Member State of OIML
Japan

National Institute of
Advanced Industrial Science
and Technology
AIST

OIML Certificate No.
R60/2000-JP1-11.05
Revision 1

OIML CERTIFICATE OF CONFORMITY

Issuing authority

Name:	National Metrology Institute of Japan / National Institute of Advanced Industrial Science and Technology (NMIJ / AIST)
Address:	AIST Tsukuba Central 3-9, Tsukuba Ibaraki 305-8563, Japan
Person responsible:	Dr. Tamotsu Nomakuchi, President of AIST

Applicant

Name:	A&D Company, Limited
Address:	3-23-14, Higashi-Ikebukuro, Toshima-ku, Tokyo 170-0013, Japan

Manufacturer of the certified pattern

Name:	A&D Company, Limited
Address:	3-23-14, Higashi-Ikebukuro, Toshima-ku, Tokyo 170-0013, Japan

Identification of the certified pattern:

Beam (shear) load cell

Type:	LCM19K500, LCM19T001, LCM19T1.5, LCM19T002
Fraction:	Pi=0.7
Temperature range	-10 ℃ / 40 ℃

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OIML Certificate No.
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Revision 1

Characteristics:

Model designation			LCM19K500	LCM19T001	LCM19T1.5	LCM19T002
Accuracy class	Class	-	C			
Maximum number of load cell verification intervals	n_{max}	-	6000 4000 3000			
Humidity symbol			CH			
Minimum dead load	E_{min}	kg	0			
Maximum capacity	E_{max}	kg	500	1000	1500	2000
Safe load limit	E_{lim}	kg	$1.5*E_{max}$			
Minimum verification interval	v_{min}	kg	E_{max} /10000			
Apportionment factor	p_{LC}		0.7			
Ratio of minimum LC Verification interval $Y=E\max / v\min$	Y	-	10000			
Ratio of minimum dead load output return $Z=E\max/(2*DR)$	Z	-	6000 in the case of n_{max}=6000			
Rated output		mV/V	2			
Maximum excitation voltage		V AC/DC	15			
Input impedance	R_{LC}	Ω	380			
Cable detail		-	3m 4wire			

This certificate attests the conformity of the above-mentioned pattern (represented by the samples identified in the associated test report(s) with the requirements of the following Recommendation of the International Organization of Legal Metrology - OIML):

R60, edition 2000 (E)
For accuracy class C

This certificate relates only to the metrological and technical characteristics of the pattern of the instrument concerned, as covered by the relevant OIML International Recommendation.
This certificate does not bestow any form of legal international approval.
The conformity was established by tests described in the associated test report no. 12-09/R60:2000, that includes 19 pages.

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OIML Certificate No.
R60/2000-JP1-11.05
Revision 1

The Issuing Authority
NMIJ/AIST

Dr. T. Nomakuchi
President of AIST
2012-05-21

The CIML member

Dr. Y. Miki

2012-05-21

Important note: Apart from the mention of certificate's reference number and the name of the OIML Member State in which the certificate is issued, partial quotation of the certificate and of the associated Test Report is not permitted, although either may be reproduced in full.

Evaluation Report

Load cells

Issuing Authority

Name : National Metrology Institute of Japan /National Institute of Advanced Industrial Science and Technology (NMIJ/AIST)

Address : AIST Tsukuba Central 3, Tsukuba Ibaraki 305-8563, Japan

Applicant : A&D Company, Limited

Manufacturer : A&D Company, Limited

Applied Type : LCM19K500, LCM19T001, LCM19T1.5, LCM19T002

Evaluation Report Number : 24-001

This report ensures the conformity of the applied type with the requirements of the OIML R60 (edition 2000), on the basis of evaluation of the attached test report (N° 12-09/R60:2000).

Evaluator :
Wataru Kaminaga
Legal Metrology Division
NMIJ/AIST
Signature : W. Kaminaga
Date: 2012. 5. 18

Supervisor :
Shigeki Yamaguchi
Head of Legal Metrology Division
NMIJ/AIST
Signature : Shigeki Yamaguchi
Date: 2012. 5. 18

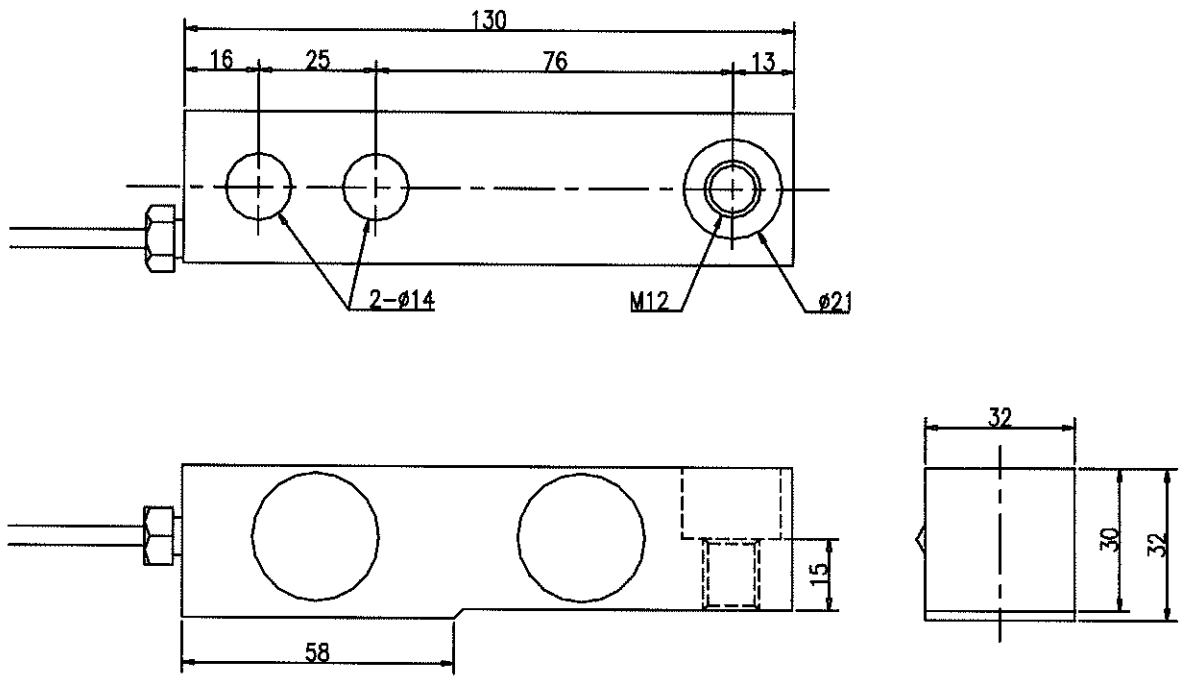
Description

Technical data

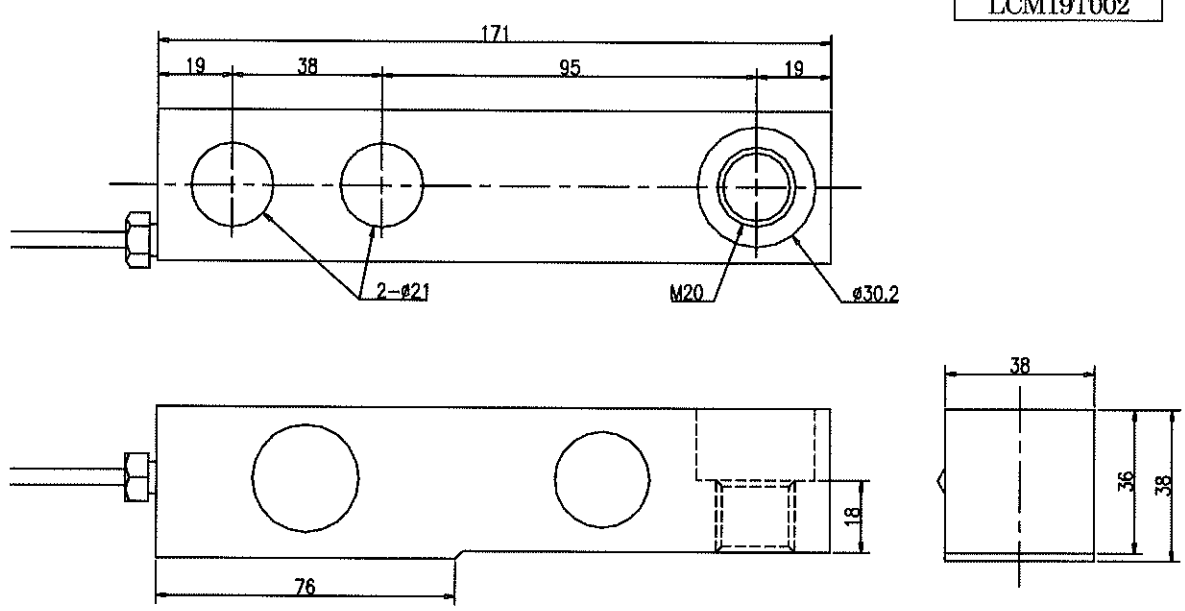
Model designation			LCM19K500	LCM19T001	LCM19T1.5	LCM19T002
Accuracy class	Class	-	C			
Maximum number of load cell verification intervals	n_{max}	-	6000 4000 3000			
Humidity symbol			CH			
Minimum dead load	E_{min}	kg	0			
Maximum capacity	E_{max}	kg	500	1000	1500	2000
Safe load limit	E_{lim}	kg	$1.5*E_{max}$			
Minimum verification interval	v_{min}	kg	E_{max} /10000			
Apportionment factor	p_{LC}		0.7			
Ratio of minimum LC Verification interval $Y=E\max / v\min$	Y	-	10000			
Ratio of minimum dead load output return $Z=E\max/(2*DR)$	Z	-	6000 in the case of n_{max}=6000			
Rated output		mV/V	2			
Maximum excitation voltage		V AC/DC	15			
Input impedance	R_{LC}	Ω	380			
Cable detail		-	3m 4wire			

LCM19 Dimension

Model
LCM19K500
LCM19T001
LCM19T1.5

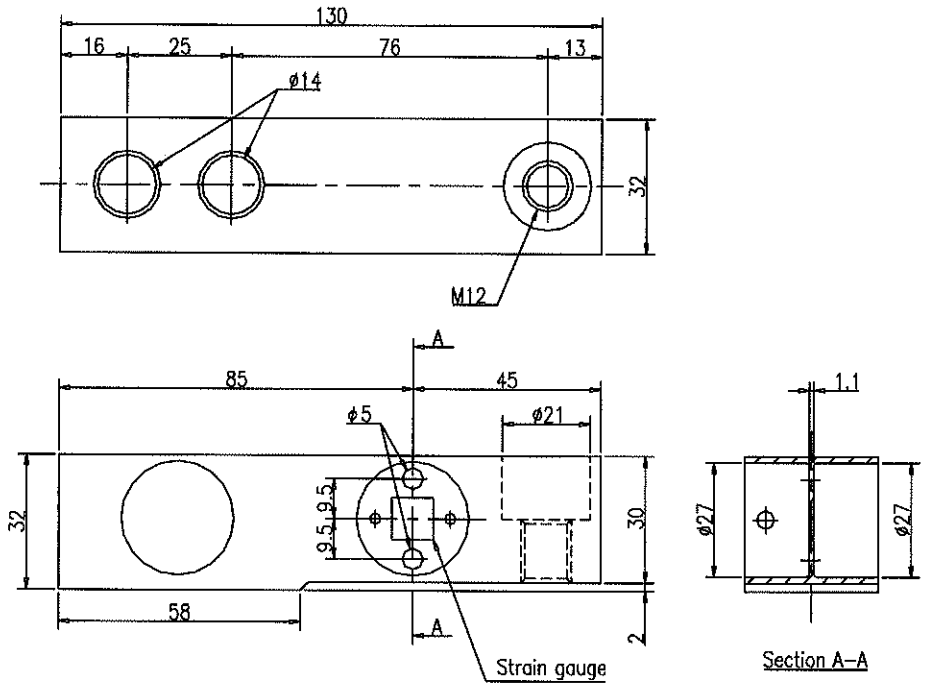


model
LCM19T002

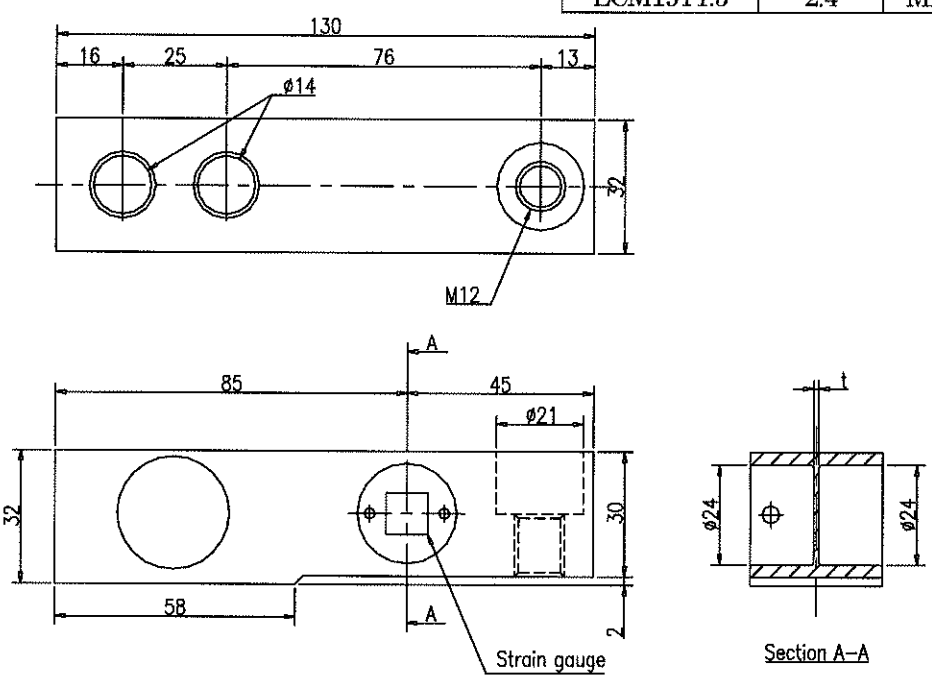


LCM19 Spring element Dimension

Model	Material
LCM19K500	Mild Steel

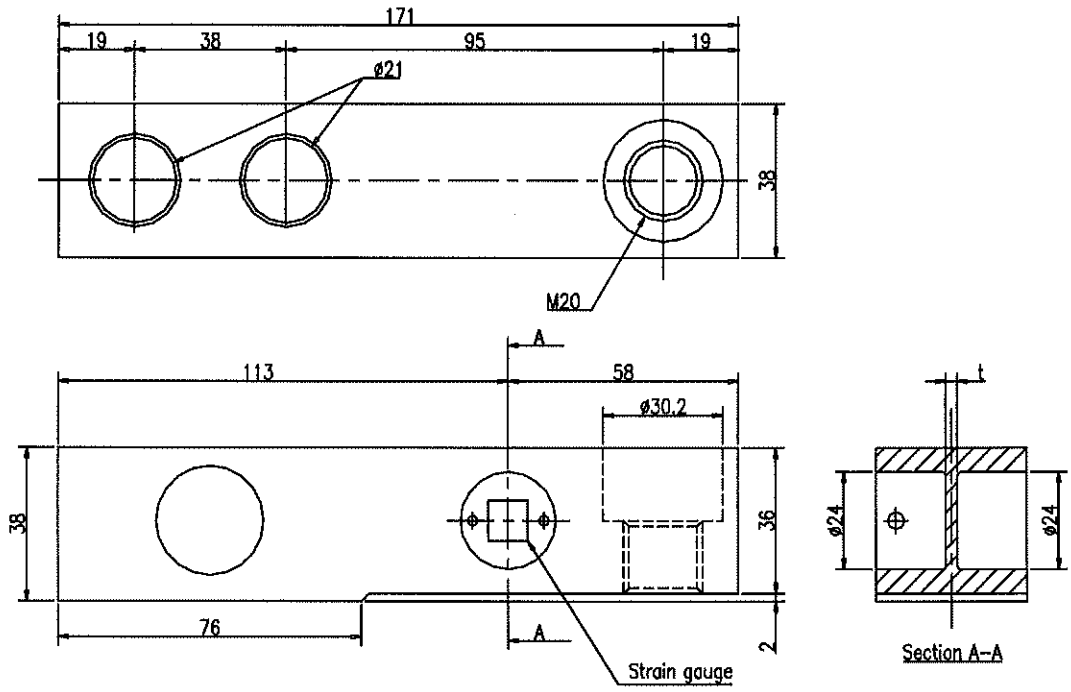


Model	t (mm)	Material
LCM19T001	1.2	Mild Steel
LCM19T1.5	2.4	Mild Steel

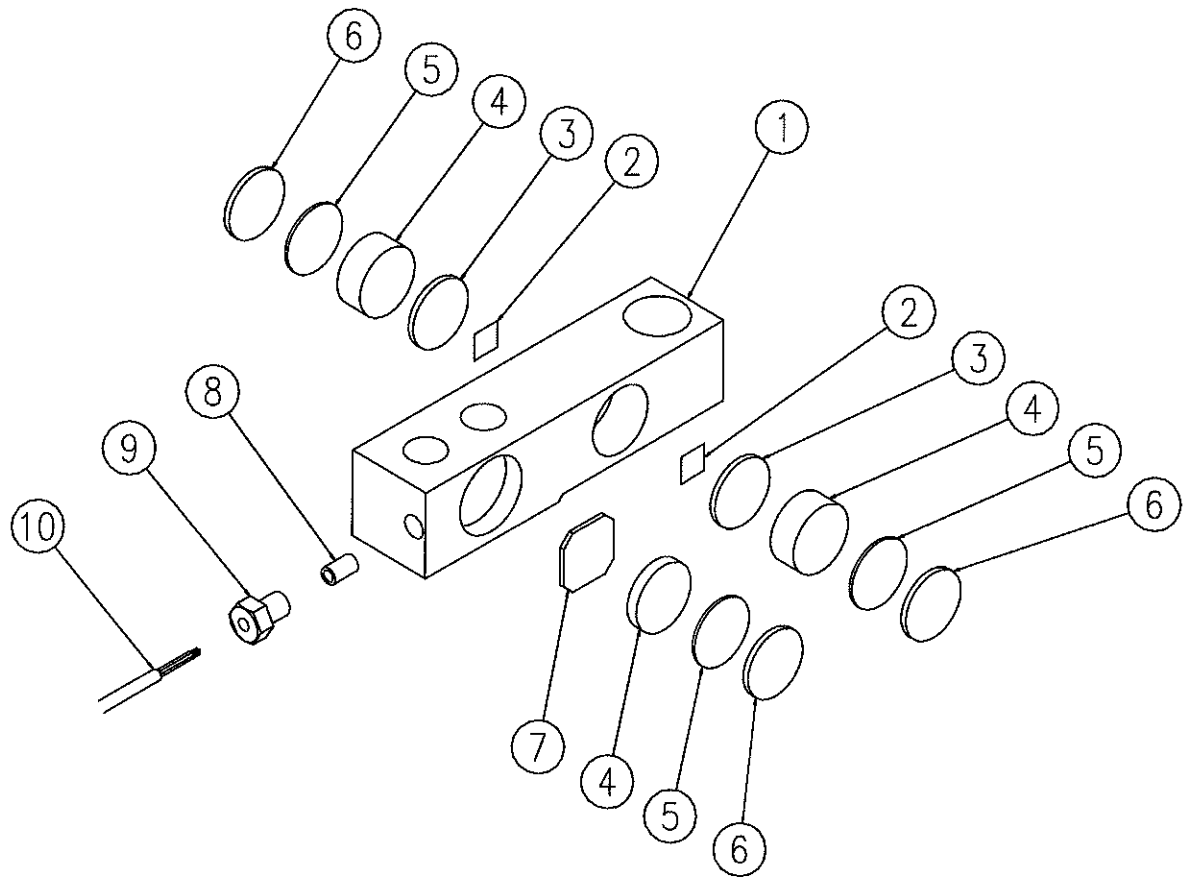


LCM19　Spring element Dimension

Model	t (mm)	Material
LCM19T002	1.2	Mild Steel

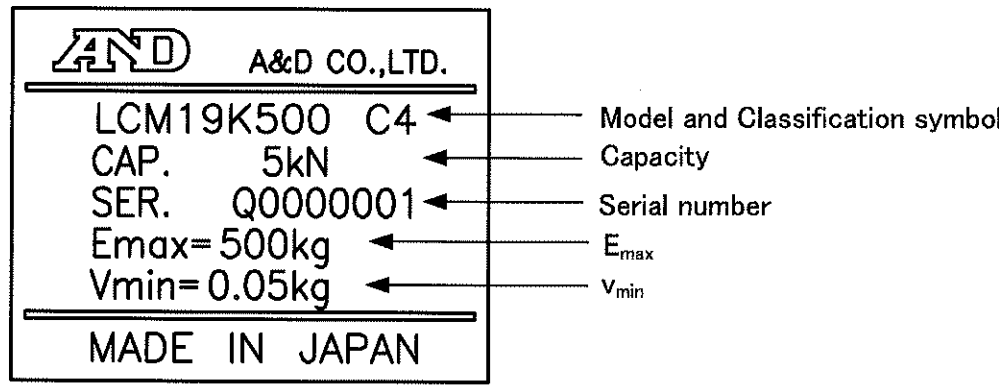


LCM19　Structural chart



Number	Part name	Quantity	Material
1	Spring Element	1	Mild Steel
2	Strain gauge	2	Polyimide、etc
3	Covering agent	2	Butyl compound
4	Encapsulation resin	3	Polyurethane
5	Protection plate	3	Aluminum
6	Sealant	3	Silicone rubber
7	Print Circuit Board	1	Glass epoxy board
8	Clamp	1	Rubber
9	Gland nut	1	Stainless Steel
10	Cable	1	PVC、etc

LCM19 Load cell markings



Model	Classification symbol	Capacity	E_{max}	v_{min}
LCM19K500	C3	5kN	500kg	0.05kg
	C4			
	C6			
LCM19T001	C3	10kN	1t	0.1kg
	C4			
	C6			
LCM19T1.5	C3	15kN	1.5t	0.15kg
	C4			
	C6			
LCM19T002	C3	20kN	2t	0.2kg
	C4			
	C6			

National Metrology Institute of Japan

Metrological regulation for load cells : Test report

Project number	:	LC-OIML-12-008
Test report number	:	12-09 / R60:2000
Issuing authority	:	National Metrology Institute of Japan /National Institute of Advanced Industrial Science and Technology (NMIJ/AIST) AIST Tsukuba Central 3 Tsukuba Ibaraki 305-8563, Japan
Applicant	:	A&D Company, Limited
Manufacturer	:	A&D Company, Limited
Date of application	:	2012.4.3
End of evaluation	:	2012.5.10
Date of issue	:	2012. 5. 16
Signature	:	Y. Koyano

Yasuhiro Koyano
Chief of Legal Weighing Metrology Section
Mechanical Metrology Division

OIML R60
Edition 2000(E)

Testing authority

Name: National Metrology Institute of Japan
Address: Central 3-1, 1-1-1 Umezono, Tsukuba, Ibaraki, 305-8563, Japan
Contact information: Telephone: +81 29 861 4389 Fax:+81 29 861 4341

Applicant/Manufacturer information

Application no.: 24-001
Application date: 2012.4.3
Model designation: LCM19****

Manufacturer: A&D Company, Limited
Address: 3-23-14 Higashi-Ikebukuro,Toshima-ku,Tokyo 170-0013 Japan

Applicant: A&D Company, Limited
Address: 3-23-14 Higashi-Ikebukuro,Toshima-ku,Tokyo 170-0013 Japan

Representative: Youichi Sansho
(name, telephone) +81 48 593 1127

Instrument category: Load cell: strain gauge Documentation no.:

Information concerning the pattern

Accuracy class: [ ] A [ ] B [×] C [ ] D

Maximum number of load cell verification intervals (n_{max}): 6000

Direction of loading: (for load cell characterization, see 4.6.3)
[ ] Tension [×] Beam (shear) [ ] Compression
[ ] Universal [ ] Beam (bending)

Safe load limit (Lim): 150% of Emax Apportionment factor, p_{LC} (see *Note*) 0.7

Limits of working temperature: (only if other than -10°C to +40°C, see 5.5.1.1)
Upper: ____ °C Lower: ____ °C

Power voltage: V_{min} ____ V V_{max} 15 V

or V: 5 ~ 12 V [×] AC [×] DC Recommended: [ ] AC [×] DC

Humidity evaluation symbol:

NH	[ ] Yes	[×] No
SH	[ ] Yes	[×] No
CH or no markings	[×] Yes	[ ] No

Electronic load cell: [ ] Yes [×] No

Note: This value of p_{LC} is assumed to be 0.7 unless otherwise declared by the manufacturer.

Information concerning the pattern (continued)

Application No: 24-001

Specify other conditions that must be observed to obtain the specified performance (for example, electrical characteristics of the load cell):

Various designs within model range:

Maximum capacity E_{max} (kg)	Minimum load cell verification interval v_{min} (kg)	Minimum dead load E_{min} (kg)	Maximum number of load cell intervals n_{max}	Minimum dead load output return DR (kg)
500	0.05	0	6000	
1000	0.1	0	6000	
1500	0.15	0	6000	
2000	0.2	0	6000	

All values in this table are taken from documentation pages _____.

DR information required only when applicable.

Load cell(s) submitted:

Model designation	Serial number	E_{max}(kg)
LCM19K500	N4	500

Secondary equipment (specify load adapters, etc.):

Remarks:

General information concerning test conditions

Ref.:A3

Application no.: 24-001

Load cell model: LCM19K500 Serial no.: N4 E_{max}: 500 kg

n_{max}: 6000 v_{min}: 0.05 kg DR (if applicable): -

Force-generating system - description: Load cell performance testing device
(see *Note*)

Minimum test load: 4.7 kg

Indicating instrument - description: HBM DMP40

Environmental equipment - description: Air Supply Epuipment ASE-210

Temperature: 20.3 ℃

Relative humidity: 46.9 ~ 47.2 %RH

Barometric pressure: 101.30 ~ 102.42 kPa

Test location: Room 023

Acceleration of gravity at test location: 9.79949 m/sec^2

Evaluator: Fukuda

Note: Include information concerning accuracy (for example, accredited laboratory).

Summary of the test

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg n_{max}: 6000
v_{min}: 0.05 kg DR: -
Force-generating system: Load cell performance testing device p_{LC}: 0.7
Indicating instrument: HBM DMP40
Evaluator: Fukuda

No.	Test description	Passed	Failed	Report page	Remarks
D.2	Load cell errors (E_L)	×		10	
D.3	Repeatability errors (E_R)	×		11	
D.4	Temperature effects on MDLO (C_M)	×		12	
D.5	Creep (C_C)	×		13-16	
D.5	DR(C_{DR})	×		13-16	(see *Note 2*) DR= -0.01 kg
D.6	Barometric pressure effects (C_p)	×		17	
D.7	Humidity effects (CH or no mark) (C_{Hmin})	×		18	
D.7	Humidity effects (CH or no mark) (C_{Hmax})	×		18	
D.8	Humidity effects (SH)				
D.9	Marking requirements	See Page ***19***, Check that marked values are correct.			
D.10	Load cells equipped with electronics				
D.11	Warm-up time				
D.12	Power voltage variations				
D.13	Short time power reductions				
D.14	Bursts (electrical fast transients)				
D.15	Electrostatic discharge				
D.16	Electromagnetic susceptibility				
D.17	Span stability				

The following table checks the required calculations as per the General notes provisions of C.4:

Paragraph No.	Description	n_{max}		n_{max}-500		n_{max}-1000	
		Pass	Fail	Pass	Fail	Pass	Fail
C.4.2, C.4.3, C.4.5	Check all calculations using values of n at n_{max} and at lower than n_{max}	×		×		×	
C.4.4	Check that $v_{mir} \leq \frac{D_{max}-D_{min}}{n_{max}}$	Pass		Fail			
		×					

Worst case figure for minimum dead load output return error (in mass units) = DR = -0.01 kg see *Note 3*

Notes:
1 Enter "NA" for "the test is not applicable".
2 Record error to accomodate OIML R76.
3 This DR value is used in association with OIML R 76.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/20	2012/4/20	
Temperature:	20.3	20.3	°C
Relative humidity:	47.2	47.2	%
Barometric pressure:	102.40	102.42	kPa
Indicator temperature:	23.7	23.1	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	0.026358	7:43:58						
450	2.163582	7:44:27						
0	0.026341	7:44:57						
450	2.163572	7:45:27						
0	0.026339	7:45:56						
450	2.163571	7:46:26						
0	0.026338	7:46:55						
0	0.026356	7:52:05	0.026346	8:00:13	0.026342	8:08:19	0.026348 *	0.000014
50	0.260896	7:52:26	0.260886	8:00:34	0.260885	8:08:40	0.260889	0.000011
100	0.495418	7:52:47	0.495405	8:00:54	0.495403	8:09:00	0.495409	0.000015
150	0.729956	7:53:07	0.729945	8:01:15	0.729941	8:09:21	0.729947	0.000015
200	0.964503	7:53:28	0.964498	8:01:35	0.964494	8:09:41	0.964498	0.000009
250	1.199051	7:53:49	1.199044	8:01:56	1.199040	8:10:02	1.199045	0.000011
300	1.433648	7:54:09	1.433639	8:02:16	1.433633	8:10:22	1.433640	0.000015
350	1.668262	7:54:30	1.668254	8:02:37	1.668251	8:10:43	1.668256	0.000011
400	1.902931	7:54:51	1.902927	8:02:57	1.902924	8:11:03	1.902927	0.000007
450	2.137507	7:55:12	2.137497	8:03:18	2.137490	8:11:24	2.137498	0.000017
500	2.372123	7:55:32	2.372118	8:03:39	2.372114	8:11:45	2.372118	0.000009
450	2.137565	7:55:53	2.137562	8:04:00	2.137559	8:12:06	2.137562	0.000006
400	1.903011	7:56:14	1.903007	8:04:21	1.903003	8:12:27	1.903007	0.000008
350	1.668454	7:56:35	1.668449	8:04:41	1.668443	8:12:48	1.668449	0.000011
300	1.433887	7:56:56	1.433882	8:05:02	1.433880	8:13:08	1.433883	0.000007
250	1.199315	7:57:17	1.199310	8:05:24	1.199306	8:13:30	1.199310	0.000009
200	0.964737	7:57:38	0.964732	8:05:45	0.964728	8:13:51	0.964732	0.000009
150	0.730159	7:57:59	0.730154	8:06:06	0.730151	8:14:11	0.730155	0.000008
100	0.495570	7:58:20	0.495564	8:06:27	0.495562	8:14:33	0.495565	0.000008
50	0.260964	7:58:42	0.260959	8:06:48	0.260956	8:14:54	0.260960	0.000008
0	0.026338	7:59:03	0.026334	8:07:09	0.026334	8:15:15	0.026335	0.000004

Notes: *1* * = Average initial minimum test load indication.
2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/23	2012/4/23	
Temperature:	40.3	40.3	°C
Relative humidity:	34.4	34.3	%
Barometric pressure:	101.53	101.51	kPa
Indicator temperature:	22.4	22.3	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	0.026555	7:03:50						
450	2.163714	7:04:19						
0	0.026564	7:04:49						
450	2.163710	7:05:18						
0	0.026569	7:05:48						
450	2.163753	7:06:17						
0	0.026570	7:06:47						
0	0.026590	7:11:57	0.0266	7:20:05	0.026610	7:28:12	0.026600 *	0.000020
50	0.261120	7:12:18	0.261134	7:20:26	0.261143	7:28:33	0.261132	0.000023
100	0.495628	7:12:39	0.495637	7:20:46	0.495646	7:28:53	0.495637	0.000018
150	0.730157	7:12:59	0.730165	7:21:07	0.730173	7:29:14	0.730165	0.000016
200	0.964703	7:13:20	0.964711	7:21:27	0.964718	7:29:34	0.964711	0.000015
250	1.199237	7:13:41	1.199242	7:21:48	1.199249	7:29:55	1.199243	0.000012
300	1.433827	7:14:01	1.433835	7:22:08	1.433840	7:30:15	1.433834	0.000013
350	1.668442	7:14:22	1.668449	7:22:29	1.668455	7:30:36	1.668449	0.000013
400	1.903105	7:14:43	1.903115	7:22:49	1.903119	7:30:56	1.903113	0.000014
450	2.137663	7:15:03	2.137672	7:23:10	2.137678	7:31:17	2.137671	0.000015
500	2.372283	7:15:24	2.372285	7:23:31	2.372290	7:31:38	2.372286	0.000007
450	2.137738	7:15:45	2.137743	7:23:51	2.137748	7:31:59	2.137743	0.000010
400	1.903200	7:16:06	1.903205	7:24:12	1.903211	7:32:19	1.903205	0.000011
350	1.668654	7:16:27	1.668659	7:24:33	1.668666	7:32:40	1.668660	0.000012
300	1.434102	7:16:48	1.434108	7:24:54	1.434114	7:33:01	1.434108	0.000012
250	1.199537	7:17:09	1.199544	7:25:15	1.199551	7:33:22	1.199544	0.000014
200	0.964967	7:17:30	0.964973	7:25:36	0.964980	7:33:43	0.964973	0.000013
150	0.730394	7:17:51	0.730400	7:25:57	0.730414	7:34:05	0.730403	0.000020
100	0.495812	7:18:12	0.495817	7:26:19	0.495825	7:34:26	0.495818	0.000013
50	0.261213	7:18:33	0.261219	7:26:40	0.261225	7:34:47	0.261219	0.000012
0	0.026595	7:18:54	0.026603	7:27:01	0.026609	7:35:08	0.026602	0.000014

Notes: *1* * = Average initial minimum test load indication.
2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/24	2012/4/24	
Temperature:	-10.3	-10.3	°C
Relative humidity:	32.3	32.0	%
Barometric pressure:	100.88	100.91	kPa
Indicator temperature:	21.7	21.8	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	0.026193	7:03:53						
450	2.163371	7:04:23						
0	0.026284	7:04:52						
450	2.163386	7:05:22						
0	0.026288	7:05:52						
450	2.163381	7:06:21						
0	0.026291	7:06:51						
0	0.026265	7:12:01	0.026280	7:20:10	0.026278	7:28:17	0.026274 *	0.000015
50	0.260764	7:12:22	0.260778	7:20:31	0.260780	7:28:38	0.260774	0.000016
100	0.495285	7:12:42	0.495299	7:20:51	0.495295	7:28:58	0.495293	0.000014
150	0.729816	7:13:03	0.729824	7:21:12	0.729821	7:29:19	0.729820	0.000008
200	0.964366	7:13:24	0.964377	7:21:32	0.964376	7:29:39	0.964373	0.000011
250	1.198908	7:13:45	1.198918	7:21:53	1.198916	7:30:00	1.198914	0.000010
300	1.433502	7:14:05	1.433508	7:22:13	1.433505	7:30:20	1.433505	0.000006
350	1.668109	7:14:26	1.668117	7:22:34	1.668111	7:30:41	1.668112	0.000008
400	1.902761	7:14:47	1.902771	7:22:54	1.902770	7:31:01	1.902767	0.000010
450	2.137554	7:15:08	2.137350	7:23:15	2.137346	7:31:22	2.137417	0.000208
500	2.371981	7:15:28	2.371981	7:23:36	2.371977	7:31:43	2.371980	0.000004
450	2.137441	7:15:49	2.137438	7:23:57	2.137436	7:32:04	2.137438	0.000005
400	1.902892	7:16:10	1.902888	7:24:17	1.902887	7:32:25	1.902889	0.000005
350	1.668334	7:16:31	1.668331	7:24:38	1.668331	7:32:46	1.668332	0.000003
300	1.433772	7:16:52	1.433771	7:25:00	1.433769	7:33:06	1.433771	0.000003
250	1.199204	7:17:13	1.199203	7:25:21	1.199202	7:33:28	1.199203	0.000002
200	0.964642	7:17:34	0.964639	7:25:42	0.964637	7:33:49	0.964639	0.000005
150	0.730081	7:17:55	0.730078	7:26:03	0.730074	7:34:10	0.730078	0.000007
100	0.495503	7:18:16	0.495499	7:26:24	0.495495	7:34:31	0.495499	0.000008
50	0.260899	7:18:37	0.260896	7:26:45	0.260896	7:34:52	0.260897	0.000003
0	0.026299	7:18:58	0.026297	7:27:06	0.026293	7:35:13	0.026296	0.000006

Notes: *1* * = Average initial minimum test load indication.
2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/25	2012/4/25	
Temperature:	20.3	20.3	°C
Relative humidity:	46.9	47.2	%
Barometric pressure:	101.31	101.30	kPa
Indicator temperature:	22.0	22.2	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	0.026252	7:33:52						
450	2.163475	7:34:21						
0	0.026273	7:34:51						
450	2.163474	7:35:20						
0	0.026273	7:35:50						
450	2.163470	7:36:19						
0	0.026273	7:36:49						
0	0.026296	7:41:59	0.026293	7:50:07	0.026293	7:58:13	0.026294 *	0.000003
50	0.260824	7:42:20	0.260821	7:50:28	0.260820	7:58:34	0.260822	0.000004
100	0.495338	7:42:41	0.495336	7:50:48	0.495340	7:58:54	0.495338	0.000004
150	0.729873	7:43:01	0.729873	7:51:09	0.729878	7:59:15	0.729875	0.000005
200	0.964414	7:43:22	0.964419	7:51:29	0.964422	7:59:35	0.964418	0.000008
250	1.198950	7:43:43	1.198967	7:51:50	1.198964	7:59:56	1.198960	0.000017
300	1.433567	7:44:03	1.433560	7:52:10	1.433561	8:00:16	1.433563	0.000007
350	1.668169	7:44:24	1.668177	7:52:31	1.668180	8:00:37	1.668175	0.000011
400	1.902833	7:44:45	1.902841	7:52:51	1.902847	8:00:57	1.902840	0.000014
450	2.137404	7:45:06	2.137410	7:53:12	2.137415	8:01:18	2.137410	0.000011
500	2.372039	7:45:26	2.372041	7:53:33	2.372042	8:01:39	2.372041	0.000003
450	2.137484	7:45:47	2.137484	7:53:54	2.137483	8:02:00	2.137484	0.000001
400	1.902933	7:46:08	1.902930	7:54:14	1.902931	8:02:20	1.902931	0.000003
350	1.668375	7:46:29	1.668373	7:54:35	1.668373	8:02:41	1.668374	0.000002
300	1.433811	7:46:50	1.433807	7:54:56	1.433811	8:03:02	1.433810	0.000004
250	1.199239	7:47:11	1.199237	7:55:17	1.199238	8:03:23	1.199238	0.000002
200	0.964665	7:47:32	0.964660	7:55:38	0.964662	8:03:44	0.964662	0.000005
150	0.730095	7:47:53	0.730090	7:55:59	0.730091	8:04:05	0.730092	0.000005
100	0.495506	7:48:14	0.495502	7:56:21	0.495504	8:04:27	0.495504	0.000004
50	0.260901	7:48:35	0.260897	7:56:42	0.260898	8:04:48	0.260899	0.000004
0	0.026288	7:48:57	0.026286	7:57:03	0.026286	8:05:09	0.026287	0.000002

Notes: 1 * = Average initial minimum test load indication.
2 Absolute (not relative) time shall be recorded.

Form D.2 Load cell errors (E_L)calculation

Ref.: 5.1.1; A.4.1.12 to A.4.1.14; C.2.2.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/20	2012/4/25	
Test temperature:	20.3	20.3	℃
Relative humidity:	47.2	47.2	%
Barometric pressure:	102.40	101.30	kPa
Indicator temperature:	23.7	22.2	℃

Conversion factor, f: 0.000391
75% test load (g, kg or t): 375 kg
Reference indication at 75% test load: 1.759244

Table D.2

Test load (kg)	Reference indication (mV/V)	20.3 ℃ (20℃) Indication (mV/V)	20.3 ℃ (20℃) Error(E_L) (V)	40.3 ℃(40℃) Indication (mV/V)	40.3 ℃(40℃) Error(E_L) (V)	-10.3 ℃(-10℃) Indication (mV/V)	-10.3 ℃(-10℃) Error(E_L) (V)	20.3 ℃(20℃) Indication (mV/V)	20.3 ℃(20℃) Error(E_L) (V)	mpe (V)
0	0.000000	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.35
50	0.234566	0.234541	-0.06	0.234532	-0.09	0.234500	-0.17	0.234528	-0.10	0.35
100	0.469132	0.469061	-0.18	0.469037	-0.24	0.469019	-0.29	0.469044	-0.22	0.70
150	0.703697	0.703599	-0.25	0.703565	-0.34	0.703546	-0.39	0.703581	-0.30	0.70
200	0.938263	0.938150	-0.29	0.938111	-0.39	0.938099	-0.42	0.938124	-0.36	0.70
250	1.172829	1.172697	-0.34	1.172643	-0.48	1.172640	-0.48	1.172666	-0.42	0.70
300	1.407395	1.407292	-0.26	1.407234	-0.41	1.407231	-0.42	1.407269	-0.32	1.05
350	1.641961	1.641908	-0.14	1.641849	-0.29	1.641838	-0.31	1.641881	-0.20	1.05
400	1.876526	1.876579	0.14	1.876513	-0.03	1.876493	-0.09	1.876546	0.05	1.05
450	2.111092	2.111150	0.15	2.111071	-0.05	2.111142	0.13	2.111116	0.06	1.05
500	2.345658	2.345770	0.29	2.345686	0.07	2.345705	0.12	2.345747	0.23	1.05
450	2.111092	2.111214	0.31	2.111143	0.13	2.111164	0.18	2.111190	0.25	1.05
400	1.876526	1.876659	0.34	1.876605	0.20	1.876615	0.23	1.876637	0.28	1.05
350	1.641961	1.642101	0.36	1.642060	0.25	1.642058	0.25	1.642080	0.30	1.05
300	1.407395	1.407535	0.36	1.407508	0.29	1.407496	0.26	1.407516	0.31	1.05
250	1.172829	1.172962	0.34	1.172944	0.29	1.172929	0.25	1.172944	0.29	0.70
200	0.938263	0.938384	0.31	0.938373	0.28	0.938365	0.26	0.938368	0.27	0.70
150	0.703697	0.703807	0.28	0.703803	0.27	0.703803	0.27	0.703798	0.26	0.70
100	0.469132	0.469217	0.22	0.469218	0.22	0.469225	0.24	0.469210	0.20	0.70
50	0.234566	0.234612	0.12	0.234619	0.14	0.234623	0.15	0.234605	0.10	0.35
0	0.000000	-0.000013	-0.03	0.000002	0.01	0.000022	0.06	-0.000007	-0.02	0.35

Minimum test load, D_{min}: 4.7 kg PASS: × FAIL:

Notes:

1 Load/reference indications: if a 75% load point was not obtained, a straight line interpolation between the adjacent higher and lower load point indications is used (see 5.2.2 and calculation procedures in C.2.2).

2 Error, E_L: the difference between the test indication and the reference indication divided by the conversion factor, f.

3 Test load values are values above minimum test load, D_{min}.

Form D.3 Repeatability errors (E_R) calculation

Ref.: 5.4; A.4.1.13; C.2.3.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

Conversion factor, f: 0.000391

Table D.3

Test load	20.3 ℃ (20℃)		40.3 ℃(40℃)		-10.3 ℃(-10℃)		20.3 ℃(20℃)		mpe
	Repeatability error	Repeatability error	Repeatability error	Repeatability error	Repeatability error	Repeatability error	Repeatability error	Repeatability error	
(kg)	(mV/V)	(V)	(mV/V)	(V)	(mV/V)	(V)	(mV/V)	(V)	(V)
0	0.000014	0.04	0.000020	0.05	0.000015	0.04	0.000003	0.01	0.35
50	0.000011	0.03	0.000023	0.06	0.000016	0.04	0.000004	0.01	0.35
100	0.000015	0.04	0.000018	0.05	0.000014	0.04	0.000004	0.01	0.70
150	0.000015	0.04	0.000016	0.04	0.000008	0.02	0.000005	0.01	0.70
200	0.000009	0.02	0.000015	0.04	0.000011	0.03	0.000008	0.02	0.70
250	0.000011	0.03	0.000012	0.03	0.000010	0.03	0.000017	0.04	0.70
300	0.000015	0.04	0.000013	0.03	0.000006	0.02	0.000007	0.02	1.05
350	0.000011	0.03	0.000013	0.03	0.000008	0.02	0.000011	0.03	1.05
400	0.000007	0.02	0.000014	0.04	0.000010	0.03	0.000014	0.04	1.05
450	0.000017	0.04	0.000015	0.04	0.000208	0.53	0.000011	0.03	1.05
500	0.000009	0.02	0.000007	0.02	0.000004	0.01	0.000003	0.01	1.05
450	0.000006	0.02	0.000010	0.03	0.000005	0.01	0.000001	0.00	1.05
400	0.000008	0.02	0.000011	0.03	0.000005	0.01	0.000003	0.01	1.05
350	0.000011	0.03	0.000012	0.03	0.000003	0.01	0.000002	0.01	1.05
300	0.000007	0.02	0.000012	0.03	0.000003	0.01	0.000004	0.01	1.05
250	0.000009	0.02	0.000014	0.04	0.000002	0.01	0.000002	0.01	0.70
200	0.000009	0.02	0.000013	0.03	0.000005	0.01	0.000005	0.01	0.70
150	0.000008	0.02	0.000020	0.05	0.000007	0.02	0.000005	0.01	0.70
100	0.000008	0.02	0.000013	0.03	0.000008	0.02	0.000004	0.01	0.70
50	0.000008	0.02	0.000012	0.03	0.000003	0.01	0.000004	0.01	0.35
0	0.000004	0.01	0.000014	0.04	0.000006	0.02	0.000002	0.01	0.35

PASS: × FAIL:

Note: Error, E_R: the maximum difference between the three test indications divided by the conversion factor, f (classes C and D) or the maximum difference between the five test indications divided by the conversion factor, f (classes A and B).

D.4 Temperature effects on MDLO (C_M) calculation

Ref.: 5.5.1.3; A.4.1.14; C.2.4.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device Conversion factor, f: 0.000391
Indicating instrument: HBM DMP40
Evaluator: Fukuda

Table D.4

Temperature °C	Indication (mV/V)	Change (C_M) (V)	Change (v_{min}/5 °C)	mpc (v_{min}/5 °C)
20.3	0.026348			
40.3	0.026600	0.64	0.27	0.70
-10.3	0.026274	-0.83	0.14	0.70
20.3	0.026294	0.05	0.01	0.70

PASS: × FAIL:

Notes:

1 MDLO: minimum dead load output.

2 Indication: the average initial minimum test load indication obtained from Table D.1.

3 The maximum permissible change(mpc) allowed is: (v_{min}/5°C) for classesB, C, and D; (v_{min}/2°C) for class A.

4 Change, $C_M(v)$: the difference between the observed indications, and the indications at the prior temperature, divided by the conversion factor, f.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/20	2012/4/20	
Temperature:	20.3	20.3	°C
Relative humidity:	47.1	47.2	%
Barometric pressure:	102.42	102.42	kPa
Indicator temperature:	22.6	22.6	°C

Conversion factor, f: 0.000356

Table D.5

	Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpc (v)	
Exercise cells	0						
These rows may be omitted for a load sequence as shown in Figure A.1	0						
	0						
	0						
(*) →	0	0.026346	102.45	9:15:32			←initial "no load" indication
Fill in time →	Record time of initial loading →			9:15:32			
(**) →	450	2.163580	102.46	9:16:02	0.00	0.735	←initial "load" indication
	450	2.163553	102.46	9:17:01	-0.08	0.735	
	450	2.163545	102.46	9:18:00	-0.10	0.735	
	450	2.163542	102.46	9:18:59	-0.11	0.735	
	450	2.163538	102.46	9:19:58	-0.12	0.735	
Constant maximum test load, Dmax	450	2.163536	102.46	9:20:58	-0.12	0.735	
	450	2.163537	102.46	9:21:57	-0.12	0.735	
	450	2.163536	102.46	9:22:56	-0.12	0.735	
	450	2.163536	102.46	9:23:55	-0.12	0.735	
	450	2.163535	102.46	9:24:54	-0.13	0.735	
	450	2.163533	102.46	9:25:53	-0.13	0.735	
	450	2.163532	102.46	9:30:52	-0.13	0.735	
	450	2.163531	102.45	9:35:51	-0.14	0.735	
	450	2.163531	102.45	9:40:50	-0.14	0.735	
	450	2.163532	102.45	9:45:49	-0.13	0.735	
Fill in time →	Record time of initial unloading →			9:45:49			
(***) →	0	0.026307	102.45	9:46:19	-0.11	0.500	←initial indication
These rows are for reference purposes only	0	0.026322	102.45	9:46:38	-0.07	0.500	
	0	0.026329	102.45	9:46:57	-0.05	0.500	
	0	0.026332	102.45	9:47:16	-0.04	0.500	
	0	0.026334	102.45	9:47:35	-0.03	0.500	
	0	0.026336	102.45	9:47:54	-0.03	0.500	
	30-20 minute creep difference in units:				0.00	0.1575	

DR (v):	-0.11	30 minute creep:	PASS:	×	FAIL:
actual time (s):	30	30-20 minute creep diffence:	PASS:	×	FAIL:
specified time (s):	30	DR ≤ 0.5v:	PASS:	×	FAIL:
mpc for DR (v):	0.50	DR within manufacturer specified DRrequirements:	PASS:		FAIL:

Notes:
1 Change (v) for creep: the observed indication minus the initial "load" indication (**) devided by the conversion factor, f.
2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (C_C) and DR (C_{DR})

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/23	2012/4/23	
Temperature:	40.3	40.3	℃
Relative humidity:	34.5	34.4	%
Barometric pressure:	101.51	101.50	kPa
Indicator temperature:	22.5	22.3	℃

Conversion factor, f: 0.000356

Table D.5

	Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpc (v)	
Exercise cells	0						
These rows may be omitted for a load sequence as shown in Figure A.1	0						
	0						
	0						
(*) →	0	0.026589	101.49	8:35:25			←initial "no load" indication
Fill in time →	Record time of initial loading →			8:35:25			
(**) →	450	2.163764	101.49	8:35:55	0.00	0.735	←initial "load" indication
	450	2.163739	101.49	8:36:54	-0.07	0.735	
	450	2.163736	101.49	8:37:53	-0.08	0.735	
	450	2.163739	101.50	8:38:52	-0.07	0.735	
	450	2.163745	101.49	8:39:52	-0.05	0.735	
Constant maximum test load, Dmax	450	2.163746	101.49	8:40:51	-0.05	0.735	
	450	2.163741	101.49	8:41:50	-0.06	0.735	
	450	2.163740	101.49	8:42:49	-0.07	0.735	
	450	2.163748	101.48	8:43:48	-0.04	0.735	
	450	2.163754	101.48	8:44:47	-0.03	0.735	
	450	2.163750	101.48	8:45:47	-0.04	0.735	
	450	2.163757	101.48	8:50:46	-0.02	0.735	
	450	2.163762	101.47	8:55:45	-0.01	0.735	
	450	2.163770	101.47	9:00:44	0.02	0.735	
	450	2.163777	101.47	9:05:43	0.04	0.735	
Fill in time →	Record time of initial unloading →			9:05:43			
(***) →	0	0.026608	101.47	9:06:13	0.05	0.500	←initial indication
These rows are for reference purposes only	0	0.026623	101.47	9:06:32	0.10	0.500	
	0	0.026629	101.47	9:06:51	0.11	0.500	
	0	0.026629	101.47	9:07:10	0.11	0.500	
	0	0.026631	101.47	9:07:29	0.12	0.500	
	0	0.026631	101.47	9:07:48	0.12	0.500	
	30-20 minute creep difference in units:				0.04	0.1575	

DR (v):	0.05	30 minute creep:	PASS:	×	FAIL:
actual time (s):	30	30-20 minute creep diffence:	PASS:	×	FAIL:
specified time (s):	30	DR ≤ 0.5v:	PASS:	×	FAIL:
mpc for DR (v):	0.50	DR within manufacturer specified DRrequirements:	PASS:		FAIL:

Notes:
1 Change (v) for creep: the observed indication minus the initial "load" indication (**) devided by the conversion factor, f.
2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/24	2012/4/24	
Temperature:	-10.3	-10.3	°C
Relative humidity:	32.3	32.0	%
Barometric pressure:	100.88	100.91	kPa
Indicator temperature:	21.7	21.8	°C

Conversion factor, f: 0.000356

Table D.5

	Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpc (v)	
Exercise cells	0						
These rows may be omitted for a load sequence as shown in Figure A.1	0						
	0						
	0						
(*) →	0	0.026265	100.98	8:35:31			←initial "no load" indication
Fill in time →	Record time of initial loading →			8:35:31			
(**) →	450	2.163392	100.98	8:36:01	0.00	0.735	←initial "load" indication
	450	2.163418	100.98	8:37:00	0.07	0.735	
	450	2.163421	100.98	8:37:59	0.08	0.735	
	450	2.163425	100.98	8:38:58	0.09	0.735	
	450	2.163426	100.98	8:39:57	0.10	0.735	
Constant maximum test load, Dmax	450	2.163424	100.98	8:40:56	0.09	0.735	
	450	2.163423	100.98	8:41:55	0.09	0.735	
	450	2.163422	100.98	8:42:54	0.08	0.735	
	450	2.163423	100.98	8:43:54	0.09	0.735	
	450	2.163420	100.98	8:44:53	0.08	0.735	
	450	2.163421	100.98	8:45:52	0.08	0.735	
	450	2.163414	100.98	8:50:51	0.06	0.735	
	450	2.163413	100.97	8:55:50	0.06	0.735	
	450	2.163412	100.97	9:00:49	0.06	0.735	
	450	2.163410	100.97	9:05:48	0.05	0.735	
Fill in time →	Record time of initial unloading →			9:05:48			
(***) →	0	0.026289	100.97	9:06:18	0.07	0.500	←initial indication
These rows are for reference purposes only	0	0.026276	100.97	9:06:37	0.03	0.500	
	0	0.026269	100.97	9:06:56	0.01	0.500	
	0	0.026263	100.97	9:07:15	-0.01	0.500	
	0	0.026260	100.97	9:07:34	-0.01	0.500	
	0	0.026258	100.97	9:07:53	-0.02	0.500	
	30-20 minute creep difference in units:				-0.01	0.1575	

DR (v):	0.07	30 minute creep:	PASS:	×	FAIL:
actual time (s):	30	30-20 minute creep diffence:	PASS:	×	FAIL:
specified time (s):	30	DR ≤ 0.5v:	PASS:	×	FAIL:
mpc for DR (v):	0.50	DR within manufacturer specified DRrequirements:	PASS:		FAIL:

Notes:
1 Change (v) for creep: the observed indication minus the initial "load" indication (**) devided by the conversion factor, f.
2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (Cc) and DR (C_{DR})

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/25	2012/4/25	
Temperature:	20.3	20.3	℃
Relative humidity:	47.5	47.2	%
Barometric pressure:	101.30	101.30	kPa
Indicator temperature:	22.6	22.1	℃

Conversion factor, f: 0.000356

Table D.5

	Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpc (v)	
Exercise cells	0						
These rows may be omitted for a load sequence as shown in Figure A.1	0						
	0						
	0						
(*) →	0	0.026297	101.30	9:05:27			←initial "no load" indication
Fill in time →	Record time of initial loading →			9:05:27			
(**) →	450	2.163501	101.30	9:05:57	0.00	0.735	←initial "load" indication
	450	2.163463	101.30	9:06:56	-0.11	0.735	
	450	2.163455	101.30	9:07:55	-0.13	0.735	
	450	2.163452	101.30	9:08:54	-0.14	0.735	
	450	2.163448	101.30	9:09:53	-0.15	0.735	
Constant maximum test load, Dmax	450	2.163444	101.30	9:10:52	-0.16	0.735	
	450	2.163442	101.29	9:11:52	-0.17	0.735	
	450	2.163443	101.29	9:12:51	-0.16	0.735	
	450	2.163441	101.29	9:13:50	-0.17	0.735	
	450	2.163442	101.29	9:14:49	-0.17	0.735	
	450	2.163437	101.29	9:15:48	-0.18	0.735	
	450	2.163437	101.29	9:20:47	-0.18	0.735	
	450	2.163435	101.28	9:25:46	-0.19	0.735	
	450	2.163438	101.28	9:30:45	-0.18	0.735	
	450	2.163436	101.27	9:35:44	-0.18	0.735	
Fill in time →	Record time of initial unloading →			9:35:44			
(***) →	0	0.026250	101.27	9:36:14	-0.13	0.500	←initial indication
These rows are for reference purposes only	0	0.026267	101.27	9:36:33	-0.08	0.500	
	0	0.026273	101.27	9:36:52	-0.07	0.500	
	0	0.026276	101.27	9:37:11	-0.06	0.500	
	0	0.026279	101.27	9:37:30	-0.05	0.500	
	0	0.026281	101.27	9:37:49	-0.04	0.500	
	30-20 minute creep difference in units:				0.00	0.1575	

DR (v):	-0.13	30 minute creep:	PASS:	×	FAIL:
actual time (s):	30	30-20 minute creep diffence:	PASS:	×	FAIL:
specified time (s):	30	DR ≤ 0.5v:	PASS:	×	FAIL:
mpc for DR (v):	0.50	DR within manufacturer specified DRrequirements:	PASS:		FAIL:

Notes:
1 Change (v) for creep: the observed indication minus the initial "load" indication (**) devided by the conversion factor, f.
2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
4 Absolute (not relative) time shall be recorded.

Form D.6 Barometric pressure effects (Cp)

Ref.: 5.5.2; A.4.4.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: –
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/5/9	2012/5/9	
Test temperature:	23.1	23.1	°C
Relative humidity:	54.0	53.8	%
Barometric pressure:	101.11	101.11	kPa
Indicator temperature:	23.1	23.1	°C

Conversion factor, f: 0.000391

Table D.6

Pressure (kPa)	Indication (mV/V)	Time	Change (V)	Change (v_{min}/kPa)	mpc (v_{min}/kPa)
101.11	0.002146	10:58	0.00	0.00	0
102.11	0.002148	10:58	0.01	0.01	1
101.11	0.002146	10:59	-0.01	0.01	1
100.11	0.002144	10:59	-0.01	0.01	1
101.11	0.002146	11:00	0.01	0.01	1

PASS: × FAIL:

Remarks:

Notes: *1* Change (v): the difference between the observed indication and the initial indication divided by the conversion factor, f.

2 Although A.4.4 specifies a change of only 1 kPa for this test, additional measurements may be taken.

3 Absolute (not relative) time shall be recorded.

Form D.7 Humidity effects (CH or no mark)

Ref.: 5.5.3.1;A.4.5.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

	At start	At end	
Date:	2012/4/26	2012/5/9	
Temperature:	20.3	20.4	℃
Relative humidity:	46.7	47.8	%
Barometric pressure:	100.90	100.87	kPa
Indicator temperature:	22.9	22.9	℃

Conversion factor, f: 0.000356

Conditions during damp heat cyclc test:
Chamber temp.(high): 40.3 ℃ Relative humidity: 95.0 %
Chamber temp.(low): 25.0 ℃ Relative humidity: 96.3 %

Table D.7

	Test load (kg)	Before humidity test Indication (mV/V)	Time	After humidity test Indication (mV/V)	Time	Change (v)	mpc (v)	
	0	0.026271	7:43:24	0.026043	10:09:38			
	450	2.163489	7:43:53	2.163049	10:10:07			
	0	0.026260	7:44:23	0.026005	10:10:37			
	450	2.163487	7:44:52	2.163028	10:11:06			
	0	0.026258	7:45:22	0.025991	10:11:36			
	450	2.163486	7:45:51	2.163025	10:12:05			
	0	0.026257	7:46:21	0.025982	10:12:35			
¤	0	0.026282	7:51:38	0.026036	10:17:52			
‡	450	2.163496	7:52:08	2.163042	10:18:22			
¤	0	0.026264	7:52:38	0.025994	10:18:52			
‡	450	2.163490	7:53:07	2.163024	10:19:21			
¤	0	0.026259	7:53:37	0.025980	10:19:51			
‡	450	2.163487	7:54:06	2.163011	10:20:20			
¤	0	0.026257	7:54:36	0.025970	10:20:50			
	Average(¤)	0.026266		0.025995		-0.76	240	←≦4%n_{max}
	Average(‡)	2.163491		2.163026				
	Averages difference(*)	2.137226		2.137031		-0.55	1.0v	

(¤) Indications at minimum test load — Change (¤), CHmin: PASS: × FAIL:

(‡) Indications at maximum test load (see Note — Change (*), CHmax: PASS: × FAIL:

(*) Average, see 5.5.3.1 and C.2.7

Notes:
1 This test is not necessary if the load cell is marked NH or SH.
2 Change(v): the difference between the after indication and the before indication divided by the conversion factor, f.
3 Use five test runs for classes A and B; use three test runs for classes C and D.
4 Absolute (not relative) time shall be recorded.

Form D.9 Marking requirements

Ref.: 4.6, 4.7.

Application no.: 24-001
Load cell model: LCM19K500
Serial no.: N4
E_{max}: 500 kg
n_{max}: 6000
v_{min}: 0.05 kg
p_{LC}: 0.7 DR: -
Force-generating system: Load cell performance testing device
Indicating instrument: HBM DMP40
Evaluator: Fukuda

Table D.9.1

R 60 reference	Mandatory information	On load cell	In document
4.6.1	Accuracy class designation	+	+
4.6.2	Maximum number of load cell verification intervals, n_{max}	+	+
4.6.3	Loading designation (if necessary)	-	-
4.6.4	Working temperature designation	-	-
4.6.5.1	Humidity symbol "NH"	/	/
4.6.5.3	Humidity symbol "SH"	/	/
4.6.6.1, 4.7.1	Name or trademark of manufacturer (see *Note 1*)	+	+
4.6.6.1, 4.7.1	Manufacturer's own designation or load cell model (see *Note 1*)	+	+
4.6.6.1, 4.7.1	Serial number (see *Note 1*)	+	+
4.6.6.1	Year of manufacture	-	+
4.6.6.1	Minimum dead load, E_{min}	-	+
4.6.6.1, 4.7.1	Maximum capacity, E_{max} (see *Note 1*)	+	+
4.6.6.1	Safe load limit, E_{lim}	-	+
4.6.6.1	Minimum load cell verification interval (v_{min})	+	+
4.6.6.1	Other pertinent conditions	-	-
4.6.6.1	Apportionment factor, p_{LC} (if not equal to 0.7)	/	/
4.6.7	Standard classification	-	-
4.6.8	Multiple classifications	-	-

Table D.9.2

R 60 reference	Non-mandatory additional information	On load cell	In document
4.6.5.2	Humidity symbol "CH"	-	+
4.6.6.2	Relative v_{min}, Y	-	-
4.6.6.2	Relative DR, Z	-	-

Include references to the following:
Documents supplied with load cells:
Diagrams showing markings on load cells:

Notes:
1 Required both on load cell and in document.
2 Indicate that the marking is present with a "+".
3 Indicate that the marking is not present with a "-".
4 Indicate that the marking is not applicable with a "/".