

European Technical Approval

ETA-01/0016

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

Handelsbezeichnung

Trade name

Hanf-Dämmwolle "HDW 1A"

Zulassungsinhaber

Holder of approval

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Zulassungsgegenstand
und Verwendungszweck

*Generic type and use
of construction product*

Dämmwolle aus Hanf zur Wärme und/oder Luftschalldämmung

Loose fill thermal and/or acoustic insulation material made of hemp fibres

Geltungsdauer vom

*Validity from
bis
to*

11. 10. 2006

10. 10. 2011

Herstellwerk

Manufacturing plant

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Diese europäische
technische Zulassung umfaßt

This European Technical Approval contains

10 Seiten

10 pages

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This European Technical Approval replaces ETA-01/0016 with validity from 19.11.2004 to 17.12.2006

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Österreichisches Institut für Bautechnik in accordance with:
 - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹, modified by the Council Directive 93/68/EEC of 22 July 1993²;
 - Gesetz vom 20. März 2001 über das Inverkehrbringen von Bauprodukten (Steiermärkisches Bauproduktengesetz, LGBl. f.d. Stmk. Nr. 50/2000);
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex of Commission Decision 94/23/EC³.
- 2 The Österreichisches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

1) Official Journal of the European Communities N° L 40, 11.02.1989, p. 12

2) Official Journal of the European Communities N° L 220, 30.08.1993, p. 1

3) Official Journal of the European Communities N° L 17, 20.01.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of products and intended use

1.1 Definition of products

This European technical approval applies to the following insulation product made of loose fill hemp:

Hanf-Dämmwolle "HDW 1A"

This product consists of pure hemp fibres with an content of shives < 7,5 % and gets its end use density of **50 – 55 kg/m³** by breaking up compressed hemp bales.

Delivery spectrum of the hemp bales:

nominal density: ca. 185 kg/m³	or	nominal density: ca. 370 kg/m³
nominal size: 45 x 45 x 80 cm		nominal size: 45 x 45 x 80 cm
nominal weight: 30 kg.		nominal weight: 60 kg

The density, dimensions and weight correspond to the delivery program of the manufacturer.

The hemp straw used in the manufacturing process has to fulfil the following quality criteria

Level of retting	1-5
weed content	< 10 % vol.
parameter of cultivation (stalk thickness)	< 15 mm

1.2 Intended use

Hanf-Dämmwolle "HDW 1A" is used as non loadable loose fill insulating material mainly for intended uses where vertical or horizontal cavities are greater than 10 cm.

Area of application for walls

- Insulation material for external walls in light wood constructions (nogging piece construction, timber frame construction, passive solar house construction method with thermal insulation up to 50 cm)
- Solid construction with external insulating system for low energy- and passive solar-buildings (external fixed wooden load-bearing system with intermediate insulating wool and panelling)
- Partition-insulation as thermal insulation and/or cavity-damping

Area of application for roofs

- Pitched roofs without ventilation (full rafter insulation)
- Flat roof with upper covering ($\mu.d \leq 0,2m$) and ventilated cavity under the waterproofing

Area of application for ceilings / floors

- Ceilings under non habitable attics (thermal insulation between or above the load-bearing structure)
- Cavity damping material respectively insulation material between floor-joists under floor constructions
- Floor against non habitable parts of buildings and against outside air
- Cavity damping material respectively insulation material in intermediate ceilings

The insulation products shall not be used in structures where it will be exposed to wetting or weathering and in such with a border to earth.

The provisions made in this ETA are based on an assumed intended working life of the insulation product of 50 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 product in relation to the expected economically reasonable working life of the works.

2 Characteristics of products and methods of verification

2.1 Composition and manufacturing process

The insulation product shall as far as its composition and manufacturing process is concerned correspond to the product subject to the approval tests. Details of composition and manufacturing process are deposited at the Österreichischen Institut für Bautechnik.

2.2 Density

The density of the products is determined according to European standard EN 1602⁴. The density is at least **50 kg/m³** and does not exceed **55 kg/m³**.

2.3 Settlement

The settlement is determined according to ISO/CD 18393⁴⁾ following the test methods stated in Table 1. The maximum values of settlement stated in Table 1 are not exceeded for the given minimum density.

Table 1: Settlement depending on the test method

Test method according to ISO/CD 18393	settlement %	bulk density kg/m ³	settled density kg/m ³
Method A – Settling by impact excitation	0	50,1	50,5
Method C – Settling of wall cavity insulation by vibration	0	50,2	50,2
Method D – Settling by specified climatization	6,6	48,9	53,0

2.4 Water absorption

The water absorption of the products is determined according to European standard EN 1609, method A⁵. The mean water absorption at a density of 50 kg/m³ and a sample thickness of 100 mm did not exceed **2,64 kg/m²**.

2.5 Water vapour diffusion resistance factor

The water vapour (see 4.2.1.1).

⁴⁾ EN 1602: 1996-11: Thermal insulation products for building applications - Determination of the apparent density

⁵⁾ EN 1609: 1996-11: Thermal insulation products for building applications - Determination of short-term water absorption by partial immersion

2.6 Airflow resistance

The airflow resistance of the products is determined according to European standard EN 29 053 , method A ⁶, at a density of 50 kg/m³. The mean longitudinal airflow resistance at a density is at least **0,2 kPa s/m²**.

2.7 Thermal conductivity

The thermal conductivity of the products is determined according to EN 12667⁷. The declared value of thermal conductivity is determined according to EN 10 456 ⁸.

The fractile value of thermal conductivity for the density range of 50 kg/m³ - 55 kg/m³ is $\lambda_{(10,dry,90/90)} = \mathbf{0,0485 W/(m\cdot K)}$ representing at least 90 % of the production with a confidence limit of 90%

The limit value of thermal conductivity for the density range of 50 kg/m³ - 55 kg/m³ is $\lambda_{(10,dry,limit)} = \mathbf{0,0469 W/(m\cdot K)}$ representing the total production. The manufacturer is responsible for keeping the limit during production.

The declared value of thermal conductivity for the density range of 50 kg/m³ - 55 kg/m³ is $\lambda_{D(23,50)} = \mathbf{0,050 W/(m\cdot K)}$ – **category 1** determined by conversion of the $\lambda_{(10,dry,90/90)}$ value.

The declared value of thermal conductivity for the density range of 55 kg/m³ - 55 kg/m³ is $\lambda_{D(23,50)} = \mathbf{0,048 W/(m\cdot K)}$ – **category 2** determined by conversion of the $\lambda_{(10,dry,limit)}$ value

For conversion of humidity the following applies:

- the moisture content mass by mass at 23 °C/50 % relative humidity: $u_{23,50} = \mathbf{0,07 kg/kg}$
- the moisture content mass by mass at 23 °C/80 % relative humidity: $u_{23,80} = \mathbf{0,14 kg/kg}$
- the moisture content conversion coefficient mass by mass: $f_{u1 (dry - 23/50)} = \mathbf{0,23 kg/kg}$
 $f_{u2 (23/50 - 23/80)} = \mathbf{0,31 kg/kg}$

2.8 Reaction to fire

The reaction to fire of the insulation products is tested by using the test methods relevant for the corresponding reaction to fire class and is classified according to EN 13 501-1⁹.

Table 2 shows the reaction to fire classes which apply to the insulation products as a function of their end use application.

Table 2 Reaction to fire classes as a function of the end use application

End use application	Reaction to fire: Class
<ul style="list-style-type: none"> - installation density of the insulating material 50 kg/m³ to 55 kg/m³, - insulation layer thickness between 100 mm and 200 mm, - end use application without air gap - end use application substrates defined in EN13238¹⁰ for the following standard substrate: 	C-s2,d0

6) EN 29 053: 1993-03: Acoustics - Materials for acoustical applications - Determination of airflow resistance

7) EN 12667: 2001 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance

8) EN ISO 10 456: 2000: Thermal insulation - Building materials and products - Determination of declared and design values

9 EN 13 501-1:2002-06: Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests

“wood based panel”: density of the board $\geq 680 \pm 50 \text{ kg/m}^3$, board thickness $\geq 12 \pm 2 \text{ mm}$, reaction to fire of the board: class D,	
<ul style="list-style-type: none"> - installation density of the insulating material 50 kg/m^3 to 55 kg/m^3, - insulation layer thickness between 40 mm and 200 mm, - end use application without air gap - end use application substrates defined in EN1323810 for the following standard substrate: “calcium silicate board”: density of the board $870 \pm 50 \text{ kg/m}^3$, board thickness $\geq 11 \pm 2 \text{ mm}$, reaction to fire of the board: class A2	C-s3,d0
<ul style="list-style-type: none"> - installation density of the insulating material 50 kg/m^3 to 55 kg/m^3, - insulation layer thickness $\geq 40 \text{ mm}$ 	E

2.9 Resistance to biological actions

The test and the assessment of the resistance to growth of mould fungus has been verified according to the EOTA testing procedure (Annex C of CUAP „In-situ formed loose filled thermal insulation material and/or acoustic insulation material made of vegetable or animal fibres; edition June 2003.”). The reached **class** of the product is **3**

2.10 Corrosion developing capacity on metal construction products

The product consists of pure hemp fibres without any additives.
No performance determined

2.11 Retention of additives

The product consists of pure hemp fibres without any additives.
No performance determined

2.12 Dangerous substances

The product consists of pure hemp fibres without any additives and complies with the provisions of guidance paper H¹¹.

A declaration of conformity in this respect was made by the manufacturer.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

¹⁰ EN 13238:2001: Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates

¹¹) Guidance paper H: A harmonised approach relating to Dangerous substances under the construction products directive, 18 February 2000

3 Evaluation of conformity and CE marking

3.1 Attestation of conformity system

3.1.1 System 3 for **Hanf-Dämmwolle "HDW 1A"** for which the following is valid:

- intended use "any"
- reaction to fire classes C, E,

The system of attestation of conformity is described in Council Directive (89/106/EEC) Annex III, 2 (ii), Second possibility and is detailed as follows:

- a) Tasks of the manufacturer
 - factory production control.
- b) Tasks of the approved body
 - initial type-testing of the product

3.2 Responsibilities

3.2.1 Tasks for the manufacturer; factory production control

The manufacturer has a factory production control system in his plant and exercises permanent internal control of production.

All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. The factory production control system ensured that the products are always in conformity with the European technical approval.

In the framework of factory production control the manufacturer shall carry out tests and controls in accordance with the control plan¹²⁾ which is fixed with this European technical approval.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to this control plan¹²⁾ which is part of the technical documentation of this European technical approval.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- designation of the products and of the basic materials,
- type of control or testing,
- date of manufacture of the products and date of testing of the products or basic materials or components,
- result of control and testing and, if appropriate, comparison with requirements,
- signature of person responsible for factory production control.

On request the records shall be presented to the Österreichisches Institut für Bautechnik.

3.2.2 Tasks for approved bodies

3.2.2.1 Initial type-testing of the products

For initial type-testing the results of the tests performed as part of the assessment for the European Technical Approval shall be used unless there are changes in the production line or plant. In such cases the necessary initial type-testing has to be agreed between the Österreichisches Institut für Bautechnik and the approved bodies involved.

3.3 CE marking

The CE marking shall be affixed on the products, the packaging or the attached label.

¹²⁾ The control plan has been deposited at the Österreichisches Institut für Bautechnik and is handed over only to the approved bodies involved in the attestation of conformity procedure

The symbol "CE" shall be accompanied by the following information:

- name or identifying mark of producer and manufacturing plant,
- the last two digits of the year in which the CE marking was affixed,
- number of the European technical approval,
- identification of products (commercial name),
- declared value of thermal conductivity
- class of reaction to fire ¹³,
- water absorption
- airflow resistance

¹³⁾ European classification of reaction to fire of building materials according to the Commission Decision 2000/147/EG of 8 February 2000 implementing Article 20 of Directive 89/106/EEC on construction products.

4 Assumptions under which the fitness of the products for the intended use was favourably assessed

4.1 Manufacturing

The thermal insulation products shall correspond as far as their composition and manufacturing process is concerned to the products subject to the approval tests. Composition and manufacturing process are deposited at the Österreichischen Institut für Bautechnik.

4.2 Installation

4.2.1 Parameters for the design of construction works or parts of construction works

4.2.1.1 Design value of thermal conductivity

The design value of thermal conductivity shall be defined in accordance with the relevant national provisions.

4.2.1.2 Value of water vapour diffusion resistance

For evaluating the diffusion equivalent thickness of air layer of the thermal insulation products the value of $\mu = 1$ of water vapour diffusion resistance factor shall be used ¹⁴.

The construction shall be designed and installed in such a way that no harmful condensation occurs within the works

4.2.2 Parameters for the installation in the construction works or parts of construction works

The fitness of the hemp wool for the intended use is given under the following condition:

- Installation carried out by appropriate personnel under the supervision of the person responsible for technical matters on of the site
- Installation in accordance with the manufacturer's specifications
- Precise compression of the hemp wool
- Installation of constructive measurements to avoid settlement by large cavity thickness

4.2.3 Use of the insulation products as airborne sound insulation

In case of use of the products as airborne sound insulation it is necessary to determine the airborne sound insulation for the specific construction work in question in accordance with the relevant technical rules in force.

5 Recommendations for the manufacturer

5.1 Recommendations on packaging, transport and storage

Packaging of the products has to be such that they are protected against moisture during transport and storage unless other measures are foreseen by the manufacturer for this purpose.

5.2 Recommendations on installation

The product has to be protected against moisture during installation.

The processing guidelines of the manufacturer have to be followed.

¹⁴⁾ For the construction work in question always the less favourable value shall be used.

5.3 Accompanying information

In the information accompanying CE marking the manufacturer shall indicate that the products shall be protected against humidity during transport, storage and installation.

Furthermore it is the responsibility of the manufacturer to ensure that the information on the installation procedure is shown clearly on the package and/or on an enclosed instruction sheet.

On behalf of Austrian Institute of Construction Engineering

Rainer Mikulits
Managing Director

Original Document is signed by Rainer Mikulits