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MONOMATERIAL PACKAGING: A SOLUTION TO THE GLOBAL PLASTICS CRISIS

In this article, Peter Grassl, Sales Director, Dividella, discusses the extent of environmental damage caused by plastic waste in the oceans, and explains how cardboard monomaterial packaging is not only a step towards tackling this issue, but also a potential source of extensive cost savings in pharmaceutical logistics and storage.

OVERVIEW

In February 2108, a young sperm whale washed up on a beach in south-eastern Spain. When scientists carried out a necropsy, they discovered the huge mammal had succumbed to a fatal infection caused by more than 30 kg of plastics in its stomach and intestines. The whale was far from alone; some 90% of dead sea birds are found to have plastic in their gullets. And the problem is only getting worse, an estimated 10 billion kg of plastics enter rivers and oceans every year – a quantity on course to double by 2025 (Figure 1).

The most obvious manifestation of this environmental crisis is the “Great Pacific Garbage Patch”, an 80,000-tonne island of mostly plastic refuse swirling around between California and Hawaii. These plastics not only kill animals, but also decimate coral reefs and damage human health as they break down into microplastic

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Figure 1: An estimated 10 billion kg of plastics enter rivers and oceans every year.



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particles that are now prevalent right across the food chain.

This is why enterprises increasingly aspire to become “plastics free” as part of their sustainability goals. For the pharmaceutical industry, the biggest use of plastics is, of course, in the packaging and logistics chain. Tackling this problem means embracing the use of monomaterials (essentially cardboard) to replace plastics in packaging.

MONOMATERIAL PACKAGING BENEFITS

Parenteral packaging specialist Dividella has long espoused the concept of using 100% monomaterials in its packaging solutions – not just for environmental reasons but

also to deliver much lower total cost of ownership (TCO) and total cost of package (TCP). In-depth research and numerous case studies have enabled Dividella to calculate the actual savings from using monomaterial packaging with some precision.

In principle, the development of the packaging solution should take place right at the beginning of the decision-making process. The choice of a suitable packaging solution has considerable impact on several TCO points. Special attention must therefore be paid to it, as it may be one of the dominant cost drivers.

To explain this, consider the simple example of packaging three syringes and

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a pack insert. The choice is between a classic blister pack in a side-loading folding box or a 100% cardboard solution, consisting of a folding box with a glued corrugated flute, which can be produced on a topper.

Table 1 shows how the material costs differ.

Thus, for an annual quantity of 2.5 million packs, total costs are US \$600,000 (£460,000) for the blister pack, compared with \$250,000 (£190,000) for the monomaterials topper pack, resulting in a saving of \$350,000 (£270,000) per year.

This is from the chosen packaging solution alone, but there are consequent savings to be achieved in simplicity of manufacture and, not insignificantly, in logistics costs from weight and volume reductions, particularly in cold-chain storage, where both are at a premium (Table 2). By land, it costs some \$5000 to shift a 9 m³ refrigerated container over 3000 km. Now consider the number of packs such a container can carry. The NeoTOP monomaterials package (Figure 2) has a volume about half that of the blister pack, partly because it is optimised for volume and also by eliminating the need to seal a blister with lidding foil. These transportation savings are further magnified when moving goods by sea or air.

The TCP savings extend onwards into energy cost in packaging installation, which can also be determined fairly easily from manufacturers’ information. The high heating demands for film forming and sealing mean that a thermoforming process for blister packs will cost more than a topper for monomaterial packaging (cardboard) that is only glue sealed. In the example above, energy costs per shift, including compressed air, came to approximately \$5000 (£3900) for the topper, compared with \$12000 (£9300) for the blister machine.

Item	Blister Pack	NeoTOP 100% Monomaterial
Folding box	10¢	8¢
Plastic tray/cardboard flute	9¢	2¢
Aluminium lidding foil	5¢	0¢
TOTAL	24¢	10¢

Table 1: Packaging material costs.

Item	Packs per Container	Cost per Pack	Cost for 2.5 million Packs
100% monomaterial cardboard	20833	24¢	\$600000
Blister pack	12315	40.6¢	\$1015000

Table 2: Logistics costs.



Figure 2: Dividella’s 100% monomaterial NeoTOP packaging solution.

ENABLING MONOMATERIAL PACKAGING

Dividella has built up an impressive reputation across the global pharmaceutical industry for the quality and effectiveness of its NeoTOP topline cartoning machines. This success has been established on a holistic approach that recognises that machine and pack design go hand in hand.

The topline concept also recognises that pack design, construction and appearance form significant added values for manufacturers, meaning that each pack

deserves to be treated as a unique entity, supported by optimised handling and a complete packaging design.

Therefore, Dividella's packaging designers are accustomed to working in close co-operation with the customer's marketing departments to determine detailed specifications for individual packs and carton loading.

Dividella is thus able to address TCO and TCP concerns at multiple levels:

- The high-quality engineering of cartoners
- The flexibility and integration of modular design concepts

- Innovative package design expertise
- Extended machine capabilities allowing for wider choice of materials and formats
- User friendliness in operation

ABOUT THE COMPANY

Dividella AG, a member of the Korber Medipak Systems Group, has specialised in developing and manufacturing packaging machinery for the pharmaceutical industry for four decades, with specific expertise in packaging requirements for parenteral products. Dividella counts 20 of the world's largest pharmaceutical companies among its clients, including the entire top ten.

Dividella's production units at Grabs, Switzerland, exclusively design and manufacture machines for packaging pharmaceutical products, with total focus on the specific requirements of parenteral pack products, i.e. liquid pharmaceuticals that are packaged in syringes, flasks, vials, autoinjectors and the like. These are highly sensitive products that demand thoroughly developed solutions.

ABOUT THE AUTHOR

Peter Grassl is Sales Director at Dividella, having previously been very successful as Area Sales Manager in the field of automated inspection machines for the pharmaceutical industry. Mr Grassl has extensive experience in the pharmaceutical packaging industry in the fields of engineering and consulting. His expertise covers the capital equipment industry and, through extensive sales activities, he has an excellent knowledge of international markets. Mr Grassl was educated as a mechanical engineer and holds an additional degree in Business and Administration.





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