



Certificate No. : LN2346-210728

財團法人全國認證基金會  
Taiwan Accreditation Foundation

## Certificate of Accreditation

This is to certify that

**National Measurement Laboratory, R.O.C.**  
**National Measurement Laboratory, R.O.C.(Chemical)**  
321, Sec. 2, Kuang Fu Rd., Hsinchu, Taiwan, R.O.C.

**is accredited in respect of laboratory**

**Accreditation Criteria** : ISO/IEC 17025:2017 ; CNS 17025:2018  
**Accreditation Number** : N2346  
**Originally Accredited** : December 29, 2010  
**Effective Period** : December 29, 2020 to December 28, 2025  
**Accredited Scope** : Calibration Field, see described in the Appendix  
**Specific Accreditation Program** : Accreditation Program for National Metrology Institutes

Ching-Chang Lien  
President, Taiwan Accreditation Foundation  
Date : July 28, 2021

# Certificate of Accreditation

This is to certify that

**National Measurement Laboratory, R.O.C.**  
**National Measurement Laboratory, R.O.C.(Chemical)**  
321, Sec. 2, Kuang Fu Rd., Hsinchu, Taiwan, R.O.C.

**is accredited in respect of laboratory**

**Accreditation Criteria** : ISO/IEC 17025:2017 ; CNS 17025:2018  
**Accreditation Number** : N2346  
**Originally Accredited** : December 29, 2010  
**Effective Period** : December 29, 2020 to December 28, 2025  
**Accredited Scope** : Calibration Field, see described in the Appendix  
**Specific Accreditation Program** : Accreditation Program for National Metrology Institutes



Ching-Chang Lien  
President, Taiwan Accreditation Foundation  
Date : July 28, 2021

Accreditation Number : N2346

Laboratory Head : LIN, Tzeng-Yow

## Chemical

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini mum value	units	maxi mum value	units	explanation	value	units
KI4000 NO, SO <sub>2</sub> (Cylinder Gas)	Standard gas: NMIs /NO, SO <sub>2</sub>	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	50	μmol /mol	2000	μmol /mol	NO/N <sub>2</sub>	0.89	μmol /mol
			50	μmol /mol	2000	μmol /mol	SO <sub>2</sub> /N <sub>2</sub>	0.82	μmol /mol
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									
KI4000 C <sub>2</sub> H <sub>5</sub> OH (Cylinder Gas)	Standard gas: NMIs /C <sub>2</sub> H <sub>5</sub> OH	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	137	μmol /mol	137	μmol /mol		1.7	μmol /mol
			301	μmol /mol	301	μmol /mol		3.2	μmol /mol
			547	μmol /mol	547	μmol /mol		4.3	μmol /mol
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									
KI4000 CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> (Cylinder Gas)	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub>	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	10	μmol /mol	1000	μmol /mol	CO	0.08	μmol /mol
			100	μmol /mol	1000	μmol /mol	CO <sub>2</sub>	1.1	μmol /mol
			100	μmol /mol	1000	μmol /mol	CH <sub>4</sub>	0.9	μmol /mol
			100	μmol /mol	1000	μmol /mol	C <sub>3</sub> H <sub>8</sub>	1.0	μmol /mol
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini value	units	maxi value	units	explanation	value	units
KI4000 CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , CF <sub>4</sub> , SF <sub>6</sub> , NO, SO <sub>2</sub> , O <sub>2</sub> (Cylinder Gas)	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , CF <sub>4</sub> , SF <sub>6</sub> , NO, SO <sub>2</sub> , O <sub>2</sub>	Instrument Certification Technique for Filling Mass Cylinder Gases and Concentration of Gas Mixtures -Gravimetric Method (Document No.: 07-3-A3-0179)	1	μmol /mol	100	μmol/ mol	CO/N <sub>2</sub>	1.0	%
			> 0.1	mmol /mol	100	mmol /mol	CO/N <sub>2</sub>	0.2	%
			100	μmol /mol	1000	μmol/ mol	CO <sub>2</sub> /N <sub>2</sub>	0.2	%
			> 1	mmol /mol	160	mmol /mol	CO <sub>2</sub> /N <sub>2</sub>	0.1	%
			100	μmol /mol	1000	μmol/ mol	CH <sub>4</sub> /N <sub>2</sub>	0.8	%
			> 1	mmol /mol	100	mmol /mol	CH <sub>4</sub> /N <sub>2</sub>	0.1	%
			0.1	mmol /mol	50	mmol /mol	C <sub>3</sub> H <sub>8</sub> /N <sub>2</sub>	0.5	%
			100	μmol /mol	3000	μmol/ mol	CF <sub>4</sub> /N <sub>2</sub>	0.3	%
			10	μmol /mol	1000	μmol/ mol	SF <sub>6</sub> /N <sub>2</sub>	0.5	%
			50	μmol /mol	2000	μmol/ mol	NO/N <sub>2</sub>	0.8	%
			50	μmol /mol	2000	μmol/ mol	SO <sub>2</sub> /N <sub>2</sub>	0.5	%
			1	μmol /mol	10	μmol/ mol	O <sub>2</sub> /N <sub>2</sub>	1.5	%
			1	mmol /mol	10	mmol /mol	O <sub>2</sub> /N <sub>2</sub>	0.5	%
			> 10	mmol /mol	250	mmol /mol	O <sub>2</sub> /N <sub>2</sub>	0.3	%
1	mmol /mol	20	mmol /mol	CH <sub>4</sub> /air	0.3	%			
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI4000 CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , O <sub>2</sub> (Cylinder Gas)	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> , O <sub>2</sub>	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	1000	μmol/mol	10000	μmol/mol	CO	9	μmol/mol
			> 10000	μmol/mol	200000	μmol/mol	CO	90	μmol/mol
			1000	μmol/mol	10000	μmol/mol	CO <sub>2</sub>	12	μmol/mol
			>10000	μmol/mol	300000	μmol/mol	CO <sub>2</sub>	120	μmol/mol
			1000	μmol/mol	10000	μmol/mol	CH <sub>4</sub>	8	μmol/mol
			>10000	μmol/mol	100000	μmol/mol	CH <sub>4</sub>	80	μmol/mol
			1000	μmol/mol	10000	μmol/mol	C <sub>3</sub> H <sub>8</sub>	6	μmol/mol
			>10000	μmol/mol	50000	μmol/mol	C <sub>3</sub> H <sub>8</sub>	60	μmol/mol
			1000	μmol/mol	10000	μmol/mol	O <sub>2</sub>	12	μmol/mol
			>10000	μmol/mol	250000	μmol/mol	O <sub>2</sub>	120	μmol/mol
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI4000 Synthetic Natural Gas (Cylinder Gas)	Standard gas: NMIs /Synthetic Natural Gas	Instrument Calibration Technique for the Component Concentration of Natural Gas (Document No.: 07-3-A1-0028)	0.1	cmol /mol	95	cmol /mol	CH <sub>4</sub>	0.18	cmol /mol
			0.1	cmol /mol	10	cmol /mol	C <sub>2</sub> H <sub>6</sub>	0.017	cmol /mol
			0.1	cmol /mol	10	cmol /mol	C <sub>3</sub> H <sub>8</sub>	0.012	cmol /mol
			0.01	cmol /mol	1.0	cmol /mol	iso-C <sub>4</sub> H <sub>10</sub>	0.0012	cmol /mol
			0.01	cmol /mol	1.0	cmol /mol	n-C <sub>4</sub> H <sub>10</sub>	0.0012	cmol /mol
			0.01	cmol /mol	0.2	cmol /mol	neo-C <sub>5</sub> H <sub>12</sub>	0.00013	cmol /mol
			0.01	cmol /mol	0.3	cmol /mol	iso-C <sub>5</sub> H <sub>12</sub>	0.0005	cmol /mol
			0.01	cmol /mol	0.3	cmol /mol	n-C <sub>5</sub> H <sub>12</sub>	0.0006	cmol /mol
			0.01	cmol /mol	0.1	cmol /mol	n-C <sub>6</sub> H <sub>14</sub>	0.00031	cmol /mol
			0.01	cmol /mol	50	cmol /mol	N <sub>2</sub>	0.0038	cmol /mol
			0.01	cmol /mol	20	cmol /mol	CO <sub>2</sub>	0.008	cmol /mol
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI6000 Gas Monitor, Gas Alarm, Gas Detector	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub>	Instrument Calibration Technique for Gas Measurement System-Gas Monitor (Document No.: 07-3-91-0072)	0.0	mol /mol	0.1	mol /mol	CO	2	μmol /mol
			0	mol /mol	1	mol /mol	CO <sub>2</sub>	6	μmol /mol
			0.00 (0)	mol /mol (%LEL)	0.05 (100)	mol /mol (%LEL)	CH <sub>4</sub>	59 (0.1)	μmol /mol (%LEL)
			0.00 (0)	mol /mol (%LEL)	0.02 (100)	mol /mol (%LEL)	C <sub>3</sub> H <sub>8</sub>	26 (0.1)	μmol /mol (%LEL)
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									
KI6000 Gas Concentration Dilution Device (CO, CO <sub>2</sub> , CH <sub>4</sub> )	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub>	Instrument Calibration Technique for the Concentration Calibration of Gas Dilutor-Gas Chromatography (Document No.: 07-3-A3-0185)	0	%	100	%	CO <sub>2</sub> /N <sub>2</sub> @ (50 to 500) μmol/mol	0.03	%
			0	%	100	%	CO/N <sub>2</sub> @ (1 to 100) μmol/mol	0.02	%
			0	%	100	%	CH <sub>4</sub> /air@ (1000 to 20000) μmol/mol	0.15	%
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									
KI7000 Gas Analyzer	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub>	Instrument Calibration Technique for Gas Measurement System-Gas Monitor (Document No.: 07-3-91-0072)	0.0	mol /mol	0.1	mol /mol	CO	2	μmol /mol
			0	mol /mol	1	mol /mol	CO <sub>2</sub>	6	μmol /mol
			0.00 (0)	mol /mol (%LEL)	0.05 (100)	mol /mol (%LEL)	CH <sub>4</sub>	59 (0.1)	μmol /mol (%LEL)
			0.00 (0)	mol /mol (%LEL)	0.02 (100)	mol /mol (%LEL)	C <sub>3</sub> H <sub>8</sub>	26 (0.1)	μmol /mol (%LEL)
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	mini mum value	units	maxi mum value	units	explanation	value	units
KI7000 Gas Concentration Dilution Device (CO, CO <sub>2</sub> , CH <sub>4</sub> )	Standard gas: NMIs /CO, CO <sub>2</sub> , CH <sub>4</sub>	Instrument Calibration Technique for the Concentration Calibration of Gas Dilutor-Gas Chromatography (Document No.: 07-3-A3-0185)	0	%	100	%	CO <sub>2</sub> /N <sub>2</sub> @ (50 to 500) μmol/mol	0.03	%
			0	%	100	%	CO/N <sub>2</sub> @ (1 to 100) μmol/mol	0.02	%
			0	%	100	%	CH <sub>4</sub> /air @ (1000 to 20000) μmol/mol	0.15	%
Approval Signatory: LIN, Tsai-Yin; LIU, Hsin-Wang									

Note : Smallest uncertainty represents an expanded uncertainty using a coverage factor approximately 95 % level of confidence.

(Null Below)