



# CERTIFIED REFERENCE MATERIAL BCR<sup>®</sup> – 321

## CERTIFICATE OF ANALYSIS

| UNALLOYED ZINC   |                           |                       |                                   |
|--|---------------------------|-----------------------|-----------------------------------|
|  | Mass Fraction             |                       | Number of accepted sets of data p |
|  | Certified value<br>[µg/g] | Uncertainty<br>[µg/g] |                                   |
| Al   | < 0.7 <sup>3)</sup>       | <sup>4)</sup>         | 8                                 |
| In   | < 0.2 <sup>3)</sup>       | <sup>4)</sup>         | 5                                 |
| Pb   | 4.85 <sup>1)</sup>        | 0.20 <sup>2)</sup>    | 8                                 |
| Sn   | < 0.5 <sup>3)</sup>       | <sup>4)</sup>         | 9                                 |
| Tl   | 0.78 <sup>1)</sup>        | 0.10 <sup>2)</sup>    | 9                                 |
| <p><sup>1)</sup> Unweighted mean value of p sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The certified values are traceable to the International System of Units (SI).</p> <p><sup>2)</sup> Half-width of the 95 % confidence interval of the certified values as defined in 1).</p> <p><sup>3)</sup> Upper limit value of means is supported by p sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The certified upper limits are traceable to the International System of Units (SI).</p> <p><sup>4)</sup> The Al, In and Sn content of BCR-321 is less than the certified value at a confidence level of about 95%.</p> |                           |                       |                                   |

This certificate is valid for five years after purchase.

Sales date:

The minimum amount of sample to be used is 1 g. It is recommended not to use the center of the samples (approx. 10 mm diameter).

### 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 1989  
Latest revision: August 2015

Signed: \_\_\_\_\_

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Joint Research Centre  
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| Indicative Values   |  |                                     |                                      |
|---|--|-------------------------------------|--------------------------------------|
|   | Mass Fraction                            |                                     |                                      |
|   | Indicative value <sup>1)</sup><br>[µg/g] | Uncertainty <sup>2)</sup><br>[µg/g] | Number of accepted<br>sets of data p |
| Cd  | 0.23                                     | 0.03                                | 4                                    |
| Cu  | 0.97                                     | 0.05                                | 9                                    |
| Fe  | 2.22                                     | 0.14                                | 9                                    |
| <sup>1)</sup> Unweighted mean value of p sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The values are traceable to the International System of Units (SI).<br><sup>2)</sup> Half-width of the 95 % confidence interval of the mean as defined in 1). |  |                                     |                                      |

## DESCRIPTION OF THE SAMPLE

The samples are discs with 80 mm diameter and 20 mm thickness.

Each sample has two different numbers:

- a five digit code, marked on the metal by the producer of the materials, defining the exact position of the sample in the original batch of rods;
- the "normal" individual identification (consecutive numbering of samples within a CRM), marked on the label of the samples.

|         | Individual identification (on label)                 | Five digit code (on metal sample) *                                  |
|---------|--|--|
| BCR-321 | 001 to 060<br>061 to 120<br>121 to 180<br>181 to 240 | 11101 to 11160<br>11201 to 11260<br>11301 to 11360<br>11401 to 11460 |

- \* First digit : 1 for unalloyed zinc  
 Second digit : 1 for BCR-321  
 Third digit : rod number within one CRM  
 Last two digits : disk number within one rod (01 = bottom, 60 = top)

## ANALYTICAL METHOD USED FOR CERTIFICATION

- Charged particle activation analysis
- Differential pulse anodic stripping voltammetry
- Electrothermal atomic absorption spectrometry
- Flame atomic absorption spectrometry
- Inductively coupled plasma emission spectrometry
- Spectrophotometry
- X-ray fluorescence spectrometry

## PARTICIPANTS

- Budelco B.V., Budel-Dorplein (NL)
- Bundesanstalt für Materialforschung und –prüfung, Berlin (DE)
- Energieonderzoek Centrum Nederland, Petten (NL)
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- Instituut voor Nucleaire Wetenschappen, Gent (BE)
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- Metaleurop Weiser Blei GmbH, Nordenham (DE)
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- Ruhr-Zink GmbH, Datteln (DE)
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- Vieille-Montagne, Overpelt (BE)
- Vieille-Montagne France, Aubry-les-Douai (FR)

## **SAFETY INFORMATION**

Not applicable.

## **INSTRUCTIONS FOR USE**

The material is mainly intended for calibration in emission spectrometry with solid samples; the usual mechanical cleaning should be applied prior to the measurement (the CRM and the user's samples should be treated in the same way). It is recommended not to use the centre of the samples (approx. 10 mm diameter).

## **STORAGE**

The CRMs should be stored in clean and dry conditions at ambient temperature. 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.

## **LEGAL NOTICE**

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## **NOTE**

A technical report on the production of BCR-321 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.

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