



NATIONAL PHYSICAL LABORATORY

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NPL Management Ltd – Registered in England and Wales No 2937881



4002

Certificate of Calibration

NPL PRIMARY REFERENCE MATERIAL

Cylinder Number: D156916

The certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units, to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes, or to other internationally recognised standards. This certificate may not be reproduced other than in full, unless permission for the publication of an approved extract has been obtained in writing from NPL Management Ltd. The data included in this certificate applies only to those items specifically listed as tested, calibrated or sampled and cannot be used to assign any attributes beyond those shown by the data.

CUSTOMER:

Finnish Meteorological Institute

ADDRESS:

Air Quality Research, P.O. Box 503, FI-00101 Helsinki, Finland

CALIBRATION DATE:

18 January 2024

AMOUNT FRACTIONS:

Component	Amount fraction / (nmol / mol)	Component	Amount fraction / (nmol / mol)
Ethane	4.14 ± 0.13	2-methylpentane	4.12 ± 0.13
Ethene	4.06 ± 0.13	<i>n</i> -hexane	4.12 ± 0.13
Propane	4.09 ± 0.13	Isoprene	4.10 ± 0.13
Propene	4.06 ± 0.13	<i>n</i> -heptane	4.13 ± 0.13
2-methylpropane	4.15 ± 0.13	Benzene	3.89 ± 0.12
<i>n</i> -butane	4.11 ± 0.13	2,2,4-trimethylpentane	3.88 ± 0.12
Ethyne	4.28 ± 0.22	<i>n</i> -octane	3.89 ± 0.12
<i>trans</i> -but-2-ene	4.13 ± 0.13	Toluene	3.97 ± 0.12
But-1-ene	4.10 ± 0.13	Ethylbenzene	4.18 ± 0.13
<i>cis</i> -but-2-ene	4.12 ± 0.13	<i>m</i> -xylene + <i>p</i> -xylene	8.12 ± 0.25
2-methylbutane	3.91 ± 0.12	<i>o</i> -xylene	3.75 ± 0.12
<i>n</i> -pentane	3.92 ± 0.12	1,3,5-trimethylbenzene	4.08 ± 0.13
1,3-butadiene	4.17 ± 0.13	1,2,4-trimethylbenzene	4.13 ± 0.13
<i>trans</i> -pent-2-ene	4.06 ± 0.13	1,2,3-trimethylbenzene	4.06 ± 0.13
Pent-1-ene	4.01 ± 0.13	Nitrogen	Balance

The reported expanded uncertainties are based on standard uncertainties multiplied by a coverage factor $k = 2$, providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

METHODS:

Preparation: gravimetry; Analysis: gas chromatography (FID)

TRACEABILITY:

The values on this certificate are traceable to NPL Primary Standards.

EXPIRY:

Certificate valid for 5 years from the date of issue

PRESSURE:

Fill pressure: 103 bar; Minimum utilisation pressure: 10 bar.

STORAGE:

No special precautions are required

HANDLING:

Refer to ISO 16664.

OUTLET:

DIN 477 No. 1 Valve

INTENDED USE:

Calibration standard.

Reference: 2023090368

Date of issue: 26 January 2024

Signed:

(Authorised Signatory)

Name: Dr P K Petrov

(on behalf of NPLML)

Checked by:

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This certificate is consistent with the capabilities that are included in Appendix C of the CIPM MRA drawn up by the CIPM. Under the CIPM MRA, all participating institutes recognise the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (for details see <https://www.bipm.org/kcdb/>). The "CIPM MRA logo" and this statement attest only to the measurement(s) applied for determining the certified values on the certificate.