SINTEF Technical Approval

TG 20602

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Revised: 19.06.2025
Amended:
Valid until 01.07.2030
Provided listed on
www.sintefcertification.no

SINTEF confirms that

Rhenofol CG, ballasted roofing- and water proofing membranes

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

FDT Flachdach Technologie GmbH
Eisenbahnstrasse 6-8
68199 Mannheim
Germany
www.fdt.de

2. Product description

Rhenofol CG are roofing and waterproofing membranes of PVC-P with a core of glass fleece as reinforcement. Stabilizer and plasticizer have been added to make the PVC coating resistant to high and low temperatures. The product is dark grey at the bottom side and light grey on top.

Measures and tolerances are stated in table 1.

Table 1
Measures and tolerances for Rhenofol CG
according to EN 1848-2 and EN 1849-2

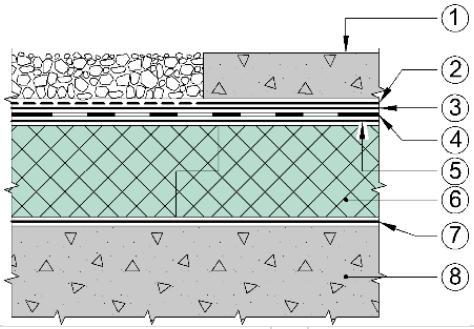
Property	CG 1.5	CG 1.8	CG 2.0	Unit	Tolerance
Thickness	1.5	1.8	2.0	mm	+10%/-5%
Area weight	1.85	2.20	2.44	kg/m²	+10%/-5%
Width	2.05	2.05	2.05	m	+1%/-0,5%
Length of roll	15	15	15	m	+5%/-0%
Weight of core	ca. 35	ca. 35	ca. 35	g/m²	-

3. Fields of application

Rhenofol CG is intended for use for ballasted roof constructions on pitched or flat roofs. The product can either be ballasted with gravel, concrete tiles on pads or tilework of concrete. Rhenofol CG can also be used in extensive or intensive green roofs.

The membrane is laid loosely with a ballast weight. The membrane cannot be used in mechanically fastened applications. Examples of use are shown in Fig. 1 – 4.

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.



1	Ballast of gravel or integral cast of concrete	5	Migration barrier when insulation of EPS/XPS *
2	Separation layer beneath gravel Sliding layer (2 layers of PE-foil) beneath concrete	6	Pressure-proof insulation
3	Protection layer of geotextile beneath gravel	7	Vapour barrier
4	Rhenofol CG	8	Structural deck

Fig. 1
Example of Rhenofol CG used as roofing with ballast on top.
* See special requirements for protection of combustible insulation during hot air welding of the roofing membrane in chapter *6. Special conditions for use and installation*, section *Installation*.

Other structures, such as parking decks and terraces, must have adequate slope to drain water from rain and melted snow. For inverted constructions or duo constructions the membrane can be laid horizontally when integrally casted wear layers have a slope towards gutter and drain of at least 1:100.

4. Product performance

Product properties
Product characteristics for fresh material of Rhenofol CG are shown in table 2.

Properties related to fire
To achieve satisfactory fire safety in buildings with requirements to class B_{ROOF} (t2) for the roofing the product must be covered. See more detailed description in chapter *6. Special conditions for use and installation*, section *Ballast*.

Table 2
Product properties for fresh material of Rhenofol CG roofing membranes

Property	Test method EN	CG 1.5		CG 1.8		CG 2.0		SINTEFs recommended minimum values[3]	Unit
		DoP [1]	Control-limit [2]	DoP [1]	Control-limit [2]	DoP [1]	Control-limit [2]		
Foldability at low temperature	495-5	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -25 [4]	°C
Dimensional stability	1107-2	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2	± 0.2	± 0.5	%
Water tightness 10 kPa/24 h	1928 (B)	-	Passed [5]	-	Passed [5]	-	Passed [5]	Passed	-
Water tightness 400 kPa/72 h	1928 (B)	Passed	-	Passed	Passed	Passed	-	-	-
Tear resistance L/T	12310-2	≥ 140	≥ 140	≥ 140	≥ 140	≥ 140	≥ 140	≥ 80	N
Tensile strength L/T	12311-2 (B)	≥ 10	≥ 10 [6]	≥ 10	≥ 10 [6]	≥ 10	≥ 10 [6]	380 N/50mm	N/mm²
Elongation at max load L/T	12311-2 (B)	≥ 200	≥ 200	≥ 200	≥ 200-	≥ 200	≥ 200	≥ 180	%
Maximum peel resistance	12316-2	≥ 250	-	≥ 250	-	≥ 250	-	-	N/50mm
Shear resistance joints	12317-2	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 600	≥ 380	N/50mm
Puncturing -Impact at +23 °C -Impact at -10 °C -Static load	12691 (A) 12691:2001 12730 (A)	≥ 700 - ≥ 20	≥ 700 ≤ 15 [5] ≥ 20	≥ 800 - ≥ 20	≥ 800 ≤ 15 ≥ 20	≥ 1450 - ≥ 20	≥ 1450 ≤ 15 ≥ 20	≥ 400 ≤ 20 ≥ 20	mm mm/diam kg
Resistance to root penetration	13948 / FLL	Passed	Passed [5]	Passed	Passed [5]	Passed	Passed [5]	-	-

[1] The manufacturers Declaration of Performance, DoP.
[2] The control limits show the values the product must satisfy during internal factory production control and audit testing
[3] SINTEFs recommended minimum values for SINTEF Technical Approval for ballasted membranes
[4] SINTEFs recommended minimum value for membranes with thickness 1.2 mm is -30 °C
SINTEFs recommended minimum value for membranes with thickness ≥1.5 mm is -25 °C
[5] Result from type testing
[6] The control limit corresponds to the following values in N/50 mm for the thicknesses 1.5/1.8/2.0 mm: 700/800/1450 N/50mm

L = Longitudinal T = Transversal

Rhenofol CG has a reaction to fire class E according to EN 13501-1.

For more information regarding fire property requirements for the roofing, see TPF Informerer no. 6 *Branntekniske løsninger for kompakte tak og terrasser* published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

Durability
Rhenofol CG has shown satisfying properties after artificial ageing in connection with type-testing and audit testing.

5. Environmental aspects

Substances hazardous to health and environment
Rhenofol CG 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 Rhenofol CG are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling
Rhenofol CG shall be sorted as residual waste. 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 15804 for Rhenofol CG. For complete documentation see EPD no. EPD-FDT-202401561-IBA1-EN, https://ibu-epd.com/.

6. Special conditions for use and installation

General
The roofing membrane shall 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*
- *525.207 Kompakte tak*
- 525.304 *Terrasse på etasjeskiller av betong for lett eller moderat trafikk*
- 525.306 *Terrasser med beplantning på bærende betongdekker*

plus, information sheets issued by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org:

- TPF informerer nr. 5 *Innfesting av fleksible takbelegg, dimensjonering og utførelse*
- TPF informerer nr. 6 *Branntekniske løsninger for kompakte tak og terrasser*
- TPF informerer nr 13 Tak under oppføring – forholdsregler og tiltak ved bruk

Installation
Joints of Rhenofol CG are welded with hot air. TPF Informerer no. 6 *Branntekniske løsninger for kompakte tak og terrasser* describes which roofing methods can be used on various roof structures. When roofing with hot air or open flame all combustible insulation must in principle be protected with non-combustible insulation. However, TPF Informerer no. 6 describes exceptions for hot air welding of roofing membranes with fire class B_{ROOF} (t2).

Hot air welding of membranes installed directly on top of combustible insulation can, in principle, only be used if the membrane has class B_{ROOF}(t2) on the relevant substrate. For membranes without B_{ROOF}(t2) classification, 30 mm of non-combustible insulation must be placed between the membrane and the combustible insulation. However, if a glass fleece ≥ 120 g/m² is placed between the insulation and the roofing membrane to protect against ignition, hot air welding can be used even for membranes without fire classification when installed directly on top of combustible insulation. The roofing membrane also has to be sufficiently covered in accordance with TPF Informerer no. 6.
In the case of hot air welding directly on combustible insulation, possibly with glass fleece in between, a risk assessment/Safe Job Analysis must be carried out for the specific construction project which documents that fire safety during welding has been taken care of.

Ballast
The membrane is laid loosely with a ballast weight. Necessary ballast must be calculated according to SINTEF Building Research Design Guide no. 544.202 *Takfolie. Egenskaper og tekking* and TPF informerer no. 5 *Innfesting av fleksible takbelegg, dimensjonering og utførelse*, clause 6.1 *Ballast*.

After welding the ballast must be applied immediately on the loose-laid roofing membrane to secure its position against wind uplift.

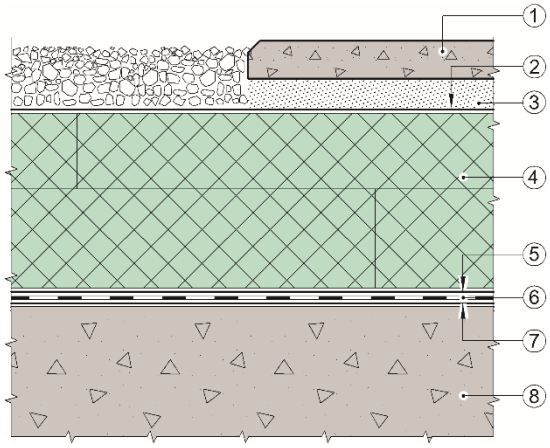
Adequate covering or ballast on the roofing membrane that do not fulfil the requirements of class B_{ROOF} (t2) is described in TPF informerer nr. 6 *Branntekniske løsninger for kompakte tak og terrasser.*

There are special requirements and restrictions when using the product under "green roofs", see TPF informerer nr. 10 *Grønne tak – Fuktsikre løsninger*.

In inverted roofs or duo-constructions, extruded polystyrene (XPS) should be used over the membrane. EPS should be avoided as EPS will absorb water and give reduced insulation.

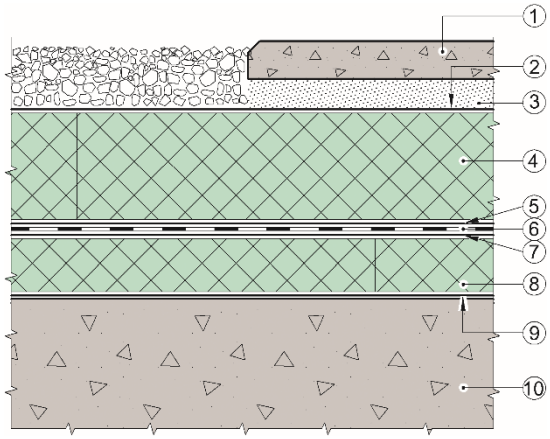
Substrate
Substrates of combustible insulation, such as EPS, must be covered or divided into areas, and replaced with non-combustible insulation around bushings and adjacent constructions, such as parapets and walls, according to pre-accepted performances given in the guidance to *Forskrift om tekniske krav til byggverk § 11-9* and in TPF informerer nr. 6 *Branntekniske løsninger for kompakte tak og terrasser*.

When the membrane is installed on old bituminous roofing, on old and rigid PVC roofing or directly on polystyrene insulation a separate migration barrier must be used in accordance with the manufacturer's installation manual.



1	Gravel, concrete slabs etc.	5	Migration barrier
2	Optional separation layer	6	Rhenofol CG
3	Sand beneath concrete slabs	7	Sliding- / protection layer
4	XPS	8	Structural deck

Fig. 2
Rhenofol CG used in ballasted, insulated, inverted roof construction. Ballast of e.g. gravel or concrete slabs.

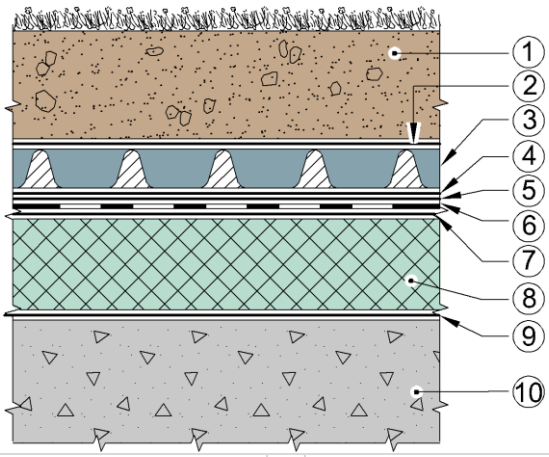


1	Gravel, concrete slabs etc.	6	Rhenofol CG
2	Optional separation layer	7	Optional migration barrier *
3	Sand beneath concrete slabs	8	Insulation
4	XPS	9	Vapour barrier
5	Migration barrier	10	Structural deck

Fig. 3
Rhenofol CG used in ballasted and insulated duo roof. Ballast of gravel or concrete slabs
* See special requirements for protection of combustible insulation during hot air welding of the roofing membrane in chapter *6. Special conditions for use and installation*, section *Installation*.

When the membrane is applied directly on rough concrete underlay without additional insulation, a sliding- and protection layer must be used. See SINTEF Building Research Design Guide no. 544.202 *Takfolie. Egenskaper og tekking* for additional requirements for migration barriers and protective layers.

Cleaning and maintenance
Before starting any welding, as a part of repair work, the roofing membrane must be cleaned locally, in accordance with the vendor's installation manual.



1	Soil	6	Rhenofol CG
2	Filtrating layer of geotextile	7	Migration barrier when insulation of EPS/XPS *
3	Draining layer	8	Insulation
4	Possible protection layer of geotextile	9	Vapour barrier
5	Sliding layer (2 layers of PE-foil)	10	Structural deck

Fig. 4
Rhenofol CG used in in ballasted, green roof.
* See special requirements for protection of combustible insulation during hot air welding of the roofing membrane in chapter *6. Special conditions for use and installation*, section *Installation*.

Transport and storage
Rhenofol CG must be transported in a manner that does not damage the product and be stored in a dry location, placed on pallets and protected at the building site.

7. Factory production control

Rhenofol CG is produced by FDT Flachdach Technologie GmbH, Eisenbahnstrasse 6-8, 68199 Mannheim, Germany.

The holder of the approval is responsible for maintaining the factory production control to ensure that Rhenofol CG is manufactured in compliance with the preconditions upon which this approval is based.

The manufacturing of the product 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 manufacturer FDT Flachdach Technologie GmbH has a quality management system 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 product standards EN 13956 and EN 13967, the guidelines for SINTEF Technical Approval, and recommendations as outlined in SINTEF Building Research Design Guides (tilpasses).

9. Marking

All rolls shall be marked on their packaging with name of manufacturer, product name, batch number and/or manufacturing date.

Rhenofol CG is CE marked in accordance with EN 13956 and EN 13967.

The approval mark for SINTEF Technical Approval TG 20602 may also be used.

10. Liability

The holder/manufacturer has sole product liability 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