

SINTEF confirms that

Kami PLEGEL® steel sheets

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

Kami AB
 Box 10130
 952 27 Kalix, Sweden
www.kami.se

2. Product description

Kami TerraPLEGEL® and Kami PlusPLEGEL® are roofing sheets of surface treated, corrosion protected steel.

Kami TerraPLEGEL® has a sand strewn rude surface. Kami PlusPLEGEL® has a varnished smooth surface. Geometric information for the sheets is given in table 2.

Products can be delivered in different colours.

Different self-drilling screws with gasket and washer for fastening of the steel sheets are also supplied. Screw dimension 4,8 x 35 mm are suitable to fix the steel sheets against the wood-based boards beneath. 4,8 x 20 mm is suitable to fix the lateral overlap.

Table 1.
Surface treatment for Kami PLEGEL® steel sheets

Type treatment	TerraPLEGEL®		PlusPLEGEL®	
	Top-side	Bottom-side	Top-side	Bottom-side
Zinc layer 275 g/m ²	Yes	Yes	Yes	Yes
Primer	Yes	Yes	Yes	Yes
Polyester layer	Yes	-	Yes	-
Varnish	ca.47,5µm	-	75 µm	-
Quartz sand	Yes	-	-	-
Varnish	ca.47,5µm	-	-	-

3. Fields of application

Kami PLEGEL® steel sheets can be used in risk classes 1-6 and in fire classes 1,2 and 3 if the earlier roofing satisfies B_{ROOF} (t2). If the earlier roofing not satisfies this requirement is the use restricted to buildings with distance of in minimum 8,0 m to the neighbour building. Given that the conditions in chapter 6 (special conditions for use and installation) are fulfilled.

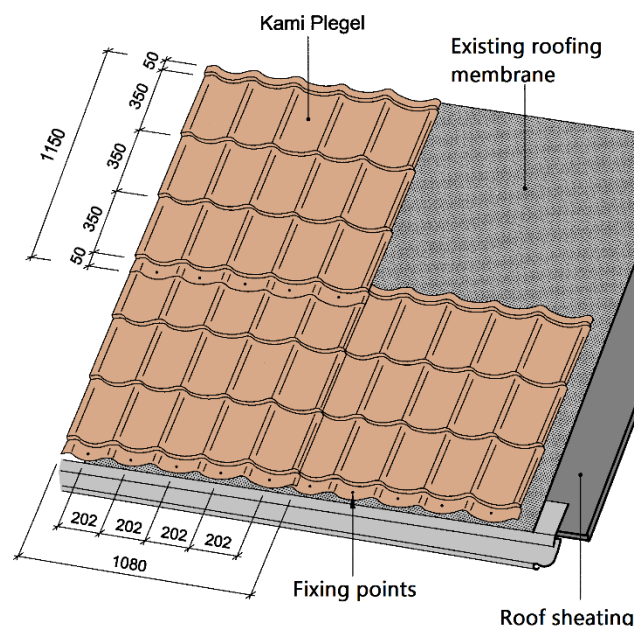


Fig. 1
Kami PLEGEL® steel sheets installed directly on existing bituminous roofing. The screws are placed at the bottom of each tile profile along the lower sheet edge and for each third tile profile in the direction of the roof slope.

Kami PLEGEL® steel sheets shall be installed directly on existing roofing of either bituminous shingles or bituminous roofing membrane.

4. Properties

Safety in case of fire

Kami PLEGEL® steel sheets satisfy class B_{ROOF} (t2) according to EN 13501-5 for external fire exposure of roofs.

Kami PLEGEL® steel sheets are considered for intendent use on roofing which has already fire classification what satisfies requirements for this building.

Water tightness

Kami PLEGEL® steel sheets used directly on older roofing is assessed to provide satisfactory water tightness, given that the conditions specified in chapter 6 are fulfilled.

Table 2
Product properties of Kami PLEGEL® steel sheets

Properties	Kami PLEGEL® stålplater				Unit	Tolerance
	TerraPLEGEL®		PlusPLEGEL®			
	DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾		
Steel thickness	0,5	0,5	0,5	0,5	mm	±0,5 %
Min. length	-	1150	-	1150	mm	0/+2 mm
Max. length	-	6500	-	6500	mm	0/+5 mm
Max. Covered length	-	6500	-	6500	mm	0/+5 mm
Width	-	1080	-	1080	mm	0/+2 mm
Max. Covered width	-	1010	-	1010	mm	-
Overlap	-	70	-	70	mm	0/+2 mm
Weight / m ²	-	ca. 5,5	-	ca. 4,8	kg/m ²	-
Snow load resistance	-	Depending of the existing roof construction	-	Depending of the existing roof construction	-	-

¹⁾ The manufacturers Declaration of performance, DoP

²⁾ Control limits show values the products have to satisfy during internal factory production control and audit testing.

5. Environmental aspects

Substances hazardous to health and environment

Kami PLEGEL® steel sheets containing 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 to soil and water have not been tested.

Waste treatment/recycling

The product shall be sorted as metal waste. The product shall be delivered to an authorized waste treatment plant for material recovery.

Environmental declaration

No environmental declaration (EPD) has been worked out for Kami PLEGEL® steel sheets.

6. Special conditions for use and installation

General

Installing the products should take respect to Kami's assembly instruction as well as to SINTEF Building Research Design Guides no 544.101 *Tekking med takstein*. *Materialer, legging og forankring* and 544.103 *Tekking med profilerte metallplater*.

Subroofing

Kami PLEGEL® steel sheets should only be installed directly on existing bituminous roofing, either shingle or bituminous roofing membranes. Subroofing beneath the bituminous membranes should be wood-based panels or boards. The steel sheets are installed without any use of battens and counter battens.

In order to have a satisfactory watertight roof before installation of the steel sheets, the existing roof must first be inspected and repaired if required.

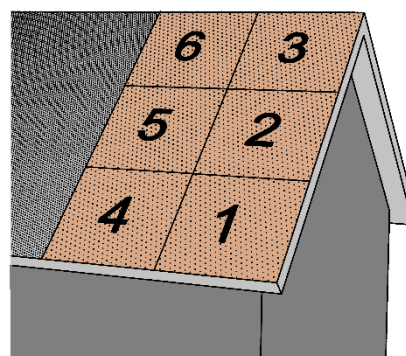


Fig. 2
Installation sequence for Kami PLEGEL® steel sheets

Roof slope

The roofing system should in general not be applied on roofs with a slope less than 10°.

Fixings

Steel sheets shall be fixed with Kami's recommended screws using a fixation pattern as shown in Fig. 1. To prevent the screw holes from expanding due to temperature movements in the sheets it is important that the fixation pattern is followed, with no additional fixation points between the specified screw rows.

It needs to be ensured that the screws are firmly fixed to the underlying wooden-based sheeting, and that the rubber gasket under the screw head is pressed approximately 1 mm outside the edge of the metal washer. If a screw strikes the joint between two roof boards, the further placement of the screws must be adjusted. Screws with poor attachment must be kept in their position.

Installation

Carefully handling has to be exercised in order not to damage the steel sheets during installation, even if the sheets can withstand ordinary walking traffic after being installed.

Taking respect to the order of the overlaps and screwing, the steel sheets are installed in the sequence shown in Fig. 2.

Cutting of the steel sheets must be done with a slow-going special saw with hard metal blade or a metal shear. Angle grinders or high-speed saws which induce much heat at the cutting edge must be avoided. Cutting edges has to be covered with a layer of corrosion protecting paint to provide corrosion from the edges.

Lateral overlap is normally one wave, and 100 mm in the direction of the roof slope. The water tightness of the lateral overlaps may be improved with the application of Kami lateral overlap screws which are fixed somewhat inclined towards the underlay as shown in Fig. 3.

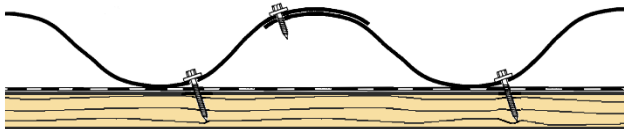


Fig. 3
Location of fixing points at lateral overlaps.

Snow fences

Snow fences installed on the roofing must be adapted to the Kami TerraPLEGEL® and PlusPLEGEL® profiles. Requirements for snow fences on roofs with TerraPLEGEL® can be considered being the same as for roofs with rude concrete tiles, and for PlusPLEGEL® the same as for glazed clay tile roofing. See SINTEF Building Research Design Guide no.: 525.931 *Snøfangere*.

7. Factory production control

The product is produced by Kami AB, Vintervägen 16, 952 61 Kalix, Sweden.

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

The installation of the roofing system has to be inspected at building site as part of the ordinary on site works inspection. The roofing manufacturer's installation guide is subject to supervisory control according to contract between SINTEF Building and Infrastructure and Kami AB concerning Technical Approval.

Quality system of Kami AB is certified from RISE according EN ISO 9001, certificate no.: 1316???

8. Basis for the approval

The SINTEF Technical Approval is based on laboratory testing during initial product testing.

- Norges byggforskningsinstitutt, report O 14362, dated 12.03.2004, Evaluation of water tightness of the screw connections

9. Marking

Kami PLEGEL® steel sheets need to be marked with manufacturers name, name of the product and production number.

The product is CE marked in accordance with EN 14782.

The approval mark for SINTEF Technical Approval No. 2400 may also be used.



Approval mark

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