

SINTEF Technical Approval

TG 20839

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 Valid until 01.05.2029
 Provided listed on
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SINTEF confirms that

Protan Radonguard

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

Protan AS
 PO Box 420
 3002 Drammen
www.protan.com

2. Product description

Protan RadonGuard is a roll product made of homogeneous polypropylene-based TPO. The colour is grey. The membrane is jointed using hot air welding.

Table 1 Dimensions and tolerances for Protan RadonGuard

Designation	Value	Unit	Tolerance
Thickness	0.85	mm	-5% / +10%
Area weight	910	g/m ²	-5% / +10%
Width of membrane	1.55	m	-0% / +5%
Roll length	20	m	-0.5% / +1%

As supplementary components to the radon membrane, the following are supplied:

- Fibertex F-300M
- Radon sealing compound Butyl
- Isola Radon Tettemasse for sealing of penetrations
- Radon pipe penetration fitting
- Internal and external radon membrane corners

3. Fields of application

Protan RadonGuard can be used as protection against radon in application areas A and B, as shown in SINTEF Building Research Design guide 520.706, provided that the conditions described in chapter 6 in this document are followed. Principal positioning of radon membranes in application areas A and B is shown in Fig. 1.

4. Product performance

Material properties

Product characteristics for fresh material are shown in table 2.

Air tightness

Protan RadonGuard is tested for performance in relation to air tightness for joints and details with satisfactory results as shown in table 2.

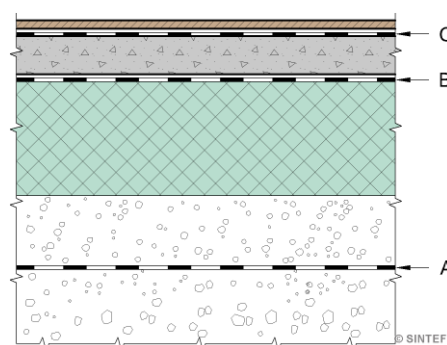


Fig.1

Principal positioning of radon membranes in different application areas. Protan RadonGuard can be used in application areas A and B.

Properties related to fire

Protan RadonGuard is not classified according to EN 13501-1.

Durability

Protan RadonGuard is assessed as having satisfactory durability when the product is used as specified in this Technical Approval document.

5. Environmental aspects

Substances hazardous to health and environment

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

Waste treatment/recycling

Protan RadonGuard shall be sorted as residual waste. The product shall be delivered to an authorized waste treatment plant for energy recovery.

Non-dried sealant or caulking material is defined as hazardous waste (according to the Norwegian Waste Regulation (Avfallsforskriften)). The products should be sorted as hazardous waste at the construction site and delivered to an authorized treatment plant for hazardous waste. In dry form, the products are not considered hazardous waste.

SINTEF is the Norwegian member of European Organisation for Technical Assessment, EOTA, and European Union of Agrément, UEAtc

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Table 2
Product characteristics for Protan RadonGuard

Property	Test-method EN	Control limits ¹⁾	Unit
Radon transmission ²⁾	SP-method 3873 ³⁾	$5.1 \cdot 10^{-9}$	m/s
Radon resistance		$2.0 \cdot 10^8$	s/m
Air tightness – construction ^{2), 4)}	NBI-method 167/01	0.1	l/min
Flexibility at low temperature	EN 495-5	≤ -45	°C
Dimensional stability - longitudinally - transverse	EN 1107-2	$\leq \pm 1$	%
Resistance to tearing - longitudinally - transverse	EN 12310-2	≥ 100	N
Tensile strength - longitudinally - transverse	EN 12311-2(B)	≥ 850 ≥ 800	N/50 mm N/50 mm
Elongation - longitudinally - transverse	EN 12311-2(B)	≥ 700 ≥ 750	% %
Shear resistance of joints	EN 12317-2	≥ 450	N/50 mm
Water vapour transmission properties ²⁾	EN ISO 12572:2001	$\geq 928 \cdot 10^9$ ≥ 183	m ² sPa/kg m equiv. air layer
Resistance to impact: Soft underlay - cylinder	EN 12691:2001	≤ 20 ≤ 15 ⁵⁾	mm diameter
Resistance to static loading: Soft underlay	EN 12730 (A)	≥ 20	kg

¹⁾ Control limit is the value the product must satisfy for internal control at the producer and for supervising control

²⁾ Result from type testing

³⁾ Test method from RISE

⁴⁾ Calculated at a pressure difference of 30 Pa

⁵⁾ For Protan RadonGuard with Fibertex F-300M installed beneath the membrane

6. Special conditions for use and installation

Application area A (fig. 2)

In application area A, the Fibertex F-300M geotextile must be installed beneath the entire radon membrane. Fibertex F-300M and Protan RadonGuard are installed in the construction pit on an even and compressed aggregate with flatness and stability at least as compressed sandy soil. The aggregate can be same sized or with mixtures 8-11 or 11-16 mm. The size of the aggregate directly above and below the membrane should not exceed 16 mm to avoid excessive loads on the membrane. Installation in application area A requires that the foundation wall is designed as an airtight construction, and with an airtight connection between the membrane and foundation, and that the transition foundation / outer wall and pipe penetrations in the foundation are airtight. A protective layer of minimum 0,8 mm thick plastic foil shall be installed between the membrane and the foundation.

Application area B (fig. 3)

The membrane must be installed on a pre-levelled surface of heat insulation which is secured against displacement. The top side of the membrane shall be protected with an antifriction and protective layer of minimum 0,2 mm thick plastic foil with mechanical properties and alkaline resistance corresponding to a radon membrane for use in application area C or a vapour barrier for floor installation with a SINTEF Technical Approval. The membrane shall be installed continuously over the top of the foundation to ensure airtight connections between the foundation and the floor.

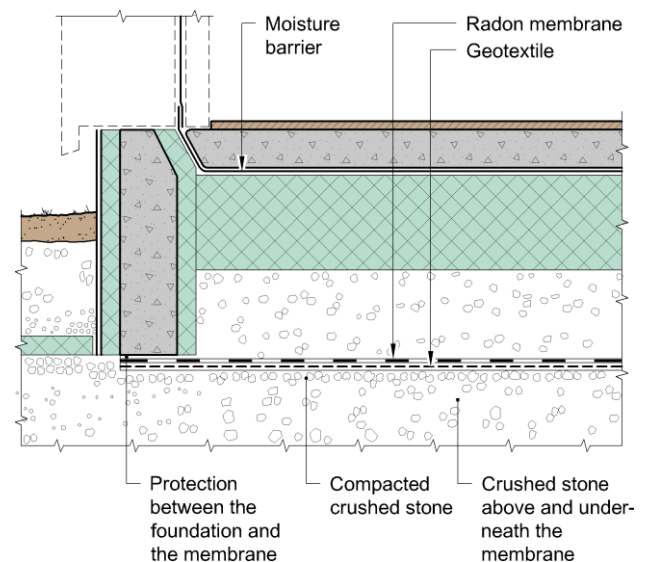


Fig. 2

Example of positioning of radon membrane in application area A. Slab on ground together with the foundation. The Fibertex F-300M geotextile is installed beneath the entire radon membrane.

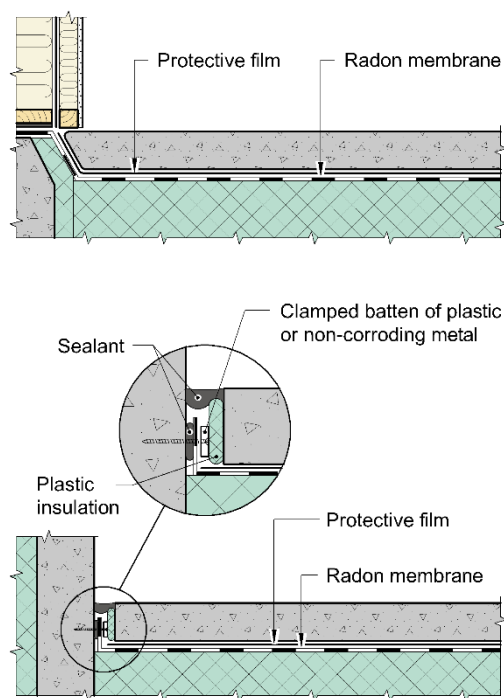


Fig. 3
Example of positioning of radon membrane in application area B.
Slab on ground together with the foundation and concrete wall.

Installation

Protan RadonGuard shall be welded by hot air with minimum 100 mm overlap joints. To avoid ignition, caution must be exercised when using heat during installation on combustible substrates.

Single pipe penetrations should be sealed using Radon pipe penetration fitting (prefabricated sleeve). Alternatively, a sleeve made on-site from the membrane can be used in combination with the sealing of Radon sealing compound Butyl. The sleeve is welded to the membrane. The sleeve is sealed against the pipe with a hose clamp as well as Radon sealant compound Butyl.

Cluster of pipe penetrations shall be sealed with Isola Radon Tettmesse poured into a casting frame made on site by the membrane. The casting frame must ensure sufficient filling height for the sealing compound. Any need for replenishing of the sealant shall be monitored, especially for slow curing sealants.

Corners can either be executed with the prefabricated corner profiles Internal and External radon membrane corners, or by adapting the membrane itself. The corner profiles are joined to the membrane using welding.

It must be checked that all joints, penetrations and transitions between floor and wall are airtight and have not opened because of loads and stresses during the construction period before the membrane is built in.

The design shall ensure that all joints, penetrations and transitions between floor and wall are airtight. The design should be according to the principles shown in SINTEF Building Research Design Guide 520.706 and 701.706.

Floor heating

Heating cables shall not be placed directly on the membrane, and there shall be a minimum of 5 mm non-combustible material between the heating cables and the membrane.

Underlay and protection

For installation in application area A, the Fibertex F-300M geotextile must be installed beneath the entire radon membrane. The radon membrane should be installed immediately after installing the geotextile.

It is important to avoid damaging the radon membrane with sharp objects or objects that are being trampled down in the membrane during the construction period. After installation, the membrane shall not be restricted from movement or span over cavities, as this can cause the membrane or its joints to tear when exposed to loads or shrinkage. Reinforcement chairs or fasteners for floor heating that may damage the membrane shall not be used.

Radon membrane as vapour barrier

Radon membrane in application areas B will replace the plastic membrane as vapour barrier, because the radon membrane will work both as vapour barrier and radon membrane. The plastic membrane with function as protection must still be used as described.

Water accumulation beneath the floor insulation

During the construction period there is a great risk for water accumulating on top of the membrane. Membrane in application area A should only be used where measures to avoid water accumulation are planned and executed.

Aggregates for application area A

To avoid dangerous concentration of radon to the indoor air, the backfill above the membrane must have documented low radon emittance, see SINTEF Building Research Design Guide 520.706.

Storage

Protan RadonGuard shall be stored dry and protected against direct UV-radiation before assembly.

7. Product and factory production control

Protan RadonGuard is produced in Turkey for Protan AS.

The holder of the approval is responsible for the factory production control to ensure that Protan RadonGuard is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product(s) and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

The producer has a quality system which is certified according to EN ISO 9001.

8. Basis for the approval

The product's characteristics are documented in reports issued by independent bodies. The technical documentation serves as the basis for SINTEF's product assessment with respect to the guidelines for SINTEF Technical Approval, and recommendations as outlined in SINTEF Building Research Design Guides.

9. Marking

All rolls shall be marked with the producer's name, product description and production date/time.

The approval mark for SINTEF Technical Approval TG 20839 may also be used.

10. Liability

The holder/manufacturer has sole product responsibility according to current law. Claims can only be made against SINTEF under general law or other special grounds.

for SINTEF



Hans Boye Skogstad
Approval Manager