

Omya Calcium Carbonate is Pushing Boundaries in Packaging Board

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INTRODUCTION:

As consumer behavior shifts in how goods are purchased and consumed, product packaging must change to match the new behaviors. Due to the global COVID-19 pandemic, we have seen an acceleration in some buying behaviors toward e-commerce where people who may have been reluctant in the past to shop anonymously online are now fully embracing this new approach.



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Another aspect of the ongoing shift in consumer behavior is the increasing awareness to adopt more sustainable and environmentally friendly lifestyles. The three golden "R's" for packaging - Reduce, Reuse, Recycle - have gained importance as notions of sustainability continue to touch everybody on planet Earth. However, even when consumers are behaving as environmentally friendly as possible, there is still complexity faced by the packaging industry to try and realize sustainability goals.

All of the shifting consumer behaviors mentioned have created a significant tailwind for cellulose-based packaging producers. Containerboard grades making corrugated products and cartonboard have always been, and continue to be, looked upon favorably through a sustainability lens by the global packaging industry. These products are successful because they are produced, traded, used, and recycled all around the world. Packaging made out of cellulose fibers, which are readily available and cost-effective, performs reliably but there is still room for improvement. In the rest of this article, we will have a closer look at the current and future needs for containerboard and cartonboard and review some available solutions.

Omya, as a leading global producer of calcium carbonate and a worldwide distributor of complementary specialty materials, has built a solid network in the packaging board industry. Based on profound knowledge, and a strong product portfolio backed by a reliable supply chain the company is appreciated by its customers and partners.

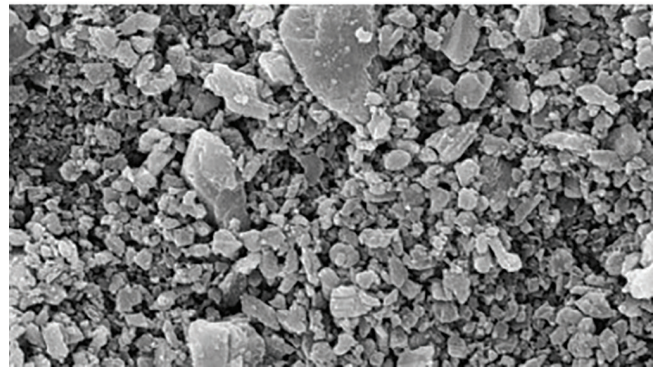
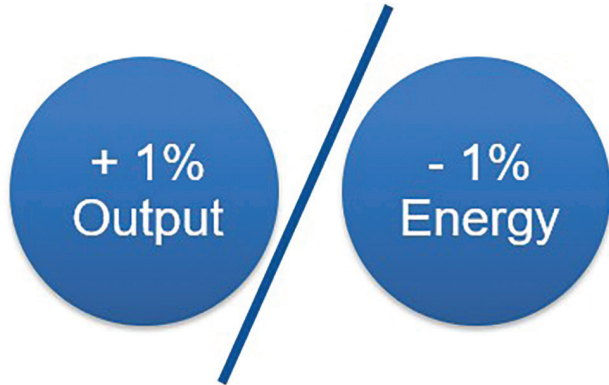


During the mid-2010s Omya began to look closer at containerboard, specifically testliner grades. The vast majority of this linerboard in most of the world is made out of recycled fibers, mostly old corrugated containers (OCC). In recent years the industry landscape experienced significant growth with new machine capacities by either green field projects, upgrading existing assets, or conversion from Graphic Paper machines. This growth resulted in greater awareness of recycled fibers as a precious raw material.

In 2015 Omya introduced a concept utilizing specific mineral fillers in the containerboard production process. With an initial focus on boosting board machine output, this concept has convinced a significant number of containerboard mills to begin using Omyaboard mineral fillers. Omyaboard grades improve the de-watering performance in the wet-end section of the machine. By having the same specific energy intake in the drying section, the machine output can be increased significantly. Based on experience as the rule of thumb 1% Omyaboard brings a 1% output increase or a 1% reduction in energy demand for drying.

This concept is not only limited to increased output. In cases machine speed is already maxed due to increased drive train or other mechanical reasons, implementing Omyaboard also allows reduced drying energy demand per tonne of paper produced. In these times of especially volatile energy prices, when for example Natural Gas EU Dutch TTF Spot (EUR/MWh) is almost four times higher in August 2022 compared with the beginning of this year. Similar strains are seen in the North American industry as the Natural Gas Spot Price Henry Hub (USD/million BTU) spiked in August almost 2.5 higher than in January 2022. Unused portions of available energy capacity can be utilized for other purposes when applying the Omyaboard concept in the scope of energy savings. Selling off overcapacity into the grid is an attractive option too.

The secondary ash content of incoming recycled fibers is a parameter that impacts the relevant mechanical properties of testliner grades, such as SCT (Short Compression Test) or Burst Strength. Fiber quality will always vary in each geographic region but the fiber mix will vary as well. In a specific case where the secondary ash level was 16%, when substituting recycled fibers with Omyaboard at 2% mechanical properties of the testliner were not degraded. Implementing this mineral filler concept could also support the quality consistency in containerboard grades. There are even ideal cases where an integrated ash level sensor measuring secondary ash level can trigger the appropriate dosage rate of such filler by targeting a constant ash level of the final linerboard.



Every case is unique because of the paper machine configuration, range of linerboard grades produced, available fibers, and other aspects. By starting with a comprehensive wet-end analysis covering various factors, Omya specialists will develop a proposal for the best-fitting Omyaboard product and can guide you through implementing this concept in your production.

The attractiveness of recycled paper and board as a fiber source is only possible because of the reliable and proven infrastructure to collect and process this resource in many countries.

However, structural changes in the paper market, specifically with the demand for graphic paper, are severely affecting the available volume of high-quality fibers which feed the recycled fiber streams. Stakeholders in the industry are continuing to report concerns about skyrocketing prices for white shaving or other adequate fibers. Besides the price, the availability of required volumes is even becoming a challenge. The future of white fiber availability doesn't seem likely to change, so what if there was a way to circumvent a dependency on white fibers?



The Omya Aqurate coating pigment product family addresses the needs of packaging board manufacturers and converters. Omya Aqurate is a modular set of products that offer alternatives to any packaging grades that contain a white ply through coating directly onto the brown or grey fiber plies. With Omya Aqurate, manufacturers can substitute white fibers completely with a coating.

Omya Aqurate products are not only focused on the board manufacturer because they perform well in other parameters beyond just excellent coverage and brightness. Omya Aqurate coated substrates also provide a solution to various challenges in the downstream printing and converting processes. Take for example Omya Aqurate HA25, a type of ground calcium carbonate (GCC) pigment that stands out with instant ink absorption. In this case, the Aqurate coated linerboard will work ideally when printed on a FlexoFolderGluer. These sheet-fed printing assets are still the vast majority of the machines installed for printing onto corrugated board. For Flexographic Inline postprint technology the biggest challenge is typically the lack of an intermediate drying step after each printing station. Even though most print jobs have only 2 or 3 colors, the board surfaces need to manage the incoming ink freight without compromising quality (ink smearing) or machine speed. Omya Aqurate HA25 is not the only Aqurate pigment that converts well, all pigments in the product family were designed and tested to allow for seamless converting increasing, folding, gluing, etc.

There is another side of printing on the packaging board where photorealistic designs are printed in high resolution. Renderings of lively color gradients, gentle skin tones, or homogeneous dark color full-tone areas are required. Ambitious prints like this are enabled by new generations of flexo printing

machines like High-Quality Flexo Postprint (HQPP) and Flexographic Preprint. Typical substrates used for these printing jobs are Coated White Topliner (CWTL), Solid Bleached Sulfate (SBS), or Coated Bleached Kraft (CUK). The correct substrate is required to take full advantage of the excellent capabilities of these new, top-notch, printing machines and meet premium quality demands without compromising possible machine speed. Omya Aqurate HD30 top-coat pigments deliver precise and vivid high-color reproduction at high printing speeds because of their fast ink absorption.

While the performance of Omya Aqurate pigments in printing and converting is strong, the value of this product family is not only limited to these process steps. Taking a holistic view, with an Omya Aqurate-based coating replacing white fibers, a new space is opened up for different aspects of packaging board. Light-weighting, or said better, right-weighting of packaging can be realized by taking the Omya Aqurate approach. A typical WTL, substance 140 gsm, has a white fiber ply of 35 gsm and a target brightness of 73% (TAPPI). Based on proven cases, the white fibers can easily be substituted with a coating layer of approximately 15gsm with Omya Aqurate HA pigments, achieving the same brightness, homogenous coverage, and identical converting results. The 20 gsm saved by the difference between 35 gsm of white fibers versus 15gsm of coating, can now be allocated to a certain extent to the brown fiber ply to fulfill the mechanical requirements in SCT, Bursting Strength. When right-weighting board manufacturers can choose to use the Omya Aqurate approach to reduce the total weight of their board and reduce the Carbon Footprint of packaging by replacing precious white fibers and optimizing grammage.

PRODUCT FAMILY OVERVIEW

Omya Aqurate® – Coating pigments for Containerboard & Folding Cartonboard

