|  |  |
| --- | --- |
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**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:

1. **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;
2. **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.

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

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INTRODUCTION

The "Test report format", the subject of OIML R 50-3, aims at presenting, in a standardized format, the results of the various tests and examinations to which a type of a continuous totalizing automatic weighing instrument (belt weigher) shall be submitted with a view to its approval.

The "Test report format" consists of two parts, the "Checklist" and the "Test report".

The "Checklist" is a summary of the examinations carried out on the instrument. It includes the conclusions of the results of the tests performed, experimental or visual checks based on the required performance criteria and associated tests in OIML R 50 parts 1 and 2. The words or condensed sentences aim at reminding the examiner of the requirements of R 50 parts 1 and 2 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 the test procedures (Annex A of OIML R 50 parts 1 and 2).

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 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 electromagnetic susceptibility.

All metrology services or laboratories evaluating types of continuous totalizing automatic weighing instruments according to OIML R 50 parts 1 and 2 or to national or regional regulations based on OIML R 50 parts 1 and 2 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 multi-lateral cooperation agreements. In the framework of the *OIML Certificate System for measuring instruments*, use of the "Test report format" is mandatory.

**TYPE EVALUATION REPORT**

**EXPLANATORY NOTES**

|  |  |
| --- | --- |
| **Symbols** | **Meaning** |
| I | Indication of the instrument |
| In | nth indication |
| L | Static load |
| ∆L | Additional static load to next changeover point |
| T | Totalized load (calculated for simulation tests or controlled load for Product tests) |
| WL | Weigh length |
| E | I – T |
| E % | E % = Error as percentage for simulation tests |
|  |  |
| P | P = I + 0.5 d - ΔL = Indication of the control instrument prior to rounding (digital indication) |
| d | Totalization scale interval |
| e | Scale interval for testing |
| pi | Fraction of the MPE applicable to a module of the instrument which is examined separately. |
| MPE | Maximum permissible error (absolute value) |
| EUT | Equipment under test |
| sf | Significant fault |
| Max | Maximum capacity of the instrument |
| Min | Minimum capacity of the instrument |
| Unom | Nominal voltage value marked on the instrument |
| Umax | Highest value of a voltage range marked on the instrument |
| Umin | Lowest value of a voltage range marked on the instrument |
| vmin | Minimum operating speed |
| vmax | 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 |

Note:

For simulation tests T is calculated from the simulation test equipment and is the product of the static load L and pulse count as indicated in the individual tests and test report sheet.

For Product tests T is the indication of the control instrument prior to rounding, thus for Product tests T = P.

The calculation of P is only relevant to the control instrument and the subsequent determination of T for Product tests.

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

The boxes under 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: | 2013-03-15 | 2013-04-15 | yyyy-mm-dd |
| Time: | 16:00:05 | 16:30:05 | hh:mm:ss |

where:

Temp = temperature

Rel. h = relative humidity

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

In the disturbance tests, significant faults are faults greater than the absolute value of the appropriate maximum permissible error for influence factor tests for a load equal to Σmin, for the designated class of the belt weigher.

IDENTIFICATION OF THE INSTRUMENT

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

Documentation from the manufacturer

(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*) |

GENERAL INFORMATION CONCERNING THE TYPE

|  |  |  |  |
| --- | --- | --- | --- |
| Application No.: | ..…………………..… | Manufacturer: | ..…………………..……… |
| Type designation: | ..………………….. | Applicant: | ..…………………..……… |
| Instrument category: | ..………………….. |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Testing on: |  | Complete instrument |  |  | Module ([[1]](#footnote-1)\*) |

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy class |  | 0.2 |  | 0.5 |  | 1 |  | 2 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | Qmin = | |  |  | Qmax= | | |  | Σmin = | |  |
|  |  |  | |  | |  | |  |  | |  |  | |  |
| Speed (v) = |  | m/s | | Vmin = | |  | | m/s | Vmax | |  | m/s | |  |
|  |  |  | |  | |  | |  |  | |  |  | |  |
| Max = |  |  | | d = | |  | |  | WL = | |  | m | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *U*nom(\*[[2]](#footnote-2)\*) = |  | V | *U*min = |  | V | *U*max = |  | V | f = |  | Hz | Battery, *U* = |  | V |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Zero-setting device: |  | Nonautomatic |  | Semi-automatic |  | Automatic |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Temperature range |  | °C |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Printer: |  | Built-in |  | Connected |  | Non present but connectable |  | No connection |

GENERAL INFORMATION CONCERNING THE TYPE (continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Instrument  submitted: | | …...…………………..... |  | Load sensor: | …...……………….... | |
| Identification No.: | | …...…………………. |  | Manufacturer: | …...……………….... | |
| Software version: …...……………………….......  …...……………………….......…..…..... | | |  | Type: | …...………………... | |
|  | Capacity: | …...……………... | |
| Connected equipment: …...…………………......  …...………………………......…...………... | | |  | Number: | …...………………... | |
|  | Classification symbol: | …...………………... | |
| Interfaces (number, nature): …...………………………......  …...………………………......…...…...... | | |  | OIML R 60 Certificate of conformity. Please tick and if "Yes" supply Certificate number. | Yes | No |
|  |  |
| Evaluation period: | …...…………..... | |  | Certificate number | ………………… | |
| Date of report: | …...…………..... | |  |  | …...…………….. | |
| Observer: | …...………………....... | |  |  |  | |

GENERAL INFORMATION CONCERNING THE TYPE (CONTINUED)

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

**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 equipment 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 the checklist

For each test, the "Summary of the checklist" below and the "Checklist" in section 3 shall be completed according to this example:

|  |  |  |
| --- | --- | --- |
|  | Passed | Failed |
| when the instrument has passed the test: | X |  |
| when the instrument has failed the test: |  | X |
| when the test is not applicable: | / | / |

Summary of the checklist:

|  |  |  |  |
| --- | --- | --- | --- |
| Requirement | Passed | Failed | Observations |
| Metrological requirements  R 50-1 clause 2 |  |  |  |
| Technical requirements  R 50-1 clause 3 |  |  |  |
| Additional requirements for belt weighers  R 50-1 clause 4 |  |  |  |
| Metrological controls  R 50-2 clause 5 |  |  |  |
| Performance tests |  |  |  |
| Overall result |  |  |  |

|  |
| --- |
| Summary of the checklist (Observations)  Use this page to detail observations from the summary of the checklist |

**SUMMARY OF TYPE EVALUATION TESTS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Application No.: …...……………………….. | | Type designation: …...……………………….. | | | | |
| Report date: …...……………………… | | Manufacturer: …...……………… | | | | |
| R 50-3 | Tests | | Report  page | Passed | Failed | Observations |
| **1** | **Simulation tests - simulator data** | |  |  |  |  |
| **1.1** | **Warm-up time** | |  |  |  |  |
| **1.2** | **Variation of simulation speed** | |  |  |  |  |
| **1.3** | **Eccentric loading** | |  |  |  |  |
| **1.4** | **Zero-setting device** | |  |  |  |  |
| 1.4.1 | Zero-setting (range) | |  |  |  |  |
| 1.4.2 | Zero-setting (semi-automatic and automatic) | |  |  |  |  |
| **1.5** | **Influence quantities** | |  |  |  |  |
| 1.5.1 | Static temperatures | |  |  |  |  |
| 1.5.2 | Temperature effect at zero flowrate | |  |  |  |  |
| 1.5.3 | Damp heat test: | |  |  |  |  |
| 1.5.3.1 | * damp heat, steady state test (non condensing) | |  |  |  |  |
| 1.5.3.2 | * damp heat, cyclic test (condensing) | |  |  |  |  |
| 1.5.4 | Mains voltage variation: | |  |  |  |  |
| 1.5.4.1 | * AC mains voltage variation | |  |  |  |  |
| 1.5.4.2 | * DC mains voltage variation | |  |  |  |  |
| 1.5.5 | Battery voltage variation, not mains connected (DC) | |  |  |  |  |
| **1.6** | **Disturbances** | |  |  |  |  |
| 1.6.1 | AC mains power dips, short interruptions and reductions | |  |  |  |  |
| 1.6.2 | Bursts (fast transient tests) on mains power lines and on signal, data and control lines | |  |  |  |  |
| 1.6.2.1 | * mains power supply lines | |  |  |  |  |
| 1.6.2.2 | * signal, data and control lines | |  |  |  |  |
| 1.6.3 | Surges on AC and DC mains power lines and on signal, data and control lines | |  |  |  |  |
| 1.6.3.1 | * AC and DC mains power lines | |  |  |  |  |
| 1.6.3.2 | * signal, data and control lines | |  |  |  |  |
| 1.6.4 | Electrostatic discharge test | |  |  |  |  |
| 1.6.4.1 | * direct application | |  |  |  |  |
| 1.6.4.2 | * indirect application | |  |  |  |  |
| 1.6.5 | Immunity to electromagnetic fields | |  |  |  |  |
| 1.6.5.1 | * immunity to radiated electromagnetic fields | |  |  |  |  |
| 1.6.5.2 | * immunity to conducted electromagnetic fields | |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R 50-3 | Tests | Report  page | Passed | Failed | Observations |
| **1.7** | **Metrological characteristics** |  |  |  |  |
| 1.7.1 | Repeatability |  |  |  |  |
| 1.7.2 | Discrimination of the totalization indicating device |  |  |  |  |
| 1.7.3 | Discrimination of the totalization indicating device used for zero totalization |  |  |  |  |
| 1.7.4 | Short- and long-term stability of zero |  |  |  |  |
| 1.8 | In-situ tests |  |  |  |  |
| 1.8.1 | Maximum permissible errors on checking of zero, or maximum variation during zero load test (depending on ratio rev/Σmin) |  |  |  |  |
| 1.8.2 | Discrimination of the indicator used for zero- setting |  |  |  |  |
| 2 | In-situ product tests (fixed and all other speed belt weighers) |  |  |  |  |
| 2.1 | Accuracy of control instrument |  |  |  |  |
| 2.2 | Repeatability: |  |  |  |  |
|  | * MPE for type evaluation |  |  |  |  |
|  | * MPE for initial verification and in-service inspection. |  |  |  |  |

**1 Simulation tests (R 50-2, 6.3 & A.5.4)**

Simulator test data

|  |  |
| --- | --- |
| Application No.:…………………… | Type designation: …...……………… |
| Report date:………………………. | Observer:………………………………… |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data | Derivation | Ref | Value | Units |
| Maximum flowrate | Max at maximum speed | Qmax |  |  |
| Totalization scale interval |  | d |  |  |
| Zero-setting scale interval |  |  |  |  |
| Simulator resolution(\*) | | d |  |  |
| Max load receptor capacity | To obtain Qmax | Max |  |  |
| Weigh length |  | WL |  | m |
| Pulses per weigh length |  |  |  |  |
| Nominal speed or  Range of speeds |  | v = .. |  | m/s |
|  |  | v = ../.. |  | m/s |
| (\*\*) |  |  |  |  |

(\*) Where:

Simulator resolution "d" is obtained in line with A.7.1 and/or A.3.7 in R 50-1 & -2. Whichever means are used, they should be noted below in description of simulator.

(\*\*) Insert other relevant data as necessary.

Detailed formula for calculating totalized load for simulation tests:



T =

DESCRIPTION OF SIMULATOR:

(Must include details of any differences from installed instruments)

* 1. **Warm-up time (R 50-1, 4.5.3 and A.5.2)**

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

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

Automatic zero-setting:

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Load receptor load  % Max as defined in R 50‑1, 2.5 | Time  (\*) | Pulses  (\*\*) | Calculated  totalization  T(\*\*\*) | Indicated  totalization  I | Error E %  (\*\*\*\*) |
|  | | | | | |
| Min load (nominally 20 % of Max) | 0 min |  |  |  |  |
| Max capacity (Max) |  |  |  |  |  |
|  | | | | | |
| Min load (nominally 20 % of Max) |  |  |  |  |  |
| Max capacity (Max) |  |  |  |  |  |
|  | | | | | |
| Min load (nominally 20 % of Max) |  |  |  |  |  |
| Max capacity (Max) |  |  |  |  |  |
|  | | | | | |
| Min load (nominally 20 % of Max) | 30 min |  |  |  |  |
| Max capacity (Max) |  |  |  |  |  |

(\*) Counted from the moment an indication first appears.

(\*\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**1.2 Variation of simulation speed (R 50-1, 2.7.1 & A.5.4.1)**

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

Belt speed or speed range = v.... m/s or = v..../...m/s

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Load L  ( ) | Speed  m/s | Flowrate  ( /h) | Revolutions  (\*) or  pulses(\*\*)  ( ) | Calculated  totalization  T(\*\*\*)  ( ) | Indicated  totalization  I | Difference  I - T  ( ) | Error  E %(\*\*\*\*) |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| (\*) “Revolutions" are the integral number of simulated belt revolutions  (\*\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement  (\*\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula  (\*\*\*\*) See the “Explanatory notes” section for the E % calculation formula | | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1**1.3 Eccentric loading (R 50-1, 2.7.2 & A.5.4.2)**

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

Location of test loads:

1

Provide the following information:

for a load equal to half Max, totalization (Σmin) (expressed as number of "d") is either

• equal to .... d or,

• 5 times the appropriate value in R 50-1, 2.4 Table 3, .... d

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Band 1 |  |  |  |  |  |  |
| Band 2 |  |  |  |  |  |  |
| Band 3 |  |  |  |  |  |  |
| (\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement  (\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula  (\*\*\*) See the “Explanatory notes” section for the E % calculation formula | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1**1.4 Zero-setting device (R 50-1, 3.5)**

1.4.1 Zero-setting (range) (R 50-1, **2.7.3,** 3.5.1 & A.5.4.3)

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Positive portion L1 | | Negative portion L2 | | Zero-setting range  L1 + L2 |
| Weight added | Re-zero  Yes/No | Weight removed | Re-zero  Yes/No |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Where:

L1 is the maximum load that can be re-zeroed (positive portion)

L2 is the maximum load that can be removed while the instrument can still be re-zeroed (negative portion)

Check: L1 + L2 ≤ 4 % of Max

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.4.2 Zero-setting (semi-automatic and automatic) (R 50-1, 3.5.1 & A.5.4.4)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| L1 |  |  |  |  |  |  |
| L2 |  |  |  |  |  |  |
| L3 |  |  |  |  |  |  |
| L4 |  |  |  |  |  |  |
| (\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement  (\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula  (\*\*\*) See the “Explanatory notes” section for the E % calculation formula | | | | | | |

Where:

L1 = 50 % of positive zero-setting range

L2 = 100 % of positive zero-setting range

L3 = -50 % of negative zero-setting

L4 = -100 % of negative zero-setting

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**1.5 Influence quantities (R 50-1, 2.7.4 & A.7)**

1.5.1 Static temperatures (R 50-1, 2.7.4.1 & A.7.2.1)

|  |  |
| --- | --- |
| Application No.: ................................ | Type designation: ................................ |
|  | Observer: ................................ |
| Resolution during test:  (smaller than d) .............................. |  |

Confirm automatic zero-setting device is:

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |
| Qintermediate |  |  |  |
| Qmin |  |  |  |

Test results (Note at each "Q" the test is repeated)

Test 1 - Static temperature 20 °C

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmin |  |  |  |  |  |  |
|  |  |  |  |
| Qintermediate |  |  |  |  |  |  |
|  |  |  |  |
| Qmax |  |  |  |  |  |  |
|  |  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula 1.5.1 Static temperatures (continued)

Test 2 - Static temperature specified high ( °C)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmin |  |  |  |  |  |  |
|  |  |  |  |
| Qintermediate |  |  |  |  |  |  |
|  |  |  |  |
| Qmax |  |  |  |  |  |  |
|  |  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

Test 3 - Static temperature specified low ( °C)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmin |  |  |  |  |  |  |
|  |  |  |  |
| Qintermediate |  |  |  |  |  |  |
|  |  |  |  |
| Qmax |  |  |  |  |  |  |
|  |  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

1.5.1 Static temperatures (continued)

Test 4 - Static temperature 5 °C

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmin |  |  |  |  |  |  |
|  |  |  |  |
| Qintermediate |  |  |  |  |  |  |
|  |  |  |  |
| Qmax |  |  |  |  |  |  |
|  |  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

Test 5 - Static temperature 20 °C

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmin |  |  |  |  |  |  |
|  |  |  |  |
| Qintermediate |  |  |  |  |  |  |
|  |  |  |  |
| Qmax |  |  |  |  |  |  |
|  |  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.11.5.2 Temperature effect on no load or zero flowrate (R 50-1, 2.7.4.2 & A.7.2.2)

|  |  |
| --- | --- |
| Application No.: ................................ | Type designation: ................................ |
|  | Observer: ................................ |
| Resolution during test:  (smaller than d) .............................. |  |

Confirm automatic zero-setting device is:

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

Temperature at start specified minimum ( ) °C

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

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Temp  °C | Pulses | Indicated  totalization  I at start  ( ) | Indicated  totalization  I at end  ( ) | Change in indication  ( ) |  | Report  page  ([[3]](#footnote-3)\*) | Date | Time |
| Start temp |  |  |  |  |  |  |  |  |  |
| End temp |  |  |  |  |  |  |  |  |  |
| Start temp |  |  |  |  |  |  |  |  |  |
| End temp |  |  |  |  |  |  |  |  |  |
| Start temp |  |  |  |  |  |  |  |  |  |
| End temp |  |  |  |  |  |  |  |  |  |
| Start temp |  |  |  |  |  |  |  |  |  |
| End temp |  |  |  |  |  |  |  |  |  |
| Start temp |  |  |  |  |  |  |  |  |  |
| End temp |  |  |  |  |  |  |  |  |  |

Where:

temp = temperature

The rate of temperature change between totalizations shall not to exceed 5 °C per hour.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.11.5.3 Damp heat (R 50-1, 4.1.1, 4.1.2, 4.5.1 & A.7.2.3)

Damp heat tests are performed alternatively in accordance with R50-1, 4.5.1, the option chosen recorded in 1.5.3.1 or 1.5.3.2 below accordingly.

1.5.3.1 Damp heat, steady state (non condensing) (R 50-1, 4.5.1 & A.7.2.3.1)

|  |  |
| --- | --- |
| Application No.: ................................ | Type designation: ................................ |
|  | Observer: ................................ |
| Resolution during test:  (smaller than d) .............................. |  |

Automatic zero-setting device is:

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |
| Qintermediate |  |  |  |
| Qmin |  |  |  |

Test results (note at each "Q" the test is repeated)

Initial test at reference temperature of 20 °C and relative humidity of 50 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

1.5.3.1 Damp heat, steady state (non condensing) (continued)

Test at specified high temperature ( °C), relative humidity 85 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

Final test at reference temperature 20 °C, relative humidity 50 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.5.3.2 Damp heat, cyclic (condensing) (R 50-1, 4.1.1, 4.1.2 & A.7.2.3.2)

|  |  |
| --- | --- |
| Application No.: ................................ | Type designation: ................................ |
|  | Observer: ................................ |
| Resolution during test:  (smaller than d) .............................. |  |

Automatic zero-setting device is:

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |
| Qintermediate |  |  |  |
| Qmin |  |  |  |

Test results (note at each "Q" the test is repeated)

Test at reference temperature and relative humidity above 95 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

Test at temperature rise and relative humidity above 95 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

Test at upper temperature and relative humidity of 93 %

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |
|  |  |  |
| Qmin |  |  |  |  |  |  |
|  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.5.4 Mains voltage variation (R 50-1, 2.7.4.3 & 4.5.4)

1.5.4.1 AC mains voltage variation (A.7.2.4)

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

Automatic zero-setting device is:

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

|  |  |  |
| --- | --- | --- |
| Marked nominal voltage, Unom, or voltage range [[4]](#footnote-4)(±): |  | V |

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

Test 1 at reference voltage ([[5]](#footnote-5)\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

Test 2 at reference voltage 0.85 x *U*nom or 0.85 x *U*min

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

1.5.4 Mains voltage variation (AC) (continued)

Test 3 at reference voltage 1.10 x *U*nom or 1.10 x *U*max

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

Test 4 at reference voltage ([[6]](#footnote-6)\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E % (\*\*\*) |
| Qmax |  |  |  |  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.5.4.2 DC mains voltage variation (A.7.2.5)

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

Automatic zero-setting device is:

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

|  |  |  |
| --- | --- | --- |
| Marked nominal voltage, Unom, or voltage range [[7]](#footnote-7)(±): |  | V |

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

Test 1 at reference voltage ([[8]](#footnote-8)\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

Test 2 at reference voltage: 1.20 x *U*nom or 1.20 x *U*max

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

Test 3 at minimum operating voltage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

1.5.4.2 DC mains voltage variation (continued)

Test 4 at reference voltage ([[9]](#footnote-9)\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses  (\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.5.5 Battery voltage variation, not mains connected (DC) (R 50-1, 2.7.4.3, 4.5.5 & A.7.2.6)

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

Automatic zero-setting device is:

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

|  |  |  |
| --- | --- | --- |
| Marked voltage: [[10]](#footnote-10)(±) |  | V |

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

Test 1 at reference voltageUnom ([[11]](#footnote-11)\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

Test 2 at minimum operating voltage[[12]](#footnote-12)(\*\*)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Q  ( /h) | Load L  ( ) | Pulses(\*) | Calculated  totalization  T(\*\*)  ( ) | Indicated  totalization  I  ( ) | Difference  I - T  ( ) | E %(\*\*\*) |
| Qmax |  |  |  |  |  |  |

(\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement

(\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula

(\*\*\*) See the “Explanatory notes” section for the E % calculation formula

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**1.6 Disturbances (R 50-1, 4.5.2 & A.7.3)**

1.6.1 AC mains voltage dips, short interruptions and reductions (R 50-1, 4.5.2 & A.7.3.1)

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

Pre-test information

|  |  |  |
| --- | --- | --- |
| Marked nominal voltage Unom or voltage range [[13]](#footnote-13)(±): |  | V |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Disturbance | | | | | Result | | |
| Amplitude  % of Unom([[14]](#footnote-14)\*) | Duration  cycles | Number of  disturbances | Repetition  interval | Pulses | Indication  I | Significant fault or detection and reaction | |
| No | Yes (Observations) |
|  | without disturbance | | | |  |  |  |
| 0 | 0.5 | 10 |  |  |  |  |  |
| 0 | 1 | 10 |  |  |  |  |  |
| 40 | 10 | 10 |  |  |  |  |  |
| 70 | 25/30[[15]](#footnote-15) | 10 |  |  |  |  |  |
| 80 | 250/300† | 10 |  |  |  |  |  |
| 0 | 250/300† | 10 |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.2 Bursts (fast transient tests) on mains power lines and on signal, data and control lines (R

50-1, 4.5.2 & A.7.3.2)

1.6.2.1 Bursts on AC and DC mains power lines

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

Pre-test information

|  |  |
| --- | --- |
| Kind or type of voltage supply |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | DC |  | Other form |  | Voltage |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

Power supply lines: test voltage 2.0 kV, duration of the test 1 min at each polarity

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Connection | | | Polarity |  |  |  | |
| L | N | PE |  | Pulses | Indicated  totalization  I  ( ) | Significant  Fault (Observations) | |
| ↓  ground | ↓  ground | ↓  ground |  |  |  | No | Yes |
| without disturbance | | | |  |  |  |  |
| X |  |  | pos |  |  |  |  |
|  |  |  | neg |  |  |  |  |
| without disturbance | | | |  |  |  |  |
|  | X |  | pos |  |  |  |  |
|  |  |  | neg |  |  |  |  |
| without disturbance | | | |  |  |  |  |
|  |  | X | pos |  |  |  |  |
|  |  |  | neg |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.2 Bursts (fast transient tests) on mains power lines and on signal, data and control lines

1.6.2.2 Bursts on signal, data and control lines

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

I/O signals, data and control lines: test voltage 1.0 kV, duration of the test 1 min at each polarity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cable/interface | Polarity | Pulses | Indicated  Totalization I  ( ) | Significant  Fault  (Observations) | |
| No | Yes |
| 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, use an additional page.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

### 1.6.3 Surges on AC and DC mains power lines and on signal, data and control lines (R 50-1, 4.5.2 & A.7.3.3)

1.6.3.1 Surges on AC and DC mains power lines

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

|  |  |
| --- | --- |
| Kind or type of power supply |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | DC |  | Other form |  | Voltage |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Load  L | Disturbance | | Result | | |
| 3 positive and 3 negative surges  (for each of the angles 0°, 90°, 180° and 270° in case of AC supply). | | Indication  I | Significant fault  or detection and reaction | |
| Amplitude / apply on | Polarity | No | Yes (Observations) |
|  | without disturbance | |  |  |  |
|  | 1.0 kV  Line  ↓  neutral | pos |  |  |  |
|  | neg |  |  |  |
|  | without disturbance | |  |  |  |
|  | 2.0 kV  Line  ↓  protective earth | pos |  |  |  |
|  | neg |  |  |  |
|  | without disturbance | |  |  |  |
|  | 2.0 kV  Neutral  ↓  protective earth | pos |  |  |  |
|  | neg |  |  |  |

Use another page for additional test set-up information.

Note: If significant faults are detected and acted upon, or if the EUT fails, the test point at which this occurs shall be recorded.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.3 Surges on AC and DC mains power lines and on signal, data and control lines (R 50-1, 4.5.2

& A.7.3.3) (continued)

1.6.3.2 Surges on signal, data and control lines

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

Signal and communication lines: test voltage 1.0 kV, 3 positive and 3 negative surges

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Cable/Interface | Polarity | Result | | | |
| Load | Indication  I | Significant fault | |
| No | Yes (Observations) |
| 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 |  |  |  |  |

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

(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.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.4 Electrostatic discharge test (R 50-1, 4.5.2 & A.7.3.4)

1.6.4.1 Direct application

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Contact discharge |  | Paint penetration |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Air discharge | Polarity ([[16]](#footnote-17)\*): |  | pos |  | neg |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Discharges | | | Pulses | Indicated  totalization  I  ( ) | Significant  fault  (Observations) | |
| Test  voltage  (kV) | Number of  discharges  ≥ 10 | Repetition  interval  (s) |  |  | No | Yes |
| 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 |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.4 Electrostatic discharge test (continued)

1.6.4.2 Indirect application (contact discharges only)

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

Pre-test information

|  |  |  |  |
| --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |
| Qmax |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Polarity ([[17]](#footnote-18)\*): |  | pos |  | neg |

Horizontal coupling plane

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Load L  ( ) | Discharges | | |  | Significant Fault (Observations) | |
|  | Test  voltage  (kV) | Number of  discharges  ≥ 10 | Repetition  interval  (s) | Indicated  totalization  I | No | Yes |
|  | without disturbance | | |  |  |  |
|  | 2 |  |  |  |  |  |
|  | 4 |  |  |  |  |  |
|  | 6 |  |  |  |  |  |

Vertical coupling plane

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Load L  ( ) | Discharges | | |  | Significant Fault (Observations) | |
|  | Test  voltage  (kV) | Number of  discharges  ≥ 10 | Repetition  interval  (s) | Indicated  totalization  I | No | Yes |
|  | without disturbance | | |  |  |  |
| 2 |  |  |  |  |  |
|  | 4 |  |  |  |  |  |
|  | 6 |  |  |  |  |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.4 Electrostatic discharge test (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

1.6.5 Immunity to electromagnetic fields (R 50-1, 4.5.2 & A.7.3.5)

1.6.5.1 Immunity to radiated electromagnetic fields (4.5.2, A.7.3.5.1)

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pre-test information | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |  |  |
| Qmax |  |  |  | Rate of sweep: |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Disturbance | | | | | Result | |  | Significant fault  (Observations)  Yes | |
| Test facility | Frequency  range (MHz) | | Polarization | Facing  EUT | Pulses | Indication | | No | Yes |
| 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 (\*) to 2000 | MHz |
| Field strength | : | 10 | V/m |
| Modulation | : | 80 % AM, 1 kHz, sine wave |  |
| (\*) For instruments having no mains or other I/O ports available so that the conducted test according to A.7.3.5.2 cannot be applied, the lower limit of the radiation test is 26 MHz | | | |

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.6.5 Immunity to electromagnetic fields (R 50-1, 4.5.2 & A.7.3.5) (continued)

1.6.5.2 Immunity to conducted electromagnetic fields (4.5.2, A.7.3.5.2)

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

Pre-test information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Flowrate  ( /h) | Equivalent  pulses for Σmin | Static load (L) for Σmin  ( ) |  |  |
| Qmax |  |  |  | Rate of sweep: |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Disturbance | | | Result | | |
| Frequency Range (MHz) | Cable / Interface | Level  (Volts RMS) | Indication  I | Significant fault | |
|  | No | Yes (Observations) |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |
| without disturbance | | |  |  |  |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Test severity; | | | |
| Frequency range | : | 0.15 – 80 | MHz |
| Repetition interval | : | 10 | V (e.m.f.) |
|  | : | 80 % AM, 1 kHz, sine wave |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**1.7 Metrological characteristics (R 50-1, 2.7.5 & A.8)**

1.7.1 Repeatability (R 50-1, 2.7.5.1 & A.8.1)

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

Pre-test information

|  |  |
| --- | --- |
| Equivalent  pulses for Σmin at L | Static load (L)  ( ) |
|  | 20 % Max = |
|  | 50 % Max = |
|  | 75 % Max = |
|  | Max = |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Load L | Pulses(\*) | T(\*\*) | Indicated total | | Difference  I1 - I2 |
|  |  |  | Run 1 I1 | Run 2 I2 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| (\*) The pulses sent by the displacement transducer (or simulator) to simulate belt movement  (\*\*) See the Simulation page in section 1 for the simulated totalization calculation formula | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.7.2 Discrimination of the totalization indicating device (R 50-1, 2.7.5.2 & A.8.2)

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

Pre-test information

|  |  |
| --- | --- |
| Equivalent  pulses for Σmin at L | Static load (L)  ( ) |
|  | 20 % Max = |
|  | 50 % Max = |
|  | 75 % Max = |
|  | Max = |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| load  L1 | Pulses | Additional load  L2 | Pulses | Calculated totalized load | | Indicated totalized load | | Difference  (I2 - I1) |
|  |  |  |  | T1 | T2 | I1 | I2 |  |
| 20 % Max = |  |  |  |  |  |  |  |  |
| 50 % Max = |  |  |  |  |  |  |  |  |
| 75 % Max = |  |  |  |  |  |  |  |  |
| Max = |  |  |  |  |  |  |  |  |

Where:

L1 = load



"Pulses" are the number of pulses sent by the displacement transducer (or simulator) to simulate belt movement



|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.7.3 Discrimination of the totalization indicating device used for zero totalization

(R 50-1, 2.7.5.3 & A.8.3)

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

Test duration = 3 minutes, equivalent pulses =

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test | Initial total  T1  ( ) | Pulses | Final total  T2  ( ) | Pulses | Difference  T1 - T2  ( ) |
| Weight added | | | | | |
| 1 |  |  |  |  |  |
| 2+ |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4+ |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6+ |  |  |  |  |  |
| Weight removed | | | | | |
| 7+ |  |  |  |  |  |
| 8 |  |  |  |  |  |
| 9+ |  |  |  |  |  |
| 10 |  |  |  |  |  |
| 11+ |  |  |  |  |  |
| 12 |  |  |  |  |  |

Where:

+ indicates presence of test weight on the load receptor

Test weight 

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.7.4 Short- and long-term stability of zero (R 50-1, 2.7.5.4 & A.8.4)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Elapsed  time in min | ZTID  indication | Load totalized in 3 min |  | Elapsed time in min | ZTID indication | Load  totalized  in 3 min |
| 0 |  |  |  | 195 |  |  |
| 3 |  |  |  | 198 |  |  |
| 6 |  |  |  | 201 |  |  |
| 9 |  |  |  | 204 |  |  |
| 12 |  |  |  | 207 |  |  |
| 15 |  |  |  | 210 |  |  |
|  |  |  |  |  |  |  |

Where ZTID = Zero totalization indicating device

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requirement (R50 -1 & -2, 2.7.5.4.1) | class 0.2: 0.0005% | class 0.5: 0.00125% | class 1: 0.0025% | class 2: 0.005% |
| Difference between the highest and lowest indicated values obtained in the set of the six readings from 0 minute to 15 minutes = |  |  |  |  |
| Difference between the highest and lowest indicated values obtained in the set of the six readings from 195 minutes to 210 minutes = |  |  |  |  |
| Requirement (R 50-1 & -2, 2.7.5.4.2) | class 0.2: 0.0007% | class 0.5: 0.001.75 | class 1: 0.003.5% | class 2: 0.007% |
| Difference between the highest and lowest indicated values obtained in the set of the twelve readings from 0 minute to 210 minutes = |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**1.8 In-situ tests (R 50-2, 5.2.2.1)**

|  |  |  |
| --- | --- | --- |
| Location details: |  |  |
| In-situ data: |  |  |
|  |  |  |
|  |  |  |
| Application No.: |  |  |
| Type designation: |  |  |
| Observer: |  |  |
| Date: |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data | Derivation | Data  Ref. | Value | Units |
| Totalization scale interval |  | d |  |  |
| Scale interval for zero-setting | From the device used for zero indication |  |  |  |
| Maximum capacity | Maximum net load of the load receptor | Max |  |  |
| Belt speed | Maximum speed | Vmax |  | m/s |
|  | Minimum speed | Vmin |  | m/s |
| Maximum flowrate | Max x Vmax | Qmax |  | kg/h or t/h |
| Minimum flowrate | Normally 20 % of Qmax, but > 35 % of Qmax | Qmin |  | kg/h or t/h |
| Weigh length |  | WL |  | m |
| Length of belt |  | B |  | m |
| Time per belt revolution | Minimum = B/Vmax |  |  | s |
|  | Maximum = B/Vmin |  |  | s |
| Load for one belt revolution at Qmax | 1 | (1) |  | kg or t |
| 2 % of the load at Qmax for 1 hour | 0.02 × load at Qmax | (2) |  | kg or t |
| Table 3 (R 50-1) | 2 | (3) |  | kg or t |
| Minimum totalized load (Σmin) | Largest of (1), (2) and (3) | Σmin |  | kg or t |
| Minimum test load (Σt) | = Σmin unless all totalizations are over whole belt revolutions, then  Σt = largest of (2) and (3) | Σt |  | kg or t |
| \* |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

\* Insert other relevant data as necessary.

|  |
| --- |
| COMMENTS ON SITE CONDITIONS (e.g. environmental protection of belt weigher, weather conditions, Product weighed): |

1.8.1 Maximum permissible errors on checking of zero (R 50-1, 2.8.2 & A.9.1 or A.9.1.2) and, where Σmin is equal to or less than 3 belt revolutions at Qmax

Maximum variation during zero-load test (R 50-1, 2.8.4 & A.9.1.2)

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

Note:

When Σmin is equal to or less than 3 belt revolutions at Qmax use the indication from the totalization indicator and tick this box.

|  |
| --- |
|  |

In all other cases the indication shall be from the indication device used for zero setting (tick this box).

|  |
| --- |
|  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test No. | Belt  revolutions | Duration  (s) | Initial  indication  I1 | Final  indication  I2 | Difference  I2 - I1 |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |

Where a separate zero (test) totalization indication device (ZTID) is provided and Σmin is equal to or less than 3 belt revolutions at Qmax then the following table should also be completed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test No. | Initial  indication  I1 | Maximum  indication  Imax | Minimum  indication  Imin | │I1 - Imax│  (A) | │I1 - Imin│  (B) | Greater of  (A) or (B) |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

1.8.2 Discrimination of the indicator used for zero-setting (R 50-1, 2.8.3 & A.9.1.1)

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test | Load LD  ( ) | Revs | Duration  ( ) | Indication | | Difference  I1 - I2 |
|  |  |  |  | I1 | I2 |  |
| A |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| A |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| A |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| A |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Where:

Revs is revolution of the belt

LD is discrimination = 

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**2 In-situ product tests (R 50-1 and 2, 2.8, 5.2.2.1, 6.1, & A.10)**

2.1 Accuracy of control instrument (R 50-2, 5.2.2.1 & A.10.1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Application No.: ...................................... |  | At start | At end |  |
| Type designation: ................................... | Temp: |  |  | °C |
| Scale interval, d: ................................... | Rel. h: |  |  | % |
| Maximum capacity: ................................... | Date: Date: |  |  | yyyy-mm-dd |
| Minimum capacity: ................................... | Time: Time: |  |  | hh:mm:ss |
| Observer: ................................... |  |  |  |  |
| Resolution during test:  (smaller than d) ................................ | | | | |

Control instrument details: Belt weigher details:

Type .......................... Σmin ..............................

Class ......................... Σt (if different)..................

Max capacity .................. Where Σt is the minimum test load defined in R 50-1, 2.4.

Min capacity ..................

Control instrument scale interval, dc ............

Approval No.: ................... Transfer vehicle: ..................

Date of last test ............. Capacity: ..........................

REQUIREMENT:

The control method used for product tests shall enable determination of the weight of the product used for testing with an error not exceeding one-third of the appropriate MPE for automatic weighing in R 50‑1, 2.2.1.

Example: Number of weighings on control instrument 

(One gross, one tare for each load)

Number of scale intervals for one 

Possible control instrument error 

(Class III) per weighing

Requirement 

where  is an adjustment for the probable error of N partial weighings.

The metrological authority may want to take into consideration other factors such as journey distance, weather, product loss on route, etc.2.2 Repeatability (R 50-1, 2.8.1 & A.10.3.1)

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

Note:

For multi-speed or variable-speed belt weighers the tests should be repeated as indicated in R 50-2, A.10.3.2 & A.10.3.3. A continuation test sheet is provided overleaf.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test pair | Controlled  load  T | Indication  I  ( ) | Feed  flowrate  ( /h) | Error  I - T  ( ) | Relative  error  % | Relative  error  difference  % |
| 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Note: To be used to determine the following:

MPE for type evaluation (R 50-2, 5.1.3.1 & A.10.3.2);

MPE for initial verification and in-service inspection (R 50 -1 & -2, 5.2.2.1).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

Continuation test sheet

Speed = m/s

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test pair | Controlled  load  T | Indication  I  ( ) | Feed  flowrate  ( /h) | Error  I - T  ( ) | Relative  error  % | Relative  error  difference  % |
| 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Speed = m/s

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test pair | Controlled  load  T | Indication  I  ( ) | Feed  flowrate  ( /h) | Error  I - T  ( ) | Relative  error  % | Relative  error  difference  % |
| 1 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Passed |  | Failed |

Observations:

Include information that affect the test condition, as indicated in the last paragraph of R 50-1 & -2, A.7.1

**3. CHECKLIST**

|  |  |
| --- | --- |
| Application No.: ................................ | Type designation: ................................ |

| **R 50-1,-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations[[18]](#footnote-19)** |
| --- | --- | --- | --- | --- | --- | --- |
| **2** |  | **METROLOGICAL REQUIREMENTS** |  |  |  |  |
| 2.2 |  | Maximum permissible errors |  |  |  |  |
| 2.2.1 | A.10.3 | Maximum permissible errors for automatic weighing: do not exceed values in Table 1 (R 50‑1) rounded to nearest d |  |  |  |  |
| 2.2.2 | A.7 | Maximum permissible errors for influence factor tests shall not exceed the values in R 50‑1 & 2, Table 2 rounded to nearest d |  |  |  |  |
| 2.3 | Observe | Agreement between multiple indicating devices | | | | |
|  |  | * no difference between results |  |  |  |  |
| 2.4 | Observe | Minimum value of minimum totalized load (Σmin) ≥ largest of the following: | | | | |
|  |  | 1. 2 % of load totalized in 1 hour at max flowrate | Confirm | |  |  |
|  |  | 1. the load obtained at maximum flowrate in one revolution of the belt. | Confirm | |  |  |
|  |  | 1. load corresponding to the appropriate number of totalization scale intervals in Table 3 (R 50‑1). | Confirm | |  |  |
| 2.5 |  | Minimum flowrate: |  |  |  |  |
|  | Observe | single speed belt weighers:  General Qmin = 20 % of Qmax |  |  |  |  |
|  |  | Particular installation : Qmin ≤ 35 % of Qmax |  |  |  |  |
|  |  | Variable and multi-speed belt weighers: Qmin may be less than 20 % of Qmax and minimum instantaneous net load ≥ 20 % of Max |  |  |  |  |
| 2.6 | Observe | The units of mass used on a belt weigher are: gram (g), kilogram (kg) and tonne (t) |  |  |  |  |
|  |  | The mass flow rate units to be used are: gram per hour (g/h); kilogram per hour (kg/h) and tonne per hour (t/h) |  |  |  |  |
| 2.7.1 |  | Verify compliance using simulation: |  |  |  |  |
| 2.7.1 | A.5.4.1 | Variation of simulation speed: errors do not exceed MPEs for influence factor tests in R 50-1 & 2, 2.2.2. |  |  |  |  |
| 2.7.2 | A.5.4.2 | Eccentric loading: errors do not exceed values in R 50-1 & 2, 2.2.2 |  |  |  |  |
| 2.7.3 | A.5.4.4 | Zero-setting: totalization error does not exceed influence factor MPE in R 50-1 & 2, 2.2.2. |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 2.7.4 | A.7.2 | Influence quantities |  |  |  |  |
| 2.7.4.1 | A.7.2.1 | Static temperatures |  |  |  |  |
| 2.7.4.2 | A.7.2.2 | Temperature effect at zero flowrate: error is not more than specified in 2.7.4.2 (R 50-1) |  |  |  |  |
| 2.7.4.3 | A.7.2.4 | Mains voltage(AC) |  |  |  |  |
| 2.7.4.4 | A.7.2.5 | Mains voltage (DC) |  |  |  |  |
| 2.7.4.4 | A.7.2.6 | Battery voltage (not main connected) |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2.7.5 |  | Metrological characteristics |  |  |  |  |
| 2.7.5.1 | A.8.1 | Repeatability: difference between 2 results obtained for the same load ≤ absolute value of MPE for influence factor tests in 2.2.2 (R 50-1) |  |  |  |  |
| 2.7.5.2 | A.8.2 | Discrimination of the totalization indicating device: error is not more than specified in 2.8.3 (R 50-1) |  |  |  |  |
| 2.7.5.3 | A.8.3 | Discrimination of the totalization indicating device used for zero totalization: visible differences between indications obtained at no load and for a load either deposited on or removed from the load receptor, equal to the following percentages of the maximum capacity: | | | | |
|  |  | 1. 0.02 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.05 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.1 % for class 1 |  |  |  |  |
|  |  | 1. 0.2 % for class 2 |  |  |  |  |
| 2.7.5.4 | A.8.4 | Stability of zero: | | | | |
| 2.7.5.4.1 |  | Difference between the highest and lowest indicated values obtained in the set of the six readings from 0 minute to 15 minutes: | | | | |
|  |  | 1. 0.00005 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.00125 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.0025 % for class 1 |  |  |  |  |
|  |  | 1. 0.005 % for class 2 |  |  |  |  |
|  |  | Difference between the highest and lowest indicated values obtained in the set of the six readings from 195 minutes to 210 minutes | | | | |
|  |  | 1. 0.00005 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.00125 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.0025 % for class 1 |  |  |  |  |
|  |  | 1. 0.005 % for class 2 |  |  |  |  |
| 2.7.5.4.2 |  | Difference between the highest and lowest indicated values obtained in the set of the twelve readings from 0 minute to 210 minutes = |  |  |  |  |
|  |  | 1. 0.00007 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.00175 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.0035 % for class 1 |  |  |  |  |
|  |  | 1. 0.007 % for class 2 |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 2.8 |  | In-situ method |  |  |  |  |
| 2.8.1 | A.10.3 | Repeatability: difference between relative errors shall not exceed the absolute value of the appropriate MPE for automatic weighing in 2.2.1 (R 50-1). |  |  |  |  |
| 2.8.2 | A.9.1 | Maximum permissible errors on checking of zero: variations of the indication of zero do not exceed the following percentage of the load totalized at max flowrate for the duration of the test: | | | | |
|  |  | 1. 0.02 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.05 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.1 % for class 1 |  |  |  |  |
|  |  | 1. 0.2 % for class 2 |  |  |  |  |
| 2.8.3 | A.9.1.1 | Discrimination of the indicator used for zero-setting: there must be a visible difference between indications obtained at no load and for a load (deposited on or removed from the load receptor) equal to: | | | | |
|  |  | 1. 0.02 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.05 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.1 % for class 1 |  |  |  |  |
|  |  | 1. 0.2 % for class 2 |  |  |  |  |

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| 2.8.4 | A.9.1.2 | Maximum variation during zero-load test: the totalization indicator shall not vary from the initial indicated value by more than the following percentage of the load totalized at Qmax for the duration of the test when Σmin is less than 3 belt revolutions at Qmax: | | | | |
|  |  | 1. 0.07 % for class 0.2 |  |  |  |  |
|  |  | 1. 0.175 % for class 0.5 |  |  |  |  |
|  |  | 1. 0.35 % for class 1 |  |  |  |  |
|  |  | 1. 0.7 % for class 2 |  |  |  |  |
| 2.8.5 | Observe | Indication over whole belt revolution (minimum load): |  |  |  |  |
|  |  | 1. include a means of permitting all test load readings to be obtained over a whole number of belt revolutions |  |  |  |  |
|  |  | 1. where such a facility is present it meets the requirements in R50-1, 3.6 (b), and for material tests complies with 2.4(a) and (c) only |  |  |  |  |
| 2.8.6 | 5 | The durability error due to wear and tear, or the decay of the properties of electronic components shall not be greater than the absolute value of the maximum permissible error for automatic weighing 2.2.2 (R50-1). |  |  |  |  |
| **3** |  | **Technical requirements** |  |  |  |  |
| 3.1 | Observe | Suitability for use: |  |  |  |  |
|  |  | 1. Instrument suits method of operation |  |  |  |  |
|  |  | 1. Instrument suits products |  |  |  |  |
|  |  | 1. Instrument suits accuracy class |  |  |  |  |
| 3.2 | Observe | Rated operating conditions: instrument does not exceed the MPE. |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.3 | Observe | Security of operation: |  |  |  |  |
| 3.3.1 | A.6.2 | 1. accidental maladjustment: effect is obvious, |  |  |  |  |
|  |  | 1. adjustable components that can disturb the metrological performance of a belt weigher are held securely and the position of the component is accurately and permanently defined, and |  |  |  |  |
| 3.3.2 |  | 1. operational adjustment: it is not possible for general totalization indicating device to be reset to zero, |  |  |  |  |
|  |  | 1. it is not possible to make operating adjustments or to reset other trade indicating devices during an automatic weighing operation. |  |  |  |  |
| 3.3.3 | Observe | Fraudulent use: no characteristics likely to facilitate fraudulent use |  |  |  |  |
| 3.3.4 | Observe | Operating devices: cannot normally come to rest in a position other than those intended unless all indication and printing disabled |  |  |  |  |
| 3.3.5 | Observe | Conveyor interlock: If instrument is switched off/ceases to function: | | | | |
|  |  | 1. conveyor stops, or |  |  |  |  |
|  |  | 1. visible or audible signal is given |  |  |  |  |
| 3.3.6 | Observe | Out of range warning or alarm: |  |  |  |  |
|  |  | 1. produces a continuous, clearly audible and/or visible warning or alarm, or |  |  |  |  |
|  |  | 1. a record of the warning or alarm with the date, time, duration and totalized value on the applicable partial or general totalized printout, or on any supplementary recording devices; if: |  |  |  |  |
|  |  | 1. the instantaneous load is above the maximum capacity of the weighing unit; |  |  |  |  |
|  |  | 1. the flowrate is above the maximum or below the minimum value |  |  |  |  |
|  |  | 1. a breakdown, maladjustment or fault has been detected (3.3.1) (R 50‑1); |  |  |  |  |
|  |  | 1. a whole belt totalization device, if applicable, provides a totalization over less than a whole number of belt revolutions; or |  |  |  |  |
|  |  | 1. the MPE on checking of zero (2.8.2) (R 50‑1) has been exceeded (3.5.1) (R 50‑1), if applicable |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.3.7 | Observe  A.6.3 | Securing and sealing of components and pre-set controls: | | | | |
|  |  | 1. components, interfaces and pre-set controls subject to legal requirements that are not intended to be adjusted or removed by the user are fitted with a securing means or enclosed. When enclosed, it is not possible to seal the enclosure. The seals are easily accessible. |  |  |  |  |
|  |  | 1. adequate securing is provided on all parts of the measuring system which cannot be protected in any other way against operations liable to affect the measurement accuracy. |  |  |  |  |
| 3.3.7.1 | Observe | Securing and sealing measures: |  |  |  |  |
|  |  | 1. access to functions liable to affect metrological properties are restricted by means such as, a switch protected by a physical seal, a password with audit trail, hard key or identification tag |  |  |  |  |
|  |  | 1. software functions are secured against intentional, unintentional and accidental changes in accordance with the requirements of 4.8 (R 50‑1); |  |  |  |  |
|  |  | 1. transmission of metrological data via interfaces are secured against intentional, unintentional and accidental changes in accordance with the requirements of 4.6.1 (R 50‑1); |  |  |  |  |
|  |  | 1. measurement data held on storage devices are secured against intentional, unintentional and accidental changes in accordance with the requirements of 4.7 (R 50‑1); |  |  |  |  |
| 3.3.7.2 | Observe | Means for securing components and pre-set controls to which access or adjustment is prohibited is provided: | | | | |
|  |  | 1. physical seals, if available, must be broken to access the components or functions, and/or an audit trail system; |  |  |  |  |
|  |  | 1. physical seals which automatically memorise access to components or functions and it shall be possible to access and display this information; the records shall include the date and a means of identifying the authorised person making the intervention; |  |  |  |  |
|  |  | 1. the audit trail should contain sufficient information to identify which password or identification tag was used to make the intervention; |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.3.7.2 | Observe | Means for securing components and pre-set controls to which access or adjustment is prohibited is provided: | | | | |
|  |  | 1. the traceability of the interventions shall be assured for at least a period of time specified by national legislation. Records of interventions shall be retained; |  |  |  |  |
|  |  | 1. records may not be overwritten, with the exception that if the storage capacity for records is exhausted, new records may replace the oldest record provided that the owner of the data has given permission to overwrite the records. |  |  |  |  |
|  |  | 1. The sealing measures provided shall be easily accessible |  |  |  |  |
| 3.4 | Observe | Totalization indicating and printing devices: |  |  |  |  |
| 3.4.1 |  | 1. quality of indication: allow reliable, simple, and non-ambiguous reading of the primary indications |  |  |  |  |
|  |  | 1. the standard uncertainty in the reading of an analogue indicating device shall not exceed 0.2 d |  |  |  |  |
|  |  | 1. the figures forming the primary indications shall be of a size, shape and clarity for reading to be easy |  |  |  |  |
|  |  | 1. the scales, numbering and printing shall permit the figures which form the results to be read by simple juxtaposition |  |  |  |  |
| 3.4.2 | Observe | Form of the indication: |  |  |  |  |
| 3.4.2.1 |  | 1. unit of mass: contain the names or symbols of the units of mass in which they are expressed. |  |  |  |  |
|  |  | 1. for any one indication of mass, only one unit of mass may be used. |  |  |  |  |
|  |  | 1. units of mass are indicated in small letters (lower case) as shown in 2.6. |  |  |  |  |
| 3.4.2.2 | Observe | Digital indication: |  |  |  |  |
|  |  | 1. shows at least one figure beginning at the extreme right. |  |  |  |  |
|  |  | 1. zero may be indicated by one zero to the extreme right, without a decimal sign. |  |  |  |  |
|  |  | 1. weight values have not more than one non-significant zero to the right, and for values with decimal sign, the non-significant zero is allowed only in the third position after the decimal sign. |  |  |  |  |
|  |  | 1. decimal fraction is separated from its integer by a decimal sign, with the indication showing at least one figure to the left of the sign and all figures to the right. |  |  |  |  |
|  |  | 1. decimal sign is on one line with the bottom of the figures (example: 0.305 kg). |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.4.3 |  | Scale interval: |  |  |  |  |
| 3.4.3.1 | Observe | is in the form of 1 x 10k, 2 x 10k, or 5 x 10k, “k” being a positive or negative whole number or zero |  |  |  |  |
| 3.4.3.2 | Observe | scale interval (d) of a partial totalization indicating device: is equal to scale interval of the general totalization indicating device |  |  |  |  |
| 3.4.3.3 | Observe | scale interval of supplementary totalization indicating devices: is at least equal to 10 times totalization scale interval |  |  |  |  |
| 3.4.4 | Observe | Range of indication: |  |  |  |  |
|  |  | 1. at least one totalization indicating device indicates a value equal to quantity of product weighed in 10 hours of operation at Qmax |  |  |  |  |
|  |  | 1. a larger range of indication may be required for installations where larger deliveries are anticipated. |  |  |  |  |
| 3.4.5 | A.6.4 | Totalization indicating devices: |  |  |  |  |
|  |  | 1. in automatic operation: it is not possible to reset the general totalization indicating device; or |  |  |  |  |
|  |  | 1. any totalization device to zero; |  |  |  |  |
|  |  | 1. it is not possible to reset the partial totalization indicating device to zero unless the last total indicated before resetting to zero is printed; or |  |  |  |  |
|  |  | 1. stored in memory with identification; |  |  |  |  |
|  |  | 1. for a multi function display an automatic indication of the total is generated if the automatic operation is interrupted or during automatic operation at the latest 20 seconds after indication of another information |  |  |  |  |
|  |  | 1. with a device such as a whole belt totalization indicating device is provided, the belt weigher shall provide a valid totalization over a whole number of complete belt revolutions. In this case the requirements of 3.2.6 apply |  |  |  |  |
| 3.4.6 | Observe | Engagement of totalization indicating and printing devices: | | | | |
|  |  | 1. permanently engaged and clearly indicates when they are not engaged. |  |  |  |  |
|  |  | 1. there is a device which disengages the totalization indicating devices where it is definitely ensured that there is no movement of the belt or product feed cannot occur. |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.4.7 | Observe | Printing device: |  |  |  |  |
|  |  | 1. printing is clear and permanent for the intended use |  |  |  |  |
|  |  | 1. printed figures is at least 2 mm high. |  |  |  |  |
|  |  | 1. if printing takes place, the name or the symbol of the unit of measurement is either to the right of the value; or |  |  |  |  |
|  |  | 1. above a column of values. |  |  |  |  |
| 3.5 | A.5.4.3 | Zero-setting device: |  |  |  |  |
|  | observe | 1. the effective mass of the belt shall be balanced by a zero-setting device of a type appropriate to the principle of operation of the belt weigher. |  |  |  |  |
|  |  | 1. does not exceed 4 % of max capacity |  |  |  |  |
| 3.5.1 |  | Semi-automatic and automatic zero-setting devices: | | | | |
|  |  | 1. the setting to zero takes place after a whole number of revolutions of the belt, and |  |  |  |  |
|  |  | 1. the end of the zero-setting operation is indicated, and |  |  |  |  |
|  |  | 1. a change in zero observed during a zero-load test that exceeds the MPE, 2.8.2 (R 50‑1) shall be corrected by an automatic zero-setting device when present |  |  |  |  |
|  |  | 1. for testing purposes, it shall be possible to disengage automatic zero-setting devices during testing as appropriate |  |  |  |  |
|  |  | 1. if an automatic zero-setting device is included must have interlock to prevent zero-setting |  |  |  |  |
| 3.6 | Observe | Belt Profile Correction Device (if fitted): | |  |  |  |
|  |  | 1. permanently in operation; |  |  |  |  |
|  |  | 1. or permanently disabled (any ability to enable or disable is sealed against user access); or |  |  |  |  |
|  |  | 1. incorporate a mechanism to reliably synchronise the belt position with the stored (empty) belt profile; |  |  |  |  |
|  |  | 1. it may be combined with an automatic or semi-automatic zero-setting device; or |  |  |  |  |
|  |  | 1. operate separately from an automatic or semi-automatic zero-setting device |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.7 | Observe | Displacement transducer: |  |  |  |  |
|  |  | 1. no possibility of slip whether the belt is loaded or not |  |  |  |  |
|  |  | 1. displacement sensing devices are driven by the clean side of the belt |  |  |  |  |
|  |  | 1. measurement signal corresponds with displacement of belt equal to or less than weigh length |  |  |  |  |
|  |  | 1. adjustable parts can be sealed |  |  |  |  |
| 3.8 | Observe | Belt weighers inclusive of conveyor: |  |  |  |  |
|  |  | 1. constructed in a rigid manner |  |  |  |  |
|  |  | 1. shall form a rigid assembly |  |  |  |  |
| 3.8.1 | Observe | Installation conditions (where applicable) | | | | |
|  |  | Instrument is installed where: |  |  |  |  |
|  |  | 1. the frame support of the conveyor is constructed in a rigid manner |  |  |  |  |
|  |  | 1. in any straight longitudinal section the roller track is such that the belt is constantly supported on the weighing rollers (idlers) |  |  |  |  |
|  |  | 1. belt cleaning devices, if fitted, are positioned and operated so as to have no significant effect on the results |  |  |  |  |
|  |  | 1. roller track does not cause slippage of the product |  |  |  |  |
|  |  | 1. Installation does not cause excessive additional errors |  |  |  |  |
| 3.8.1.1 | Observe | Roller track: |  |  |  |  |
|  |  | 1. is protected against corrosion and clogging |  |  |  |  |
|  |  | 1. is aligned properly |  |  |  |  |
| 3.8.1.2 | Observe | Conveyor belt: |  |  |  |  |
|  |  | Variations in the mass per unit length of the belt (including belt joins) shall not have any significant effect on the results (so as to ensure the requirement of 2.8.4 (R 50‑1) is met). |  |  |  |  |
| 3.8.1.3 | Observe | Speed control: |  |  |  |  |
|  |  | For single or multiple speed weighers, the speed of the belt during weighing shall not vary by more than 5 % of the nominal speed |  |  |  |  |
|  |  | For variable speed belt weighers having a speed setting control, the speed of the belt shall not vary by more than 5 % of the set speed |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.8.1.4 | Observe | Weigh length: |  |  |  |  |
|  |  | 1. installed in such a way that the weigh length and vertical alignment remains unchanged while in service |  |  |  |  |
|  |  | 1. it is possible to seal the weigh length adjusting devices on the belt weigher to prevent adjustments of the weigh length while in service |  |  |  |  |
| 3.8.1.5 | Observe | Belt tension for belt weighers with load receptor: longitudinal tension is maintained independent of the effects of: | | | | |
|  |  | 1. temperature |  |  |  |  |
|  |  | 1. wear |  |  |  |  |
|  |  | 1. load |  |  |  |  |
|  |  | 1. no slip between belt and driving drum |  |  |  |  |
| 3.9 |  | Descriptive markings: |  |  |  |  |
| 3.9.1 | Observe | Markings shown in full: |  |  |  |  |
|  |  | 1. identification mark of the manufacturer |  |  |  |  |
|  |  | 1. serial number and type designation of the belt weigher |  |  |  |  |
|  |  | 1. the inscription: zero testing shall involve at least ..... revolutions |  |  |  |  |
|  |  | 1. mains voltage ...V |  |  |  |  |
|  |  | 1. mains frequency ...Hz (if applicable) |  |  |  |  |
|  |  | 1. designation of type(s) of product to be weighed |  |  |  |  |
|  |  | 1. weigh length (WL) .... m |  |  |  |  |
|  |  | 1. product description |  |  |  |  |
|  |  | 1. identification mark on each unit of the belt weigher consisting of separate but associated units |  |  |  |  |
| 3.9.2 | Observe | Markings in code: |  |  |  |  |
|  |  | 1. type approval sign |  |  |  |  |
|  |  | 1. maximum capacity (Max) .. g, kg or t |  |  |  |  |
|  |  | 1. temperature range .... °C / ... °C, (If applicable, see 2.7.4.1) |  |  |  |  |
|  |  | 1. accuracy class 0.2, 0.5, 1 or 2 |  |  |  |  |
|  |  | 1. totalization scale interval d = … kg or t |  |  |  |  |
|  |  | 1. nominal speed(s) of the belt v = m/s, or |  |  |  |  |
|  |  | 1. range of speeds of the belt v = .../... m/s |  |  |  |  |
|  |  | 1. maximum flowrate Qmax = ... g/h, kg/h or t/h |  |  |  |  |
|  |  | 1. minimum flowrate Qmin = ... g/h, kg/h or t/h |  |  |  |  |
|  |  | 1. minimum totalized load Σmin = ... g, kg or t |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | | **N/A** | | **Observations** |
| 3.9.3 | Observe | Supplementary markings: as required by metrological authority | Note in Observations | | |  | |  |
| 3.9.4 | Observe | Presentation of descriptive markings: |  |  | |  | |  |
|  |  | 1. indelible and of a size, shape and clarity to enable legibility under typical weighing conditions |  |  | |  | |  |
|  |  | 1. either in the national language or a language which is allowed to be applied in the particular country or in form of adequate, internationally agreed and published pictograms or signs. | Confirm | | |  | |  |
|  |  | 1. grouped together in a clearly visible place either on a descriptive plate near the general totalization indicating device or on the indicating device itself. |  |  | |  | |  |
|  |  | 1. in case of a plate or sticker which is not destroyed when removed, a means of securing shall be provided; or |  |  | |  | |  |
|  |  | 1. it shall be possible to seal the plate bearing the markings |  |  | |  | |  |
|  | Observe | The markings above may also be shown on a software controlled programmable display provided that: | | | | | | |
|  |  | 1. at least Max, Qmax,QMin, ∑min and d are displayed as long as the instrument is switched on |  |  | |  | |  |
|  |  | 1. the other marking may be shown on manual command; and |  |  | |  | |  |
|  |  | 1. it must be described in the type approval certificate |  |  | |  | |  |
|  |  | 1. the markings are considered as device-specific parameters (see 0.2.12.4) and shall comply with the appropriate requirements for securing in 3.3.7 and 4.8 (R50-1). |  |  | |  | |  |
|  | Observe | Software controlled display markings need not be repeated on the data plate, if they are shown on or indicated near the display of the weighing result, with the exception of the following markings which shall be shown on the data plate: | | | | | | |
|  |  | 1. max, Qmax,QMin, ∑min and d are shown near the display |  |  |  | |  | |
|  |  | 1. type approval sign in accordance with national requirements |  |  |  | |  | |
|  |  | 1. name or identification mark of the manufacturer |  |  |  | |  | |
|  |  | 1. voltage supply |  |  |  | |  | |
|  |  | 1. voltage supply frequency, (if applicable) |  |  |  | |  | |
|  |  | 1. pneumatic/hydraulic pressure, (if applicable) |  |  |  | |  | |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 3.10 | Observe | Verification marks |  |  |  |  |
| 3.10.1 |  | Position of verification marks: | | | | |
|  |  | 1. part on which it is located cannot be removed from the belt weigher without damaging the marks |  |  |  |  |
|  |  | 1. allows easy application of mark without changing the metrological qualities of the belt weigher |  |  |  |  |
|  |  | 1. is visible without the belt weigher or its protective covers having to be moved when it is in service |  |  |  |  |
| 3.10.2 | Observe | Mounting: Belt weighers required to have verification marks shall have: |  |  |  |  |
|  |  | 1. verification mark support, at the place provided for above to ensure conservation of the marks |  |  |  |  |
|  |  | 1. When the mark is made by a stamp, the support is a strip of lead or other Product with similar qualities inserted into a plate fixed to the belt weigher; or |  |  |  |  |
|  |  | 1. into a cavity in the belt weigher |  |  |  |  |
|  |  | 1. space provided for adhesive transfer (if applicable) |  |  |  |  |
| **4** |  | **Requirements for belt weighers:** | | | | |
| 4.1 |  | General requirements |  |  |  |  |
| 4.1.1 | A.7.3 | Disturbances: |  |  |  |  |
|  | A.7.3.1 | AC mains voltage dips, short interruptions and reductions |  |  |  |  |
|  | A.7.3.2 | Bursts (fast transient tests) on mains power lines and on signal, data and control lines |  |  |  |  |
|  | A.7.3.3 | Surges on AC and DC mains power lines and on signal, data and control lines |  |  |  |  |
|  | A.7.3.4 | electrostatic discharge test |  |  |  |  |
|  | A.7.3.5.1 | immunity to radiated electromagnetic fields |  |  |  |  |
|  | A.7.3.5.2 | immunity to conducted electromagnetic fields |  |  |  |  |
| 4.1.2 | Observe | Durability: |  |  |  |  |
|  |  | requirements of 2, 3 and 4.1.1 (R 50‑1) shall be met durably |  |  |  |  |
| 4.1.3 | Observe | Evaluation for compliance: |  |  |  |  |
|  |  | instrument has passed examination and tests specified in Annex A: |  |  |  |  |
| 2.7.4.2 | A.7.2.1 | static temperatures: |  |  |  |  |
| 2.7.4.2 | A.7.2.2 | temperature effect at zero flowrate test |  |  |  |  |
| 4.5.1 | A.7.2.3.1 | damp heat, steady state (non condensing) |  |  |  |  |
| 4.1.1 | A.7.2.3.2 | damp heat, steady state (condensing) |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 2.7.4.3 and 4.5.4 | A.7.2.4 | AC mains voltage variations |  |  |  |  |
| 2.7.4.3 and 4.5.5 | A.7.2.5 | DC mains voltage variations |  |  |  |  |
| 2.7.4.3 and 4.5.5 | A.7.2.6 | Battery voltage variations, not mains connected (DC) |  |  |  |  |
| 4.2 | Observe | Application: requirement in 4.1.1 (R 50-1) may be applied separately to: | | | | |
| 4.2.1 |  | 1. each individual cause of significant fault, and/or | Note in Observations | |  |  |
|  |  | 1. each part of the electronic instrument |  | |  |  |
| 4.2.2 |  | Choice of (a) or (b) above is made by the manufacturer | Note in Observations | |  |  |

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| 4.3 | Observe | Acting upon a significant fault: |  |  |  |  |
|  |  | 1. visual indication, or |  |  |  |  |
|  |  | 1. audible indication is provided and continues until user takes action or the fault disappears |  |  |  |  |
|  |  | Totalized load information is retained when a significant fault occurs |  |  |  |  |
| 4.4 | Observe | indicator display test: all relevant signs of indicating devices are activated |  |  |  |  |
| 4.5 |  | Functional requirements |  |  |  |  |
| 4.5.1 | A.7 | Influence factors: complies with R 50‑1, 2.7.4, and |  |  |  |  |
|  | A.7.2.3.1 | maintains its characteristics at a relative humidity of 85 % at the upper limit of its temperature range |  |  |  |  |
| 4.5.2 | See A.7.3 | Disturbances: |  |  |  |  |
|  |  | 1. either difference in indications shall not exceed value in R 50-1, 0.4.5.4; or | Note in Observations | |  |  |
|  |  | 1. instrument detects and act upon a significant fault | Note in Observations | |  |  |
| 4.5.3 | A.5.2.2 | Warm-up time: |  |  |  |  |
|  |  | no indication/transmission of results and automatic operation is inhibited |  |  |  |  |
| 4.5.4 | Observe | interface: does not affect metrological functions and instrument functions correctly |  |  |  |  |
| 4.5.4 | A.7.2.4 A.7.2.5 | mains electrical power supply failure: |  |  |  |  |
|  | retain the metrological information contained in the belt weigher at the time of failure for at least 24 hours; and |  |  |  |  |
|  |  | is capable of indicating that information for at least 5 minutes following energization during the 24-hour period. |  |  |  |  |
|  |  | Switch-over to emergency power supply shall not cause a significant fault |  |  |  |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 4.5.5 | A.7.2.6 | Battery power supply failure: |  |  |  |  |
|  |  | 1. whenever the voltage drops below the manufacturer’s specified minimum value, either continue to function correctly or is automatically put out of service; |  |  |  |  |
|  |  | 1. retain the metrological information contained in the belt weigher at the time of failure for at least 24 hours; and |  |  |  |  |
|  |  | 1. be capable of indicating that information for at least 5 minutes following energization during the 24-hour period |  |  |  |  |

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| 4.6 | Observe | Interfaces: |  |  |  |  | |
|  |  | 1. where used, the belt weighers shall continue to function correctly and its metrological functions (including all metrologically relevant parameters and software) shall not be influenced |  |  |  |  | |
|  |  | 1. includes sufficient information on belt weigher interfaces as specified in 4.6 (R50-1) |  |  |  |  | |
| 4.6.1 | Annex B.2.3 | Interface security: |  |  |  |  | |
|  |  | 1. does not allow the legally relevant software and functions of the belt weigher and its measurement data to be inadmissibly influenced by other interconnected instruments, or |  |  |  |  | |
|  |  | 1. by disturbances acting on the interface |  |  |  |  | |
|  | Observe | An interface through which the functions mentioned above cannot be performed or initiated, need not be protected. Other interfaces shall be secured as follows: | | | | | |
|  |  | 1. data is protected e.g., with a protective interface (0.2.14.2) (R50-1), against accidental or intentional interference; |  |  |  | |  |
|  |  | 1. hardware and software functions shall comply with the appropriate requirements for securing in 3.3.7 and 4.8 (R50-1) |  |  |  | |  |
|  |  | 1. it shall be easily possible to verify the authenticity and integrity of data transmitted to and from the belt weigher; |  |  |  | |  |
|  |  | 1. other devices required by national regulations to be connected to the interfaces of a belt weigher shall be secured to inhibit automatically the operation of the belt weigher for reasons of the non-presence or improper functioning of the required device. |  |  |  | |  |

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| **R 50-1** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 4.7 | Annex B.3 | Data storage device: |  |  |  |  |
|  |  | 1. stored in internal memory or on external storage for subsequent use. |  |  |  |  |
|  |  | 1. the stored data is adequately protected against intentional and unintentional changes during the data transmission and/or storage process |  |  |  |  |
|  |  | 1. contains all relevant information necessary to reconstruct an earlier measurement. |  |  |  |  |
| 4.7.1 | Observe | Data storage sealing measures: |  |  |  |  |
|  |  | 1. meets the appropriate requirements of 3.3.7 (R50-1) for securing; |  |  |  |  |
|  |  | 1. external storage devices identification and security attributes shall be automatically verified to ensure integrity and authenticity; |  |  |  |  |
|  |  | 1. 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; |  |  |  |  |
|  |  | 1. when storage capacity is exhausted, new data may replace the oldest data provided that overwriting the old data has been archived and/or authorized. |  |  |  |  |
| 4.8 | Annex B | Software: |  |  |  |  |
|  | Annex B.1 | 1. legally relevant software of the belt weigher is identified by the manufacturer |  |  |  |  |
|  | Annex B.2.1 | 1. sufficient information on software controlled instruments is available |  |  |  |  |
| 4.8.2 | Annex B.2.2 | Security of legally relevant software: |  |  |  |  |
|  |  | 1. legally relevant software is adequately protected against accidental or intentional changes. |  |  |  |  |
|  | Annex B.2.4 | 1. software is assigned with appropriate software identification which is adapted in the case of every software change that may affect the functions and accuracy of the belt weigher. |  |  |  |  |
|  | Annex B.2.3 | 1. functions performed or initiated via connected interfaces, i.e., transmission of legally relevant software, shall comply with the securing requirements for interfaces in 4.6 (R50-1) |  |  |  |  |

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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| **5** |  | **Metrological controls** |  |  |  |  |
|  | Annex D | Measures to ensure durability shall be taken subject to national regulations, and shall include assessments under items (a) to (d) below in compliance with 2.8 (R50-1). | Note in Observations | |  |  |
|  |  | 1. Type approval |  |  |  |  |
|  |  | 1. Initial verification |  |  |  |  |
|  |  | 1. Subsequent verification |  |  |  |  |
|  |  | 1. In-service verification |  |  |  |  |
| 5.1 |  | Type evaluation: | | | | |
| 5.1.1 | Observe | Documentation: |  |  |  |  |
|  |  | 1. metrological characteristics of the belt weigher |  |  |  |  |
|  |  | 1. a standard set of specifications for the belt weigher |  |  |  |  |
|  |  | 1. a functional description of components and devices |  |  |  |  |
|  |  | 1. drawings, diagrams and general software information |  |  |  |  |
|  |  | 1. description and application of securing components, interlocks, adjustment devices, controls, etc. (3.3, 4.8, 3.9) (R50-1) |  |  |  |  |
|  |  | 1. details of fractions pi (modules tested separately) R50-2, 5.1.6.7 |  |  |  |  |
|  |  | 1. totalization indicating and printing devices R50-1, 3.4 |  |  |  |  |
|  |  | 1. data storage device (4.7) (R50-1) |  |  |  |  |
|  |  | 1. zero-setting devices (3.5) (R50-1) |  |  |  |  |
|  |  | 1. interfaces (types, intended use, immunity to external influences instructions, etc, R50-1, 4.6 |  |  |  |  |
|  |  | 1. for software controlled instruments detailed software information (4.8) (R50-1) |  |  |  |  |
|  |  | 1. 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) (R50-1) |  |  |  |  |
|  |  | 1. operating instructions, operating manual; |  |  |  |  |
|  |  | 1. any document or other evidence that the belt weigher complies with the requirements |  |  |  |  |
| 5.1.2 | Observe | General requirements: |  |  |  |  |
|  |  | 1. at least one and not normally > 3 units that represent the definitive type, one of these in a form suitable for simulation testing in a laboratory |  |  |  |  |
|  |  | 1. at least one unit installed at a typical site |  |  |  |  |

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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 5.1.3 | Observe | Examinations and tests |  |  |  |  |
|  |  | 1. complies with R 50-1, clause 2, particularly with reference to maximum permissible errors, when the instrument is operated in accordance with the manufacturer’s specifications for range and product(s); |  |  |  |  |
|  |  | 1. complies with R 50-1, clause 3 |  |  |  |  |
|  |  | 1. complies with R 50-1, clause 4 |  |  |  |  |
|  |  | 1. submitted documents examined and tests carried out to verify that the instruments comply with the above requirements |  | |  |  |
|  |  | 1. tests conducted without unnecessary commitment of resources | Note in Observations | |  |  |
|  |  | 1. metrological authority permits the results of these tests to be assessed for initial verification | Note in Observations | |  |  |
| 5.1.3.1 | A.8.2 | In-situ product tests shall be done as follows: | | | | |
|  |  | 1. in accordance with the descriptive markings | Confirm | |  |  |
|  |  | 1. under the normal conditions of use for which the instrument is intended | Confirm | |  |  |
|  |  | 1. with a quantity of the product not less than the minimum test load | Confirm | |  |  |
|  |  | 1. at flowrates between the minimum and maximum values | Confirm | |  |  |
|  |  | 1. at each belt speed for conveyors with more than one fixed speed, or throughout the speed range for variable speed conveyors | Confirm | |  |  |
|  |  | 1. in accordance with the test methods in A.11 (R 50-2) | Confirm | |  |  |
| 5.1.3.2 | Observe | Provision for means of testing: |  | |  |  |
|  |  | For the purposes of testing, the applicant may be required to furnish the metrological authority with the quantity of product, handling equipment, qualified personnel, and a control instrument | Confirm | |  |  |
| 5.1.3.3 | Observe | Place of testing: |  | |  |  |
|  |  | 1. the premises of the metrological authority to which the application has been submitted; | Confirm | |  |  |
|  |  | 1. any other suitable place mutually agreed upon between the metrological authority and the applicant | Confirm | |  |  |

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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 5.1.4 | Observe | Type approval certificate: states the appropriate accuracy classes 0.2, 0.5, 1 or 2, as specified at type approval stage and determined by compliance with the metrological requirements at initial verification of the instrument. | Confirm | |  |  |
| 5.1.5 | Observe | Influence factor tests: is applied to the complete instrument or simulator as specified in 6.3 and in Annex A in a manner that will reveal a corruption of the weighing result of any weighing process to which the belt weigher could normally be applied, in accordance with sub clause 2.7 and clause 4 (R50-1). | Confirm | |  |  |
| 5.1.6 | Annex C | Testing of a family of instruments or modules: | | |  |  |
|  |  | 1. as agreed between the metrological authority and the manufacturer |  | |  |  |
|  |  | 1. where testing the instrument as a whole is difficult or impossible |  | |  |  |
|  |  | 1. where modules are manufactured and/or placed on the market as separate units to be incorporated in a complete instrument; |  | |  |  |
|  |  | 1. where the applicant wants to have a variety of modules included in the approved type; |  | |  |  |
|  |  | 1. when a module is intended to be used for various kinds of belt weighers (in particular load sensors, indicators, data storage). |  | |  |  |
| 5.1.6.1 | Annex C. | Selection of EUTs: |  | |  |  |
|  |  | number of EUTs selected is minimized but nevertheless sufficiently representative |  |  |  |  |
|  |  | when a choice exists, the EUTs with the highest metrological characteristics is selected for test |  |  |  |  |
| 5.1.6.2 | Observe | Accuracy class: |  |  |  |  |
|  |  | if an EUT of a family has been tested completely for one accuracy class, it is sufficient for an EUT of a lower class if only partial tests are carried out that are not yet covered |  |  |  |  |
| 5.1.6.3 | Observe | Other metrological features to be considered: | | | | |
|  |  | all metrologically relevant features and functions are tested at least once in an EUT as far as applicable and as many as possible in the same EUT |  |  |  |  |
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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 5.1.6.4 | Observe | Summary of relevant metrological characteristics: The EUTs cover: | | | | |
|  |  | 1. lowest input signal(when using analogue strain gauge load cells, see R50-2, 5.1.6.5; |  |  |  |  |
|  |  | 1. all accuracy classes; |  |  |  |  |
|  |  | 1. all temperature ranges; |  |  |  |  |
|  |  | 1. single speed, variable or multiple speed belt weigher; |  |  |  |  |
|  |  | 1. maximum size of load receptor, if significant; |  |  |  |  |
|  |  | 1. displacement transducer; |  |  |  |  |
|  |  | 1. metrologically relevant features (see 5.1.6.3) (R50-2); |  |  |  |  |
|  |  | 1. all possible instrument functions; |  |  |  |  |
|  |  | 1. different types of load receptors, if connectable to the indicator; and 2. different types of belt conveyors. |  |  |  |  |
|  |  | 1. all possible indications; |  |  |  |  |
|  |  | 1. all possible implemented digital devices; |  |  |  |  |
|  |  | 1. all possible interfaces; |  |  |  |  |
|  |  | 1. weigh idlers; |  |  |  |  |
| 5.1.6.5 | Observe | Minimum input voltage of electronics for maximum capacity | | | | |
|  |  | 1. An analogue data processing device or indicator intended for analogue load cell(s) is tested at a minimum input voltage signal - specified by the manufacturer - for a load equal to maximum capacity. |  |  |  |  |
|  |  | 1. A complete instrument shall not be configured in such a way that its input voltage signal for a load equal to maximum capacity is below the value used at type testing. |  |  |  |  |
|  |  | Requirement to the minimum scale interval (vmin) of the used load cell(s). | | | | |
| 5.1.6.6 |  | When analogue strain gauge load cells are used then the minimum scale interval (vmin) of the load cell shall fulfil the equation in R50 -1 & -2, 5.1.6.6 |  |  |  |  |
|  |  | When digital load cells are used the equation in R50 -1 & -2, 5.1.6.6 shall also be used, with the corresponding S values. |  |  |  |  |

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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations** |
| 5.1.6.7 |  | Apportioning of errors |  |  |  |  |
|  |  | The error limits applicable to a module which is examined separately are equal to a fraction pi of the maximum permissible errors (R50-1 & -2, 2.2.2 Table 2) or the allowed variations of the indication of the complete instrument. The fractions for any module have to be taken for the same accuracy class as for the complete instrument incorporating the module. |  |  |  |  |
|  |  | The fraction pi shall be chosen by the manufacturer of the module and shall be verified by an appropriate test, taking into account the following conditions:   1. For purely digital devices pi may be equal to 0. 2. For weighing modules pi may be equal to 1. 3. For all other modules (including digital load sensors) the fraction shall not exceed 0.8 and shall not be less than 0.3, when more than one module contributes to the effect in question. |  |  |  |  |
|  |  | For mechanical structures evidently designed and manufactured according to sound engineering practice, an overall fraction, *pi* = 0.5 may be applied without any test, e.g. when levers are made of the same material and when the chain of levers has two planes of symmetry (longitudinal and transversal). |  |  |  |  |
|  |  | For instruments incorporating the typical modules (see R50-1 & -2, 0.2.10) the fractions *pi* may have the values given in Table 4, which takes into account the fact that the modules are affected in a different manner depending on the different performance criteria. |  |  |  |  |

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| **R 50-2** | **Test**  **procedure** | **Belt weighers**  **Checklist** | **Passed** | **Failed** | **N/A** | **Observations**3 |
| 6.3 | A.5.4 | Simulation tests (test with static load without the belt conveyor): |  |  |  |  |
|  |  | carried out in a way that will reveal a corruption of any weighing result. |  |  |  |  |
|  |  | The EUT is fitted with: |  | |  |  |
|  |  | 1. a complete belt weigher without the belt conveyor; |  |  |  |  |
|  |  | 1. a representative load receptor (normally the complete load receptor); |  |  |  |  |
|  |  | 1. a platform (pan) for the standard weights; |  |  |  |  |
|  |  | 1. a device (such as an operation checking device, 0.2.8) enabling the comparison of integrations with a constant load over equal complete belt revolutions predetermined by the operator and measured by the displacement transducer; |  |  |  |  |
|  |  | 1. a displacement simulation device |  |  |  |  |
|  |  | Means of assessing results can be: |  | |  |  |
|  |  | 1. adaptation of the totalization indicating device, or |  |  |  |  |
|  |  | 1. use of change point weights, or |  |  |  |  |
|  |  | 1. any other means mutually agreed |  |  |  |  |

Use this page to detail observations from the checklist:

1. (\*) The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used. [↑](#footnote-ref-1)
2. (\*\*) The voltage Unom shall be as defined in IEC 61000-4-11 section 5. [↑](#footnote-ref-2)
3. (\*) Indicate the report page of the relevant test where the temperature effect at zero flowrate and static temperature tests are conducted together. [↑](#footnote-ref-3)
4. (±) In case a voltage-range is marked, use the average value as nominal Unom [↑](#footnote-ref-4)
5. (\*) The reference voltage shall be as defined in IEC 61000-4-11. [↑](#footnote-ref-5)
6. (\*) The reference voltage shall be as defined in IEC 61000-4-11. [↑](#footnote-ref-6)
7. (±) In case a voltage-range is marked, use the average value as nominal *U*nom [↑](#footnote-ref-7)
8. (\*) The reference voltage shall be as defined in IEC 61000-4-11. [↑](#footnote-ref-8)
9. (\*) The reference voltage shall be as defined in IEC 61000-4-11. [↑](#footnote-ref-9)
10. (±)In case a voltage-range is marked, use the average value as nominal *U*nom [↑](#footnote-ref-10)
11. (\*)The voltage as marked on the instrument. [↑](#footnote-ref-11)
12. (\*\*)The minimum battery supply voltage is to be specified by the manufacturer of the instrument. [↑](#footnote-ref-12)
13. (±) In case a voltage-range is marked, use the average value as nominal *U*nom [↑](#footnote-ref-13)
14. (\*) The reference voltage shall be as defined in IEC 61000-4-11. [↑](#footnote-ref-14)
15. These values are for 50 Hz/60 Hz, respectively. [↑](#footnote-ref-15)
16. (\*) IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity. [↑](#footnote-ref-17)
17. (\*) IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity. [↑](#footnote-ref-18)
18. Use continuation sheet if necessary. [↑](#footnote-ref-19)