RT 91-11259
SAUNA HEATERS AND CHIMNEYS

English Translation

April 2017 | 11 Pages

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1 HEATERS

1.1 Heater Selection

Building design should anticipate that heaters may be changed over time. Heater safety clearance requirements vary by model and are stated in the heater type plate. If clearances are not met, protection is achieved with fire-resistant wall and ceiling cladding.

Selection criteria include: preferences, sauna design, heater appearance, desired temperature and humidity, number of bathers, session duration, ventilation, insulation, and any uninsulated wall or ceiling surfaces. Glass partition walls require additional heater power.

Heaters are generally selected based on manufacturer guidelines.

1.2 Safety of Use

A guard rail or wall is built around the heater so users cannot accidentally touch hot surfaces. Guard and clearance specifications come from heater manufacturers.

2 WOOD-FIRED HEATERS

2.1 Continuous-Heating Wood-Fired Heater

The continuous-heating wood-fired heater is heated before and continuously during sauna use. Flames circulate in a metal channel between stones. Temperature is controlled by wood quantity and burn rate. Stone mass ranges from 25-100 kg depending on the model. The heater reaches operational temperature in approximately half an hour. Stones remain touchable during use. This heater type is often connected to water heating via the chimney or direct connection, and is generally selected per manufacturer guidelines.

Continuous-heating wood-fired heater

Continuous-heating heater variant

Wood-fired heater with chimney connection

2.2 CE Marking of Continuous Wood-Fired Heaters

CE marking requirements for continuous wood-fired heaters are governed by applicable European standards and safety regulations.

2.3 Batch-Heating Wood-Fired Heater

The batch-heating wood-fired heater is heated entirely before use and is not heated during the sauna session. Stones are enclosed in an insulated chamber behind a door. Flames pass through the stone chamber to the chimney. This heater type can function as a smoke sauna by closing the chimney damper and opening the stone chamber door. Stone mass varies by size and is selected per manufacturer instructions.

Batch-heating heater type 1

Batch-heating heater type 2

2.4 Sauna Heat Requirement and Wood-Fired Heater Output

The batch-fired heater output is estimated from reference charts (heat requirement Q in MJ versus sauna surface area A in m², with curves for different heating times). Continuous-fired heater output is determined from similar reference charts. Starting temperature is assumed at +20°C. If outdoor temperature drops to -20°C, the heat requirement increases by a factor of 1.5.

Reference charts for heat requirement calculation

2.5 Wood-Fired Heater Protections and Safety Clearances

Safety clearances from wood-fired heaters to combustible surfaces are critical for fire safety. The following minimum distances must be maintained:

Surface	Clearance	Notes
Front	1000 mm	Can be reduced 50% with single-layer, 75% with double-layer protection
Back	500 mm	Same reduction rules apply
Sides	500 mm	Same reduction rules apply
Bottom	250 mm	No reduction
Top	1200 mm	Can be reduced 25% with single, 50% with double protection

A minimum of 1 meter clear space must be maintained in front of the firebox for tending and maintenance.

Light Protection Options:

- Minimum 7 mm non-combustible fiber cement board
- Minimum 7 mm calcium silicate board
- Minimum 1 mm hot-dip galvanized steel sheet with mounting pins at 400-500 mm spacing

Installation: Single-layer protection is mounted minimum 30 mm from combustible surfaces with ventilation gap. Double-layer protection is mounted with minimum 30 mm gap between layers.

2.6 Wall and Ceiling Protection

At the heater location, wall and ceiling structures must be fire-protected as per fire code requirements. Fire-resistant protection materials are required to ensure safe operation.

Safety clearance and protection installation

3 CHIMNEYS AND HEATERS

3.1 Chimneys

Chimneys are built from brick or block per building code E1, E3, E8. The minimum flue opening diameter or cross-section is 100 mm. A damper is placed 1600-1800 mm from the floor. Fire safety requires the chimney to extend a minimum of 0.8 m above the roof ridge.

The chimney is built on a non-combustible, fire-resistant foundation. A brick chimney is typically half-brick diameter. Suitable bricks are fired without cracks. Foundation moisture is proofed with a bitumen membrane.

The chimney can be built from weather-resistant exterior brick or normal interior brick. Mortar is weather-resistant cement or lime-cement mortar.

Flue gas temperature can exceed 350°C. The chimney must be built as straight as possible and should avoid sharp bends. If a connection angle exceeds 45 degrees, the chimney is considered to function at the connection point and fire-resistant materials must be used. The chimney is covered with a rainwater protection cap and can also be built from prefabricated elements. A temperature class of T600 is recommended as a minimum (depends on heater and chimney configuration).

3.2 CE Marking of Chimneys and Heaters

CE marking requirements for chimneys and heaters must comply with applicable European standards for safety and performance.

3.3 Heater and Chimney Connection

The fireplace maximum flue gas temperature is 600°C. The connection must meet building code E3 requirements for small chimney fire safety requirements. Proper connection ensures safe operation and compliance with fire regulations.

Connection angle requirements

4 ELECTRIC HEATERS

4.1 Continuous-Heating Electric Heater

The continuous-heating electric heater typically operates continuously. Stones are heated from below and sides by heating elements. The sauna heats through air circulating between the stones. Power is controlled by a thermostat with timer. Stone mass is selected per manufacturer guidelines. Heating time is approximately 30 minutes. Electric heaters can also be wall-mounted or panel-type designs.

4.2 Thermal Storage Heater

The thermal storage heater (varaava kiuas) contains more stones than standard heaters and can also be continuously heated. The stone chamber is insulated and maintains a temperature of 200-300°C when idle. Heating time is 1-1.5 hours. The heater can maintain low heat for extended periods. At startup, larger power is connected, the cover is opened, and a small amount of water is thrown on the stones.

4.3 Electric Heater Selection

Heater power is typically selected at 1 kW per m³ for saunas up to 10 m³. Larger saunas can use 0.7 kW/m³.

Adjustments are needed for:

• Uninsulated wall or ceiling surfaces: add 0.8-1.5 m² per uninsulated surface

• Glass walls: add equivalent to the glass area as extra volume

• Windows larger than 0.5 m²: add equivalent area as extra volume

For steam room (löylyhuone), if the stone chamber is on the steam room side of the sauna, the heater is selected based on the combined calculated volume.

If the sauna has heavy log walls (massive timber) or is in a ground temperature basement, the sauna volume is multiplied by 1.5 to get the effective heating volume.

4.4 Electric Heater Installation

Electric heater installation must follow the equipment's installation manual. Minimum and maximum sauna dimensions are specified. The installation manual also provides required clearances, electrical

specifications, and wiring requirements.

4.5 Electric Heater Installation and Surrounding Free Space

Free space around the electric heater must be maintained per manufacturer specifications. Minimum clearances between the heater and combustible surfaces are required for safe operation.

4.6 Combined Electric and Wood-Fired Heater Installation

When combining electric and wood-fired heater installations, separate safety clearance requirements must be met for each heater type, and the installation must comply with regulations for both heating technologies.

7 GAS-FIRED HEATERS

Gas-fired heaters are available in batch and continuous operation modes. Installation and operation must comply with gas appliance regulations and building codes.

8 OIL-FIRED HEATERS

Oil-fired heaters are available in batch and continuous operation modes. Installation and operation must comply with oil-fired appliance regulations and building codes.

9 HEATER STONES

Heater stones (kiuaskivet) should be dense, heat-resistant rocks. Common types include olivine diabase, peridotite, and similar igneous rocks. Stone size is selected per heater manufacturer recommendations. Stones are checked and replaced periodically as they crack and deteriorate from thermal cycling.