

CCQM-K111, CCQM-K111.1, EURAMET.QM-K111, COOMET.QM-K111 APMP.QM-K111 and SIM.QM-K111

Key comparison CCQM-K111

MEASURAND : Amount-of-substance fraction of propane in nitrogen

NOMINAL VALUE : 1000 $\mu\text{mol/mol}$

$x_{\text{prep } i}$	amount of substance fraction from preparation
$u_{\text{prep } i}$	standard uncertainty of $x_{\text{prep } i}$
$u_{\text{ver } i}$	standard uncertainty from verification
$u_{\text{ref } i}$	standard uncertainty of reference value
$x_{\text{Lab } i}$	result of laboratory i
$U_{\text{Lab } i}$	stated expanded uncertainty of $x_{\text{Lab } i}$ at a 95 % level of confidence
$k_{\text{Lab } i}$	stated coverage factor

Lab i	Cylinder	$x_{\text{prep } i}$ / ($\mu\text{mol/mol}$)	$u_{\text{prep } i}$ / ($\mu\text{mol/mol}$)	$u_{\text{ver } i}$ / ($\mu\text{mol/mol}$)	$u_{\text{ref } i}$ / ($\mu\text{mol/mol}$)	$x_{\text{Lab } i}$ / ($\mu\text{mol/mol}$)	$U_{\text{Lab } i}$ / ($\mu\text{mol/mol}$)	$k_{\text{Lab } i}$
CERI	153748	992.99	0.27	0.35	0.44	993.1	1.1	2
INMETRO	153926	991.44	0.26	0.35	0.44	990.9	2.3	2
KRISS	153769	991.01	0.27	0.35	0.44	991.2	1.0	2
NIST	153887	992.51	0.27	0.35	0.44	994.3	2.1	2.78
NMISA	153929	989.47	0.27	0.35	0.44	1000.20	2.00	2
NPL	153465	990.47	0.28	0.35	0.44	989.40	0.99	2
VNIIM	153166	993.56	0.27	0.35	0.44	994.46	1.40	2
VSL	153513	993.40	0.27	0.35	0.44	993.4	0.7	2

Key comparison CCQM-K111.1

The numerical results of CCQM-K111.1 are listed on p. 4 of the Final Report.

Key comparison EURAMET.QM-K111

The numerical results of EURAMET.QM-K111 are listed in Table 4 of the Final Report.

Key comparison COOMET.QM-K111

The numerical results of COOMET.QM-K111 are listed in Annex 4 of the Final Report.

Key comparison APMP.QM-K111

The numerical results of APMP.QM-K111 are listed in Table 4 of the Final Report.

Key comparison SIM.QM-K111

The numerical results of SIM.QM-K111 are listed in Table 5 of the Final Report.

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The key comparison reference value for each cylinder is identical to $x_{\text{prep } i}$ with the standard uncertainty $u_{\text{ref } i}$

The degree of equivalence of each laboratory i with respect to the key comparison reference value is given by a pair of terms:

$D_i = (x_{\text{Lab } i} - x_{\text{prep } i})$ and its expanded uncertainty at a 95% level of confidence U_i computed as explained in the Final Report.

Linking key comparison CCQM-K111.1 to CCQM-K111

The degrees of equivalence determined from the CCQM-K111.1 comparison are linked to the CCQM-K111 via VSL who participated in both comparisons.

Linking key comparison EURAMET.QM-K111 to CCQM-K111:

The degrees of equivalence determined from the EURAMET.QM-K111 comparison are linked to the CCQM-K111 via VSL who participated in both comparisons.

Linking key comparison COOMET.QM-K111 to CCQM-K111:

The degrees of equivalence determined from the COOMET.QM-K111 comparison are linked to the CCQM-K111 via VNIIM who participated in both comparisons.

Linking key comparison APMP.QM-K111 to CCQM-K111:

The degrees of equivalence determined from the COOMET.QM-K111 comparison are linked to the CCQM-K111 via CERI and KRISS who participated in both comparisons.

Linking SIM.QM-K111 to CCQM-K111

The link is made using the results from INMETRO having participated in both comparisons (See section 2.8 in SIM.QM-K111 Final Report)

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NOMINAL VALUE : 1000 $\mu\text{mol/mol}$

Degrees of equivalence, D_i and expanded uncertainty U_i (95% level of confidence) expressed in $\mu\text{mol/mol}$

Lab <i>i</i> ↓	D_i	U_i
	/ ($\mu\text{mol/mol}$)	
CERI	0.1	1.4
INMETRO	-0.5	2.5
KRISS	0.2	1.3
NIST	1.8	1.8
NMISA	10.7	2.2
NPL	-1.1	1.3
VNIIM	0.9	1.7
VSL	0.0	1.1
NMISA	-0.5	3.5
MKEH	7.6	6.9
METAS	2.3	4.1
VSL	0.0	1.1
IPQ	7.7	7.5
LNE	0.1	2.0
CEM	-1.0	3.1
BAM	-2.1	4.7
GUM	1.9	4.1
UME	-0.5	2.0
BelGIM	-3.7	2.5
KazInMetr	0.6	14.5
Ukr. Standart	-0.8	1.2
NIM	-1.3	1.3
NMC, A*STAR	2.1	4.6
NIMT	1.9	3.6
NMIA	0.6	1.7
NMIJ	-0.3	1.3
CMS/ITRI	0.6	2.1
NML SIRIM	-38.2	1.7
CENAM	-0.67	4.18
INMETRO	0.12	4.15

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 Amount-of-substance fraction of propane in nitrogen at a nominal value of 1000 $\mu\text{mol/mol}$

Degrees of equivalence [D_i and its expanded uncertainty ($k = 2$), U_i]

