DRAFT RECOMMENDATION

DR 8

42nd CIML Meeting

Shanghai 2007

(Item 8.1)

SUBMITTED FOR CIML APPROVAL

Revision R 107-2

Discontinuous totalizing automatic weighing instruments (totalizing hopper weighers).

Part 2: Test report format

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

EXPLANATORY NOTE

This Draft Recommendation of OIML R 107-2 was developed by the OIML Secretariat for TC 9/SC 2 *Automatic weighing instruments*, following the online CIML ballot which ended in September 2007. This ballot did not achieve the required majority to approve the Recommendation, so the CIML comments have been taken into account in this Draft Recommendation which is now submitted for approval at the 42nd CIML Meeting.

OIML TC 9/ SC 2 "Automatic Weighing instruments"
Secretariat: United Kingdom

Composition of TC 9/ SC 2:

Participating States:	Observer States:	Institutions in liaison:
Australia	Bulgaria	BIML
Austria	Canada	CECIP
Belgium	Cyprus	ISO
Brazil	Hungary	COPAMA
China	Ireland	
Czech Republic		
Denmark	Slovakia	
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Russian Federation		
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South Africa		
Spain		
Sweden		
Switzerland		
United Kingdom		
United States		

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FOREWORD

To be added by the BIML

INTRODUCTION

This "test report format" aims at presenting, in a standardized format, the results of the various tests and examinations to which a type of a totalizing automatic weighing instrument shall be submitted with a view to its approval.

The test report format consists of two parts, a "checklist" and the "test report" itself.

The checklist is a summary of the examinations carried out on the instrument. It includes the conclusions of the results of the test performed, experimental or visual checks based on the requirements of Part 1. The words or condensed sentences aim at reminding the examiner of the requirements in OIML R 107-1 without reproducing them.

The test report is a record of the results of the tests carried out on the instrument. The "test report" forms have been produced based on the tests detailed in OIML R 107-1.

All metrology services or laboratories evaluating types of totalizing automatic weighing instruments accordingly to R 107 or to national or regional regulations based on this OIML Recommendation are strongly advised to use this test report format, directly or after translation into a language other than English or French. Its direct use in English or in French, or in both languages, is even more strongly recommended whenever test results may be transmitted by the country performing these tests to the approving authorities of another country, under bi- or multilateral cooperation agreements. In the framework of the *OIML Certificate System for measuring instruments*, use of this test report format is mandatory.

The "information concerning the test equipment used for type evaluation" shall cover all test equipment which has been used in determining the test results given in a report. The information may be a short list containing only essential data (name, type, reference number for purpose of traceability). For example:

- Verification standards (accuracy, or accuracy class, and No)
- Simulator for testing of modules (name, type, traceability and No)
- Climatic test and static temperature chamber (name, type and No)
- Electrical tests, bursts (name of the instrument, type and No)
- Description of the procedure of field calibration for the test of immunity to radiated electromagnetic fields

Note concerning the numbering of the following pages

In addition to a sequential numbering: "R 107-2 page ..." at the bottom of the pages of this publication, a special place is left at the top of each page (starting with the following page) for numbering the pages of reports established following this model; in particular, some tests (e.g. metrological performance tests) shall be repeated several times, each test being reported individually on a separate page following the relevant format; in the same way, a multiple range instrument shall be tested separately for each range and a separate form (including the general information form) shall be filled out for each range. For a given report, it is advisable to complete the sequential numbering of each page by the indication of the total number of pages of the report.

DISCONTINUOUS TOTALIZING AUTOMATIC WEIGHING INSTRUMENTS (TOTALIZING HOPPER WEIGHERS)

TYPE EVALUATION REPORT

EXPLANATORY NOTES

Symbols	Meaning
I	Indication
I_n	n^{th} indication
L	Load
ΔL	Additional load to next changeover point
P	I + 1/2 e – ΔL = Indication prior to rounding (digital indication)
E	I – L or P – L = Error
E%	(P – L) / L %
E_0	Error at zero load
d	Actual scale interval
d_t	Totalization scale interval
p_i	Fraction of the MPE applicable to a module of the instrument which is examined separately
MPE	Maximum permissible error
EUT	Equipment under test
sf	Significant fault
Max	Maximum capacity of the weighing instrument
Min	Minimum capacity of the weighing instrument
U_{nom}	Nominal voltage value marked on the instrument
U_{max}	Highest value of a voltage range marked on the instrument
U_{min}	Lowest value of a voltage range marked on the instrument
v_{min}	Minimum operating speed
v_{max}	Maximum operating speed
e.m.f	Electromotive force
I/O	Input / output ports
RF	Radio frequency
V/m	Volts per meter
kV	Kilovolt
DC	Direct current
AC	Alternating current
MHz	Megahertz

The name(s) or symbol(s) of the unit(s) used to express test results shall be specified in each form.

For each test, the "SUMMARY OF TYPE EVALUATION" and the "CHECKLIST" shall be completed according to this example:

	P	F
when the instrument has passed the test:	X	
when the instrument has failed the test:		X
when the test is not applicable:	—	—

P = Passed
F = Failed

The white spaces in boxes in the headings of the report should always be filled according to the following example:

	At start	At end	
Temp.:	20.5	21.1	°C
Rel. h:			%
Date:	2006-01-29	2006-01-30	yyyy-mm-dd
Time:	16:00:05	16:30:25	hh:mm:ss
Bar. pres			hPa

"Date" in the test report refers to the date that the test was performed.

In the disturbance tests, faults greater than d are acceptable provided that they are detected and acted upon, or that they result from circumstances such that these faults shall not be considered as significant; an appropriate explanation shall be given in the column "Yes (remarks)".

Section numbers in brackets refer to the corresponding clauses of R 107-1.

GENERAL INFORMATION CONCERNING THE TYPE

Application no: ..... Manufacturer: .....

Type designation: ..... Applicant: .....

Instrument category: ....

Testing on: ☐ Complete instrument ☐ Module [1]

Accuracy class ☐ 0.2 ☐ 0.5 ☐ 1 ☐ 2

Min = ☐ Σ_{min} = ☐

Max = ☐

T + = ☐ T – = ☐ d = ☐ d_t = ☐

U_{nom} = ☐ V U_{min} = ☐ V U_{max} = ☐ V f = ☐ Hz Battery, U = ☐ V

Zero-setting device:

☐ Nonautomatic

☐ Semi-automatic

☐ Automatic zero-setting

☐ Initial zero-setting

☐ Zero-tracking

Initial zero-setting range ☐ % of Max Temperature range ☐ °C

Printer: ☐ Built in ☐ Connected ☐ Not present but connectable ☐ No connection

Instrument submitted: ..... Load sensor: .....

Identification Number: ..... Manufacturer: .....

Software version: ..... Type: .....

Connected equipment: ..... Capacity: .....

..... Number: .....

Interfaces(number, nature): ..... Classification symbol: .....

..... Remarks: .....

....

Evaluation period: ....

Date of report: ....

Observer: ....

[1] The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used.

GENERAL INFORMATION CONCERNING THE TYPE (continued)

Use this space to indicate additional remarks and / or information: other connected equipment, interfaces and load cells, choice of the manufacturer regarding protection against disturbances, etc.

IDENTIFICATION OF THE INSTRUMENT

Application no:	…..…….....	Type designation:	…..…….....
Identification No:	…..…….....	Manufacturer:	…..…….....
Software version:	…..…….....	…..……..……..……....	
Report date:	…..…….....	…..……..……..……....	

Manufacturing documentation

(Record as necessary to identify the equipment under test)

System or module name	Drawing number or software reference	Issue level	Serial No
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Simulator documentation

System or module name	Drawing number or software reference	Issue level	Serial No
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Simulator function (summary)

(Simulator description and drawings, block diagram etc should be attached to the report if available)

IDENTIFICATION OF THE INSTRUMENT (continued)

Description or other information pertaining to identification of the instrument:
(*attach photograph here if available*)

INFORMATION CONCERNING THE TEST EQUIPMENT USED FOR TYPE EVALUATION

TEST EQUIPMENT

Application no: …..……..... Type designation: …..……..…..

Report date: …..……..... Manufacturer: …..……..…..

List all test equipment used in this report (including descriptions of the reference vehicles used for testing)

Equipment name	Manufacturer	Type No	Serial No	Used for (test references)
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

CONFIGURATION FOR TEST

Application no:	…..…….....	Type designation:	…..…….....
Report date:	…..…….....	Manufacturer:	…..…….....

Use this space for additional information relating to equipment configuration, interfaces, data rates, load cells EMC protection options etc, for the instrument and / or simulator.

SUMMARY OF TYPE EVALUATION

Application no: …..……..... Type designation: …..…….....
Report date: …..……..... …..…….....……...……...……....

	TESTS	Report page	Passed	Failed	Remarks
1	Zero-setting				
2	Warm-up time test				
3	Stability of equilibrium				
4	**Influence factors**				
4.1	Static temperatures				
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5.1	AC mains short time power reductions				
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5.2.2	Electrical bursts on I/O circuits and communication lines				
5.3.1	Surges on AC mains voltage lines				
5.3.2	Surges on I/O signal and communication lines (if any)				
5.4.1	Electrostatic discharges on direct application				
5.4.2	Electrostatic discharges on indirect application (contact discharges only)				
5.5.1	Immunity to radiated electromagnetic fields				
5.5.2	Immunity to conducted radio-frequency fields				
5.6.1	Electrical transient conduction along supply lines of 12 V or 24 V road vehicle batteries				
5.6.2	Electrical transient conduction via lines other supply lines 12 V or 24 V road vehicle batteries				
6	Span stability				
7	Material tests:				
7.1	Separate verification method				
7.2	Integral verification method				
	EXAMINATIONS				
8	Examination of the construction				
9	Checklist				

Deleted: on any other kind of voltage supply lines

SUMMARY OF TYPE EVALUATION (continued)

Use this page to detail remarks from the summary of the type evaluation.

1 ZERO-SETTING DEVICE (3.8, A.5.4)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
		Time:			hh:mm:ss
		Bar. pres			hPa

Control scale interval, *d*: .....
Resolution during test
(smaller than *d*): .....

1.1 Modes of zero-setting (A.5.4.1)

Modes of zero-setting	Present
Non-automatic	
Semi-automatic	
Automatic operation	

1.2 Range of zero-setting (3.8.2, A.5.4.2)

1.2.1 Initial zero-setting range (A.5.4.2.1)

Positive range, L_p		Negative range, L_n		Zero setting range $L_p + L_n$	% of Max load

1.2.2 Zero-setting range (A.5.4.2.3)

Weight added	Zero Yes/No	Zero setting range	% of Max load

1.3 Accuracy of zero-setting (A.5.4.3)

$E = I + ½\ d - \Delta L$
$E = I - L$ or $P - L$ = Error

Zero-setting mode:	Add. load ΔL	$E = I + ½\ d - \Delta L$	E/d

☐ Passed ☐ Failed

Remarks:

1 ZERO-SETTING DEVICE (continued)

1.4 Zero offset interlock (3.8.3, A.6.8)

Method of zero-setting:

☐	Non-automatic
☐	Semi-automatic
☐	Automatic operation

Positive offset:

Load applied after zeroing:		
Automatic operation	inhibited	
	Not inhibited	

Negative offset:

Load removed after zeroing:		
Automatic operation	inhibited	
	Not inhibited	

☐ Passed ☐ Failed

Remarks:

2 WARM-UP TIME (4.2.5, A.5.3)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
		Time:			hh:mm:ss
		Bar. pres			hPa

Control scale interval, *d*: .....
Resolution during test (smaller than *d*): .....

Duration of disconnection before test: ..... hours

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation [2]

$E = I + ½\ d - \Delta L - L$
E_0 = error calculated prior to each measurement at zero or near zero (unloaded)
E_L = error calculated at load (loaded)

	Time (*)	Load L	Indication I	Add. load ΔL	Error	$E_L - E_0$
Unloaded	0 min				E_{0I} =	
Loaded					E_L =	
Unloaded	5 min				E_0 =	
Loaded					E_L =	
Unloaded	15 min				E_0 =	
Loaded					E_L =	
Unloaded	30 min				E_0 =	
Loaded					E_L =	

(*) Counted from the moment an indication has first appeared.

		Error	MPE	R 107-1 Clause
Check if:	a)	Initial zero-setting error, E_{0I}	$\leq 0.25\ d_t$	A.5.4
	b)	Maximum value of error unloaded, E_0	$\leq 0.25\ d_t$	
	c)	Maximum value of zero variation, $E_0 - E_{0I}$	$\leq 0.25\ d_t \times P_i$	
	d)	Maximum value of error loaded, $E_L - E_0$	$\leq 0.25\ d_t \times P_i$	

☐ Passed ☐ Failed

Remarks:

[2] In operation only if zero operates as part of every automatic weighing cycle

3 STABILITY OF EQUILIBRIUM FOR STATIC WEIGHING (3.2.10, A.6.1)

Deleted: 11

Application no: .....
Type designation: .....
Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

Control scale interval, *d*: .....
Resolution during test (smaller than *d*): .....

In the case of printing or data storage

Load = ☐

Printing or data storage			
Number	First recorded or printed value after manual disturbance and command	Reading during 5 seconds after print-out or storage	
		Minimum	Maximum
1			
2			
3			
4			
5			

Check separately for each of the 5 tests if only two adjacent figures appear, one being the printed value

In the case of zero-setting

$E = I + ½\ d - \Delta L - L$ L = zero or near zero

Zero-setting				
Number	Load L	Indication I	Add. load ΔL	Error E
1				
2				
3				
4				
5				

Check the accuracy according to A.5.4.3 for zero-setting.

☐ Passed ☐ Failed

Remarks:

4 INFLUENCE FACTORS (2.7, A.7.3)

4.1 Static temperatures (2.7.1.1, A.7.3.1)

4.1.1 Reference of 20 °C

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
		Time:			hh:mm:ss
		Bar. pres			hPa

Control scale interval, d: .....

Totalization scale interval, d_t: .....

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test	At end of test	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks:

4.1.2 Static temperatures, specified high of:,……°C

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add load ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test	At end of test	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_i = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.1.3 Static temperatures, specified low of: ……..°C

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

Formatted Table

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test	At end of test	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.1.4 Static temperatures, 5 °C (if applicable)

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test	At end of test	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.1.5 Static temperatures, reference of 20 °C

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E = I + ½\ d - \Delta L - L$, $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test	At end of test	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_i = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.2 Temperature effect on no-load indication (2.7.1.2, A.7.3.2)

Application no: .....

Type designation: .....

Observer: .....

Control scale interval, *d*: .....

Totalization scale interval, d_t: .....

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

$P = I + ½\ d - \Delta L$

Report Page [3]	Date	Time	Temp (°C)	Zero indication *I*	Add. load Δ*L*	*P*	Δ*P*	ΔTemp	Zero-change per ... °C

Δ*P* = difference of *P* for two consecutive tests at different temperatures
ΔTemp = difference of temperature for two consecutive tests at different temperatures

Check if the zero change per 5 °C is smaller than *d*.

☐ Passed ☐ Failed

Remarks:

[3] Give the report page of the relevant weighing test where weighing tests and temperature effect on no-load indication test are conducted together.

4.3 Damp heat, steady state (non-condensing) (4.2.3, A.7.3.3)

4.3.1 Reference temperature of 20 °C at 50 % humidity

			At start	After 3 h	At end	
Application no:	.....	Temp.:				°C
Type designation:	.....	Rel. h:				%
Observer:	.....	Date:				yyyy-mm-dd
Scale interval, *d*:	.....	Time:				hh:mm:ss
Totalization scale interval, d_t:		Bar. pres				hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, *L*	Indication, *I*		Add. load, Δ*L*		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test ( )	At end of test ( )	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.3.2 Damp heat, steady state, upper limit temperature of:…… °C and 85 % humidity

	At start	After 3 h	At end	
Temp.:				°C
Rel. h:				%
Date:				yyyy-mm-dd
Time:				hh:mm:ss
Bar. pres				hPa

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test ( )	At end of test ( )	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.3.3 Damp heat, steady state, reference temperature of 20 °C and 50 % humidity

	At start	After 3 h	At end	
Temp.:				°C
Rel. h:				%
Date:				yyyy-mm-dd
Time:				hh:mm:ss
Bar. pres				hPa

$E = I + ½\ d - \Delta L - L$ $E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Load, L	Indication, I		Add. load, ΔL		Error		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Totalization indication		
At start of test ( )	At end of test ( )	Max deviation observed (except for non-recordable transients)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$

☐ Passed ☐ Failed

Remarks

4.4 Voltage supply variations test (2.7.2, A.7.3)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

☐ AC mains supply voltage, A.7.3.4

☐ DC mains voltage, A.7.3.5

☐ Battery voltage supply (DC), A.7.3.6

☐ 12 V or 24 V road vehicle battery power supply, A.7.3.7

Deleted: - external or plug-in voltage (AC or DC), including rechargeable battery voltage supply during operation of the instrument

Deleted: including rechargeable battery voltage supply not possible during the operation

Supply voltage[4]: U_{nom} = ☐ V U_{min} = ☐ V U_{max} = ☐ V

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

[4]a) Calculate lower and upper limits of applied voltages according to 2.7.2. In case a voltage-range (U_{min} / U_{max}) is marked, use the average value as reference value.

b) For road vehicle battery, U_{nom} of the vehicle's electrical system is usually 12 V or 24 V. However, the practical voltage at the battery-terminals of a road vehicle can vary considerably.

4.4.1 Voltage variations test (continued)

Category of power supply (if an instrument has more than one power supply): .....

$E = I + ½\ d - \Delta L - L$
$E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Voltage conditions	U (V)	Load, L	Indication, I	Add. load, ΔL	Error	Corrected error, E_c
U_{nom}				(*)		
Lower limit						
Upper limit						

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Voltage conditions	U (V)	Totalization indication		
		At start of test	At end of test	Max deviation observed (except for non-recordable transients)
U_{nom}				
Lower limit				
Upper limit				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Voltage conditions	U (V)	Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_i = T_a - T_b$	Error $T_c - T_i$
U_{nom}							
Lower limit							
Upper limit							

☐ Passed ☐ Failed

Remarks

4.4.2 Voltage variations test (continued)

Category of power supply (if an instrument has more than one power supply): .....

$E = I + ½\ d - \Delta L - L$
$E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Voltage conditions	U (V)	Load, L	Indication, I	Add. load, ΔL	Error	Corrected error E_c
U_{nom}				(*)		
Lower limit						
Upper limit						

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Voltage conditions	U (V)	Totalization indication		
		At start of test	At end of test	Max deviation observed (except for non-recordable transients)
U_{nom}				
Lower limit				
Upper limit				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Voltage conditions	U (V)	Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$
U_{nom}							
Lower limit							
Upper limit							

☐ Passed ☐ Failed

Remarks

4.4.3 Voltage variations test (continued)

Category of power supply (if an instrument has more than one power supply): .....

$E = I + ½\ d - \Delta L - L$
$E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Voltage conditions	U (V)	Load, L	Indication, I	Add. load, ΔL	Error	Corrected error, E_c
U_{nom}				(*)		
Lower limit						
Upper limit						

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Voltage conditions	U (V)	Totalization indication		
		At start of test	At end of test	Max deviation observed (except for non-recordable transients)
U_{nom}				
Lower limit				
Upper limit				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Voltage conditions	U (V)	Static load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Error $T_c - T_i$
U_{nom}							
Lower limit							
Upper limit							

☐ Passed ☐ Failed

Remarks

5 DISTURBANCES (4.1.2, A.7.4)

5.1 AC mains voltage dips and short interruptions (A.7.4.1)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Formatted Table

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Supply voltage[5]: U_{nom} = ☐ V U_{min} = ☐ V U_{max} = ☐ V

Pre-test information

Disturbance parameters			
Amplitude % of U_{nom}	Duration cycles	Number of disturbances	Repetition interval (s)
0 %	0.5	10	
0 %	1	10	
40 %	10	10	
70 %	25	10	
80 %	250	10	
0 %	250	10	

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Disturbance	Result			
Amplitude % of U_{nom} (other pre-test information)	Load	Indication I	Significant fault (> 1 d_t) No	Yes (remarks)
without disturbance				
0 %				
0 %				
40 %				
70 %				
80 %				
0 %				

[5]Calculate lower and upper limits of applied voltages according to 2.7.2. In case a voltage-range (U_{min} / U_{max}) is marked, use the average value as reference value.

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Disturbance	Result			
Amplitude % of U_{nom} (other pre-test information)	Totalization indication		Significant fault (> 1 d_t)	
	At start of test	At end of test	No	Yes (remarks)
without disturbance				
0 %				
0 %				
40 %				
70 %				
80 %				
0 %				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Disturbance	Result						
Amplitude % of U_{nom} (other pre-test information)	Load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Significant fault ($T_c - T_I$) or detection and reaction	
						No	Yes (remarks)
without disturbance							
0 %							
0 %							
40 %							
70 %							
80 %							
0 %							

☐ Passed ☐ Failed

Remarks:

5.2 Bursts (transients) on mains voltage lines and on signal and communication lines (A.7.4.2)

5.2.1 Mains voltage lines

Deleted: power

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Mains voltage lines: test voltage 1.0 kV (peak), duration of the test > 1 minute at each amplitude and polarity

Deleted: power

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Connection	Polarity	Result			
		Load	Indication I	Significant fault (> 1 d_t)	
				No	Yes (remarks)
without disturbance					
Live ↓ ground	pos				
	neg				
without disturbance					
Neutral ↓ ground	pos				
	neg				
without disturbance					
Protective earth ↓ ground	pos				
	neg				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Connection	Polarity	Result			
		Totalization indication		Significant fault (> 1 d_t)	
		At start of test	At end of test	No	Yes (remarks)
without disturbance					
Live ↓ ground	pos				
	neg				
without disturbance					
Neutral ↓ ground	pos				
	neg				
without disturbance					
Protective earth ↓ ground	pos				
	neg				

5.2.1 Mains voltage lines (continued)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Connection	Polarity	Result						
		Load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Significant fault ($T_c - T_I$)	
							No	Yes (remarks)
without disturbance								
Live ↓ ground	pos							
	neg							
without disturbance								
Neutral ↓ ground	pos							
	neg							
without disturbance								
Protective earth ↓ ground	pos							
	neg							

☐ Passed ☐ Failed

Remarks:

5.2.2 Signal and communication lines

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Signal and communication lines: test voltage 0.5 kV (peak), duration of the test > 1 minute at each amplitude and polarity

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Cable / interface	Polarity	Result			
		Load	Indication *I*	Significant fault (> 1 d_t)	
				No	Yes (remarks)
without disturbance					
C/1,1	pos				
	neg				
without disturbance					
C/1,2	pos				
	neg				
without disturbance					
C/1,3	pos				
	neg				
without disturbance					
C/1,4	pos				
	neg				
without disturbance					
C/1,5	pos				
	neg				
without disturbance					
C/1,6	pos				
	neg				

Note 1: Explain or make a sketch indicating where the clamp is located on the cable; if necessary, add additional page.

Note 2: The cell references C/1,1 to C/1,6 should be used to cross-reference the cable or interface between Tables A and B.

5.2.2 Signal and communication lines (continued)

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Cable/Interface	Polarity	Result			
		At start of test	At end of test	Significant fault (> 1 d_t) No	Yes (remarks)
without disturbance					
C/1,1	pos				
	neg				
without disturbance					
C/1,2	pos				
	neg				
without disturbance					
C/1,3	pos				
	neg				
without disturbance					
C/1,4	pos				
	neg				
without disturbance					
C/1,5	pos				
	neg				
without disturbance					
C/1,6	pos				
	neg				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Cable/Interface	Polarity	Result						
		Load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_i = T_a - T_b$	Significant fault ($T_c - T_i$) No	Yes (remarks)
without disturbance								
C/1,1	pos							
	neg							
without disturbance								
C/1,2	pos							
	neg							
without disturbance								
C/1,3	pos							
	neg							
without disturbance								
C/1,4	pos							
	neg							
without disturbance								
C/1,5	pos							
	neg							
without disturbance								
C/1,6	pos							
	neg							

☐ Passed ☐ Failed

Remarks:

5.3 Electrical surges on mains voltage lines and on I/O signal and communication lines (if any) (A.7.4.3)

Deleted: power

5.3.1 Mains voltage lines

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Mains voltage lines: test voltage 1.0 kV, duration of the test > 1 minute at each amplitude and polarity

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Connection	Polarity	Result			
		Load	Indication I	Significant fault (> 1 d_t)	
				No	Yes (remarks)
without disturbance					
Live ↓ ground	pos				
	neg				
without disturbance					
Neutral ↓ ground	pos				
	neg				
without disturbance					
Protective earth ↓ ground	pos				
	neg				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Connection	Polarity	Result			
		Totalization indication		Significant fault (> 1 d_t)	
		At start of test	At end of test	No	Yes (remarks)
without disturbance					
Live ↓ ground	pos				
	neg				
without disturbance					
Neutral ↓ ground	pos				
	neg				
without disturbance					
Protective earth ↓ ground	pos				
	neg				

5.3.1 Mains voltage lines (continued)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Connection	Polarity	Result						
		Load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_I = T_a - T_b$	Significant fault ($T_c - T_I$)	
							No	Yes (remarks)
without disturbance								
Live ↓ ground	pos							
	neg							
without disturbance								
Neutral ↓ ground	pos							
	neg							
without disturbance								
Protective earth ↓ ground	pos							
	neg							

☐ Passed ☐ Failed

Remarks (including additional test set-up information):

5.3 Electrical surges on mains voltage lines and on I/O signal and communication lines (if any) **(A.7.4.3)**

5.3.2 Electrical surges on I/O signal and communication lines (if any)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

I/O signal and communication lines (if any): test voltage 0.5 kV, duration of the test 1 minute at each amplitude and polarity

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Cable/Interface	Polarity	Result			
		Load	Indication *I*	Significant fault (> 1 d_t) No	Yes (remarks)
without disturbance					
C/1,1	pos				
	neg				
without disturbance					
C/1,2	pos				
	neg				
without disturbance					
C/1,3	pos				
	neg				
without disturbance					
C/1,4	pos				
	neg				
without disturbance					
C/1,5	pos				
	neg				
without disturbance					
C/1,6	pos				
	neg				

Note 1: Explain or make a sketch indicating where the clamp is located on the cable; if necessary, add additional page.

Note 2: The cell references C/1,1 to C/1,6 should be used to cross-reference the cable or interface between Tables A and B.

5.3.2 Electrical surges on I/O signal and communication lines (if any) **(continued)**

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Cable/Interface	Polarity	Result			
		At start of test	At end of test	Significant fault (> 1 d_t) No	Significant fault (> 1 d_t) Yes (remarks)
without disturbance					
C/1,1	pos				
	neg				
without disturbance					
C/1,2	pos				
	neg				
without disturbance					
C/1,3	pos				
	neg				
without disturbance					
C/1,4	pos				
	neg				
without disturbance					
C/1,5	pos				
	neg				
without disturbance					
C/1,6	pos				
	neg				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Cable/Interface	Polarity	Result						
		Load	Calculated change in totalization T_c	Totalization before adding load T_b	Totalization after adding load T_a	Indicated change in totalization $T_i = T_a - T_b$	Significant fault ($T_c - T_i$) No	Significant fault ($T_c - T_i$) Yes (remarks)
without disturbance								
C/1,1	pos							
	neg							
without disturbance								
C/1,2	pos							
	neg							
without disturbance								
C/1,3	pos							
	neg							
without disturbance								
C/1,4	pos							
	neg							
without disturbance								
C/1,5	pos							
	neg							
without disturbance								
C/1,6	pos							
	neg							

☐ Passed ☐ Failed

Remarks:

5.4 Electrostatic discharge test (A.7.4.4)

5.4.1 Direct application

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

☐ Contact discharges ☐ Paint penetration

☐ Air discharges Polarity [6]: ☐ pos ☐ neg

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Discharges			Result			
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Load	Indication I	Significant fault (> 1 d_t)	
					No	Yes (remarks)
without disturbance						
2						
4						
6						
8 (air discharges)						

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Discharges			Result			
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	At start of test	t end of test	Significant fault (> 1 d_t)	
					No	Yes (remarks)
without disturbance						
2						
4						
6						
8 (air discharges)						

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Discharges			Result						
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Load	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	Significant fault ($T_c - T_I$)	
								No	Yes (remarks)
without disturbance									
2									
4									
6									
8 (air discharges)									

Note: If the EUT fails, the test point at which this occurs shall be recorded.

☐ Passed ☐ Failed

Remarks:

[6] IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity.

5.4.2 Indirect application (contact discharges only)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Automatic zero-setting device is:

Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

Polarity [7]: ☐ pos ☐ neg

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Horizontal coupling plane

Discharges			Result			
Test Voltage (kV)	Number of discharges ≥ 10	Repetition Interval (s)	Load	Indication I	Significant fault (> 1 d_t) No	Yes (remarks)
without disturbance						
2						
4						
6						

Vertical coupling plane

Discharges			Result			
Test Voltage (kV)	Number of discharges ≥ 10	Repetition Interval (s)	Load	Indication I	Significant fault (> 1 d_t) No	Yes (remarks)
without disturbance						
2						
4						
6						

[7] IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity.

5.4.2 Indirect application – contact discharges only (continued)

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Horizontal coupling plane

Discharges			Result			
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Totalization		Significant fault (> 1 d_t)	
			At start of test	At end of test	No	Yes (remarks)
without disturbance						
2						
4						
6						

Vertical coupling plane

Discharges			Result			
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Totalization		Significant fault (> 1 d_t)	
			At start of test	At end of test	No	Yes (remarks)
without disturbance						
2						
4						
6						

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Horizontal coupling plane

Discharges			Result						
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Totalization					Significant fault ($T_c - T_I$)	
			Load ( )	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
without disturbance									
2									
4									
6									

Vertical coupling plane

Discharges			Result						
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Totalization					Significant fault (T_c - T_I)	
			Load ( )	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
without disturbance									
2									
4									
6									

Note: If the EUT fails, the test point at which this occurs shall be recorded.

☐ Passed ☐ Failed

Remarks:

5.4 Electrostatic discharge test (A.7.4.4)

Specification of test points of EUT (direct application), e.g. by photos or sketches

a) Direct application

Contact discharges:

Air discharges:

b) Indirect application

5.5 Immunity to electromagnetic fields (A.7.4.5)

5.5.1 Immunity to radiated electromagnetic fields (A.7.4.5.1)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Rate of sweep: ☐

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Disturbances				Result			
Antenna	Frequency range (MHz)	Polarization	Facing EUT	Load	Indication I		Significant fault (> 1 d_t)
						No	Yes (remarks)
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
		Horizontal	Front				
			Right				
			Left				
			Rear				
		Vertical	Front				
			Right				
			Left				
			Rear				
		Horizontal	Front				
			Right				
			Left				
			Rear				

Test severity;

Frequency range: 80 MHz [(1)] to 2000 MHz
RF amplitude (50 ohms): 10 V/m
Modulation: 80 % AM, 1 kHz, sine wave

[(1)] Lower limit is 26 MHz if the test according to A.7.4.5.2 cannot be applied due to lack of mains or I/O ports.

Note: If the EUT fails, the frequency and field strength at which this occurs must be recorded.

☐ Passed ☐ Failed

Remarks:

5.5.1 Immunity to radiated electromagnetic fields (continued)

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Disturbances				Result			
Antenna	Frequency range (MHz)	Polarization	Facing EUT	Totalization indication			Significant fault ($> 1\ d_t$)
				At start of test	At end of test	No	Yes (remarks)
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Horizontal	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Horizontal	Front				
			Right				
			Left				
			Rear				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Disturbances				Result						
Antenna	Frequency range (MHz)	Polarization	Facing EUT	Totalization						Significant fault ($T_c - T_I$)
				Load	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
without disturbance										
		Vertical	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Horizontal	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Vertical	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Horizontal	Front							
			Right							
			Left							
			Rear							

☐ Passed ☐ Failed

Remarks:

5.5.2 Immunity to conducted electromagnetic fields (A.7.4.5.2)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

Rate of sweep: ☐

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Disturbances				Result			
Antenna	Frequency range (MHz)	Polarization	Level (volts e.m.f)	Load	Indication I		Significant fault (> 1 d_t)
						No	Yes (remarks)
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
		Horizontal	Front				
			Right				
			Left				
			Rear				
		Vertical	Front				
			Right				
			Left				
			Rear				
		Horizontal	Front				
			Right				
			Left				
			Rear				

Test severity;

Frequency range: 0.15 MHz - 80 MHz
RF amplitude (50 ohms): 10 V (e.m.f.)
Modulation: 80 % AM, 1 kHz, sine wave

Note: If EUT fails, the frequency and field strength at which this occurs must be recorded.

☐ Passed ☐ Failed

Remarks:

5.5.2 Immunity to conducted electromagnetic fields (continued)

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Disturbances				Result			
Antenna	Frequency range (MHz)	Polarization	Level (volts e.m.f)	Totalization indication			Significant fault (> 1 d_t)
				At start of test	At end of test	No	Yes (remarks)
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Horizontal	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Vertical	Front				
			Right				
			Left				
			Rear				
without disturbance							
		Horizontal	Front				
			Right				
			Left				
			Rear				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Disturbances				Result						
Antenna	Frequency range (MHz)	Polarization	Level (volts e.m.f)	Totalization						Significant fault ($T_c - T_I$)
				Load	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
without disturbance										
		Vertical	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Horizontal	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Vertical	Front							
			Right							
			Left							
			Rear							
without disturbance										
		Horizontal	Front							
			Right							
			Left							
			Rear							

☐ Passed ☐ Failed

Remarks:

5.5 Immunity to electromagnetic fields (A.7.4.5)

Include a description of the set-up of EUT, e.g. by photos or sketches.

Radiated:

Conducted:

5.6 Electrical transient conduction for instruments powered by road vehicle batteries (A.7.4.6)

5.6.1 Conduction along supply lines of 12 V or 24 V road vehicle batteries (A.7.4.6.1)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

☐ 12 V battery voltage ☐ 24 V battery voltage

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result			
			Load	Indication I	Significant fault (> 1 d_t)	
					No	Yes (remarks) [8]
12 V	2a	+ 50				
	2b[9]	+ 10				
	3a	– 150				
	3b	+ 100				
	4	– 7				
24 V	2a	+ 50				
	2b	+ 20				
	3a	– 200				
	3b	+ 200				
	4	– 16				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result			
			Totalization indication		Significant fault (> 1 d_t)	
			At start of test	At end of test	No	Yes (remarks)
12 V	2a	+ 50				
	2b	+ 10				
	3a	– 150				
	3b	+ 100				
	4	– 7				
24 V	2a	+ 50				
	2b	+ 20				
	3a	– 200				
	3b	+ 200				
	4	– 16				

[8] Functional status of the instrument during and after exposure to test pulses

[9] Test pulse 2b is only applicable if the instrument is connected to the battery via the main (ignition) switch of the car, i.e. if the manufacturer has not specified that the instrument is to be connected directly (or by its own main switch) to the battery.

5.6.1 Conduction along supply lines of external 12 V or 24 V road vehicle batteries (continued)

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result						
			Totalization indication					Significant fault ($T_c - T_I$)	
			Load	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
12 V	2a	+ 50							
	2b	+ 10							
	3a	– 150							
	3b	+ 100							
	4	– 7							
24 V	2a	+ 50							
	2b	+ 20							
	3a	– 200							
	3b	+ 200							
	4	– 16							

☐ Passed ☐ Failed

Remarks:

5.6 Electrical transient conduction for instruments powered by road vehicle batteries (A.7.4.6)

5.6.2 Electrical transient conduction via lines other supply lines, for external 12 V or 24 V road vehicle batteries (A.7.4.6.2)

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:		Time:			hh:mm:ss
Totalization scale interval, d_t:		Bar. pres			hPa

☐ 12 V battery voltage ☐ 24 V battery voltage

Result sheet A - Used in conjunction with result sheet B when the integral control device is used to determine the error

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result			
			Load	Indication I	Significant fault (> 1 d_t)	
					No	Yes (remarks) [10]
12 V	a	– 60 V				
	b	+ 40 V				
24 V	a	– 80 V				
	b	+ 80 V				

Result sheet B - Used in conjunction with result sheet A to record the retained totalization

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result			
			Totalization indication		Significant fault (> 1 d_t)	
			At start of test	At end of test	No	Yes (remarks)
12 V	a	– 60 V				
	b	+ 40 V				
24 V	a	– 80 V				
	b	+ 80 V				

Result sheet C - Used where the total is being increased by continually adding the result of weighing a static load and the totalization indicator is used to determine the error

Voltage conditions U_{nom}	Test pulse	Pulse voltage U_s	Result						
			Totalization indication					Significant fault ($T_c - T_I$)	
			Load	Calculated change T_c	Before adding load T_b	After adding load T_a	Indicated change $T_I = T_a - T_b$	No	Yes (remarks)
12 V	a	– 60 V							
	b	+ 40 V							
24 V	a	– 80 V							
	b	+ 80 V							

☐ Passed ☐ Failed

Remarks:

[10] Functional status of the instrument during and after exposure to test pulses

6 SPAN STABILITY (6.7.3, A.8)

Application no: .....

Type designation: .....

Control scale interval, *d*: .....

Resolution during test (smaller than *d*): .....

Automatic zero-setting and zero-tracking device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range

Zero load = ☐ Test load = ☐

Automatic span adjustment device:

☐ Non-existent ☐ In operation

Measurement no 1: Initial measurement

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

No	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value[11]
1								
2								
3								
4								
5								

Average error = average $(E_L - E_0)$ ☐

$(E_L - E_0)_{max} - (E_L - E_0)_{min}$ = ☐

0.1 *d* = ☐

If $\left|(E_L - E_0)_{max} - (E_L - E_0)_{min}\right| \leq 0.1\ d$, one loading and reading will be sufficient for each of the subsequent measurements: if not, five loadings and readings shall be performed at each measurement.

Remarks:

[11] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

6 Span stability (continued)

For each of the subsequent measurements (at least 7), indicate on the "conditions of the measurement", as appropriate, if the measurement has been performed after:

☐	the temperature test, the EUT having been stabilized for at least 16 h
☐	the damp heat test, the EUT having been stabilized for at least 16 h
☐	the EUT has been disconnected from the mains for at least 8 h and then stabilized for at least 5 h
☐	any change in the test location
☐	any other specific condition: ……...

Measurement no 2:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value [12]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average (E_L - E_0) ☐

Remarks:

[12] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

6 Span stability (continued)

Measurement no 3:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value [13]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average (E_L - E_0)

Remarks:

Measurement no 4:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$)

Remarks:

[13] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

6 Span stability (continued)

Measurement no 5:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value [14]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$) ☐

Remarks:

Measurement no 6:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$) ☐

Remarks:

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[14] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

6 Span stability (continued)

Measurement no 7:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value [15]
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average ($E_L - E_0$)

Remarks:

Measurement no 8:

Application no: .....

Type designation: .....

Observer: .....

	At start	At end	
Temp.:			°C
Rel. h:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss
Bar. pres			hPa

$E_0 = I_0 + ½\ d - \Delta L_0 - L_0$ $E_L = I_L + ½\ d - \Delta L - L$

	Indication of zero, I_0	Add. load ΔL_0	E_0	Indication of load, I_L	Add. load ΔL	E_L	$E_L - E_0$	Corrected value
1								
2								
3								
4								
5								

If five loadings and readings have been performed: Average error = average (E_L - E_0)

Remarks:

[15] When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

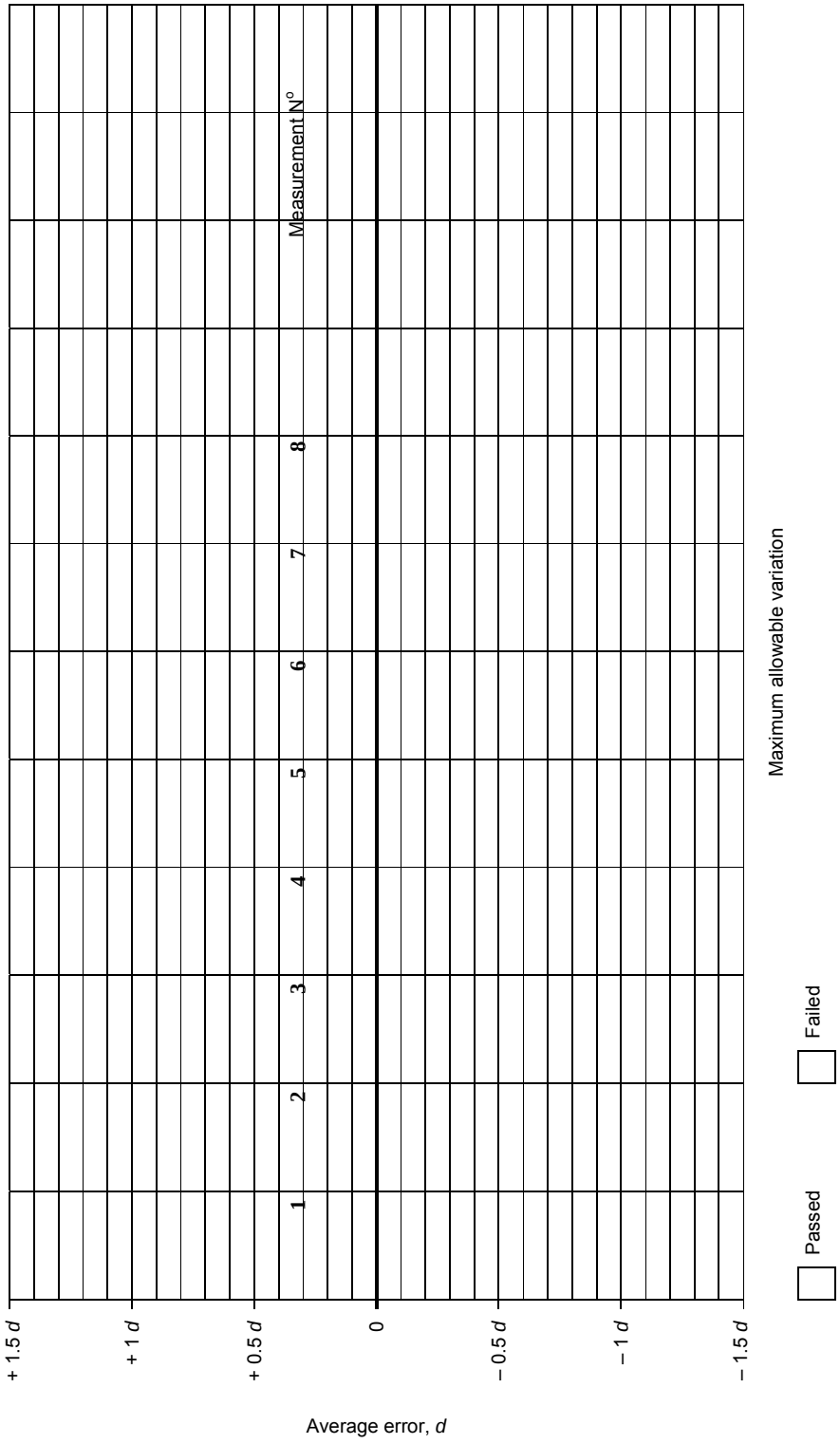
6 Span stability (continued)

5 SPAN STABILITY (A.8)

Application no: .....

Type designation: .....

Plot on the diagram the indication of temperature test (T), damp heat test (D) and disconnections from the mains power supply (P)



7 Material tests (6.1, A.5.1)

7.1 Material testing (separate verification method) (6.2.1, A.5.1.1, A.9.2.3)

Test 1

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

Parameter	Results
Number of loads	
Indicated total at start, T_S	
Indicated total at end, T_F	
$I = T_F - T_S$	
Control instrument indication for total load, L	
Error = $\frac{I - L}{L} \times 100$ %	

Remarks:

7.1 Material testing (separate verification method) (continued)

Test 2

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

Parameter	Results
Number of loads	
Indicated total at start, T_S	
Indicated total at end, T_F	
$I = T_F - T_S$	
Control instrument indication for total load, L	
Error = $\frac{I - L}{L} \times 100\%$	

Remarks

7.1 Material testing (separate verification method) (continued)

Test 3

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

Parameter	Results
Number of loads	
Indicated total at start, T_S	
Indicated total at end, T_F	
$I = T_F - T_S$	
Control instrument indication for total load, L	
Error = $\frac{I - L}{L} \times 100\%$	

Remarks

7.1 Material testing (separate verification method) (continued)

Additional test

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

Parameter	Results
Number of loads	
Indicated total at start, T_S	
Indicated total at end, T_F	
$I = T_F - T_S$	
Control instrument indication for total load, L	
Error = $\frac{I - L}{L} \times 100\%$	

Note: Reproduce this page for additional tests as necessary.

Remarks

7 Material tests (continued)

7.2 Integral verification weighing test performance (A.5.1.2.1, A.5.1.2.4)

Note: This test is only part of the material tests when the integral weighing method is used for the tests. It is then conducted prior to the actual material test.

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Resolution during test	.....	Time:			hh:mm:ss
(smaller than *d*):	.....	Bar. pres			hPa

Automatic zero-setting device is:

☐ Non-existent ☐ Not in operation ☐ Out of working range ☐ In operation

$E = I + ½\ d - \Delta L - L$
$E_c = E - E_o$ with E_o = error calculated at or near zero (*)

Load, *L*	Indication, *I*		Add. load, Δ*L*		Error, *E*		Corrected error, E_c		MPE
	↓	↑	↓	↑	↓	↑	↓	↑	
(*)					(*)				

☐ Passed ☐ Failed

Remarks:

7 Material tests (continued)

7.2.1 Material tests (integral verification method) (6.2.2, A.5.1.2, A.9.2.1)

Test 1

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, d:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

	Hopper contents static weighing							Indicated total
	Indication I	Add. load, ΔL	Indication prior to rounding $P = I + ½\,d - \Delta L$	Calculated error, E	Corrected indication $I_C = P - E$	Load indication $L = I_{CL} - I_{CD}$		At start, T_S
Loaded					I_{CL}			
Discharged					I_{CD}			
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								At end, T_F
	$\text{Error} = \frac{T_F - T_S - \Sigma_L}{\Sigma_L} \times 100\ \%$					Σ_L (Total load)		
	Error =_____ %							

Remarks:

7.2.1 Material tests (integral verification method) (continued)

Test 2

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

	Hopper contents static weighing							Indicated total
	Indication I	Add. load, ΔL	Indication prior to rounding $P = I + ½\,d - \Delta L$	Calculated error, E	Corrected indication $I_C = P - E$	Load indication $L = I_{CL} - I_{CD}$		At start, T_S
Loaded					I_{CL}			
Discharged					I_{CD}			
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								At end, T_F
	Error = $\frac{T_F - T_S - \Sigma L}{\Sigma L} \times 100\ \%$ Error =_____ %					ΣL (Total load)		

Remarks:

7.2.1 Material tests (integral verification method) (continued)

Test 3

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

	Hopper contents static weighing							Indicated total
	Indication *I*	Add. load, Δ*L*	Indication prior to rounding $P = I + ½\,d - \Delta L$	Calculated error, *E*	Corrected indication $I_C = P - E$	Load indication $L = I_{CL} - I_{CD}$		At start, T_S
Loaded					I_{CL}			
Discharged					I_{CD}			
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								At end, T_F
	$\text{Error} = \frac{T_F - T_S - \Sigma L}{\Sigma L} \times 100\ \%$ Error =_____ %					ΣL (Total load)		

Remarks:

7.2.1 Material tests (integral verification method) (continued)

Test 4

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

	Hopper contents static weighing							Indicated total
	Indication *I*	Add. load, Δ*L*	Indication prior to rounding $P = I + ½\,d - \Delta L$	Calculated error, *E*	Corrected indication $I_C = P - E$	Load indication $L = I_{CL} - I_{CD}$		At start, T_S
Loaded					I_{CL}			
Discharged					I_{CD}			
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								At end, T_F
	$\text{Error} = \frac{T_F - T_S - \Sigma L}{\Sigma L} \times 100\ \%$ Error =_____ %					ΣL (Total load)		

Remarks:

7.2.1 Material tests (integral verification method) (continued)

Test 5

			At start	At end	
Application no:	.....	Temp.:			°C
Type designation:	.....	Rel. h:			%
Observer:	.....	Date:			yyyy-mm-dd
Control scale interval, *d*:	.....	Time:			hh:mm:ss
Totalization scale interval, d_t:	.....	Bar. pres			hPa
Material:	.....				
Condition of material:	.....				
Nominal load:	.....				

	Hopper contents static weighing							Indicated total
	Indication *I*	Add load, Δ*L*	Indication prior to rounding $P = I + ½\,d - \Delta L$	Calculated error, *E*	Corrected indication $I_C = P - E$	Load indication $L = I_{CL} - I_{CD}$		At start, T_S
Loaded					I_{CL}			
Discharged					I_{CD}			
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								
Loaded								
Discharged								At end T_F
	$\text{Error} = \frac{T_F - T_S - \Sigma L}{\Sigma L} \times 100\ \%$ Error =_____ %					ΣL (Total load)		

☐ Passed ☐ Failed

Remarks:

8 EXAMINATION OF THE CONSTRUCTION OF THE INSTRUMENT

Use this page to indicate any description or information pertaining to the instrument, additional to that already contained in this report and in the accompanying national type approval or OIML Certificate. This may include a picture of the complete instrument, a description of its main components, and any remark which could be useful for authorities responsible for the initial or subsequent verifications of individual instruments built according to the type. It may also include references to the manufacturer description.

Description:

Remarks:

9 CHECKLIST

This checklist is intended to serve as a summary of the results of examinations to be performed and not as a procedure. The items on this checklist are provided to recall the requirements specified in R 107-1 and they shall not be considered as a substitution for these requirements.

For non-mandatory devices, the checklist provides space to indicate whether or not the device exists and, if appropriate, its type. A cross in the box for “present” indicates that the device exists and that it complies with the definition given in the terminology; when indicating that a device is “not present”, also check the boxes to indicate that the tests are not applicable (see p. 5).

If appropriate, the results stated in this checklist may be supplemented by remarks given on additional pages.

9.1 CHECKLIST

Application no: ..... Type designation: .....

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
		Metrological requirements			
2.2.1	A.5.1	**Maximum permissible errors**			
		Maximum permissible errors for automatic weighing for each class for loads not less than Σ_{min}: – do not exceed values in Table 1 rounded to nearest d_t			
2.2.2	A.7	Maximum permissible errors for influence factor tests:			
		– do not exceed values in Table 2,			
		– accuracy of rounding errors at least 0.2 d_t			
2.3	Observe	Form of the scale interval: 1×10^k, 2×10^k or 5×10^k	Note		
2.4	Observe	Totalization scale interval: 0.01 % ≤ d_t ≤ 0.1 % Max	Note		
2.5	Observe	Minimum totalized load: Σ_{min} ≥ Min Σ_{min} ≥ 1000 d_t for class 0.2 or 400 d_t for class 0.5 or 200 d_t for class 1 or 100 d_t for class 2			
2.6	**A.6.2**	**Agreement between multiple indicating devices**			
		For a given load, the difference between the weighing results from any two devices having same scale interval is:			
	Observe	– not greater than the absolute value of the maximum permissible errors for automatic weighing for analogue devices.			
		– zero for digital displaying and printing devices;			
2.7	A.7.3	**Influence factors**			
2.7.1.1	A.7.3.1	Static temperatures			
2.7.1.2		Temperature effect on no-load indication			
2.7.2		Voltage supply:			
	A.7.3.4	AC mains voltage			
	A.7.3.5	DC mains voltage			
	A.7.3.6	Battery power (DC)			
	A.7.3.7	12 V or 24 V road vehicle battery power			
2.8	Observe	Units of measurement: gram (g), kilogram (kg), tonne (t)			
3		**Technical requirements**			
3.1	Observe	Suitability for use: design to suit intended materials and usage, and robust construction to maintain its metrological characteristics			
3.2	Observe	**Security of operation**			
3.2.1		No characteristics likely to facilitate fraudulent use			
3.2.2		Effect of accidental breakdown or maladjustment is evident			
3.2.3		Operation unaffected by incomplete discharge			
3.2.4		Effects of variation in the quantity of the load ≥ Lim is evident			
3.2.5		Inhibition of usage at loads: > Max; < Min;			

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Deleted: AC or DC external or plug-in mains power

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.2.6	Observe	**Use as a nonautomatic weighing instrument:**			
		Complies with the requirements of OIML R 76-1 *Non-automatic weighing instruments*			
3.2.7	A.6.3	**Operational adjustments**			
		Adjustment prevented in automatic mode, except during tests in accordance with 3.2.5 and 6.3 of R 107-1			
3.2.8	Observe	**Controls**			
		Controls come to rest in intended positions and unambiguously marked keys			
3.2.9	Observe	**Dust extraction**			
		Shall not affect measurement			
3.2.10	A.6.1	**Stable equilibrium**			
		Under continuous or temporary disturbance of stable equilibrium:			
		– printed or stored weighing values show no more than two adjacent; with one of them being the final weight value;			
		– for zero operations, correct operation according to 3.8.1 of R 107-1 is achievable			
3.2.11	Observe	**Interlocks**			
		Prevent or indicate operation outside specified working conditions for:			
		minimum operating voltage (2.7.2)			
		maximum safe load (3.2.4)			
		zero-setting (3.8.3)			
		automatic operation (3.2.5)			
3.3	A.6.4	**Securing of components and pre-set controls**			
3.3.1	Observe	Instrument, modules, devices and controls:			
		Fitted with a securing means, or			
		Enclosed;			
		If enclosed, the enclosure is sealed;			
		Seals are easily accessible;			
		Legally relevant parameters protected by hard- or software means;			
		Securing provided on all parts of the measuring system which cannot be materially protected in any other way against operations liable to affect the measurement accuracy			
		National regulations may specify the securing that is needed.			

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.3.2	Observe	**Means of security:**			
		Hardware and/or software means of security to restrict access to authorised persons only;			
		Records of interventions including the date and a means of identifying the authorised person making the intervention (see a) above): – can be memorised, accessed and displayed; – traceability of the interventions is assured for at least the period of time in between periodical verifications depending on national regulations.			
		Records may not be overwritten, and if the storage capacities for records is exhausted, no further intervention shall be possible without breaking a physical seal;			
		Software functions secured against intentional, unintentional and accidental changes in accordance with 3.6 of R 107-1;			
		Transmission of legally relevant data via interfaces secured against intentional, unintentional and accidental changes according to 4.2.6.2 of R 107-1;			
		Securing possibilities available in an instrument shall be such that separate securing of the settings may be possible;			
		Stored measurement data is secured against intentional, unintentional and accidental changes in accordance with 3.5 of R 107-1.			
3.4	A.6.5	**Indication and recording of weighing results**			
		Devices included with the instruments			
	Observe	Principal totalization indicating device	Present [ ]	Not present [ ]	
		Supplementary totalization indicating device	Present [ ]	Not present [ ]	
		Partial totalization indicating device	Present [ ]	Not present [ ]	
		Data storage device	Present [ ]	Not present [ ]	
		Printer	Present [ ]	Not present [ ]	
3.4.1		**Quality of indication**			
	Observe	Reliable, easy and unambiguous under normal conditions			
		Overall inaccuracy of an analogue device < 0.2 d_t			
		The scales, numbering and printing shall permit the figures which form the results to be read by simple juxtaposition			
3.4.2	A.6.5	**Form of the indication**			
3.4.2.1		**Units of mass**			
	Observe	Results contain names and symbols of the units of mass			
		for any one indication, only one unit of mass			
		Units of mass written in small letters (lower case) in accordance with 2.8 of R 107-1.			

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.4.2.2	Observe	**Digital indication**			
		Digital zero indication includes the display of a zero for all places that are displayed to the right of a decimal point and at least one place to the left.			
		When no decimal values are displayed, a zero shall be displayed for each place of the displayed division.			
		Decimal fraction is separated from its integer by a decimal sign (comma or dot) with the indication showing at least one figure to the left of the sign and all figures to the right.			
		Decimal sign on one line with the bottom of the figures (e.g. 0.305 kg) to separate integer and decimal fraction.			
3.4.2.3		**Scale interval**			
	Observe	All devices (except supplementary devices) shall have the same scale interval			
		Form of the scale interval is in accordance with requirements in 2.3 of R 107-1			
		Decimal sign maintains its position in the display where the scale interval is changed automatically.			
3.4.3		**Totalization indicating devices**			
	Observe	Allow reliable, clear and unambiguous reading of the results by simple juxtaposition and bear the symbol of the appropriate unit of mass;			
		Printing is clear and permanent for the intended use. Printed figures are at least 2 mm high.			
		It is not possible to reset the principle totalization device to zero an automatic operation;			
		On interruption of automatic operation, it is not possible to reset the partial totalization indicating device to zero unless the last total indicated before resetting to zero is automatically recorded;			
		Control indicating device is to a higher resolution than that of the principal totalization indicating device.			
		During static weighing in nonautomatic operations, printing is inhibited if the stability criteria in 3.2.10 of R 107-1 are not fulfilled.			
3.4.4	Observe	**Combined indicating devices**			
		Combined indication on demand clearly identified.			
3.4.5		Instruments that tare weigh			
		For instruments used to receive (weigh in), the no-load reference value shall be determined and recorded only at the beginning of each weighing cycle.			
		For instruments used to deliver (weigh out), the no-load reference value shall be determined and recorded only after the gross load reference value for each weighing cycle has been indicated and recorded.			
3.5	Observe	**Data storage device**			
		Memory of the instrument (hard drive),	Present [ ]	Not present [ ]	
		Removable external storage	Present [ ]	Not present [ ]	
		Stored data is adequately protected against intentional and unintentional changes during storage process and contains all relevant information necessary to reconstruct an earlier measurement.			

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.5		**Data storage security**			
		Stored data is secured in accordance with the appropriate requirements in 3.5 of R 107-1;			
		If software realizing the data storage can be transmitted to or downloaded into the instrument these processes shall be secured in accordance with requirements in 3.6 of R 107-1;			
		External storage devices identification and security attributes are automatically verified to ensure integrity and authenticity;			
		Exchangeable storage media for storing measurement data need not be sealed provided that the stored data is secured by a specific checksum or key code			
		Replacement of old data with new data is only possible when the owner of the old data has given authority to overwrite the old data.			
3.6	A.1.1 Observe	**Software**			
		Legally relevant software (T.2.7.7.1) of the instrument is identified by the manufacturer.			
3.6.1	A.1.1	**Software information submitted with software controlled instruments**			
		Description of the legally relevant software;			
		Description of the accuracy of the measuring algorithms (e.g. programming modes);			
		Description of the user interface, menus and dialogues;			
		The unambiguous software identification;			
		Description of the embedded software;			
		Overview of the system hardware, e.g. block diagram, type of computer(s), software source code, etc, if not described in the operating manual;			
		Means of securing software;			
		Operating manual.			
3.6.2		**Security of legally relevant software**			
		a) Appropriate requirements for securing given in 3.3 and 3.6 of R 107-1;			
		b) Assignment of appropriate software identification to legally relevant software, which is adapted in the case of every software change that may affect the functions and accuracy of the instrument;			
		c) Functions performed or initiated via connected interfaces, i.e., transmission of legally relevant software, shall comply with the securing requirements for interfaces in 4.2.6 in R 107-1.			
		d) National regulation may specify the requirements for security of software controlled instruments.			
3.7		**Instruments with control indicating devices**			
		Load receptor shall have the facility to support a quantity of standard weights in accordance with Table 3 of R 107-1.			

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist		Passed	Failed	Remarks
3.8	A.5.4	**Zero-setting devices**				
	Observe	Provided on instruments that not tare-weigh after each discharge				
		The types and modes of zero-setting required on an instrument are specified in accordance with national regulations.		enter in remarks		
	Observe	Zero-setting modes:		Present	Not present	
		Automatic zero-setting		[ ]	[ ]	
		Semi-automatic zero-setting		[ ]	[ ]	
		Non-automatic zero-setting		[ ]	[ ]	
3.8.1	A.5.4.3	**Accuracy of zero-setting:** $\leq 0.25\ d_t$				
3.8.2	Observe	**Maximum effect**				
		Effect of zero-setting device does not alter the maximum weighing capacity				
		Overall effect of:				
		Zero-setting range < 4 % =	%			
		Initial zero-setting < 20 % =	%			
3.8.3	A.6.8.1	**Control of the zero-setting device**				
		Operation of the zero-setting device shall be possible only when the instrument is in stable equilibrium (3.2.10), and				
		Rate of correction of zero-tracking shall not be more than 0.5 *d* per second.				
	Observe	Interlock prevents automatic operation:				
		a) if the zero indication varies by or more than:				
		i) 1 d_t on instruments with an automatic zero-setting device, or				
		ii) 0.5 d_t on instruments with a semi-automatic or non-automatic zero-setting device.				
		b) if the instrument is not zeroed automatically following an automatic weighing cycle.				
		A description of the operation of the automatic zero-setting device (e.g. the maximum programmable time interval) is specified by the manufacturer.				
		The programmable interval specified by the manufacturer is sufficient to maintain zero within 0.5 d_t;				
		Non-automatic or semi-automatic zero-setting device inoperable during automatic operation.				
3.8.4	Observe	**Digital indicating device:**				
		a) provides an indication of when the deviation from zero is not more than 0.25 d_t, or				
		b) automatically maintains a “centre of zero” condition to ± ¼ d_t or less.				

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.9	A.1.4	**Descriptive markings, variable according to national regulation:**			
3.9.1	Observe	**Markings shown in full:**			
		Identification mark or name of the manufacturer;			
		Identification mark or name of the importer (if applicable);			
		Serial number of the instrument;			
		Product description;			
		Control scale interval (if applicable) g or kg or t;			
		Electrical supply voltage (V);			
		Electrical supply frequency, if applicable (Hz);			
		Pneumatic/hydraulic pressure (if applicable) (kPa or bar);			
		software identification (if applicable)			
3.9.2	Observe	**Markings shown in code:**			
		type approval sign;			
		indication of the class of accuracy: 0.2, 0.5, 1 or 2;			
		maximum capacity, Max (g or kg or t);			
		minimum capacity, Min (g or kg or t);			
		minimum totalized load, Σ_{min} (g or kg or t);			
		totalization scale interval, d_t (g or kg or t);			
3.9.3	Observe	**Supplementary markings:**			
		Any additional markings	enter in remarks		
3.9.4	Observe	**Presentation of descriptive markings:**			
		Indelible and of size, shape and clarity that allows easy reading;			
		Shown in accordance with national language or in form of adequate, internationally agreed and published pictograms or signs;			
		Grouped together in a clearly visible place either on a descriptive plate or sticker fixed permanently near the indicating device, or on a non removable part of the instrument itself;			
		In case of a plate or sticker which is not destroyed when removed, a means of securing shall be provided;			
		Shown on a programmable display, and:			
		At least Max, Min and d_t shall be displayed as long as the instrument is switched on;			
		The other marking may be shown on manual commend;			
		Described in the type approval certificate;			
		Markings (device-specific parameters) comply with the securing requirements in 3.3 and 3.6;			

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
3.9.4	Observe	Markings on a data plate for software controlled display include:			
		Max, Min and d_t shown near the display;			
		Type and designation of the instrument;			
		Type approval number or sign;			
		Name or identification mark of the manufacturer;			
		electrical supply voltage (V);			
		electrical supply frequency (Hz);			
		pneumatic/hydraulic pressure, (if applicable) (kPa or bar);			
3.10	**A.1.4**	**Verification marks**			
3.10.1	Observe	**Position of verification marks:**			
		Cannot be removed without damaging the marks			
		Allows easy application of marks			
		Visible without the instrument having to be removed			
3.10.2	Observe	**Mounting**			
		Verification mark support ensures conservation of the marks			
		The type and method of sealing shall be determined by national prescription.			
4		**General requirements**			
4.1.1		Rated operating conditions: errors do not exceed mpe			
4.1.2		**Disturbances**			
		Electronic instruments designed and manufactured so that:			
		Significant faults do not occur, or			
		Significant faults are detected and acted upon			
4.2	A.1.5	**Functional requirements**			
4.2.1	Observe	**Acting upon significant faults:**	Note below		
		Instrument is made inoperative automatically, or			
		Visual or audible indication is provided automatically and continuous until the user takes action or the fault disappears			
		Totalized load information is retained when a significant fault occurs			
4.2.2	Observe	**Indicator display test:** Upon switch-on of displays on which failures become evident, all relevant signs of indicating device are active and non-active for sufficient time to be checked by operator			
4.2.5	A.5.3	**Warm-up time:**			
	Observe	No indication or transmission of weighing results			
		Automatic operation is inhibited			

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
4.2.6	A.7.2.2	**Interfaces**			
		When fitted: Instrument shall continue to function correctly and its metrological functions shall not be influenced.			
4.2.6.1	Observe	Interfaces information submitted with instrument:			
	A.7.2.3	a) list of all commands (e.g. menu items);			
		b) description of the software interface;			
		c) list of all commands together;			
		d) brief description of their meaning and their effect on the functions and data of the instrument;			
		e) other interface description			
4.2.6.2		**Interface security:**			
	Observe	– legally relevant software, measurement data and functions of the instrument are not adversely affected or influenced by other interconnected instruments, or by disturbances acting on the interface.			
		– protective interface protects data against accidental or deliberate interference during the transfer;			
		– hardware and software functions comply with the appropriate securing requirements in 3.3 and 3.6 respectively;			
		– it shall be easily possible to verify the authenticity and integrity of data transmitted to and from the instrument;			
		Other instruments required by national regulation to be connected to the interfaces of an instrument shall be secured to inhibit automatically the operation of the instrument for reasons of the non-presence or improper functioning of the required device.			
4.2.7	A.6.6	**AC mains voltage supply failure:**			
	Observe	Metrological information retained for at least 24 hours			
		Switch-over to emergency power supply shall not cause significant fault			
		External or plug-in (AC or DC) battery voltage supply:			
4.2.8	A.6.7	When battery voltage is below the specified voltage value, the instrument:			
		Continues to function correctly, or			
		Is automatically put out of service			
5		**Type approval**			
5.1.1	A.1.1	Documentation submitted for type approval includes:			
		Metrological characteristics of the instrument			
		Standard set of specifications for the instrument			
		Functional description of the components and devices			
		Drawings, diagrams and general software information explaining the construction and operation			
		Details of fractions P_i (modules tested separately)			
		Indicating devices (3.4.3);			
		Data storage device (3.5);			
		Zero-setting device (3.8);			

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
5.1.1	A.1.1	**Documentation submitted for type approval includes:**			
		Interfaces (types, intended use, immunity to external influences instructions (4.2.6);			
		For software controlled instruments detailed software information (3.6);			
		Description of the stable equilibrium function of the instrument (3.2.11);			
		Drawing or photo of the instrument showing the principle and the location of control marks, securing marks, descriptive and verification marks (3.9, 3.10);			
		Operating instructions, operating manual;			
		Any document or other evidence that the design and construction of the instrument complies with the requirements of the recommendation			
5.1.2.1		General requirements			
		Instruments available for tests as follows:			
		– fully operational at a typical site	Confirm		
		– for laboratory simulation testing	Confirm		
5.1.2.2		**Type evaluation tests**			
		Documents examined and tests carried to verify that instrument complies with:			
		– metrological requirements in Clause 2;			
		– technical requirements in Clause 3;			
		– requirements in Clause 4 for electronic instruments;			
		Acceptance of test report from another metrological authorities;	Note		
		Instruments used in static weighing shall comply with the requirements of 3.2.6.	Note		
5.1.2.3	A.5.1	**Material tests**			
		Instruments subjected to in-site material tests in accordance with:			
		Separate verification method as in A.5.1.1			
		Integral verification method as in A.5.1.2			
5.1.2.4		**Simulation tests**			
		Influence quantities shall be applied during simulation tests in a manner that will reveal an alteration in accordance with:			
		R 107-1, 2.7 for all instruments; and			
		R 107-1, 4, for electronic instruments			
5.1.4		**Modules**			
		Examination and separate test of modules of an instrument or system according to:			
		Modules to be examined separately define and submitted by the manufacturer.			
		The error limits applicable to a module which is examined separately apportioned in accordance with requirements in 5.1.4.1 of R 107-1			

Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
5.2		**Initial verification**			
		Instruments shall comply with R 107-1, 2 (except 2.7) and 3 for any product(s) for which they are intended and when operated under normal weighing conditions.	Confirm		
5.2.1		**General requirements**			
		Tests shall be carried out, in-situ, with the instrument fully assembled and fixed in the position in which it is intended to be used. Instrument installed such that the weighing operation will be the same whether for the purposes of testing or for normal weighing operation.	Confirm		
5.2.2		**Operational tests**			
		Instruments subjected to in-site material tests in accordance with:			
		Separate verification method as in A.5.1.1			
		Integral verification method as in A.5.1.2			
		Instruments used in static weighing in accordance with the integral verification method in A.5.1.2 shall comply with the requirements of 3.2.6.			
5.2.3		**Conformity**			
		Conformity to the approved type and/or this Recommendation shall cover:			
		compliance with the appropriate maximum permissible errors in 2.2.1;	Confirm		
		correct functioning of all devices, e.g. interlocks, indicating and recording devices;	Confirm		
		construction material and design, as far as they are of metrological relevance;	Confirm		
		if appropriate a list of the tests performed	Confirm		
6		**Test methods**			
6.1		**General test procedure**			
		In-situ material tests shall be carried out as follows:			
		In accordance with the descriptive markings;	Confirm		
		Under the rated operating conditions for the instrument;	Confirm		
		Not less than three material tests shall be conducted, one at maximum capacity, Max, one at minimum capacity, Min, and one close to the minimum totalized load, Σ_{min} marked on the instrument;	Confirm		
		With test load(s) that is representative of the range and type of products for which the instrument is likely to be used or product(s) for which the instrument is intended;	Confirm		
		Each test shall be conducted at the maximum rate of weighing cycles per hour;	Confirm		
		Minimum of five weighing cycles per material test shall be conducted.	Note		
		Equipment near the instrument, including conveyors, dust collection systems etc. that are in use when the instrument is in normal operation, shall be in use during the tests;	Note		
		If the instrument can divert weighed material through alternative discharge facilities the test program shall be performed for each alternative unless weigh hopper is not affected, for example, by different air flow.	Note		

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Requirement (R 107-1)	Test procedure	Totalizing hopper weigher checklist	Passed	Failed	Remarks
6.2		**Control instruments and test standards**			
6.2.1	A.5.1.1	**Separate control instrument**			
		Error and uncertainty of a separate control instrument verified at any time other than immediately prior to the weighing tests shall be less than one-fifth of the maximum permissible error for automatic weighing in 2.2.1.			
6.2.2	A.5.1.2	**Integral control instrument**			
		Combined error and uncertainty of the integral control instrument shall be less than one-third of the maximum permissible error in 2.2.1.	Note mpe		
		Integral control instrument provided with an appropriate scale interval, and complies with the requirements of 3.2.6 and A.5.1.2.	Confirm		
		When load receptor cannot be loaded with sufficient standard weights, instrument shall be subjected to material tests by the separate verification method. In which case an appropriate control instrument shall be available.	Note method		
6.2.4		**Standard weights**			
		Reference standard weights or masses used for type examination or verification comply with the metrological requirements of OIML R 111. Error of the additional weights used to determine the rounding error of the control instrument shall not exceed one-fifth of the maximum permissible errors of the instrument to be verified for the load, as specified in R 107-1, 2.2.2 for initial verification.	Confirm		
6.3	**A.5.1.2.3**	**Interruption of the automatic operation**			
		Integral control instrument uses a test-stop program as part of the automatic weighing program to automatically interrupt automatic weighing operation twice as specified in R 107-1, A.5.1.2.3 during each weighing cycle in order to weigh and discharge a subdivision of the test load. If the integral control instrument is installed as an air-enclosed system interruption of the automatic operation during consecutive weighing cycles may not be possible and tests shall be conducted as specified in R 107-1, A.5.1.2.7.	Confirm		

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Use this space to detail remarks from the checklist: