

SINTEF Building and Infrastructure 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
 2016 Frogner
 Norge
www.bauder.no

2. Manufacturer

Paul Bauder GmbH & Co. KG
 Dresdener Strasse 80
 02994 Bernsdorf
 Germany
www.bauder.de

3. 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 retardent.

Installation is carried out by using hot air welding.

The upper side is light grey or dark grey and the underside is dark grey. Table 1 shows product specifications for Bauder Thermofol U 15.

Table 1

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

Description	Measures and tolerances	
Thickness	1,5 mm	+10/-5 %
Mass per unit	1,90 kg/m ²	+10/-5 %
Roll width	1,50 m	+1 /-0,5 %
Roll length	20 m	+5 /-0 %
Vekt av stamme	Ca. 100 g/m ²	

The product is CE marked according to EN 13956.

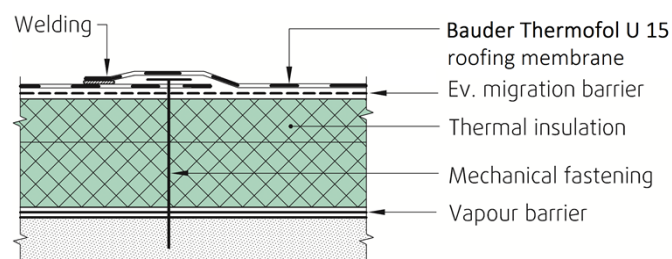


Fig. 1
 Example of mechanical fastening of roofing membrane with welded overlap

4. 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 in order to drain water from rain and melting snow. SINTEF Building and Infrastructure recommends in general a minimum slope of 1:40 for all roofs.

5. Properties

Material properties

Product properties for fresh material are shown in Table 2. Properties measured after artificial ageing are shown in Table 3.

Properties related to fire

Bauder Thermofol U 15 fulfils the requirements for class B_{ROOF}(t2) according to EN 13501-5 for underlays, shown in Table 4. The product has been tested in accordance with CEN/TS 1187-2.

Calculation of fasteners

The capacities for several anchoring materials are given in table 5. These capacities are applying to the connection between the membrane and the fastener according to EN 16002.

Table 2

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

Property	Test method	DoP ¹⁾	Control limit ²⁾	SINTEF's recommended minimum performance ³⁾	Unit
Flexibility at low temperature	EN 495-5 :2013	≤ -30	≤ -30	≤ -30	°C
Dimensional stability	EN 1107-2:2001	-	± 0,3	± 0,5	%
Water tightness (10 kPa)	EN 1928:2000 (A)	Tight	Tight	Tight	-
Tear resistance	EN 12310-2:2000	≥ 200	≥ 200	≥ 180	N
Tensile strength	EN 12311-2:2013 (A)	≥ 1000	≥ 1000	≥ 600	N/50 mm
Elongation	EN 12311-2:2013 (A)	≥ 19	≥ 19	≥ 10	%
Average peel resistance of joints (T-peel)	EN 12316-2:2013	≥ 200	≥ 200	≥ 150	N/50 mm
Shear resistance of joints	EN 12317-2:2010	≥ 600	≥ 600	≥ 600	N/50 mm
Resistance to puncture					
- by impact at +23°C	EN 12691:2006 (A)	≥ 400	≥ 400	≥ 400	mm
- by impact at -10°C	EN 12691:2001	-	≤ 10	≤ 15	mm diam.
- by static loading	EN 12730:2001 (A)	≥ 20	≥ 20	≥ 20	kg

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limit shows values, 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.

Table 3

Product properties for aged material of Bauder Thermofol U 15

Property	Test method	Values	Unit
Foldability at low temperature aged ¹⁾	NS-EN 495-5	≤ -30	°C

¹⁾ Aged according to method EN 1297 with specimen exposed to UV light, heat, water and laboratory climate

Table 4

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

Eurofast DVP-EF-8240D plug / EDS-BZT-48120	820
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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

Table 5

Design capacities for mechanical fasteners combined with Bauder Thermofol U 15

Fastener	Capacity, N/piece ¹⁾
SFS Intec Iso-Tak R45xL fastning plug/BS4,8xL	400
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

For weak underlays the connection between the underlay and the fastener might limit the capacity. The lowest value for membrane/underlay must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Research Design Sheet no. 544.206 and "TPF Informs No. 5".

Durability

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

6. Environmental aspects

Substances hazardous to health and environment

Bauder Thermofol U 15 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 soil, surface water and ground water

The leaching properties of the product are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling

Bauder Thermofol U 15 shall be sorted as residual waste on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for energy recovery.

Environmental declaration

An environmental declaration (EPD) has been worked out according to EN 14025 for Bauder Thermofol U 15. Environmental indicators are given in Table 6. For complete documentation see EPD no. EPD-BAU-20130188-IBCC-EN, www.bau-umwelt.com.

Table 6

Environmental declaration according to EN 14025 for Bauder Thermofol U. Cradle to gate (Germany). Transport to construction site: 686 km. The functional unit is: 1 m² in 25 years.

Indicators	Value
Global warming, kg CO ₂ eq.	9,9
Energy use, MJ	
- Renewable energy	6,9
- Nonrenewable energy	3,6

7. Special conditions for use and installation

Installation

Bauder Thermofol U 15 is welded by hot air, and shall be installed by an authorised installer according to the manufacturer's instruction. The membrane shall otherwise be installed in accordance with the principles shown in SINTEF Building Design Guide 544.202, 544.204 and 544.206, and in "TPFinforms" no. 5.

Fasteners

Fastening with normal steel washer in longitudinal overlap joints can be used for solid substructures such as wood-based roof sheathing or concrete.

On thermal insulation with compressive strength ≥ 80 kN/m² (level CS(10)80 according to EN 13162/13163) it is recommended to use plastic washers with sleeve.

When roofing membranes are installed on insulation material with lower compression strength, the tightening of the fasteners must be controlled and fasteners with good telescopic effect must be used.

Underlay

When a fire classification is required, the underlay must be in accordance with the provisions stated in section 5 "Properties related to fire".

When the membrane is installed on asphalt roofing without additional insulation, or directly on EPS or XPS, a separate migration barrier 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.

Maintenance

The roofing membrane must be cleaned locally before starting welding as part of repair work.

Transport and storage

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

8. Factory production control

Bauder Thermofol U 15 is subject to supervisory factory production and product control according to contract between SINTEF Building and Infrastructure and Paul Bauder GmbH & Co. KG concerning 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.

9. Basis for the approval

Material- and design data has been verified by type testing, and are documented in the following reports:

- BDA KEUR, report Prüfbericht Bauder Thermofol U 15, dated 28.9.2005 Material properties
- Intron Certificatie – Komo, Report Attest-met-productcertificaat, dated 18.08.2004 Material properties
- BDA KEUR, Rapport Prüfbericht Bauder Thermofol U 15, dated 18.01.2007, strength against wind load
- Helstrab, report BaBe_01/08, dated 24.06.2008 Classification according EN 13501-5:2005
- SINTEF Building and Infrastructure, Report 3D0434, dated 27.8.2009, Material properties
- SINTEF Building and Infrastructure, Report 3D0434, dated 18.09.2009 strength against wind load
- Institut für Industriaerodynamik GmbH, Report 35/2010, dated 25.08.2010, strength against wind load
- Institut für Industriaerodynamik GmbH, Report 26-1/2011, dated 30.09.2011, strength against wind load
- Institut für Industriaerodynamik GmbH, Report 26-2/2011, dated 30.09.2011, strength against wind load
- Institut für Industriaerodynamik GmbH, Rapport IBU Institut Bauen und Umwelt e.V. Report EPD-BAU-20130188-IBCC-DE, dated 26.09.2013, Environmental product declaration.

10. Marking

All rolls shall be marked with the manufacturer's product code, product name and date of production. The approval mark for SINTEF Technical Approval No. 20024 may also be used.



Approval mark

11. 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.

12. Technical management

Project manager for this approval is Knut Noreng at SINTEF Building and Infrastructure, dep. Materials and structures, Trondheim.

for SINTEF Building and Infrastructure

A handwritten signature in blue ink that reads 'Marius Kvalvik'.

Marius Kvalvik
Approval Manager