



CERTIFIED REFERENCE MATERIAL BCR[®] – 068

CERTIFICATE OF ANALYSIS

QUARTZ			
Stokes diameter x_v [μm]	Cumulative particle size distribution based on mass fraction		
	Certified value of particles undersize ¹⁾ [g/g]	Uncertainty ²⁾ [g/g]	Number of data points
160.0	0.042	0.009	52
250.0	0.23	0.04	25
320.0	0.449	0.024	25
400.0	0.689	0.027	34
500.0	0.888	0.012	28
630.0	0.974	0.009	24
<p>1) The certified value is the mean value of mass fraction of particles undersize a given equivalent volume diameter obtained in five laboratories by means of sieving. The certified value is traceable to sieve analysis.</p> <p>2) The uncertainty is the standard uncertainty (confidence level of about 68 %) derived from the inter-laboratory variance of the average mass fraction of particles undersize determined in five laboratories.</p>			

This certificate is valid for three years after purchase.

Sales date:

The minimum amount of sample to be used is 1 g.

NOTE

This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, November 1979
Revised: May 2007

Signed: _____

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Indicative Value		
	Indicative value ¹⁾ [kg/m ³]	Uncertainty ²⁾ [kg/m ³]
Density ρ_s	2647	4
1) The indicative value is the unweighted mean of the results obtained in four different laboratories, each using a pycnometry method. 2) The indicative uncertainty is the standard uncertainty (confidence level of about 68 %) derived from the inter-laboratory variance of the average density determined in four laboratories.		

DESCRIPTION OF THE SAMPLE

Each sample consists of a glass bottle filled with approximately 100 g of quartz powder obtained by subdividing a bulk quantity of the material with the aid of a rotating riffle.

ANALYTICAL METHOD USED FOR CERTIFICATION

The material is certified with respect to the cumulative distribution by mass of the equivalent volume diameter of the particles as measured by calibrated sieves. The cumulative particle size distribution versus equivalent volume diameter was measured using sieves with square holes and sieves with round holes. Each sieve was calibrated using a counting/weighing procedure. This technique involved the counting of n particles of total mass m which only passed through the sieve. The equivalent volume diameter, x_v , is then given by the equation

$$x_v = \left(\frac{6m}{\rho_s \pi n} \right)^{1/3}$$

where m is the mass of the n particles counted and ρ_s is the density of the particles.

PARTICIPANTS

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- University of Technology, Loughborough (GB)
- National Physical Laboratory, Teddington (GB)

SAFETY INFORMATION

Particles 10 μm or less in diameter can enter deeply into the respiratory system when inhaled. Precautions must then be taken accordingly when manipulating this CRM.

INSTRUCTIONS FOR USE

BCR-068 is intended to be used by laboratories either to test the accuracy and the effectiveness of their particle sizing procedures or alternatively to calibrate particle sizing instruments. If compatible with the measurement technique, the total sample should be used. If further subdivision is necessary, a rotating riffle is recommended for the abstraction of sub-samples down to a suitable quantity for sieving from the supplied 100 g sample.

A stack of sieves, or a single sieve, with nominal mesh diameters in approximately the range 160 to 630 μm may be calibrated using BCR-068 by sieving the whole of a single sample and weighing the various sieve fractions. The mass fractions of the particles passed by the individual sieves are then calculated and the equivalent volume diameters of the cutsizes of the individual sieves obtained by referring to the certified results in the table on the first page of this certificate; interpolation will usually be necessary. A plot of the mass fraction of particles undersize versus the equivalent volume diameter is a useful aid, and is provided in the certification report.

STORAGE

Specimens should be kept at ambient temperature in their original packing until used. However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

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NOTE

A technical report on the production of BCR-068 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.