

European Technical Assessment

ETA 14/0257
of 20/01/2020

General Part

Technical Assessment Body issuing the European Technical Assessment:

RISE Research Institutes of Sweden AB

Trade name of the construction product

Lättelement Roof

Product family to which the construction product belongs

Prefabricated wood-based loadbearing stressed skin panels

Manufacturer

Lättelement AB
Höglandsvägen 9
SE-891 50 Örnsköldsvik, Sweden
Internet: www.m-l.se

Manufacturing plant(s)

Lättelement AB
Höglandsvägen 9
SE-891 50 Örnsköldsvik, Sweden

This European Technical Assessment contains

12 pages including 6 annexes which form an integral part of this assessment.

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of

EAD 140022-00-0304, Prefabricated wood-based loadbearing stressed skin panels.

This version replaces*

ETA 14/0257, issued on 18/08/2014

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Specific parts

1 Technical description of the product

Lättelement Roof are load bearing stressed skin panels made of structural wood based beams, underlay roofing felt, external wood based boards, mineral wool insulation and internal lacquered steel sheets. The materials and dimensions are given in Annex 1, Annex 2 and Annex 3. The wood based boards are fully bonded with adhesive type I according to EN 301 and mechanically fixed to the beams.

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

The panels are intended to be used as load bearing elements in roofs in service class 1 and 2 according to EN 1995-1-1 and in internal humidity class 1-4 according to EN ISO 13788. The panels may be used in load bearing function or for load transmission stressed perpendicular as well as in plane of the panels.

The performances given in Section 3 and the assumed working life are only valid if the periodic inspection and maintenance are made according to the manufacturers instructions.

The provisions made in this European Technical Assessment are based on an assumed working life of the stressed skin panels of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for 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 Essential characteristics and their performance

		Characteristic	Performance
BWR 1	Mechanical resistance and stability	Load bearing capacities	Clause 3.1.1
BWR 2	Safety in case of fire	Reaction to fire	See Annex 2
		Resistance to fire	See Annex 3
BWR 3	Hygiene, health and the environment	Water vapour permeability and moisture resistance	Clause 3.1.3.1
		Watertightness	Clause 3.1.3.2
		Content and/or release of dangerous substances	Clause 3.1.3.3
BWR 5	Protection against noise	Airborne sound insulation	See Annex 4
BWR 6	Energy economy and heat retention	Thermal resistance	See Annex 5
		Air permeability	Clause 3.1.6.1

3.1.1 Mechanical resistance and stability

The design calculations are either made case by case by the manufacturer according to order for the works (Method 3b), or by the purchaser and the party responsible for the design (Method 3a.)

The load bearing structures are planned individually according to the regulations valid on the place of use.

The information related to the panels, such as material specifications, structural sections and details, given in the annexes are necessary for the mechanical resistance and stability of the structure.

The panels are not intended to be used in areas where they might support seismic action.

3.1.2 Hygiene, health and the environment

3.1.3.1 Vapour permeability and moisture resistance

Based on calculations, field examinations and experience, the function of Lättelement Roof is adequate in a climate where temperature flow is from inside out most part of the year.

Note: National regulations valid in the place of use may apply.

3.1.3.2 Watertightness

The water tightness of the external envelope has been assessed to fulfil the common requirements against driving rain when the elements are covered with watertight membranes or metal sheets.

Note: National regulations valid in the place of use may apply.

3.1.3.3 Content and/or release of dangerous substances

All wood based boards in the kit satisfy formaldehyde class E1 in EN 13986.

A written statement from the manufacturer has been provided and the kit does not include any other substances listed in the EU database.

Regarding dangerous substances contained in this European technical assessment, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.1.6.2 Air permeability

The panels have been assessed to have adequate air tightness for the specified intended use.

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

According to the decision 2000/447/EC - Commission decision of date 13 June 2000, published in the Official Journal of the European Union (OJEU) L180 of 19/07/2000, of the European Commission the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) given in the following table applies:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Prefabricated wood-based load-bearing stressed skin panels	For building works	-	1

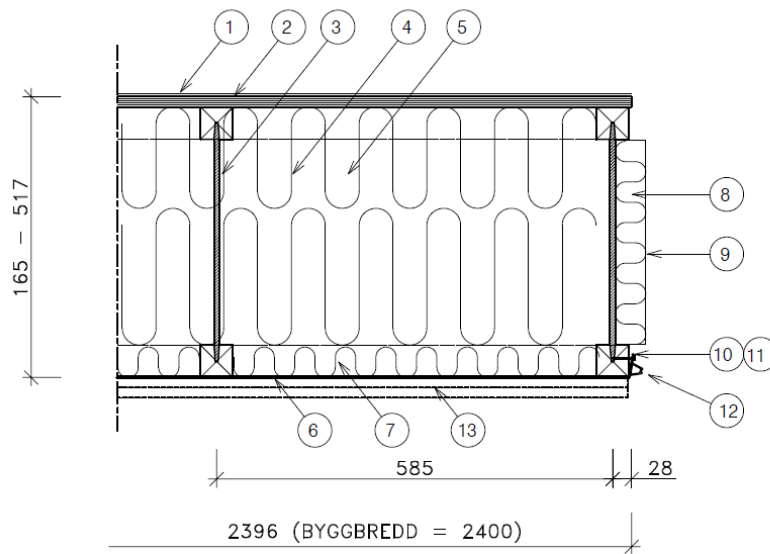
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

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

Issued in Borås on 20.01.2020
By RISE Research Institutes of Sweden AB

Johan Åkesson
Certification Manager

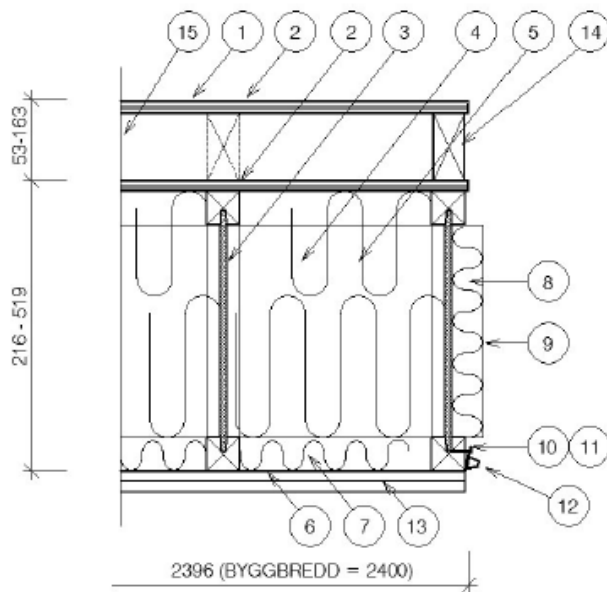
Annex 1



Materials:

1. Roof underlay or Roof covering
2. 14,5 – 18 mm Plywood
3. I-beams, standard spacing 585 mm
(LVL-beams or glulam beams may be used for one or more beams in an element)
4. Noggings pieces
5. 50-400 mm Mineral wool insulation
6. 0,5 or 0,7 mm Metal sheets
7. 50 mm mineral wool insulation
8. 50 mm mineral wool insulation
9. Noggings pieces
10. Edge of metal sheet
11. Nailing
12. Rubber moulding EPDM
13. Plasterboard for fire protection, when relevant (see Annex 3)

Annex 2



Materials:

1. Roof underlay or Roof covering on top plywood
2. 14,5 – 18 mm Plywood
3. I-beams, standard spacing 585 mm
(LVL-beams or glulam beams may be used for one or more beams in an element)
4. Nogging pieces
5. 50-400 mm Mineral wool insulation
6. 0,5 or 0,7 mm metal sheets
7. 50 mm mineral wool insulation
8. 50 mm mineral wool insulation
9. Nogging pieces
10. Edge of metal sheet
11. Nailing
12. Rubber moulding EPDM
13. Plasterboard for fire protection, when relevant (see Annex 3)
14. Wood 34x45-45x145 s585 or s 1170 (optional)
15. Ventilated space (optional)

Element types: I-beams with 47x47 mm flanges and 10 mm OSB or Particleboard web

Designation	2. Plywood	3. Truss height	5. Mineral wool	6. Metal sheet
A 154	Min 14,5 mm	150 mm	50 mm	0,5 or 0,7 mm
A 204	Min 14,5 mm	200 mm	100 mm	0,5 or 0,7 mm
A 254	Min 14,5 mm	250 mm	150 mm	0,5 or 0,7 mm
A 304	Min 14,5 mm	300 mm	200 mm	0,5 or 0,7 mm
A 354	Min 14,5 mm	350 mm	250 mm	0,5 or 0,7 mm
A 404	Min 14,5 mm	400 mm	300 mm	0,5 or 0,7 mm
A 454	Min 14,5 mm	450 mm	350 mm	0,5 or 0,7 mm
A 504	Min 14,5 mm	500 mm	400 mm	0,5 or 0,7 mm
A 155	Min 16,5 mm	150 mm	50 mm	0,5 or 0,7 mm
A 205	Min 16,5 mm	200 mm	100 mm	0,5 or 0,7 mm
A 255	Min 16,5 mm	250 mm	150 mm	0,5 or 0,7 mm
A 305	Min 16,5 mm	300 mm	200 mm	0,5 or 0,7 mm
A 355	Min 16,5 mm	350 mm	250 mm	0,5 or 0,7 mm
A 405	Min 16,5 mm	400 mm	300 mm	0,5 or 0,7 mm
A 455	Min 16,5 mm	450 mm	350 mm	0,5 or 0,7 mm
A 505	Min 16,5 mm	500 mm	400 mm	0,5 or 0,7 mm

I-beams with 47x70 mm flanges (47x47 mm at edges) and 10 mm OSB or Particleboard web

Designation	2. Plywood	3. Truss height	5. Mineral wool	6. Metal sheet
AI 155	Min 16,5 mm	150 mm	50 mm	0,5 or 0,7 mm
AI 205	Min 16,5 mm	200 mm	100 mm	0,5 or 0,7 mm
AI 255	Min 16,5 mm	250 mm	150 mm	0,5 or 0,7 mm
AI 305	Min 16,5 mm	300 mm	200 mm	0,5 or 0,7 mm
AI 355	Min 16,5 mm	350 mm	250 mm	0,5 or 0,7 mm
AI 405	Min 16,5 mm	400 mm	300 mm	0,5 or 0,7 mm
AI 455	Min 16,5 mm	450 mm	350 mm	0,5 or 0,7 mm
AI 505	Min 16,5 mm	500 mm	400 mm	0,5 or 0,7 mm

I-beams with 47x97 mm flanges (47x47 mm at edges) and 10 mm OSB or Particleboard web

Designation	2. Plywood	3. Truss height	5. Mineral wool	6. Metal sheet
AB 155	Min 16,5 mm	150 mm	50 mm	0,5 or 0,7 mm
AB 205	Min 16,5 mm	200 mm	100 mm	0,5 or 0,7 mm
AB 255	Min 16,5 mm	250 mm	150 mm	0,5 or 0,7 mm
AB 305	Min 16,5 mm	300 mm	200 mm	0,5 or 0,7 mm
AB 355	Min 16,5 mm	350 mm	250 mm	0,5 or 0,7 mm
AB 405	Min 16,5 mm	400 mm	300 mm	0,5 or 0,7 mm
AB 455	Min 16,5 mm	450 mm	350 mm	0,5 or 0,7 mm
AB 505	Min 16,5 mm	500 mm	400 mm	0,5 or 0,7 mm

Annex 3

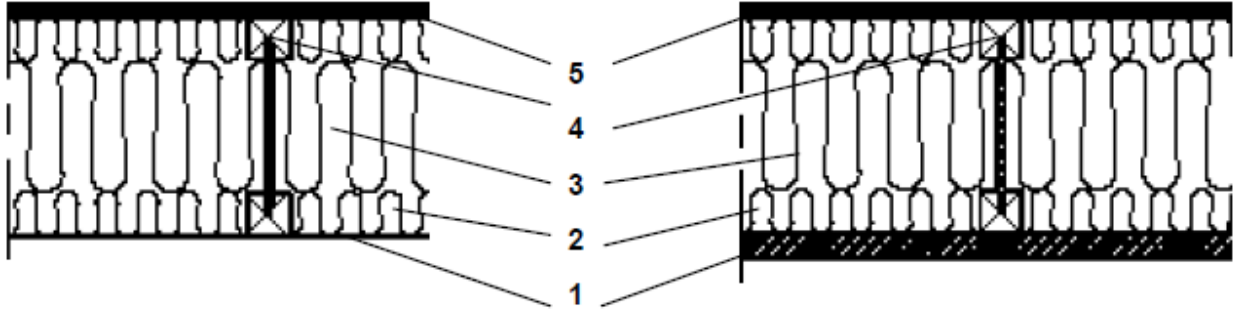
Material and component specifications

Component / material	Classification	Standard	Reaction to fire class
Timber	C18, C24, C30	EN 338, EN 519	D-s2, d0
Glulam-beams	Strength values specified in the design documents	EN 386, EN 1194	D-s2, d0
LVL-beams	Strength values specified in the design documents	EN 14374	D-s2, d0
I-beams	Strength values specified in the design documents	Valid ETA	D-s2, d
Plywood		EN 13986, EN 636	D-s2, d0
Plasterboard	Type A, $\mu=10$	EN 520	A2-s1, d0
Plasterboard	Type F, $\mu=10$	EN 520	A2-s1, d0
Roof underlay Micoral		EN 13707	F
Roof underlay Micoral YAM 2500		EN 13707	F
Roof underlay Membrane 3		EN 13707	E
Roof covering Monolight NXT		EN 13707	B _{ROOF(t2)} *
Roof covering Mono PM		EN 13707	B _{ROOF(t2)} *
Roof covering Mono P/Noxite		EN 13707	B _{ROOF(t2)} *
Mineral wool insulation	$\lambda= 0,036$	EN 13162	A1
Metal sheet	S350GD+Z275-M-C	EN 10346	
Fasteners		EN 14592	
Steel connectors		EN14545	
Sealings EPDM			

*Class B_{ROOF(t2)} is applicable for installation on plywood.

Annex 4

Resistance to fire:



Protection type 1
Standard panel

Protection type 6
2x15 mm plasterboard type F

The fire resistance classification REI 30 and REI 60 of the elements require the following component specifications.

Component	Identification	Material	Depth	Product specification
Fire protection system (Protection type 1)	1	Metal sheet	≥ 0.5 mm	S350 EN 10346
Fire protection system (Protection type 6)	1	Gypsum plaster board	2x15 mm	Gyproc GF 15 Protect F EN 520
	1	Metal sheet	≥ 0.5 mm	
Cavity insulation at the fire exposed side	2	Stone wool Nominell density ≥ 30 kg/m ³	≥ 50mm	PAROC eXtra or ROCKWOOL Flexibatts EN 13162
Cavity insulation in the remaining cavity (100% filling required)	3	Mineral wool Nominell density ≥ 30 kg/m ³	100 to 450 mm (5 mm deviation acceptable)	EN 13162
Joist	4	I-joist	150 to 500	Masonite Beams typ H or type HI ETA-12/0018
Decking	5	Plywood	≥ 14.5 mm	EN 13986

Element joints have to be designed to provide a fire resistance equal or higher then the fire resistance of the floor elements. For insulation used in element joists no glass wool shall be used.

The classification of the fire resistance (R) is valid up to a specific loading of the element. The moment capacities of elements Type 1 and Type 6 are given below in kNm/m.

Type		Protection type 1		Protection type 6	
Group	Designation	Fire resistance	Effect [kNm/m]	Fire resistance	Effect [kNm/m]
A	A 154	REI 30	3.8	REI 60 ²	24.5
	A 155		4.0		31.0
	A 204		5.7		33.2
	A 205		5.8		42.2
	A 254		8.4		41.9
	A 255		8.6		53.7
	A 304		12.0		50.7
	A 305		12.2		65.4
	A 354		16.3		59.4
	A 355		16.6		77.3
	A 404		20.8		68.2
	A 405		21.7		89.4
	A 454		26.4		76.9
	A 455		27.5		101.6
	A 504		32.6		85.6
A 505	34.0	113.4			
AI	AI155	REI 30	6.6	REI 60 ²	33.5
	AI 205		9.3		45.9
	AI 255		13.0		58.1
	AI 305		17.6		70.3
	AI 355		23.0		82.4
	AI 405		29.0		94.5
	AI 455		35.8		106.6
	AI 505		43.3		118.7
AB	AB 155	REI 30	9.4	REI 60 ²	34.9
	AB 205		13.2		47.5
	AB 255		18.0		60.3
	AB 305		23.7		73.1
	AB 355		30.2		85.9
	AB 405		37.4		98.7
	AB 455		45.4		111.6
	AB 505		54.0		124.4
¹ The moment capacity for the fire resistance up to 30 minutes of elements with fire protection type 1 deviating from specified types (e.g. deviating joist spacing) can be calculated by means of EN 1995-1-2 assuming $d_0 = 7$ mm. ² Moment capacity as in ULS					

Annex 5

Sound insulation for standard panels

Sound insulation for other types will be calculated for each individual works. Given values are stated as calculated or measured under laboratory conditions.

No correction for flanking transmission has been accounted for in the declared values.

Designation	Plywood	Mineral wool thickness	Metal sheet	R_w / C_{tr}
A 204	Min 14,5 mm	200	0,5 or 0,7 mm	48 / -6
A 254	Min 14,5 mm	250	0,5 or 0,7 mm	48 / -6
A 304	Min 14,5 mm	300	0,5 or 0,7 mm	49 / -4
A 354	Min 14,5 mm	350	0,5 or 0,7 mm	49 / -4
A 404	Min 14,5 mm	400	0,5 or 0,7 mm	49 / -4
A 454	Min 14,5 mm	450	0,5 or 0,7 mm	50 / -4
A 504	Min 14,5 mm	500	0,5 or 0,7 mm	51 / -4
A 205	Min 16,5 mm	200	0,7 mm	49 / -4
A 255	Min 16,5 mm	250	0,7 mm	49 / -4
A 305	Min 16,5 mm	300	0,7 mm	50 / -4
A 355	Min 16,5 mm	350	0,7 mm	50 / -4
A 405	Min 16,5 mm	400	0,7 mm	50 / -3
A 455	Min 16,5 mm	450	0,7 mm	50 / -3
A 505	Min 16,5 mm	500	0,7 mm	51 / -3

Annex 6

U-values

Designation	Mineral wool thickness	U (W/m ² K)
A 154 and A 155	150	0,257
A 204 and A 205	200	0,192
A 254 and A 255	250	0,153
A 304 and A 305	300	0,127
A 354 and A 355	350	0,109
A 404 and A 405	400	0,095
A 454 and A 455	450	0,080
A 504 and A 505	500	0,076

Designation	Mineral wool thickness	U (W/m ² K)
AI 155	150	0,264
AI 205	200	0,196
AI 255	250	0,156
AI 305	300	0,129
AI 355	350	0,110
AI 405	400	0,096
AI 455	450	0,090
AI 505	500	0,077

Designation	Mineral wool thickness	U (W/m ² K)
AB 155	150	0,272
AB 205	200	0,201
AB 255	250	0,159
AB 305	300	0,132
AB 355	350	0,112
AB 405	400	0,098
AB 455	450	0,090
AB 505	500	0,078