INTERNATIONAL RECOMMENDATION

OIML R 61-2

Edition 2004 (E)

Automatic gravimetric filling instruments

Part 2: Test report format

Doseuses pondérales à fonctionnement automatique

Partie 2: Format du rapport d'essai

OIML R 61-2 Edition 2004 (E)

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

Contents

Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States.

The two main categories of OIML publications are:

- **International Recommendations (OIML R)**, which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity; the OIML Member States shall implement these Recommendations to the greatest possible extent;
- **International Documents (OIML D)**, which are informative in nature and intended to improve the work of the metrological services.

OIML Draft Recommendations and Documents are developed by technical committees or subcommittees which are formed by the Member States. Certain international and regional institutions also participate on a consultation basis.

Cooperative agreements are established between OIML and certain institutions, such as ISO and IEC, with the objective of avoiding contradictory requirements; consequently, manufacturers and users of measuring instruments, test laboratories, etc. may apply simultaneously OIML publications and those of other institutions.

International Recommendations and International Documents are published in French (F) and English (E) and are subject to periodic revision.

This publication – reference R 61-2, edition 2005 (E) – was developed by the OIML Subcommittee TC 9/SC 2 *Automatic weighing instruments*. It was approved for final publication by the International Committee of Legal Metrology in 2004. OIML publications may be downloaded from the Organization's web site, www.oiml.org/publications.

BIML contact details:

Bureau International de Métrologie Légale
11, rue Turgot - 75009 Paris - France

Telephone: 33 (0)1 48 78 12 82
Fax: 33 (0)1 42 82 17 27
E-mail: biml@oiml.org
Internet: www.oiml.org

INTRODUCTION

This “Test Report Format” aims to present, in a standardized format, the results of the various tests and examinations to which a type of an automatic gravimetric filling instrument shall be submitted with a view to its approval.

The Test Report Format consists of two parts, a “Checklist” and the “Test Report Format” 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, and experimental or visual checks based on the requirements of R 61-1. The words or condensed sentences aim to remind the examiner of the requirements in R 61-1 without reproducing them.

The Test Report is a record of the results of the tests carried out on the instrument. The “Test Report Format” forms have been produced based on the tests detailed in R 61-1.

All metrology services or laboratories evaluating types of automatic gravimetric filling instruments according to OIML R 61 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 the purpose of traceability). For example:

- Verification standards (accuracy, or accuracy class, and number);
- Simulator for testing of modules (name, type, traceability and number);
- Climatic test and static temperature chamber (name, type and number);
- Electrical tests, bursts (name of the instrument, type and number);
- 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 61-2 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.

IDENTIFICATION OF THE INSTRUMENT

Application no.: .....

Report date: .....

Type designation: .....

Manufacturer: .....

Serial no.: .....

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)

Application no.: .....

Report date: .....

Type designation: .....

Manufacturer: .....

Serial no.: .....

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

GENERAL INFORMATION CONCERNING THE TYPE

Application no.: .....

Type designation: .....

Manufacturer: .....

Applicant: .....

Instrument category: .....

Testing on: ☐ Complete instrument ☐ Module(*)

Reference accuracy class: Ref ( ) Accuracy class: X ( )

T = + ☐ T = – ☐ *d* = ☐ ☐ ☐

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

Max = ☐ *d* = ☐ *n* = ☐

Min = ☐

Maximum operating speed = ☐ Minimum operating speed = ☐

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

Zero-setting device:

☐ Semi-automatic

☐ Automatic zero-setting

☐ Initial zero-setting

☐ Zero-tracking

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

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

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

(**) The voltage U_{nom} shall be as defined at IEC 61000-4-11 (2001) section 5.

GENERAL INFORMATION CONCERNING THE TYPE (continued)

Instrument submitted:	.....	Load cell:	.....
Identification no.:	.....	Manufacturer:	.....
Connected equipment:	.....	Type:	.....
Remarks:		Capacity:	.....
		Number:	.....
Interfaces: (number, nature)	.....	Classification symbol:	.....

Remarks: see following page

Date of report:	.....	Evaluation period:	.....
Observer:	.....		

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.)

INFORMATION CONCERNING THE TEST EQUIPMENT USED FOR TYPE EVALUATION

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

List all test equipment used for the tests:

Equipment name	Manufacturer	Type no.	Serial no.	Used for (Test references)
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....
....	....	....	....	....

CONFIGURATION FOR TEST

Application no.: .....

Report date: .....

Type designation: .....

Manufacturer: .....

Serial no.: .....

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:

EXPLANATORY NOTES

Meaning of symbols:

I = Indication
I_n = n^{th} indication
L = Load
ΔL = Additional load to next changeover point
P = $I + ½\ d - \Delta L$ = Indication prior to rounding (digital indication)
E = $I - L$ or $P - L$ = Error
F = Mass of fill
F_P = Preset value of fill
P_i = Fraction of the $MPE_{(1)}$ applicable to one part of the instrument which is examined separately
(x) = Class designation factor
MPE = Maximum permissible error (absolute value)
EUT = Equipment under test
$MPE_{(1)}$ = Maximum permissible error for influence factor tests for class X(1)
se = Preset value error (setting error)
$MPSE_{(1)}$ = Maximum permissible preset value error for class X(1)
md_{max} = Maximum of the actual deviations of each fill from the average of all fills
$MPD_{(1)}$ = Maximum permissible deviation of each fill from the average for class X(1)
$mp\Delta z_{(1)}$ = Maximum permissible zero change per 5 °C for class X(1)

COMPLETION OF TYPE EVALUATION CHECKLIST

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	P = Passed, F = Failed
when the instrument has passed the test:	X		
when the instrument has failed the test:		X	
when the test is not applicable:	/	/	

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

	At start	At end	
Temp.:	20.5	21.1	°C
Rel. h.:			%
Date:	2004-11-29	2004-11-30	yyyy-mm-dd
Time:	16:00:05	16:30:25	hh:mm:ss

where:

Temp. = temperature
Rel. h. = relative humidity
Date = date on which the test was performed

In the disturbance tests, faults greater than 0.25 MPD 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)”.

Numbers in brackets refer to the corresponding subclauses of R 61-1.

SUMMARY OF TYPE EVALUATION

Application no.: .....

Report date: .....

Type designation: .....

Manufacturer: .....

Serial no.: .....

Requirements	Passed	Failed	Remarks
Metrological requirements Part 1 clause 2			
Technical requirements Part 1 clause 3			
Requirements for electronic instruments Part 1 clause 4			
Metrological controls Part 1 clause 5			
Test Report			
Overall results			

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

SUMMARY OF TEST REPORT

	Test reference	R 76-2 reference (if used)	Tests	Report page	Passed	Failed	Place of test	Remarks
1	A.5.2		Warm-up time					
2	A.5.3		Zero-setting					
3	A.5.3		Tare setting					
4	A.6.2		**Influence factor tests**					
4.1	A.6.2.1		Prescribed (static) temperatures					
4.2	A.6.2.2		Temperature effect on no-load indication					
4.3	A.6.2.3		Damp heat, steady state					
4.4	A.6.2.4		Power voltage variation					
4.5	A.6.2.5		Tilting					
5	A.6.3		**Disturbance tests**					
5.1	A.6.3.1		Short time power reduction					
5.2	A.6.3.2		Electrical bursts					
5.3	A.6.3.3		Electrostatic discharge					
5.4.1	A.6.3.4.1		Radiated electromagnetic susceptibility					
5.4.2	A.6.3.4.2		Conducted electromagnetic susceptibility					
6.1.1	A.6.4.1		DC voltage variations					
6.1.2	A.6.4.1		Battery power supply					
7	A.7		Span stability test					
8	A.8.2.2		Load indicator performance test					
9	A.8.2		Material tests at initial verification					

Use this space to detail remarks from the Checklist.

1 WARM-UP TIME (4.2.4, A.5.2)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: .....

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

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

E = *I* – *L* or *P* – *L* = error
P = *I* + ½ *d* – *ΔL* = digital indication
E_{0I} = Initial zero-setting error
E_L = error calculated at load (loaded)
E_0 = error calculated at zero or near zero (unloaded)

	Time*	Load *L*	Indication *I*	Add. load *ΔL*	Error *E*	$E_L - E_0$
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	
Initial zero-setting error,	E_{0I} =	0.25 MPD(x) in service × Minfill	=
Maximum value of error unloaded,	E_0 =		=
Maximum value of zero variation,	$E_0 - E_{0I}$ =	0.25 MPD(x) in service × Minfill × P_i	=
Maximum value of error loaded,	$E_L - E_0$ =	0.25 MPD(x) in service × Max × P_i	=

** Check that the Error is ≤ MPE

Remarks: ☐ Passed ☐ Failed

2 ZERO-SETTING (3.8, A.5.3)

2.1 Range of zero setting (3.8.1, A.5.3.2)

2.1.1 Initial zero-setting (A.5.3.2.1)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: .....

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

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

Positive range L_p		Negative range L_n		Zero-setting range $L_p + L_n$	% of maximum load
Weight added	Zero (yes/no)	Weight added	Zero (yes/no)		

Remarks: ☐ Passed ☐ Failed

2.1 Range of zero-setting (continued)

2.1.2 Automatic zero-setting range (3.8.1, A.5.3.2.2)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: .....

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

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

Weight added	Zero (yes/no)	Zero-setting range	% of maximum load

Remarks: ☐ Passed ☐ Failed

2.2 Accuracy of zero-setting (3.8.2, A.5.3.3)

Application no.: ....

Type designation: ....

Observer: ....

Scale interval, *d*: ....

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

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

P = $I + ½ d – ΔL$ = digital indication
E = $I – L$ or $P – L$ = error
$MPE_{(zero)}$ = 0.25 MPD(x) in-service × Minfill

Zero-setting mode:						
Load L	Indication I	Add. load $ΔL$	P	Error E	E/d	$MPE_{(zero)}$

Remarks:

Zero-setting mode:						
Load L	Indication I	Add. load $ΔL$	P	Error E	E/d	$MPE_{(zero)}$

Remarks:

Zero-setting mode:						
Load L	Indication I	Add. load $ΔL$	P	Error E	E/d	$MPE_{(zero)}$

Remarks:

☐ Passed ☐ Failed

3 TARE DEVICE (3.8, A.5.3)

3.1 Accuracy of tare device (3.8.5.1, A.5.3.4)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: .....

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

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

P = *I* + ½ *d* – *ΔL* = digital indication
E = *I* – *L* or *P* – *L* = error
$MPE_{(tare)}$ = 0.25 MPD(x) in-service × Minfill

Tare balancing mode:						
Load *L*	Indication *I*	Add. load *ΔL*	*P*	Error *E*	*E*/*d*	$MPE_{(tare)}$

Remarks:

Tare balancing mode:						
Load *L*	Indication *I*	Add. load ΔL	*P*	Error *E*	*E*/*d*	$MPE_{(tare)}$

Remarks:

Tare balancing mode:						
Load *L*	Indication *I*	Add. load *ΔL*	*P*	Error *E*	*E*/*d*	$MPE_{(tare)}$

Remarks:

☐ Passed ☐ Failed

4 INFLUENCE FACTORS (2.8, A.6.2)

4.1 Prescribed temperatures for static tests (2.8.1.1, A.6.2.1)

4.1.1 Initial reference temperature of 20 °C

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c **/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.1 Prescribed temperatures for static tests (continued)

4.1.2 Specified high temperature

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c**/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.1 Prescribed temperatures for static tests (continued)

4.1.3 Specified low temperature

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c**/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.1 Prescribed temperatures for static tests (continued)

4.1.3 Temperature of 5 °C

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

E = I + ½ d – ΔL – L

E_c = E – E_0 with E_0 = error calculated at or near zero (*)

$MPE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load L	Indication I		Add. load ΔL		Error E		Corrected error E_c		$MPE_{(1)}$	E_c **/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of E_c/$MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks:

☐ Passed ☐ Failed

4.1 Prescribed temperatures for static tests (continued)

4.1.4 Reference temperature of 20 °C

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

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 = $E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load L	Indication I		Add. load ΔL		Error E		Corrected error E_c		$MPE_{(1)}$	E_c **/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.2 Temperature effect on no-load indication (2.8.1.3, A.6.2.2)

Application no.: .....

Type designation: .....

Date: .....

Observer: .....

Scale interval, *d*: .....

Automatic zero-setting device is:

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

P = $I + ½\ d - \Delta L$ = digital indication

Maximum permissible zero change per 5 °C for the Min ($mp\Delta z_{(1)}$) = 0.25MPD in service × Min (× P_i if applicable)
ΔP = difference in P for two consecutive tests at different temperatures
$\Delta Temp$ = difference in Temp for two consecutive tests at different temperatures

Report page*	Date	Time	Temp (°C)	Zero indication I	Add. load ΔL	P	ΔP	$\Delta Temp$	Zero-change per 5 °C Δz	$mp\Delta z_{(1)}$	Δz / $mp\Delta z_{(1)}$

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

Maximum of the values of Δz / $mp\Delta z_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.3 Damp heat, steady state (4.2.1, A.6.2.3)

4.3.1 Initial test (at reference temperature and 50 % humidity)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c**/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.3 Damp heat, steady state (continued)

4.3.2 Test at high temperature and 85 % relative humidity

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c**/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.3 Damp heat, steady state (continued)

4.3.3 Final test (at reference temperature and 50 % relative humidity)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

$E_c = E - E_0$ with E_0 = error calculated at or near zero (*)

$MPE_{(1)} = 0.25\ MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Load *L*	Indication *I*		Add. load *ΔL*		Error *E*		Corrected error E_c		$MPE_{(1)}$	E_c **/$MPE_{(1)}$
	↓	↑	↓	↑	↓	↑	↓	↑		
(*)					(*)					

** Use the largest value of E_c in each case.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.4 AC power voltage variation (2.8.2, A.6.2.4)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

Marked nominal voltage U_{nom} or voltage range (U_{min} to U_{max}): ☐ V

Test supply voltage: ☐ V Test supply frequency: ☐ Hz

E = $I + ½\ d - \Delta L - L$
E_c = $E - E_0$ with E_0 = error calculated at or near zero*
$MPE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Voltage**	U (V)	Load L	Indication I	Add. load ΔL	Error E	Corrected error, E_c	$MPE_{(1)}$	$E_c/MPE_{(1)}$
Reference value					(*)			
Reference value – 15 %								
Reference value + 10 %								
Reference value								

** The reference voltage shall be as defined in IEC 61000-4-11 (2001) section 5 or the most recent issue of the publication valid at the time of testing the instrument.

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

4.5 Tilting (2.8.4, A.6.2.5)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Automatic zero-setting device is:

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

☐ Tilting by 5 % not required for fixed installation ☐ Tilting by 5 % not required, can be adjusted to 1 % or less ☐ Tilting by 5 % if no level indicator on instrument liable to be tilted

E = $I + ½\ d - \Delta L - L$

E_c = $E - E_0$ with E_0 = error calculated at or near zero(*)

$MPE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i, if applicable)

Tilting position	Load *L*	Indication *I*	Add. load *ΔL*	Error *E*	Corrected error, E_c	$MPE_{(1)}$	$E_c/MPE_{(1)}$
Reference				(*)			
5 % → longitudinally forwards							
5 % ← longitudinally backwards							
5 % ↑ transversely forwards							
5 % ↓ transversely backwards							
Reference							

Maximum of the values of $E_c/MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: ☐ Passed ☐ Failed

5 DISTURBANCES (4.1.2, A.6.3)

5.1 Short time power reduction (A.6.3.1)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Marked nominal voltage U_{nom} or voltage range (U_{min} to U_{max}): V

Load	Disturbance				Result		
	Amplitude (% of U_{nom})	Duration (Cycles)	Number of disturbances	Repetition interval (s)	Indication *I*	Significant fault	
						No	Yes (remarks)
	without disturbance						
	0	0.5	10				
	50	1	10				

Remarks: ☐ Passed ☐ Failed

5.2 Electrical bursts (fast transient tests) (A.6.3.2)

5.2.1 Power supply lines

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Power supply lines: test voltage 1 kV, duration of the test 1 min at each polarity

Load	Connection			Polarity	Result		
	L ↓ ground	N ↓ ground	PE ↓ ground		Indication *I*	Significant fault	
						No	Yes (remarks)
	without disturbance						
				pos			
				neg			
	without disturbance						
				pos			
				neg			
	without disturbance						
				pos			
				neg			

L = phase, N = neutral, PE = protective earth

Remarks: ☐ Passed ☐ Failed

5.2 Electrical bursts (continued)

5.2.2 I/O circuits and communication lines

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

I/O signals, data and control lines: test voltage 0.5 kV; duration of the test: 1 min at each polarity.

Load	Cable / interface	Polarity	Result		
			Indication /	Significant fault	
				No	Yes (remarks)
	without disturbance				
		pos			
		neg			
	without disturbance				
		pos			
		neg			
	without disturbance				
		pos			
		neg			
	without disturbance				
		pos			
		neg			
	without disturbance				
		pos			
		neg			
	without disturbance				
		pos			
		neg			

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

Remarks: ☐ Passed ☐ Failed

5.3 Electrostatic discharge (A.6.3.3)

5.3.1 Direct application

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

☐ Contact discharges ☐ Paint penetration

☐ Air discharges Polarity*: ☐ pos ☐ neg

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

* IEC 61000-4-2 (2001) specifies that the test shall be conducted with the most sensitive polarity.

Remarks: ☐ Passed ☐ Failed

5.3 Electrostatic discharge (continued)

5.3.2 Indirect application (contact discharges only)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Polarity*: ☐ pos ☐ neg

Horizontal coupling plane

Load	Discharges			Result		
	Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Indication *I*	Significant fault	
					No	Yes (remarks, test points)
	without disturbance					
	2					
	4					
	6					

Vertical coupling plane

Load	Discharges			Result		
	Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)	Indication *I*	Significant fault	
					No	Yes (remarks, test points)
	without disturbance					
	2					
	4					
	6					

* IEC 61000-4-2 (2001) specifies that the test shall be conducted with the most sensitive polarity.

Remarks: ☐ Passed ☐ Failed

5.3 Electrostatic discharge (continued)

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

a) Direct application

Contact discharges:

Air discharges:

b) Indirect application

5.4 Electromagnetic susceptibility (A.6.3.4)

5.4.1 Radiated (A.6.3.4.1)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Rate of sweep: ☐ ☐

Load: ☐ Material load: ☐

Disturbances				Result		
Antenna	Frequency range (MHz)	Polarization	Facing EUT	Indication /	Significant fault	
					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			

Frequency range: 80 MHz – 2 GHz
Field strength: 6 V/m on one face or 3 V/m on all four faces if fails
Modulation: 80 % AM, 1 kHz sine wave

Remarks: ☐ Passed ☐ Failed

5.4 Electromagnetic susceptibility (continued)

5.4.2 Conducted (A.6.3.4.2)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Rate of sweep: ☐ ☐

Load: ☐ Material load: ☐

Frequency Range (MHz)	Cable / interface	Level (Volts RMS)	Result		
			Indication /	Significant fault	
				No	Yes (remarks)
without disturbance					
without disturbance					
without disturbance					
without disturbance					
without disturbance					
without disturbance					

Frequency range: 150 kHz – 80 MHz
Voltage level: 3 V RMS
Modulation: 80 % AM, 1 kHz sine wave

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

Remarks: ☐ Passed ☐ Failed

5.4 Electromagnetic susceptibility (continued)

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

6 DISTURBANCES ON DC POWERED INSTRUMENTS (2.8.3, A.6.4)

6.1.1 DC voltage variations (4.2.6, A.6.4.1)

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

Marked nominal voltage or voltage range: [ ] V

E = $I + ½\ d - \Delta L - L$
E_c = $E - E_0$ with E_0 = error calculated at or near zero
$MPE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the mass of fill equal to the test load(s) × (P_i , if applicable)

Voltage	*U* (DC Volts)	Load *L*	Indication *I*	Error *E*	Corrected error, E_c	$MPE_{(1)}$	E_c / $MPE_{(1)}$
Reference Voltage							
Under-voltage							
Over-voltage							
Reference Voltage							

Maximum of the values of E_c / $MPE_{(1)}$:	

Note: This value is to be inserted in the Checklist

Remarks: [ ] Passed [ ] Failed

6 DISTURBANCES ON DC POWERED INSTRUMENTS (continued)

6.1.2 Battery power supply (4.2.6)

For battery powered instruments only:

Manufacturer's specified minimum voltage value: ☐ V

When the voltage drops below the manufacturer's specified minimum value, the instrument (please tick):

☐ Continues to function

☐ Automatically goes out of service

☐ Functions with errors

☐ N/A as instrument is not battery powered

Remarks: ☐ Passed ☐ Failed

7 SPAN STABILITY TEST (4.3.3, A.7)

Application no.: .....

Type designation: .....

Scale interval *d*:
(Control indicating device) .....

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

Automatic zero-setting device is:

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

Test load: ☐

Measurement no. 1: Initial measurement

		At start	At end	
Observer:	Temp.:			°C
Location:	Rel. h.:			%
	Date:			yyyy-mm-dd
	Time:			hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

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

0.1 *d* = ☐

If $\left|(E_L - E_0)_{max} - (E_L - E_0)_{min}\right| \leq 0.1\ d$, the 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:

7 SPAN STABILITY TEST (continued)

Subsequent measurements

For each of the subsequent measurements (at least 7), indicate on the line “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;
- after the humidity test, the EUT having been stabilized for at least 16 h;
- after the EUT has been disconnected from the mains for at least 8 h and then stabilized for at least 5 h;
- after any change in the test location;
- under any other specific condition.

Measurement no. 2:

Observer: .....

Location: .....

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

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

7 SPAN STABILITY TEST (continued)

Measurement no. 3:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

Measurement no. 4:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

7 SPAN STABILITY TEST (continued)

Measurement no. 5:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

Measurement no. 6:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

7 SPAN STABILITY TEST (continued)

Measurement no. 7:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

Remarks:

Measurement no. 8:

		At start	At end	
Observer:	.....	Temp.:		°C
Location:	.....	Rel. h.:		%
		Date:		yyyy-mm-dd
		Time:		hh:mm:ss

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

	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								

* When applicable, necessary corrections resulting from variations of temperature, pressure, etc. See remarks.

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

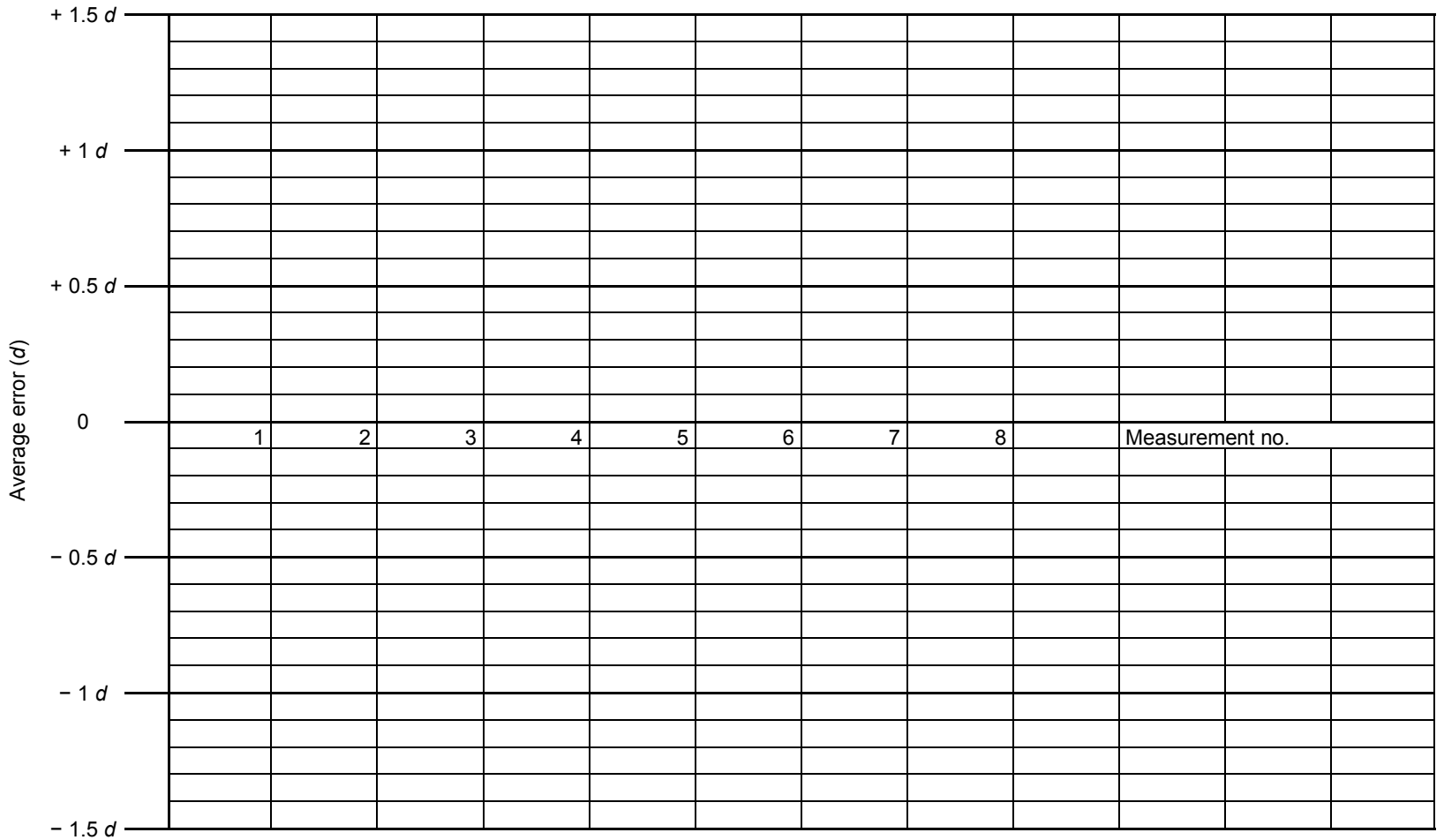
Remarks:

7 SPAN STABILITY TEST (continued)

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)



☐ Passed ☐ Failed Remarks:

8 MATERIAL TESTING (6, A.8)

8.1 Load indicator performance (6.5.2, A.8.2.2)

This form may be used to record static weighing performance of the load indicator if necessary for the integral verification method for material tests.

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

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

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

Automatic zero-setting device is:

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

$E = I + ½\ d - \Delta L - L$

Load *L*	Indication *I*		Additional load *ΔL*		Error *E*	
	↓	↑	↓	↑	↓	↑
(*)					*	

* At or near zero

Remarks:

8 MATERIAL TESTING (continued)

8.2 Separate verification method (6.5.1, A.8.2.2)

Test no.: .....

	Maximum capacity (6.2.1(a))		g/kg
Load value close to*:	Minfill (6.2.1 (a))		g/kg
	Mid-range critical value (6.2.1 (c))		g/kg

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

Material: .....

Condition of material: .....

Nominal load: .....

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

Correction devices	
Type	Settings

Preset value of fill, F_P	
Number of loads per fill	
Average value of the fills' container tare (if applicable)	
Error of the control instrument (if applicable)	

Fill no.	Container tare g or kg	Indication of control instrument, *I* g or kg	Additional load, *ΔL* g	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
1					
2					
3					
4					
5					
6					
7					
8					
9					

Fill no.	Container tare g or kg	Indication of control instrument, *I* g or kg	Additional load, *ΔL* g	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					

Fill no.	Container tare g or kg	Indication of control instrument, *I* g or kg	Additional load, *ΔL* g	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					

Results of material test no.: Load value close to:

Preset value of fill, F_P	
Average mass of all fills $\Sigma F / n$	
Preset value error se = $\Sigma F / n - F_P$	
Maximum permissible preset value error for class X(1): ($MPSE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the fill value equal to F_P)	
se / $MPSE_{(1)}$	

Maximum of the absolute values of the actual deviation from the average, md_{max}	
Maximum permissible deviation from average for class X(1): ($MPD_{(1)}$ = initial verification for the fill value equal to F_P)	
md_{max} / $MPD_{(1)}$	

Remarks:

8 MATERIAL TESTING (continued)

8.3 Integral verification method (6.5.2, A.8.2.2)

Test no.: .....

	Maximum capacity (6.2.1(a))		g/kg
Load value close to*:	Minfill (6.2.1 (a))		g/kg
	Mid-range critical value (6.2.1 (c))		g/kg

Application no.: .....

Type designation: .....

Observer: .....

Scale interval, *d*: (Control indicating device) .....

Material: .....

Condition of material: .....

Nominal load: .....

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

Correction devices	
Type	Settings

Preset value of fill, F_P	
Number of loads per fill	
Average value of the fills' container tare (if applicable)	
Error of the control instrument (if applicable)	

Fill no.		Container tare g or kg	Indication of control instrument, *I* g or kg	Add. load, *ΔL* g	Mass of load, *L* g or kg	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
1	Full						
	Empty						
2	Full						
	Empty						
3	Full						
	Empty						
4	Full						
	Empty						

Fill no.		Container tare g or kg	Indication of control instrument, *I* g or kg	Add. load, *ΔL* g	Mass of load, *L* g or kg	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
5	Full						
	Empty						
6	Full						
	Empty						
7	Full						
	Empty						
8	Full						
	Empty						
9	Full						
	Empty						
10	Full						
	Empty						
11	Full						
	Empty						
12	Full						
	Empty						
13	Full						
	Empty						
14	Full						
	Empty						
15	Full						
	Empty						
16	Full						
	Empty						
17	Full						
	Empty						
18	Full						
	Empty						
19	Full						
	Empty						
20	Full						
	Empty						
21	Full						
	Empty						
22	Full						
	Empty						

Fill no.		Container tare g or kg	Indication of control instrument, *I* g or kg	Add. load, *ΔL* g	Mass of load, *L* g or kg	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
23	Full						
	Empty						
24	Full						
	Empty						
25	Full						
	Empty						
26	Full						
	Empty						
27	Full						
	Empty						
28	Full						
	Empty						
29	Full						
	Empty						
30	Full						
	Empty						
31	Full						
	Empty						
32	Full						
	Empty						
33	Full						
	Empty						
34	Full						
	Empty						
35	Full						
	Empty						
36	Full						
	Empty						
37	Full						
	Empty						
38	Full						
	Empty						
39	Full						
	Empty						
40	Full						
	Empty						

Fill no.		Container tare g or kg	Indication of control instrument, *I* g or kg	Add. load, *ΔL* g	Mass of load, *L* g or kg	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
41	Full						
	Empty						
42	Full						
	Empty						
43	Full						
	Empty						
44	Full						
	Empty						
45	Full						
	Empty						
46	Full						
	Empty						
47	Full						
	Empty						
48	Full						
	Empty						
49	Full						
	Empty						
50	Full						
	Empty						
51	Full						
	Empty						
52	Full						
	Empty						
53	Full						
	Empty						
54	Full						
	Empty						
55	Full						
	Empty						
56	Full						
	Empty						
57	Full						
	Empty						
58	Full						
	Empty						

Fill no.		Container tare g or kg	Indication of control instrument, *I* g or kg	Add. load, *ΔL* g	Mass of load, *L* g or kg	Mass of fill, *F* g or kg	Deviation from the average of all fills, *md* g
59	Full						
	Empty						
60	Full						
	Empty						

Results of material test no.: Load value close to:

Preset value of fill, F_P	
Average mass of all fills $\Sigma F / n$	
Preset value error se = $\Sigma F / n - F_P$	
Maximum permissible preset value error for class X(1): ($MPSE_{(1)}$ = 0.25 $MPD_{(1)}$ in-service for the fill value equal to F_P)	
se / $MPSE_{(1)}$	

Maximum of the absolute values of the actual deviation from the average, md_{max}	
Maximum permissible deviation from average for class X(1): ($MPD_{(1)}$ = initial verification for the fill value equal to F_P)	
md_{max} / $MPD_{(1)}$	

Remarks:

CHECKLIST

Application no.: .....

Type designation: .....

References		Automatic gravimetric filling instruments		Enter value	Remarks
Requirement (R 61-1)	Test procedure				
2.2.1	A.5.5	Influence factor tests and determination of reference value for accuracy class Ref(x):			
2.8.1	A.6.2.1	Prescribed temperatures for static tests: Maximum of the values of E_c / $MPE_{(1)}$	Reference		
			High		
			Low		
			+ 5 °C		
			Reference		
2.8.1.3	A.6.2.2	Temperature effect on no-load indication ($mp\Delta z_{(1)}$ = $MPE_{(1)}$ for Minfill): Maximum of the values of Δz / $mp\Delta z_{(1)}$			
4.2.1	A.6.2.3	Damp heat: Maximum of the values of E_c / $MPE_{(1)}$	Reference + 50 % humidity		
			High + 85 % humidity		
			Reference + 50 % humidity		
2.8.2	A.6.2.4	Power voltage variation: Maximum of the values of E_c / $MPE_{(1)}$	– 15 %		
			+ 10 %		
2.8.3	A.6.4	DC voltage variations: Maximum of the values of E_c / $MPE_{(1)}$	Under-voltage		
			Over-voltage		
2.8.4	A.6.2.5	Tilting by up to 5 %:			
		Maximum of the values of E_c / $MPE_{(1)}$:			
		or level indicator enables tilt of 1 % or less		Note in Remarks	
	A.5.5	Maximum value of Error / $MPE_{(1)}$ $[Error / MPE_{(1)}]_{max}$:			
5.2.5		Reference accuracy class Ref(x) ≥ $[E_c / MPE_{(1)}]_{max}$ and Ref(x) = (x) = 1×10^k, 2×10^k, 5×10^k, k being a positive or negative whole number or zero.			
T.4.2.6 2.5	A.6.1.3.1	Significant fault			

Note: The above portion of the Checklist enables the reference value for the accuracy class and the value of the significant fault to be determined. The results column should indicate the maximum value from the report for each test (it is not sufficient just to tick the box).

Use this page to detail remarks from the Checklist:

Determination of accuracy class, X(x) (5.2.5, A.8.2.4)

Requirement (R61-1)	Mass of the fill g/kg	se / $MPSE_{(1)}$	$[md / MPD_{(1)}]_{max}$	Remarks
6.2.1 (a)	Close to Max capacity			
6.2.1 (a)	Close to Minfill			
6.2.1 (c)	Close to Mid-range critical value			
	Maximum value of the above			
Reference accuracy class is Ref(.....) – from Checklist.				
Accuracy class of the instrument is X(.....)				

$X(x) \geq [se / MPSE_{(1)}]_{max}$, $X(x) \geq [md / MPD_{(1)}]_{max}$, (x) = 1×10^k, 2×10^k, 5×10^k (k being a positive or negative whole number or zero) and $X(x) \geq Ref(x)$, so the accuracy class of the instrument is X(.....).

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments	Passed	Failed	Remarks
2	**A.1.3**	**METROLOGICAL REQUIREMENTS**			
2.1		**Accuracy classes**	Note in remarks		
2.2		**Limits of error**			
2.2.1	A.5.5	Static testing only, MPE for influence factor tests	Note in remarks Ref(x)		
2.2.2		Specified accuracy class X(x) MPD	Note in remarks		
2.4		MPSE	Note in remarks		
2.5		MPE for influence factor tests	Note in remarks		
2.6		Minimum capacity (Min)	Note in remarks		
2.7		Rated minimum fill (Minfill)	Note in remarks		
2.8	**A.6.2**	**Influence factors**			
2.8.1.1	A.6.2.1	Prescribed temperatures for static tests			
2.8.1.2		Special temperature limits	Note in remarks		
2.8.1.3	A.6.2.2	Temperature effect on no-load indication			
2.8.2	A.6.2.4	Power supply (AC power voltage variations)			
2.8.3	A.6.4	Power supply (DC power voltage variations)			
2.8.4	A.6.2.5	**Tilting:**	Yes		No
		Instrument permanently installed	[.....]		[.....]
		Instrument not permanently installed, no level indicator	[.....]		[.....]
		Instrument not permanently installed with level indicator, can be set to 1 % or less	[.....]		[.....]
2.8.5	A.1.3	**Units of measurement:**			
		Metric carat (ct)	[.....]		[.....]
		Milligram (mg)	[.....]		[.....]
		Gram (g)	[.....]		[.....]
		Kilogram (kg)	[.....]		[.....]
		Tonne (t)	[.....]		[.....]
3	**A.1.4**	**TECHNICAL REQUIREMENTS**			
3.1		**Suitability for use:** Instrument suits method of operation and products for which it is intended			
3.2		**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		**Security of components, software and pre-set controls**			
		Function secured / Means of securing			
		Audit trail facility or similar			
3.2.4		Modifications do not affect correct operation and are identifiable			

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments		Passed	Failed	Remarks
3.3.1	A.1.4	**Indication of weighing results:** Quality of reading is reliable, bright and easy				
3.3.2		**Form of the indication:**				
		Results contain names and symbols of the units of mass				
		Scale interval is the same for all indicating devices within any one weighing range				
3.3.3		**Printing device:**		Yes [.....]		No [.....]
		Clear and permanent				
		Name or symbol of unit is to the right of the value or above a column of values				
3.3.4		All scale intervals are the same				
3.4		**Fill setting:**				
		Scale graduated in units of mass		Note in remarks		
		Or, fill setting weights,				
		In accordance with OIML requirements		Note in remarks		
		Or, purpose-designed and identified with instrument		Note in remarks		
3.5		**Final feed cut-off device**				
		Clearly differentiated				
		Direction of movement is shown				
3.6		**Feeding device:**				
		Sufficient and regular flowrate(s)				
		Indication of the direction of movement resulting from adjustment				
3.7		**Load receptor:**				
		Load receptor, feed and discharge devices are designed to ensure negligible retention of residual material				
		Has facilities for test weights up to max capacity				
		Manual discharge is not possible during automatic operation				
3.8	A.5.3	**Zero-setting and tare devices**				
	A.5.3.1	**Zero-setting mode:**		Yes		No
		Initial zero-setting		[.....]		[.....]
		Automatic zero-setting		[.....]		[.....]
		Semi-automatic zero-setting		[.....]		[.....]
		Non-automatic zero-setting		[.....]		[.....]
		Zero-tracking		[.....]		[.....]
3.8.1	A.5.3.2	**Range of zero-setting:**				
		Zero-setting does not alter maximum weighing capacity				
		Overall effect of zero-setting	= ..... %			
		Overall effect of zero-tracking	= ..... %			
		Initial zero-setting	= ..... %			
3.8.2	A.5.3.3	**Accuracy of zero-setting device ≤ 0.25 MPD in service**				
3.8.3		**Control of zero-setting devices:**				

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments	Passed	Failed	Remarks
3.8.3.1		**Non-automatic and semi-automatic devices:**			
		Not operable during automatic zero-setting			
		In stable equilibrium			
3.8.3.2		**Automatic zero-setting device:**			
		Operates only when stable equilibrium			
		Sufficiently often to maintain zero within 0.5 MPD in service			
		When operating as part of every weighing cycle, it is not possible to disable or set at time intervals			
		When operating after a programmable time interval the maximum time interval is within the value in A.5.3.4, or	Note in remarks		
3.8.4		**Zero-tracking device:**			
		Operates only when indication is at zero, or			
		At negative net zero value equivalent to gross zero, and			
		Corrections are ≤ 0.25 MPD in service			
		When operates after tare, the overall effect may be within 4 % of Max			
3.8	A.5.3	**Tare device mode:**	Yes		No
		Preset tare	[.....]		[.....]
		Tare balancing	[.....]		[.....]
		Additive [ ] % of Max	[.....]		[.....]
		Subtractive [ ] % of Max	[.....]		[.....]
		Combined zero-setting and tare balancing	[.....]		[.....]
3.8.5.1	A.5.3.4	**Accuracy of tare device ≤ 0.25 MPD in service**			
		Non-automatic or semi-automatic tare inoperable during automatic operation			
		Semi-automatic or automatic tare operates only when at stable equilibrium			
3.8.5.2		**Subtractive tare device:** Prevention of use above Max or indication that capacity has been reached			
3.8.5.3		**Combined zero-setting and tare balancing:** Capable of setting to within specified limits for in 3.8.2 and 3.8.4			
3.8.6		**Preset tare device scale interval:** Equal to or rounded to the scale interval of the instrument			
3.8.6.1 3.8.6.2		**Modes of operation:** Cannot be modified or cancelled if tare operated after the preset tare is still in use			
3.9	A.1.4	Equilibrium mechanism - uses weights	Yes [.....]		No [.....]
3.10	A.2.2	**Descriptive markings**			
3.10.1		**Markings shown in full:**			
		Name or identification mark of the manufacturer			
		Name or identification mark of the importer			
		Date of manufacture of the instrument			
		Serial number and type designation of the instrument			

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments			Passed	Failed	Remarks
		Temperature range	°C	°C			
		Supply voltage		V			
		Supply frequency		Hz			
		Pneumatic and/or hydraulic pressure		kPa			
		Average number of loads/fill					
		Maximum fill (Maxfill)					
		Rated minimum fill (Minfill)					
		Maximum rate of operation (loads per minute)					
3.10.2		**Markings shown in code:**					
		Type approval sign					
		Reference accuracy class, Ref(x)					
		Class of accuracy, X(x)					
		Scale interval, *d*					
		Maximum capacity					
		Minimum capacity					
		Maximum additive tare +					
		Maximum subtractive tare –					
3.10.3		**Supplementary markings:** As required			Note in remarks		
3.10.4		**Presentation of descriptive markings:**					
		Indelible					
		Size, shape and clarity enables legibility					
		Grouped together in clearly visible place					
		Possible to seal the plate bearing the markings					
		Programmable display is used for markings			Yes [.....]		No [.....]
		If programmable display is used, instrument has means for any access to be automatically and non-erasably recorded and made evident					
		Plate contains type and designation of instrument					
		Name or mark of manufacturer					
		Type approval number					
		Electrical supply voltage					
		Pneumatic and/or hydraulic pressure					
		Other markings			Note in remarks		
3.11	**A.2.2**	**Verification marks**					
3.11.1		**Position:**					
		Place where verification marks are located cannot be removed without damaging the marks					
		Allows easy application of the mark					
		Visible without instrument or its protective covers having to be removed					

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments	Passed	Failed	Remarks
3.11.2		**Mounting**			
		Verification mark support ensures conservation of the marks			
3.12	A.3.6	**Control Instrument is:**	Yes		No
		Separate part	[.....]		[.....]
		Integral part	[.....]		[.....]
		Metrological functions not influenced when control instrument is coupled with other devices	Note in remarks		
4		**REQUIREMENTS FOR ELECTRONIC INSTRUMENTS**			
4.2	A.1.5	**Functional requirements**			
4.2.1		**Switch on procedure / indicator test:** Relevant signs of indicator are active and non-active for sufficient time to be checked by operator			
		Upon a significant fault: The instrument is made inoperative automatically, or			
		A visual or audible indication is provided automatically and continues until the user takes action or the fault disappears			
4.2.3	A.5.2	**During warm-up time:** No indication or transmission of weighing results			
		During first 30 minutes of operation:			
		Zero error complies with specified requirements			
		Span error complies with specified requirements			
4.2.5		**When interfaces are used:**			
		Instrument continues to function correctly			
		Metrological functions are not influenced			
		Functions performed or initiated through the interface meet relevant requirements of clause 3			
		The display of unclear data is not possible			
		Falsification of weighing results is not possible			
		Unauthorized adjustments of the instrument is not possible			
4.2.6		**Battery power supply:**			
		Continues to function correctly whenever the voltage drops below the manufacturer's specified minimum value, or			
		Is automatically put out of service			
5	**A.1.3**	**METROLOGICAL CONTROLS**			
5.2	A.1.1	**Type approval**			
5.2.1		**Documentation includes:**			
		Metrological characteristics of the instrument			
		Set of specifications			
		Functional description of the components and devices			
		Drawings, diagrams and general software information as applicable, to explain construction and operation			
		Documentary evidence that the design and construction of the instrument complies with the requirements of R 61-1	Note in remarks		
5.2.3		**Examination of:**			
		Documents			

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments	Passed	Failed	Remarks
		Functional checks			
		Test reports from other authorities			
5.2.3.1	A.8.1	Material tests			
		Material used as the test load representative of a product for which the instrument is designed			
5.2.3.2	A.5	Influence factor tests applied during simulation tests in a manner that reveals corruption of weighing results of any weighing process			
5.3	**A.2**	**Initial verification**			
5.3.1		Instruments examined for conformity with the approved type			
		Tested for compliance with clause 2 (excluding 2.2.1 and 2.5) for intended products and corresponding accuracy classes under normal conditions of use			
		Tests carried out by metrological authority, in situ, with instrument fully assembled and fixed in position in which it is intended to be used. The installation so designed that automatic weighing operation is the same whether for testing or used for transaction			
5.3.2	A.8.2	The in-situ material tests conducted in accordance with the procedure in A.8.2 and the descriptive markings in 3.10, under normal conditions for which the filling instrument is intended			
5.3.3		**Conduct of the tests**			
		Where appropriate and to avoid duplicating tests previously done for type evaluation under 5.2.3.1and 5.2.3.2, use the results from these tests	Note in remarks		
5.4		**Subsequent verification**			
		Conducted as the same as the initial verification test			
5.5		**In-service inspection tests**			
		Conducted as the same as the initial verification test			
6		**TEST METHODS**			
6.1	A.8.2.2	Mass of individual fills is determined using either:	Yes	No	
6.5.1		Separate verification method, or	[.....]	[.....]	
6.5.2		Integral verification method:	[.....]	[.....]	
		Using either an appropriately designed indicating device, or	Note in remarks		
		Indicating device with standard weights to assess rounding error	Note in remarks		
		Total uncertainty (separate or integral verification) not greater than 1/3 of MPE for the instrument			
6.2	A.8.2.3	**Conduct of material tests**			
		(a) Tests carried out on fills using loads at or near: - Max, - Minfill, - With products instrument is intended to be used for			
		(b) Cumulative weighers tested as above with: - Maximum practical number of loads per fill, - Minimum number of loads per fill, and - Associated weighers as above with average (or optimum) number of loads per fill			

Requirement (R 61-1)	Test procedure	Automatic gravimetric filling instruments	Passed	Failed	Remarks
		(c) If Min ≤ 1/3 of Max, tests carried out at near center of load weighing range, at value close to, but not above, 100 g, 300 g, 1000 g, or 1500 g as appropriate			
6.2.3		**Condition of material tests**			
		All tests conducted with adjustable parameters critical to metrological integrity set to most onerous condition allowed			
		Prior to test, filling instrument operated to achieve stability as per manufacturer's written instructions, and fills discharged in this period not included in test			
		Instrument fitted with correction device	Yes [.....]	No [.....]	
		Any correction device shall be operated during tests	Note in remarks		
6.3		Number of test fills as indicated in Table 2 in R 61-1	Note in remarks		

Use this space to detail remarks from the Checklist: