

# Effective Sealing of UHB Laminates for VIPs

## Tips for successful sealing of Avery Dennison Hanita LDPE- and HDPE-based UHB laminates

Avery Dennison Hanita metallized polyester (MetPET) and Aluminium foil (Al foil) based Ultra High Barrier (UHB) laminates have been engineered for ease and success of sealing. However, the sealing parameters used during panel manufacture are hugely important, and although equipment varies, use of the conditions outlined should achieve the following typical required sealing peel strengths:

### Typical Sealing Peel Strength:

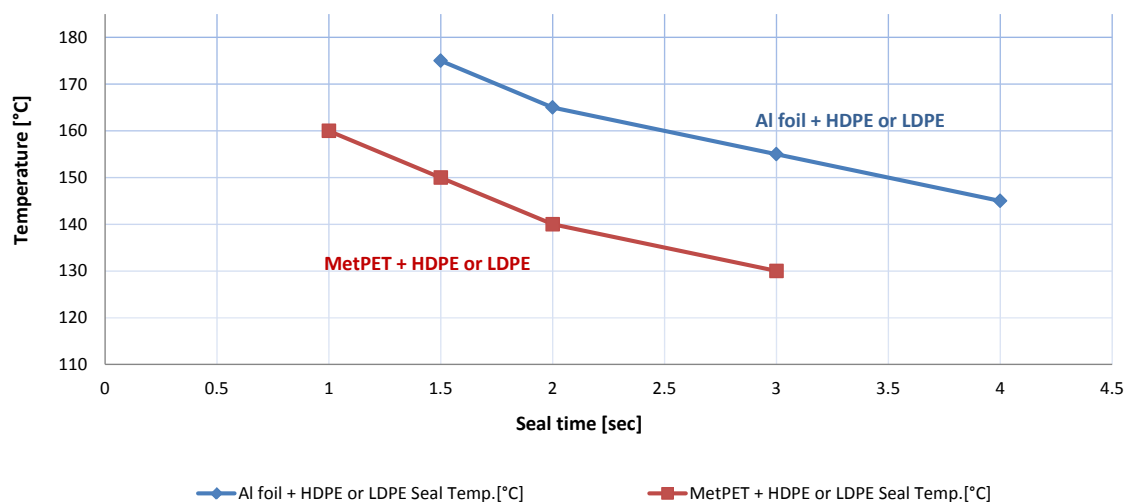
	MetPET based laminates	Al Foil based laminates
HDPE	>2.5 N/mm	>2 N/mm
LDPE	>3 N/mm	>2.5 N/mm

## Constant / direct heat sealers with two heated bars

When using a constant heat sealer, the following conditions may be suitable for sealing of both MetPET based laminates and Al foil based laminates with either HDPE and LDPE.

Since the optimal total heat flux is consistent, a range of temperatures and sealing times work successfully. As a generalization, the higher the temperature (within the given range), the shorter the exposure time.

### Conditions for Constant Sealing Al foil and MetPET Based Laminates



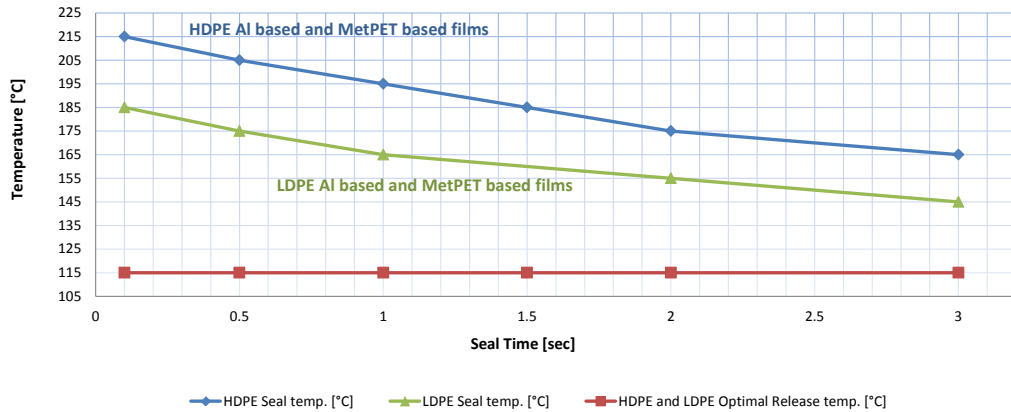
Achieve optimized seal strength for Aluminum foil based laminates by applying a consistent temperature ranging from 145°C - 180°C ( 293°F - 356°F) for 1.5 - 4 seconds respectively. *For example, a sealing temperature of ~150°C would require a sealing time of ~3.5 seconds, whilst a temperature of 160°C would need around 2.5 seconds of heat exposure.*

Achieve optimized seal strength for metallized PET based laminates by applying a consistent temperature ranging from 130°C - 160°C (266°F - 320°F) for 1 - 4 seconds respectively.

# Impulse sealers with one upper heated bar

When using an Impulse sealer for both Al foil based laminates and for MetPET based laminates, the conditions vary according to the use of either HDPE or LDPE based sealing layers.

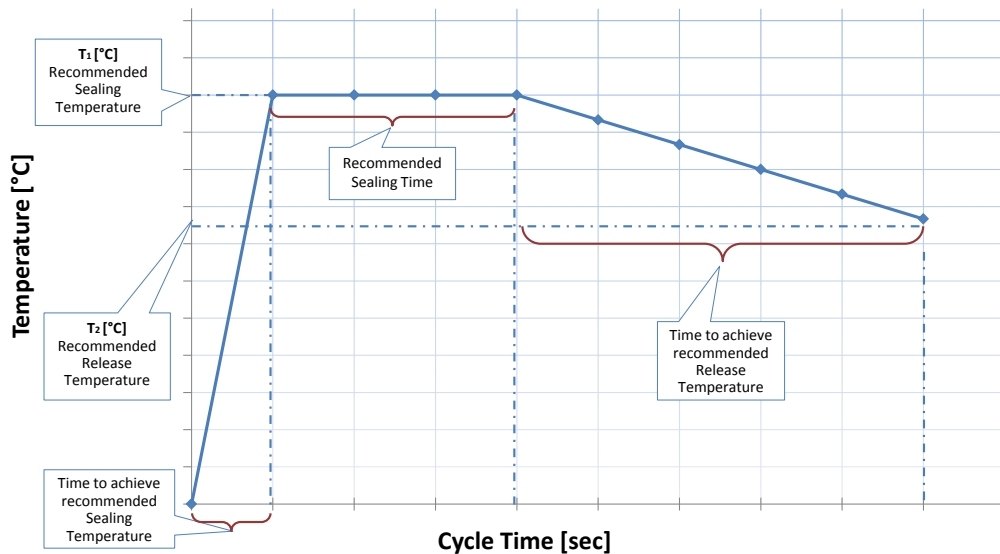
## Conditions for Impulse Sealing Al foil and MetPET Based Laminates



Optimal seal strength may be reached with an impulse sealer by applying a consistent temperature ranging from 165°C - 215°C (329° F - 419°F) for 0.1 - 3 seconds for HDPE, and 145°C - 185°C (239° F - 365°F) for 0.1 - 3 seconds for LDPE. *For example, a sealing temperature for LDPE of ~165°C would require a sealing time of 1 second, whilst a temperature of 155°C would need around 2 seconds of heat exposure, for both Al foil and MetPET based laminates.*

The following graph illustrates the impulse sealing cycle. The three main parameters to consider while establishing optimal conditions are: sealing time, sealing temperature, and release temperature at which heating bars will open.

## Impulse Sealing Full Cycle Time vs Temperature (One Upper Heated Bar)



## Summary

There are four different UHB laminate structures: Al foil with LDPE, Al foil with HDPE, MetPET with LDPE, MetPET with HDPE. Fine-tuning the sealing conditions of each according to the specific sealing equipment type (Constant or Impulse) as per the graphs above should give satisfactory seal strengths. Within these parameters, using the higher temperatures for a shorter period or the lower temperatures for a longer period should deliver satisfactory results.

For further information contact [tech.industrial@eu.averydennison.com](mailto:tech.industrial@eu.averydennison.com)

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