

Avery Dennison Performance Tapes
**Ultra High Barrier
Metallized PET
Laminates for
Vacuum Insulation
Panels (VIPs)**

Application overview

VIPs reduce energy consumption, increase internal volume and deliver effective engineering solutions for electric appliances

The energy efficiency of household appliances such as refrigerators largely depends on the properties of the thermal insulation solution used. The challenge lies in how to reach top performance levels without restricting internal dimensions or changing standard sizes and production methods. Since the thermal conductivity of VIPs is 6-8 times smaller than bulky PU foam insulation, VIPs deliver an exceptionally efficient solution to upgrade the efficiency rating of the appliance or increase the usable internal volume.

The lifetime performance of the VIP depends on three key properties:

- Type of core material
- Type of internal getter used
- Barrier properties of the envelope laminate



Avery Dennison Hanita's range of ultra-high barrier laminate solutions upgrade the functionality, increase the performance and maximize the longevity of VIPs

A hybrid envelope construction for fiberglass cores is the solution to coping with elevated temperature applications such as hot snack vending machines, rice cookers, or hot water boilers/heaters. Pair the Hanita aluminum foil laminates on the high-temperature side with Hanita MetPET laminates on the cooler-facing side. This optimal construction minimizes the thermal bridge effect and delivers a highly effective insulation solution.

The Challenge

With **fumed silica cores**, the challenge is to select the best envelope material to prolong service life through minimizing moisture permeation. Fumed silica cores with Al-foil laminates are subject to high thermal bridging, and poorer performance.

Fiberglass cores provide a low center of panel thermal conductivity. Although cheaper to produce, they are susceptible to permeation by gas and moisture, which may require aluminum foil-based envelopes. The heat conducted by the relatively thick aluminum foil causes a thermal bridge that has a negative impact on the performance of the panels and overall energy consumption of the appliance.



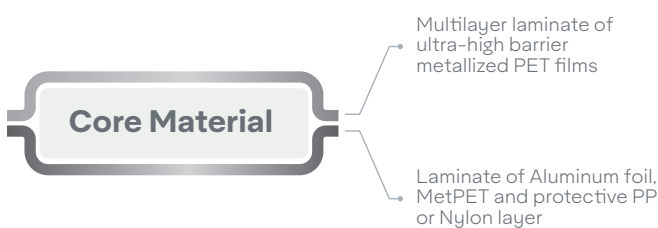
The Avery Dennison Hanita Solution

Fumed silica cores generally show a higher center of panel thermal conductivity, but due to a nanoscopic pore size, **metallized (MetPET) laminates** can easily be used for the envelope material to limit the thermal bridge effect, with negligible degradation during the life of the refrigerator.

Using **Avery Dennison Hanita ultra-high barrier PST MetPET films** with fiberglass cores dramatically decreases the air transmission rate (GTR), and reduces the heat bridge.

VIPs for high-temperature appliances

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The hybrid solution:

Pair the foil layer with the high-temperature side, and the metallized laminate to the cooler-facing side.

Technical Properties & Key Application Requirements

Avery Dennison Hanita offers a full range of laminate options as either master rolls or envelopes.

Portfolio Overview

Application	Requirement	Core Type	Suggested Laminate*	Envelope Construction
Low-temperature appliances: fridges, freezers, cryogenics etc	Ultra-high barrier, Cost, Longevity	Fiberglass	PST range: V085HB3, V096B3N	Fully MetPET or Hybrid
		Fumed Silica	V08621B, V07421	Fully MetPET or Hybrid
High-temperature appliances: rice cookers, vending machines etc	High temp resistance, Ultra high barrier, Cost	Fiberglass	PST range / Al foil laminate	Hybrid
		Fumed Silica	V08621B / V07941P, V08341B - high puncture resistance	Hybrid

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