

Excelfrax® 200 VIP Insulation

Excelfrax® 200 VIP is a Vacuum Insulation Panel (VIP) designed to provide superior insulation at temperatures between -300°F and +300°F. This advanced thermal insulation provides extremely low thermal conductivity by drastically reducing the heat transfer due to convection and conduction. The graph on page 2 details the thermal conductivity of Excelfrax 200 VIP.

Excelfrax 200 VIP uses a similar mechanism as a thermos bottle to achieve low thermal conductivity. In a thermos bottle, the double cavity walls are completely evacuated, which leaves virtually no gas available for heat transfer due to convection or conduction.

Welded in polyethylene (PE) film under vacuum, the exceptionally low thermal conductivity values of Excelfrax 200 VIP are due to extremely low inner pressure. (See table 1.) Its superior insulating value provides equipment designers and users with significant advantages, such as:

- Design flexibility by reducing insulation space requirements in appliances
- Increased volume in commercial and domestic refrigerators
- Reduction in package size and weight of insulated shipping containers
- Increased volume for cargo in insulated shipping containers
- Allows for longer shipping times/distances for temperature-controlled transportation systems

Product Forms

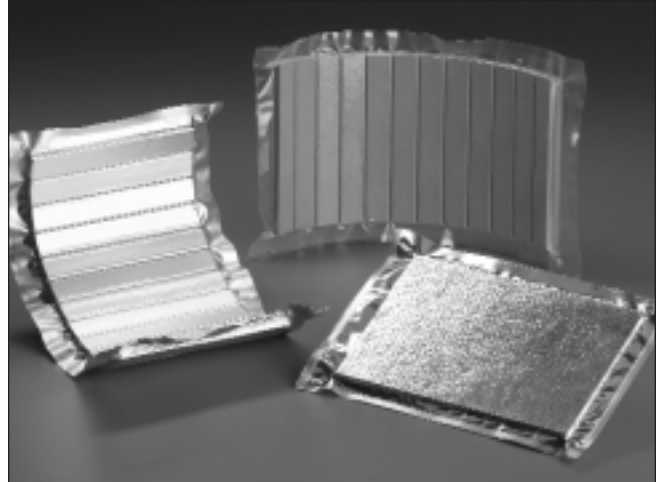
Excelfrax 200 Vacuum Insulation Panels (VIPs) are available in two basic product forms:

- Flat panels
- Curved VIPs

Higher temperature Vacuum Insulation Panels for applications up to 1832°F are available on a nonstandard basis. Please contact Unifrax Application Engineering for details.

Typical applications for Excelfrax 200 VIP include:

- Residential and industrial refrigerators
- Insulated packaging/shipping containers
- Refrigerated trucks/transportation systems
- Marine/Recreational Vehicle refrigerators
- Vending machines
- Cold storage units



Typical Product Properties

| | |
|--|---------------------------------|
| Color | Silver |
| Recommended Operating Temperature | -30°C (-22°F) to +90°C (+194°F) |
| Specific Heat J/Kg°C (BTU/Lb°F) (RT to 800°C (1472°F)) | 800 (0.19) |
| Compression at 1 bar | 7.0% |
| Shrinkage – All sides, long term | |
| 50°C (122°F) | 0.03% |
| 100°C (212°F) | 0.1% |

Typical Insulation Values

| Material | Thermal Conductivity mW/M•K |
|--------------------------|--------------------------------|
| Excelfrax 200 VIP | 3.75 |
| Closed Cell Polyurethane | 27 |
| Fiberglass Insulation | 30-40 |
| Expandable Polystyrene | 35 |

Refer to the product Material Safety Data Sheet (MSDS) for recommended work practices and other product safety information.

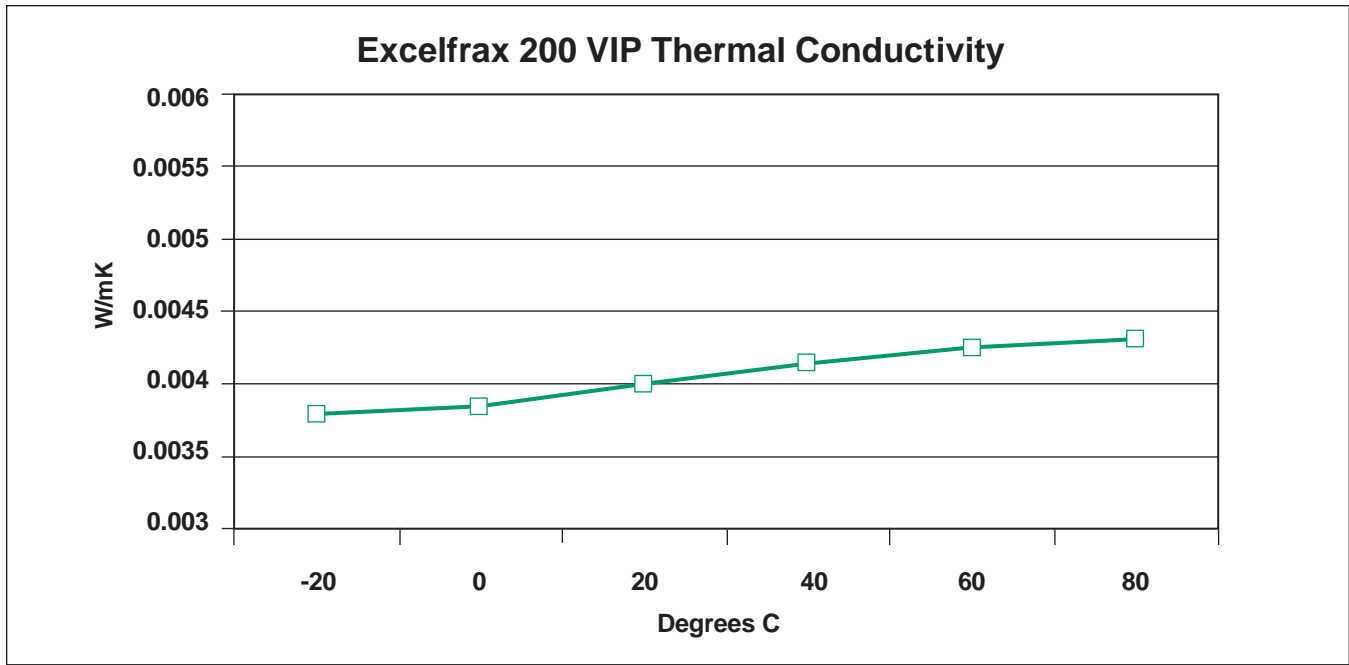


Table 1

| Gas Pressure (hPa) | Thermal Conductivity (mW/M ² •K) | Heat Flux (W/M ² •K) |
|--------------------|---|---------------------------------|
| <10 ⁻³ | 3.63 | 0.187 |
| 0.1 | 3.66 | 0.188 |
| 1.0 | 3.75 | 0.193 |
| 10 | 4.25 | 0.219 |
| 25 | 4.84 | 0.249 |

Typical Product Parameters

| | |
|---|-----------------------------|
| Density kg/m ³ (pcf) | 185 (11.6) |
| Chemical Composition | |
| SiO ₂ | 80% |
| SiC | 15% |
| ZrSiO ₄ | — |
| Others | 5% |
| Cold Crushing Strength (N/mm ²) (DIN 51067/DIN 53421) | 0.5 |
| Standard Thicknesses | |
| mm | 10, 15, 20, 25, 30 |
| in | 0.39, 0.59, 0.79, 1.0, 1.18 |
| Standard Panel Sizes | |
| mm | 490 x 490 980 x 1225 |
| in | 19.3 x 19.3 38.6 x 48.0 |
| Covering/Edge Protection | Laminated PE film |

Data based on core material

For additional information about product performance or to identify the recommended product for your application, please contact the Unifrax Application Engineering Group at 716-278-3888.

The test data shown are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

