The report shown in this file states that the examined stone type is suitable for sauna heater stone use. The study was conducted by Geological Survey of Finland.

Studied rock type is used in following Harvia products manufactured by Sauna-Eurox OY that is part of Harvia Group:

- **AC3040** Vulcanite sauna heater stone (5-10 cm diameter)
- **AC3045** Vulcanite sauna heater stone (10-15 cm diameter)

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Etelä-Suomen yksikkö
Espoo

14.6.2012 M108E2012

A study of sauna stove stones, VULLÄ

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GEOLOGIAN TUTKIMUSKESKUS

14.6.2012

GEOLOGICAL SURVEY OF FINLAND **DOCUMENTATION PAGE**

Date / Rec. no.

Authors Hannu Kujala	Type of report
	Commissioned by Sauna-Eurox Oy
Title of report A study of sauna stove stones, VULLÄ	
Abstract A study of polished thin section was carried out. On the basis of the mineral composition and texture the rock type of the sample is an intermediate volcanic rock with plafioclase and uralite phenocrysts. The fine- grained ground mass consists mainly of plagioclase. Other minerals in the ground mass are amphibole, chlorite, biotite and opaque minerals. Small (<0.1 mm) sulphide grains consist of chalcopyrite, pyrite and pyrrhotite. Ilmenite and magnetite occur as rare oxide minerals. A rock sample from VULLÄ was examined by Työterveyslaitos (Finnish Institute of Occupational Health) for possible asbestos minerals. The sample did not contain any asbestiform minerals. The conclusion of the study is that this rock type is very suitable to be used as sauna stove stone.	
Keywords	
Geographical area	
Map sheet	
Other information	

Report serial		Archive code	
Total pages 3	Language english	Price	Confidentiality confidential
Unit and section ESY, Bedrock and raw materials, VA211		Project code 1420000	
Signature/name Hannu Kujala Research assistant Hannu Kujala		Signature/name Kalevi Rasilainen Geologist Kalevi Rasilainen	

Samples and the purpose of the study

Sauna-Eurox Oy sent rock samples to the Geological Survey of Finland (GTK) from VULLÄ quarry in western Finland. The purpose of this study is to test the usability of the rock material as raw material for sauna stove stone production. Research methods were a microscopical study and the examination for possible asbestos minerals.

Macroscopical examination

Macroscopically all samples were very similar. Light gray, 1– 4 mm plagioclase phenocrysts are distinguished from the fine- grained, dark gray ground mass. They are prismatic and have often euhedral form. Black hornblende phenocrysts occur less often. The rock is homogenous and isotropic. No veins or inclusions exist.

Microscopical examination

A study of polished thin section was carried out. The porphyritic texture of the rock is clearly visible.

Prismatic plagioclase grains have often euhedral form. Zonal structure is a common feature. Plagioclase has only slightly altered to sericite.

Primary pyroxene phenocrysts have altered completely to amphibole and biotite. The grain size is 1–2 mm. Pyroxene has been clearly less common than plagioclase.

The fine- grained ground mass consists mainly of plagioclase, which has been strongly altered to saussurite. Other minerals in the ground mass are amphibole, chlorite, biotite and opaque minerals. Zircon and apatite occur occasionally. Sphene appears commonly with opaque minerals. Small (<0.1 mm) sulphide grains consist of chalcopyrite, pyrite and pyrrhotite. Ilmenite and magnetite occur as rare oxide minerals.

A rock sample from VULLÄ was examined by Työterveyslaitos (Finnish Institute of Occupational Health) for possible asbestos minerals. The sample did not contain any asbestiform minerals. (Report TY-03/hl/1536-2011).

On the basis of the mineral composition and texture the rock type of the sample is an intermediate volcanic rock, a lava or a dyke.

The specific rock type of the sample could be uralite-plagioclase porphyry

Conclusions

Fine grained groundmass with a porphyritic texture is very durable . No harmful minerals were found.

The conclusion of the study is that this rock type is very suitable to be used as sauna stove stone.