

SINTEF Technical Approval

TG 20024



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Provided listed on
www.sintefcertification.no

SINTEF confirms that

Bauder Thermofol U 15 roofing membrane

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

Bauder AS
Lindebergveien 1
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Norway
www.bauder.no

2. Product description

Bauder Thermofol U 15 is a roofing membrane made of pliable PVC with a core of woven polyester. Additives have been included to make the roofing resistant to high-, low temperatures and ultra violet radiation etc. In addition, the additives making the membrane fire retardant. Installation is carried out by using hot air welding. The upper side is light grey or dark grey and the underside is dark grey. Measures and tolerances are stated in Table 1.

Table 1

Measures and tolerances for Bauder Thermofol U 15 according to EN 1848-2 and EN 1849-2

Property	Measure	Unit	Tolerance
Thickness	1.5	mm	+10/-5 %
Area weight	1.90	kg/m ²	+10/-5 %
Width	1.50	m	+1 /-0.5 %
Length of roll	20	m	+5 /-0 %
Weight of polyester core	ca. 100	g/m ²	-

3. Fields of application

Bauder Thermofol U 15 is used as roofing membrane on sloping and flat roofs. The product is intended for exposed mechanically fastened roofing, see example in fig. 1

Roofs must have adequate slope to drain water from rain and melted snow. SINTEF recommends in general a minimum slope of 1:40 for all roofs

4. Properties

Product properties

Product properties for fresh material are shown in Table 2.

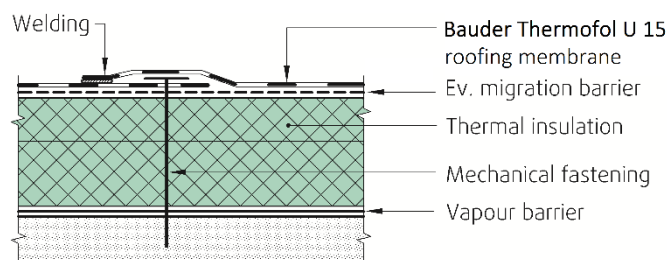


Fig. 1
Example of mechanical fastening of roofing membrane with welded overlap

Properties related to fire

Bauder Thermofol U 15 fulfils the requirements of class B_{ROOF} (t2) according to EN 13501-5 regarding external fire performance on substrates shown in Table 3. The product has been tested in accordance with CEN/TS 1187, test 2.

Durability

The product has shown satisfying properties after artificial ageing in connection with type-testing and audit testing performed by SINTEF.

Fastening capacity

The design capacity for tested fasteners is given in Table 4. The capacity applies to the connection between the membrane and the fasteners

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered, and only the lowest capacity for membrane or substrate underlays must always be used.

Calculation of fasteners' spacing is carried out according to SINTEF Building Research Design Guide no. 544.206 *Mekanisk feste av asfalt takbelegg og takfolie på flate tak* and "TPF informerer nr. 5" published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

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 properties for fresh material of Bauder Thermofol U 15 according to EN 13956

Property	Test method	DoP ¹⁾	Control limit ²⁾	SINTEF's recommended minimum performance ³⁾	Unit
Flexibility at low temperature	495-5	≤ -30	≤ -30	≤ -30 ⁴⁾ ≤ -25 ⁴⁾	°C
Dimensional stability	1107-2	-	± 0.3	± 0.5	%
Water tightness (10 kPa)	1928 (A)	Tight	Tight	Tight	-
Tear resistance	12310-2	≥ 200	≥ 200	≥ 180	N
Tensile strength	12311-2 (A)	≥ 1000	≥ 1000	≥ 600	N/50 mm
Elongation	12311-2 (A)	≥ 19	≥ 19	≥ 10	%
Average peel resistance of joints (T-peel)	12316-2	≥ 200	≥ 200	≥ 150	N/50 mm
Shear resistance of joints	12317-2	≥ 600	≥ 600	≥ 600	N/50 mm
Resistance to puncture					
- by impact at +23°C	12691 (A)	≥ 400	≥ 400	≥ 400	mm
- by impact at -10°C	12691:2001	-	≤ 10	≤ 15	mm diam.
- by static loading	12730 (A)	≥ 20	≥ 20	≥ 20	kg

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limit shows values the product has to satisfy during internal factory production control and audit testing.³⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for mechanically fastened roofing membranes.⁴⁾ SINTEF's recommended minimum value for membranes with thickness 1.2 mm is -30 °C.

SINTEF's recommended minimum value for membranes with thickness ≥1.5 mm is -25 °C

L = Longitudinal

T = Transversal

Table 3

Bauder Thermofol U 15 achieves reaction-to-fire classification class B_{ROOF} (t2) on following substrates

Type of substrate	Thermofol U 15
EPS *	No
EPS and migration barrier of min. 120 g/m ² *	Yes
Rock wool	Yes
Wooden sheeting	Yes
Concrete	Yes
Reroofing on old membrane on EPS *	No
Reroofing on old membranes on EPS and migration barrier of min. 120 g/m ² *	Yes
Reroofing on old membrane on rock wool	Yes
Reroofing on old membrane on wooden sheeting	Yes
Reroofing on old membrane on concrete	Yes

* In case of roofing on lightweight combustible insulation (eg EPS, XPS or PIR): See clause 6 Special conditions for use and installation, section Substrate, regarding requirements for replacement of combustible insulation to non-combustible insulation around passages and against adjacent structures.

Table 4

Design capacities for mechanical fasteners at ultimate limit state for the attachment of Bauder Thermofol U 15

Fastener	Capacity, N/piece ¹⁾
SFS Intec Iso-Tak R45xL fastning plug/BS4,8xL	400 ¹⁾
SFS Intec Iso-Tak RP45xL fastning plug/BS4,8xL	580
SFS Intec IR 82-40 steel washer / IR2 4,8xL	630
Ejot Eco Tek 50 plug / TKR-4,8 x 80mm	680 ²⁾
Eurofast DVP-EF-8240D plug / EDS-BZT-48120	820 ²⁾

¹⁾ Målt i henhold til Nordtest metode NT BUILD 307²⁾ Målt i henhold til metode EOTA ETAG 006 og sikkerhetsfaktor γ_m=1.5

5. Environmental aspects

Substances hazardous to health and environment

Bauder Thermofol U 15 contains Diantimontrioxid, CAS 1309-64-4 in quantities that pose increased risk for human health and environment. Diantimontrioxid is a chemical with priority. Chemicals with priority include CMR, PBT and vPvB substances.

Effect on soil, surface water and ground water

The leaching properties of Bauder Thermofol U 15 are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling

Product contains Diantimontrioxid and is defined as hazardous waste (according to the Norwegian Waste Regulation (Avfallsforskriften)). Bauder Thermofol U 15 must be sorted as hazardous waste on the building site, and be delivered to an authorized treatment plant for hazardous waste.

Environmental declaration

An environmental declaration (EPD) has been worked out according to EN 14025 for Bauder Thermofol U. For complete documentation see EPD no. EPD-BAU-20130188-IBCC-EN, www.bau-umwelt.com.

6. Special conditions for use and installation

Installation

Bauder Thermofol U 15 is welded by hot air, and shall generally be installed in accordance with the vendor's installation manual and the principles shown in SINTEF Building Research Design Guide no. 544.202 *Takfolie. Egenskaper og tekking*, 544.204 *Tekking med asfalttakbelegg eller takfolie. Detaljløsninger* and 544.206 *Mekanisk feste av asfalttakbelegg og takfolie på flate tak*, plus "TPF informerer nr. 5" published by Takprodusentenes Forskningsgruppe.

Fasteners

Normal steel washers may be used in longitudinal overlapping joints on firm substrates such as wood-based roof sheathing or concrete.

On substrates of thermal insulation with compressive strength $\geq 80 \text{ kN/m}^2$ (level CS(10)80 according to EN 13162/13163) steel washers with deep collars or plastic washers should be used.

Washers with integrated sleeves and good telescopic function must be used for installation on thermal insulation with lower compression strength, and the tightening of the fasteners must be checked particularly

Substrate

When a fire classification is required the substrate must be in accordance with the provisions stated in clause 4 regarding *Properties related to fire*.

Substrates of combustible insulation as EPS, XPS or PIR must be covered or divided, and also replaced with non-combustible insulation around bushings and adjacent constructions according to regulations in "Veiledning om tekniske krav til byggverk" § 11-9 and further description in "TPF informerer nr. 6" *Branntekniske konstruksjoner for tak* published by Takprodusentenes Forskningsgruppe.

When the membrane is installed on old asphalt roofing without additional insulation, or directly on EPS or XPS insulation, a separate migration barrier/separation layer of glass felt (minimum 100 g/m^2) or polyester felt (minimum 180 g/m^2) shall be used.

Traffic on the roof

Special precautionary measures should be taken to protect the roofing membrane if the roof is expected to have more traffic than is necessary for inspection and maintenance purposes only.

Cleaning and maintenance

Before starting any welding, as a part of repair work, the roofing membrane must be cleaned locally.

Transport and storage

Bauder Thermofol U 15 shall be stored in a dry location, placed on pallets and protected at the building site.

7. Factory production control

Bauder Thermofol U 15 is produced by Paul Bauder GmbH & Co. KG, Dresdener Strasse 80, 02994 Bernsdorf, Germany.

The holder of the approval is responsible for the factory production control in order to ensure that Bauder Thermofol U 15 is produced in accordance with the preconditions applying to this approval.

The manufacturing of Bauder Thermofol U 15 is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

The quality system at Paul Bauder GmbH & Co. KG is certified by German Institute of Certification (DQS), according to ISO 9001:2008, certificate no. 002735 QM08

8. Basis for the approval

The evaluation of Bauder Thermofol U 15 is based on reports owned by the holder of the approval.

The evaluation of design and technical solutions are based on recommendations given in SINTEF Building Research Design Guides.

9. Marking

All rolls shall be marked with the manufacturer's name, product code, product name and date of production.

The product is CE marked according to EN 13956.

The approval mark for SINTEF Technical Approval TG 20024 may also be used.

10. Liability

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

for SINTEF



Hans Boye Skogstad
Approval Manager