Technical Assessment 20/15-365

Interior wall thermal insulation product based on polyester

Produit d'isolation thermique de mur

Thermal insulation product for wall

Wärmedämmstoffe von Gebäudewänden

ECOPEG® 35
for wall application

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Commission in charge of issuing Technical Assessments and Technical Application Documents

(order of 21 March 2012)

Specialised Group no. 20

Special insulation products and processes

Seen for registration

In case of doubt or dispute, the French version only is valid.

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On 08 December 2015, Specialised Group no.20 'Special insulation products and processes' of the Commission in charge of issuing Technical Assessments and Technical Application Documents examined the interior wall thermal insulation process ECOPEG® 35 made of bonded polyester fibres, presented by the PEG Company. It has formulated this Technical Assessment hereafter no. 20/15-365 for use in mainland France.

1. Brief definition

1.1 Brief description

Interior wall thermal insulation process made of polyester fibres commercially designated 'ECOPEG® 35'.

1.2 Identification

The product is supplied in the form of panels stored on pallets. Each package of panels features a label indicating:

- The company identification and manufacturing plant,
- The product's commercial brand,
- The product's dimensions and technical specifications,
- The product's reference code, batch number and date of manufacture,
- The ACERMI certificate number,
- The technical Assessment number.

2. ASSESSMENT

2.1 Accepted area of use

2.11 Types of premises

The process is designed for thermal insulation of the following types of buildings, whether in renovation or new construction:

- detached one-family houses,
- twinned or terraced houses,
- congregate housing buildings,
- buildings housing offices, schools, hospitals, hotels, and other public assembly buildings,
- industrial and commercial premises.

The process is applied in interior wall thermal insulation. Wet walls or walls with rising damp require treatment and sanitizing prior to insulation.

The area of use of these processes is limited to the following two types of premises:

- premises in which the quantity of vapour produced in the interior ambiance is on average during the cold season below that of the external ambiance plus 5 g/m3 (low or medium hygrometry premises in the meaning of DTU 43.1 and DTU 20.1 P1 such as W/n ≤ 5 g/m3),
- premises of the EA, EB, and EB+ type. Private premises as defined in the CSTB sheet no. 3567 of May 2006 'Classification of premises according to the exposure to humidity of walls and nomenclature of substrates for interior wall coatings'.

2.12 Interior insulation on masonry walls complying with DTU 20.1 and on concrete walls complying with DTU 23.1

The process is applicable to new or existing substrates:

- The process, when associated to a masonry wall compliant with DTU 20.1 or to reinforced concrete compliant with DTU 23.1, makes up a type I wall whose use is limited to zones of exposure to rain and wind for which this type of wall is approved.
- When cladding is fitted on the outer side with a ventilated air gap, this interior process is accepted in the conditions of exposure to rain and wind set by the technical assessment on cladding.

2.13 Interior insulation on wooden framework houses compliant with DTU 31.2

The process also applies to wooden frame walls compliant with NF DTU 31.2, with ventilated cladding as defined in §13 of NF DTU 31.2 or under Technical Assessment or Technical Application Document favourably aiming at usage on wooden framework construction.

2.2 Assessment of the product

2.21 Meets current laws and regulations and other suitability-for-use qualities

Stability

This product does not participate in the stability of the structures.

Safety in case of fire

General provisions

The system is not designed to remain apparent.

The system meets currently enforced requirements. Compliance of the following must be checked:

- Electrical installations,
- Provisions relative to safety distances between the flue and combustible element as set by the NF DTU 24.1 standard.

Provisions relative to residential buildings

Interior claddings must meet the criteria of the 'Guide on interior insulation of residential buildings on fire risks' more particularly, and be fitted in compliance with currently enforced DTUs and Technical Assessments.

Provisions applicable to buildings governed by the labour code

In all cases, the provisions of the guide on interior insulation of residential buildings are to be observed.

In buildings whose last level lower floor is located more than eight metres above ground, these provisions meet the requirements of article 9 of the order of 5 August 1992.

Provisions relative to PAB and HRB

Appropriateness in terms of fire of the system, particularly when used in PAB or HRB shall be examined according to their combustible mass and degree of flammability, as set by the various regulations applicable to the premises considered.

In the particular case of PABs:

Refer to the user guide on combustible insulators in PABs (Appendix to the order published in the J.O. of 28 July 2007).

Safety in case of earthquake

According to the nomenclature planned by the order of 22 October 2010, the process is applicable to any seismic zone, for any class of soil and any category of importance of building.

Environmental data

There is an Environmental Statement Sheet ES in §C.1 of the DTED. It is reminded that the ES is not considered in the review of fitness for use of the process.

Health aspects

This assessment is formulated based on the written commitment of the holder to apply the regulations, and particularly all regulatory obligations relative to hazardous substances, for their manufacturing, integration in the structures of the area of use accepted and their use.

Control of the information and declarations issued in application of currently enforced regulations is out of the scope of this assessment. The holder of this assessment remains fully liable for this information and these declarations.

Prevention and risk of accidents during installation and maintenance

The ECOPEG® 35 product has a Material Safety Data Sheet (MSDS). The purpose of the MSDS is to inform the product's user on the dangers associated with its use and the preventive measures to implement to avoid these dangers, in particular by wearing personal protective equipment (PPE).

2.22 Thermal insulation

The process can allow meeting thermal regulatory requirements in new works and current requirements in rehabilitation. The product's thickness must be adapted to the type of wall to check compliance with the regulatory requirements requested.

The useful thermal resistance of the ECOPEG® 35 product is specified in the ACERMI certificate no.15-188-1069.

Acoustic insulation

The process has not been tested to assess acoustic performance.

The acoustic performance of the systems, when declared, makes up data necessary to the compliance inspection of a building with respect to currently enforced acoustic regulation (orders of 30 June 1999 relative to residential buildings, of 25 April 2003 relative to hotels, institutions, and healthcare facilities).

Passage from system performance to structure performance can be performed using one of the following approaches:

- The calculation (as per NF EN 12354-1 to 5; object of the ACOUBAT software),
- the QUALITEL baseline,
- the Examples of Acoustic Solutions (published in May 2002 by the DHUP).

2.23 Sealing

- To air: The product is not designed to ensure air tightness of the wall.
- To water: The product is not designed to ensure water tightness of the wall.
- To water vapour: The process is not designed to ensure vapour tightness of the wall.

2.24 Durability - Maintenance

Considering compliance with the DTUs and the accepted area of use, risks of condensation in the insulator and on the level of the interior cladding are limited.

2.25 Manufacturing and checking

The ECOPEG® 35 product is subject to self-checking defined in the technical file. In addition, the product is subject to monitoring by ACERMI certification through 2 visits per year.

2.26 Installation

It causes no particular difficulties. More particularly, it requires care for accurate positioning of all constituents and processing of singular points.

2.3 Technical Specifications Sheet

2.31 Design conditions

The design of the walls shall meet currently enforced DTUs.

The process requires a vapour barrier. Its characteristics are chosen according to relative permeances of internal and external walls and external climatic conditions, in compliance with the Technical File.

2.32 Installation conditions

In no event shall the product be exposed to a source of intense heat (welding, flame, spark).

Flue linings

The NF DTU 24.1 standard plans a fire safety protection which depends on the nature and type of the flue lining as well as the temperature class. These provisions relative to safety distance must be observed.

Electrical ducts

The applicant shall ensure that the electrical ducts fitted in air spaces are placed under a flame non-propagating duct (P).

Refer to the NF C 15 100 standard (Low voltage installations and equipment).

2.33 Technical Support

The PEG Company entrusts installation with companies specializing in this field. It trains the application teams and provides them with permanent technical support.

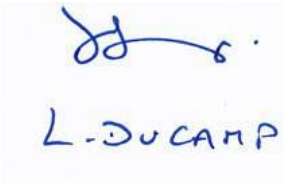
Conclusions

Overall assessment

The use in the suggested area of use is assessed positively.

Validity 3 years

For Specialised Group no.20
Chairman

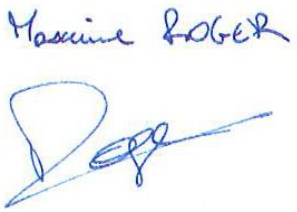


3. Additional comments from the Specialised Group

The justifications on durability and fitness for use have been made, particularly by tests, within the preparation of this Assessment. The justifications relative to thermal performance and product thickness rework were within ACERMI certification. This process requires the installation of a continuous vapour barrier on the interior side. This condition is important to ensure the structure is effective and durable.

The tests led during the preparation of this Technical Assessment met the prescriptions of the 'Specialised Technical Guide for the construction of a Technical Assessment request file: Insulator based on vegetal or animal fibres' e-Cahier of the CSTB 3713 of June 2012.

Rapporteur of Specialised Group no.20



Appendix

Reminder on the specific requirements of thermal regulation

The specific requirements on the process covered by this Technical Assessment are detailed below. However, they must be checked during the design of the structure to consider any regulatory changes.

- **Calculation rules:**

Thermal resistance of the wall (R_T) is ensured as follows:

$$R_T = R_U + R_c$$

Where:

- R_U: Useful thermal resistance of the ECOPEG® 35 product + defined in the ACERMI certificate.
- R_c: Thermal resistance of the backing wall. Generally:

$$- \quad R_c = \frac{e_c}{\lambda_c} \ m^2.K/W.$$

e_c: wall thickness m.

λ_c: thermal conductivity of the backing wall in W/ (m.K).

The linking thermal bridges are calculated as per leaflet 5/5 of the Th-U rules and addenda according to the configurations.

- **Regulatory requirements:**

Minimum regulatory values	Walls facing the outside	Walls facing a non-heated volume	Walls facing discontinuous occupation
RT ex compensation (order of 13 June 2008)	Up ≤ 0.45	Up ≤ 0.45/b	Up ≤ 0.45
RT ex per element (order of 03 May 2007)	$R_T \geq 2.3$ or $R_T \geq 2$*	$R_T \geq 2$	$R_T \geq 2.3$ or $R_T \geq 2$*
RT 2005 (order of 24 May 2006)	Up ≤ 0.45	Up ≤ 0.45/b	Up ≤ 0.45
RT 2012 (orders of 26 October 2010 and 28 December 2012)	-**	-**	Up ≤ 0.36

* Case of adaptation as per Order of 3 May 2007.

** There are no insulation requirements on the wall. RT 2012 imposes a requirement on the global energetic performance of the construction.

With:

Up: surface coefficient of heat transfer of the wall (in W/(m².K))

R_T: total thermal resistance of the wall after renovation (in m².K/W)

Technical File
drawn up by the applicant

A. Description

1. Principle

It is an interior wall thermal insulation process made of polyester fibres, in the form of panels, bearing the commercial designation 'ECOPEG® 35'.

2. Area of use

2.1 Types of premises

The process is designed for thermal insulation of the following types of buildings, whether in renovation or new construction:

- detached one-family houses,
- twinned or terraced houses,
- congregate housing buildings,
- buildings housing offices, schools, hospitals, hotels, and other public assembly buildings,
- industrial and commercial premises.

The process is applied in interior wall thermal insulation. Wet walls or walls with rising damp require treatment and sanitizing prior to insulation.

The area of use of these processes is limited to the following two types of premises:

- premises in which the quantity of vapour produced in the interior ambiance is on average during the cold season below that of the external ambiance plus 5 g/m3 (low or medium hygrometry premises in the meaning of DTU 43.1 and DTU 20.1 P1 such as W/n ≤ 5 g/m3),
- premises of the EA, EB, and EB+ type. Private premises as defined in the CSTB sheet no. 3567 of May 2006 'Classification of premises according to the exposure to humidity of walls and nomenclature of substrates for interior wall coatings'.

2.2 Interior insulation on masonry walls complying with DTU 20.1 and on concrete walls complying with DTU 23.1

The process is applicable to new or existing substrates:

- The process, when associated to a masonry wall compliant with DTU 20.1 or to reinforced concrete compliant with DTU 23.1, makes up a type I wall whose use is limited to zones of exposure to rain and wind for which this type of wall is approved.
- When cladding is fitted on the outer side with a ventilated air gap, this interior process is accepted in the conditions of exposure to rain and wind set by the technical assessment on cladding.

2.3 Interior insulation on wooden framework houses compliant with DTU 31.2

The process also applies to wooden frame walls compliant with NF DTU 31.2, with ventilated cladding as defined in §13 of NF DTU 31.2 or under Technical Assessment or Technical Application Document favourably aiming at usage on wooden framework construction.

3. Materials

3.1 General description

The ECOPEG® 35 product is made exclusively of polyester fibres, mixed and linked together by thermo fusible fibres in order to form an insulating mattress. The product can then be conditioned in the form of panels.

The composition of the ECOPEG® 35 product is the following (weight % at ambient relative temperature and humidity):

- Flame resistant polyester fibres: 80 (+/- 2%),
- Thermally bonded polyester fibres: 20 (+/- 2%).

The manufacturer has a Material Safety Data Sheet (MSDS) in compliance with Appendix 2 of the Reach regulation.

3.2 Characteristics

The ECOPEG® 35 product is not subject to CE Marking.

3.21 Certified characteristics

The ECOPEG®35 product is ACERMI certified under the certificate no. 15/188/1069.

Its certified characteristics are summarized in table 1 below:

Table 1 - Characteristics certified by ACERMI

Thermal conductivity	See ACERMI Certificate
Thermal resistance	See ACERMI Certificate
Thickness t (mm)	45 to 120

3.22 Other characteristics

Table 2 –Other characteristics

Density (kg/m^3)	23 (+/- 1.15)
Thickness tolerances	+/- 5 mm
Fire reaction (Euroclass)(1)	B-s1, d0
Ws: short-term water absorption NF EN 1609	1.6 kg/m^2 ECOPEG 35 is hydrophilic (2)
Permeability to water vapour NF EN 12086	μ = 3.9 (Sd = 0.15m)
Semi-rigidity	ECOPEG 35 is semi-rigid

(1) product tested bare without protection cladding

(2) Hydrophilic product ($W_S \geq 1$ kg/m²).

3.3 Packaging:

- Packing: Packed under transparent polyethylene film.
- Packaging: Packaging in panel parcels (see appendix).
- Storage: The product must be stored sheltered from the weather.

4. Manufacturing, control and marking

4.1 Manufacturing

The ECOPEG® 35 product is manufactured in the PEG plant, 1 route de Saint-Martin, 76590 Dénestanville (76).

Manufacturing includes the following steps:

- Mix different fibres by electronic weighing,
- Web formation by carding,
- Overlaying the webs obtained,
- Product thermofixing and finished product calibration,
- Cutting and packaging of products,
- Automatic palletisation by covering.

4.2 Inspections

4.21 Raw materials inspections

They cover the following points:

- The supplier certificates guaranteeing the composition and properties of the materials delivered,
- Inspection of materials delivered upon acceptance (quantity and references).

4.22 In-production checks

Various automatic and permanent inspections are performed through the manufacturing process, corrections being made when necessary, such as automatic and permanent inspection of density.

4.23 Finished product inspections

The inspections led on the finished product comply with the specifications of the ACERMI certification reference system. The results are saved in a control register.

The list of checks as well as the frequencies are defined in the table appended.

4.24 External inspections

Inspection of plant production and the product are subject to monitoring within the ACERMI certification twice per year.

4.3 Marking

The packaged product features a label with:

- The company identification and manufacturing plant,
- The product's commercial brand,
- The product's dimensions and technical specifications,
- The product's reference code, batch number and date of manufacture,
- The ACERMI certificate number,
- The Technical Assessment number.

5. Commercialisation

The ECOPEG® 35 product is marketed by the PEG Company, supported by a network of dealers specializing in construction.

6. Technical Support

The PEG Company provides technical support by means of different media:

- Technical support for fitters (hotline, fitting guides, etc.),
- Training of fitters upon request,
- Training of sales engineers on currently enforced regulations (thermal, fire, acoustic, health, etc.),
- On their website: http://www.peg-isolation.fr

7. Installation

7.1 Prior provisions

The provisions described in §4 of e-Cahier 3728 must be observed.

7.2 Installation principle

7.21 Insulator thickness

The product's thickness is determined according to the thermal resistance value sought. The minimum thermal requirements must be observed as per the current thermal regulation.

7.22 Insulator cutting

The insulator is cut with a 'utility knife' or 'wool cutter', along a mason's rule on a rigid backing (wood or gypsum board). It may also be cut using a lapidary stone with a large diameter smooth diamond disc (250mm).

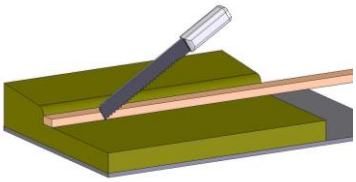


Figure 1: insulator cutting

7.3 System installation

Regardless of the nature of the fibres, the system is installed according to the type of substrate in compliance with §5 of e-Cahier 3728: December 2012.

The following additional installation precautions must be considered:

- the product is compressed in its packaging and actual thickness restoring is not instant. It is important to consider this thickness restoring properly in the space planned for insulation (space between supporting walls and interior cladding).
- About 1 to 2 cm more must be planned for the insulator thickness restoring.
- As the ECOPEG 35 product is semi-rigid, it is blocked between the supporting wall and the two uprights or packings of the metallic framework.
- The length of the panels must be increased by about 1 cm with respect to the ground/ceiling distance
- For a wooden framework construction, measure the spacing between the uprights, cut the insulator panels while adding about 1 cm to ensure the insulator is maintained and proper contact between the uprights.

  Insert the insulator panels between the uprights of the wooden framework by compressing them slightly.

7.4 Installation of the vapour barrier

An independent and continuous vapour barrier must be fitted. The type of vapour barrier required (permeance, material) depends on the constructive principle planned.

In the case of a house with a wooden framework, the vapour barrier must comply with the DTU 31.2.

In the case of masonry or concrete walls, permeance of the vapour barrier must comply with CSTB sheet 3728, i.e.

- Permeance below or equal to 0.005 g/h.m².mmHg (sd ≥ 18 m),
- Permeance below or equal to 0.0015 g/h.m².mmHg (sd ≥ 57 m) in very cold zone.

Note: A very cold zone is defined by a low temperature below -15°C (NF P 52-612-2) or an altitude above or equal to 600 m. In France, the very cold zone includes the Bas-Rhin, Haut-Rhin, Vosges, Belfort, Moselle and Meurthe et Moselle counties.

A vapour barrier can also be used under Technical Application Document provided its use is compatible with this family of products.

7.5 Singular points

Singular points must be handled in compliance with §4 of e-cahier 3728: December 2012.

B. Experimental results

Certificate of tests on the assessment of emissions of Volatile Organic Compounds (VOCs), performed by WESSLING on 10/09/2014.

CSTB test report no. HO15E15-006 short-term water absorption.

Durability test report and deviation under own weight no. P126578 performed by the LNE in 2014.

C. References

C1. Health and Environmental Data[1]

The ECOPEG® 35 product is not subject to an Environmental and Health Declaration Sheet (EHDS) complying with the NF P 01-010 standard.

The purpose of data issued from the EHDFs is to participate in the calculation of the environmental impacts of structures in which the products (or systems) aimed at are likely to be integrated.

C2. Other references

The ECOPEG® 35 product has been installed in France since 2014.

About 5,000 m² have been installed since.

Appendix 1

Characteristics of the product and inspection plan

Table 3 – Panel packaging

Dimensions			Packaging				
Thickness (mm)	Width (m)	Length (m)	m²/plate	Nbr/pack	Number of parcels per pallet	m²/pack	m²/pallet
45	0.6	1.2	0.72	13	4	9.36	37.44
60				10		7.2	28.80
75				8		5.76	23 04
100				6		4.32	17.28
120				5		3.6	14.40

Table 5 – Internal checks on the product

Quality assurance operations	Frequency	Reference documents
	Panels	
Length	1 / h	NF EN 822
Width		
Thickness		NF EN 823
Density		NF EN 1602
Thermal conductivity (λ)	1 / batch	NF EN 12667
Thermal resistance (R)		
Thickness restoration of the panels at 9 weeks	1 / batch	ACERMI reference system
SBI test	1 / year	NF EN 13 501-1