SINTEF

SINTEF Certification

No. 2554

Technical Approval

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Revised: 14.12.2018
Amended: 10.01.2019
Valid until: 31.12.2023
Provided listed on www.sintefcertification.no

SINTEF Building and Infrastructure confirms that

Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff
Vapour barriers

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

Tommen Gram Folie AS
Halsanvegen 3-11
7600 Levanger
www.tommen.no

2. Product description

Gram Dampsperre is an age resistant, UV stabilized vapour barrier, made from polyethylene sheets. The film color is gently blue. The product can be delivered in the following dimensions (possibly also according to separate specifications):

- Thickness 0.15 mm, length 15 m and widths of 2.6 m and 3 m.
- Thickness 0.20 mm, lengths of 15 m and 25 m, and widths of 2.6 m, 3 m, 4 m and 6 m.

Gram Dampsperre av Fornybart Råstoff is an age resistant, UV stabilized vapour barrier, made from polyethylene sheets. The film color is gently blue. The product is produced of fossil- or bio-based raw materials on customer request. The product can be delivered in the following dimensions (possibly also according to separate specifications):

- Thickness 0.15 mm, length 15 m and widths of 2.6 m and 3 m
- Thickness 0.20 mm, lengths of 15 m and 25 m and widths of 2.6 m, 3 m, 4 m and 6 m.

Dimensional tolerances are given in Table 1 below.

Table 1
Tolerances for Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff

Property	Value	Tolerance
Length	m	+/- 5 %
Width	m	+/- 5 %
Thickness	mm	+/- 10 %
Weight	g/m²	0.15 mm: 139 ± 10 % 0.20 mm: 185 ± 20 %

3. Fields of application

Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff are used as indoor vapour barriers in insulated building constructions, see examples in figure 1-3. SINTEF Building and Infrastructure recommend vapour barriers with thickness 0.15 mm in walls and in ventilated pitched roofs. In compact flat roofs and in floors, we recommend thickness 0.2 mm.

4. Properties

Product characteristics for fresh material are shown in Table 2. Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff is mainly tested according to EN 13984 with a few simple tests in addition. Durability evaluations have been done in a more comprehensive way than given in the mentioned standard.

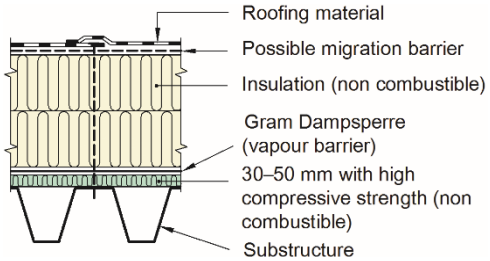

Fig. 1
Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff installed in a compact roof construction

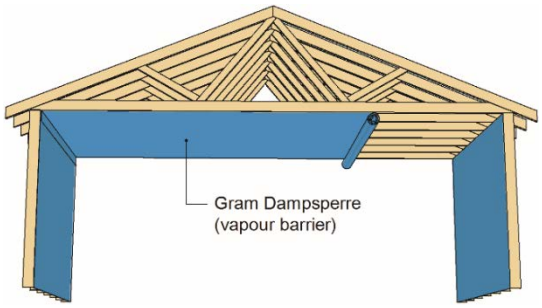

Fig. 2
Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff installed in outdoor walls and in roofs against cold lofts

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Table 2
Product characteristics for Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff, fresh material

Property	Test method	DoP [1)]	Control limit [2)]	Unit
Flexibility at low temperature	EN 495-5: 2013	≤ - 30	≤ - 30	° C
Dimensional stability	EN 1107-2: 2001	± 1,0	± 1,0	%
Watertightness	EN 1928: 2000	Tight at 2 kPa for 24 hours	Tight at 2 kPa for 24 hours	-
Resistance to tearing	EN 12310-1: 1999	≥60	≥60	N
Elongation	EN 12311-2: 2000	Longitudinal ≥ 300 Transversal ≥ 300	Longitudinal ≥ 300 Transversal ≥ 300	%
Tensile strength	EN 12311-2: 2013	Longitudinal ≥ 19 Transversal ≥ 19	Longitudinal ≥ 19 Transversal ≥ 19	N/mm²
Water vapour resistance	EN ISO 12572:2016	≥ 40 ≥ 200 x 10^9	≥ 40 ≥ 200 x 10^9	s_d-value (m) m^2sPa/kg
Resistance to impact Tested at 23 ºC	EN 12691: 2006 (A)	Tight after stroke from a puncture-object with a diameter between 25 and 30 mm Drop height of 300 mm	Tight after stroke from a puncture-object with a diameter between 25 and 30 mm Drop height of 300 mm	-
Resistance against static loading	EN 12730 (A):2015	≥ 5	≥ 5	kg

[1)] Declared value given in the manufacturers DoP (Declaration of performance)
[2)] Control limit shows values the product has to satisfy during internal factory production control and audit testing

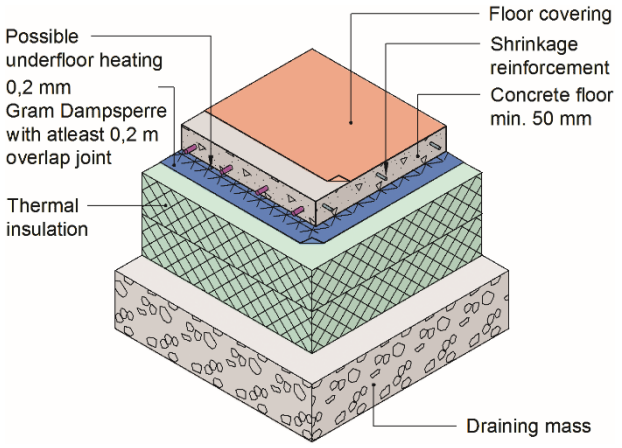

Fig 3
Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff installed in concrete floors on the ground

Reaction to fire

Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff are not classified according to EN 13501-1.

Durability

The products are considered to have satisfactory durability as long as they are used as specified in this Approval. The products have been tested for alkaline resistance according to SP-Method 0414 (corresponding to NT-Poly 161) which also includes heat ageing.

Resistance against UV radiation is carried out according to ISO 4892-2. Compared to fresh material, the product showed no significant changes for tensile strength, elongation or water vapour resistance after ageing.

5. Environmental aspects

Substances hazardous to health and environment

The products contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Effect on indoor environment

The products are not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health.

Waste treatment/recycling

The products shall be sorted as plastic-based waste and have to be delivered to an authorized waste treatment plant for material recovery.

Environmental declaration

An environmental declaration (EPD) has been worked out according to EN 15804 for Tommen Gram Dampsperre vapour barrier. For complete documentation see EPD no. NEPD-341-230-NO, http://epd-norge.no/.

6. Special conditions for use and installation

General

Generally, vapour barriers should be installed on the inner warm side of the construction. Continuously clamping of the joints, together with sealing of bushings, is a prerequisite to prevent air leakage and water vapour transmission into the construction.

External walls and insulated pitched wooden roofs

The installation must be done as soon as the construction is insulated, and before the heating of the building commences. The installation must be done in a way that the film will not be punctured or teared.

Generally, vapour barriers shall be installed according to SINTEF Building Research Design guides No. 523.255 *Bindingsverk av tre. Varmeisolering* and *tetting,* 525.101 *Isolerte skrå tretak med lufting mellom vindsperre* and *undertak,* 525.102 *Isolerte skrå tretak med kombinert undertak* and *vindsperre,* 525.106 *Skrå tretak med kaldt loft and* 525.107 *Skrå tretak med oppholdsrom på deler av loftet.*

Vapour barriers installed into the insulation layer

For easier to avoid damage from for example hidden electrical systems, the vapour barriers can be installed behind an internal battening. To avoid condensation on the vapor barriers, the insulation thickness on the cold side should then be at least three times as thick as on the warm side.

Flat roofs on load-bearing profiled steel decks

In roofs with supporting profiled steel decks, the vapour barriers should be placed on a flat surface, eg. of 50 mm rock wool, and not directly on the steel plates to ensure that the overlapping joints is closed (see fig. 1). See also SINTEF Building Research Design guide No. 525.207 *Kompakte tak.*

Floors on the ground

In floors on the ground the vapour barriers should be installed above the insulation layer to prevent moisture accumulation in the heat insulation during the building period. In the case that pipes for district heating is installed in the ground under the floor, it is recommended to install an additional vapor barrier under the heat insulation a few meters to each side of the heating pipes. See also SINTEF Building Research Design guide No. 521.112 *Golv på grunnen med ringmur. Varmeisolering, frostsikring and beregning av varmetap.*

7. Factory production control

The products are produced by Tommen Gram Folie AS Halsanvegen 3-11, 7600 Levanger.

The holder of the approval is responible for the factory production control in order to ensure that the products are produced in accordance with the preconditions applying to this approval.

The manufacturing of the products are subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

The manufacturer Tommen Gram Folie AS has a quality system which is certified by Det Norske Veritas according to ISO 9001, certificate No. QSL-6014.

8. Basis for the approval

The approval is mainly based on verification of product characteristics documented in the following reports:

- SINTEF Report B22487 dated 28.05.2008 (material properties)
- SP Sveriges Tekniska Forskningsinstitut. Report F410332B, dated 02.02.2005 (material properties and durability)
- SP Sveriges Tekniska Forskningsinstitut. Report F611247B, dated 14.11.2006 (material properties and durability)
- SP Sveriges Tekniska Forskningsinstitut. Report F709602B, dated 16.08.2007 (material properties)
- SINTEF Report 102000497-2, dated 12.09.2013 (material properties 5-year renewal)

9. Marking

Gram Dampsperre and Gram Dampsperre av Fornybart Råstoff shall be marked with the name of manufacturer, production year and –month together with the production number, directly on the product.

The products are CE marked in accordance with EN 13984.

The approval mark for SINTEF Technical Approval No. 2554 may also be used.

Approval mark

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the products cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402.

for SINTEF Building and Infrastructure

Marius Kvalvik

Marius Kvalvik
Approval Manager