

**Reference Material**

This certificate is designed in accordance with ISO 17034 and ISO Guide 31. This reference material (RM) was designed, produced and verified in accordance with ISO/IEC 17025, ISO 17034 and a registered quality management system ISO 9001.

**Product Name**  
4,4'-Benzidine

**Product Code**  
DRE-C10536000

**Lot Number**  
G1239693

**CAS No.**  
92-87-5

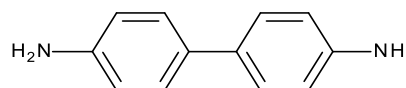
**Format**  
Neat

**Mol. Weight**  
184.24

**Expiry Date**  
01 Apr 2028

**Mol. Formula**  
C<sub>12</sub>H<sub>12</sub>N<sub>2</sub>

**Storage Temp**  
20°C ± 4°C



<b>CERTIFIED</b> Purity 98.72% (g/g)	<b>CERTIFIED</b> Expanded Uncertainty (U) 0.94% (g/g)
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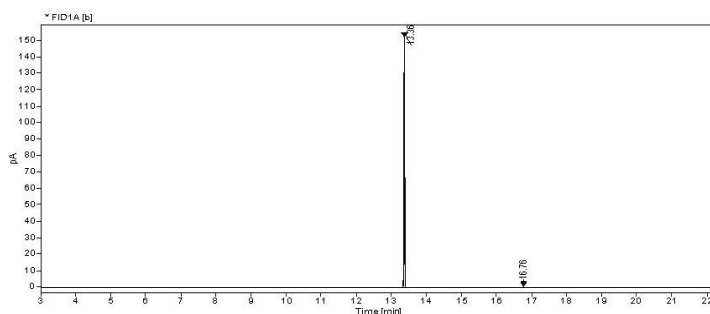
**Uncertainty**

The certified value(s) and uncertainty(ies) are determined in accordance with ISO 17034 with an 95% confidence level (k=2). Uncertainty is based on the Total Combined Uncertainty, including uncertainties of characterisation, homogeneity and stability testing. Stability values are based on real evidence opposed to simulation.

The producer certifies that this reference material meets the specification stated in this certificate until the expiry date, provided it is stored unopened at the recommended temperature herein. Product warranties for this reference material are set out in the terms and conditions of purchase.

CERTIFIED BY	CERTIFIED ON		
N. Müller	01 Apr 2022	<i>N. Müller</i>	RM Release

CHROMATOGRAM



Signal:	* FID1A [b]	RT [min]	Area [pA*s]	Height [pA]	Area%	Width [min]
Nr.						
1		13.36	212.6716	151.85	99.95	0.021
2		16.76	0.10986	0.08	0.05	0.017

**Instrument**

GC/FID

**Detection**

FID

**Column**

Optima-5MS, 0.25 µm, 0.25 mm

**Method Details**

Initial Temp: 120°C / 4 min, End Temp: 320°C / 5 min, Gradient: 15°C/min

**Inj.-Vol.**

1.0 µL

**Flow**

1 mL/min

**Method of Characterisation**

Purity = 100% - Assay impurities - Water content (KF)

**Method of Identification**

EA, NMR, RT, IR, MS

**Batch Information**

Water Content: 1.23% (g/g) by Karl-Fischer-Titration (U(exp) = 0.28% (g/g)).

**Intended Use**

This RM is intended for use in a laboratory as a calibration and quality control standard or in method development for analytical techniques.

**Safety**

Proper precautions should be observed while handling. See Safety Data Sheet.

**Traceability**

The balances used for gravimetric measurements are calibrated with weights traceable to the national standards (DKD). The calibration of

the balances is verified daily internally and annually by an external accredited calibration service. Chromatographic methods are traceable to the International System of Units (SI).

**Homogeneity**

Random replicate samples of the final packaged RM have been analysed to prove homogeneity compliant with ISO 17034.

**Storage**

The RM should be stored in the original sealed container at the indicated temperature.

**Instructions for use**

It is recommended to use 1 mg as the minimum sample size and if less material is used, to increase the certified uncertainty by a factor of two for half sample and four for a quarter of sample. If storage after opening is necessary, the RM should be tightly closed and kept from light and moisture. If the RM was in a sealed ampoule, it should be transferred to a vial with minimum head space. Visit the support section of our website [lgcstandards.com](http://lgcstandards.com) for a series of Dr. Ehrenstorfer Tech Tip videos and frequently asked questions.

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LGC Labor GmbH is accredited by  
DAkkS accreditation numbers  
D-RM-19883-01-00 & D-PL-19883-01-00  
on ISO 17034:2017 & ISO/IEC 17025:2018

