

## Reference material of <Component> in nitrogen

**Description** Primary reference gas mixture (PRM), cylinder number <number>.  
The cylinder contains a mixture of <Component> in nitrogen.  
The PRM is contained in a passivated aluminium cylinder. The cylinder has a water volume of 5 L and is pressurized to <number> MPa.  
Cylinder outlet conforms to DIN 1 specifications.

**Method of preparation** Gravimetric preparation in accordance with ISO 6142-1:2015.

**Result**

Component	Amount fraction [mol/mol]	Uncertainty [mol/mol]
<Component>	<number> × 10 <sup>-&lt;no&gt;</sup>	<number> × 10 <sup>-&lt;no&gt;</sup>

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor  $k = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the Expression of Uncertainty in Measurement'.

**Traceability** The values on this certificate are traceable to VSL Primary Standards.

**Safety information** The cylinder should be handled with care and by experienced personnel in a laboratory environment suitably equipped for the safe handling of gaseous materials.

**Instructions for use** The gas mixture can be used to validate and/or calibrate analytical methods and equipment.  
Do not use the cylinder in case the cylinder pressure is below 1 MPa.  
Further instructions regarding the handling of calibration gases can be found in ISO 16664:2017.

**Expiry date** This certificate is valid until <Date>.

Delft, <Date>

On behalf of VSL,  
The Certificate Committee

[1] The reported content in this certificate is traceable to National (Primary) Standards of The Netherlands, which realize units of measurements according to the international system of units (SI). Measurement traceability is realized according ILAC policy on Metrological Traceability of Measurement results (ILAC-P10:07/2020) and Acceptable Traceability (RvA-T018-NL/UK, article 3.1).



*Van Swinden Laboratorium (VSL) is designated by law as the National Metrology Institute (NMI) of the Netherlands. As such, it provides direct traceability of measurement results to internationally accepted measurement standards. VSL is signatory member of the of the Mutual Recognition Arrangement (MRA) of the International Committee of Weights and Measures (CIPM). The existence of mutual confidence in product specifications and product control is of fundamental importance in order to fulfil international, harmonized legislation on trade, quality, health, safety and environment. In this respect, standardized and equivalent measurement units and traceability to internationally accepted standards are essential. More information can be found on <https://www.vsl.nl/>.*

[2] The reported content in this certificate is consistent with the Calibration and Measurement Capability represented in the Key Comparison Database (KCDB) as part of the Mutual Recognition Arrangement (MRA) of the International Committee of Weights and Measures (CIPM).



*This certificate is consistent with the calibration and measurement capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (CIPM MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the CIPM MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in the KCDB (for details <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.*

[3] The reported content in this certificate is consistent with the RvA scope of accreditation of VSL with identification P002.



*The scope can be verified on <https://www.rva.nl/>. RvA is signatory of the EA MLA and ILAC MRA.*