



**STANDARDS OF THE ESTONIAN WOODHOUSE ASSOCIATION FOR
LOG HOUSES**

Standards of the Estonian Woodhouse Association for log houses have been prepared in cooperation between the Estonian Woodhouse Association, the enterprises belonging to the Estonian Woodhouse Association, Estonian University of Life Sciences and the Tallinn University of Technology. The standards are recommended minimum requirements for heated log houses produced in Estonia.

The standards include requirements for the quality of materials and the construction process in conformity with general building requirements.

The standards are applicable to both log buildings made as handcrafted as well as made of machined logs, and they are valid at the moment of the delivery of the building.

Standards of the Estonian Woodhouse Association for log houses have been approved by the Management Board of the Estonian Woodhouse Association on 10 March 2011.

Revision 2 of the standards of the Estonian Woodhouse Association has been approved by the Management Board of the Estonian Woodhouse Association on 28 April 2011.

Revision 3 of the standards of the Estonian Woodhouse Association has been approved by the Management Board of the Estonian Woodhouse Association on 6 February 2026.

The 3rd revision clarifies and expands the terminology, clarifies the moisture and strength requirements, and introduces additional structural detail requirements (e.g., log splicing, placement of dowels, and consideration of settlement). The document has also been linguistically and structurally refined, improving clarity and usability without altering the fundamental requirements.

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1 TERMS

- 1.1. **Beam** – sawn timber generally at least 80 mm wide, with width + height ≥ 200 mm and a height-to-width ratio not exceeding three.
- 1.2. **Blue stain** – a fungus growing on the timber surface that does not reduce strength but may affect appearance.
- 1.3. **Burr** – a knot transformed into a grey-brown or mottled mass that can be rubbed into powder.
- 1.4. **Dowel** – a vertical stick in the logs penetrating two or more logs to ensure wall stability.
- 1.5. **Edged log** – a log sawn on two sides.
- 1.6. **Glue-laminated log** – a composite log material consisting of two or more glued lamellas.
- 1.7. **Groove** – a longitudinal channel along the log matching the shape of the lower log and containing sealing material.
- 1.8. **Handcrafted log house** – a building constructed from peeled tree trunks or hewn logs and produced manually.
- 1.9. **Kerf (drying groove)** – a longitudinal groove on the upper or lower side of the log that helps to control cracking during drying.
- 1.10. **Log** – a felled and delimbed tree stem section with a top diameter (without bark) of at least 15 cm and a length of at least 3 m.
- 1.11. **Log back** – the upper side of a wall log.
- 1.12. **Log house** – a building constructed from peeled, hewn, sawn, milled, turned, or glued logs.
- 1.13. **Machined log house** – a building constructed from sawn, milled, turned, or glued logs.
- 1.14. **Moisture content of timber/log** – the amount of water in wood expressed as a percentage of oven-dry mass.
- 1.15. **Purlin** – a longitudinal load-bearing beam in the roof structure supporting rafters.
- 1.16. **Rot** – wood damage caused by fungi that decompose the wood structure and reduce strength and other physical properties.
- 1.17. **Round log** – a cylindrical or conical log that has been peeled or turned from a tree trunk.
- 1.18. **Sapwood** – the outer part of the stem containing living cells and conducting sap in a growing tree.
- 1.19. **Slider** – a metal fastening detail allowing movement in a fixed direction, used for connecting log walls with non-settling structural elements.
- 1.20. **T-stud** – a vertical support used near openings or corners to ensure stability and to connect log and non-settling structures.
- 1.21. **Tenon** – a joint or connection between logs.
- 1.22. **Twisted grain** – deviation of wood fibres from the longitudinal axis of the log, which may affect the mechanical properties of the log.
- 1.23. **Wall log** – the uppermost wall log supporting roof rafters.
- 1.24. **Wane** – the unprocessed or unsawn outer surface remaining on a log.

2 GENERAL REQUIREMENTS

2.1. Timber used for log houses

2.1.1. Both European spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*) are acceptable. When other timber species are used, their durability must be at least equivalent to spruce and pine. Glue-laminated logs may also be used. The timber species and log type must be specified in the contract.

2.2. Moisture content of timber

2.2.1. Pine shrinks during drying up to 4% radially, 7.7% tangentially, and 0.3% longitudinally. Spruce shows similar values.

2.2.2. Moisture content shall be measured with an electrical-resistance device at a depth of at least 25 mm, in accordance with the device instructions.

2.2.3. Moisture content of wall logs at the time of manufacture shall not exceed 20%. Up to 10% of logs may vary by +3%.

2.2.4. Average moisture content of purlins, posts, and columns shall not exceed 23% at manufacture.

2.2.5. Moisture content of glue-laminated logs may be up to 18% and must be supported by a manufacturer's conformity certificate.

2.2.6. Due to timber shrinkage (tangential shrinkage being approximately twice radial shrinkage), cracking of massive logs is unavoidable. A drying groove (kerf) may be used to reduce internal stresses.

2.3. Factors affecting log strength

2.3.1. Properties reducing the strength of a log:

Property	Requirement
Knots	Single knots allowed up to 1/3 of log diameter
Twisted grain	Allowed in logs ≤ 25 cm diameter / Allowed up to 1:10 in logs > 26 cm diameter
Average annual ring width	Max 6 mm
Burrs and knot holes	Allowed if replaced with sound timber
Dead knots	Allowed if not loose or falling out
Cracks (both the ones through entire cross-section as well the ones not through entire cross-section)	Allowed if caused by drying (full or partial cross-section)
Insect damage	Not allowed
Rot	Not allowed

2.3.2. Properties not reducing the strength of a log:

Property	Requirement
Wane	Allowed only without bark on non-visible surfaces
Blue stain	Allowed to a limited extent
Sapwood	Allowed

2.4. Tolerances

2.4.1. The deviation of the vertical axis of a log wall shall not exceed 1 cm per linear metre in handcrafted log houses and 0.5 cm per linear metre in houses constructed from machined logs.

2.4.2. In machined log structures, the actual width of the logs used may deviate from the nominal dimension by a maximum of ± 1.5 mm at the time of delivery. For handcrafted edged logs, a deviation of $\pm 5\%$ of the structural thickness is permitted.

2.4.3. In handcrafted log structures, the height of the wall log may vary by a maximum of ± 3 cm at different points of the structure. In machined log structures, the permitted variation is a maximum of ± 1 cm.

3 CONSTRUCTIONS

3.1. Foundations

3.1.1. During the design and construction of the foundation, the requirements of the designer and manufacturer of the log structure shall be taken into account, as well as, where necessary, the method of fastening the log structure to the foundation.

3.1.2. The foundation plinth shall be located at least 30 cm above the surrounding ground level in order to ensure protection of the structure against moisture.

3.1.3. The first course of wall logs shall be separated from the foundation by a waterproofing layer to prevent moisture from rising into the timber.

3.2. Log structures

3.2.1. The log structure shall be installed on the foundation in a manner that prevents water from entering between the logs and between the foundation and the first log.

3.2.2. Settlement of the log structure of 3–5% of the structural height is permitted and results from the natural shrinkage of the timber material.

3.2.3. To compensate for differences in settlement between load-bearing and non-load-bearing walls, the building structures shall be designed so that the load is distributed as evenly as possible among all walls.

3.3. Joining logs in the wall construction

3.3.1. If the use of full-length logs is not possible due to the wall length, it is allowed to join the logs.

3.3.2. Joining the logs in wall structures is permitted using joints and/or connection equipment that prevent horizontal movement of the log and ensure that the joint in the log wall is airtight. When joining the wall without tenons, the minimum horizontal distance between vertically aligned log joints shall be at least 1.5 m.

3.3.3. The use of finger-jointed logs in wall structures is permitted without restriction.

3.3.4. When joined, the log shall bear on the log wall for a length of at least 60 cm.

3.4. Groove

3.4.1. The width of the groove in a machined square log shall be at least 60% of the log diameter.

3.4.2. The width of the groove in a machined round log shall be at least 40% of the log diameter.

3.4.3. In handcrafted edged logs used in external walls, the groove width shall be on average 55% of the wall thickness, but not less than 40% of the wall thickness.

3.4.4. In handcrafted round logs used in external walls, the groove width shall be on average 35% of the average log diameter, but not less than 8 cm.

3.4.5. In handcrafted log structures, the back of the lower log should be at least 10 mm higher than the groove edges of the upper log to prevent water from flowing into the groove. Manufacturer of a machined log house must produce the groove in a way that would prevent water from leaking into it.

3.5. Sealing of log wall

3.5.1. The joints between logs shall be sealed in accordance with the design documentation or the properties of the selected sealing material in order to ensure the thermal performance and airtightness of the structure.

3.5.2. Any sealing material remaining visible after installation shall subsequently be removed to prevent water ingress between the logs.

3.6. Wall stiffening

3.6.1. Stiffening of wall ends is required if the length of the unsupported section exceeds 650 mm in the case of square logs and 1200 mm in the case of round log walls.

3.6.2. The need for wall stiffening shall be specified in the building design or in the manufacturer's instructions.

3.6.3. In the external corners of machined log structures, the installation of tension bolts is recommended in order to ensure wall rigidity, accelerate the compression of insulation between the logs, and strengthen the connection between the roof and the wall.

3.6.4. T-studs (support posts adjacent to openings) shall be shorter than the opening by the amount of the required settlement allowance.

3.6.5. T-studs shall be fastened to the log wall in a manner that allows the log wall to settle.

3.7. Joining wall logs with dowels

3.7.1. Dowels shall ensure the stable relative position of the logs and allow the settlement of the log wall.

3.7.2. In machined log houses, the holes for dowels shall be drilled in the factory during production. In handcrafted log houses, the dowel holes may be drilled during erection, provided that the work is carried out by the manufacturer.

3.7.3. Dowels shall be installed at intervals of at least every 2 m, connecting at least two logs vertically. Dowels should not be placed closer than 15 cm to the end of a log, an opening, or a tenon.

3.7.4. The dowel shall be at least 5% shorter than the hole in order to allow structural settlement.

3.7.5. To ensure the straightness and rigidity of the walls, corrosion-protected metal pipes or other fastening devices designed to allow settlement may be used instead of dowels, in accordance with their instructions for use.

4 ROOF STRUCTURES

4.1. If the load-bearing walls of the second storey are constructed from logs, roof purlins shall be used in the roof structure. If the load-bearing walls of the second storey are of frame construction, the use of roof purlins is not mandatory.

4.2. If the second-storey walls are constructed from logs, the rafters of roofs with a pitch of more than 18°, as well as of wide low-slope roofs, shall always be connected to the side walls by means of sliders to allow structural settlement.

5 OPENINGS

5.1. To allow settlement of the wall structure, openings (windows and doors) shall be fastened to the t-studs within the log wall.

5.2. When installing door and window frames, the settlement allowance specified in the design shall be left between the top of the frame and the upper log, and this gap shall be filled with an elastic insulation material that permits settlement.

5.3. The trim boards of doors and windows in the log structure shall be installed so as to cover the t-studs and settlement allowances, ensuring visual and structural integrity.

5.4. Openings shall be installed in a manner that ensures wind-tightness and water-tightness.

6 FLOORS

6.1. All conventional floor structures may be used in log houses, depending on the function of the building and the design requirements.

6.2. Terrace floors shall be constructed in such a way that rainwater falling on the terrace does not reach or damage the lower logs of the exterior wall.

7 INTERMEDIATE FLOORS

7.1. The load-bearing structure of an intermediate floor may consist of joists made of logs or beams installed into the wall during wall construction or fixed to the wall with brackets after erection of the frame.

7.2. When constructing intermediate floors and installing technical services within the floor structure and on the second storey, the settlement of the structure together with the log wall shall be taken into account.

8 WALL CLADDING AND ADDITIONAL INSULATION

8.1. Cladding of a log wall is used for the visual design of the façade or interior, for improving the thermal performance of the wall, or for protecting the wall in wet rooms.

8.2. A (wooden) frame shall be constructed as the base for the wall cladding, and the fixing battens and cladding shall be attached in a manner that allows settlement of the log wall.

8.3. Additional insulation may be installed on either the interior or exterior side of the wall, depending on the purpose. It shall be ensured that the construction does not promote moisture condensation.

9 NON-SETTLING STRUCTURES IN LOG HOUSES

9.1. Non-settling walls shall be connected to the ceiling and/or log walls in a manner that allows settlement of the log wall, and the settlement gap shall, where necessary, be covered with a trim board.

9.2. T-studs are generally used to connect masonry and log walls.

9.3. A sufficient settlement allowance shall be provided between a log wall or intermediate floor supported on a load-bearing non-settling wall to accommodate settlement of the log wall or intermediate floor. Fasteners that allow structural settlement and ensure wall stability, as well as insulation and trim boards, shall be installed.

10 STAIRS AND RAILINGS

10.1. Stairs and railings shall be fixed in a manner that allows settlement of the log house, so that after settlement of the log structure they comply with the heights specified in the design and ensure the safe use of the stairs during the operation of the building.

11 SUPPORTING POSTS

11.1. Supporting posts shall be installed in a manner that allows settlement of the log structure.

12 SURFACE TREATMENT OF EXTERIOR WALLS

12.1. For the exterior finishing of log walls, treatments that do not form a membrane shall be used and that do not prevent the drying of construction moisture within the structure.

12.2. Treatment of exterior walls shall be carried out in accordance with the manufacturer's instructions for the finishing material used, in order to ensure weather resistance and protection against UV radiation, rain, and mould.

13 WET ROOMS

13.1. Floors in wet rooms shall be designed in a manner that prevents water from entering the junctions between the wall and the floor.

13.2. For tiling log walls in wet rooms, a separate frame structure shall be constructed on the wall to allow wall settlement and to ensure air circulation between the log wall and the moisture barrier.

14 DELIVERY AND PACKAGING OF A LOG HOUSE SET

14.1. During transport and on the construction site, the log house set shall be packaged in a weatherproof manner.

14.2. At the time of handover, the log house set shall include drawings and documents describing the completeness of the set.

14.3. Unless explicitly stated otherwise in the sales contract, the log house set shall include all materials required for the erection of the load-bearing structures of the building.