CALIBRATION SYSTEM CERTIFICATE

With respect to products (measuring instruments and testing instruments), we hereby certify that we have established our calibration system traceable to the national (international) standards, as shown below.

Mitutoyo Corporation qualifies for the registered business operator^{*1} of the Japan Calibration Service System (JCSS^{*2}) and use standards that are traceable to the national standard owned by the National Metrology Institute of Japan / National Institute of Advanced Industrial Science and Technology (NMIJ/AIST^{*3}) for calibration service.

Being endorsed by the above facts, the calibration results stated in the Mitutoyo-issued calibration certificate stamped with a JCSS mark shall be deemed to be traceable to the national standard.

The Production, Inspection and Calibration Service Departments of Mitutoyo Corporation also use standards which are traceable to the standard calibrated in advance by one of the registered operators of JCSS to perform inspection and calibration services for products (measuring equipment) so that calibration results are traceable to the national standard.

Since the International Accreditation Japan / National Institute of Technology and Evaluation (IAJapan/NITE^{*4}), which is the accredited organization of JCSS, has signed in the International Laboratory Accreditation Cooperation (ILAC^{*5}) and the Asia Pacific Laboratory Accreditation Cooperation (APLAC^{*6}), the calibration certificate issued by Mitutoyo Corporation and stamped with a JCSS mark shall be valid in the countries and commercial areas which also have signed in ILAC and APLAC.

- *1) In Mitutoyo Corporation, we have 6 JCSS registered operations as follows:
 - •Metrological Standards Calibration Section
 - ·Miyazaki Plant
 - ·Utsunomiya Calibration Center
 - ·Kawasaki Calibration Center
 - ·Hiroshima Calibration Center
 - Techno Services Business Division
- *2) The JCSS registered operator conforms to the requirement of ISO/IEC 17025.
- *3) National Metrology Institute of Japan/National Institute of Advanced Industrial Science and Technology
- *4) International Accreditation Japan/National Institute of Technology and Evaluation
- *5) International Laboratory Accreditation Cooperation
- *6) Asia Pacific Laboratory Accreditation Cooperation

Mitutoyo Corporation Quality Assurance Department

Yasuhiro Takahashi, Department Manager

As of 2017-10-02

Traceability of Mitutoyo Standard



• This chart shows a simplified traceability system of a part of Mitutoyo products. Detailed traceability charts are published for each product.

Traceability of Test Equipment



• This chart shows a simplified traceability system of a part of Mitutoyo products. Detailed traceability charts are published for each product.

Certification of Accreditation by JCSS

- (1) Metrological Standards Calibration Section
- (2) Miyazaki Plant
- (3) Utsunomiya Calibration Center
- (4) Kawasaki Calibration Center
- (5) Hiroshima Calibration Center
- (6) Techno Services Business Division



To Mitutoyo Corporation

IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

Accreditation No. JCSS0067 Name of Laboratory

Metrological Standards Calibration Section, Metrological Standards Office, Mitutoyo Corporation Address of Laboratory 430-1, Kamiyokoba, Tsukuba-shi, Ibaraki 305-0854, Japan Accreditation Scope Length (as attached) Accreditation Criterion

ISO/IEC 17025:2005

ILAC-MRA IA

To Mitutovo Corporation

Accreditation No. JCSS0086

Kawasaki Calibration Center,

Kanagawa 213-8533, Japan

Accreditation Scope Force (as attached)

Accreditation Criterion ISO/IEC 17025:2005

Date of Initial Accreditation : 2005-09-01

Latest Date of Issue : 2017-07-31

Chief Executive, IAJapan

Kyoko Yamasaki

ILAC and APLAC.

Name of Laboratory

Address of Laboratory

Date of Initial Accreditation : 2017-04-28 Latest Date of Issue : 2017-04-28

Kyoko Yamasaki Chief Executive, IAJapan National Institute of Technology and Evaluation

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(English Translation)

Certificate of Accreditation

IAJapan hereby accredits the following laboratory as a calibration

laboratory based on the Measurement Law as it meets the requirements

of relevant international standards. This laboratory also meets the

requirements for Mutual Recognition Arrangements (MRA) of

Techno Service Business Division, Mitutoyo Corporation

1-20-1 Sakado, Takatsu-ku Kawasaki-shi,

National Institute of Technology and Evaluation

nal Accreditation Japan (IAJapan) is a laboratory accreditation body which has signed MRAs of ILAC(International Laboratory ion Cooperation) and APLAC (Asia Pacific Laboratory Accreditation Cooperation).

ton) and APLAC (Aula Pacific Laboratory Accordination Corporation), in addition to refrain intensational adamts and pulsion, requirements for participation in preficiency testing is and reasonsment; and the policy for the transmitty of measurement for MRA, parpose. Anatoria turbulenci complexes for A default accept and the operation of a biometry walls management system, sitements in thiOUEC 17825/2005 meet the principles of ISO 9900 2008 and are aligned with its pertinent



Certificate of Accreditation

To Mitutoyo Corporation

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IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

(English Translation)

(2)

(5)

Accreditation No. JCSS0030

Name of Laboratory Miyazaki Plant, Mitutoyo Corporation Address of Laboratory 10652-1, Kou, Tano-cho, Miyazaki-shi, Miyazaki 889-1701, Japan Accreditation Scope Length (as attached) Accreditation Criterion ISO/IEC 17025:2005

Date of Initial Accreditation: 2004-08-13 Latest Date of Issue: 2016-11-02

Hideyuki Ota Chief Executive, IAJapan National Institute of Technology and Evaluation

- Interactional Accreditation Japon (Adapano) in a bidiwatery accreditation body which has aigued MRAs of ILACCrementational ILACCRementational ILACCREMENT (Adapano) and ACREA (Adapano) and Adapano and Adapa



Certificate of Accreditation

To Mitutoyo Corporation

IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

Accreditation No.

Iac-MRA

JCSS0109

Name of Laboratory Hiroshima Calibration Center, Techno-Service Business Division, Mitutoyo Corporation Address of Laboratory

626-62 Ichinomakkoyama, Gohara-cho, Kure-shi, Hiroshima 737-0161, Japan

Accreditation Scope Length, Hardness (as attached) Accreditation Criterion

ISO/IEC 17025:2005

Date of Initial Accreditation : 2002-04-11 Latest Date of Issue : 2017-08-03

Kyoko Yamasaki Chief Executive, IAJapan National Institute of Technology and Evaluation

International Acceleration Japan (UA)span) is a balanetary acceleration body which has signed MEAs of ILAC (International Loboratory Acceleration and AFAC (Conte Paralle Loboratory Acceleration Cooperation). International Cooperation and AFAC (Conte Paralle Loboratory Acceleration Cooperation). The acceleration of the Acceleration and the Acceleration acceleration and the acceleration acceleration and The acceleration demonstration the Industry of the Acceleration acce



To Mitutoyo Corporation

IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

Accreditation No. JCSS0031 Name of Laboratory Utsunomiya Calibration Center, Techno-Service Business Division, Mitutoyo Corporation Address of Laboratory 2200-1, Shimoguri-machi, Utsunomiya-shi, Tochigi 321-0923, Japan

Accreditation Scope Length, Temperature (as attached) Accreditation Criterion ISO/IEC 17025:2005

Date of Initial Accreditation : 1994-05-02 Latest Date of Issue : 2017-07-31

Kyoko Yamasaki Chief Executive, IAJapan National Institute of Technology and Evaluation

nmarinel Accordingtion Jupus (LAppus) is a laboratory accordination body which has signed MEAA of EAC/Isomational Laboratory combined Cooperating in and PLAC (Laboratory Accordingtion) Cooperating). Support of the PLAC of the PLAC (Laboratory Accordingtion) Cooperating). Support, screditions are instruments, and the placing for the transitiony of constrainers for RAL Appundic and accordination subscred cooperative for a definition of the place and the operation of a host-transmit place. The structure accordingtion of the place and the operation of a host-transmit place according on the place accordingtion of the place accordingtion of



Certificate of Accreditation To Mitutovo Corporation

IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

Accreditation No JCSS0186

Name of Laboratory

Techno Services Business Division, Mitutoyo Corporation

Address of Laboratory 796-1, Hiramatsuhoncho, Utsunomiya-shi, Tochigi

321-0932, Japan Accreditation Scope

Length (as attached)

Accreditation Criterion ISO/IEC 17025:2005

Date of Initial Accreditation : 2006-12-27 Latest Date of Issue : 2015-10-26

> Hideyuki Ota Chief Executive, IAJapan National Institute of Technology and Evaluation

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Scope of Service and Calibration Uncertainty

♦G	eneral Field of Calibra	ation: Length	measured length (mm)	♦G	Seneral Field of Cali	libration : L	ength				<i>L</i> is	measure	d length (mm)		
\backslash	Ť T T T T T T T T T T T T T T T T T T T				CMC Note 1		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						CMC Note 1		
\backslash	Туре	of Service	Item	Calibration Scope	(Level of Confidence		Type of S	Service	ice Item		Calibration Scope		(L	evel of Co	nfidence
					Approximately 95%)								Approximately 95%)		
1	_aser Wave Length Frequency stabilized laser in the 633nm/532nr		r in the 633nm/532nm regi	ion	1.1 × 10 ⁻¹³	26	Dimensional	Coordin	nate CNC Coordin	nate	Up to 61mm		(0.1+0.6• <i>L</i> /1000)µm		
2	Length Measuring	Block Gauge	Gauge Block	From 0.1mm up to 100mm	0.020µm		Measuring	Measur	ring Measuring N	lachines	Up to 650mm		(0.13+0.11• <i>L</i> /1000)µm))µm
	Instrument	(Interferometry method)		More than 100mm up to 250mm	(0.010+0.00010• <i>L</i>)µm		Instrument	Machin	es Vision Meas	uring	Up to 1000mm		(0.2+0.2	<i>•L</i> /1000)μ	ım
				More than 250mm up to 1000mm	(0.020+0.00020· <i>L</i>)µm				System		Up to 10000mm Note 2		(0.1+0.6• <i>L</i> /1000)µm		
3		Block Gauge	Gauge Block	From 0.1mm up to 100mm	0.06µm	0.06μm 27 (0.04+0.00043• <i>L</i>)μm		Surface	e Surface Rou	ghness	ness Depth: hines From 0.3µm up to 20µm		$2 \times \sqrt{6.70}$	$^{2} + (2.74 \times d)$	²) ² nm
		(Comparison method)		More than 100mm up to 1000mm	(0.04+0.00043• <i>L</i>)µm			Texture	e Measuring N	lachines			d(µm) Depth		
4		End gages with	Check Master	Up to 2100mm	(0.18+0.38• <i>L</i> /1000)µm						Arithmetical mean deviation		$2 \times \sqrt{6.82^2 + (2.74 \times Ra)^2}$ nm		
5		Flat ends	Caliper Checker								of the roughness profile:		$Ra(\mu m)$: Arithmetical mea		cal mean
6		(Interferometry method)	Inside Micro Checker								From 0.1µm up to 5µm		deviation of the roughness profile		
7		End gages with Flat ends (Comparison	Depth Micro Checker	From 0.5mm up to 300mm	(0.5+ <i>L</i> /1000)µm						Maximum height of the roughness profile		$2 \times \sqrt{35.8^2 + (2.74 \times R_Z)^2}$ nm R_Z (µm) : Maximum height		$(R_7)^2$ nm
8			Height Master	Up to 1000mm											height of
9		method)	Cylindrical Gages	From 25mm up to 500mm							From 0.3µm up to 20µ	m t	the roug	hness prof	ile
10			Micrometer standards	From 25mm up to 1000mm	(0.4+ <i>L</i> /1000)µm		Conoral Field of Cal	libration · T							
11		Standard Scale	Standard scale	Up to 350mm	(0.10+0.12• <i>L</i> /1000)µm			emperature					C1	Note 1	
				More than 350mm up to 1000mm	(0.06+0.25• <i>L</i> /1000)µm		Time		Type of Service		Calibration				VIC
12			Reference scale	Pattern size: From 0.2mm up	0.11µm			i ype oi	Service		Calibration Scope		Approvimately 05		imately 95%)
13			Chart for QV calibration	to 4mm		1	Contact type	Resistar	stance thermometer		Platinum Resistance		ວິ	6mK Note 3	indicity 55707
14		Ring Gages Dial Indicator Tester	Setting Rings Calibration Tester	From 6mm up to 80mm	0.7µm		thermometer	(Compa	rison calibration)		Thermometer (4 wires	up to 40	ວິດ	onne	
				More than 80mm up to 120mm	0.8µm			(compa		_	system, 100Ω)	up to 10			
15				Up to 5mm	0.10µm						Platinum Resistance	ance From 0°		50mK Note	3
				More than 5mm up to 25mm	0.21µm						system 1000)	up to 40	°C		
				More than 25mm up to 100mm	(0.1+4.8• <i>L</i> /1000)µm			Tempera	ature sensors with dis	play					
16		Micrometers (including micrometer heads)		Up to 25mm	0.3µm		unit (unit (Comparison method)		From 0°C up to 40°C			8mK	
					(1.2+ <i>L</i> /175)µm	•	General Field of Ca	libration · F	Force						
17	' Indicating Micrometers			Micrometer: Up to 100mm	(0.9+ <i>L</i> /250)µm						Calibration Scone		CMC Note 1		
				Indicator: ±0.06mm	(0.3+ <i>L</i> /125)µm	\backslash	Type of Se								
18		Calipers		Up to 600mm	0.02mm		Type of e		e di Service				Approximately 95%)		
				More than 600mm up to 1000mm	0.03mm	1	Force-proving	JIS B	7728	Comp	mpression From 10N up to 200		0.042%		
19		Height Gages		Up to 600mm	0.015mm		Instruments				From 30N up to 2kN		0.049%		
				More than 600mm up to 1000mm	0.020mm		J		I I						
20	Depth Gages			Up to 600mm	0.02mm	• G	Seneral Field of Cal	libration : H	ion:Hardness				-		
				More than 600mm up to 1000mm	0.03mm	\backslash	1							CMC Note 1	
21		Dial Indicators		Up to 5mm	0.5µm		Type of		be of Service		Calibration Scope		(Level of Confidence		
				More than 5mm up to 50.8mm	1.1µm									Approxima	itely 95%)
				More than 50.8mm up to100mm	1.7µm	1	Rockwell hardnes	is F	Rockwell Hardness	From			0.43	IRC	-
22		Lever-type Dial	Dial Test Indicators	Up to 0.6mm	0.5µm		testing machines,	etc. F	Reference Blocks	More	nan 25HRC less than 35HRC		0.44	IRC	-
		Indicators		More than 0.6mm up to 1.6mm	1.2µm		1			From	35HRC up to 45HRC	up to 45HRC C		IKC	—
23		Bore Gages		From 6mm up to 400mm	0.7µm		1			More	han 45HRC less than 55HRC		0.39	IRC	—
24		Electrical	Mu-Checker	±5μm	0.15µm					From	55HRC up to 65HRC		0.35	IRC	-
		Comparator		±200µm	0.2µm			٦ -	Kockwell Hardness	From	1 20HRC up to 25HRC		+	-	0.41HRC
		0.1		±2000µm	1.0µm		1		esting machines	More	than 25HRC less than 35HRC		+	-	U.41HRC
25	Dimensional Measuring	Sphere (Average diameter)	Master Ball	From 2mm less than 10mm From 10mm up to 40mm	0.06µm (0.024+2.6•L/1000)µm					From	35HRC up to 45HRC			-	0.39HRC
										More	than 45HRC less than 55HRC		-	-	0.3/HRC
	instrument			4°						From	55HRC up to 65HRC			_	U.34HRC

NOTE 1) Calibration and Measurement Capabilities: These values are the smallest uncertainties. Therefore, they sometimes differ from the uncertainties written in the Calibration Certificates. NOTE 2) Exclude Vision Measuring System.

NOTE 3) These values are the temperature conversed into resistance.