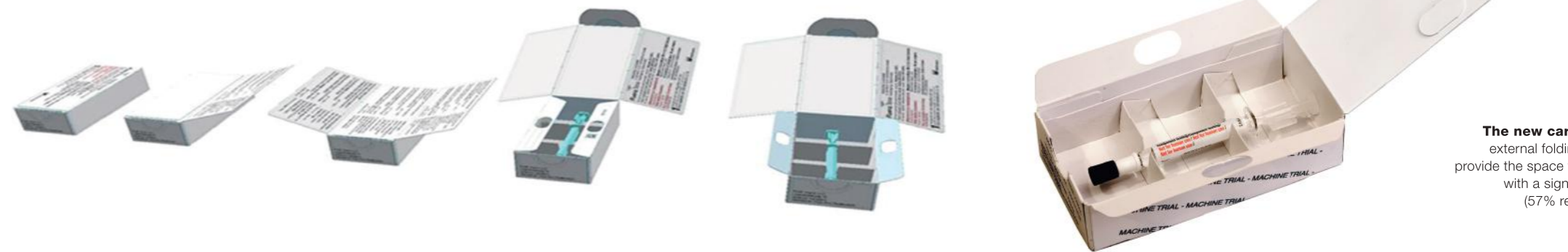


CASE STUDY

‘Winged’ PACKAGE DESIGN RESULTS IN COST SAVINGS



The new carton design utilizes two external folding panels (i.e., wings) to provide the space for the same information with a significantly smaller footprint (57% reduction in pack volume)

A SINGLE UNIT DOSE NASAL SPRAYER CARTON FOR FLU VACCINE PROVIDES A MORE COMPACT AND LOWER COST ALTERNATIVE TO BLISTER PACKAGING

BACKGROUND

MedImmune wanted to respond to the voice of the customer who was requesting a new unit of sales – Single Unit Dose package. This new package format for a nasal administration live virus flu vaccine must be stored at sub-zero temperatures (-25 deg C) and shipped at -80 deg C. The costs to maintain the infrastructure to store product at these freezing temperatures is very expensive.

In addition, the healthcare professionals (i.e., customers) enjoy a huge benefit with the compact SUD pack design by doubling the quantity of product they can keep on-hand to support their patients. Customers also lower costs by reducing the number of expensive refrigerated storage systems and shipping containers in half.

INNOVATION

The package demonstrates an application of a “new idea”

Previous package design for MedImmune’s Single Unit Dose (SUD) nasal sprayer was sized with sufficient billboard space on the exterior of the carton to provide product information for three different languages. The new carton design utilizes two external folding panels (i.e., wings) to provide the space for the same information with a significantly smaller footprint (57 % reduction in pack volume).

The package demonstrates a creative use of existing ideas

The use of an extended flap (a.k.a. 5th panel) to increase printed space has been applied to cartons in the Over-the-Counter market for many years. The overlapping dual flap design is an extension of the 5th panel approach for increasing printable space. This “wing” design for the SUD carton is an advancement over the 5th panel, and is the first of its kind in the live vaccine segment.

The package makes use of new design, material or technique

The existing 5 count package format for the nasal administration flu vaccine used PETG roll stock for the blister tray and Tyvek® film for the lidding material. The new SUD package using a 100 % recyclable paperboard carton and partition reduces material cost and dramatically improves environmental sustainability for the product lifecycle. The elimination of an external tamper evident wafer seal with the use of glued perforated tabs within the carton’s construction also saves material costs and improves the ease-of-use for opening the pack.

The package reflects new manufacturing advances

The replacement of the tamper evident (TE) wafer seal with glued perforation tabs resulted in the removal of a labeler from the packaging process. This lowered the cost and raised the Overall Equipment Effectiveness (OEE). However, the new TE method required rigorous testing of the hot melt adhesive to ensure its capability to withstand the -80 deg C storage temperature.

PRODUCT PROTECTION

The testing specified sufficiently addresses the need for protection for this application

The SUD package incorporates a paperboard partition specifically designed to protect the product during supply chain distribution activities that is glued to the bottom of the carton. The partition is shaped to tightly secure the nasal sprayer in position so there isn’t any contact with the sides of the carton. In addition, an extended panel prevents movement of the plunger rod through phase changes, i.e. solid to liquid throughout the cold chain distribution channels. This partition absorbs impact forces to the sprayer and greatly reduces risk of container closure integrity. Shock, vibration, and altitude testing have confirmed the robustness of the package design.

ECONOMICS

The package addresses a specific economic concern

The smaller SUD carton with wings design allows us to reduce the size of the package and still maintain enough copy space for artwork to meet strict regulatory text requirements for live vaccines. Implementation of the glued Tear Away Ovals design allowed us to eliminate the use of a Tamper Evident seal wafer applied by hand to provide product security.

The package design results in cost savings

Cost savings may be demonstrated by any or all of the following:

- **Distribution Improvements:** Warehouse Storage – Reduction in pallet locations for packaging materials by over 40 % for new package format design components.
- **Cold-Chain Storage & Distribution Savings:** The reduction in package volume by approximately 50 % cut the number of refrigerated trucks and internal cold-chain storage burden in half. Investment in additional cold-storage capacity was eliminated.
- **Damage Reduction:** The partition design prevents glass breakage and movement of the plunger rod during transportation and cold chain distribution channels. This presents an ideal method of preventing glass breakage and reducing risks to container closure integrity.
- **Packing/Processing Efficiencies:** Packaging Process Efficiency – Elimination of Tamper Evident seals application improved OEE.
- **Material Costs:** Material Cost Savings: The elimination of the PETG blister trays and Tyvek® lid material resulted in material unit costs being reduced by over 400 %.

PACKAGE PERFORMANCE

The package is easily filled, opened, dispensed, reclosed, and stored

The new design allows for easier product insertion and carton closing process in manufacturing. The new design allows for easier opening by the customer. The smaller package allows the customer to store twice as much product.

It can be run on existing packaging machinery

The SUD carton design runs on two new Dividella Neo-TOP x top-load cartoning machines. No customization to Dividella’s standard platform was required. The OEE of the NTx machines is 50 % higher than the thermoformers previously used.

The package offers significant new benefits in handling, storage and warehousing

Ocean shipping containers now hold more than 50 % product due to the package redesign. This eliminated 50 % pallet spaces reserved for components and finished products per year in storage and shipping. This also reduced the pallet handling labor in the warehouse. Furthermore, the implementation of a serialization-ready system on the Dividella NTx machines allows for compliance with FDA regulations to support Track and Trace regulatory requirements.

“DIVIDELLA NT_x PACKAGING LINES ARE SETTING PRODUCTION RECORDS AT THE PA SITE”

WILFREDO RIVERA, PE, CPP
SR. PACKAGING ENGINEER/DESIGN

THE CUSTOMER'S REQUIREMENT

MedImmune wanted to respond to the voice of the customer who was requesting a new unit of sales – Single Unit Dose package. This new package format for a nasal administration live virus flu vaccine must be stored at sub-zero temperatures (-25 deg C) and shipped at -80 deg C. The costs to maintain the infrastructure to store product at these freezing temperatures is very expensive.

THE SOLUTION

MedImmune invested in two Dividella NeoTOP x cartoners to package the Single Unit Dose (USD) nasal sprayer using a 100 % recyclable paperboard carton and partition, reducing material cost and dramatically improving environmental sustainability for the product lifecycle. The overlapping dual flap design is an extension of the 5th panel approach for increasing printable space.

CUSTOMER BENEFITS

The transition to the new Dividella Cartoners allowed MedImmune to eliminate materials that were not BFFs with the environment; Tyvek® and PETG. MedImmune is helping to improve the environment! The new carton designs reduced the carton volume by an estimated 18 % for the 10 count carton and 57 % for the SUD carton thus allowing to package more doses per pallet load using environmentally friendly materials. This also reduces shipping and distribution costs. We had seven different leaflet specifications and changing our package format to the Dividella Cartoner system allows us to reduce this number to three; that's a reduction of over 200 %!



Dividella NeoTOP x

MARKETING

The structural design contributes to product image or shelf impact

The SUD carton with wings design improves our product image by leveraging significant environmental attributes that emphasize reduction of materials, use of biodegradable materials, reductions in cold storage distribution infrastructure. More importantly for our customers, reducing the amount of refrigerated storage space required for our new SUD Carton with wings package format.

The package design improves or contributes to acceptance of the product

Several voice of customers surveys were conducted to verify that the package change would not negatively impact the customer. Some of our customers in Europe were only interested in a single unit dose option. However, years of internal debate only found reasons not to meet this need and the project was shelved. The current SUD team found solutions; within a year, they overcame the challenges and were able to supply Germany and Austria a total over 70,000 single unit dose packages. This is now the fastest growing configuration in our flu franchise with forecasted 5.8 million doses to be supplied in 2022 without eroding sales of the current 10 count package format.

In addition to the 'winged' 1-count format, MedImmune is also running 2 other formats on the same machines. The carton blank has the same dimensions for the 5 and the 10 count pack. This way only the partition blank varies.

"I wanted to tell you how impressed I am about how well your project team executed our challenging project on schedule and with the expected equipment performance! Every member of your team demonstrated a true sense of ownership and knowledge in assuring our total satisfaction every step of the way in our journey to success."

Wilfredo Rivera, PE, CPP
 Sr. Packaging Engineer/Design

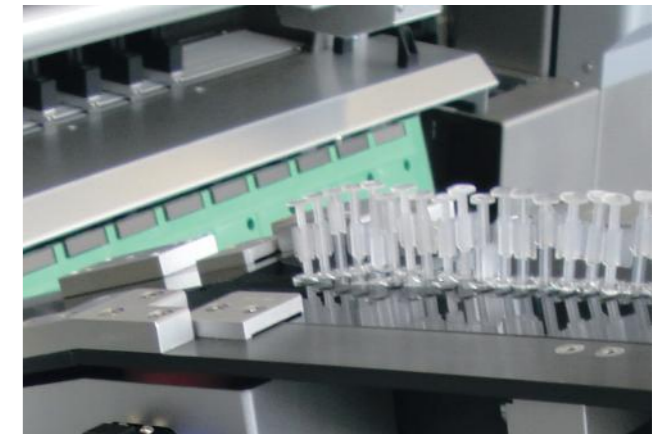
TECHNICAL DATA

NeoTOP x

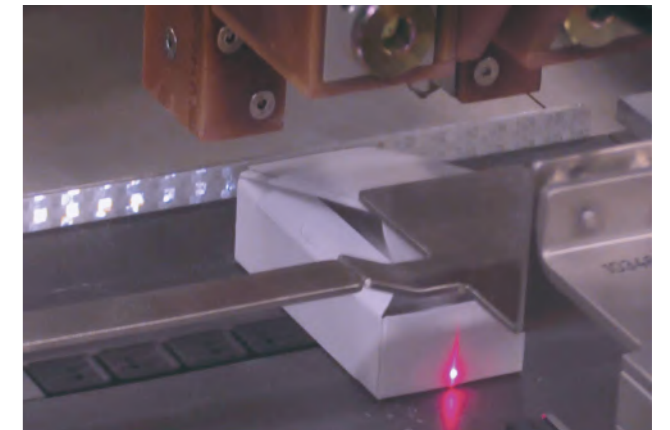
Format range:	Length x Width x Height [mm]
minimum	60 x 45 x 17
maximum	240 x 170 x 70
No. of partitions	4
Output packs/min.	45

The modular machine construction offers the maximum flexibility in the packaging of blisters, ampoules, vials, syringes, injectors and similar products. Fully automated forming and erecting of NeoTOP cartons including integrated partition from flat blanks – up to 45 packs per minute. Ideal for smaller batches, for example for country-specific packaging.

The modular concept allows the machine to expand at any time. (For example, integration of another product inserter or a manual inserting module, etc.). The NeoTOP concept is adaptable to accommodate extreme product changes and complex pack arrangements.



Nasal Spray Infeed



Tamper evident Closing of winged Lid