

Analysis of radionuclides

Test report no.:	190716-02
Client:	Rodacal Beyem S.L. Ctra. Madrid-Alicante, Km. 213 (Extramuro) 02630 La Roda (Albacete) Spain
Date of order:	08 July 2019
Type of samples:	Solid material sample
Number of samples:	1
Sampling by:	Client
Date of sampling:	not specified
Delivery of the samples:	16 July 2019
Date of analytical works:	16 July 2019 - 22 July 2019
Analytical methods:	Gamma-ray spectrometry (γ ; SOP 3-09, 2018-11)
Evaluation and uncertainties:	Measurement uncertainties and decision thresholds are determined according to standard DIN ISO 11929:2011-01 with $k_{1-\alpha} = 1,645$; $k_{1-\beta} = 1,645$
General remarks:	None
Release date:	22 July 2019
Number of pages:	2

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The accreditation is valid for the methods mentioned in the certificate. Test results refer to the tested samples.
The test report may be forwarded to other parties provided that it is not changed in any way.
Excerpts from the test reports require the prior, written permission of IAF-Radioökologie GmbH.

Test report no.: 190716-02

Client: Rodacal Beyem S.L.
Ctra. Madrid-Alicante, Km. 213 (Extramuro)
02630 La Roda (Albacete)
Spain

Type of samples: Solid material sample

Reference date: 22 July 2019

Analytical results			No. 1	
Specification			Beyem Bioterm	
Nuclide		Units	Result	U [%]
<i>U-238-series</i>				
U-238	γ	Bq/kg	26	15
Ra-226	γ	Bq/kg	25	15
Pb-210	γ	Bq/kg	27	18
<i>U-235-series</i>				
U-235	γ	Bq/kg	1,2	15
Ac-227	γ	Bq/kg	1,1	50
<i>Th-232-series</i>				
Ra-228	γ	Bq/kg	10	12
Th-228	γ	Bq/kg	11	10
<i>Further Radionuclides</i>				
K-40		Bq/kg	176	6,4

U [%]: the measurement uncertainty includes the counting statistics and all that can be recorded in the laboratory uncertainties (calibration, nuclide data, etc.); $k_{(1-\gamma/2)} = 1,96$.

Data indicated with "<" are below the decision threshold.

The results refer to the sample as delivered by the client.

Note: This test report uses commas as decimal separators in accordance with European convention.

Seek clarification if in doubt as to intended meaning.

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Your reference

Your letter of (date)

Our reference

Date

08.07.2019

22.07.2019

"RADIATION-FREE DECLARATION"

IAF-Radioökologie GmbH as independent, accredited test laboratory declares that according to the attached test report No. **190716-02** of 22.07.2019 the material

Beyem Bioterm

is radiation free in line with German and European norms.

The measured **specific activities** of each of the natural radionuclides of the U-238 and Th-232 series is lower than the level of **200 Bq/kg**, according to Annex I of the the German Radiation Protection Act (Bundesgesetzblatt Jg. 2017 Teil I Nr. 42 of 3 July 2017).

The activity concentration index

$$I = \frac{C_{Ra}}{300 \frac{Bq}{kg}} + \frac{C_{Th}}{200 \frac{Bq}{kg}} + \frac{C_K}{3000 \frac{Bq}{kg}}$$

according to Annex VIII of Council Directive 2013/59/Euratom (European Basic Safety Standards, Official Journal of the European Union, 17.1.2014) is

$$I = 0,197$$



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