

# Vacupor® NT-B2

Building authorities approved Vacuum-Insulation-Panel

## Characteristics

Vacupor® NT-B2 is a microporous insulation material with an extremely low coefficient of thermal conductivity, i.e. with very good insulating properties. Vacupor® NT-B2 consists of inorganic oxides. The main constituent is fumed silica, the other components are opacifiers for minimizing infrared radiation, and silicates.

Dated 3rd of December 2008 the German Institut for civil engineering (DIBT) granted the approval by the building authorities for Vacupor® NT-B2 under the certification number Z-23.11-1662. The approval is valid for construction applications DAD, DAA, DZ, DI, DEO, WAB, WAA, WH, WTR and WI according to standard DIN 4108-10, table 1 and for prefabricated façade panels with insulated glass character.

Vacupor® NT-B2 conforms to Baustoffklasse B2. The test of behaviour in case of fire according DIN 4102-1, May 1998, Baustoffklasse B2; Testcertificate No. H.3-145/07 and H.3-146/07, was issued by the Forschungsinstitut für Wärmeschutz e.V. München

Vacupor® NT-B2 (core material) is not flammable and is classified A1 according to DIN ISO EN 13501-1.

Vacupor® NT-B2 is heat sealed in a barrier film under vacuum. The very low internal pressure and the microporous panel core is responsible for the extremely low thermal conductivity values.

## Application

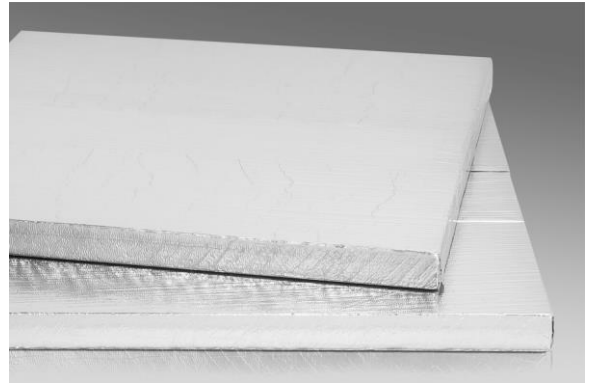
Vacupor® NT-B2 was specially developed for applications in the building and construction industry where an approval by the building authorities is required.

Due to the usage of a special metallized, multi-layer plastic film, the panel is beyond this most suitable for applications, where improved fire protection behaviour is required.

The low density and the specially developed IR opacifiers contained in these grades, greatly reduce the thermal conductivity of Vacupor® NT-B2 Systems.

**Vacupor® NT-B2 is also successfully used as insulation material in the following areas:**

- Terrace insulation
- Flat roof insulation
- Cold storage floor insulation
- Facade elements
- Fire protection- / Cold storage doors



## Form of delivery

### 1. Standard sizes:

• 1200 mm	*	1000 mm	* X
• 1000 mm	*	600 mm	* X
• 1200 mm	*	500 mm	* X
• 600 mm	*	500 mm	* X
• 1000 mm	*	300 mm	* X
• 300 mm	*	250 mm	* X
• 600 mm	*	250 mm	* X

### 2. Standard thicknesses (X):

- 10, 15, 20, 25 and 30 mm
- Further thicknesses on request

### 3. Special formats available on request

## Restrictions on Applications

The laminated aluminum foil of the Vacupor® NT-B2 must not be damaged by drilling, cutting, milling, nailing 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 lost.

## Shelf life

Vacupor® NT-B2 has a very long shelf life. Please also observe our pressure rise table: Thermal conductivity as a function of interior pressure.

## Product data

Properties (applicable to standard format)	Comments	Standards	Units	Values
Color	Caused by film			silver
Density <sup>1</sup>			kg / m <sup>3</sup>	170-210
Thermal conductivity	@ 1 mbar <sup>2</sup>	DIN 52612	W / (m×K)	≤ 0,005
	@ ambient pressure		W / (m×K)	≤ 0,019
Rated value	According to DIBT approval number Z-23.11-1662		W / (m×K)	0,008
Heat resistance <sup>3</sup>	Caused by film weld seam		°C	-50 <T< 120
Maximum film projection			mm	150
Interior pressure <sup>2</sup>	As delivered		mbar	≤ 5
Theoretical pressure rise	At 23 °C / 50 % r.H. and panel thickness 20 mm		mbar / a	~ 1,0
Maximum panel dimensions	Length		mm	150 - 2200
	Width		mm	150 - 1000
	Thickness		mm	10 - 50
Length and width tolerances	0 to 500 mm		mm	+ 1,0 / - 2,0
	501 to 1000 mm		mm	+ 1,0 / - 4,0
	> 1000		mm	+ 1,0 / - 6,0
Thickness tolerances	< 20 mm		mm	± 1,0
	20 mm to 30 mm		mm	+ 1,0 / - 2,0
	> 30 mm		mm	+ 1,0 / - 3,0
Thermal shock resistance	Vacupor <sup>®</sup> NT-B2 (corematerial) is insensitive to high and low tempera- ture thermal shocks			

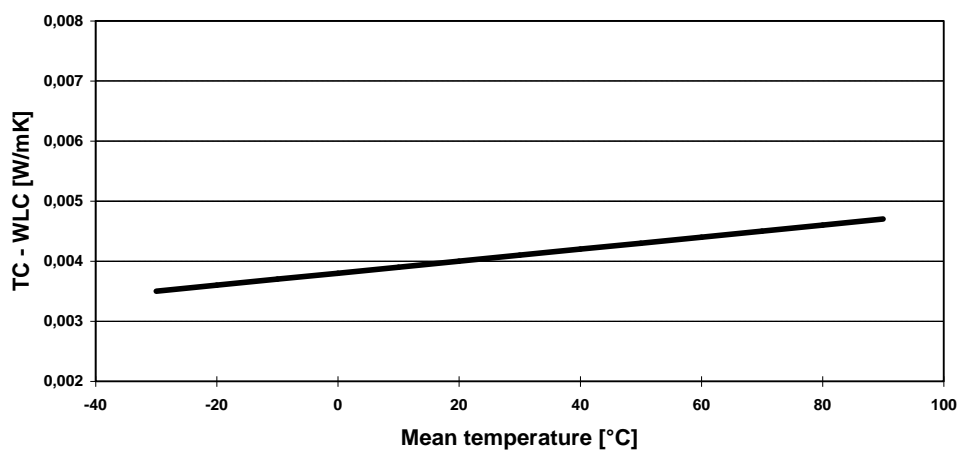
<sup>1</sup> Dependent on board thickness

<sup>2</sup> Dependent on the panel-size and -thickness, internal pressure can be between 0.5 – 5 mbar. The standard internal pressure in the evacuation chamber is < 0.5 mbar.

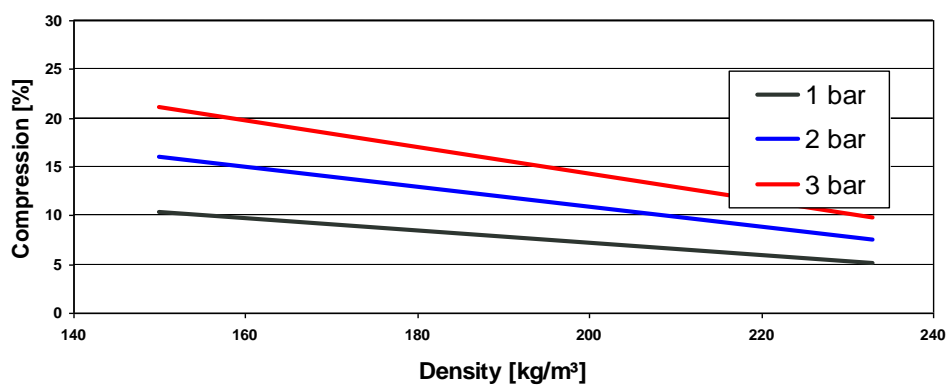
<sup>3</sup> The limits are fixed by the barrier film (sealing material) used; constant load: ≤ 80°C (176°F); short load time with 120°C (248°F): roughly 30 minutes.

The above data are only intended as a guide and should not be used in preparing specifications.

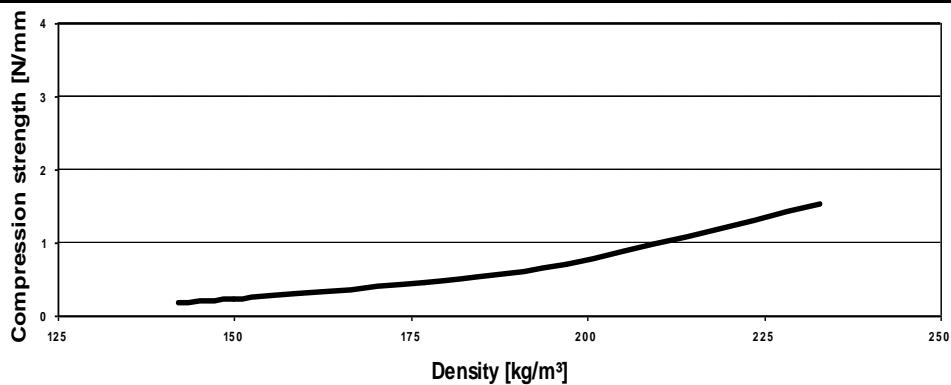
### Thermal conductivity (panel core) DIN 52612



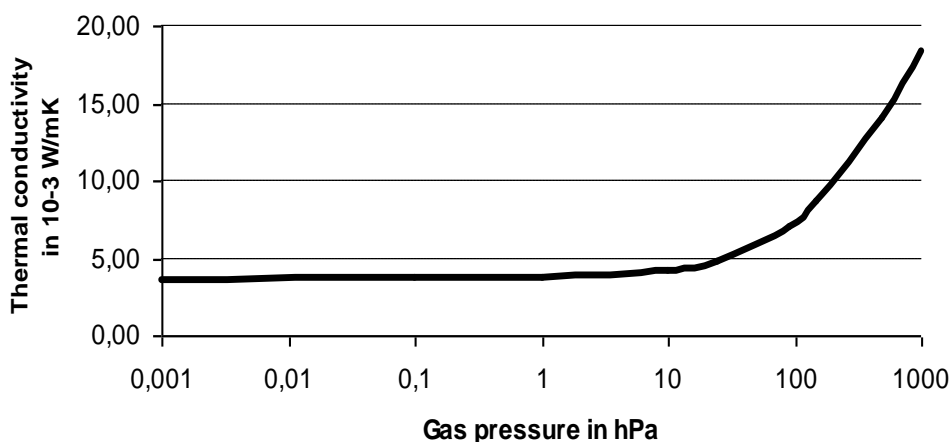
### Compression behavior (panel core)



### Low-temp. Compression strength (panel core)



### Thermal conductivity as a function of internal pressure ( DIN 52612 )



gas pressure $p_{\text{gas}}$	U- Value	$\lambda$
[ hPa ]	[ W/(m <sup>2</sup> K) ]	[ 10 <sup>-3</sup> W/(mK) ]
< 10 <sup>-3</sup>	0.187	3.63
0.1	0.188	3.66
1.0	0.193	3.75
10	0.219	4.25
150	0.448	8.70
1000	0.943	18.30

### Composition

Silicon dioxide	SiO <sub>2</sub>	approx. 80%
Silicon carbide	SiC	approx. 15%
Others		approx. 5%

### Safety directions

Vacupor® NT-B2 is not a hazardous material as defined in EU directive 2006/1907/EEC. Please also observe our material safety data sheet. Vacupor® NT-B2 does not liberate hazardous decomposition products and, as far as is known at present, does not cause any problems to human health or the environment.

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