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INTRODUCTION:

Growing environmental awareness, the single use plastic directive, and concerns over microplastics are driving the packaging industry towards more sustainable and renewable products and solutions. Globally, exciting collecting and recycling systems are already in place to put paper and board-based materials in a superb position to change the big picture. With new barrier solutions, guaranteeing the required performance, Omya can make a valuable contribution.

Have you ever asked yourself, what is the real purpose of packaging? Of course you did - to protect the packed goods, whether it is a set of electronics or your cereals bar! As most of us grew up during times where packaging simply had to fulfill its job, providing the required functionality at lowest possible costs, nobody was questioned the resulting impact on our resources and the environment. And as of today we still don't do so, at least most of us! Last, but not least, the consumer awareness on the environmental impact of packing products is picking up, which may lead to unacceptable production methods, restrictions on the used materials or the sources thereof.

So there are regulations in place, for example in Europe with the national waste directives which are addressing defined recycling rates for various materials, or the single use plastic directive (SUPD)



which define the regulatory and legal landscape for the packaging industry.

But the voice of the consumer is becoming louder, addressing the consequences of our unlimited use of resources and finally the impact on our wellbeing, whether pollution of land and oceans, the omnipresence of microplastics, or the effect of unhindered carbon dioxide and other greenhouse gas emissions.

Figures 1 & 2: Consumer awareness on the environmental impact of packing products is rapidly growing.

Besides the direct costs of the packaging material, costs factors like converting speed, transport, and complexity of the packaging process had been, and still are, a big issue for the brand owners and marketeers. Well, times are changing; on the one hand the industry is confronted with ever increasing regulations, and on the other hand secondary costs for certification and licensing, respectively waste handling are becoming more and more relevant.





Maybe this observation is too Eurocentric and only from a quite specific standpoint, but I am convinced that the end consumer will lead finally to a way more restrictive, as well as smart, use of packaging solutions.

If we want to pass on an earth worth living on we have to change our habits – quickly! I do not want to say that everything we have done in the past is not an option for the future, existing means of packaging e.g. based on polyolefins, if properly collected and recycled will have their place in the future too. But we still have too many solutions in place which are either not suitable for recycling – and here I want to be more precise, real recycling, and not only downcycling, or do not have functioning collecting systems in place, or indeed in many cases lacking the awareness of the consumer on how to deal with their used packaging materials.

Furthermore, we are still using solutions which may look from a technical point of view very smart (commercially feasible) and convenient but are unacceptable from a health or environmental perspective, e.g. per or poly fluorinated products

A complex topic with no black and white answers some might say! Of course, a multilayer multi-material packaging solution is providing from a technical and commercial point of view some benefits, high functionality with superb performance or light weighting. As an example, a PE-PET-PE solution may be addressed, however if you think about the recyclability of such a product there are no feasible solutions in place currently. Critics may say that pyrolysis of such a material mix is possible to create a new "raw" material which can be used for new grades of packaging, but is this recycling? I would say it is rather downcycling than recycling.

The required investments and the needed process energy may be addressed here as well. Light weighting as a, for sure, valid argument is also often used to justify "plastic"-based solutions, but will you really be able to load one palette more in the truck due to lighter packaging material in comparison to fiber-based alternatives? Figures 3: Packaging needs to be an environmentally friendly and sustainable product.

To the understanding of knowledgeable experts, the nature of the SUP is heading in the wrong direction! On the one hand nature based products like chemically modified natural polymers are stigmatized as being "plastic"; on the other hand the given recyclability of polymer-based solutions for paper and board packaging systems is not addressed as being more environmental friendly due to its recyclability by the currently available infrastructure! There is no legal differentiation of a multi-layer, multimaterial derived from 100% crude oil and a paper and board product with a thin layer of non-renewable but fully recyclable functional product. Even worse, if this required functionality is coming from natural resources, as for example a modified starch, which has to be considered as fully biodegradable, the general idea of evolving packaging solutions towards being more environmentally friendly is compromised.

Last, but by no means least, the design of packaging materials and required performance has to be challenged, the performance coming with some plastics is not always required!

An application-orientated design with the target in mind to find the most environmentally friendly means of packaging should always be sought, without compromising the foremost task of packaging – to protect the packed goods!

I am convinced that the answer lies in a smart combination of the production equipment of the paper and board producer, together with those of the converter and printer, coupled with the application methods of coating, printing, or spraying. Functional chemistry, such as classical polymers, specific products for paper and board, and finally the design being honed for every product, will surely lead to a far more environmentally friendly and sustainable product.

Summary:

Omya is developing functional solutions for fiber-based packaging materials. Whether based on classical chemistry or natural polymers the end result will be the same – always recyclable!

The Omya **"Extomine"** product family is based on classical, functional polymer solutions. With the target in mind to offer the paper and board producer, the converter or the printer, a fully recyclable application. We have designed and successfully introduced a broad, ready-to-use product range into the market:

"Extomine M" gives superb protection of packed food against harmful MOH (Mineral Oil Hydrocarbons). This product is an economical and ecological viable solution for paper and board based packaging, in comparison to a PET or PA-based multi-layer plastic film.

"Extomine G" gives superb protection against water vapor migration as well as water and oil/grease repellence. This product gives paper and board qualities the required functionality to replace the typical laminated or extruded polyolefine film, or to replace the health and environment questionable PFAS (fluorine) solutions.

"Extomine S" This adhesive with additional functionality of oil/grease and water repellence gives the required sealing performance for paper and board products required on high-speed converting lines

With the "Earth" product line Omya is offering solutions with highest bio-based ingredients up to 100%.

"EarthGuard" is the solution for good oil and grease repellence as required for QSR packaging solutions.

"EarthWrap" was, like "EarthGuard", developed for food packaging applications, but with additional water-vapor performance.

At Omya we are passionate about the environment and sustainability - Please feel free to enter into a discussion with us!



Figure 4: Extomine M offers superb protection of packed food against harmful MOH (Mineral Oil Hydrocarbons).