

**SOAPSTONE FIREPLACES
Tulikivi Group**

Tulikivi Group's factories at Juuka and Suomussalmi process soapstone while those at Taivassalo and Vinkkilä process mainly granite and other types of hard stone. The Juuka soapstone deposit, first exploited industrially in the 1880s, is considered one of the world's best in terms of quantity and quality.

Soapstone was formed approximately 2.7 billion years ago during the folding of the Karelian mountain chain. Over a period of approximately 200 million years, heat and pressure changed olivine stone into soapstone through the process of steatitization.



Aurora Flammea fireplace designed by Hannu Kähönen. Partly sandblasted Kianta Sky stone.



COMPOSITION

Soapstone is composed of soft and medium-hard minerals. Soapstone is easy to saw, carve and shave.

Soapstone occurs in nodules and veins, especially in serpentinite. In soapstone, talc and magnesite have firmly bonded themselves to each other in such a way that flakes of talc have formed inside the magnesite to create a homogeneous and uniformly grey mass of stone.

Chemical composition

SiO ₂	30...33%
MgO	27...32%
CO	20...21%
H ₂ O (as water of crystallization)	2...3%
FeO, Fe ₂ O	8...10%
CaO	1...2%
Al ₂ O ₃	1...3%

Mineral composition

Talc Mg ₃ Si ₄ O ₁₀ (OH) ₂	40...50%
Magnesite MgCO ₃	40...50%
Penninite Mg ₅ Al ₂ Si ₃ O ₁₀ (OH) ₈	5...8%

The concentration of talc makes stone from Juuka easy to machine. Due to its exceptionally high percentage of magnesite, its strength properties are better than those of other types of soapstone.

Structure

Soapstone is varve-like in structure. Due to its high heat-resistance, stone that is sawn perpendicular to the varves is used in fireplace structures that are in direct contact with fire and high temperatures. Stone sawn in the direction of the varves is suitable for all other uses.

Colour

Soapstone contains numerous shades of grey. The structure is best seen in light-coloured stone, whereas dark stone is more uniform in colour than light stone. The colour and structure of soapstone can be highlighted by using suitable finishing agents.

Density

The density of soapstone is 2980 kg/m³.

STUDIES MADE BY THE TECHNICAL RESEARCH CENTRE OF FINLAND (VTT)

Thermal properties

Data about the thermal properties of soapstone are based on study no. 174/80/BET made by the Technical Research Centre of Finland.

Melting point: 1630–1640°C

Softening temperatures:

ta = 1420°C, te > 1510°C

Specific thermal capacity 0.98 kJ/kg°C

Thermal conductivity: 6.4 W/mK

Resistance against freezing

In freezing tests, no signs of crumbling or reduction in strength could be detected in the soapstone after 100 freezing and water submersion cycles.

Thermal expansion

The thermal expansion of soapstone is linear up to 500 °C, approx. 0.0017%/°C.

Strength properties

Data about the strength properties of soapstone are based on study no. 174/80/BET made by the Technical Research Centre of Finland.

Compressive strength

The compressive strength of soapstone is 25 MN/m².

Flexural strength

The flexural strength of soapstone is 16.8 MN/m² in the direction of the varves and 15.7 MN/m² perpendicular to the varves.

Hardness

The hardness of soapstone is 2–3 on the Mohs scale. Due to its softness, soapstone is easy to machine using ordinary tools. Surface finishes can increase its hardness to 4 on the Mohs scale.

Resistance against chemicals

Soapstone is highly resistant to chemicals. Even strong acids will not damage soapstone and only very strong alkalis can corrode it. Soapstone complies with the requirements of Section 16 of *Suomen elintarvikeasetus* (Foodstuffs Decree) concerning suitability for use with foodstuffs intended for human consumption.

Electrical properties

Soapstone is classified as a good insulator in 50% relative humidity, in which its specific electrical resistance is 2 x 10⁷–19 x 10⁷ Ω m.

Even in 95% relative humidity, its specific electrical resistance is 2 x 10⁵ Ω m.

MACHINING

Because soapstone is a soft but very tough type of stone, chain saws are used to extract it from open pit mines in blocks from 1.5 to 4 m³ in size. At Tuli-kivi Group's production plants, the soapstone is sawn with diamond-pointed circular saws. Minor machining can be made even on the construction site with tools provided with a hard metal bit or blade. Soapstone can also be sawn with hacksaws and woodworking saws.



Kianta Sky



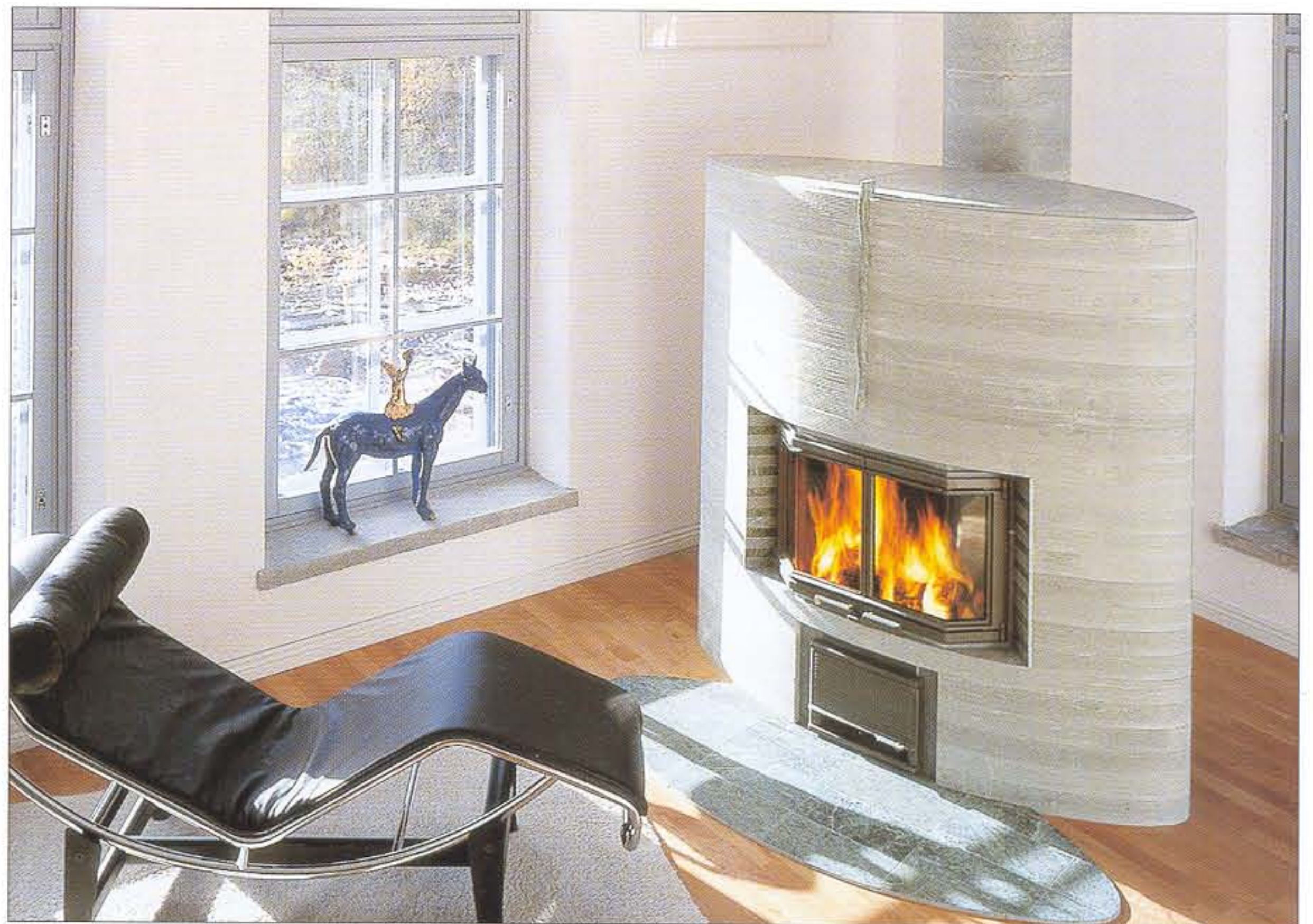
Kianta Blue



Tulikivi Classic



Standard fireplace manufactured from Kianta Blue, featuring decorations made with abrasive water jets.



Standard Tulikivi Classic fireplace with CNC-milled finish.

FIREPLACES

Soapstone is traditionally known as an excellent fireplace material. Because of its good heat-retaining capacity and fire resistance, it has been used in fireplaces for centuries.

All the standard fireplaces in the Tulikivi collection are heat-retaining. The collections include fireplaces, fireplace/bakeovens, stoves and combinations thereof. Sauna heaters and barbecues are also manufactured.

Emissions tests

Tulikivi fireplaces comply with the stringiest emissions requirements in the European territory (Article 15a B-VG of Austria) and the particle emissions limits of Colorado and New Zealand (Colorado Regulation 4 and Applied Research Services Ltd Report R98/20 Canterbury Regional Council 1998 respectively).

Supply air

Wood needs oxygen in order to burn and a fireplace needs a supply of air in order to function. To ensure a supply of air, a valve can be installed in a wall or window of the room. The valve can also be positioned near the fireplace by using a separate approx. Ø 100 mm closable duct. Supply air should not be fed directly into the fireplace.

TULIKIVI FIREPLACES

Tulikivi Oyj manufactures a wide range of carefully designed standard fireplaces distinguished by their excellent operating features.

CUSTOM-MADE FIREPLACES

Custom-made service include fulfilling the wishes of its customers by combining modern production equipment with traditional craft skills.

Surface finishes

Fireplaces are generally manufactured with a water-sanded or cleaved surface finish. The surface can also be point-hammered or diamond-calibrated. The surfaces of made-to-measure products are finished according to the customer's wishes. However, due to its softness, soapstone cannot be polished to the same level of gloss as hard types of stone.

Cleaning of stone surfaces

Fireplace stone surfaces can be cleaned with dishwashing detergent. More tenacious grease stains such as stearine can be removed with spray thinner or Tulikivi soapstone cleaning agent. Difficult sticky stains can be cleaned with a 500-grit abrasive sponge.



Made-to-measure fireplace oven with a natural cleavage surface. Floor, Kianta Blue. Abrasive water jet pattern, light Tulikivi Classic and Kianta Black.



Floor and walls, Kianta Blue. Abrasive water jet border strips, Kianta Black and Tulikivi Classic. Shower walls, marble.



Bathroom materials, Tulikivi Green and pearl grey Tulikivi Classic.



Sandblasted Tulikivi Classic.

DECORATIVE ELEMENTS

Sandblasted illustrations provide expression to tiles, slabs and fireplaces.

Individual patterns and border strips for tiles and slabs are also manufactured using abrasive water jet technology. Soapstone's various colour shades are utilised in projects.

TILES, SLABS AND BUILDING STONES

Stone is a versatile building material. Stone tiles and slabs are used in façades, floors, stairs, partitions etc.

Thin tiles and slabs are 8, 10 and 15 mm thick. 20 and 30 mm thick tiles and slabs are suitable for public buildings. Stone tiles and slabs are weatherproof and impressive-looking materials also for landscaping. Correctly designed and implemented stone structures serve users from one generation to the next.

STONE FLOORS

Although stone is a practical flooring material for public buildings in particular, it is increasingly being used also in private buildings. Stone surfaces have excellent resistance against abrasion, moisture and chemicals. Stone floors also bring value to buildings. With its heat-retaining features, stone is also suitable for use with floor heating. Floor surfaces can be patterned by using stones of different colours, bond patterns and finishes.

COUNTERTOPS

Countertops manufactured from stone withstand wear and moisture. Tulikivi manufactures stone kitchen countertops, tabletops, bathroom basin countertops, windowsills and shelves. The area in front of fireplaces is often provided with a stone fi-



Countertops and tiles, Tulikivi Classic soapstone. Floor, Tulikivi Black serpentinite.

regard. Because of their diverse appearance, stone surfaces are suitable for individually designed furniture. Stone countertops create an impression of value and enduringness in buildings.



MANUFACTURE AND SALES

Tulikivi Group
FIN-83900 JUUKA
Tel. +358 13 681 111
E-mail firstname.lastname@tulikivi.fi
www.tulikivi.com

