SINTEF Technical Approval

TG 2136

Issued first time: 04.12.1998
Revised: 30.06.2022
Amended:
Valid until 01.07.2027
Provided listed on
www.sintefcertification.no

SINTEF confirms that

Icopal Fonda Universal, Type V

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

BMI Norge AS
Postboks 55
1477 Fjellhamar
Norway
www.bmigroup.com

2. Product description

Icopal Fonda Universal is a combined waterproof membrane and protection sheet for use on outside walls against the ground, as drainage plate under turf on turfed roof and as versatile layer on concrete under flooring.

Icopal Fonda Universal is supplied as roll-product and is produced of polypropylene (PP) with a density of 900 – 920 kg/m^3. The product has a nominal thickness of 0,5 mm. Icopal Fonda Universal is made with dimple studs and a pattern of intersecting channels forming a 7 mm air gap between the sheet and the underlying surface, see figure 1. The membrane has flat jointing flanges on each side. Measures and tolerances are shown in table 1.

Product specifications for additional accessories for mounting fixing Icopal Fonda Universal are given in Table 3.

Table 1
Measures and tolerances for Icopal Fonda Universal, Type V

Property	Test method EN	Measure	Unit	Tolerance
Spec. weight	1849-2	0,5	kg/m^2	± 10 %
Total height	1849-2	7	mm	± 5 %
Std. roll width	1848-2	1,28 / 1,65 2,08 / 2,40	m	+ 1 % / - 0 %
Std. roll length	1848-2	20	m	+ 1 % / - 0 %

3. Fields of application

Moisture protection of external walls against terrain
Icopal Fonda Universal can be used in buildings in hazard classes 1-6 in fire classes 1-3 as waterproofing and capillary breaking layer outside of walls against terrain. See also figure 2 and 3.

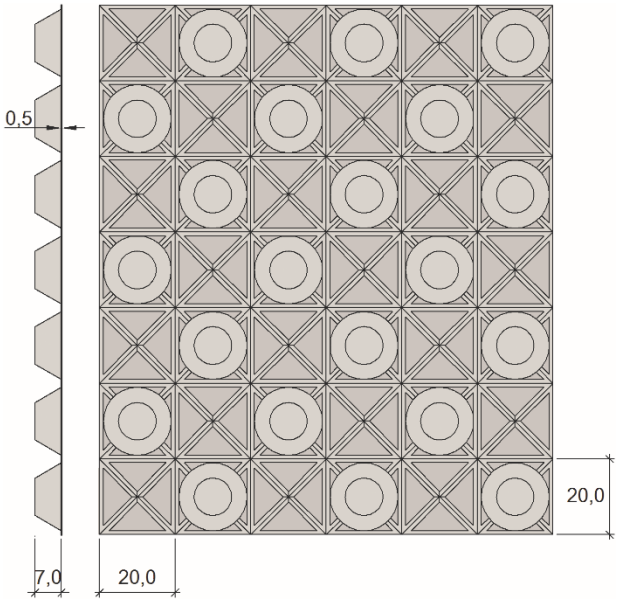


Fig. 1
Plan and section drawing of Icopal Fonda Universal shows pattern with their channels and dimples. Measurements in mm.

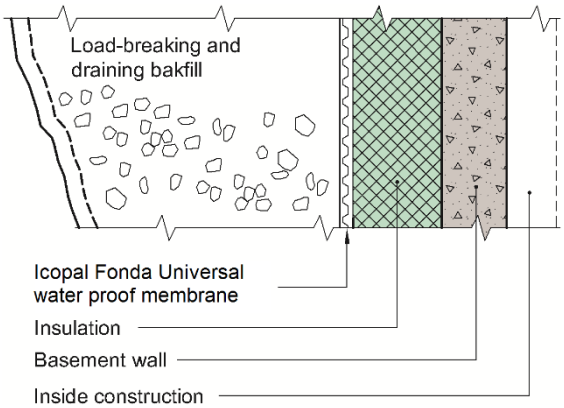


Fig. 2
Icopal Fonda Universal, used as moisture protection of external walls against terrain, is recommended to be placed outside a vapour open insulation, as e.g. EPS, with dimples against the insulation. See also SINTEF Building Research Design Guide 523.111 Yttervegger mot terreng. Varmeisolering og tetting.

Table 2
Product properties of Icopal Fonda Universal

Egenskap	Prøvemetode EN	Produktnavn		Enhet
		Ytelseserklæring[1)]	Kontrollgrense[2)]	
Water tightness 2 kPa, 24 h	1928	tight	tight	-
Water vapour resistance	1931	-	≥ $2x10^{11}$ ≥ 40	m^2sPa/kg m (equivalent air layer thickn., s_d)
Tearing resistance (nail shank) L T	12310-1	100 100	≥ 100 ≥ 100	N
Tensile strength L T	12311-2 (A)	300 300	≥ 300 ≥ 300	N/50 mm
Elongation L T	12311-2 (A)	30 30	≥ 30 ≥ 30	%
Shear resistance of joint	12317-2	-	≥ 5	N
Puncturing - Impact at/23°C - Static load	 12691 (A)[3)] 12730 (B)[3)]	 250 -	 ≥ 250 ≥ 20	 mm kg
Deformation at load after 60 hour	13967, Annex B	-	≤ 1,4 ≥ 50	mm deformation kN/m^2 Load

[1)] Manufacturers Declaration of Performance, DoP
[2)] Control limit shows values, product need to satisfy during internal factory production control and audit testing
[3)] Tested on hard and soft support

Table 3
Product specifications for associated installation components for Icopal Fonda Universal

Component	Material type	Description	Measures
Joining tape	Butyl rubber with lining of PE	Overlap of joints	Width / Thickn.: 30 mm / 1,0mm 50 mm / 1,5 mm Length: 5, 10, 20 m
Multitape Butyl	Butyl rubber with lining of HDPE	Overlap of joints	Width / Thickn.: 80 mm / 1,0mm Length: 20 m
Sealing butyl MATERIAL IS NOT INTENDED FOR USE INSIDE OF THE VAPOUR BARRIER.	Pasty butyl rubber	Sealing of turf roof- or moisture protection of basement joints.	Cartridge: 310 ml.

Turf roof
Icopal Fonda Universal can be used in buildings in hazard class 4 in fire class 1. Distance between building shall be in minimum 8 m according to SINTEF Building Research Design Guide:

- 523.803 *Torvtak.*

Icopal Fonda Universal is used for protection of the waterproofing roofing layer to avoid growing through and ensure the permanent drainage over roofing layer, see figure 4.

Moisture barrier on concrete floors
Icopal Fonda Universal can be used in buildings in hazard classes 1-6 in fire classes 1-3 as moisture barrier on concrete floor or concrete slab under floating floor of plates, lamella- or laminated parquet, levelling mortar or floating floor screed. An example of floor setup is shown in in principle in figure 5. Moisture barrier can be used both for new buildings and for refurbishment.

Moisture barrier can be used in floor constructions with imposed traffic loads category A and B according to EN 1991-1-1:2002 up to 3,0 kN/m^2 evenly distributed load and 2,0 kN point load.

Where there are problems with odor / degassing from the ground, special solutions need to be used, as e.g. systems with mechanical ventilation of air gaps under the moisture barrier.

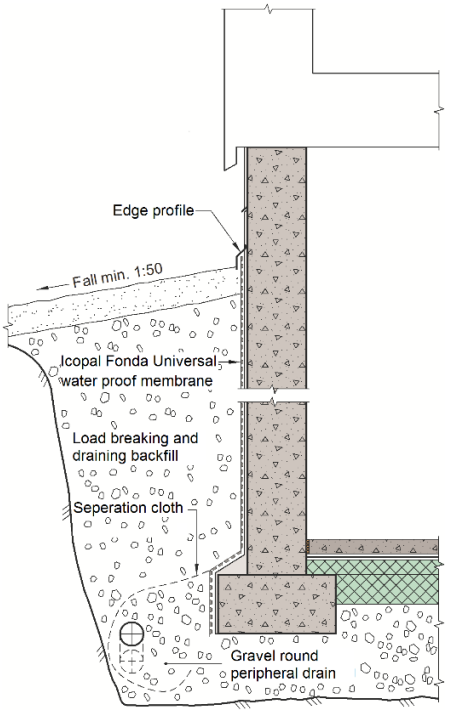


Fig. 3
Example for Icopal Fonda Universal, used as moisture barrier for unheated basements.

4. Properties

Product properties

Product properties of Icopal Fonda Universal are shown in table 2. Product is classified from manufacturer according EN 13967 as Type V.

Properties related to fire

Classification of reaction to fire according to EN 13501-1 is not defined for Icopal Fonda Universal.

Durability

Icopal Fonda Universal is evaluated to have satisfying durability in physical contact to concrete- and mortar materials, based on testing before and after accelerated alkali, climate ageing (NT Poly 161).

5. Environmental aspects

Substances hazardous to health and environment

Icopal Fonda Universal contains no harzardous 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 indoor environment

The product is not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health.

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

The product 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 Icopal Fonda Universal.

6. Special conditions for use and installation

Design considerations regarding safety in case of fire, in general

Icopal Fonda Universal need to be separated at fire cell limiting constructions in a way that fire spread is avoided and the fire cell limiting function is ensured.

Design considerations regarding safety in case of fire (external walls against terrain)

Icopal Fonda Universal shall be completely covered of soil. Regarding covering of insulation of basement walls see also to SINTEF Building Research Design Guide:

- 520.339 *Bruk av brennbar isolasjon i bygninger*

Design considerations regarding safety in case of fire (turf roof)

Icopal Fonda Universal need to be completely covered with turf.

Design considerations regarding safety in case of fire (Moisture barrier on concrete floors)

Icopal Fonda Universal need always to be covered with materials which satisfies actual fire requirements for the room they are used in. Insualtion plates to be used under or over Icopal Fonda Universal must be evaluated according to Technical Regulation or to SINTEF Building Research Design Guide:

- 520.339 *Bruk av brennbar isolasjon i bygninger*

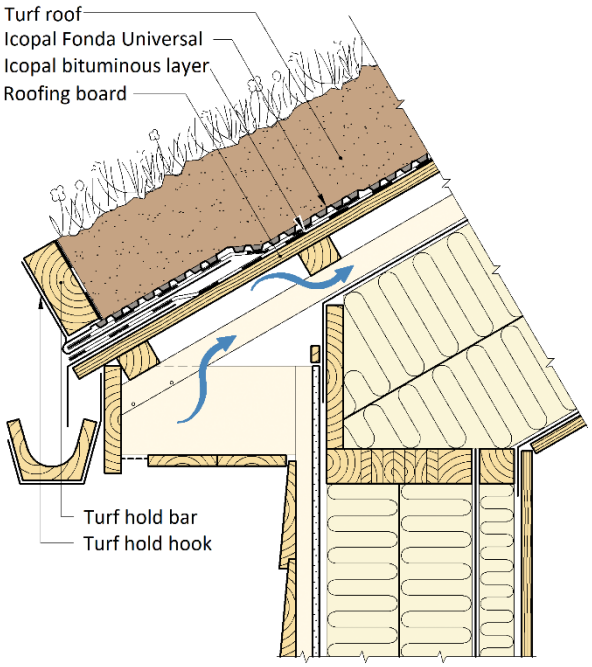


Fig. 4.
Example of the use of Icopal Fonda Universal as protection for drainage for of penetrating water between dimple sheet and roofing layer.

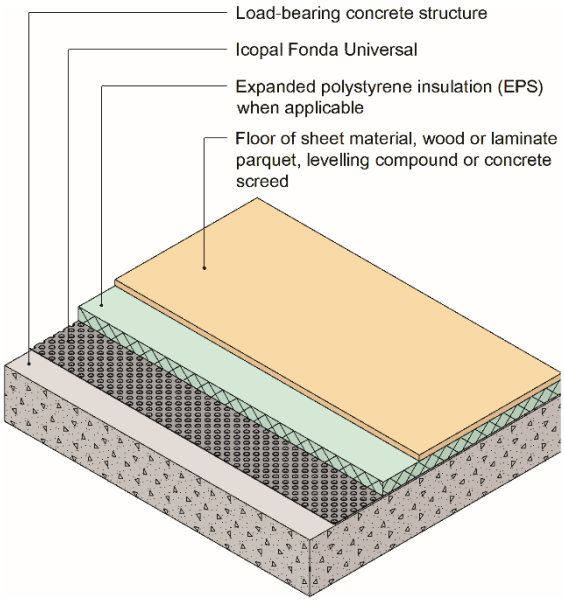


Fig. 5
Example for a floating floor construction with Icopal Fonda Universal.

External walls against terrain

Icopal Fonda Universal should be applied with the dimples against the wall and rolled out along the length of the wall. Installation shall start at the bottom of the wall, and horizontal joints should have an overlap of 120 mm and vertical joints of 500 mm.

The membrane is fastened with nails and plugs every 250 mm along the top edge after which the finishing profile is applied. Fastening plugs shall be fixed with 6 mm pre-bored holes in concrete and 5,5 mm holes in expanded clay aggregate blocks.

Icopal Fonda Universal should cover both the foundations and the wall and installed up to outside ground level.

Icopal Fonda Universal used as dimple sheet for protection of the basement wall shall avoid that water can penetrate insulation and concrete construction uncontrolled. Self-draining back-fill on the outside and draining pipes underneath bottom of the dimple sheet are necessary to drain water satisfying fast away from the basement construction.

External insulation between concrete and dimple sheet should be vapour open to ensure a faster drying of the basement wall.

Icopal Fonda Universal used as basement dimple sheet shall follow principles shown in SINTEF Building Research Design Guide:

- 514.221 *Fuktsikring av bygninger*
- 523.111 *Yttervegger mot terreng. Varmeisolering / tetting*

Turfed roof

Icopal Fonda Universal shall be mounted with dimples orientated downwards to the roofing layer. The structured surface on top shall avoid that the turf glides down the roof slope to the turf-hold bar. With bigger roof slopes the turf needs to be reinforced.

To avoid accumulation of water between dimple sheet and roofing layer the dimple sheet needs to be installed as described. The system with two tight layers with possibilities of drying out makes it probable that the construction has a durability for the buildings entire life time. Principle is shown in figure 4.

Mounting of Icopal Fonda Universal should start at the eaves of the roof. Sheets shall be fastened along the upper edge with plugs and nails. Maximum of nail distance should be:

- ca. 200 mm for 1,28 m width of plate
- ca. 150 mm for 1,65 m width of plate
- ca. 100 mm for 2,08 m width of plate
- ca. 100 mm for 2,40 m width of plate

With a roof pitch ≥ 25° joints along the length should have a minimum overlap of 250 mm, and 300 mm for roofs with less fall. Overlap at transverse joints should be 400 mm.

Dimples of the upper plate shall fit right into the dimples of the lower sheet for to increase the safety for water penetration.

Icopal Fonda Universal used as turfed roof dimple sheet shall follow principles shown in SINTEF Building Research Design Guide:

- 544.803 *Torvtak*

Moisture barrier on concrete floors

The building, where Icopal Fonda Universal shall be used, is presumed to have a normal indoor climate. Icopal Fonda Universal can be laid independently of the moisture content of the underlying concrete construction. Icopal Fonda Universal cannot be used where free flowing water can occur.

Wall strips should be installed to avoid increased moisture content of the lower parts of existing walls standing on concrete floors. These should be fixed with the dimples behind the skirting to form an air gap between the skirting and the wall. The membrane may also be installed with the edges raised against the wall. The skirting must allow passage between the air gap under the membrane and the air in the room. The wall strip is fastened to the membrane using joining tape or joint filler.

Floors may be insulated with polystyrene sheets between the waterproof membrane and the floating floor. When parquet flooring or sheet materials are used over insulation it is required to use extruded polystyrene (XPS) or expanded polystyrene (EPS) sheets with a resistance to compression of at least 200 kN/m2 (CS(10)200)). A thin fibre cloth or equivalent should be laid between the insulation and flooring to avoid squeaking.

Regarding covering of XPS or EPS see also to SINTEF Building Research Design Guide:

- 520.339 *Bruk av brennbar isolasjon i bygninger*

Icopal Fonda Universal shall be joined by using joining tape. Lengthwise joints are performed with tape between the overlapping flanges of the membrane. Transverse joints are made as butt joints with Multitape Butyl across the top of the joint.

Pipes or the equivalent passing through the membrane should be sealed with two rings of joining tape against the concrete floor which must be primed beforehand to bind any dust.

Non load bearing walls which do not have any requirement according to safety in case of fire can be erected directly on the membrane.

Transport and storage

The rolls shall be stored and transported standing vertically on pallets, protected from sunlight. Pallets may be stacked in two levels, providing the stacks are staggered. Caution must be shown when stacking pallets.

7. Factory production control

The product is produced in France for BMI Norge AS, Postbox 55, 1477 Fjellhamar, Norway.

The holder of the approval is responsible for the factory production control in order to ensure that Icopal Fonda Universal is produced in accordance with the preconditions applying to this approval.

The manufacturing of Icopal Fonda Universal and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

Manufacturer of Icopal Fonda Universal has a certified quality management system according to EN-ISO 9001.

8. Basis for the approval

The evaluation of Icopal Fonda Universal 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

The rolls of Icopal Fonda Universal shall be marked with name of producer, name of product and date of production.

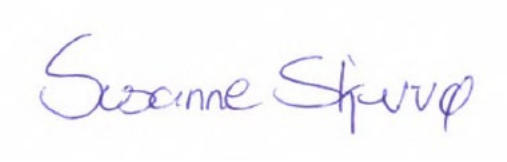
The product is CE marked in accordance with EN 13967

The approval mark for SINTEF Technical Approval No. 2136 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



Susanne Skjervø
Approval Manager