



Second Draft 4.6.2007

CUAP/ETA request N° 12.01/21

Common Understanding of Assessment procedure

for European Technical Approval according to
Article 9.2 of the Construction Products Directive

Soft foam insulation

Internal EOTA working document resulting from procedure according to clause 3.2.3. of the Common Procedural Rules.

Endorsed by the Technical Board of EOTA.

Reference for the necessary consent of the relevant EOTA bodies on draft ETA according to clause 3.2.5 of the Common Procedural Rules.

To be applied in all cases in which the conditions of clause 3.2.4 of the Common Procedural Rules are met.

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1. SCOPE OF THE CUAP

1.1 Definition of the construction product

Soft foam insulation is low density open cell insulation. The insulation is sprayed or injected. It is produced by mixing the components resin and polyisocyanate components together.

1.2 Intended use of the construction product

The product is intended to be used in walls, partitions, floors, intermediate floors and ceilings as thermal and acoustic insulation. The insulation can be used in constructions where it is not exposed to wetting, weathering, heavy moisture transport, condensation or long term compression.

1.3. Assumed working life of the construction product

The provisions and the verification and assessment methods included or referred to in this CUAP have been written based upon the assumed working life of 50 years of the product, provided that the product is subjected to appropriate installation, use and maintenance. These provisions are based upon the current state of the art and available knowledge and experience.

“Assumed working life” means that, when an assessment following the CUAP provisions is made, and when working life has elapsed, the real working life may be, in normal use conditions considerably longer without major degradation affecting the Essential Requirements¹.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee given by the product manufacturer or his representative or the approval body issuing the ETA, but are regarded only as means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

¹ The real working life of the product incorporated in a specific works depends on the environmental conditions to which that works is subjected and the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that there are cases in which the real working life of the product may also be shorter than the assumed working life.

1.4 Terminology

1.4.1 Common terms relating to the Construction Products Directive

For the meaning of these terms see EOTA document "Common terms used in Guidelines for European technical approval" published in the EOTA website.

1.5 Procedure in the case of a significant deviation from the CUAP

In cases in which this CUAP is intended to be used for another similar product and/or intended use but not complete or fully applicable in all aspects, the approval body concerned shall prepare a draft supplement or modification to the CUAP for endorsement in EOTA TB. The procedure of Art. 9.2 of the CPD and section 3.2 of the Common procedural Rules will then be based on the supplemented or modified CUAP.

2. ASSESSMENT OF FITNESS FOR USE

2.1 Meaning of "fitness for use"

"Fitness for (the intended) use" of a construction product means that

the product has such characteristics that the *works* in which it is to be incorporated *can*, if properly designed and built,

1. *satisfy* the Essential Requirements when and where such works are subject to regulations containing such requirements (CPD Art. 2.1) and
2. *be fit* for their intended use, account being taken of economy, *and* in this connection *satisfy* the Essential Requirements for an economically reasonable working life, if normally maintained (see CPD Annex I, sentence 1 and 2).

2.2 Elements of the assessment of fitness for use

The assessment of the fitness of a construction product for its intended use includes:

- § the identification of the characteristics of the product which are relevant to its fitness for use (in the following referred to as "regulatory characteristics");
- § the establishment of methods for the verification and assessment of the regulatory product characteristics and the expression of the respective product performances;
- § the identification of such regulatory characteristics to which the option "No Performance Determined" applies for the reason that in one or more Member States they are not relevant for the fulfilment of the requirements applicable to the works;
- § the identification of such regulatory characteristics for which limit values (threshold values) have to be respected for technical reasons.

2.3 Relationship of requirements to the product characteristics and methods of verification and assessment

The product characteristics, methods of verification and assessment criteria which are relevant for intended use referred in clause 1.2 are given in the table1.

Table 1. Product characteristics and methods of verification and assessment

Nr	Product characteristic (where relevant with footnote*) (where relevant indicate respective ID clause)	Option "No Performance Determined"	Method of verification and assessment	Expression of product performance (value, class, NPD, criterion, etc)
(1)	(2)	(3)	(4)	(5)
Essential Requirement 1: Mechanical resistance and stability				
1	Corrosion developing capacity on metal constructions	No	2.4.1	According to the test results
Essential Requirement 2: Safety in case of fire				
2	Reaction to fire	Yes	2.4.2	Euroclass A1 - F
Essential Requirement 3: Hygiene, health and environment				
3	Release of dangerous substances ¹⁾	Yes	2.4.3	Statement by applicant
4	Water absorption	No	2.4.4	MDV
5	Water vapour permeability	No	2.4.5	MDV
6	Susceptibility to mould growth	Yes	2.4.6	According to test results
Essential Requirement 4: Safety in use				
	Not relevant			
Essential Requirement 5: Protection against noise				
7	Sound insulation	Yes	2.4.7	MDV
Essential Requirement 6: Energy economy and heat retention				
8	Thermal conductivity	No	2.4.8	MDV
9	Compression strength/stress	No	2.4.9	MDV
10	Tensile strength parallel to faces	No	2.4.10	MDV
11	Delamination strength	Yes	2.4.11	MDV
12	Dimensional stability	No	2.4.12	MDV
General aspects relating to fitness for use *				
	Durability (included into earlier points)	no		
<p>*) Aspects of durability and economy of the works (see CPD Annex 1, sentence 1 and 2) which are not dealt with under Essential Requirements 1 to 6. Such aspects are also referred to as "serviceability".</p> <p>¹⁾ The product must be such that, when installed according to the appropriate provisions of the Member States, it allows for the satisfaction of the ER 3 of the CPD as expressed by the national provisions of the member states and in particular does not cause harmful emission of toxic gases, dangerous particles or radiation to the indoor environment nor contamination of the outdoor environment (air, soil or water).</p>				

2.4 Product characteristics which are relevant for the fitness for use

2.4.1 Corrosion developing capacity

2.4.1.1 Methods of verification

The corrosion developing capacity on metal constructions is assessed on the basis of composition of the insulation product including possible additives.

If such test is not feasible then the test in annex C shall be carried out.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.2 Reaction to fire

2.4.2.1 Method of verification

The soft foam thermal insulation shall be tested, using the test method(s) relevant for the corresponding reaction to fire class, in order to be classified according to EN 13501-1. Classification of the insulation can be done either as such or as part of the construction (with studs and surfaces) where it is intended to be used. If no performance determined option is used the product falls in class F without testing.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.2.2 Method of assessing and judging

The reaction to fire class is given in the ETA according to the standard EN 13501-1, or NPD option is used.

2.4.3 Dangerous substances

2.4.3.1 Content of dangerous substances

The applicant shall submit a written declaration stating whether or not the thermal insulation contains dangerous substances according to European and national regulations, when and where relevant in the Member States of destination, and shall list these substances.

2.4.3.2 Compliance with the applicable regulations

If the product contains dangerous substances as declared above, the ETA will provide the method(s) which has (have) to be used for demonstrating compliance with the applicable regulations in the Member States of destination, according to the dated EU data-base (method(s) of content or release, as appropriate).

2.4.3.3 Method of assessing and judging

The product/kit shall comply with all relevant European and national provisions applicable for the intended uses for which it is brought to the market. The attention of the applicant should be drawn on the fact that for other uses or other Member States of destination there may be other requirements which would have to be respected. For dangerous substances contained in the product but not covered by the ETA, the NPD option (no performance determined) is applicable.

2.4.3.4 Application of the precautionary principle

An EOTA member has the possibility to provide to the other members, through the Secretary General, warning about substances which, according to Health authorities of its country, are considered to be dangerous under sound scientific evidence, but are not yet regulated. Complete references about this evidence will be provided.

This information once agreed upon, will be kept in an EOTA data base, and will be transferred to the Commission services.

The information contained in this EOTA data base will also be communicated to any ETA applicant.

On the basis of this information, a protocol of assessment of the product, regarding this substance, could be established on request of a manufacturer with the participation of the Approval Body which raised the issue.

2.4.4 Water absorption

2.4.4.1 Methods of verification

The water absorption is measured according to the standard EN 1609.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.4.2 Method of assessing and judging

The water absorption shall be given in the ETA.

2.4.5 Water vapour permeability

2.4.5.1 Methods of verification

Water vapour permeability is measured according to the standard EN 12086.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.5.2 Method for assessing and judging

Results of the tests are given in the ETA or NPD option is used.

2.4.6 Susceptibility to mould growth

2.4.6.1 Method of verification

The determination of the susceptibility to mould growth is tested according to the Annex B of this CUAP.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.6.2 Method for assessing and judging

The results are given in the ETA or NPD option will be used.

2.4.7 Sound insulation

2.4.7.1 Method of verification

Dynamic stiffness is measured according to the standard, EN 29052-1 and compressibility according to the standard EN 12431.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.7.2 Method for assessing and judging

The results are given in the ETA or NPD option is used.

2.4.8 Thermal conductivity

2.4.8.1 Method of verification

The thermal conductivity of the insulation material is tested according to the EN 12667.

Lamda declared is calculated according to the standard EN ISO 10456. Lamda declared is 90/90 value for thermal conductivity.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.8.2 Method for assessing and judging

The thermal conductivity is given in the ETA.

2.4.9 Compression strength

2.4.9.1 Method of verification

The compression strength is measured according to the standard EN 826.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.9.2 Method for assessing and judging

The results are given in the ETA

2.4.10 Tensile strength parallel to faces

2.4.10.1 Method of verification

The compression strength is measured according to the standard EN 1608.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.10.2 Method for assessing and judging

The results are given in the ETA

2.4.11 Tensile strength perpendicular to faces (delamination)

2.4.11.1 Method of verification

The compression strength is measured according to the standard EN 1607.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.11.2 Method for assessing and judging

The results are given in the ETA

2.4.12 Dimensional stability

2.4.12.1 Method of verification

Dimensional stability is measured according to the EN 1603 and also with EN 1604 and EN 1605 (test condition 1), if two latter methods are relevant as end use conditions.

Test samples (number and size) shall be cut from the test piece according to the test method description. Test piece from which the test samples are cut shall be made according to the annex A.

2.4.12.2 Methods for assessing and judging

The results are given in the ETA

3 EVALUATION AND ATTESTATION OF CONFORMITY AND CE-MARKING

3.1 System of attestation of conformity

According to the decision of the European Commission 99/91/EC, the system of attestation of conformity given in the tables 2a or 2b shall be applied to the soft foam thermal insulation.

Table 2a. System of attestation of conformity applicable to any intended use

Product(s)	Intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Thermal insulation product	Any	-	3

Table 2b System of attestation of conformity applicable to the product covered by this CUAP with respect to reaction to fire (AC class 4 is valid for the product and AC class 3 for structural solutions)

Product(s)	Intended use(s)	Level(s) or class(es) <i>(reaction to fire)</i>	Attestation of conformity system(s)
Thermal insulation	for uses subject to regulations on reaction to fire	A1*, A2*, B*, C*	1
		A1**, A2**, B**, C**, D, E,	3
		F	4
System 1: See Directive 89/106/EEC Annex III.2.(i), without audit-testing of samples System 3: See Directive 89/106/EEC Annex III.2.(ii), Second possibility System 4: See Directive 89/106/EEC Annex III.2.(ii), Third possibility * Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material) ** Products/materials not covered by footnote (*) *** Products/materials that do not require to be tested for reaction to fire (eg. Products/materials of class A1 according to Commission Decision 96/603/EC, as amended)			

AoC system 1

Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer
 - (1) factory production control;
 - (2) testing of samples taken at the factory in accordance with the prescribed test plan;
- (b) Tasks for the notified body:
 - (3) Certification of conformity of the product and factory production control on the basis of:
 - Initial type testing of the product
 - initial inspection of factory and factory production control;
 - continuous surveillance, assessment and approval of factory production control.

AoC system 3

Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer
 - (1) factory production control;
 - (2) testing of samples taken at the factory in accordance with the prescribed test plan;
- (b) Tasks for the notified body:
 - (3) Initial type testing of the product

3.2 Tasks and responsibilities of the manufacturer and notified bodies

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control (FPC)

The corner stones of the actions to be undertaken by the manufacturer of the product in the procedure of attestation of conformity are laid down in table 3.

Table 3 Control plan for the manufacturer; corner stones (when the properties are declared)

Nr	Subject of control	Test method	*Minimum frequency of control	
			Direct testing	Indirect testing
1	Thermal conductivity	EN 12667 or EN 1602 and EN 12667	1 per day or 1 per 3 months and indirect testing	Density 1 per h
2	Compression strength	EN 826	1 per 8 h and indirect	Density 1 per h
3	Water absorption	EN 1609	1 per month and indirect	Manufacturers method 1 per day
4	Tensile strength perpendicular to faces	EN 1607	1 per 8 h and indirect	Density 1 per h
5	Tensile strength parallel to faces	EN 1608	1 per year and indirect	Manufacturers method 1 per day
6	Reaction to fire	EN 13823 EN 1602	1 per month or 1 per 2 years and indirect testing	Density 1 per day

* When the production take place as batches these frequencies shall be followed taking into account the annual amount of produced batches and duration of one batch production.

The manufacturer shall exercise permanent internal control of production. All the elements requirements and provisions adopted by the manufacturer shall be documented in a systematic

manner including policies and procedures and records of test results. This production control system shall insure that the product is in conformity with the ETA.

Manufacturers having a FPC system which complies with EN ISO 9001 and addresses the requirements of an ETA are recognized as satisfying the FPC requirements of the CPD.

3.2.2 Tasks of notified bodies

The corner stones of actions to be undertaken by the notified body in the attestation of conformity procedure are according to the table 4.

Table 4 Control plan for the notified body; corner stones

Subject of control	Control method	Frequency of control
AoC system 1		
Initial inspection of factory and factory production control (FPC)		
Inspection of the factory and factory production control as described in the control plan	Control of devices, results, and documentation of FPC	In connection of initial inspection of FPC and when relevant changes take place
Aoc system 1 and 3		
Approval/Initial type testing of the product		
Properties of the product	Methods mentioned in this CUAP chapter 2.4	Before issuing the ETA and when relevant changes take place in product or production
AoC system 1		
Continuous surveillance, judgement and assessment of factory production control (FPC)		
Inspection of the factory and factory production control as described in the control plan	Control of the documentation and results of FPC	Once a year

Approval testing will have been conducted by an approval body or under its responsibility (which may include a proportion conducted by a laboratory or by the manufacturer witnessed by the approval body) in accordance with section 2 of this CUAP. The approval body will have assessed the results of these tests in accordance with section 2 of this CUAP, as part of ETA issuing procedure.

These tests shall be used for the purposes of initial type testing if they are done on samples coming from the current production process, so further testing is not necessary.

If new production line is started or new subcontractors used the new ITT is necessary

3.3 CE marking and accompanying information

According to Council Directive 93/68/EEC¹ the CE marking consists of the letters "CE" in the form laid down in the Directive, followed by the identification number of the notified certification body, where applicable. For products subject to Council Directive 89/106/EEC the identification number of the notified certification body shall be given for products to which systems 1+, 1 and/or 2+ of attestation of conformity apply.


The CE marking of the levelling fastener shall be accompanied by the following information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity in AoC 1,

¹ Official Journal of the European Communities L 220 of 30.8.1993

- the number of the European technical approval,

Example of CE marking and accompanying information:

 1234	Letters "CE" <i>Identification number of notified certification body (when AoC 1 is applied)</i>
Any Company Street 1, City, Country 04 yyy-CPD-0xxx	Name and address of the producer (legal entity responsible for the manufacture) Two last digits of year of affixing CE marking <i>Number of EC certificate of conformity (when AoC 1 is applied)</i>
ETA-06/xxxx CUAP No xxx Polyester fibre thermal insulation	ETA number Type / intended use / use category / product characteristic(s) / declared values and/or classes in accordance with section 2. of the ETA

4 ASSUMPTIONS UNDER WHICH THE FITNESS FOR THE INTENDED USE IS ASSESSED

4.1 Manufacture of the product

Manufacturing of the soft foam thermal insulation 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 according to the provisions of this CUAP.

4.2 Packaging, transport, storage of the product

The insulation products are transported to the building site in barrels. The products components shall be stored at temperature above 10 °C before the installation.

4.3 Installation of the product in the works

The thermal 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.

4.4 Use, maintenance, repair

The thermal insulation shall work adequately when the construction where it is installed according to the instructions of the manufacturer is maintained and repaired so that the provisions of use given in chapter 1.2 of this CUAP are fulfilled.

5 IDENTIFICATION OF THE CONSTRUCTION PRODUCT

5.1 Means of identification

The product which is the subject of the technical approval shall be identified according to the table 3 and properties presented in the paragraph 2.4.

5.2 Product characteristics which are relevant for identification checking

5.2.1 Density of the insulation

5.2.1.1 Method of verification

The density is measured according to the EN 1602

5.2.1.2 Criteria for product identity

Results are compared to the information given in the ETA

5.2.3 Water absorption of the insulation

5.2.3.1 Method of verification

The short term water absorption is measured according to the EN 1609.

5.2.3.2 Criteria for product identity

Results are compared to the information given in the ETA

5.2.4 Compression strength

5.2.3.1 Method of verification

The compression strength is measured according to the EN 826.

5.2.3.2 Criteria for product identity

Results are compared to the information given in the ETA

6 FORMAT OF ETAs ISSUED ON THE BASIS OF THE CUAP

European technical approvals issued on the basis of this CUAP shall be in accordance with the ETA format given in the Addendum to the ETAG/CUAP format.

The minimum and maximum thickness of the insulation layer formed by the product shall be laid down in the ETA depending on the product properties determined.

References:

EN 822	Thermal insulating products for building applications. Determination of length and width
EN 823	Thermal insulating products for building applications. Determination of thickness
EN 824	Thermal insulating products for building applications. Determination of squareness
EN 825	Thermal insulating products for building applications. Determination of flatness
EN 1602	Thermal insulating products for building applications. Determination of density
EN 1603	Thermal insulating products for building applications. Determination of dimensional stability under constant normal laboratory conditions (23 °C/50 % relative humidity)
EN 1608	Thermal insulating products for building applications. Determination of tensile strength parallel to faces
EN 1609	Thermal insulating products for building applications. Determination of short term water absorption by partial immersion
EN ISO 10456	Building materials and products. Procedures for determining declared and design thermal values (ISO 10456:1999)
EN 12086	Thermal insulating products for building applications. Determination of water vapour transmission properties
EN 12431	Thermal insulating products for building applications. Determination of thickness for floating floor insulating products
EN 12667	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
EN 29052-1	Acoustics. Determination of dynamic stiffness. Part 1: Materials used under floating floors in dwellings
EN 13501-1	Fire classification of construction products and building elements. Part 1: Classification using test data from reaction to fire tests
Annex A	Preparation of samples for testing
Annex B	Susceptibility of mould growth test/Cluster CUAP edition June 2003
Annex C	Corrosion developing capacity/Cluster CUAP edition June 2003
Annex D	Mounting and fixing rules for the reaction to fire tests

ANNEX A

Preparation of the test pieces for the samples

1 Principle

The test pieces are prepared in the factory or in building site using the spraying facilities of the manufacturer. The selection of the sprayed material components shall be done from the stock of the manufacturer, in the control of the third party.

The spraying is done on to plastics sheets in the sizes of about 700 mm x 2,5 m x. 300 mm (thickness).

The test pieces are removed from the plastic and cut into smaller sizes either according to the instruction of the test laboratory or to the bigger sizes suitable for transporting.

The density of the test pieces are controlled after spraying and those test pieces which do not meet the specifications are rejected and new test pieces are sprayed.

ANNEX B

Determination of resistance to mould fungus

Resistance to mould fungus

Note: *The determination method is taken from the Austrian Standard ÖNORM B 6010, clause 3.22.*

B.1 Principle

A test specimen is exposed for a defined period time at a constant temperature to a high moisture climate.

After this period of time the test specimen is visually inspected for the presence of mould fungus.

B.2 Apparatus

B.2.1 Desiccator, of sufficient size, that can contain a test specimen of 50 mm x 20 mm x 30 mm or for loose fill material a cage of wire according to B.2.2.

B.2.2 Cage made of stainless steel with an internal volume of approx. 0,05 litres for loose fill materials.

Cage A, for large fibres, with a mesh size of 10 mm x 10 mm and a wire thickness of 0,4 mm.

Cage B, for small fibres, with a mesh size 1 mm x 1 mm and a wire thickness of 0,25 mm.

B.3 Testing conditions

The exposure shall be performed at a constant temperature of (23 ± 2) °C.

Note: *This constant temperature is very necessary to avoid any condensation during the exposure period.*

B.4 Sample preparation for loose fill materials

The loose fill material shall be put in either cage A or cage B, depending to the fibre length.

Care shall be taken that density in the cage is the declared density.

B.5 Procedure

- The desiccator is filled at the bottom with water;
- The sample is then put in the desiccator, taking care that no part of the sample can come into contact with the water;
- The desiccator is then closed tightly and put in the temperature-conditioned room for a period of four weeks;
- After four weeks the desiccator is opened and the sample visually inspected on the presence of mould fungus according to EN ISO 846 clause 9.1.

B.6 Expression of results

The presence of mould fungus is expressed in classes of intensity of growth according to table 4 of EN ISO 846.

ANNEX C

Determination of metal corrosion developing capacity

Note: The determination method is taken from the British Standard BS 5803: Part 3: 1985 Appendix.

Method of test for corrosivity

1 Principle

This test is intended to provide a basis for the acceptance or rejection of the level of corrosivity displayed by a fibrous insulation where water may cause chemical constituents to migrate to thin copper or zinc-coated elements adjacent to the insulation.

NOTE 1. This is an accelerated test and analytical laboratory hygiene is required at all stages.

NOTE 2. Material passing this test is deemed acceptable when installed adjacent to the thick-sectioned steel components (e.g. nails) which may be present in a loft. Thin-sectional steel components devoid of zinc coating or other protection are at risk in any humid loft environment irrespective of the nature of any insulation present.

2 Reagents and materials

2.1 Four metal test coupons, two of copper foil of 99.9 % purity and two of zinc foil of 99.9 % purity, each 50 mm x 50 mm x 0.075 mm thick, judged free of tears, distortions, scratches, perforations, corrosion or other flaws when viewed under and over a 40 W coiled coll incandescent light bulb.

2.2 Trichloroethylene, of analytical reagent quality.

NOTE. Attention is drawn to the possible health risks when using this material.

2.3 Sulphuric acid, (C) $\text{H}_2\text{SO}_4 = 0.5 \text{ mol/l}$ to 1 mol/l .

2.4 Saturated ammonium acetate solution.

3 Apparatus

3.1 Humidity chamber maintained at $40 \pm 2 \text{ }^\circ\text{C}$ and 90 % RH.

3.2 Four cylindrical glass crystallising dishes, well washed, nominally 90 mm in diameter and 50 mm deep.

3.3 Rubber or PVC gloves.

3.4 Stainless steel spatula.

3.5 Tweezers

4 Procedure

Carry out the procedure as follows:

Wash each coupon successively in two glass dishes of the trichloroethylene to remove any grease or oil, and dry at room temperature. At this and all subsequent handling of the coupons, thin rubber or PVC gloves should be worn and tweezers used.

- (a) Take four 20 g samples of fibrous insulation and mix each with 150 ml of distilled or deionized water at room temperature in a clean glass beaker.
- (b) Transfer approximately half of one sample of the saturated fibrous insulation, using gloved hands and a clean stainless spatula, to one of the crystallising dishes and tamp level such that a layer of 10 mm to 15 mm thickness is formed. Place one of the metal coupons horizontally on this layer by introducing one end at a slight angle to the saturated material, progressively pressing the remainder of the coupon gently down and shaking the dish slightly, in such a way that all air bubbles are expelled from the underside of the coupon. If necessary, gently tamp the saturated layer and coupon level again.

Transfer the remainder of the sample of saturated fibrous insulation as before, together with any free liquor, to cover the first layer and coupon evenly. Remove carefully any air (silvery bubbles) still visible through the glass and then gently tamp the compact level.

Repeat the above procedure so that composite test assemblies are produced for all four metal coupons.

- (c) Transfer the four composite test assemblies without delay to the preconditioned humidity chamber.

The assemblies are not covered, but if the chamber is capable of dripping onto them, position a guard so as to prevent it.

- (d) Leave the test assemblies undisturbed in the humidity chamber for 336 ± 4 h (14 days), except for brief and occasional opening of the chamber for visual inspection or the introduction of other test assemblies. If, as a result of a visual inspection, it is found that a detectable drying of the surface of a composite test assembly has occurred, the minimum quantity of distilled or deionized water necessary to restore the original condition may be sprayed onto that surface, and a check made on the functioning of the chamber.
- (e) Upon completion of the test period, take the metal coupons from the assemblies and remove loose corrosion products by immersion for not longer than 30 s, as follows:
 - i. copper coupons in sulphuric acid at room temperature,
 - ii. zinc coupons in saturated ammonium acetate solution at room temperature.

Wash the coupons immediately under running water and dry without delay.

- (f) Immediately after cleaning, examine the metal coupons for perforation over the 40 W light bulb. Discount any notches or perforation within 3 mm of the edge of a coupon and note only those perforations within the remaining central zone.

ANNEX D

Reaction to fire testing

1. General

The testing covers homogenous insulation materials either without any covering or coating or covered according to the application in practice. In the latter case the results are relevant only for that application.

2. Conditioning

All specimens are conditioned according to the provisions given in EN 13238 before the testing.

3. Testing according to EN ISO 1182 and EN ISO 1716

Test method is relevant for fire classes A1 and A2.

Each chemical composition has to be considered when testing. If there are several density classes at least lowest and highest density shall be tested.

The test results are valid for the tested product and following variations:

- same chemical composition
- of any thickness

4. Testing according to EN 13823

The test method is relevant for fire classes A, B, C and D and additional classification regarding smoke production and flaming droplets, s1, s2, d0, d1 and d2.

The specimens are fastened to the test apparatus as such or covered in a way which it will be attached in practice by using a similar method as is used in practice.

Several wall or floor substrates are possible, e.g. timber, building boards.

The Corner specimen consist of two wings (495 +/- 5) mm x (1500 +/-5) mm and (1000 +/-5 mm) x (1000 +/-5 mm) , respectively. If the thickness of the specimens is more than 200 mm, the thickness is reduced to 200 +/- 10) mm.

The joints are used in applications where there are normally joints like when the product is used with building board.

The horizontal joint shall be done in the middle of the log wing at the height of 500 mm from the bottom edge of the sample and a vertical joint in the long wing at a distance of 200 mm from the corner line. The joints can be butt joints or grooved according to the application. The backing of the joints shall be done according to the application in question.

The backing shall be non ventilated.

The following parameters of the insulation and possible substrate shall be taken into account when conducting the SBI testing because the results will be valid:

- with the same chemical composition of the insulation
- with the same density
- the construction of possible end use solution
- tested thickness and all thicknesses between the tested thicknesses

5. Testing according to EN ISO 11925-2

The method is relevant for reaction to fire classes B, C, D and E.

Influence of the end use conditions can be considered as negligible when testing the specimens.

Each composition, the greatest possible thickness and the actual or maximum and minimum density shall be tested.