue