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 sub-zero temperatures (-25 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 a creative use of existing ideas. Previous package design for MedImmune’s Single Unit Dose (SUD) nasal sprayer was sized with sufficient bill-board space on the exterior of the carton to provide product information for three different languages. The new car-ton design utilizes two external folding panels (i.e., wings) to provide the space for the same information with a signifi- cantly smaller footprint (57% reduction in pack volume).

The package makes use of new design, material or technique. The existing 5 count package format for the nasal admi-nistration flu vaccine used PETG roll stock for the blister tray and Tyvek ® film for the lidding material. The new SUD packaging uses 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 water seal with the use of glued perforated tabs within the carton’s construction also saves materials and improves the ease-of-use for opening the pack.

The package reflects new manufacturing advances. The replacement of the tamper evident (TE) water seal with glued perforation tabs resulted in the removal of a labeller from the packaging process. This lowered the cost and raised the Overall Equipment Effectiveness (OEE). How-ever, 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 side of the carton. In addition, an extended lip 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 artworks to meet strict regulatory test re-quirements for live vaccines. Implementation of the glued Tear Away Ovals design allowed us to eliminate the use of a Tamper Evident seal water 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 burdens 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 prevents an ideal method of preventing glass breakage and reducing risks to container closure integrity.
- Processing/Processing Efficiencies: Packaging Pro-cess Efficiency – Elimination of Tamper Evident seal appli-cation improved OEE.
- Material Cost: Material Cost Savings: The elimina-tion of the PETS blister traps and Tyvek ® lid material re-sulted in material unit costs being reduced by over 400%.

PACKAGE PERFORMANCE
The package is easily filled, opened, dispensed, recycled, and stored. The new design allows for easier product insertion and car-ton closing process in manufacturing. The new design al-lows for easier opening by the customer. The smaller pack-age allows the customer to store twice as much product.

It can be run on existing packaging machinery. The SUD carton design runs on two Dividella Neo-Top® top-load cartoning machines. No customization to Dividella’s standard platform was required. The OEE of the NTx machines is 50 % higher than the thermofomer pre-viously used.

The package offers significant new benefits in handling, storage and warehousing. Ocean shipping containers now hold more than 50% more product due to the package redesign. The redesigned 50% pallet spaces reserves for components and finished prod-ucts 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 require-ments.

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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 (SUD) 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 with wings package format. This also reduces shipping and distribution costs.

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 blanks have the same dimensions for the 3 and the 10 count packs. 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 ensuring 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, injection and similar products. Fully automated forming and nesting 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 x concept is adaptable to accommodate extreme product changes and complex pack arrangements.