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Rakennusalan tuotteita koskevan jäsenvaltioiden lainsäädännön lähentämisestä 21 päivänä joulukuuta 1988 annetun neuvoston direktiivin 89/106/EEC mukaisesti ilmoitettu tuotehyväksyntälaitos

EOTAN JÄSEN

Eurooppalainen tekninen hyväksyntä European Technical Approval

ETA-09/0344

Kauppanimi:

Trade name

Lapponia house Oy

Hyväksynnän haltija:

Holder of approval:

Lapponia house Oy

Verkkokarinkatu
94900 Kemi
Finland

Tuotetyyppi ja sen käyttötarkoitus:

Generic type and use of construction product:

Puutalon rakennussarja

Timber frame building kit

Voimassaoloaika:

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Manufacturing plants:

Lapponia house Oy

Verkkokarinkatu
94900 Kemi

Tämä hyväksyntä sisältää

This European Technical Approval contains

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67 pages including 1 annex + 2 separate annexes



Eurooppalainen tekninen hyväksyntäorganisaatio
European Organisation for Technical Approvals

I LEGAL BASIS AND GENERAL CONDITIONS

1. This European Technical Approval is issued by the Technical Research Centre of Finland (VTT) in accordance with:
 - Council Directive (89/106/EEC)¹ of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products, modified by the Council Directive 93/68/EEC of 22 July 1993² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - Laki rakennustuotteiden hyväksynnästä (230/2003) luvut 3 ja 10, Ympäristöministeriön asetus rakennustuotteiden hyväksynnästä 3 § sekä Ympäristöministeriön 14.10.1997 antama valtuutus päätös (12/352/94).
 - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC⁴;
 - Guideline Nr 007 for European Technical Approval of Timber frame building kits
2. The Technical Research Centre of Finland (VTT) is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.
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¹ Official Journal of the European Communities N° L 40, 11.2.1989, p. 12

² Official Journal of the European Communities N° L 220, 30.8.1993, p. 1

³ Official Journal of the European Union N° L284, 31.10.2003, p. 1

⁴ Official Journal of the European Communities N° L 17, 20.1.1994, p. 34

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SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of the construction product

Lapponia house homes are predesigned timber frame building kits prepared in the factory for each individual house, and delivered as a package to be assembled on site.

The kits covered by this ETA consist of the main building parts such as walls, suspended floors and roof structures described in the ETA.

The Lapponia house building kits are made up of large prefabricated external timber frame wall units, floors, ceiling, roof units as well as windows and doors. Parts of the interior or exterior wall cladding may be delivered to the site as separate packages for technical reasons. The delivery content depends on the kit model in question and on the destination country.

The walls of the building kit are load bearing and these are made of a 'thermo log' concept, where the wall is timber frame with mineral wool insulation. In the exterior side the wall is covered with a wind brake board (fibreboard), a ventilation gap and log panelling. In the interior side, there is a polyethylene moisture barrier together with the cladding, which may be of log panels or gypsum boards. These elements are of a constant height of 2710 mm and their length is a multiple of 600 mm with a maximum of 6500 mm. The interior walls are delivered as separate elements or they may be constructed on site from bricks. The wall elements are anchored to the foundations at 1200 mm intervals. Laminated log pieces may be used as corner pieces in the façade, these have no load bearing function.

The basic design of the assembled components as well as the material and component specifications are shown in Annexes 1 and 2. Detailed design specifications including connections between the components and assembly are shown in the supporting document Annex 3: Lapponia house building kit. Supplement to ETA no.09/0344. Annex 3 is a formal part of the ETA and the valid version of the document is the latest version filed by VTT.

The kits covered by this ETA may, in addition to the timber frame parts needed, comprise also glulam constructions, roof trusses and frames, windows and doors, thermal insulation, air and moisture control layers, linings, claddings, roofing and fixings. The timber frame parts may also be delivered in falling lengths. The extension of the delivery varies according to the option chosen by the customer and country of destination.

The minimum content of the delivery comprises at least all timber frame parts and the necessary fixings and connectors of load bearing parts. Windows and doors are optional. In addition, roofing and roof underlay may be delivered.

Complementary parts like substructure, surface coverings, stairs, internal fittings, technical installations for water, heating, ventilation, electricity and other components necessary to form completed works are not a part of this approval. This includes also supplementary constructions like such load-bearing constructions and such compartment walls not specified in this ETA.

More detailed information of the standard components, materials and dimensions are given in Annex 1. Typical solutions are presented in Annex 2, Supporting drawings.

1.2 Intended use

The kits are intended mainly to be used as residential buildings. Other possible uses are as kindergardens, shops, hostels, restaurants and corresponding when the performance requirements are applicable. The number of storeys is in general one or two, in addition also an attic.

The kits are intended to be placed on all types of substructure such as concrete slab on ground, basement made of blocks of lightweight aggregate concrete, or pillars.

The building kits are suitable for various climatic conditions. For timber frame parts as suspended base floors, roofs and parts with internal insulation and vapour barrier the moisture flow shall be from inside out for the most time of the year. Vapour barrier can be replaced by an air control layer, if the climatic conditions provide for that e.g. if the house were cooled during the summer time.

The wood components are not treated for use in areas with termite attacks. For such an application, chemical treatment may be done according to the rules valid on the building site. These kinds of treatment are not a part of this approval.

The provisions made in this European Technical Approval are based on an assumed intended working life of the building kit of 50 years for the load-bearing structure and non-accessible components and materials, and 25 years for repairable or replaceable components and materials like claddings, roofing materials, exterior trims, and integrated components like windows and doors provided the kit is subject to appropriate use and maintenance.⁵

2 Characteristics of product and methods of verification

ER 1 Mechanical resistance and stability

The kits are delivered according to either as a model house with predefined structural materials and sizes or as a "made to measure" principle with design documentation or reference to such documentation made by a third party.⁶

In case method 1 is applied, the actual design is not included in the CE-marking. Components normally used are specified in annex 2.

In case method 3 is applied, the manufacturer provides the design documents of the load-bearing structures (method 3b) or alternatively the design is carried out by the local structural designer and reference is made to this (method 3a). Only in the first case, the design is included in the CE-marking.

The information related to the kit, such as material specifications, structural sections and details, given in annex 1 and in annex 2, are necessary for the mechanical resistance and stability of the structure.

⁵ This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of a building kit cannot be interpreted as a guarantee given by the producer or the approval body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for building kits in relation to the expected, economically reasonable working life of the works.

⁶ This means that Methods 1, 3a or 3b may be used as referred to the Guidance paper L, Application and use of Eurocodes, 3.3.4.

Characteristic resistance of anchorage

Anchorage of the building to the foundations is dealt with as a part of design of works.

The roofing constructions will be anchored with the walls by nailing, screws, steel strap, ordinary nailing plates or sliding fixings specified by the manufacturer. The type and characteristic resistance of the anchorage depends of the amount of fasteners according to the specific design of the kit.

Resistance against seismic actions

No performance is determined for resistance against seismic actions.

Resistance to wind load of windows

Wind load resistance class of windows is given in annex 1.

ER 2 Safety in case of fire

Reaction to fire

The classification of the main materials with regard to reaction to fire is given in Annex 1.

For roofing, reaction to fire is NPD.⁷

Resistance to fire

For the timber framed walls resistance to fire is NPD.

Resistance to fire is usually considered as a part of the design of the works and achieved so that compartment walls made of other materials such as brickwork, concrete or gypsum plasterboard are used. These walls are not included to the building kit according to this approval.

External fire performance of roof coverings

Roof tiles (concrete or clay) and corrugated steel sheet roofing (thickness at least 0,4 mm) are considered to fulfil all requirements. The provisions for this are that the mass of any organic coating does not exceed 200 g/m².⁸ For pural coated steel roof sheets the external fire performance of roof covering is B_{ROOF}(t2). For bituminous roofing materials the external fire performance of roof covering is B_{ROOF}(t2).

ER 3 Hygiene, health and environment

Vapour permeability and moisture resistance

Vapour permeability and moisture resistance of the external envelope have been assessed to fulfil the common requirements for such climatic conditions, where the tendency of moisture flow is from inside out for the most time of the year, as in Northern part of Europe.

⁷ Reaction of fire of the roofing shall meet the requirements set in the place of use.

⁸ Some member states may have national provisions regarding the reaction to fire performance of the roof underlay, which shall be taken into account.

If the kit will be used in a building that is intended to be cooled during summertime, the function of the envelope shall be separately assessed with regard to moisture diffusion and condensation as a part of the design of works.

Water tightness

Water tightness of the external envelope has been assessed to fulfil the common requirements. The ventilation gap behind the façade will prohibit water to penetrate into the wind barrier.

Requirements concerning the waterproofing of internal surfaces refer to wet areas as bathrooms. Waterproofing of internal surfaces is not a part of the kit. The long term performance of the kit provides that proper waterproofing of internal surfaces is used. Tiles can not be considered to be a sufficient waterproofing in wet areas. E.g. a liquid applied waterproofing system with water vapour permeability less than 8×10^{-12} kg/(m²sPa), crack bridging capacity >1,5 mm and durability against alkali exposure shall be used under the tiles. Penetrations, corners and wall-floor joints shall be protected carefully. The vapour barrier shall be removed behind the waterproofing.

Windows

Water tightness class of windows is given in annex 1.

Dangerous substances

According to the declaration of the manufacturer, Lapponia house building kit does not contain harmful or dangerous substances as defined in the EU database. The product does not contain pentachlorophenol.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other 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 EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

ER 4 Safety in use

General

This approval of a building kit does not comprise the stairs that may be needed for the building⁹. The barriers that are part of the building kit will be planned (height, openings railing load) according to the specific requirements valid on the building site.

Slipperiness of floor finishes

This approval does not comprise the surface material or surface treatment of the floor.

⁹ Stairs will be manufactured individually and if they are prefabricated, they shall bear a CE-marking on their own when obligatory.

Impact resistance

A wall covered with log panels bear the impact caused by falling humans without structural damage. Impact resistance of walls covered by gypsum plasterboard is assessed on the basis of experience to be adequate for the normal use of the kit.

ER 5 Protection against noise

The acoustical planning of the kit is a part of the design of the works. The kit does not contain separating walls or floors with determined acoustic performance.¹⁰

The acoustic performance of windows and doors is NPD.

ER 6 Energy economy and heat retention

Thermal resistance

The corrected thermal transmittance coefficients for the Lapponia house components is as given below.

The thermal transmission coefficient of doors and windows is given in Annex 1.

Table 1. U_c -values in $W/(m^2K)$ for Lapponia homes

U_c-value of wall (Isover KL 35)	Thickness of insulation, $\lambda_{design} = 0,035 W/(mK)$				
	98 mm	170 mm	170+45 mm	198+45 mm	
	0,33	0,21	0,17	0,15	
U_c-value of wall (Isover KL 37)	Thickness of insulation, $\lambda_{design} = 0,037 W/(mK)$				
	98 mm	170 mm	170+45 mm	198+45 mm	
	0,34	0,22	0,18	0,16	
U_c-value of roof rafters spaced 600 or 900 mm	Thickness of insulation, $\lambda_{design} = 0,037 W/(mK)$				
	250mm	300 mm	350 mm	400 mm	450mm
	0,17	0,14	0,13	0,11	0,09
U_c-value of floor self-supported floor	Thickness of insulation, $\lambda_{design} = 0,037 W/(mK)$				
	150 mm	250 mm			
	0,28	0,18			

¹⁰ In several Member States there are no requirements set within one dwelling.

Air permeability

Air permeability is assessed to fulfil common requirements in conditions where the wind speed exceeds 25 m/s only occasionally¹¹. The air tightness of the components is provided by the vapour barrier made of building plastics. The joints of the vapour barrier and between the components are made such, that an overall air tightness is achieved.

Thermal inertia

NPD. Data for thermal inertia calculation of the works will be provided by the manufacturer on request.

Aspects of durability, serviceability and identification

Aspects of durability

When properly assembled, the product will stay against the effects of weather during the intended working life. Some components as window and door sealing shall be maintained and replaced when needed, according to the recommendations given in the maintenance guide provided by the manufacturer.

The external wall elements persist against the effects of weather if it has the possibility to dry out between the wet periods (hazard class 3 according to definition in standard EN 335-1).

The fasteners used in the building kit fulfil the requirements for service class (use class) 2. The fasteners of the external cladding parts fulfil the requirements for service class 3 (use class 3.1).

Aspects of serviceability / Floor stiffness

Serviceability of a building kit is understood as the ability of the horizontal load bearing structures to resist loads without unacceptable deformation. Under ER 1, the capacity of the load-bearing constructions is verified also in the serviceability limit states¹².

Identification

The building kit is identified by the CE-marking as described in clause 3.3.

The separate components and materials are identified as being of a generic type as described in Annex 1 and specified in the manufacturer's delivery list.

¹¹ The mean wind speed during 10 minutes. (See climatic data for Utö, http://www.fmi.fi/saa/tilastot_22.html)

¹² The concept serviceability limit states is defined in Eurocode, basis of structural design, EN 1990. Corresponding design criteria commonly exist in other design codes that may be the basis for fulfilling ER1.

3 Evaluation and attestation of conformity and CE marking

3.1 Attestation of conformity

The system of attestation of conformity specified by the European Commission in Decision 99/455/EC - Official Journal L 178, 14.07.1999 is System 1, according to Council Directive 89/106/EEC Annex III.2.(i), without audit-testing of samples, and provides:

(i) Certification of the conformity of the product by an approved certification body on the basis of:

(a) (tasks for the manufacturer)

(1) factory production control;

(2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

(b) (tasks for the approved body)

(3) initial type-testing of the product;

(4) initial inspection of factory and of factory production control;

(5) continuous surveillance, assessment and approval of factory production control;

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer shall only use such materials and components that have similar performance to those stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the Control Plan which is part of the technical documentation of this European technical approval. The Control Plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at VTT.¹³

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

3.2.1.2 Testing of samples taken at the factory

Testing of samples taken at the factory according to a prescribed test plan is not needed in the production control.

¹³ The "control plan" is a confidential part of the European technical approval and only handed over to the approved body or bodies involved in the procedure of attestation of conformity. See section 3.2.2.

3.2.1.3 Other tasks of the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of timber frame building kits in order to undertake the actions laid down in section 3.3. For this purpose, the "control plan" referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body or bodies involved.

When all the criteria of the Conformity Attestation are satisfied the manufacturer shall make a Declaration of Conformity.

3.2.2 Tasks of approved bodies

3.2.2.1 Initial assessment of the product

Initial assessment of the product has been carried out by the approval body in accordance with section 6 of the ETA Guideline, as part of the ETA issuing procedure.

In general, product performance stated in the initial assessment has been characterised sufficiently to serve as a basis for subsequent quality assurance evaluations (to ascertain whether a given production lot remains well represented by the initial assessment material). The approved body shall, however, conduct initial type testing of those performances that will be separately mentioned in the documentation agreed on by the manufacturer and the approval body and passed to the approved body.

Characteristic to the product is that components of the kit may be changed from time to time provided that they fulfil the provisions set by the product performance¹⁴. The adequacy of changeable components shall be proven each time by an initial assessment based on initial type testing, when this is stated in the respective harmonised product specification, or by CE-marking of the component.

3.2.2.2 Initial inspection of factory and of factory production control

The approved body shall conduct initial inspection of the factory in order to ensure that the manufacturer has acceptable premises, technical equipment, qualified personnel and a factory production control system which is in accordance with the provisions in the ETA Guideline and this ETA.

3.2.2.3 Continuous surveillance, assessment and approval of the factory production control

Assessment of the factory production control system is the responsibility of the approved body.

An assessment shall be carried out of each production unit to demonstrate that the factory production control is in conformity with the ETA and any subsidiary information. This assessment shall be based on an initial inspection of the factory

Subsequently continuous surveillance of factory production control is necessary to ensure continuing conformity with the ETA. It is recommended that surveillance inspections are conducted at least twice a year.

¹⁴ An example thereof are the windows and doors that may be bought by one-year contract from several subsuppliers.

3.2.2.4 Certification

When all the criteria of the Conformity Attestation are satisfied the approved certification body shall issue a Certification of Conformity with this European Technical Approval.

In cases where the provisions of the European Technical Approval and the prescribed test plan are no longer fulfilled the Certification of Conformity shall be withdrawn.

3.3 CE-Marking

The CE marking shall be affixed on the packages of the building kit parts or in accompanying commercial documents, e.g. the EC declaration of conformity. The letters "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product
- the number of the European technical approval and the specification of the product

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The components of the Lapponia house building kit are assembled in the factory in accordance with the provisions of this European Technical Approval as identified during the inspection of the plant by the Technical Research Centre of Finland (VTT).

4.2 Design and building regulations

Design of the works comprises the structural design (see 2, ER1). This European technical approval is based on the assumption that this and any other plans needed have been made correctly according to the regulations valid on the building site.

A specification of relevant requirements concerning structural design, fire resistance and reaction to fire, sound insulation performance, thermal insulation performance and ventilation provisions shall be elaborated for each delivery as a basis for the production of a kit.

4.3 Requirements set for the substructure

This European technical approval does not comprise the substructure of the building.

A plan drawing with the dimensions and schematic details of the substructure are delivered by the manufacturer. The substructure shall be individually designed according to the local building regulations to fit the building site. The tolerances of the finished substructure level shall be ± 5 mm/ 3 m and ± 10 mm for other dimensions.

4.4 Installation

A general manual for the installation of the kit in the works is available from the manufacturer, and is assessed by the approval body. The manual covers all important aspects related to the site work, such as:

- erection techniques and necessary equipment
- temporary bracing
- completion of joints between kit components (structural fixing, weather sealing etc.)
- fixing of any wind and seismic anchorage to the substructure and between building parts
- additional materials and components applied on the site, and which are a precondition for the fitness in use of the kit
- protection against weather during erection

As a supplement to the general manual, a specific manual which contains special aspects related to each individual building project(e.g. special crane requirements, hoisting strap positions etc.) shall normally be prepared.

The completed building (the works) shall comply with the building regulations (regulations on the works) applicable in the Member States in which the building is to be constructed. The procedures foreseen in the Member State for demonstrating compliance with the building regulations shall also be followed by the entity held responsible for this act. An ETA for a timber frame building kit does not amend this process in any way.

4.5 Design and building regulations

Design of the works comprises the structural design (see 2, ER1) and, when necessary, also a heat loss calculation or energy calculation of the building. This European technical approval is based on the assumption that this and any other plans needed have been made correctly according to the regulations valid on the building site.

A specification of relevant requirements concerning structural design, fire safety, noise protection and, energy saving including ventilation provisions shall be elaborated for each delivery as a basis for the production of a kit.

4.6 Requirements set for the substructure

This European technical approval does not comprise the substructure of the building.

A plan drawing with the dimensions and schematic details of the substructure are delivered by the manufacturer. The substructure shall be individually designed according to the local building regulations to fit the building site. The tolerances of the finished substructure shall be ± 5 mm (dimensions and levels). The level of the substructure with regard to the surrounding soil shall be chosen so, that there is no adverse effect on the durability of the construction, which depends on the local conditions

5 Recommendations

5.1 Packaging, transport and storage

The manufacturer's instructions regarding transport and storage shall be followed.

The components and materials shall be protected against harmful wetting during transport and storage.

The components must not be lifted or stored in such a way that they will be damaged e.g. because of local stresses due to dead load or excessive bending deformation.

5.2 Use, maintenance and repair

The manufacturer shall ensure that proper information for the use of the building kit is available at each delivery, including general guidance on the basis of this ETA and the specific installation plans and construction details mentioned in clause 4.4.

Before the installation the components of the building kit shall be controlled not to be damaged during transport or storage. Damaged components and materials shall be replaced by sound ones.

If there is a need to modify or repair the construction this may be done if allowed for in the installation plans mentioned in clause 4.4. In other case, modifications are allowed only by written consent by the manufacturer of the kit.

On behalf of VTT

Espoo, 23.09.2009



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ANNEX 1 DESIGN OF LAPPONIA HOUSE BUILDING KITS

1 Contents of this Annex

This Annex presents more detailed information about the Lapponia house building kit. Section drawings are presented in Annex 2. Typical solutions for the construction details are presented in Annex 3, Supporting drawings

This Annex also presents the standard windows and external doors, which may be included in the kit, specified according to EN 14351. Alternatively, other windows or external doors which are compatible with the requirements valid on the building site may be used. In that case the windows and doors are installed at the building site and they are not a part of a building kit in accordance with this ETA (no performance determined, NPD). In the CE-marking, the options chosen shall be stated.

This approval of a building kit does not comprise the stairs that may be needed for the building even if they were delivered at the same time as the CE-marked building kit. Further, timber treated against fungi and biological wood degrading agents is not part of this kit.

In the following, the main constructions, components and materials are described. When CE-marking is done, the last page of this Annex may be used to indicate the performance profile relevant for the eventual kit to be delivered to the customer so that the adequate option is marked.

2 General view of the building kit

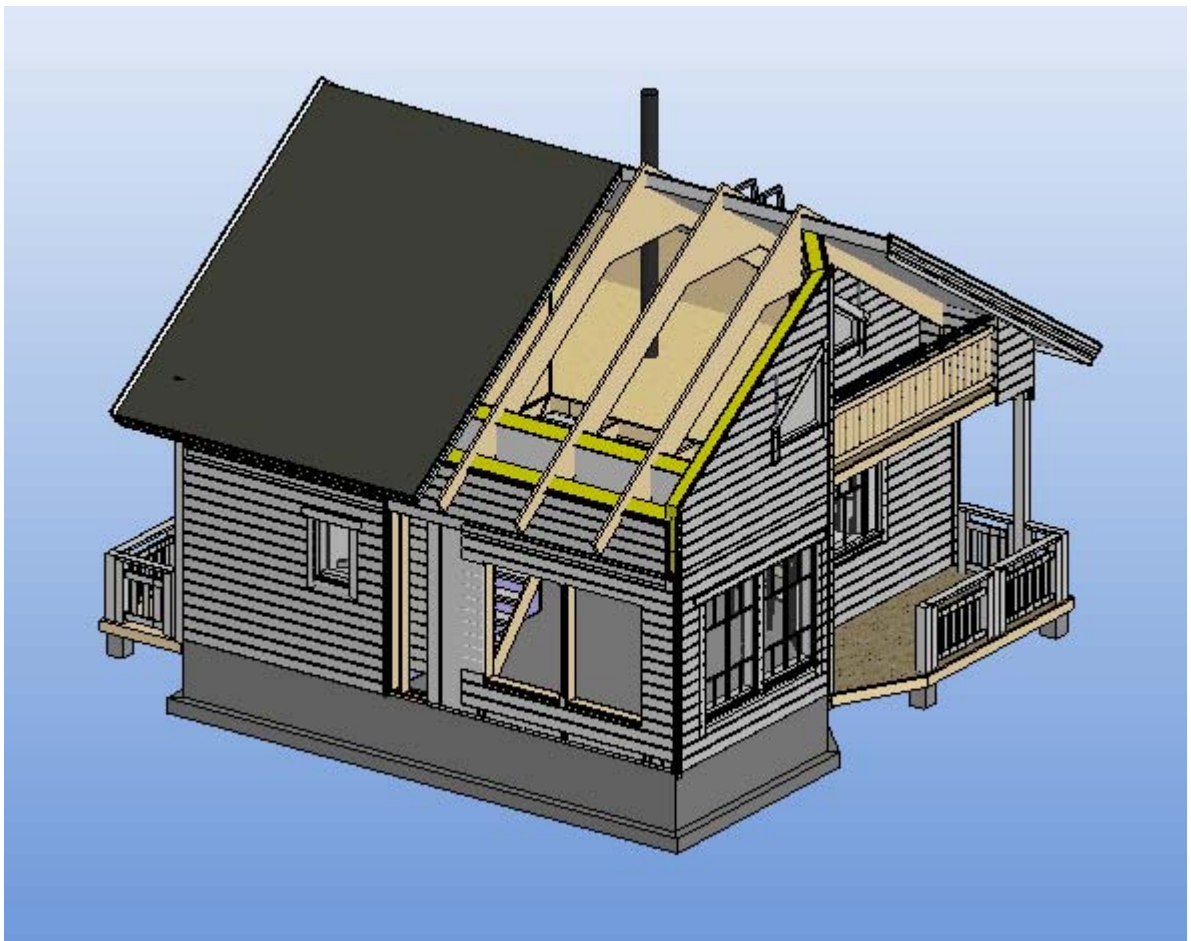


Fig A1-1 General architectural view of the building kit

2.1 Windows and external doors

Windows and external doors are tested according to the provisions stated in EN 14351, the properties are given in the following table according to that standard. The works may have roof windows; the properties of these shall comply with the local provisions.

		Property					
	WINDOW/DOOR TYPE	MSEA-131	MSEA-175	EKA3-131	EKA3-175	Other window	External door
ER1 Mechanical resistance and stability							
1	Resistance to wind	C3	C3	C3	C3	NPD	NPD
2	Frame deflection	C	C	C	C	NPD	NPD
ER2 Safety in case of fire							
4a	Reaction to fire	NPD	NPD	NPD	NPD	NPD	NPD
4b	External fire performance	NPD	NPD	NPD	NPD	NPD	NPD
ER3 Hygiene, health and environment							
5	Watertightness, non-shielded	9A	9A	9A	9A	NPD	NPD
6	Watertightness, shielded	NPD	NPD	NPD	NPD	NPD	NPD
7	ER 3 Dangerous substances	NPD	NPD	NPD	NPD	NPD	NPD
ER4 Safety in use							
8a	Impact resistance, drop height mm	NPD	NPD	NPD	NPD	NPD	NPD
8b	Glass thickness 6 mm ¹⁵	4	6	4	6	4	6
9	Load-bearing capacity of safety devices	not provided					
ER5 Protection against noise							
10	Weighted sound reduction index R_w (C;C _{tr}) dB	NPD	NPD	NPD	NPD	NPD	NPD
ER6 Energy economy and heat retention							
11	Thermal transmittance U_w W/(m ² K),	1,20	1,18	1,23	1,23	NPD	NPD
12	Solar factor g	NPD	NPD	NPD	NPD	NPD	NPD
13	Light transmittance τ_v	NPD	NPD	NPD	NPD	NPD	NPD
14	Air permeability	4	4	4	4	NPD	NPD

Properties marked with - are not relevant for others than roof windows

2.2 Materials

The following materials may be part of the kit or they are necessary for the proper function of the kit. Only properties to be indicated in the CE-marking have been mentioned.

¹⁵ Finnish regulations contain safety provisions for windows. 6 mm glass or safety glass shall be used when there is risk for falling through the window.

Material function	Material type	Material specification		
		C18	C24	C30
Timber structures	Structural timber, EN 14081-1	D-s1,d0		
		C24	C30	C35
Roof trusses and frames	Structural timber and nail plates, EN 14250, nail plates e.g. MiTek	D-s1,d0		NPD
		C24	C30	C35
Beams and columns	Glulam, EN 14080	GL 24c	GL 28c	GL32c
		D-s2,d0		NPD
	LVL, EN 14374 e.g. Kerto-S	Strength values specified in the design documents		
		D-s2,d0		NPD
External cladding	Timber panel	D-s2,d0		
Windows and doors	Windows and doors, EN 14351	As defined in section 2.1		
Wind barrier	Wood-based panel, SB.H, EN 13986, e.g. Leijona	E		
	Gypsum panel EN 520, e.g. Knauf	B-s1,d0	NPD	
Air control layer	Building paper, e.g. Rakonor Oy	NPD		
Thermal insulation	Mineral wool, EN 13162 (Isover KL 37)	A1	NPD	
		$\lambda_d < 0,037 \text{ W/(m K)}$		
	Isover KL 35	A1	NPD	
		$\lambda_d < 0,035 \text{ W/(m K)}$		
	Wood fibre insulation, EN 13171 e.g. Vital	NPD		
$\lambda_d < 0,037 \text{ W/(m K)}$				
Water vapour barrier	Polyethylene foil 0,2 mm ¹⁶ , SFS 4225, e.g. Lapin-Muovi	NPD		
		NPD		
	Aluminium paper, e.g. Rakonor Oy	NPD		
		$Z_p = 0,3 \cdot 10^9 \text{ m}^2 \text{ sPa/kg}$		
Mechanical fasteners	Screws, 1,9 mm - 12 mm EN 14592, e.g. Wurth	NPD		
	Nails, 1,7 mm - 5,5 mm EN 14592, e.g. Koskensaaren, Kartro	NPD		
Fixings and other metal parts	Nailing plates, bracings and anchors, e.g. Sievi Steel OY	NPD		

¹⁶ The ageing properties of the foil correspond to the intended working life of the building, 50 years, (see II 1 of this Approval).

	Sliding fixings Screw feet Stiffening rods and tubes Special fixings	NPD
Roofing	Concrete roof tiles, e.g. Monier	B _{ROOF}
	Corrugated steel roofing, e.g. Ruukki	B _{ROOF}
	Bituminous roofing EN 13707, e.g. Katepal	B _{ROOF(t2)}
	Bituminous roof shingles EN 544, e.g. Katepal	B _{ROOF(t2)}
Roof underlay	Reinforced plastic foil EN 13859-1, e.g. Tyvek Soft 1460B or Tyvek SuproT 2507B	NPD
Flooring	Timber planks	D _{FL-s1}
	Soft wood flooring, EN 13990	D _{FL-s1}
	Wood-based panel, P5 & P7, EN 13986, e.g. Schauman	D _{FL-s1}
Internal lining ¹⁷	Gypsum plasterboard, e.g. Knauf, EN 520	B-s1,d0
Sealing materials	Polyurethane foam, e.g. Wurth	NPD
The following are not part of the building kit, but they have been assessed with the building kit and they are necessary for the proper function of the kit.		
Internal walls, fire walls ¹⁷	Bricks ¹⁸	A1
Surface treatments and waterproofings ¹⁷	Liquid applicable products	According to local provisions and the erection manual

Waterproofing materials to be used in the wet areas are not included in the delivery.

3 Identification of the kit

The CE-marking of every single delivery can be accompanied with the following table, where the options chosen have been marked.

WHOLE BUILDING KIT		
Name of the customer	Order number	Model
ER1 Mechanical resistance and stability	Values given in the element drawings	
ER3 Hygiene, health and environment	Name of any chemical treatment given in the element drawings	

¹⁷ Will not be delivered but shall be installed according to the instructions of the kit manufacturer

¹⁸ Brickwork shall be made according to the provisions valid on the building site.

EXTERNAL WALL				
ER2 Safety in case of fire		Class		
Reaction to fire, materials		As specified in materials list		
Reaction to fire, whole component		F		
Resistance to fire		NPD		
ER5 Protection against noise		Value dB		
Airborne sound insulation, R_w		NPD		
ER6 Energy economy and heat retention		Value W/(m2K)		
Wall thickness [mm]		191	263	308
Thermal transmittance U_c		0,33	0,21	0,17
				336
				0,15
WINDOW/DOOR TYPE				
MSEA-131	MSEA-175	EKA3-131	EKA3-175	NPD
INTERNAL WALL				
ER2 Safety in case of fire		Class		
Reaction to fire, materials		As specified in the materials' list		
Reaction to fire, whole component		F		
Resistance to fire		NPD		
ER5 Protection against noise		Value dB		
Airborne sound insulation, R_w		NPD		
SUSPENDED FLOOR				
ER2 Safety in case of fire		Class		
Reaction to fire		As specified in the materials' list		
Reaction to fire, whole component		F_{FL}		
Resistance to fire		NPD		
ER5 Protection against noise		Value dB		
Airborne sound insulation, R_w		NPD		
Impact sound insulation, L_n,w		NPD		
ER6 Energy economy and heat retention		Value W/(m2K)		
Thermal transmittance U_c		0,28	0,18	NPD
ROOFS				
ER2 Safety in case of fire		Class		
Reaction to fire		As specified in the materials' list		
Reaction to fire, whole component		D-s2,d0	F	
Resistance to fire		NPD		
External performance in fire, whole component		B_{ROOF}	$B_{ROOF}(t2)$	
ER6 Energy economy and heat retention		Value W/(m2K)		
Thermal transmittance U_c		NPD		