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Designated according to Article 29 of Regulation (EU) No 305/2011

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European Technical Assessment

ETA-13/1026 of 15/04/2022

(English language translation, the original version is in French language)

Nom commercial **Trade name**	**Promat ULTIMA® VIP**
Famille de produit **Product family**	Panneau isolant sous vide avec un cœur microporeux à base de silice amorphe protégé par un complexe barrière multicouche. **Vacuum insulation panel consisting of a micro-porous core of amorphous silica enclosed by a multi-layer film.**
Titulaire **Manufacturer**	**MICROTHERM N.V** **Industriepark Noord 1** **9100 SINT-NIKLAAS** **BELGIQUE**
Usine de fabrication **Manufacturing plant**	**SINT-NIKLAAS** **(Belgique)**
Cette évaluation contient : **This Assessment contains**	6 pages incluant 0 annexes qui font partie intégrante de cette évaluation **6 pages including 0 annexes which form an integral part of this assessment**
Base de l'ETE **Basis of ETA**	Document d'Evaluation Européen (DEE) (EAD 040011-00-1201) « Panneaux d'isolation sous vide (VIP) avec enveloppe de protection, juillet 2017 » **European Technical Assessment (EAD) (EAD 040011-00-1201) "Vacuum insulation panels (VIP) with factory applied protection layers, December 2017"**
Cette évaluation remplace : **This Assessment replaces**	ETE 13/1026 du 23/08/2019 **ETA 13/1026 of 23/08/2019**

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SPECIFIC PART

1 Technical: definition of product and intended use

1.1 Definition of product

The insulation Promat ULTIMA® VIP product is a vacuum insulation panel, consisting of a micro-porous core of amorphous silica enclosed by a multi-layer film, a barrier against water vapour and air.

1.2 Composition and manufacturing-process

The Promat ULTIMA® VIP product contains:

- a core composed of amorphous silica, silicon carbide and cellulose filaments,
- a multilayer barrier film to water vapour and air, consisting of PE and PET film.

The production process uses the following raw materials: fumed silica, opacifiers, fibers, shrink-wrapping film and barrier film.

The microporous core material includes fumed silica, an opacifier and fibers. On the mixing platform all ingredients are carefully weighed and mixed. The microporous powder is then pressed into a panel of the desired thickness; afterwards the panels are sawn to the right dimensions to be used as VIP cores.

The next steps of the manufacture of VIP include shrink-wrapping of the core, drying of the core, assembly of the dried core into the barrier film, evacuation and sealing in the vacuum equipment, and finishing of the VIP as specified.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The panel is a thermal insulation for buildings.

It is used in new construction and in renovation, under normal humidity and temperature conditions within the walls in the internal part of buildings:

- insulation at the inside of walls,
- insulation of non-heating ceilings,
- insulation of flat roofs and pitched roofs (in association with another thermal insulation on the outside face),
- insulation under screed (except for floors with in-floor heating for which complementary insulation is required),
- insulation underneath the flooring (without in-floor heating).

A protection will need to be installed between the vacuum insulation panel and the interior of the building.

The vacuum insulation panel is to be installed protected from all humidity and liquid water.

NOTE: In those parts of the building in which the temperature or humidity are considerable (example: laundry rooms…) the Promat ULTIMA® VIP product must not be used.

The correction factor for the influence of humidity is a provisional one in the EAD 040011-00-1201 ““Vacuum insulation panels (VIP) with factory applied protection layers, December 2017”; furthermore, the applications are limited to intended uses where the temperature remains below 50°C.

The design value of the thermal conductivity shall be laid down according to relevant national provisions.

This European Technical Approval does not cover the complete or finished system of insulation. As for the application of all products insulating, the national codes of practice and regulations must be respected for design and implementation of construction systems.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the thermal insulation products of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works

3 Performance of the product and references to the methods used for its assessment

The identification tests and the assessment for the intended use of this product according to the Essential Requirements were carried out in compliance with the European Assessment Document EAD 040011-00-1201 for “Vacuum insulation panels (VIP) with factory applied protection layers, December 2017”

3.1 Nominal dimensions

	Length × width (mm)	Tolerance (mm)
Nominal Minimal Dimensions of panels	300 × 400 ou 400 × 600	+1/-4
Nominal Maximal Dimensions of panels	1 300 × 600	+1/-6
Minimum thickness (mm)	< 20	+/-1
Thickness (mm)	20 ≤ e ≤ 30	+1/-2
Maximum thickness (mm)	> 30	+1/-3

Length and width:

Length and width are determined according to EN 822.

Thickness:

The thickness of the product is determined according to European standard EN 823

The values obtained of thickness, length and width are all included within the tolerances.

3.2 Apparent density

The density of the products is determined according to European standard EN 1602. The density of the VIP-elements (excluding plastic foil) is at least 160 kg/m³ and does not exceed 210 kg/m³.

3.3 Mass per square meter of the plastic foil

The mass per unit area of the plastic foil shall be determined with a calibrated scale with an accuracy of 0,01 g on samples at least 200mm **×** 200mm. The mass per unit area of the plastic foil shall be at least 108 g/m².

3.4 Tensile strength of the multilayer high barrier foil

The tensile strength of the multilayer high barrier foil shall be determined according to EN ISO 527-3. The test shall be carried before and after ageing (Annex B of the EAD 040011-00-1201). The value of the tensile strength before and after aging shall be declared.

The value of tensile strength before ageing is ≥ 80 MPa.

The value of tensile strength after ageing is ≥ 65 MPa.

3.5 Squareness

The squareness of the boards is determined according to European standard EN 824. The deviation from squareness on length and width does not exceed 5 mm/m

3.6 Flatness

The flatness Smax shall be determined in accordance with the methods described in to European standard EN 825.

Smax ≤ 5 mm/m.

3.7 Dimensional stability under specified temperature and humidity

The dimensional stability of the insulation products is determined according to European standard EN 1604. The test is carried out after conditioning at a temperature of (70 ± 2)°C and (90 ± 5)% relative humidity for 48 h.

Each single value of length and width change of dimensions is less than is ± 1%.

Each single value of thickness change of dimensions is less than -2% / +1%.

3.8 Behaviour under compressive stress

The behaviour under compressive stress shall be determined in accordance with the methods described in EN 826. Each single value of the compressive stress at 10% deformation is at least σ10% = 180 kPa.

3.9 Internal pressure

The internal pressure shall be determined in a low-pressure enclosure with the use of a laser sensor to determine the point of the shift of the barrier film during the pressure variation. The method is described in § 2.2.15 of the EAD 040011-00-1201

Each single value of the internal pressure is less than 5 mbar.

3.10 Core thermal resistance

The thermal conductivity of the products is determined according to EN 12667. The declared value of thermal conductivity is determined according to EN 10456

The fractile value of thermal conductivity representing at least 90% of the production with a confidence limit of 90% is determined as following:

Thermal conductivity

Calculation of declared conductivity according to EAD

λD heart (just taking into account the ageing) = ($\lambda_{90/90}$ + $\Delta\lambda$a) = 4,76 + 0,58 = 5,34 mW/m.K

*λD panel (taking into account the thermal bridge effect and ageing) = ($\lambda_{90/90}$ + $\Delta\lambda$a) * F_{TB} = (4,76 + 0,58) * 1,10 = 5,87 mW/m.K*

$\lambda_{90/90}$ (mW/m.K)	$\Delta\lambda a$ (mW/m.K)	λ_D heart (mW/m.K)	λ_D panel (mW/m.K)
4,76	0,58	5,34	5,87

Thermal Resistance of panel - R_D (taking into account the thermal bridge effect and ageing)

Calculation of thermal resistance

$\Delta Ra = R_{90/90} - (thickness / \lambda aged)$

R_D = thickness / λ_D panel (taking into account thermal bridge effect)

Thickness (mm)	$R_{90/90}$ (m².K/W)	ΔRa (m².K/W)	R_D (m².K/W)
10	2,10	0,20	1,70
15	3,15	0,30	2,55
20	4,20	0,40	3,40
25	5,25	0,50	4,26
30	6,30	0,60	5,11
35	7,35	0,70	5,96
40	8,40	0,80	6,81
45	9,45	0,90	7,66
50	10,50	1,00	8,51

3.11 Reaction to fire

The reaction to fire of the product is not determined according to EN 13501-1.

Product	thickness (mm)	class
Promat ULTIMA® VIP	10 à 50	NPD

3.12 Behaviour under point load for boards exposed to compression loads

The behaviour under point load is determined according to EN 12430.

The point load PL (5) amounts to at least 1050 N.

3.13 Deformation under specified load and temperature

No performance determined

3.14 Water vapour resistance

Water vapour resistance is determined according to EN 12572 :2014. (Condition B according to EN 12086 :2013).

The nominal Sd value of multilayer high barrier foil is 4700 m, ($W = 4{,}19.10^{-14}$ kg/m².s.Pa).

3.15 Release of dangerous substances

For the sustainable use of natural resources, no performance was investigated for this product.

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with the European Assessment Document EAD 040007-00-1201, the applicable European legal act is: 1999/91/EC.

The system to be applied is: 3.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with CSTB.

The original French version is signed By

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Building Envelope Direction

CSTB