

28.1.2008



STATEMENT

The radioactivity of mineral wool products manufactured by Paroc Group

The stone wool products produced by Paroc (in Finland, Sweden, Poland and Lithuania) have similar chemical composition. The raw materials are also of the same quality.

A measurement - DNo 185/645/08 of the radioactivity of the mineral wools made by STUK, Radiation and Nuclear Safety Authority (Säteilyturvakeskus) shows the following activities:

Th-232	between 2,2 and 19 Bq/kg depending on the line.
Ra-226	between 6,3 and 23 Bq/kg depending on the line.
K-40	between 90 and 300 Bq/kg depending on the line.

The Finnish Centre for Radiation and Nuclear Safety has also developed a guideline – “ST-OHJE, “Rakennusmateriaalien radioaktiivisuus”, which can be used in order to evaluate the radioactivity of building products.

According to this guideline ST 12.2 the activity index can be calculated if the activity of the radioactive isotopes in the products is known.

The activity index I_1 relevant for building products according to the Finnish Building guideline is calculated as:

$$I_1 = \text{activity(Th-232)} / 200 + \text{activity(Ra-226)} / 300 + (\text{K-40}) / 3000.$$

No restrictions for use are needed if this value is below 1.

The column I_1 in the table on page 3 shows that all lines are well below the regulated limit value 1. The highest value 0,26 for Lappeenranta is only one fourth of the limit.

A handwritten signature in blue ink, appearing to read "Jacob Fellman".

Jacob Fellman
Senior Scientist

Paroc Oy Ab Research & Development

PAROC OY AB

FI-21600 Parainen, Finland
Tel. +358 (0)204 55 6868
Fax +358 (0)204 55 6687
www.paroc.com

Test report

18.1.2008

185/645/08

RADIOACTIVITY ANALYSIS OF RAW MATERIAL OF STONE WOOL

Customer Paroc Oy
Mika Honkasalo
Skräbbölenie 14-16
21600 PARAINEN

Object of measurement Stone wool raw material samples

Object of measurement	Arrival date	Analysis date
Oulu VU6 (TT295-08)	10.1.2008	11.-14.1.2008
Parainen VU5 (TT296-08)	10.1.2008	14.-15.1.2008
Parainen VU11 (TT297-08)	10.1.2008	14.-15.1.2008
Lappeenranta (TT298-08)	10.1.2008	14.-15.1.2008
Vilna (TT299-08)	10.1.2008	15.-16.1.2008
Trzemeszno L3 (TT300-08)	10.1.2008	15.-16.1.2008
Trzemeszno L4 (TT301-08)	10.1.2008	16.-17.1.2008
Hällekis L14 (TT302-08)	10.1.2008	15.-16.1.2008
Hässleholm L12 (TT303-08)	10.1.2008	14.-15.1.2008

Method of analysis Gammasspectrometric measurements (gammasspectrometry, in-house guide TKO 3.1.4).

Sampling The measurements and analyses were made from the samples delivered to STUK by the customer.

Results

The radionuclide concentrations given in the following table are calculated to the reference date.

Object of measurement	Reference date*	Nuclide	Result ± uncertainty
Oulu VU6 (TT295-08)	26.10.2007	K-40	90 ± 7 Bq/kg
		Ra-226	8 ± 4 Bq/kg
		Th-232	6 ± 1 Bq/kg
Parainen VU5 (TT296-08)	15.11.2007	K-40	98 ± 11 Bq/kg
		Ra-226	8,4 ± 3,5 Bq/kg
		Th-232	2,2 ± 0,6 Bq/kg
Parainen VU11 (TT297-08)	15.11.2007	K-40	102 ± 6 Bq/kg
		Ra-226	6,3 ± 4,9 Bq/kg
		Th-232	6,7 ± 0,8 Bq/kg
Lappeenranta (TT298-08)	15.10.2007	K-40	300 ± 30 Bq/kg
		Ra-226	23 ± 9 Bq/kg
		Th-232	16 ± 2 Bq/kg
Vilna (TT299-08)	15.12.2007	K-40	208 ± 21 Bq/kg
		Ra-226	14 ± 7 Bq/kg
		Th-232	9,2 ± 1,1 Bq/kg
Trzemeszno L3 (TT300-08)	15.11.2007	K-40	111 ± 20 Bq/kg
		Ra-226	20 ± 11 Bq/kg
		Th-232	19 ± 1,9 Bq/kg
Trzemeszno L4 (TT301-08)	15.11.2007	K-40	115 ± 11 Bq/kg
		Ra-226	19 ± 10 Bq/kg
		Th-232	18 ± 2 Bq/kg
Hällekis L14 (TT302-08)	15.11.2007	K-40	113 ± 11 Bq/kg
		Ra-226	10 ± 6 Bq/kg
		Th-232	9,6 ± 1,2 Bq/kg
Hässleholm L12 (TT303-08)	15.11.2007	K-40	176 ± 32 Bq/kg
		Ra-226	9 ± 8 Bq/kg
		Th-232	11,0 ± 1,3 Bq/kg

* Reference date is the date for which the result has been calculated.

Uncertainty of results

The uncertainty of results (2 sigma) indicates that the results are, with a 95% confidence interval, within the given limit values.

Interpretation of results Calculated activity indexes (as defined in Guide ST 12.2) are given in the following table.

Object of measurement	I ₁	I ₂	I ₃	I ₄
Oulu VU6 (TT295-08)	0,09 ± 0,01	0,03 ± 0,01	0,01	0,01
Parainen VU5 (TT296-08)	0,07 ± 0,01	0,03 ± 0,01	0,01	0,01
Parainen VU11 (TT297-08)	0,09 ± 0,02	0,04 ± 0,01	0,01	0,01
Lappeenranta (TT298-08)	0,26 ± 0,03	0,10 ± 0,01	0,04 ± 0,01	0,01
Vilna (TT299-08)	0,16 ± 0,02	0,06 ± 0,01	0,02	0,01
Trzemeszno L3 (TT300-08)	0,20 ± 0,04	0,08 ± 0,02	0,03 ± 0,01	0,01
Trzemeszno L4 (TT301-08)	0,19 ± 0,03	0,08 ± 0,01	0,03 ± 0,01	0,01
Hällekis L14 (TT302-08)	0,12 ± 0,02	0,05 ± 0,01	0,02	0,01
Hässleholm L12 (TT303-08)	0,14 ± 0,03	0,06 ± 0,01	0,02	0,01

Signature

Senior Scientist



Seppo Klemola

This test report may only be published and copied in full, except with a prior written permission by the Radiation and Nuclear Safety Authority (STUK). The test results only apply to the tested samples. Interpretation of results is not included in accreditation.