VTT Valtion Teknillinen Tutkimuskeskus
PL 1000
02044 VTT
Puh. +358 20 722 4911
Telekopio +358 20 722 6251

Rakennustuotedirektiivin (89/106/EEC) artiklan 10, neuvoston direktiivi 21. joulukuuta 1988, mukaisesti notifioitu tuotehyväksyntälaitos

EOTAN JÄSEN

# Eurooppalainen tekninen hyväksyntä ETA-09/0082
## European Technical Approval

| | |
|---|---|
| **Kauppanimi:** Trade name | **Termex puhallettavat puukuitueristeet**<br>**Termex in-situ formed loose fill cellulose fibre insulations** |
| **Hyväksynnän haltija:** Holder of approval: | **Termex-Eriste Oy**<br>**Po Box 34**<br>**43101 Saarijärvi**<br>**Finland** |
| **Tuotetyyppi ja sen käyttötarkoitus**: Generic type and use of construction product: | **PAIKALLA PUHALLETTAVA SELLULOOSAKUIDUSTA VALMISTETTU LÄMMÖNERISTE**<br>**IN-SITU FORMED LOOSE FILL THERMAL INSULATION MATERIAL MADE OF CELLULOSE** |
| **Voimassaoloaika:** Validity from/to | **25.05.2009**<br>**24.05.2014** |
| **Valmistuspaikka:** Manufacturing plants: | Termex –Eriste Oy, Saarijärvi, Finland |
| **Tämä hyväksyntä sisältää** This European Technical Approval contains<br>sivuja/liitteitä | 6 sivua, ei liitteitä |
| pages/annexes | 6 pages including no annexes |

Eurooppalainen tekninen hyväksyntäorganisaatio
European Organisation for Technical Approvals

# I LEGAL BASES AND GENERAL CONDITIONS

1. This European Technical Approval is issued by the VTT Technical Research Centre of Finland 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 products[1], modified by the Council Directive 93/68/EEC[2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council[3],

   - Laki rakennustuotteiden hyväksynnästä (230/2003) luvut 3 ja 10, Ympäristöministeriön asetus rakennustuotteiden hyväksynnästä 3 § sekä Ympäristöministeriön 14.10.1997 antama valtuutuspäätös (12/352/94),

   - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[4];

2. The Technical Research Centre of Finland (VTT) is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant(s). 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.

3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturer other than those indicated on Annex 1; or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4. This European Technical Approval may be withdrawn by the Technical Research Centre of Finland (VTT) pursuant to Article 5 (1) of the Council Directive 89/106/EEC.

5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Technical Research Centre of Finland (VTT). In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6. The European Technical Approval is issued by VTT in English. 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 Nº L 40, 11.2.1989, p. 12
2. Official Journal of the European Communities Nº L 220, 30.8.1993, p. 1
3. official Journal of the European Union Nº L 284, 31.10.2003, p. 25
4. Official Journal of European Communities Nº L 17, 20.1.1994, p. 34

# II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

## 1. Definition of the product and intended use

### 1.1 Definition of the construction product

In-situ formed Termex loose fill cellulose fibre thermal insulations consists of wood fibres derived from wood by paper production and crushing. During the manufacturing process the product is provided with a fire retardant and an additive for enhancing the biological resistance (boric acid and borax). The final product can also contain a binding agent (PVA) according to the below.

The thermal insulation products are produced four different types:

| Type of the insulation | Type 1 | Type 2 | Type 3 | type 4 |
|---|---|---|---|---|
| Trade name | Puhallus-Termex | Vino-ontelo-Termex | Sidox-Termex | Pystyontelo-Termex |
| Use area | Blown freely into open space, horizontal and slightly tilting targets | Blown into closed space, horizontal or tilted highest 60 ° compared to horizontal | Blown with binding agent into open space | Blown into closed spac which is tilted more than 60 ° compared to the horizontal |
| Minimum density, kg/m$^3$ | ≥ 26 | ≥ 42 | ≥ 32 | ≥ 55 |

The maximum density of the Type 1 insulation is 36 kg/m$^3$ and the maximum density of the other products 65 kg/m$^3$.

### 1.2 Intended use

The products are intended to be used as thermal insulation in walls, partitions, floors, intermediate floors and ceilings according to the use area of the product type.

The insulation can be used in constructions where it is not exposed to wetting, weathering, heavy moisture transport, condensation or compression loads. The blowing is carried out in dry conditions.

The provisions made in this ETA are based on an assumed working life of the thermal insulation of 50 years provided that the conditions laid down in this section and sections 4.2/5.1/5.2 for the packaging, transport, storage, installation, use maintenance and repair are met. 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.

## 2. Characteristics of product and methods of verification

The methods of verification and characteristics of the insulation evaluated in this ETA are as follows:

| CUAP Paragraph | Characteristic | Assessment of the characteristic | | | |
|---|---|---|---|---|---|
| | **ER1 Mechanical resistance and stability** | Not relevant | | | |
| 4.1.1 | Corrosion developing capacity on metal constructions | No pits in copper sheets, 2 and 4 pits in the zinc sheets | | | |
| | **ER2 Safety in case of fire** | | | | |
| 4.2.1 | Reaction to fire, EN ISO 11925-2 | Type 1<br>Class E | Type 2<br>NPD | Type 3<br>NPD | Type 4<br>NPD |
| | **ER 3 Hygiene, health and environment** | | | | |
| 4.3.1 | Water vapour diffusion resistance, EN 12086 | NPD | | | |
| 4.3.2 | Content and release of dangerous substances | **No dangerous substances *)**<br>Products contain Boric acid and Borax | | | |
| 2.4.6 | Air flow resistance,( kPa s/$m^2$ ) EN 29053 | Type 1<br>5,0 | Type 2<br>10 | Type 3<br>15 | Type 4<br>37 |
| **4.4** | **ER 4 Safety in use** | Not relevant | | | |
| **4.5** | **ER 5 Protection against noise** | NPD | | | |
| **4.6** | **ER 6 Energy economy and heat retention** | | | | |
| 4.6.1.1.1 | Thermal conductivity, $\lambda_{10, dry, 90/90}$ of the products with different densities, EN 12667(testing) and 90/90 % calculation | Type 1<br>0,038 W/mK | Type 2<br>0,038 W/mK | Type 3<br>0,039 W/mK | Type 4<br>0,040 |
| 4.6.1.1.2 | Moisture conversion factor for $\lambda_{DECLARED\ (23,50)}$ $f_{u\ 1}$ | 0,12 | 0,20 | 0,12 | 0,30 |
| 4.6.1.1.3 | Thermal conductivity , $\lambda_{DECLARED\ (23,50)}$ | 0,039 | 0,040 | 0,040 | 0,043 |
| **4.7** | **Aspects of durability, serviceability and identifcation** | | | | |
| 4.7.1 ans 4.7.2 | Biological resistance, According to EOTA testing procedure and EN ISO 846 | 0 (no mould growth before or after the handling test) | | | |
| 4.7.3 | Water absorption, EN 1609 | NPD | | | |
| 4.7.4 | Settlement | | | | |
| | Maximum settlement, % ISO/CD 18303 | Type 1 | Type 2 | Type 3 | Type 4 |
| | Method A - Settling by impact excitation | 20 | | | |
| | Method C – Settling by vibration | | | 0 | 0 |
| | Method D - Settling by specified climatization | | 0 | | |

*In addition of 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 Construction Products directive, these requirements need also to be compiled with, when and where they apply.

# 3. Evaluation and attestation of conformity and CE marking

## 3.1 System of attestation of conformity

According to the decision 99/91/EC of 25.01.1999 of the European Commission the system 3 of attestation of conformity applies, since reaction to fire classification is E.

This system of attestation of conformity is defined as follows:

System 3: declaration of conformity of the product by the manufacturer on the basis of:

(a) Tasks for the manufacturer:
  (1) Factory production control,

(b) Tasks for the notified body:
  (3) Initial type testing of the product

## 3.2 Responsibilities

### *3.2.1 Tasks of the manufacturer*

#### *3.2.1.1 Factory production control*

The manufacturer shall have permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results. This production control system shall ensure that the product is in conformity with this European technical approval.

The manufacturer may only use initial materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the control plan of 12.8.2008 relating to the European Technical approval ETA -09/0082 issued on 25 May 2009 which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with VTT[5].

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the "Control plan".

#### *3.2.1.2 Other tasks of the manufacturer*

The manufacturer shall involve a body which is notified for the tasks referred to in section 3.1 in the field of insulating materials to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction products are in conformity with the provisions of the European technical approval ETA-09/0082 issued on 25 May 2009.

### *3.2.2 Tasks of approved bodies*

The approved body shall perform the

- Initial type testing of the product

In accordance with the provisions laid down in control plan.

For initial type testing the results of the tests performed as part of the assessment for this European Technical Approval shall be used provided nothing changes in the production or factory. Otherwise the necessary type testing shall be agreed between VTT and approved bodies involved.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

### 3.3 CE-marking

The CE-marking shall be affixed on the each packaging or on the delivery tickets put into the packages. The symbol “CE” shall be accompanied by the following additional information:

- Identification of the product: Commercial trade name as indicated in this ETA
- Name and address of the ETA holder(legal entity responsible for the manufacture)
- The last two digits of the year in which the CE marking was affixed
- The number of the European Technical Approval, ETA-09/0082
- Installation density depending on the area of application
- The declared value of thermal conductivity at 23 °C and 50 % RH
- The settlement percentage
- The class of reaction to fire or NPD
- The products corrosion developing capacity on metal parts of construction
- Other properties manufacturer wants to declare and which are included in the ETA

## 4. Assumptions under which the fitness of the product for the intended use was favourably assessed

### 4.1 Manufacturing

Manufacturing of the loose fill cellulose fibre thermal insulations is based on the defined production method, use of defined raw materials and tolerances. If changes take place manufacturer is responsible to clarify if the change has influence on the properties of the product tested to VTT before the changes are introduced. VTT will decide whether or not such changes affect the ETA and consequently the validity of the CE-marking on the basis of the ETA and if so whether further assessments or alterations of the ETA shall be necessary.

### 4.2 Installation

The insulation is installed on to the building according to the instructions of the manufacturer. The suitability of the insulation to the planned purpose shall be evaluated taking into account what has been said in chapter 1.2.

Machine installations of the insulating material shall be performed by companies trained and listed by the manufacturer. In case of processing under the action of water it shall be ensured that the main share of water is evaporated before closing the cavity. Time period necessary for this depends on the climatic conditions of the surroundings. Only building materials allowing an evaporation of moisture may be used as facing.

When calculating the thermal resistances of the insulations the nominal thickness of the insulation layer according to the following shall be applied:

| Use area | Insulation type | Density, $kg/m^3$ | Planned thickness |
|---|---|---|---|
| Blown freely into open space, horizontal and slightly tilting targets | Type 1 | 26 - 36 | Equal to blown thickness plus 20 % |
| Blown into closed space, horizontal or tilted highest 60 ° compared to horizontal | Type 2 | 42 - 65 | Clear span of the filled cavity |
| Blown with binding agent into open space | Type 3 | 32 -65 | Equal to blown thickness |
| Blown into closed space which is tilted more than 60 ° compared to the horizontal | Type 4 | 55 - 65 | Clear span of the filled cavity |

The density is determined by calculation from the mass of material brought in and the full volume. The executing company shall check the density.

# 5. Indications to the manufacturer

## 5.1 Packaging transport and storage

The insulation products are transported to the building site in truck containers. The products shall be stored protected from rain and at temperatures between – 40 and + 80 °C before the installation.

## 5.2 Use, maintenance and repair

In the information accompanying the CE marking the manufacturer shall specify that the product shall be installed following the installation instructions given by the manufacturer (machine processing by trained companies according to 4.2 only) and that the product is to be protected from moisture during transport storage and installation.

On behalf of VTT Technical Research Centre of Finland

Espoo 25.05.2009

Liisa Rautiainen
Assessment Manager

Lina Markelin-Rantala
Senior Research Scientist