

# THRESHHOLD™

– The Next Step –



## Vacuum Insulation Panel – VIP R50

**THRESHHOLD™** is “The Next Step” in the advancement of vacuum insulation. It provides exceptionally high R value at moderate vacuum levels which results in increased energy savings, increased usable volume, and very long panel life. It also has exceptional dimensional stability and control for tight fitting panel joints. **THRESHHOLD™** comes in virtually any thickness so you can design for the exact thermal resistance that you need. It is the result of over 20 years of experience in developing high performance insulations. You will find you are at the **THRESHHOLD™** of a whole new opportunity for thermal product design.

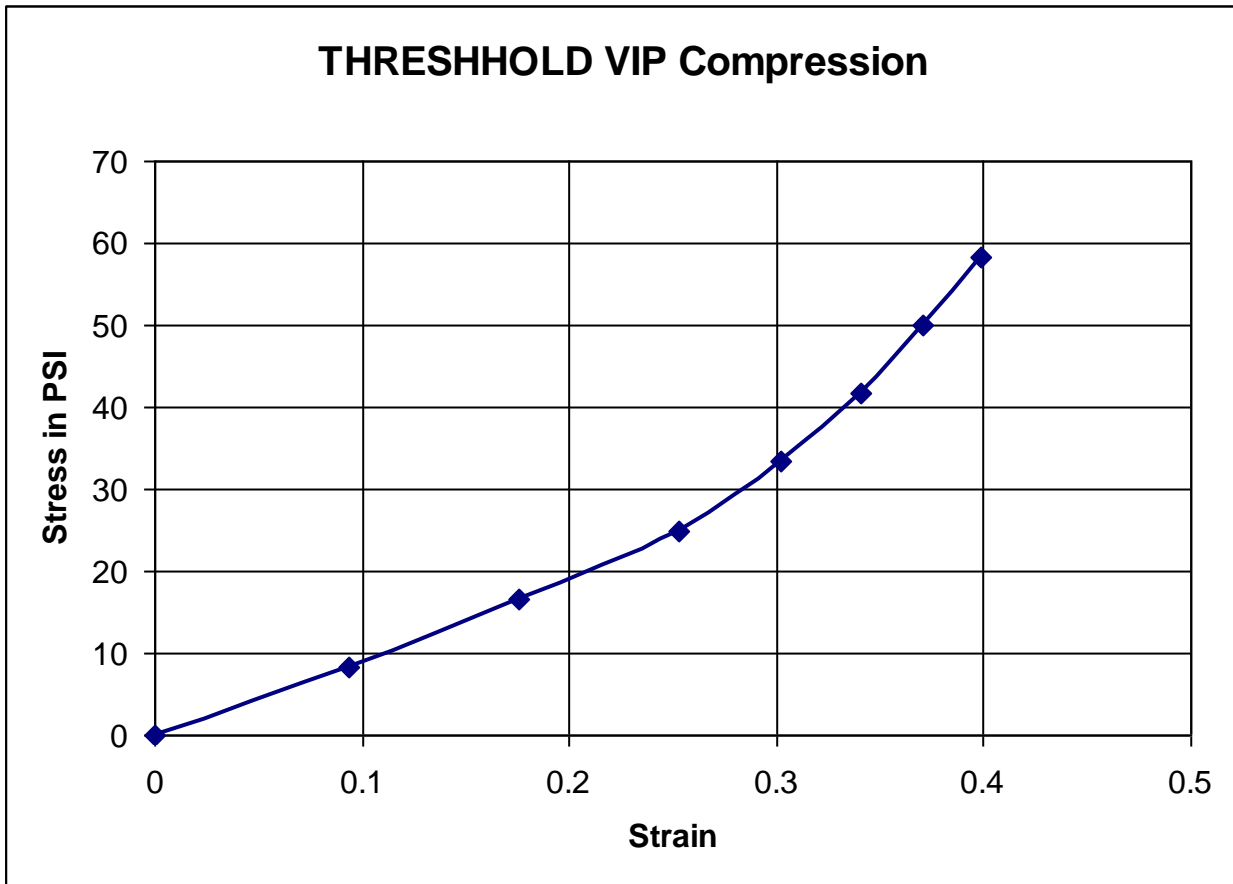
### Key Applications:

- Scientific freezers
- Cryogenic applications
- Water heaters
- Consumer refrigerators and freezers
- Cold storage units
- Refrigerated trucks and rail cars
- Insulated shipping containers
- Medical applications
- Marine and RV refrigeration
- Vending machines

Physical Properties	Test Method	English Units	Metric Units
Thickness		0.065 inch increments	1.65 mm increments
Density	ASTM D 1622-93	16 lb/ft <sup>3</sup>	256 kg/m <sup>3</sup>
Thermal Conductivity @ 0.05 torr (0.065 mbar) 75°F Mean Temperature	ASTM C518-93	0.020 BTU-in/ft <sup>2</sup> -hr-F	2.88 mW/m-K
Specific Heat		0.20 BTU/lb. °F	837.36 J/kg °K
Vacuum Panel Temperature Stability		< 2% Shrinkage @ 200°F	< 2% Shrinkage @ 93°C
Compression Upon Evacuation	Vertical direction Horizontal	≈ 30% < 0.5%	≈ 30% < 0.5%
Flexural Yield Strength	ASTM C203-99	at 10% 45 psi	0.31 MPa
Flexural Modulus	ASTM C203-99	7400 psi	51.0 MPa
Compressive Strength	ASTM C165-95	See attached chart	
Compressive Modulus	ASTM C165-95	See attached chart	

Typical properties, not specification values.

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Note: Maximum load was not determined. The maximum is greater than 60 psi. Thickness did not recover after load was removed. THRESHHOLD can be pre-compressed to reduce deflection under load. Testing not yet completed on pre-compressed THRESHHOLD VIP. However, it is known that the strain will be greatly reduced under load. At 33% pre-compression, the thermal conductivity did not increase.