



Member State of OIML  
Japan



OIML Certificate No.  
R60/2000-JP1-12.02

## 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:

Tension load cell  
Type: LC1205- T001A , LC1205- T002, LC1205- T005  
Fraction:  $\pi=0.7$   
Temperature range:  $-10\text{ }^{\circ}\text{C} / 40\text{ }^{\circ}\text{C}$



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OIML Certificate No.  
R60/2000-JP1-12.02

Characteristics:

Model designation			LC1205-T001A	LC1205-T002	LC1205-T005
Accuracy class	Class	-	C		
Maximum number of load cell verification intervals	$n_{max}$	-	4000 3000		
Humidity symbol			CH		
Minimum dead load	$E_{min}$	kg	0		
Maximum capacity	$E_{max}$	kg	1000	2000	5000
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 $Z = E_{max} / (2 * DR)$	$Z$	-	4000 in the case of $n_{max} = 4000$		
Rated output		mV/V	2		
Maximum excitation voltage		V AC/DC	15		
Input impedance	$R_{LC}$	$\Omega$	440		
Cable detail		-	5m 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. 12-05/R60:2000, that includes 19 pages.



Member State of OIML  
Japan



OIML Certificate No.  
R60/2000-JP1-12.02

The Issuing Authority  
NMIJ/AIST



Dr. T. Nomakuchi  
President of AIST  
2012-03-09

The OIML member

Dr. Y. Miki  
2012-03-09

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 : LC1205- T001A , LC1205- T002, LC1205- T005

Evaluation Report Number : 23-020

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<sup>o</sup> 12-05/R60:2000).

Evaluator :

Wataru Kaminaga  
Legal Metrology Division  
NMIJ/AIST

Signature :

*W. Kaminaga*

Date: 2012. 3. 6

Supervisor :

Shigeki Yamaguchi  
Head of Legal Metrology Division  
NMIJ/AIST

Signature :

*Shigeki Yamaguchi*

Date: 2012. 3. 6

## Description

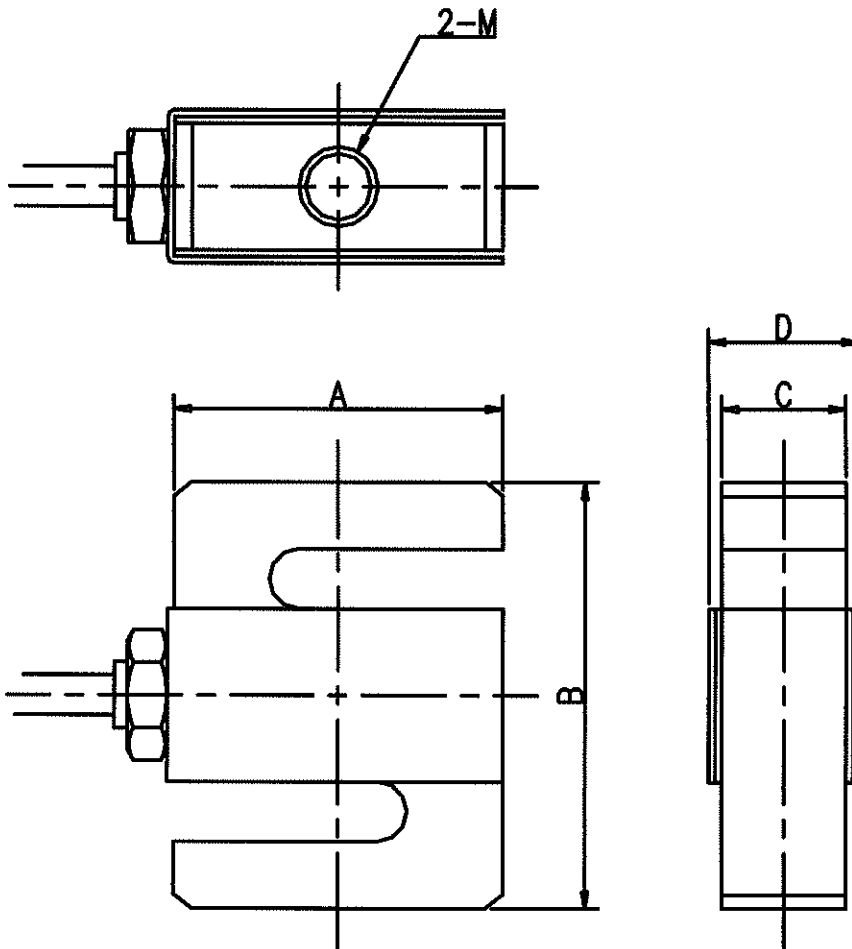
### Technical data

Model designation			LC1205-T001A	LC1205-T002	LC1205-T005
Accuracy class	Class	-	C		
Maximum number of load cell verification intervals	$n_{\max}$	-	4000 3000		
Humidity symbol			CH		
Minimum dead load	$E_{\min}$	kg	0		
Maximum capacity	$E_{\max}$	kg	1000	2000	5000
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 $Z = E_{\max} / (2 * DR)$	$Z$	-	4000 in the case of $n_{\max} = 4000$		
Rated output		mV/V	2		
Maximum excitation voltage		V AC/DC	15		
Input impedance	$R_{LC}$	$\Omega$	440		
Cable detail		-	5m 4wire		

LC1205-T Dimension

(mm)

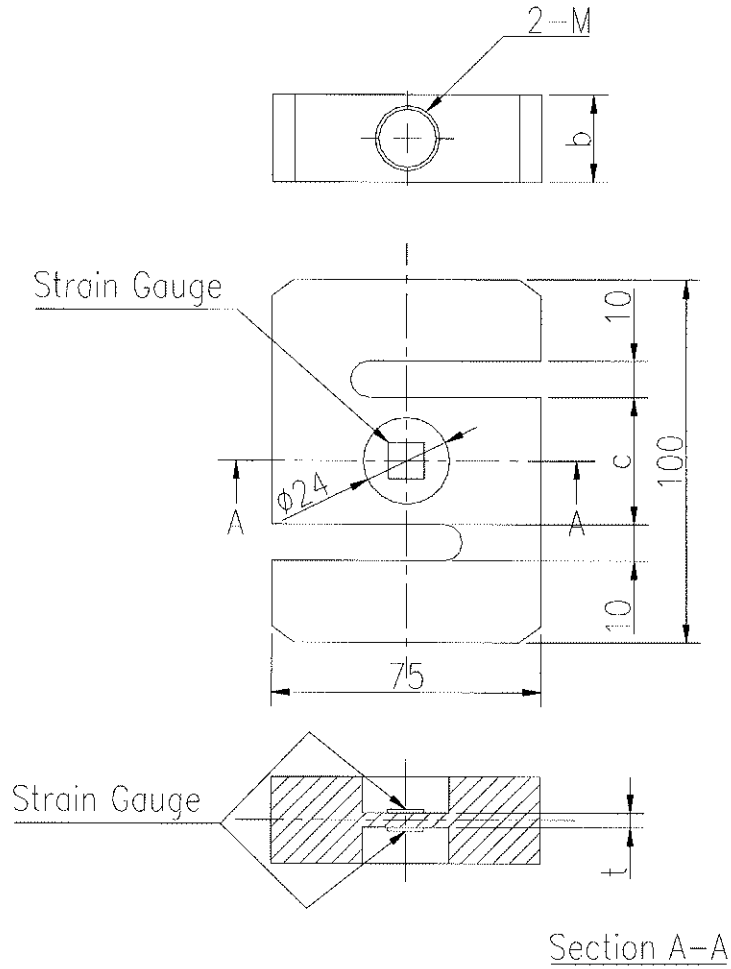
Model	A	B	C	D	M
LC1205-T001A	75	100	24	28	M18x1.5
LC1205-T002	75	100	24	28	M18x1.5
LC1205-T005	75	100	36	40	M24x2



LC1205-T-003

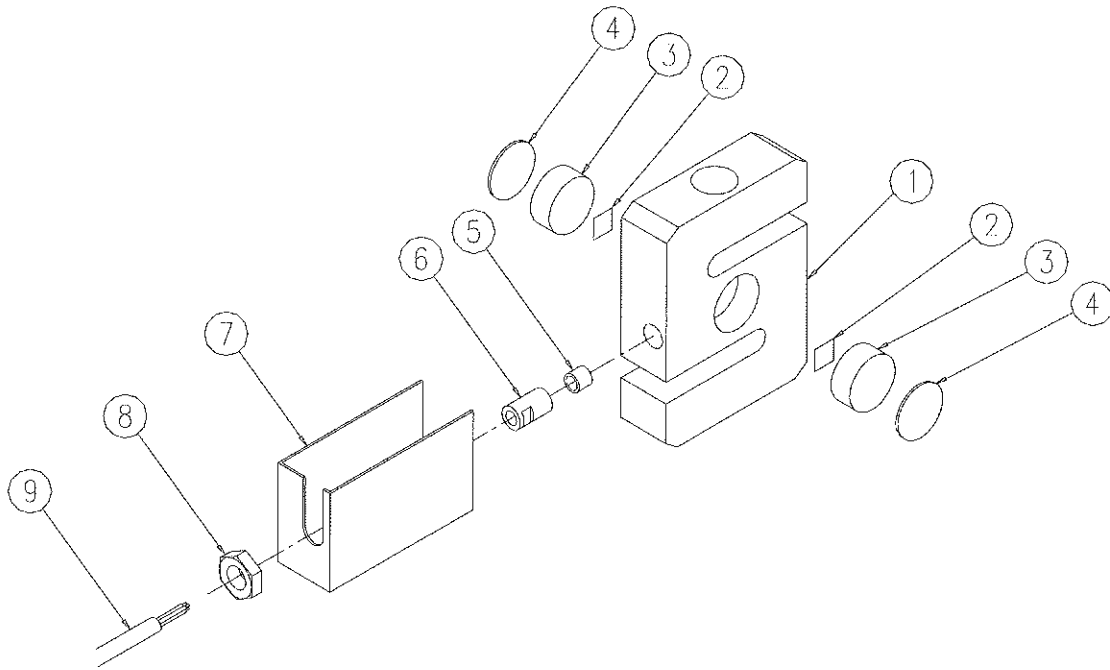
LC1205-T Spring element Dimension  
 (mm)

Model	b	c	t	M	Material
LC1205-T001A	24	30	1.5	M18x1.5	Mild Steel
LC1205-T002	24	35	2.3	M18x1.5	Mild Steel
LC1205-T005	36	38	5.4	M24x2	Mild Steel



LC1205-T-004

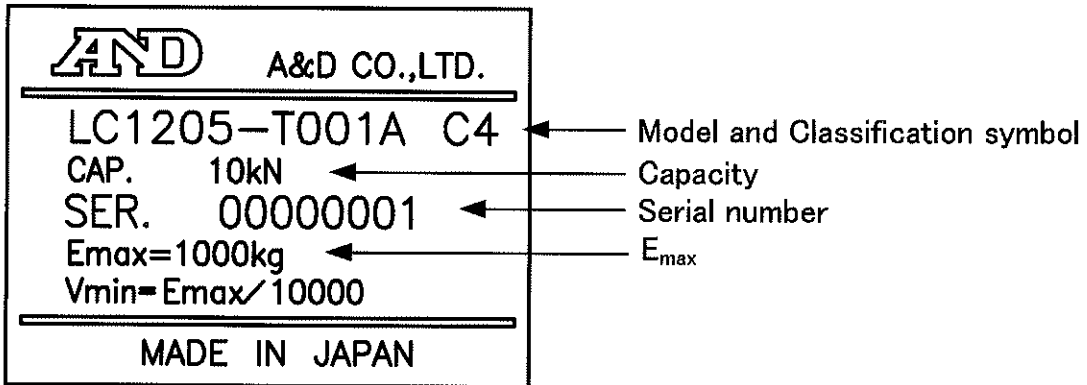
LC1205-T Structural chart



Number	Part name	Quantity	Material
1	Spring Element	1	Mild Steel
2	Strain gauge	2	Polyimide, etc
3	Encapsulation resin	2	Polyurethane
4	Sealant	2	Silicone rubber
5	Clamp	1	Rubber
6	Gland nut	1	Brass
7	Cover	1	Stainless Steel
8	Nut	1	Mild Steel
9	Cable	1	PVC, etc



LC1205-T Load cell markings



Model	Classification symbol	Capacity	E <sub>max</sub>
LC1205-T001A	C4	10kN	1000kg
	C3		
LC1205-T002	C4	20kN	2000kg
	C3		
LC1205-T005	C4	50kN	5000kg
	C3		



National Metrology Institute of Japan

Metrological regulation for load cells :  
Test report

Project number : LC-OIML-12-006  
Test report number : 12-05 / 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 : 2012.2.24  
End of evaluation : 2012.3.1  
Date of issue : 2012.3.2  
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.: 23-020  
 Application date: 2012.2.24  
 Model designation: LC1205-T\*\*\*

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 ( $n_{max}$ ): 4000

Direction of loading: (for load cell characterization, see 4.6.3)

Tension  Beam (shear)  Compression  
 Universal  Beam (bending)

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

Limits of working temperature: (only if other than  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ , see 5.5.1.1)

Upper: \_\_\_\_\_  $^{\circ}\text{C}$  Lower: \_\_\_\_\_  $^{\circ}\text{C}$

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: 23-020

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)	Maximum dead load $E_{min}$ (kg)	Maximum number of load cell intervals $n_{max}$	Minimum dead load output return DR (kg)
1000	0.1	0	4000	
2000	0.2	0	4000	
5000	0.5	0	4000	

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)
LC1205-T001A	C6410490	1000

Secondary equipment (specify load adapters, etc.):

Remarks:

**General information concerning test conditions**

Ref.:A3

Application no.: 23-020Load cell model: LC1205-T001A Serial no.: C6410490  $E_{\max}$ : 1000 kg $n_{\max}$ : 4000  $v_{\min}$ : 0.1 kg DR (if applicable):           Force-generating system - description: Load cell performance testing device  
(see *Note*)Minimum test load: 2.05 kgIndicating instrument - description: HBM DMP40Environmental equipment - description: Air Supply Equipment ASE-210Temperature: 20.4 °CRelative humidity: 45.6 ~ 46.3 %RHBarometric pressure: 101.72 ~ 101.89 kPaTest location: Room 023Acceleration of gravity at test location: 9.79949 m/sec<sup>2</sup>Evaluator: Fukuda*Note* : Include information concerning accuracy (for example, accredited laboratory).

**Summary of the test**

Application no.: 23-020

Load cell model: LC1205-T001A

Serial no.: C6410490

E<sub>max</sub>: 1000 kgV<sub>min</sub>: 0.1 kg

Force-generating system: Load cell performance testing device

Indicating instrument: HBM DMP40

Evaluator: Fukuda

n<sub>max</sub>: 4000

DR: \_\_\_\_\_

PLC: 0.7

No.	Test description	Passed	Failed	Report page	Remarks
D.2	Load cell errors (E <sub>L</sub> )	x		10	
D.3	Repeatability errors (E <sub>R</sub> )	x		11	
D.4	Temperature effects on MDLO (C <sub>M</sub> )	x		12	
D.5	Creep (C <sub>C</sub> )	x		13-16	
D.5	DR(C <sub>DR</sub> )	x		13-16	(see Note 2) DR: -0.08 kg
D.6	Barometric pressure effects (C <sub>p</sub> )	x		17	
D.7	Humidity effects (CH or no mark) (C <sub>Hmin</sub> )	x		18	
D.7	Humidity effects (CH or no mark) (C <sub>Hmax</sub> )	x		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 <sub>max</sub>		n <sub>max</sub> -500		n <sub>max</sub> -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 <sub>max</sub> and at lower than n <sub>max</sub>	x		x		x	
C.4.4	Check that $v_{min} \leq \frac{D_{max}-D_{min}}{n_{max}}$	Pass		Fail			
		x					

Worst case figure for minimum dead load output return error (in mass units) = DR = -0.08 kg see Note 3

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

**Form D.1 (3 runs) Load test data (E<sub>L</sub>)**

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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 η<sub>max</sub>: 4000  
 V<sub>min</sub>: 0.1 kg  
 PLC: 0.7 DR:  
 Force-generating system: Load cell performance testing device  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

	At start	At end	
Date:	2012/1/17	2012/1/17	
Temperature:	20.4	20.4	°C
Relative humidity:	46.3	45.6	%
Barometric pressure:	101.73	101.72	kPa
Indicator temperature:	24.8	23.2	°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	0.031743	9:56:04						
1000	2.260119	9:56:34						
0	0.031707	9:57:03						
1000	2.260110	9:57:33						
0	0.031702	9:58:02						
1000	2.260126	9:58:31						
0	0.031697	9:59:01						
0	0.031754	10:04:11	0.031736	10:12:17	0.031730	10:20:21	0.031740 *	0.000024
100	0.252248	10:04:32	0.252233	10:12:38	0.252227	10:20:42	0.252236	0.000021
200	0.472777	10:04:53	0.472763	10:12:58	0.472757	10:21:02	0.472766	0.000020
300	0.693325	10:05:13	0.693313	10:13:19	0.693307	10:21:23	0.693315	0.000018
400	0.913945	10:05:34	0.913928	10:13:39	0.913923	10:21:43	0.913932	0.000022
500	1.134531	10:05:55	1.134520	10:14:00	1.134519	10:22:04	1.134523	0.000012
600	1.355203	10:06:15	1.355185	10:14:20	1.355182	10:22:24	1.355190	0.000021
700	1.575879	10:06:36	1.575866	10:14:41	1.575865	10:22:45	1.575870	0.000014
800	1.796584	10:06:57	1.796568	10:15:01	1.796567	10:23:05	1.796573	0.000017
900	2.017313	10:07:17	2.017301	10:15:22	2.017299	10:23:26	2.017304	0.000014
1000	2.238026	10:07:38	2.238011	10:15:43	2.238011	10:23:47	2.238016	0.000015
900	2.017357	10:07:59	2.017347	10:16:03	2.017344	10:24:07	2.017349	0.000013
800	1.796715	10:08:19	1.796703	10:16:24	1.796703	10:24:28	1.796707	0.000012
700	1.576083	10:08:40	1.576074	10:16:45	1.576071	10:24:49	1.576076	0.000012
600	1.355453	10:09:01	1.355444	10:17:06	1.355445	10:25:09	1.355447	0.000009
500	1.134828	10:09:22	1.134823	10:17:26	1.134822	10:25:30	1.134824	0.000006
400	0.914208	10:09:43	0.914200	10:17:47	0.914200	10:25:51	0.914203	0.000008
300	0.693580	10:10:03	0.693573	10:18:08	0.693572	10:26:12	0.693575	0.000008
200	0.472955	10:10:24	0.472949	10:18:29	0.472949	10:26:33	0.472951	0.000006
100	0.252328	10:10:45	0.252323	10:18:50	0.252322	10:26:54	0.252324	0.000006
0	0.031716	10:11:06	0.031711	10:19:10	0.031712	10:27:15	0.031713	0.000005

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<sub>L</sub>)**

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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 v<sub>min</sub>: 0.1 kg  
 PLC: 0.7 DR:  
 Force-generating system: Load cell performance testing device  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

Date:	At start	At end	
Temperature:	2012/1/18	2012/1/18	°C
Relative humidity:	40.0	40.0	°C
Barometric pressure:	33.9	33.6	%
Indicator temperature:	102.14	102.15	kPa
	24.5	23.6	°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	0.032129	7:24:08						
1000	2.260214	7:24:37						
0	0.032081	7:25:07						
1000	2.260198	7:25:36						
0	0.032073	7:26:06						
1000	2.260201	7:26:35						
0	0.032070	7:27:05						
0	0.032135	7:32:15	0.032113	7:40:20	0.032109	7:48:25	0.032119 *	0.000026
100	0.252614	7:32:36	0.252590	7:40:41	0.252586	7:48:46	0.252597	0.000028
200	0.473107	7:32:57	0.473088	7:41:01	0.473081	7:49:06	0.473092	0.000026
300	0.693620	7:33:17	0.693601	7:41:22	0.693593	7:49:27	0.693605	0.000027
400	0.914204	7:33:38	0.914182	7:41:42	0.914177	7:49:47	0.914188	0.000027
500	1.134762	7:33:59	1.134738	7:42:03	1.134735	7:50:08	1.134745	0.000027
600	1.355385	7:34:19	1.355367	7:42:23	1.355361	7:50:28	1.355371	0.000024
700	1.576023	7:34:40	1.576011	7:42:43	1.576002	7:50:48	1.576012	0.000021
800	1.796689	7:35:00	1.796680	7:43:04	1.796674	7:51:09	1.796681	0.000015
900	2.017388	7:35:21	2.017380	7:43:25	2.017371	7:51:30	2.017380	0.000017
1000	2.238065	7:35:42	2.238056	7:43:45	2.238047	7:51:50	2.238056	0.000018
900	2.017428	7:36:02	2.017420	7:44:06	2.017409	7:52:11	2.017419	0.000019
800	1.796823	7:36:23	1.796815	7:44:27	1.796804	7:52:32	1.796814	0.000019
700	1.576227	7:36:44	1.576219	7:44:48	1.576210	7:52:53	1.576219	0.000017
600	1.355645	7:37:05	1.355632	7:45:09	1.355624	7:53:14	1.355634	0.000021
500	1.135051	7:37:26	1.135045	7:45:29	1.135040	7:53:34	1.135045	0.000011
400	0.914468	7:37:46	0.914462	7:45:50	0.914452	7:53:55	0.914461	0.000016
300	0.693880	7:38:07	0.693875	7:46:11	0.693865	7:54:16	0.693873	0.000015
200	0.473288	7:38:28	0.473281	7:46:32	0.473272	7:54:37	0.473280	0.000016
100	0.252693	7:38:49	0.252688	7:46:53	0.252681	7:54:58	0.252687	0.000012
0	0.032088	7:39:10	0.032086	7:47:14	0.032080	7:55:19	0.032085	0.000008

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<sub>L</sub>)**

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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 η<sub>max</sub>: 4000  
 V<sub>min</sub>: 0.1 kg  
 PLC: 0.7 DR:  
 Force-generating system: Load cell performance testing device  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

	At start	At end	
Date:	2012/1/19	2012/1/19	
Temperature:	-9.5	-9.5	°C
Relative humidity:	33.9	33.4	%
Barometric pressure:	102.15	102.18	kPa
Indicator temperature:	23.7	23.3	°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	0.032386	7:12:45						
1000	2.260970	7:13:14						
0	0.032401	7:13:44						
1000	2.260986	7:14:13						
0	0.032407	7:14:43						
1000	2.260992	7:15:12						
0	0.032405	7:15:42						
0	0.032382	7:20:52	0.032380	7:28:57	0.032373	7:37:01	0.032378 *	0.000009
100	0.252902	7:21:13	0.252899	7:29:18	0.252891	7:37:22	0.252897	0.000011
200	0.473447	7:21:34	0.473445	7:29:38	0.473438	7:37:42	0.473443	0.000009
300	0.694027	7:21:54	0.694022	7:29:59	0.694010	7:38:03	0.694020	0.000017
400	0.914657	7:22:15	0.914655	7:30:19	0.914644	7:38:23	0.914652	0.000013
500	1.135292	7:22:36	1.135288	7:30:40	1.135272	7:38:44	1.135284	0.000020
600	1.355964	7:22:56	1.355957	7:31:00	1.355948	7:39:04	1.355956	0.000016
700	1.576667	7:23:17	1.576662	7:31:20	1.576651	7:39:24	1.576660	0.000016
800	1.797400	7:23:37	1.797396	7:31:41	1.797385	7:39:45	1.797394	0.000015
900	2.018162	7:23:58	2.018154	7:32:02	2.018143	7:40:06	2.018153	0.000019
1000	2.238905	7:24:19	2.238898	7:32:23	2.238886	7:40:26	2.238896	0.000019
900	2.018242	7:24:39	2.018234	7:32:43	2.018227	7:40:47	2.018234	0.000015
800	1.797591	7:25:00	1.797580	7:33:04	1.797574	7:41:08	1.797582	0.000017
700	1.576939	7:25:21	1.576930	7:33:24	1.576924	7:41:29	1.576931	0.000015
600	1.356294	7:25:42	1.356279	7:33:45	1.356274	7:41:49	1.356282	0.000020
500	1.135647	7:26:03	1.135632	7:34:06	1.135627	7:42:10	1.135635	0.000020
400	0.915009	7:26:24	0.914998	7:34:27	0.914991	7:42:31	0.914999	0.000018
300	0.694357	7:26:44	0.694348	7:34:48	0.694339	7:42:52	0.694348	0.000018
200	0.473705	7:27:05	0.473696	7:35:09	0.473689	7:43:13	0.473697	0.000016
100	0.253047	7:27:26	0.253046	7:35:30	0.253037	7:43:33	0.253043	0.000010
0	0.032404	7:27:47	0.032397	7:35:50	0.032391	7:43:54	0.032397	0.000013

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<sub>L</sub>)**

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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 V<sub>min</sub>: 0.1 kg  
 PLC: 0.7 DR:  
 Force-generating system: Load cell performance testing device  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

Date:	At start	At end	
Temperature:	2012/1/20	2012/1/20	°C
Relative humidity:	20.4	20.4	°C
Barometric pressure:	46.1	46.1	%
Indicator temperature:	101.89	101.89	kPa
	24.3	23.0	°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	0.031619	7:32:18						
1000	2.260013	7:32:47						
0	0.031584	7:33:17						
1000	2.259999	7:33:46						
0	0.031576	7:34:15						
1000	2.260001	7:34:45						
0	0.031572	7:35:14						
0	0.031633	7:40:24	0.031610	7:48:30	0.031603	7:56:34	0.031615 *	0.000030
100	0.252130	7:40:45	0.252108	7:48:51	0.252103	7:56:55	0.252114	0.000027
200	0.472655	7:41:06	0.472635	7:49:11	0.472633	7:57:15	0.472641	0.000022
300	0.693208	7:41:26	0.693186	7:49:32	0.693184	7:57:36	0.693193	0.000024
400	0.913813	7:41:47	0.913807	7:49:52	0.913797	7:57:56	0.913806	0.000016
500	1.134408	7:42:07	1.134400	7:50:13	1.134391	7:58:17	1.134400	0.000017
600	1.355064	7:42:28	1.355043	7:50:33	1.355040	7:58:37	1.355049	0.000024
700	1.575737	7:42:49	1.575717	7:50:54	1.575717	7:58:57	1.575724	0.000020
800	1.796433	7:43:09	1.796414	7:51:14	1.796415	7:59:18	1.796421	0.000019
900	2.017157	7:43:30	2.017143	7:51:35	2.017137	7:59:39	2.017146	0.000020
1000	2.237863	7:43:51	2.237849	7:51:56	2.237846	7:59:59	2.237853	0.000017
900	2.017196	7:44:11	2.017184	7:52:16	2.017181	8:00:20	2.017187	0.000015
800	1.796555	7:44:32	1.796545	7:52:37	1.796543	8:00:41	1.796548	0.000012
700	1.575925	7:44:53	1.575916	7:52:58	1.575914	8:01:02	1.575918	0.000011
600	1.355306	7:45:14	1.355296	7:53:19	1.355297	8:01:22	1.355300	0.000010
500	1.134687	7:45:35	1.134679	7:53:39	1.134677	8:01:43	1.134681	0.000010
400	0.914072	7:45:55	0.914062	7:54:00	0.914058	8:02:04	0.914064	0.000014
300	0.693449	7:46:16	0.693439	7:54:21	0.693436	8:02:25	0.693441	0.000013
200	0.472826	7:46:37	0.472819	7:54:42	0.472817	8:02:46	0.472821	0.000009
100	0.252200	7:46:58	0.252192	7:55:03	0.252190	8:03:07	0.252194	0.000010
0	0.031589	7:47:19	0.031580	7:55:24	0.031576	8:03:27	0.031582	0.000013

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

**Form D.2 Load cell errors (E<sub>L</sub>) calculation**

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

Application no.:	<u>23-020</u>								
Load cell model:	<u>LC1205-T001A</u>								
Serial no.:	<u>C6410490</u>								
E <sub>max</sub> :	<u>1000 kg</u>								
n <sub>max</sub> :	<u>4000</u>								
v <sub>min</sub> :	<u>0.1 kg</u>								
P <sub>LC</sub> :	<u>0.7</u>	DR:							
Force-generating system:	<u>Load cell performance testing device</u>	Conversion factor, f:	<u>0.000551</u>						
Indicating instrument:	<u>HBM DMP40</u>	75% test load (g, kg or t):	<u>750 kg</u>						
Evaluator:	<u>Fukuda</u>	Reference indication at 75% test load:	<u>1.654482</u>						

	At start	At end	
Date:	2012/1/17	2012/1/20	
Test temperature:	20.4	20.4	°C
Relative humidity:	46.3	46.1	%
Barometric pressure:	101.73	101.89	kPa
Indicator temperature:	24.8	23.0	°C

**Table D.2**

Test load (kg)	Reference indication ( mV/V )	20.4 °C (20°C)		40.0 °C(40°C)		-9.5 °C(-10°C)		20.4 °C(20°C)		mpe (V)
		Indication ( mV/V )	Error(E <sub>L</sub> ) (V)	Indication ( mV/V )	Error(E <sub>L</sub> ) (V)	Indication ( mV/V )	Error(E <sub>L</sub> ) (V)	Indication ( mV/V )	Error(E <sub>L</sub> ) (V)	
0	0.000000	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.35
100	0.220598	0.220496	-0.18	0.220478	-0.22	0.220519	-0.14	0.220498	-0.18	0.35
200	0.441195	0.441026	-0.31	0.440973	-0.40	0.441065	-0.24	0.441026	-0.31	0.70
300	0.661793	0.661575	-0.39	0.661486	-0.56	0.661641	-0.27	0.661577	-0.39	0.70
400	0.882390	0.882192	-0.36	0.882069	-0.58	0.882274	-0.21	0.882190	-0.36	0.70
500	1.102988	1.102783	-0.37	1.102626	-0.66	1.102906	-0.15	1.102784	-0.37	1.05
600	1.323585	1.323450	-0.25	1.323252	-0.60	1.323578	-0.01	1.323434	-0.27	1.05
700	1.544183	1.544130	-0.10	1.543893	-0.53	1.544282	0.18	1.544108	-0.13	1.05
800	1.764780	1.764833	0.10	1.764562	-0.40	1.765015	0.43	1.764805	0.05	1.05
900	1.985378	1.985564	0.34	1.985261	-0.21	1.985775	0.72	1.985530	0.28	1.05
1000	2.205975	2.206276	0.55	2.205937	-0.07	2.206518	0.98	2.206237	0.48	1.05
900	1.985378	1.985609	0.42	1.985300	-0.14	1.985856	0.87	1.985572	0.35	1.05
800	1.764780	1.764967	0.34	1.764695	-0.15	1.765203	0.77	1.764932	0.28	1.05
700	1.544183	1.544336	0.28	1.544100	-0.15	1.544553	0.67	1.544303	0.22	1.05
600	1.323585	1.323707	0.22	1.323515	-0.13	1.323904	0.58	1.323684	0.18	1.05
500	1.102988	1.103084	0.18	1.102926	-0.11	1.103257	0.49	1.103066	0.14	1.05
400	0.882390	0.882463	0.13	0.882342	-0.09	0.882621	0.42	0.882449	0.11	0.70
300	0.661793	0.661835	0.08	0.661754	-0.07	0.661970	0.32	0.661826	0.06	0.70
200	0.441195	0.441211	0.03	0.441161	-0.06	0.441318	0.22	0.441205	0.02	0.70
100	0.220598	0.220584	-0.02	0.220568	-0.05	0.220665	0.12	0.220579	-0.03	0.35
0	0.000000	-0.000027	-0.05	-0.000034	-0.06	0.000019	0.03	-0.000034	-0.06	0.35

Minimum test load, D<sub>min</sub>: 2.05 kgPASS:  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<sub>L</sub>: 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<sub>min</sub>.

**Form D.3 Repeatability errors (E<sub>a</sub>) calculation**

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

Application no.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 V<sub>min</sub>: 0.1 kg  
 p<sub>LC</sub>: 0.7 DR:  
 Force-generating system: Load cell performance testing device  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

Conversion factor, f: 0.000551

**Table D.3**

Test load (kg)	20.4 °C (20°C)		40.0 °C(40°C)		-9.5 °C(-10°C)		20.4 °C(20°C)		mpe (V)
	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	
0	0.000024	0.04	0.000026	0.05	0.000009	0.02	0.000030	0.05	0.35
100	0.000021	0.04	0.000028	0.05	0.000011	0.02	0.000027	0.05	0.35
200	0.000020	0.04	0.000026	0.05	0.000009	0.02	0.000022	0.04	0.70
300	0.000018	0.03	0.000027	0.05	0.000017	0.03	0.000024	0.04	0.70
400	0.000022	0.04	0.000027	0.05	0.000013	0.02	0.000016	0.03	0.70
500	0.000012	0.02	0.000027	0.05	0.000020	0.04	0.000017	0.03	1.05
600	0.000021	0.04	0.000024	0.04	0.000016	0.03	0.000024	0.04	1.05
700	0.000014	0.03	0.000021	0.04	0.000016	0.03	0.000020	0.04	1.05
800	0.000017	0.03	0.000015	0.03	0.000015	0.03	0.000019	0.03	1.05
900	0.000014	0.03	0.000017	0.03	0.000019	0.03	0.000020	0.04	1.05
1000	0.000015	0.03	0.000018	0.03	0.000019	0.03	0.000017	0.03	1.05
900	0.000013	0.02	0.000019	0.03	0.000015	0.03	0.000015	0.03	1.05
800	0.000012	0.02	0.000019	0.03	0.000017	0.03	0.000012	0.02	1.05
700	0.000012	0.02	0.000017	0.03	0.000015	0.03	0.000011	0.02	1.05
600	0.000009	0.02	0.000021	0.04	0.000020	0.04	0.000010	0.02	1.05
500	0.000006	0.01	0.000011	0.02	0.000020	0.04	0.000010	0.02	1.05
400	0.000008	0.01	0.000016	0.03	0.000018	0.03	0.000014	0.03	0.70
300	0.000008	0.01	0.000015	0.03	0.000018	0.03	0.000013	0.02	0.70
200	0.000006	0.01	0.000016	0.03	0.000016	0.03	0.000009	0.02	0.70
100	0.000006	0.01	0.000012	0.02	0.000010	0.02	0.000010	0.02	0.35
0	0.000005	0.01	0.000008	0.01	0.000013	0.02	0.000013	0.02	0.35

PASS:  x FAIL:

**Note :** Error, E<sub>a</sub>: 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<sub>M</sub>) calculation**

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

Application no.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 v<sub>min</sub>: 0.1 kg  
 PLC: 0.7 DR: \_\_\_\_\_  
 Force-generating system: Load cell performance testing device Conversion factor, f: 0.000551  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

**Table D.4**

Temperature °C	Indication (mV/V)	Change (C <sub>M</sub> ) (V)	Change (v <sub>min</sub> /5 °C)	mpc (v <sub>min</sub> /5 °C)
20.4	0.031740			
40.0	0.032119	0.69	0.44	0.70
-9.5	0.032378	0.47	-0.12	0.70
20.4	0.031615	-1.38	-0.58	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<sub>min</sub>/5°C) for classesB, C, and D; (v<sub>min</sub>/2°C) for class A.
  - 4 Change, C<sub>M</sub>(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.:	<u>23-020</u>	At start	At end	
Load cell model:	<u>LC1205-T001A</u>	Date:	<u>2012/1/17</u>	<u>2012/1/17</u>
Serial no.:	<u>C6410490</u>	Temperature:	<u>20.4</u>	<u>20.4</u> °C
E <sub>max</sub> :	<u>1000 kg</u>	Relative humidity:	<u>46.0</u>	<u>45.6</u> %
n <sub>max</sub> :	<u>4000</u>	Barometric pressure:	<u>101.72</u>	<u>101.70</u> kPa
V <sub>min</sub> :	<u>0.1 kg</u>	Indicator temperature:	<u>24.4</u>	<u>23.2</u> °C
p <sub>LC</sub> :	<u>0.7</u>	DR:		

Force generating system: Load cell performance testing device Conversion factor, f: 0.000502

Indicating instrument: HBM DMP40

Evaluator: Fukuda

**Table D.5**

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)
0					
0					
0					
0					
(*) → 0	0.031773	101.60	11:27:32		
Fill in time →	Record time of initial loading →		11:27:32		
(**) → 900	2.039861	101.60	11:28:02	0.00	0.735
900	2.039798	101.60	11:29:01	-0.13	0.735
900	2.039779	101.59	11:30:00	-0.16	0.735
900	2.039780	101.59	11:30:59	-0.16	0.735
900	2.039759	101.58	11:31:58	-0.20	0.735
900	2.039751	101.58	11:32:57	-0.22	0.735
900	2.039746	101.58	11:33:57	-0.23	0.735
900	2.039739	101.57	11:34:56	-0.24	0.735
900	2.039732	101.57	11:35:55	-0.26	0.735
900	2.039733	101.57	11:36:54	-0.25	0.735
900	2.039731	101.58	11:37:53	-0.26	0.735
900	2.039723	101.57	11:42:52	-0.27	0.735
900	2.039715	101.57	11:47:51	-0.29	0.735
900	2.039712	101.55	11:52:50	-0.30	0.735
900	2.039710	101.56	11:57:49	-0.30	0.735
Fill in time →	Record time of initial unloading →		11:57:49		
(***) → 0	0.031636	101.55	11:58:19	-0.27	0.500
0	0.031670	101.56	11:58:38	-0.21	0.500
0	0.031682	101.55	11:58:57	-0.18	0.500
0	0.031690	101.55	11:59:16	-0.17	0.500
0	0.031696	101.56	11:59:35	-0.15	0.500
0	0.031701	101.55	11:59:54	-0.14	0.500
30-20 minute creep difference in units:				-0.01	0.1575

DR (v):	-0.27	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	30	30-20 minute creep difference:	PASS:	x	FAIL:	
specified time (s):	30	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpe for DR (v):	0.50	DR within manufacturer specified DR requirements:	PASS:		FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (\*\*) divided 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.:	<u>23-020</u>	At start	At end	
Load cell model:	<u>LC1205-T001A</u>	Date:	<u>2012/1/18</u>	<u>2012/1/18</u>
Serial no.:	<u>C6410490</u>	Temperature:	<u>40.0</u>	<u>40.0</u> °C
E <sub>max</sub> :	<u>1000 kg</u>	Relative humidity:	<u>34.1</u>	<u>33.9</u> %
η <sub>max</sub> :	<u>4000</u>	Barometric pressure:	<u>102.15</u>	<u>102.17</u> kPa
V <sub>min</sub> :	<u>0.1 kg</u>	Indicator temperature:	<u>23.9</u>	<u>24.2</u> °C
p <sub>LC</sub> :	<u>0.7</u>	DR:		

Force generating system: Load cell performance testing device Conversion factor, f: 0.000502  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

**Table D.5**

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)	
0						
0						
0						
0						
(*) →	0	0.032127	102.22	8:55:37		←initial "no load" indication
Fill in time →	Record time of initial loading →			8:55:37		
(**) →	900	2.039916	102.22	8:56:07	0.00	0.735 ←initial "load" indication
Constant maximum test load, Dmax	900	2.039835	102.22	8:57:07	-0.16	0.735
	900	2.039816	102.22	8:58:06	-0.20	0.735
	900	2.039804	102.23	8:59:05	-0.22	0.735
	900	2.039793	102.23	9:00:04	-0.25	0.735
	900	2.039790	102.22	9:01:04	-0.25	0.735
	900	2.039783	102.22	9:02:03	-0.26	0.735
	900	2.039779	102.22	9:03:02	-0.27	0.735
	900	2.039776	102.22	9:04:01	-0.28	0.735
	900	2.039774	102.22	9:05:00	-0.28	0.735
	900	2.039771	102.22	9:05:59	-0.29	0.735
	900	2.039766	102.23	9:10:58	-0.30	0.735
	900	2.039758	102.23	9:15:57	-0.31	0.735
	900	2.039751	102.23	9:20:56	-0.33	0.735
	900	2.039753	102.23	9:25:55	-0.32	0.735
Fill in time →	Record time of initial unloading →			9:25:55		
(***) →	0	0.031983	102.23	9:26:25	-0.29	0.500 ←initial indication
These rows are for reference purposes only	0	0.032022	102.24	9:26:44	-0.21	0.500
	0	0.032038	102.24	9:27:03	-0.18	0.500
	0	0.032046	102.24	9:27:22	-0.16	0.500
	0	0.032053	102.24	9:27:41	-0.15	0.500
	0	0.032059	102.24	9:28:00	-0.14	0.500
30-20 minute creep difference in units:				-0.01	0.1575	

DR (v):	-0.29	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	30	30-20 minute creep difference:	PASS:	x	FAIL:	
specified time (s):	30	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpe for DR (v):	0.50	DR within manufacturer specified DR requirements:	PASS:		FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (\*\*) divided 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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 V<sub>min</sub>: 0.1 kg  
 p<sub>LC</sub>: 0.7 DR:

	At start	At end	
Date:	2012/1/19	2012/1/19	
Temperature:	-9.5	-9.5	°C
Relative humidity:	33.9	33.4	%
Barometric pressure:	102.15	102.18	kPa
Indicator temperature:	23.7	23.3	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000502  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

**Table D.5**

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)
0					
0					
0					
0					
(*) → 0	0.032376	102.25	8:44:12		
Fill in time →	Record time of initial loading →		8:44:12		
(**) → 900	2.040638	102.25	8:44:42	0.00	0.735
900	2.040667	102.25	8:45:41	0.06	0.735
900	2.040674	102.26	8:46:40	0.07	0.735
900	2.040673	102.26	8:47:39	0.07	0.735
900	2.040672	102.26	8:48:39	0.07	0.735
900	2.040670	102.26	8:49:38	0.06	0.735
900	2.040673	102.26	8:50:37	0.07	0.735
900	2.040669	102.26	8:51:36	0.06	0.735
900	2.040665	102.26	8:52:35	0.05	0.735
900	2.040666	102.26	8:53:34	0.06	0.735
900	2.040662	102.26	8:54:34	0.05	0.735
900	2.040643	102.26	8:59:33	0.01	0.735
900	2.040637	102.25	9:04:32	0.00	0.735
900	2.040630	102.24	9:09:31	-0.02	0.735
900	2.040616	102.25	9:14:30	-0.04	0.735
Fill in time →	Record time of initial unloading →		9:14:30		
(***) → 0	0.032356	102.24	9:15:00	-0.04	0.500
0	0.032344	102.24	9:15:19	-0.06	0.500
0	0.032333	102.24	9:15:38	-0.09	0.500
0	0.032326	102.24	9:15:57	-0.10	0.500
0	0.032320	102.24	9:16:16	-0.11	0.500
0	0.032315	102.24	9:16:35	-0.12	0.500
30-20 minute creep difference in units:				-0.04	0.1575

DR (v):	-0.04	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	30	30-20 minute creep difference:	PASS:	x	FAIL:	
specified time (s):	30	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpc for DR (v):	0.50	DR within manufacturer specified DR requirements:	PASS:		FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (\*\*) divided 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.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 $E_{max}$ : 1000 kg  
 $\eta_{max}$ : 4000  
 $V_{min}$ : 0.1 kg  
 $p_{LC}$ : 0.7 DR: \_\_\_\_\_

	At start	At end	
Date:	2012/1/20	2012/1/20	
Temperature:	20.4	20.4	°C
Relative humidity:	46.2	45.9	%
Barometric pressure:	101.89	101.88	kPa
Indicator temperature:	23.2	24.3	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000502  
 Indicating instrument: HBM DMP40  
 Evaluator: Fukuda

**Table D.5**

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)	
0						
0						
0						
0						
(*) → 0	0.031641	101.89	9:03:45			←initial "no load" indication
Fill in time →	Record time of initial loading →		9:03:45			
(**) → 900	2.039707	101.88	9:04:15	0.00	0.735	←initial "load" indication
Constant maximum test load, Dmax	900	2.039638	9:05:14	-0.14	0.735	
	900	2.039616	9:06:13	-0.18	0.735	
	900	2.039603	9:07:12	-0.21	0.735	
	900	2.039597	9:08:11	-0.22	0.735	
	900	2.039588	9:09:10	-0.24	0.735	
	900	2.039582	9:10:09	-0.25	0.735	
	900	2.039577	9:11:09	-0.26	0.735	
	900	2.039571	9:12:08	-0.27	0.735	
	900	2.039565	9:13:07	-0.28	0.735	
	900	2.039561	9:14:06	-0.29	0.735	
	900	2.039545	9:19:05	-0.32	0.735	
	900	2.039542	9:24:04	-0.33	0.735	
	900	2.039532	9:29:03	-0.35	0.735	
	900	2.039527	9:34:02	-0.36	0.735	
Fill in time →	Record time of initial unloading →		9:34:02			
(***) → 0	0.031479	101.89	9:34:32	-0.32	0.500	←initial indication
These rows are for reference purposes only	0	0.031512	9:34:51	-0.26	0.500	
	0	0.031527	9:35:10	-0.23	0.500	
	0	0.031537	9:35:29	-0.21	0.500	
	0	0.031544	9:35:48	-0.19	0.500	
	0	0.031550	9:36:07	-0.18	0.500	
30-20 minute creep difference in units:				-0.03	0.1575	

DR (v):	-0.32	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	30	30-20 minute creep diffence:	PASS:	x	FAIL:	
specified time (s):	30	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpc for DR (v):	0.50	DR within manufacturer specified DR requirements:	PASS:		FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (\*\*) divided 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.: <u>23-020</u>		<b>At start</b>	<b>At end</b>	
Load cell model: <u>LC1205-T001A</u>		<u>2012/2/2</u>	<u>2012/2/2</u>	
Serial no.: <u>C6410490</u>	Test temperature:	<u>23.2</u>	<u>23.2</u>	°C
$E_{max}$ : <u>1000 kg</u>	Relative humidity:	<u>38.0</u>	<u>38.1</u>	%
$n_{max}$ : <u>4000</u>	Barometric pressure:	<u>100.59</u>	<u>100.58</u>	kPa
$V_{min}$ : <u>0.1 kg</u>	Indicator temperature:	<u>22.7</u>	<u>23.0</u>	°C
$P_{LC}$ : <u>0.7</u>	DR: _____			

Force-generating system: - Conversion factor, f: 0.000551

Indicating instrument: HBM DMP40

Evaluator: Fukuda

**Table D.6**

Pressure (kPa)	Indication (mV/V)	Time	Change (V)	Change ( $v_{min}/kPa$ )	mpc ( $v_{min}/kPa$ )
100.59	0.026753	13:15	0.00	0.00	0
101.59	0.026766	13:16	0.02	0.06	1
100.59	0.026752	13:16	-0.03	0.06	1
99.59	0.026726	13:17	-0.05	0.12	1
100.59	0.026763	13:17	0.07	0.17	1

PASS:  x  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.:	<u>23-020</u>				
Load cell model:	<u>LC1205-T001A</u>				
Serial no.:	<u>C6410490</u>				
E <sub>max</sub> :	<u>1000 kg</u>	Date:	<u>2012/1/20</u>	<u>2012/2/2</u>	
n <sub>max</sub> :	<u>4000</u>	Temperature:	<u>20.4</u>	<u>20.5</u>	°C
v <sub>min</sub> :	<u>0.1 kg</u>	Relative humidity:	<u>46.1</u>	<u>46.5</u>	%
ρ <sub>LC</sub> :	<u>0.7</u>	Barometric pressure:	<u>101.8</u>	<u>100.48</u>	kPa
	DR: -	Indicator temperature:	<u>23.9</u>	<u>24.5</u>	°C
Force generating system:	<u>Load cell performance testing device</u>	Conversion factor, f:	<u>0.000502</u>		
Indicating instrument:	<u>HBM DMP40</u>	Conditions during damp heat cycle test:			
Evaluator:	<u>Fukuda</u>	Chamber temp.(high):	<u>40.1 °C</u>	Relative humidity:	<u>95.3 %</u>
		Chamber temp.(low):	<u>24.9 °C</u>	Relative humidity:	<u>95.8 %</u>

**Table D.7**

Test load (kg)	Before humidity test		After humidity test		Change (v)	mpc (v)
	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	0.031638	11:15:35	0.033037	10:16:53		
900	2.039721	11:16:04	2.040802	10:17:22		
0	0.031603	11:16:34	0.033032	10:17:51		
900	2.039713	11:17:03	2.040787	10:18:20		
0	0.031593	11:17:33	0.033006	10:18:49		
900	2.039696	11:18:02	2.040721	10:19:18		
0	0.031587	11:18:32	0.032983	10:19:48		
0	0.031633	11:23:49	0.033056	10:25:05		
900	2.039704	11:24:19	2.040784	10:25:34		
0	0.031594	11:24:49	0.033044	10:26:04		
900	2.039682	11:25:18	2.040748	10:26:32		
0	0.031587	11:25:48	0.033012	10:27:02		
900	2.039693	11:26:17	2.040712	10:27:31		
0	0.031580	11:26:47	0.032993	10:28:00		
Average(⊖)	0.031599		0.033026		2.84	160 ← ≤ 4%n <sub>max</sub>
Average(⊕)	2.039693		2.040748			
Averages difference(*)	2.008095		2.007722		-0.74	1.0v

(⊖) Indications at minimum test load	Change (⊖), CHmin:	PASS:	<input type="checkbox"/>	FAIL:	<input type="checkbox"/>
(⊕) Indications at maximum test load (see Note)	Change (*), CHmax:	PASS:	<input type="checkbox"/>	FAIL:	<input type="checkbox"/>

(\*) Average, see 5.5.3.1 and C.2.7

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

**Form D.9 Marking requirements**

Ref.: 4.6, 4.7.

Application no.: 23-020  
 Load cell model: LC1205-T001A  
 Serial no.: C6410490  
 E<sub>max</sub>: 1000 kg  
 n<sub>max</sub>: 4000  
 v<sub>min</sub>: 0.1 kg  
 ρ<sub>LC</sub>: 0.7 DR: \_\_\_\_\_  
 Force-generating system: -  
 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 <sub>max</sub>	+	+
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 <sub>min</sub>	-	+
4.6.6.1, 4.7.1	Maximum capacity, E <sub>max</sub> (see Note 1)	+	+
4.6.6.1	Safe load limit, E <sub>lim</sub>	-	+
4.6.6.1	Minimum load cell verification interval (v <sub>min</sub> )	+	+
4.6.6.1	Other pertinent conditions	-	-
4.6.6.1	Apportionment factor, ρ <sub>LC</sub> (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 <sub>min</sub> , 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 "/".