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European Technical Assessment ETA-15/0473 of 05.02.2025

General Part

Technical Assessment Body issuing the European Technical Assessment:	SINTEF AS by its institute SINTEF Community
Trade name of the construction product	Lett-Tak roof elements
Product family to which the construction product belongs	Light weight steel/wood load bearing prefabricated roof elements
Manufacturer	Lett-Tak Systemer AS Hegdalveien 139 NO-3261 Larvik Norway Tel. + 47 33 13 28 00 E-mail: firmapost@lett-tak.no www.lett-tak.no
Manufacturing plant(s)	Lett-Tak Systemer AS Hegdalveien 139 NO-3261 Larvik
This European Technical Assessment contains	10 pages including Annex A - C which form an integral part of this assessment. Annex C refers to confidential information which is not included in the European Technical Assessment when that assessment is publicly disseminated
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 340037-00-0204 Light weight steel/wood load bearing roof elements, edition July 2015
This version replaces	ETA 15/07473-2023-02-06

Specific parts

1. Technical description of the product

Lett-Tak roof elements are load-bearing, light-weight roof elements based on two parallel, U-shaped galvanized steel sheets, wood members and structural spruce plywood panel or structural laminated spruce or pine veneer lumber acting together as a structural, stressed-skin construction. Annex A shows the basic construction design. The main load-bearing, steel profiles are either nailed and glued or only nailed to load bearing flanges. The flanges and the structural spruce plywood panel are glued together and work as a compression flange for the structural system.

The elements are delivered on site with a bitumen, PVC or TPO roofing membrane on top, thermal insulation inside, and a water vapour barrier underneath.

The elements are being produced and assembled in the factory with different types of ceilings, most frequently with 50 mm stone wool fire protection. Ceiling sheets may be perforated to achieve better acoustic absorption. Colour coated steel ceiling sheets are delivered on demand.

Standard element width is 2,4 m. The length of elements is custom made for each delivery with lengths up to approximately 18 m. Annex A Table 2 shows the thickness and weight of standard elements. The element thickness is determined by span requirements and the structural design, as well as thermal insulation requirements.

Material and component specifications are shown in Annex A Table 1.

2. Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The intended use of Lett-Tak elements is flat or sloped roofs for buildings with normal, dry indoor climate and for use in service class 1 or 2 in accordance with EN 1995-1-1. Lett-Tak can be delivered with outside drainage but must be evaluated for each building project.

Lett-Tak roof elements are not intended for use over rooms with high moisture content, such as swimming pools, printing works etc., neither in buildings with positive-pressure ventilation systems, without supplementary measures being considered in each case, to protect and avoid damage caused by moisture.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the elements of 50 years. These provisions are based upon the current state of the art and the available knowledge and experience.

The indication given on the working life cannot be interpreted as a guarantee given by the product manufacturer, or his representative, nor by EOTA, nor by the Technical Assessment Body, but are to be regarded to the means of choosing the right products in relation to the expected economically reasonable working life of the works.

3. Performance of the product and references to the methods used for its assessment

3.1 General

The following table shows the characteristics for which the product performances are declared in Annex A and B. The characteristics correspond to the Lett-Tak roof elements design specified in Annex A.

Basic works requirement		Product characteristic	Product performance
BWR 1	Mechanical resistance and stability	Load bearing capacities	See cl. 3.2 and Annex C
BWR 2	Safety in case of fire	Fire resistance	See cl. 3.3 and Annex B Table 4
		Reaction to fire	See cl. 3.3 and Annex A
BWR 3	Hygiene, health and the environment	Content and release of dangerous substances	See cl. 3.4
		Roof watertightness	See cl. 3.5
		Water vapour resistance	See cl. 3.1.6
BWR 4	Safety and accessibility in use	No performance declared	
BWR 5	Protection against noise	Airborne sound reduction index	See cl. 3.7 and Annex B Table 4
BWR 6	Energy economy and heat retention	Thermal resistance	NPA
		Airtightness of element joints	See cl. 3.8 and Annex B Table 5
BWR 7	Sustainable use of natural resources	No performance declared	
Durability aspects		See cl. 3.9	

3.2 Load bearing capacities

Load bearing capacities are calculated by the manufacturer case by case according to the structural requirements for the specific works. The structural designs are made according to the version of the structural design method specified in Annex C, which is filed by SINTEF and is an integral part of the technical assessment. The structural design method has been verified by full scale testing according to EAD 340037-00-0204.

3.3 Safety in case of fire

The resistance against fire from below depends on the ceiling construction and is shown in Annex B Table 4. The declared fire resistances are based on fire tests equivalent to EN 1356-2, and calculations of temperature increase in the load bearing steel profiles.

Classification of reaction to fire according to EN 13501-1 for materials and components of the elements are shown in Annex A, based on CE-marking of the specific products.

3.4 Hygiene, health and environment

The material and components used in Lett-Tak roof elements are not regarded as emitting any particles, gases or radiation that have any negative effect on indoor climate in general, or to have any significant impact on health.

Leaching from the elements is assessed to have no negative impact on soil, ground water or drinking water.

3.5 Roof watertightness

The roofing materials are CE-marked according to EN 13707 or 13956 and pass the requirement for watertightness at 10 kPa pressure.

3.6 Water vapour resistance

The water vapour control layer is CE-marked according to EN 13984.

Water vapour control layer is either type A or type V depending on specified delivery.

An inadmissible modification of moisture content caused by condensation from vapour diffusion or convection shall be avoided.

3.7 Airborne sound reduction index

Weighted apparent sound reduction index based on tests according to EN ISO 10140-2 and classification according to EN ISO 717-1 is shown in Annex B Table 4 for some standard element designs.

3.8 Airtightness of element joints

Airtightness of element joints tested according to EN 12114 is shown in Annex B Table 5.

3.9 Durability aspects

The structural steel components are hot-dip galvanized steel with zinc coating Z275MA according to EN 10027. Structural spruce plywood type exterior according to EN 13986 or Structural laminated veneer lumber according to EN 14374. Corrosion protection of fasteners is specified in Annex A Table 1 and meet the requirements for durability according to EN 1995-1-1.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the Decision 2003/728/EC of the European Commission as amended, the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is system 1.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVPC system are laid down in the control plan deposited at SINTEF.

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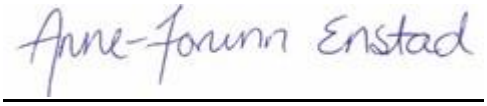
By

SINTEF AS by its institute SINTEF Community



Anne-Jorunn Enstad

Certification Manager

Annexes

ANNEX A

Lett-Tak roof elements	**Annex A**
Basic element design	

The figure and cross-section and Table 1 shows the basic built up of the element and material specifications. Table 2 shows standard element type designations, dimensions and weights.

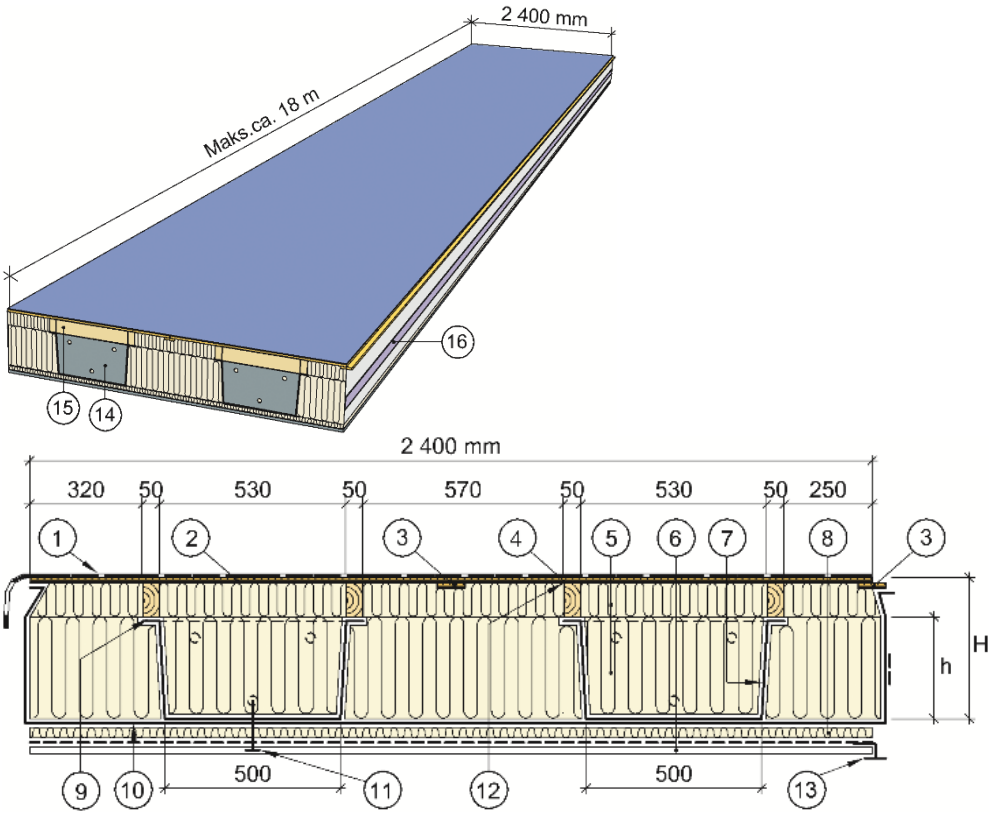


Table 1 Lett-Tak roof elements. Material and component specifications

Material/Component		Specification	Reaction to fire classification
1	Roofing	Bitumen roof waterproofing sheet according to EN 13707 PVC and TPO waterproofing sheet according to EN 13956.	$B_{roof}(t2)$ $B_{roof}(t2)$
2	Roof sheathing	Minimum 15 mm structural spruce plywood type Exterior according to EN 13986 or structural spruce or pine laminated veneer lumber (LVL) according to EN 14374. Thickness and material properties according to the individual structural element design,	D-s2, d0
3	Sheathing joint strip	Minimum 15 mm structural spruce plywood strip type Exterior according to EN 13986 or structural spruce or pine laminated veneer lumber(LVL) according to EN 14374.	D-s2, d0
4a[1)]	Timber flanges	Structural timber C 24 or C 30 according to EN 14081-1 and EN 338, as specified in the individual structural element design.	D-s2, d0
4b	Lvl flanges	Structural spruce or pine laminated veneer lumber (LVL) according to EN 14374	D-s2, d0
5	Mineral wool	Mineral wool according to EN 13162, with maximum λ_D = 0,037 W/mK,	A1
6a[1)]	Steel ceiling sheets	TRP 20 steel corrugated ceiling sheet (alternatively perforated),	A1

Continued on page 7

Table 1 continued

6b	Profile system	Steel profile system holding the ceiling insulation	A1
6c	Battens	Timber battens holding the ceiling insulation	D-s2, d0
7	Load bearing steel profiles	0,9 – 2,0 mm thick galvanized steel profiles S350GD +Z275MA according to EN 10027. Steel thickness as specified in the individual structural element design.	A1
8	Celling insulation	30-120 mm stone wool according to EN 13162, with λ_D = 0,034 W/mK	A1
9	Steel to wood connection	SikaForce Base 636 structural polyurethane glue with hardener 7050, plus Galvanized steel nails according to EN 14592, spaced c/c 60 mm. Alternatively nails only, spaced c/c 30 mm. Elements intended for use in service class 2 have nails with corrosion protection Fe/Zn 12c.	NPA
10	Water vapour control layer	0,20 mm polyethylene water vapour control layer type A or V according to EN 13984	F
11	Ceiling screw	Steel screw for ceiling installation.	A1
12	Plywood to wood connection	MUF structural glue, Type I, approved and certified according to EN 301,, installed with 11,1 x 22 – 44 mm staples, spaced 50 mm.	NPA
13	Ceiling profiles	Steel T-profile for ceiling edge.	A1
14	Steel gable ends	Galvanized steel end plate similar to pos. 7	A1
15	Timber reinforcement over steel gable ends	Structural timber C 18 according to EN 14081-1 and EN 338, as specified in the individual structural element design.	D-s2, d0
16	Tape	Double-sided tape for connecting water vapour control layers.	NPA

1) Elements can be delivered with one of the following alternatives a, b or c in the material specifications.

Table 2

Standard element type designations, dimensions and self-weights

Element type [1] (h/t)	Timber flange dimension 48 mm x 71 mm		Timber flange dimension 48 mm x 96 mm		Timber flange dimension 48 mm x 121 mm	
	Total element height H [2] (mm)	Self-weight [3] kN / m²	Total element height H [2] (mm)	Self-weight [3] kN / m²	Total element height H [2] (mm)	Self-weight [3] kN / m²
16/0,9	246	0,38	271	0,39	296	0,41
16/1,5	246	0,41	271	0,43	296	0,45
21/0,9	296	0,40	321	0,41	346	0,43
21/2,0	296	0,47	321	0,49	346	0,50
31/0,9	396	0,44	421	0,45	446	0,47
31/2,0	396	0,52	421	0,54	446	0,55
36/0,9	446	0,46	471	0,47	496	0,49
36/1,5	446	0,51	471	0,53	496	0,54
36/2,0	446	0,55	471	0,57	496	0,58
44/1,5	526	0,55	551	0,57	576	0,58
44/2,0	526	0,55	551	0,61	576	0,63

1) Standard element type designation is characterized by the height h in cm and the steel thickness t in mm

2) Total height is without ceiling. The thickness of standard ceilings is 30 mm or 50 mm, which adds to the total element thickness.

3) The values apply to elements with 50 mm ceiling insulation. Elements with 30 mm ceiling insulation have 0,03 kN/m² lower self-weight.

ANNEX B

Lett-Tak roof elements	**Annex B**
Product Performance	

Table 3
Fire resistance of standard Lett-Tak Roof Elements

Fire resistance	Type of Ceiling	Insulation in ceiling	Insulation in element
REI 15	Battens	None	Stone wool or glass wool
	Steel plate		
REI 30	Steel plate	30 mm stone wool [1)]	Stone wool
	Steel profile system	50 mm stone wool [2)]	Stone wool or glass wool
	Timber battens		
REI 60	Steel profile system	50 mm stone wool [2)]	Stone wool. Up to 100 mm glass wool can be used at the top outside of load bearing profiles. Glass wool can be used for the whole height inside the chamber /canal [3)]
REI 60	Steel profile system	100 mm stone wool [2)]	Stone wool or glass wool
	Steel plate	50 mm stone wool [2)]	Stone wool or glass wool
		100 mm stone wool [2)]	Stone wool or glass wool
REI 90	Steel profile system	100 mm stone wool [2)]	Stone wool
	Steel plate		

[1)] Stone wool with density minimum 110 kg/m^3

[2)] Stone wool with density minimum 90 kg/m^3

[3)] With glass wool in the load-bearing profiles 2 x 185 glass wool with density minimum 15 kg/m^3, compressed to 306 mm, shall be used. For ceiling insulation connected with profile system (iso-list) a combination of stone wool and glass wool outside the load bearing profiles can be used (210 mm stone wool with nominal density minimum 35 kg/m^3 and 100 mm glass wool with nominal density minimum 15 kg/m^3), eventually only stone wool.

Table 4

Weighted apparent sound reduction index, R_w, and weighted apparent sound reduction index plus spectrum adaption term for traffic noise, $R_w + C_{tr}$, for Lett-Tak roof elements with 20 mm TRP steel ceiling.

Element type	Ceiling insulation	Ceiling sheets	R_w	$R_w + C_{tr}$
29	30 mm	Sheets with 15 % perforation	52 dB	45 dB
29		Sheets without perforation	54 dB	46 dB
31 and 36	50 mm	Sheets without perforation	61 dB	61 dB

Table 5

Air tightness of element joints

Solution	Air leakage per meter joint at 50 Pa pressure difference
Longitudinal joints	≤ 0,1 m^3/h
Transversal joints - with loose overlap vapour barrier joints	≤ 0,6 m^3/h
Transversal joints – with overlap vapour barrier joints clamped with plywood collar	≤ 0,5 m^3/h

ANNEX C

Lett-Tak roof elements	**Annex C**
Structural design method	

The structural capacity of Lett-Tak roof elements is calculated according to the document "Calculation of the load-bearing capacity of Lett-Tak – Description of calculation tools and principals". The structural design method is part of this European Technical Assessment, and the valid version is the version filed at SINTEF at any time.