



# Vacupor<sup>®</sup> MS

## Product Data Sheet

### Product Description

Vacupor<sup>®</sup> MS is a highly efficient vacuum insulation panel (VIP) developed to significantly reduce heat loss in low temperature applications and offers thermal insulating performance several times better than typical insulation solutions.

Vacupor MS primarily comprises of a fumed silica based microporous core which is encapsulated in a high quality, multi-layer barrier film and evacuated to approximately 1mbar. This combination ensures the excellent performance of the Vacuum Insulation Panel which is maintained over an exceptionally long lifespan. Vacupor Vacuum Insulation Panels (VIPs) are the ideal choice for applications requiring increased energy savings, improved cold storage times, space optimization and/or reduction of weight.

### Features

- Optimised Formulation
- Fumed Silica Microporous Core
- High Quality, Multi-Layer Barrier Film
- Middle Seam Encapsulation Technology
- Excellent Surface and Dimensional Stability
- Sealed, rigid construction
- Fully Recyclable Core

### Benefits

- > Class leading insulating performance for a fumed silica based VIP
- > Core maintains excellent standalone performance and is classified as not flammable A1 according to DIN ISO EN 1350-1
- > Negligible thermal performance impact due to aging and is suitable for applications requiring consistent performance over time
- > Lack of edge flaps allows for butt join fit against other surfaces ensuring limited thermal bridging
- > Quick, accurate and repeatable installation
- > No dust, excellent handling characteristics
- > Promotes Circular Manufacturing

### Typical Applications

- Refrigerators and freezers
- Cryogenic freezers
- Temperature controlled packaging
- Refrigerated Transport

### Application notes:

Vacupor MS has not been developed for use in the building and construction industry and as such is not approved by the German building and construction authorities for building applications. Vacupor MS may just be applied in areas where a Vacuum Insulation Panel is treated as an unregulated construction product, if an admission on a single case exists or will be obtained.

Alternate forms of Vacupor and Vacuspeed have been developed for the building and construction industry. Please refer to their respective data sheets for further information.

### Restrictions on Installation of Vacupor MS:

The metallized, multilayer barrier film of the Vacupor MS must not be damaged by drilling, cutting, milling, nailing, scratching or the like, since the interior pressure of the panel will rise and the special properties of the panel, in particular its excellent insulation characteristics, will be impacted.

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| Properties  |                                | Vacupor MS  |
|---|--------------------------------|---|
| Colour of barrier film  |                                | Silver  |
| Density, kg/m <sup>3</sup> (pcf), DIN 66133   |                                | 160 - 210 (10 - 13.1)   |
| Heat resistance, °C (°F)  |                                | <sup>(1)</sup> -50 <T< 80 <sup>(2)</sup>  |
| Theoretical pressure rise <sup>(3)</sup> , mbar/a, 23°C, 50% r.H., panel thickness 20mm (0.8in) |                                | ~1.0  |
| Thermal Shock Resistance  |                                | The core material of Vacupor MS is insensitive to high and low temperature thermal shocks |
| Thermal Conductivity, W/m·K (BTU·in/hr·ft <sup>2</sup> ·°F), DIN 52612, ASTM C177               |                                |   |
|   | mean temperature, °C (°F)      | <u>10 (50)</u>  |
|   | 1 mbar                         | 0.0035 (0.0243)   |
| Minimum / Maximum Panel Dimensions  |                                |   |
|   | Length, mm (in)                | 155 / 1200 (6.2 / 48)   |
|   | Width, mm (in)                 | 155 / 1000 (6.2 / 40)   |
|   | Thickness, mm (in)             | 10 - 50 (0.4 - 2)   |
| Length tolerance, mm (in)   |                                |   |
|   | 155 to 500mm (6.2 to 20in)     | +4.0 / -4.0   |
|   | 501 to 1000mm (20.04 to 40in)  | +5.0 / -5.0   |
|   | 1001 to 1200mm (40.04 to 48in) | +6.5 / -6.5   |
| Width tolerance, mm (in)  |                                |   |
|   | 155 to 500mm (6.2 to 20in)     | +4.0 / -4.0   |
|   | 501 to 1000mm (20.04 to 40in)  | +5.0 / -5.0   |
| Thickness tolerance, mm (in)  |                                |   |
|   | ≤20mm (≤0.8in)                 | ±1.0  |
|   | >20mm (>0.8in)                 | +1.0 / -2.0   |

- (1) Product can be utilized at lower temperatures depending on the application. Should this be required, please contact your Thermal Ceramics representative to determine the suitability
- (2) Short term maximum application temperature is 120°C (248°F) for approximately 30 minutes.
- (3) According to EMPA test report No. 437'840/1 dated 21st December 2006. For sample size 1000x600 mm.

### Shelf Life

Vacupor MS has a shelf life of 50+ years if utilized in undamaged condition and stored in normal environmental conditions.

### Environmental & Health Safety

Vacupor MS is not a hazardous material as defined in EU directive 2006/1907/EEC. Please review our material safety data sheet for further information.

| Standard sizes, LxW, mm (in)                  | Standard thickness, mm (in)                                   |
|---|---|
| 1200 x 1000 (48 x 40)                         | 10, 15, 20, 25, 30, 40, 50<br>(0.4, 0.6, 0.8, 1, 1.2, 1.6, 2) |
| 1200 x 500 (48 x 20)                          |   |
| 1000 x 600 (40 x 24)                          |   |
| 1000 x 300 (40 x 12)                          |   |
| 600 x 500 (24 x 20)                           |   |
| 600 x 250 (24 x 10)                           |   |
| 155 x 155 (6.2 x 6.2)                         |   |
| *Custom dimensions are available upon request |   |

Whilst the values and application information in this datasheet are typical, they are given for guidance only. The values and the information given are subject to normal manufacturing variation and may be subject to change without notice. Morgan Advanced Materials – Thermal Ceramics makes no guarantees and gives no warranties about the suitability of a product and you should seek advice to confirm the product's suitability for use with Morgan Advanced Materials - Thermal Ceramics.