

# Upgrade your cold chain packaging

## Description

Inhance Technologies' ColdShield™ technology provides the best barrier for phase change materials (PCM) formulations packaged in rigid plastic panels, ensuring safe and reliable passive temperature controlled packaging and transportation of biologics, vaccines and Active Pharmaceutical Ingredients (APIs).

Today's biologics, vaccines and pharma compounds require storage and transportation within specific temperature ranges to avoid costly losses or failures. Small temperature fluctuations can cause pharmaceutical products to lose potency and efficacy. Phase change materials (PCM) are used in rigid HDPE plastic panels in highly engineered cold chain packaging to maintain temperature specifications.

However, these PCMs permeate through the panel walls, potentially altering the intended temperature profile of the PCM formulation, and contaminating the packaging and contents during transportation and storage.

## ColdShield™ transforms ordinary HDPE panels into high performing cold chain solutions

Inhance Technologies' ColdShield™ technology provides the best barrier performance against a wide range of PCM's used in plastic panels. This permanent barrier enables PCM panels to maintain their specified temperature range for extended shelf life. ColdShield™ is a proven technology that transforms ordinary HDPE plastic panels into high performing cold chain solutions. ColdShield™ protects the packaging, the valuable contents and the environment from PCM formulations, whether organic, paraffinic, or bio-based.

## Advantages of ColdShield™ technology

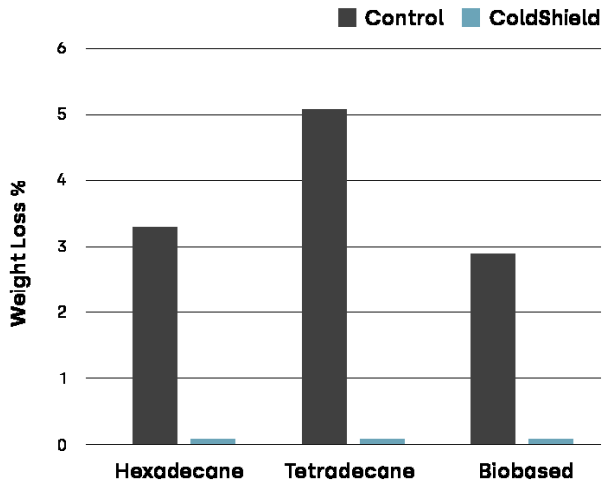
- Effective barrier for all PCM formulations
- Full design freedom of the plastic panel
- Long term storage stability (5+ years)
- Enables reuse while sustaining performance
- Fully recyclable



# ColdShield™

## Blocks permeation of PCM formulations

Permeation against select PCM ingredients is shown in the chart below. While ordinary HDPE panels lose a significant amount of the PCM due to permeation, ColdShield™ reduces permeation 10 - 100 fold. The reduced permeation prevents any changes in the intended PCM formulation and temperature profile, thus extending the useful life of the panel and maintaining the pharmaceutical product integrity.



Permeation of different PCM ingredients in ordinary HDPE panels (grey) versus ColdShield™ treated HDPE panels (blue). Permeation measured at 50°C for 30 days.



Inhance Technologies ColdShield™ is used to safely transport vaccines across the globe, minimizing contamination and product failure.

Inhance Technologies' solutions can be applied in a number of industries to improve product performance and sustainability:

- Consumer Goods
- Transportation
- Industrial Products
- Fuel Systems
- Healthcare

## Contact Information

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ColdShield™ is a product in the Enkase™ line of barrier packaging.