

Bundesanstalt für Materialforschung und -prüfung (BAM)

Certified Reference Material

BAM-U021a Mineral oil contaminated soil

Certified Values

Measurand	Mass fraction ¹⁾ in mg/kg	Uncertainty ²⁾ in mg/kg
Total petroleum hydrocarbon (TPH)	2801	204
¹⁾ Unweighted mean value of 11 laboratory means. ²⁾ Estimated expanded uncertainty U with a coverage factor of $k = 2$, corresponding to a level of confidence of approx. 95 %, as defined in the Guide to the expression of uncertainty in measurement, (GUM, ISO/IEC Guide 98-3:2008) [1].		

This certificate is valid for a period of 12 months starting with the dispatch of the reference material from BAM.

Date of dispatch:

Sample No.:

The minimum sample size for one determination is 5 g. The total petroleum hydrocarbon (TPH) mass fraction according to ISO 16703:2011 is related to sample intake (not to dry mass). The water content is (1.68 ± 0.12) % and remains stable if the material is handled as indicated below.

Instructions for use

BAM-U021a is explicitly meant only to be used in analytical laboratories. The intended purpose of reference material BAM-U021a is the verification of analytical procedures equivalent to ISO 16703:2011 [2,3] for the determination of the TPH content in soils and sediments by GC-FID.

It is strongly recommended to handle and dispose of the reference material in accordance with the guidelines for analytical soil samples legally in force at the site of end use and disposal.

Material description

Reference material BAM-U021a was obtained by blending soil from a contaminated site in Bremen, Germany with a TPH free sandy loamy soil sampled near Berlin, Germany. After air-drying, sieving and homogenisation, the fraction $< 125 \mu\text{m}$ was subdivided into units of 71 g which were filled in amber glass bottles with screw caps equipped with PTFE-inserts and sealed with shrinking foil. The material is stored at BAM at $-20 \text{ }^\circ\text{C}$ until dispatch. Details on the preparation and characterisation procedures are specified in the certification report.

Transport and Storage

BAM-U021a can be shipped at ambient temperature. Upon receipt the material must be stored at -20 °C in its original bottle. Before taking a subsample the bottle must have reached ambient temperature. Thereafter, the bottle must be closed tightly and stored at -20 °C. The stability of the reference material is not affected by short periods of handling at ambient temperature during transport and use.

Metrological Traceability

The total petroleum hydrocarbon content is defined by the method employed for its determination. The certified value is the mass fraction of mineral oil obtained by the analytical procedure according to ISO 16703:2011 in relation to the certified calibration standard BAM-K010g. Thus, the stated references for BAM-U021a are ISO 16703:2011 and the calibration standard BAM-K010g mentioned for this purpose therein.

Participating Laboratories

Analysen Service GmbH, Privates Institut für Umweltanalytik	Penzlin, Germany
Analysen Service GmbH, Umwelt- und Öllabor Leipzig	Leipzig, Germany
Bundesanstalt für Materialforschung und -prüfung (BAM)	Berlin, Germany
chemlab	Bensheim, Germany
Eurofins Umwelt Ost GmbH	Bobritzsch, Germany
Landeskriminalamt Berlin	Berlin, Germany
Landeskriminalamt Brandenburg	Eberswalde, Germany
NIUTEK AG	Winterthur, Switzerland
SGS Institut Fresenius GmbH	Berlin, Germany
SYNLAB A&S Germany GmbH	Augsburg, Germany
WESSLING GmbH	Landsberg, Germany

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Technical Report

A detailed technical report describing the analytical procedures and the treatment of the analytical data used to certify BAM-U021a is available on request or can be downloaded from the BAM website (www.bam.de).

Literature

- [1] ISO/IEC Guide 98-3:2008. Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) ISO, Geneva, Switzerland.
- [2] EN ISO 16703:2011. Soil quality - Determination of content of hydrocarbon in the range C₁₀ to C₄₀ by gas chromatography.
- [3] EN 14039:2005. Characterization of waste - Determination of hydrocarbon content in the range of C₁₀ to C₄₀ by gas chromatography.

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Bundesanstalt für Materialforschung und -prüfung (BAM)



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BAM holds an accreditation as a reference material producer according to ISO Guide 34 in combination with ISO/IEC 17025. This accreditation is valid only for the scope as specified in the certificate D-RM-11075-01-00. DAKKS is a signatory of the multilateral agreement (MLA) between EA, ILAC and IAF for mutual acceptance.

