# CERTIFICATE OF ANALYSIS

## ERM®-BD274

| Acrylamide in Rusk | | |
|---|---|---|
| Compound | Certified value [1)] | Uncertainty [2)] |
| | Mass fraction in µg/kg | |
| Acrylamide | 74 | ± 7 |

[1)] Unweighted mean of accepted mean values, independently obtained by 8 laboratories using different analytical methods. The certified value is traceable to the SI.

[2)] Estimated expanded uncertainty *U* with a coverage factor of *k* = 2, corresponding to a level of confidence of about 95 %, as defined in the Guide to the expression of uncertainty in measurement (GUM), ISO, 1995. Uncertainty contributions arising from characterisation as well as from homogeneity and stability testing were taken into account.

The certified properties will be valid for 12 months beginning with the dispatch of the material from BAM; this validity may be extended as further evidence of stability becomes available.

The minimum sample intake is 4 g.

### NOTE

European Reference Material ERM®-BD274 was produced and certified under the responsibility of Bundesanstalt für Materialforschung und –prüfung (BAM) according to the principles laid down in the technical guidelines of the European Reference Materials® co-operation agreement between BAM-LGC-IRMM. Information on these guidelines is available on the Internet (http://www.erm-crm.org).

Accepted as an ERM®, Berlin, 2008-12-08

Berlin, 2008-12-08

**Signed**

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## DESCRIPTION OF THE SAMPLE

The intended purpose of reference material ERM®-BD274 is i) validation of analytical procedures for the determination of acrylamide in food, and ii) quality assurance in the analytical laboratory.
The material ERM®-BD274 is a rusk sample from commercial sources intended for human consumption. After grinding and fractionation by sieving and homogenisation, the sieve fraction < 500 µm was subdivided into 200 units of approximately 48 g. Units were filled in brown glass bottles with screw caps containing PTFE-inlays, bottles are sealed with shrinking foil. The material is stored at BAM at –20°C until dispatch.
The between-bottle homogeneity was evaluated by analysis of variance (ANOVA) on 12 out of 200 bottles (4 replicate analyses per bottle). Extensive stability tests provided sound evidence for a minimum validity of the material as indicated on page 1 of this certificate provided the material is stored according to the instructions given on page 3.
Homogeneity and stability testing are described in detail in the certification report.

## PARTICIPANTS

The certification study involved the following 8 laboratories using various analytical methods for the determination of acrylamide in food:

| Laboratory | City, State |
|---|---|
| BAM, I.2 | Berlin, Germany |
| Institut für Qualitätsförderung in der Süßwarenwirtschaft | Köln, Germany |
| Kantonales Labor Zürich | Zürich, Switzerland |
| Lebensmittelchemisches Institut Köln | Köln, Germany |
| National Food Administration Sweden | Uppsala, Sweden |
| Nestlé Research Centre | Lausanne, Switzerland |
| Public Analyst´s Laboratory Dublin | Dublin, Ireland |
| VWA/KvW Keuringsdienst van Waren Zuid Limburg, Noord Brabant | Eindhoven, The Netherlands |

## ANALYTICAL METHODs USED FOR CERTIFICATION

The following analytical methods were employed by the participating laboratories:

| Derivatisation | Analytical method |
|---|---|
| Bromination | GC-MS |
| Without | GC-MS |
| Without | HPLC-ESI-MS/MS |

The acrylamide mass fraction is, although not method-specific, clearly a parameter which is influenced by the method employed for its determination, namely the extraction and (if applicable) derivatisation procedure. The measurement step takes traceability from calibration using the pure substance acrylamide (99+%; Merck Darmstadt), sample preparation steps from spiking using the deuterium-labelled [$^2H_3$] acrylamide ($D_3$-AA) (99+%; Polymer Source), both having independently confirmed purities. Overall recovery was estimated to 95 - 105 %. Remaining systematic between-method biases are sufficiently covered by the allowance made for the intercomparison contribution to the total uncertainty budget. The certified value is traceable to the SI.

## SAFETY INFORMATION

Acrylamide is a (suspected) carcinogen and should be handled with due caution. No hazardous effect is to be expected when the material is used under conditions usually adopted for the analysis of foodstuff matrices with a low level of contamination of acrylamide.

## INSTRUCTIONS FOR USE

Before withdrawing a sub-sample, the bottle should be allowed to reach room temperature and the contents mixed thoroughly. Thereafter, the bottle should be kept tightly closed. To the best of our knowledge, the stability of the reference material is not affected by short periods of handling at ambient temperature during transport and use. However, BAM cannot be held responsible for any alterations of the material occurring during transportation to, and handling and storage at, the customer's premises, especially of opened samples.

## STORAGE

The material has to be stored at a temperature equal to or lower than –20 °C in its original bottle.

## LEGAL NOTICE

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## TECHNICAL REPORT

A detailed technical report (pdf file or paper copy; in English) describing the production, general characterisation as well as the analytical procedures applied and the treatment of the analytical data during certification of ERM®-BD274 is available on request from BAM.

Supply of Reference Materials by Bundesanstalt für Materialforschung und –prüfung:

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