

SINTEF Technical Approval

TG 2307

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 Provided listed on
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SINTEF confirms that

Dörken DELTA®-VITAXX and DELTA®-VITAXX PLUS

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

Dörken GmbH & Co. KG
 Wetterstr. 58
 58313 Herdecke / Germany
www.doerken.de

2. Product description

DELTA®-VITAXX and DELTA®-VITAXX PLUS combined roofing underlay and wind barrier are identical triple layer membranes, made of a vapour open microporous functional polypropylene film sandwiched between two layers of nonwoven, spunbonded polypropylene. In addition, a mesh, made of polypropylene, reinforces the membrane between the underside of the functional layer and the lower spunbonded polypropylene. DELTA®-VITAXX products are black on top, with white letters, the bottom is dark grey.

DELTA®-VITAXX PLUS includes an adhesive area on both edges to tighten the standard joints of the membrane. DELTA®-VITAXX does not include an adhesive area.

Accessories which can be used during installation are shown in table 3.

Table 1
 Measures and tolerances for DELTA®-VITAXX PLUS

Property	Measure	Tolerance	Unit
Roll width	1,50	- 0,5 % / + 1,5 %	m
Roll length	50,0	- 0 %	m
Mass per unit	160	- 10 % / + 20 %	g/m ²

Measured according EN 1848-2 and EN 1849-2.

3. Fields of application

DELTA®-VITAXX PLUS is intended for use as a combined roofing underlay and wind barrier in thermal insulated pitched wooden roofs ventilated with battens under discontinuous roofing with outside drainage as shown in fig. 2.

Used as combined roofing underlay and wind barrier is DELTA®-VITAXX PLUS particularly suitable for roofs with continuous thermal insulation from eaves to ridge. The membrane may also be applied in with heated rooms in parts of the attic, and above uninsulated attic spaces

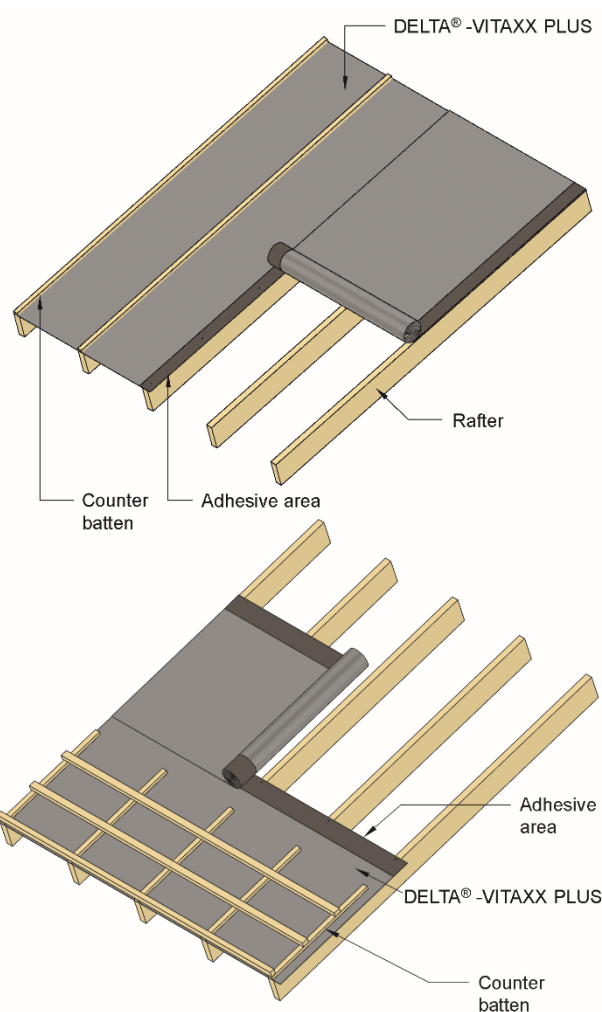


Fig. 1

DELTA®-VITAXX PLUS combined roofing underlay and wind barrier used parallel and perpendicular to rafters. Alternatively, DELTA®-VITAXX (without adhesive area) can be used parallel of rafters with counter battens as clamp battens.

DELTA®-VITAXX PLUS can be used as combined roof underlayer and wind barrier on roofs in buildings in hazard class 1-6 and fire class 1, 2 and 3.

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

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 Enterprise register: NO 919 303 808 MVA

Table 2

Product properties for DELTA®-VITAXX PLUS

Property	Test method	DELTA®-VITAXX PLUS		Unit
		DoP ¹⁾	Control limit ²⁾	
Dimensional stability	EN 1107-2	-	- 2,0 ³⁾	%
Longitudinal		-	- 0,8 ³⁾	
Transversal				
Watertightness	EN 1928	W1	W1	Class
Air permeability material	EN 12114	-	≤ 0,45 ³⁾	m ³ /(m ² h50Pa)
Air permeability construction	EN 12114	-	≤ 0,15 ³⁾	m ³ /(m ² h50Pa)
Jointed parallel to rafters		-	≤ 0,10 ³⁾	
Jointed perpendicular to rafters				
Rain tightness construction	NT Build 421	-	15 ³⁾ 400 ³⁾	° roof slope Pa
Tearing resistance (nail shank)	EN 12310-1	550 ± 20 %	≥ 440	N
Longitudinal		550 ± 20 %	≥ 440	
Transversal				
Tensile strength	EN 12311-1 EN 13859-2	550 ± 20 %	≥ 450	N / 50 mm
Longitudinal		450 ± 20 %	≥ 360	
Transversal				
Elongation	EN 12311-1 EN 13859-2	13 – 30	≥ 13	%
Longitudinal		13 – 30	≥ 13	
Transversal				
Water vapour resistance	EN 12572	0,05 (+0,05 / - 0,04)	≤ 0,1	m s _d -value
Step through resistance, rafters c/c 1,20 m	SP 0487	-	2,68 ³⁾	kN
Membrane used perpendicular to rafters		-	2,68 ³⁾	

¹⁾ Manufacturers Declaration of Performance, DoP²⁾ Control limit shows values, product has to satisfy during internal factory production control and audit testing³⁾ Results from type testing

Table 3

Accessories for mounting of DELTA®-VITAXX PLUS

Accessory	Material / Description	Used for	Measures
DELTA®-MULTI-BAND	Acryl-tape with PE-backing and reinforcement with synthetic strings	Taping of penetrations, alternative joining in small areas and connection to windows.	Width : 60 / 100 and 150 mm Roll length: 25 m
DELTA®-FLEXX-BAND	Butyl-rubber tape with backing of nonwoven, spunbonded PP	Taping of penetrations and small repairs	Width : 100 mm Roll length: 10 m
DELTA®-SCHAUM-BAND	VPE foam	Sealing nail penetrations under counter battens	Width : 60 mm Roll length: 30 m
DELTA®-THAN	Permanently elastic, special rubber compound adhesive in cartridge	Additional tightening material in, for tape, inaccessible areas.	Cartridge : 310 ml

4. Properties

Material properties

Material characteristics for DELTA®-VITAXX PLUS combined roofing underlay and wind barrier are shown in Table 2.

Safety in case of fire

Reaction to fire performance for the product has not been determined.

Airtightness

The airtightness of DELTA®-VITAXX PLUS makes it possible to fulfil any requirements regarding airtightness n_{50} given in the building regulations, and in the Norwegian passive house standards before the vapour barrier is installed.

Durability

DELTA®-VITAXX PLUS combined roofing underlay and wind barrier is considered to have satisfactory durability based on laboratory testing before- and after accelerated artificial climate ageing.

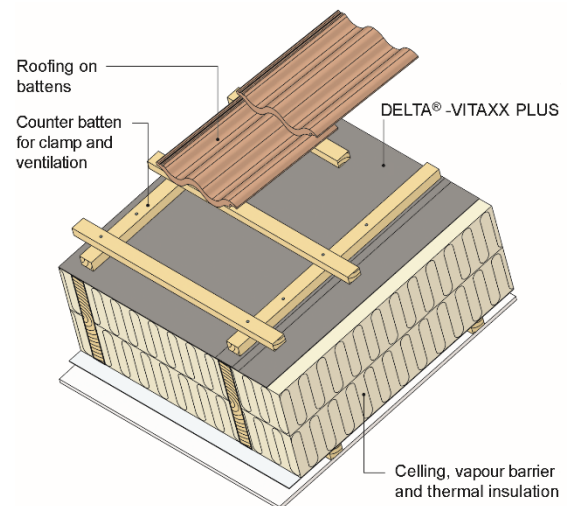


Fig. 2

Principle of a roof construction with DELTA®-VITAXX PLUS used as combined roofing underlay and wind barrier

The product must be protected against direct exposure to UV radiation in the completed construction. DELTA®-VITAXX PLUS needs to be covered as soon as possible after installation at roof, without unnecessary delay.

Durability of adhesive joint is also evaluated as satisfying, based on testing before and after artificial ageing.

Durability of DELTA®-MULTI-BAND is evaluated as satisfying, based on testing before and after artificial ageing. Product has shown satisfying durability tested on DELTA®-VITAXX PLUS, untreated timber and galvanized steel.

5. Environmental aspects

Substances hazardous to health and environment

DELTA®-VITAXX PLUS 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

Waste treatment/recycling

The product shall be sorted as plastic. The product shall be delivered to an authorized waste treatment plant for energy recycling.

Environmental declaration

No environmental declaration (EPD) has been worked out for DELTA®-VITAXX PLUS.

6. Special conditions for use and installation

General

DELTA®-VITAXX PLUS shall be installed to achieve wind tight and watertight layer. The application shall follow the principles shown in the installing guidelines for the product and in Building Research Design Sheet:

- 525.102 Isolerte skrå tretak med kombinert undertak og vindsperre

Design considerations

DELTA®-VITAXX PLUS shall not be used on roofs with a slope of less than 10°.

Combined roofing underlay and wind barrier should not be used at especially exposed places where experience shows that drifting snow often may be accumulated between the roofing and the roofing underlay.

The roofing should be laid as soon as possible after the product is installed, in order to prevent that the underlay is exposed for a longer period of time for weather or UV radiation. Thermal insulation, vapour barrier and the ceiling should not be installed until roofing has been laid and the underlay is checked to be properly installed, see also clause 4..

Installation

DELTA®-VITAXX PLUS can be installed parallel and perpendicular to rafters like shown I fig. 1.

In case of installing parallel to rafters, the membrane need to be installed continuously from eave to ridge and joints have to be clamped with counter battens on rafters.

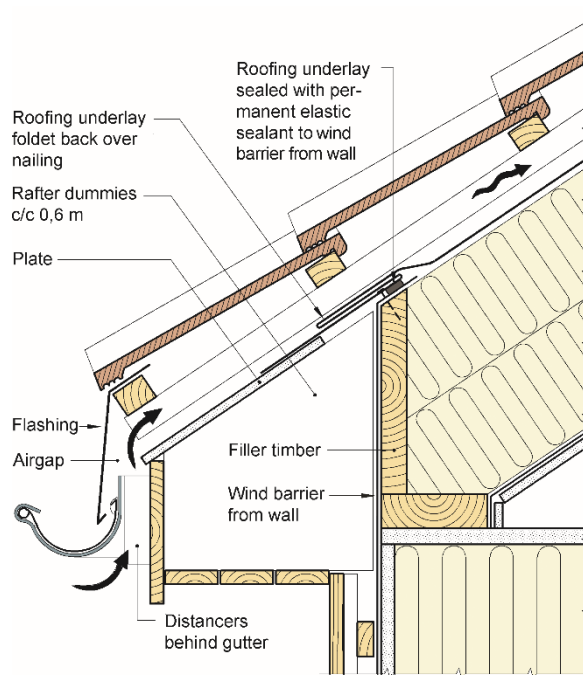


Fig. 3

Example of a connection detail between roof and wall without extending rafters. DELTA®-VITAXX PLUS is folded and positioned over the filler timber, sealed and clamped together with the wind barrier from wall.

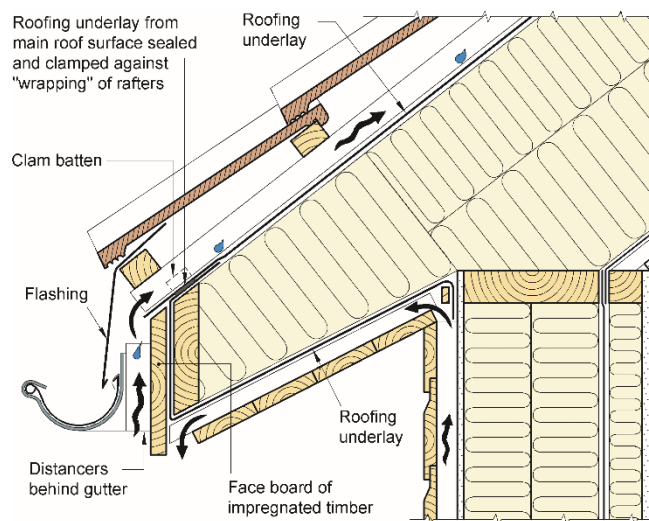


Fig. 4

Example of a connection detail between roof and wall with extending rafters. DELTA®-VITAXX PLUS is wrapped around the rafter shape and has been connected to the wind barrier of wall with a clamp batten.

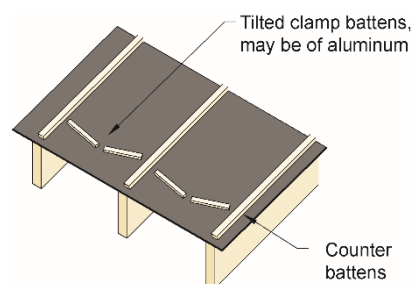


Fig. 5

Tilted clamp battens on filler timber of fig. 4. Clamp battens are tilted to avoid damming of water. Material can also be of aluminum.

In case of installing perpendicular to rafters, the membrane shall be installed continuously from gable to gable. All horizontal joints need to be performed with DELTA®-VITAXX PLUS (with adhesive area). Vertical joints need to be clamped with counter battens on rafters.

Battens and air ventilation

In order to avoid minimize the pressure at the overlaps, due to shrinkage of the timber, the moisture content of the rafters and the battens should be less than 20% when installing the roofing underlay.

Discontinuous roofing shall be ventilated between roofing and the roofing underlay with counter battens and battens. Recommended dimensions related to the roof slope and to the length of the rafters are shown in table 4.

Table 4

Recommended height of counter battens (mm) related to roof slope and length of rafters

Roof slope	Length of rafter (m) ¹⁾	
	7,5	10
10 – 30 °	36	36 + 36
31 – 40 °	30	36
≥ 41 °	23	36

¹⁾ Measured distance of rafters from eave to ridge. For longer rafters should battens increases according to Building Research Design Sheet:

- 525.102 Isolerte skrå tretak med kombinert undertak og vindsperre

Counter batten which are used to clamp overlap joints for the DELTA®-VITAXX PLUS must not be thicker than 36 mm. The counter battens are screwed with a distance $c/c \leq 300$ mm. It is recommended to use screws with plain shank on the part which penetrates the counter battens. For roof pitches above 18° the counter battens can be fixed with 3.1 mm galvanized, square nails c/c maximum 300 mm, eventually with length 2.5 times the counter batten height.

Connections to other components and structures

DELTA®-VITAXX PLUS combined roofing underlay and wind barrier shall be installed with airtight connections to the wind barrier of exterior walls, and with airtight joints at the ridge and valley gutters.

At roof eaves without extending rafters roofing underlay and wind barrier need to be connected at the top of the filler timber like shown in fig. 3.

At roof eaves with extending rafters the roofing underlay shall wrap the rafter shape and be clamped together with the wind barrier at the top sill of the wall. See also fig. 4.

Figure 5 shows an example of inclined clamping battens across the roof slope, to prevent damming of water. The battens can also consist of aluminum and must not prevent aeration of the roof surfaces.

Penetrations

Penetrations like chimneys, roof windows or pipes need to be prepared both wind- and watertight. See also fig. 6 and 7.

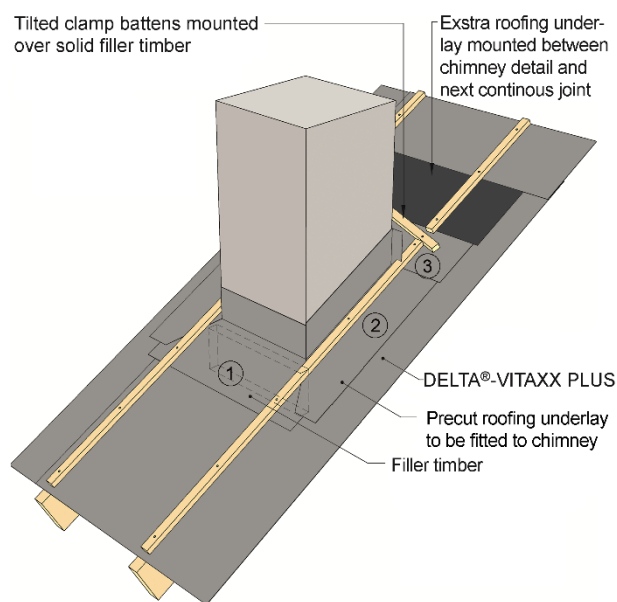


Fig. 6

Example of a chimney, penetrating the roofing underlay. On-site prefabricated sleeves installed using DELTA® MULTI-BAND and DELTA® THAN for tightening sleeves against each other and against chimney.

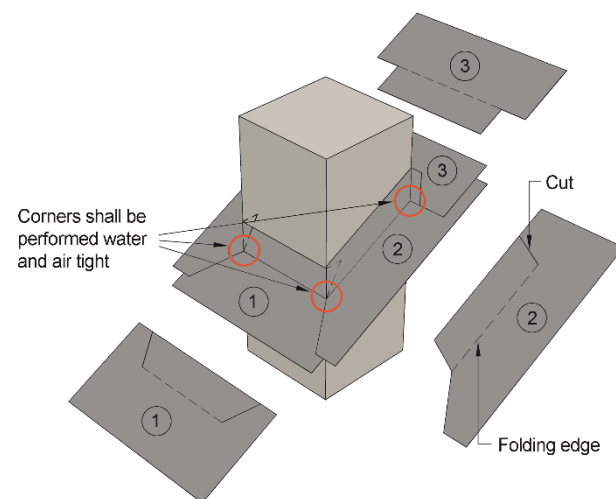


Fig. 7

Example of sleeves around chimney

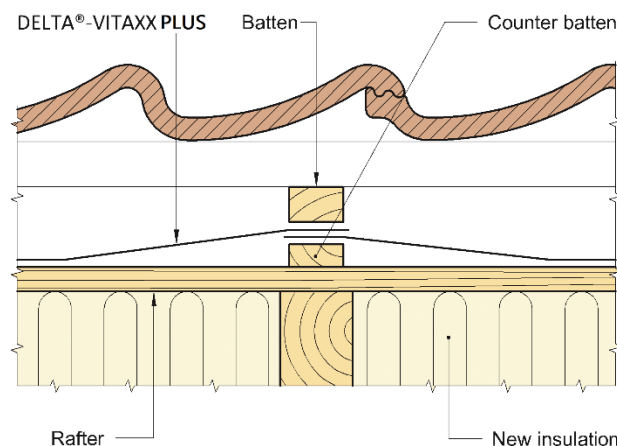


Fig. 8

Example of installation of DELTA®-VITAXX PLUS on wooden board roof

Roofs with attics

DELTA®-VITAXX PLUS has sufficient low vapour resistance to be used as roofing underlay in non-ventilated attic spaces and living room in parts of the attic. For more information, see Building Research Design Sheet:

- 525.107 *Skrå tretak med oppholdsrom på deler av loftet*

Combination to wooden sheeting

DELTA®-VITAXX PLUS can be applied as roofing underlay and wind barrier on wooden sheeting provided that the total water vapour resistance does not exceed s_d – value = 0,5 m.

DELTA®-VITAXX PLUS can be installed on wooden boards of spruce or pine in old roof which shall be refurbished and insulated. The insulation can then be installed directly underneath the wooden boards.

If DELTA®-VITAXX PLUS is installed on wooden sheeting, which is not smooth, and is insulated underneath, an extra counter batten shall be placed under the regular batten like shown in fig. 8. In case of a smooth surface, DELTA®-SCHAUM-BAND can alternatively be used between the membrane and the counter batten.

In case of refurbishing old roofs, all roofing and other water vapour tight materials need to be removed.

If plywood- or OSB-boards are used, the water vapour resistance has to be documented. The total water vapour resistance, for all layers, as mentioned above, shall not exceed s_d – value = 0,5 m.

Transport and storage

DELTA®-VITAXX PLUS should be stored under dry conditions on pallets with wrapping.

7. Factory production control

DELTA®-VITAXX PLUS are produced by Dörken GmbH & Co. KG, Wetterstr. 58, 58313 Herdecke, Germany.

The holder of the approval is responsible for the factory production control in order to ensure that DELTA®-VITAXX PLUS are produced in accordance with the preconditions applying to this approval. The manufacturing of DELTA®-VITAXX PLUS is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

The manufacturer's quality management system is certified by TÜV Rheinland Cert GmbH according to EN ISO 9001, certificate no. 01 100 041012/03

The manufacturer's environmental system is certified by TÜV Rheinland Cert GmbH according to EN ISO 14001, certificate no. 01 104 042109/03

8. Basis for the approval

The evaluation of DELTA®-VITAXX PLUS 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

DELTA®-VITAXX PLUS shall be marked on the wrapping of each roll with the brand name, the manufacturer's name and a bar code for product identification including production date and time.

DELTA®-VITAXX PLUS is CE-marked in accordance with EN 13859-1 and EN 13859-2.

The approval mark for SINTEF Technical Approval No. 2307 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