EUROPEAN COMMISSION

JOINT RESEARCH CENTRE

Institute for Reference Materials and Measurements

CERTIFIED REFERENCE MATERIAL
BCR® – 066

CERTIFICATE OF ANALYSIS

QUARTZ			
Stokes diameter x_{st} [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
0.35	0.024	0.013	18
0.50	0.063	0.019	29
0.60	0.11	0.04	27
0.75	0.20	0.06	30
0.90	0.33	0.06	29
1.05	0.45	0.06	29
1.20	0.54	0.07	29
1.50	0.72	0.06	30
1.85	0.85	0.04	43
2.50	0.955	0.023	37
3.50	0.996	0.005	40

1) The certified value is the mean value of mass fraction of particles undersize a given Stokes diameter obtained in five laboratories by means of sedimentation analysis in the gravity field. The certified value is traceable to the sedimentation analysis in the gravity field (Pipette method).
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.

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	2619	7

1) The indicative value is the unweighted mean of the results obtained in five different laboratories, each using a pycnometry method.
2) The uncertainty is the standard uncertainty (confidence level of about 68 %) derived from the inter-laboratory variance of the average density determined in five laboratories.

DESCRIPTION OF THE SAMPLE

Each sample consists of a glass bottle filled with approximately 10 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 Stokes diameters of the particles as measured by sedimentation analysis in the gravity field (Pipette Method). The Stokes diameter, x_{st}, is defined by the equation

$$x_{st} = \sqrt{\frac{18\ \eta h}{(\rho_s - \rho_f)\ g\ t}}$$

where η is the viscosity of the liquid in which the particles are suspended, h is the vertical distance through which the particles fall in time t, ρ_s and ρ_f are respectively the densities of the particles and the sedimentation fluid and g the gravity.

PARTICIPANTS

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- 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-066 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 ca 1 g from the supplied 10 g samples.
Reproduction of the certified results is most likely if the detailed methodology used for certification and detailed in the standard DIN 66115 is closely adhered to; deviations from these results are possible if other methods are used. However BCR-066 may be used to check and/or calibrate apparatuses that measure Stokes diameter in the range covered by this reference material.

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-066 is available on the internet (http://www.irmm.jrc.be). A paper copy can be obtained from IRMM on request.

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