SINTEF

SINTEF Certification

No. 20437

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Page: 1 of 4

Technical Approval

SINTEF confirms that

Derbicolor Artic single layer 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

Derbigum Norge AS
Brevikbråteveien 9
1555 Son
www.derbigum.no

2. Manufacturer

Imperbel SA
1360 Perwez
Belgium

3. Product description

Derbicolor Artic single layer roofing membrane is made of SBS modified bitumen with a reinforcement of polyester and glass fibers. On the upper face are slate granules added. The lower face is protected by a thin plastic foil which melts during welding overlapping. Measures and tolerances are given in table 1. Joints can be torched or hot air welded. See also fig. 1 and fig 2. Material can be purchased in different colors.

Table 1
Measures / tolerances for Derbicolor Artic according EN 1848-1 and EN 1849-1

Property	Derbicolor Artic	Tolerance
Thickness	4.8 mm	± 5 %
Weight	6.0 kg/m²	± 15 %
Roll widht	1.1 m	+5 / -0 mm
Roll length Jumbo-rolls	7.27 m up to 130m	+20 / -0 mm
Weight of reinforcement	ca. 200 g/m²	-

Derbicolor Artic can be purchased in three different types:

1) *Derbicolor Artic* is a single layer roofing membrane with 130 mm overlapping joints. The overlapping area is protected by talcum. See also fig. 1.

2) *Derbicolor Artic Patch* is single layer roofing membrane with 130 mm overlapping joints. The overlapping area is protected by thin plastic foil, melting during welding. See also fig. 1. Patches (40 x 350mm / composing ca. 50 % of area) at the lower face can be activated for adhesion with little heat.

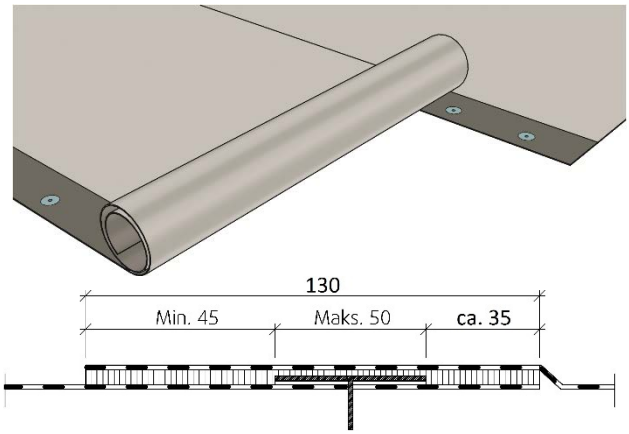

Fig. 1
Derbicolor Artic and Derbicolor Artic Patch mechanically fixed in a 130 mm welded side-overlap

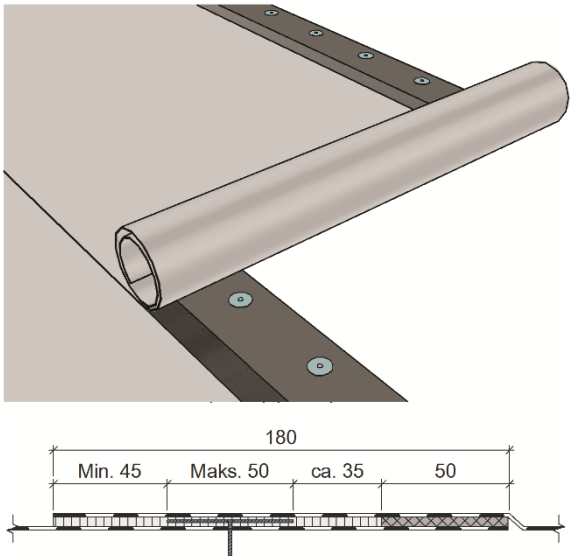

Fig. 2
Derbicolor Artic FS mechanically fixed in a 130 mm welded side-overlap with additional 50mm self-adhesive joint.

3) *Derbicolor Artic FS* is single layer roofing membrane with 180 mm overlapping joints. Beside the normal 130 mm overlap, protected by talcum, is there a 50 mm self-adhesive stripe positioned, protected by siliconised paper. See also fig. 2.

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Table 2
Product-properties for fresh material of all Derbicolor Artic products

Property	Test method EN	Derbicolor Artic			Unit
		DoP[1)]	Control limit[2)]	SINTEFs recommended min. values	
Dimensional stability	1107 -1	≤ ± 0.3	± 0.3	0.6	%
Flexibility at low temperature upper face: lower face:	1109	≤ - 20 ≤ - 20	≤ - 20 ≤ - 20	≤ - 15 ≤ - 15	°C
Flow resistance at elevated temperature	1110	≥ 100	≥ 100	≥ 90	°C
Water tightness 10kPa / 24t:	1928 (A)	Tight	Tight	Tight	-
Adhesion of granules [3)]	12039	-	< 1	≤ 2.5	g
Resistance to tearing, nail shank L: T:	12310 -1	350 ± 25 % 350 ± 25 %	≥ 260 ≥ 260	≥ 150	N
Tensile strength L: T:	12311 -1	900 ± 20 % 750 ± 20 %	≥ 720 ≥ 600	≥ 600	N/50 mm
Elongation L: T:	12311 -1	40 ± 15 40 ± 15	≥ 25 ≥ 25	≥ 10	%
Average peel resistance of joints L: T:	12316 -1	170 ± 30 % 170 ± 30 %	≥ 120 ≥ 120	≥ 50	N/50mm
Shear resistance of joints L: T:	12317 -1	750 ± 20 % 750 ± 20 %	≥ 600 ≥ 600	≥ 600	N/50mm
Resistance to puncturing Impact +23 °C: Impact -10 °C: Static load:	12691 (A) 12691 :2001 12730 (A)	≥ 1250 - ≥ 15	≥ 1250 ≤ 30 ≥ 15 [4)]	≥ 500 ≤ 30 ≥ 20	mm mm diam kg
Watertightness after streching at low temperature (10% at -10°C)	13897	Tight	Tight	Tight	-

[1)] The manufacturers Declaration of performance, DoP
[2)] Control limit shows values, product has to satisfy during internal factory production control and audit testing.
[3)] Modified to loss of granules in gram.
[4)] The product has limited resistance to static load. In the installation- and operational phase it must therefore be protected against strain from ladders, scaffolding etc., e.g. with a separate protective layer on top of the roofing membrane.

4. Fields of application

Derbicolor Artic and Derbicolor Artic FS can be used as single layer membrane for covering sloped and flat roofs. The membranes are designed special for use as mechanically fixed single roofing membranes. Whereas Derbicolor Artic is to use without special conditions is Derbicolor Artic FS designed for to avoid too much heat is brought onto combustible substrates. The self-adhesive stripe shall restrict the flames to the overlapping area.

Derbicolor Artic Patch is designed as a single layer membrane on pitched roofs but also can be used on flat roofs. Patches with special bitumen can help during assembling on hard substrates.

The slope of the roof must be sufficient to allow rain and melting water to drain away. SINTEF recommends a slope of at least 1:40 for all roofs.

Derbicolor Artic products can be used for new roofing or under rehabilitation. In general Derbicolor Artic can be used for accessible and non-accessible roofs, terrace roofs and parking roofs with floating floor and culverts.

5. Properties

Product-properties:

Product-properties for fresh material are shown in table 2.

Properties related to fire

Derbicolor Artic products fulfilling the requirements of class BROOF (t2) according to EN 13501-5 for all substrates mentioned in table 3. The products have been tested in accordance with CEN/TS 1187-2.

Durability

Derbicolor Artic bituminous roofing membranes have shown during type testing satisfying properties after artificial ageing, for 12 weeks in heat chamber (at 70 °C) performed at SINTEF.

Calculation of fasteners

The capacity for anchoring Derbicolor Artic and Derbicolor Artic FS with SFS Intec BS-4,8xL roofing screw and SFS Intec ISO-TAK R45xL plastic-washer with integrated sleeve is 1080 N per fastener. This capacity applies to the connection between the membrane and the fastener according to EN 16002.

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered. The lowest value for membrane/substrate must always be used.

Derbicolor Artic Patch has also been tested according EN 16002, assembled on plywood. Patches were activated with heat and joints were mechanically fixed with SFS Intec MW-40-FH steel washers and SFS Intec IWF-5,2xL screws. This system is assessed as to have in minimum the wind load resistance like the mechanically fixed system of Derbicolor Artic mentioned in the paragraph before.

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

Table 3
Derbicolor Artic products achieving reaction-to-fire classification class B_{ROOF} (t2) on following substrates

Type of substrate	Derbicolor Artic
EPS	No
Rock wool	Yes
Wooden sheeting	Yes
Concrete	Yes
Reroofing on old membrane on EPS */**	Yes
Reroofing on old membrane on rock wool	Yes
Reroofing on old membrane on wood	Yes
Reroofing on old membrane on concrete	Yes

* "Old membrane" test build-up (from top):
PF 5000 SBS (5.19 kg/m^2) + PF 3500 SBS (3.20 kg/m^2)

** In case of roofing on lightweight combustible insulation (eg EPS, XPS or PIR): See section 6 Condition for use, in section on substrates, on the requirements for replacement of flammable insulation for non-combustible around passages and against adjacent structures.

6. Environmental aspects

Substances hazardous to health and environment

Derbicolor Artic 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

Derbicolor Artic 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

No environmental declaration (EPD) has been worked out for the product.

7. Special conditions for use and installation

Fasteners

Fastening with ordinary steel washers and screws in longitudinal overlaps may be used on firm substrates such as wood based sheets or concrete.

Derbicolor Artic Patch should be installed with as airtight connections to eaves, ridges, valleys and penetrations as possible. The vacuum effect between hard substrate and membrane will in this case guarantee a good wind load resistance.

On substrates of thermal insulation with good compression strength, such as expanded polystyrene (EPS) with compression strength of at least 80 kPa/m2 (level CS (10) 80 according to EN 13162/13163), steel washers with deep collars or telescopic plastic washers should be used.

Fasteners with good telescopic effect must be used when the membrane is installed on thermal insulation materials with lower compressive strength. The tightening of the fasteners must be specially checked.

Installation

Mechanical fasteners shall be placed at welded overlaps with a minimum width of 130 mm. The fasteners must be positioned at a distance from the membrane edges that provides ca. 35 mm bonding on the inside and minimum 45 mm bonding on the outside of the fastener, see fig. 1.

Transverse joints must have a 150 mm overlap. The underlying corner is fastened, and the overlying corner is cut at an angle. A good result is achieved by ‘drowning’ the surfaces in bitumen before the joint is fully welded.

The roofing system shall be installed in accordance with the principles shown in the instruction sheet of the manufacturer and the in SINTEF Building Design Sheets 544.203, 544.204, 544.206 and in “TPF informs No. 5”.

Substrate

When a fire classification is required the substrate must be in accordance with the provisions stated in section 5 “*Properties related to fire*”.

Substrate 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 kostruksjoner for tak* published by Takprodusentenes Forskningsgruppe, see www.tpf-info.org.

For re-roofing on old roofing that contains softeners as for example PVC a separate migration barrier of approximately 150 g/m² polyester felt has to be used.

In reverse constructions the concrete surface must be clean and dry, and even as with a screed finish.

Traffic on the roof and maintenance

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. The product has limited resistance to static load. In the installation- and operational phase it must therefore be protected against strain from ladders, scaffolding etc., e.g. with a separate protective layer on top of the roofing membrane.

Storage

Derbicolor Artic products must be stored in an upright position.

8. Factory production control

Derbicolor Artic is subject to supervisory factory production and product control according to contract between SINTEF and Derbigum Norge AS concerning Technical Approval

The manufacturer Imperbel SA has a management quality system certified by Bureau Veritas Certification in accordance with EN ISO 9001, certificate no. BE009216-1

9. Basis for the approval

Properties of the product have been determined by initial type testing on fresh and aged material, documented in following reports:

- SINTEF Building and Infrastructure, Report 102007918-4-1, dated 2015-03-19, Type testing of material properties
- SINTEF Building and Infrastructure, Report 102007918-4-2, dated 2015-03-19, Wind-load testing according EN 16002
- DBI Denmark, Report PFA11284G, dated 2019-01-21, fire test (mineral wool)
- DBI Denmark, Report PCA10538A, dated 2019-01-18, fire classification (mineral wool)
- DBI Denmark, Report PFA11284H, dated 2019-03-20, fire test (wood particle board)
- DBI Denmark, Report PCA10538B, dated 2019-03-21, fire classification (wood particle board)
- DBI Denmark, Report PFA11284I, dated 2019-03-21, fire test (renovation)
- DBI Denmark, Report PCA10538C, dated 2019-03-22, fire classification (renovation)

10. Marking

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

The product is CE marked according to EN 13707.

The approval mark for SINTEF Technical Approval No. 20437 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 Holger Halstedt, SINTEF Building and Infrastructure, dep. Materials and structures, Trondheim

for SINTEF Byggforsk

Hans Boye Skogstad
Godkjenningsleder