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| INTERNATIONAL | **OIML R 76-4** |
| RECOMMENDATION | Edition 202x (E) |

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| Non-automatic weighing instruments  Part 4: Type evaluation report format |
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|  |
| Instruments de pesage à fonctionnement non automatique  Partie 4: Format du rapport d'évaluation de type |
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| OIML R 76-4 Edition 202x (E) |  |  |  |
|  |  | Organisation Internationale  de Métrologie Légale |
| International Organization  of Legal Metrology |

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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 main categories of OIML publications are:

* **International Recommendations (OIML R),** which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity. OIML Member States shall implement these Recommendations to the greatest possible extent;
* **International Documents (OIML D),** which are informative in nature and which are intended to harmonize and improve work in the field of legal metrology;
* **International Guides (OIML G),** which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and
* **International Basic Publications (OIML B),** which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Project Groups linked to Technical Committees or Subcommittees which comprise representatives from the Member States. Certain international and regional institutions also participate on a consultation basis. Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

International Recommendations, Documents, Guides and Basic Publications are published in English (E) and translated into French (F) and are subject to periodic revision.

Additionally, the OIML publishes or participates in the publication of **Vocabularies (OIML V)** and periodically commissions legal metrology experts to write **Expert Reports (OIML E)**. Expert Reports are intended to provide information and advice, and are written solely from the viewpoint of their author, without the involvement of a Technical Committee or Subcommittee, nor that of the CIML. Thus, they do not necessarily represent the views of the OIML.

This publication - reference OIML R 76-4, Edition 202x - was developed by Project Group 2 of OIML TC 9/SC 1 *Non-automatic weighing instruments*. It was approved for final publication by the International Committee of Legal Metrology in 20xx and supersedes the previous edition of R 76-2 (2007).

OIML Publications may be downloaded from the OIML web site in the form of PDF files. Additional information on OIML Publications may be obtained from the Organization’s headquarters:

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# Introduction

The “Type evaluation report format”, the subject of OIML R 76-4, aims at presenting, in a standardized format, the results of the evaluation to which a type of non-automatic weighing instrument shall be submitted with a view to its approval.

The “Checklist” is a summary of the evaluation and 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 76-1 and -2. The words or condensed sentences intend to remind the examiner of the requirements of R 76-1 and -2 without reproducing them.

All metrology services evaluating types of non-automatic weighing instruments according to OIML R 76‑1 and -2 or to national or regional regulations based on OIML R 76-1 and -2 are strongly advised to use this “Type evaluation 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 the results of type evaluation may be transmitted by the country performing these evaluations to the approving authorities of another country, under bi- or multi-lateral cooperation agreements. In the framework of the OIML Certification System (OIML-CS), use of the “Type evaluation report format” is mandatory.

**Type evaluation report**

# Explanatory notes

Meaning of symbols:

*I* = Indication

*In* = *n*th indication

*L* = Load

Δ*L* = Additional load to next changeover point

*P* = *I* + ½ *e* – Δ*L* = Indication prior to rounding (digital indication)

*E* = *I* – *L* or = *P* – *L* or = *I* + ½ *e* – Δ*L* – *L* = Error

*E*c = Corrected error

mpe = Maximum permissible error (absolute value)

EUT = Equipment under test

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

|  |  |  |
| --- | --- | --- |
| For each test, the “SUMMARY OF TYPE EVALUATION” and the  “CHECKLIST” shall be completed according to this example: | PASSED | FAILED |
| when the instrument has passed the test: | X |  |
| when the instrument has failed the test: |  | X |
| when the test is not applicable: | – | – |

# 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 evaluation)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| System or module name |  | Drawing number or software reference |  | Issue level |  | Serial no. |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Simulator documentation (if applicable)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| System or module name |  | Drawing number or software reference |  | Issue level |  | Serial no. |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |

**Identification of the instrument (continued)**



Simulator function (summary) (if applicable)

(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: |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Complete instrument |  | Module[[1]](#footnote-1) with | error fraction *pi* = |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accuracy class[[2]](#footnote-2): |  | classeI |  | classeII |  | classeIII |  | classeIIII |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Self-indicating |  | Semi-self-indicating |  | Non-self-indicating |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Min = |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| *e* = |  | Max = |  | *d* = |  | *n* = |  |
|  |  |  |  |  |  |  |  |
| *e*1 = |  | Max1 = |  | *d*1 = |  | *n*1 = |  |
| *e*2 = |  | Max2 = |  | *d*2 = |  | *n*2 = |  |
| *e*3 = |  | Max3 = |  | *d*3 = |  | *n*3 = |  |

|  |  |  |  |
| --- | --- | --- | --- |
| T = + |  | T = – |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *U*nom = |  | V | *U*min = |  | V | *U*max = |  | V | *f* = |  | Hz | Battery, *U*nom = |  | V |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Zero-setting device: | | Tare device: | |  |  |
|  |  |  |  |  |  |
|  | Non-automatic |  | Tare balancing |  | Combined zero/tare device |
|  |  |  |  |  |  |
|  | Semi-automatic |  | Tare weighing |  |  |
|  |  |  |  |  |  |
|  | Automatic zero-setting |  | Preset tare device |  |  |
|  |  |  |  |  |  |
|  | Initial zero-setting |  | Subtractive tare |  |  |
|  |  |  |  |  |  |
|  | Zero-tracking |  | Additive tare |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Initial zero-setting range = |  | % of Max | Temperature range: |  | °C |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Printer: |  | Built-in |  | Connected |  | Not present |  | No connection |
|  |  |  |  |  |  | but connectable |  |  |

Instrument submitted: ………………………… Load cell: …………………………

Identification no.: ………………………… Manufacturer: …………………………

Software version: ………………………… Type: …………………………

Connected equipment: ………………………… Capacity: …………………………

………………………… Number: …………………………

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

…………………………

………………………… Remarks: …………………………

Evaluation period: ………………………… …………………………

Date of report: ………………………… …………………………

Observer: ………………………… …………………………

**General information concerning the type (continued)**







Use this space to indicate additional remarks and/or information: connecting equipment, interfaces and load cells, choice of the manufacturer regarding protection against disturbances (6.1.3 a) or 6.1.3 b) of R 76-1), etc.

# Configuration for type evaluation



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.

# Selection of sample(s)



Use this space for additional information relating to the justification for the selection of sample(s), in particular in case of a family of instruments or modules or if specific requirements are mentioned in OIML R 76-1 and -2. Adjustments or modifications



Use this space for additional information relating to the identification of any authorized and agreed upon adjustments or modifications made to the sample or samples during the evaluation.

Summary of test report(s)

Use the table below to summarize the test report(s) used to support the type evaluation:

|  |  |  |
| --- | --- | --- |
| **Test Report Number** | **Issued by** | **Remarks\*** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

\* Use this column to record if the test report was issued:

* under the OIML Basic Certificate System, the OIML Mutual Acceptance Arrangement (MAA) or the OIML Certification System Scheme A or B. Where the test report was used as the basis for issuing an existing OIML certificate, the relevant OIML Certificate Number should be noted;
* by a Manufacturer Test Laboratory (MTL);
* under the scope of ISO/IEC 17025 accreditation.

Summary of appraisal of test data (where applicable)

Use this space to record the appraisal of test data [reference OIML-CS PD-05 and PD-07]:

Summary of the checklist

For each test, the “Summary of the checklist” below and the “Checklist” in clause 1 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** | **Remarks** |
| Metrological requirements  R 76-1 clause 5 |  |  |  |
| Technical requirements  R 76-1 clause 6 |  |  |  |
| Specific technical requirements and uses  R 76-1 clause 7 |  |  |  |
| Technical requirements for non-self-indicating instruments  R 76-1 clause 8 |  |  |  |
| Marking of instruments and modules  R 76-1 clause 9 |  |  |  |
| Metrological controls  R 76-1 clause 10 |  |  |  |
| Test procedures  R 76-2 |  |  |  |
| Overall result |  |  |  |



Use this page to detail remarks from the summary of the checklist

Checklist

This checklist has been developed based on the following principles:

* to include requirements that cannot be tested according to tests specified in R 76-2, but that shall be checked experimentally, e.g. the operating range of the tare device (R 76-1, 6.7.4), or visually, e.g. the descriptive markings (R 76-1, 9.1);
* to include requirements which indicate prohibitions of some functions, e.g. automatic tare device for instruments for direct sales to the public (R 76-1, 7.1.3.3);
* to include neither general requirements, e.g. suitability for use (R 76-1, 6.1.1), nor weights and verification devices, e.g. auxiliary verification devices (R 76-1, 6.10);
* not to include requirements that allow functions or devices to be used, e.g. a combined semi-automatic zero-setting and tare device operated by the same key (R 76-1, 6.8.9).

This checklist is intended to serve as a summary of the results of examinations to be performed and not as a procedure.

The items on this checklist are provided to recall the requirements specified in R 76-1 and R 76-2, and they shall not be considered as a substitution to these requirements.

As for non-self-indicating instruments, clause 8 of R 76 1 shall be followed in lieu of this checklist.

The requirements that are not included in this type evaluation report (tests specified in R 76-2) are considered to be globally covered by the type approval or OIML certificate (e.g. classification criteria [R 76-1, 5.2 and 5.3], suitability for application, use and verification [R 76-1, 6.1.1.1, 6.1.1.2 and 6.1.1.3]).

For non-mandatory devices, the checklist provides space to indicate whether or not the device exists and, if appropriate, its type. A cross in the box for “existent” indicates that the device exists and that it complies with the definition given in the terminology. When indicating that a device is non-existent, also check the boxes to indicate that the tests are not applicable (see page 6).

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

**Checklist**



## All types of weighing instruments except non-self-indicating instruments (R 76-1, 8.1 - 8.9)

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | **FAILED** | **Remarks** |
| --- | --- | --- | --- | --- | --- |
|  |  | **Descriptive markings** |  |  |  |
| **9.1.1** | **Clause 4** | **Compulsory in all cases:** | | | |
|  |  | manufacturer's mark or name |  |  |  |
|  |  | accuracy class |  |  |  |
| **(+5.3.1)** |  | maximum capacity, Max, Max1, Max2,... |  |  |  |
|  |  | minimum capacity, Min |  |  |  |
| **(+5.3.1)** |  | verification scale interval, *e*, *e*1, *e*2, ... |  |  |  |
| **9.1.2** | **Clause 4** | **Compulsory if applicable:** | | | |
|  |  | name or mark of manufacturer’s agent |  |  |  |
|  |  | serial number |  |  |  |
|  |  | identification marks on separate but associated units |  |  |  |
|  |  | type approval mark |  |  |  |
|  |  | scale interval, *d* (*d* < *e*) |  |  |  |
|  |  | software identification (if applicable) |  |  |  |
|  |  | maximum tare effect, T (subtractive tare only if T ≠ Max) |  |  |  |
|  |  | maximum safe load, Lim (if Lim > Max + T) |  |  |  |
|  |  | special temperature limits |  |  |  |
|  |  | counting ratio |  |  |  |
|  |  | ratio between weight platform and load platform |  |  |  |
|  |  | range of plus/minus indication |  |  |  |
| **9.1.3** | **Clause 4** | **Additional markings:** | | | |
|  |  | not to be used for direct sales to the public |  |  |  |
|  |  | to be used exclusively for: |  |  |  |
|  |  | the stamp does not guarantee ..... / guarantees only ..... |  |  |  |
|  |  | to be used only as follows: |  |  |  |
| **5.2** |  | special applications clearly marked (weighing ranges in classes I and II or II and III) |  |  |  |
| **7.3** |  | near display “not to be used for direct sales to the public” (for instruments similar to those used for direct sales to the public) |  |  |  |
| **9.1.4** | **Clause 4** | **Presentation of markings:** | | | |
|  |  | indelible |  |  |  |
|  |  | easily readable |  |  |  |
|  |  | grouped together in a clearly visible place |  |  |  |
|  |  | Max, Min, *e* and *d* (if *d* ≠*e*) on or near display permanently shown in a clearly visible position |  |  |  |
|  |  | possible to seal and apply a control mark/removal will result in destruction |  |  |  |
|  |  | markings B and G |  |  |  |
| **9.1.4 and**  **9.1.1 B, 9.1.2 G** |  | additional information shown alternatively on a plate or displayed by a software solution either permanently or accessed by a simple manual command |  |  |  |
| **9.1.5.1** | **Clause 4** | **Instruments with several load receptors and load measuring devices:** | | | |
|  |  | identification mark, Max, Min and *e* of each load receptor on relating load measuring device (Lim and T = + if applicable) |  |  |  |
| **9.1.5.2** | **Clause 4** | **Separately-built main parts:** | | | |
|  |  | identification mark repeated in descriptive markings |  |  |  |
| **6.1.1.3** |  | **Suitability for verification:** | | | |
|  |  | identification of devices which have been subject to separate type examination |  |  |  |
|  |  | **Verification marks and sealing** |  |  |  |
| **9.2** | **Clause 4** | **Verification mark:** | | | |
|  |  | cannot be removed |  |  |  |
|  |  | easy application |  |  |  |
|  |  | visibility without the instrument to be moved when it is in service |  |  |  |
| **9.2** |  | **Verification mark support or space:** | | | |
|  |  | which ensures conservation of the mark |  |  |  |
|  |  | for stamp, stamping area ≥ 150 mm2 |  |  |  |
|  |  | for self-adhesive type, ø ≥ 15 mm |  |  |  |
| **6.1.2.4** | **Clause 4** | **Securing of components and preset controls:** | | | |
|  |  | location |  |  |  |
|  |  | form |  |  |  |
| **6.1.2.4** |  | **Securing with software means** | | | |
| **6.1.2.4 a** |  | legal status of the instrument recognizable |  |  |  |
|  |  | evidence of any intervention |  |  |  |
| **6.1.2.4 b** |  | protection against changes of parameters and the reference numbers |  |  |  |
| **6.1.2.4 c** |  | facilities for affixing the reference number |  |  |  |
| **6.1.2.5** |  | **Span adjustment device (automatic or semi-automatic):** Existent casenoncochée Non-existent casenoncochée | | | |
|  |  | external influence impossible after securing |  |  |  |
| **6.1.2.6** |  | **Gravity compensation:** Existent casenoncochée Non-existent casenoncochée | | | |
|  |  | external influence on or access to impossible after securing |  |  |  |
|  |  | **Documentation** |  |  |  |
| **10.2.1** | **Clause 2** | **Technical information and data:** | | | |
| **10.2.1.1,** |  | characteristics of the instrument |  |  |  |
| **5.9.2** |  | specifications of modules |  |  |  |
| **5.9.2.1** |  | fractions, *pi* (modules tested separately) |  |  |  |
| **5.9.4** |  | specifications of families |  |  |  |
|  |  | specifications of components |  |  |  |
| **10.2.1.2** |  | applicable descriptive documents (according to nos. 1-11) |  |  |  |
| **6.1.5** | **Clause 2** | specific declaration of the manufacturer |  |  |  |
| **5.8.1.1** |  | limiting value of tilting defined by the manufacturer |  |  |
| **10.2.2** | **Clause 3** | **Examination of:** | | | |
|  |  | documents |  |  |  |
|  |  | functions (spot checks) |  |  |
|  |  | test reports from other authorities |  |  |
|  |  | **Indicating device** |  |  |  |
| **6.4.1** |  | **Reading:** | | | |
|  |  | reliable, easy and unambiguous |  |  |  |
|  |  | overall inaccuracy ≤ 0.2 *e* (analog indication) |  |  |  |
|  |  | size, shape and clarity |  |  |  |
|  |  | by simple juxtaposition |  |  |  |
| **6.4.2.1** | **Clause 4** | **Units of:** | | | |
|  |  | mass |  |  |  |
|  |  | price |  |  |  |
| **6.4.2.1** |  | **Form of indication:** | | | |
|  |  | for one indication, one unit of mass |  |  |  |
|  |  | scale interval in the form (1, 2 or 5) × 10*k* |  |  |  |
|  |  | same scale interval for all indicating devices, printing devices and tare weighing devices |  |  |  |
| **6.4.2.2** |  | **Form of digital indication:** | | | |
|  |  | at least one figure at right |  |  |  |
|  |  | **Decimal sign:** | | | |
|  |  | shall maintain its position (scale interval changed automatically) |  |  |  |
|  |  | separate at least one figure to the left and all to the right |  |  |  |
|  |  | on one line with the bottom of the figures |  |  |  |
|  |  | **Zero:** | | | |
|  |  | only one non-significant zero to the right |  |  |  |
|  |  | for values with decimal sign, non-significant zero only in third position |  |  |  |
| **6.4.3** |  | **Limits:** | | | |
|  |  | preventing of indication above Max + 9*e* |  |  |  |
|  |  | preventing of indication below zero unless a tare device is in operation (–20 *d* is accepted) |  |  |  |
| **6.4.4** |  | **“Approximate” displaying device:** Existent casenoncochée Non-existent casenoncochée | | | |
|  |  | scale interval > Max/100 without being smaller than 20 *e* |  |  |  |
| **6.4.5** |  | **Semi-self indicating instruments:** | | | |
|  |  | extension of self-indication range ≤ self-indication capacity |  |  |  |
|  |  | **Analogue indication:** | | | |
| **6.5.1** |  | thickness and length of scale marks |  |  |  |
| **6.5.2** |  | scale spacing |  |  |  |
| **6.5.3** |  | limit of movement below zero and above capacity of self-indication |  |  |  |
| **6.5.4** |  | damping of oscillations of displaying component |  |  |  |
| **6.6.1** |  | **Changing of digital indication:** | | | |
|  |  | after change in load, previous indication not longer than 1 s |  |  |  |
| **6.6.2** |  | **Stable equilibrium of digital indication:** | | | |
|  |  | printed or stored weight values do not deviate more than 1 e from the final weight value |  |  |  |
|  |  | zero or tare operations are within their accuracy requirements |  |  |  |
|  |  | no printing, data storage, zero-setting, or taring during continuous or temporary disturbance of equilibrium |  |  |  |
| **6.6.3** |  | **Extended digital indication:** Existent casenoncochée Non-existent casenoncochée | | | |
|  |  | not allowed when there is a differentiated scale division |  |  |  |
|  |  | displaying a smaller scale interval only during pressing a key |  |  |  |
|  |  | at most, 5 s after manual command |  |  |  |
|  |  | prevention of printing while the device is in operation |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | | **PASSED** | | **FAILED** | | **Remarks** |
| **6.6.4** |  | **Digital indications other than primary indications:** Existent casenoncochée Non-existent casenoncochée | | | | | | |
|  |  | additional indications do not lead to any ambiguity to primary indications | | |  | |  |  |
|  |  | quantities identified by units, symbols, signs or designations thereof | | |  | |  |  |
|  |  | weight values (not weighed) shall be clearly identified or | | |  | |  |  |
|  |  | display only temporarily on manual command and | | |  | |  |  |
|  |  | shall not be printed | | |  | |  |  |
|  |  | the inoperative weighing mode is clear and unambiguously recognizable | | |  | |  |  |
| **6.6.5** |  | **Digital printing:** Existent casenoncochée Non-existent casenoncochée | | | | | | |
|  |  | clear and permanent | | |  | |  |  |
|  |  | figures ≥ 2 mm high | | |  | |  |  |
|  |  | name or symbol of units | to the right of the value | |  | |  |  |
|  |  |  | above column of values | |  | |  |  |
|  |  | printing impossible when equilibrium not stable | | |  | |  |  |
| **6.6.6** |  | **Memory storage:** Existent casenoncochée Non-existent casenoncochée | | | | | | |
|  |  | storage, transfer, totalizing, etc. inhibited when equilibrium not stable | | |  | |  |  |
| **5.4.1** |  | **Auxiliary indicating device (Classes I and II only;**  **not allowed on multi-interval instruments)** | | | Existent casenoncochée Non-existent casenoncochée | | | |
|  |  | If existent, type: rider casenoncochée interpolation casenoncochée complementary casenoncochée differentiated scale division casenoncochée | | | | | | |
|  |  | only to the right of decimal sign | | |  | |  |  |
| **5.4.2** |  | *d* < *e* ≤ 10 *d*, *e* = 10*k* kg or *e* = 1 mg for class I with *d* < 1 mg | | |  | |  |  |
|  |  | **Differences between results** | | |  | |  |  |
| **5.5.6** |  | Differences: | | | | | | |
|  |  | between multiple indications: ≤ mpe | | |  | |  |  |
|  |  | between digital indications and printout: zero | | |  | |  |  |
| **5.5.7** |  | between two results: ≤ mpe for same load when method of balancing changed (semi-self-indicating) | | |  | |  |  |
| **5.8.1.1** |  | **Tilting of instrument of class II, III or IIII** | | | | | | |
|  |  | a marking on the level indicator shows the limiting value of tilting | | |  | |  |  |
|  |  | level indicator fixed firmly in a place clearly visible to the user | | |  | |  |  |
|  |  | an automatic tilt sensor releases a display switch-off or other appropriate alarm signal | | |  | |  |  |
|  |  | and inhibits the printout and data transmission | | |  | |  |  |
|  |  | **Zero-setting, -tracking and -indicating** Existent Non-existent | | | | | | |
|  |  | Initial zero-setting casenoncochée casenoncochée | | | | | | |
|  |  | Automatic zero-setting casenoncochée casenoncochée | | | | | | |
|  |  | Semi-automatic zero-setting casenoncochée casenoncochée | | | | | | |
|  |  | Non automatic zero-setting casenoncochée casenoncochée | | | | | | |
|  |  | Zero-tracking casenoncochée casenoncochée | | | | | | |
|  |  | Zero-indicating casenoncochée casenoncochée | | | | | | |
| **6.7.1** |  | **Effect shall not alter Max** | | |  | |  |  |
|  | **5.2.1** | Overall effect of: zero-setting | | |  | |  | = % |
|  |  | zero-tracking | | |  | |  |
|  |  | initial zero-setting | | |  | |  | = % |

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | | **PASSED** | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **6.7.2** | **5.2.3** | **Accuracy:** | | | | | |
|  |  | deviation ≤ 0.25 *e* | |  |  |  | |
| **6.7.3** |  | Multiple range: Existent casenoncochée Non-existent casenoncochée | | | | | |
|  |  | effective for greater weighing range (if switching when loaded possible) | |  |  |  | |
| **6.7.4** |  | **Control of zero-setting:** | | | | | |
|  |  | separate from that of tare weighing device | |  |  |  | |
|  |  | **Semi-automatic zero-setting: functions only** | | | | | |
|  |  | in stable equilibrium and | |  |  |  | |
|  |  | if it cancels any previous tare operation | |  |  |  | |
| **6.7.5** | **5.2.2** | **Zero-indicating device (digital indication):** | | | | | |
|  |  | shows deviation ≤ 0.25 *e* | |  |  |  | |
|  |  | not mandatory if auxiliary indicating device or rate of zero-tracking ≥ 0.25 *d*/s | |  |  |  | |
| **6.7.6** |  | **Automatic zero-setting:** | | | | | |
|  |  | operates only when equilibrium stable and | |  |  |  | |
|  |  | indication has remained stable below zero at least 5 seconds | |  |  |  | |
| **6.7.7** |  | **Zero-tracking:** | | | | | |
|  |  | operates only when indication at zero or | |  |  |  | |
|  |  | at negative net value equivalent to gross zero and | |  |  |  | |
|  |  | equilibrium stable | |  |  |  | |
|  |  | corrections ≤ 0.5 *d*/s | |  |  |  | |
|  |  | when operates after tare, the overall effect may be 4 % of Max | |  |  |  | |
|  |  | **Tare devices** | | Existent Non-existent | | | |
|  |  | Tare weighing casenoncochée casenoncochée | | | | | |
|  |  | Tare balancing casenoncochée casenoncochée | | | | | |
|  |  | Combined zero-setting and tare balancing casenoncochée casenoncochée | | | | | |
|  |  | Tare indicating casenoncochée casenoncochée | | | | | |
|  |  | Type: Subtractive casenoncochée Additive casenoncochée | | | | | |
| **6.8.1** |  | applicable requirements from 6.1 through 6.4 are fulfilled | |  |  |  | |
| **6.8.2** |  | **Tare weighing device:** | | | | | |
|  |  | *d*T = *d* | |  |  |  | |
| **6.8.3** | **5.6.2** | **Accuracy:** | | | | | |
|  |  | ±0.25 *e* (electronic instruments and instruments with analog indication), *e* = *e*1 for multi-interval | |  |  |  | |
|  |  | better than ±0.5 *d* (mechanical instruments with digital indication | |  |  |  | |
| **6.8.4** |  | **Operating range:** | | | | | |
|  |  | prevention of operation | at its zero effect |  |  |  | |
|  |  | or | below its zero effect |  |  |  | |
|  |  | prevention of operation above its maximum indicated | |  |  |  | |
| **6.8.5** |  | **Visibility of operation:** | | | | | |
|  |  | operation indicated | |  |  |  | |
|  |  | net with sign “NET”, “Net”, “net” or complete word (digital indication) | |  |  |  | |
|  |  | NET disappears if gross displayed temporarily | |  |  |  | |
|  |  | tare value or letter “T” (mechanical additive tare device) | |  |  |  | |

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- |
| **6.8.6** |  | **Subtractive tare:** | | | | |
|  |  | prevention of use above Max or indication that capacity is reached |  |  |  | |
| **6.8.7** |  | **Multiple range:** | | | | |
|  |  | operation effective in greater weighing ranges if switching when loaded possible |  |  |  | |
|  |  | tare values are rounded to the scale interval of the actual weighing range which is in operation |  |  |  | |
| **6.8.8** |  | **Semi-automatic or automatic tare:** | | | | |
|  |  | operation only in stable equilibrium |  |  |  | |
| **6.8.9** |  | **Combined zero/tare:** | | | | |
|  |  | accuracy (6.7.2) |  |  |  | |
|  |  | zero indicating device (6.7.5) |  |  |  | |
|  |  | zero-tracking (6.7.7) |  |  |  | |
| **6.8.10** |  | **Consecutive tare operations:** | | | | |
|  |  | indicated or printed tare weight values clearly designated (if tare devices operative at the same time) |  |  |  | |
| **6.8.11** |  | **Printing net or gross:** | | | | |
|  |  | without designation |  |  |  | |
|  |  | designation: by G or B (gross) |  |  |  | |
|  |  | by N (only net printed) |  |  |  | |
|  |  | designation of net and tare by N and T (if net printed with gross and/or tare) |  |  |  | |
|  |  | instead of G, B, N and T, complete words |  |  |  | |
|  |  | printing separately net and tare with identification (determined by different tare devices) |  |  |  | |
|  |  | **Preset tare** | Existent casenoncochée Non-existent casenoncochée | | | |
| **6.9.1** |  | *d*T = *d* or automatically rounded to *d* |  |  |  | |
|  |  | transferred from one range to another one with larger *ei*, shall be rounded to the latter (multiple range) |  |  |  | |
|  |  | tare value ≤ Max1 for the same net weight value (multi-interval) and calculated net value rounded to the scale interval for the same net weight value |  |  |  | |
| **6.9.2** |  | 6.7.10 applies |  |  |  | |
|  |  | cannot be modified/cancelled if tare operated after the preset tare is still in use |  |  |  | |
|  |  | operates automatically if clearly identified with load |  |  |  | |
| **6.9.3** |  | 6.8.5 applies |  |  |  | |
|  |  | possibility to indicate preset tare |  |  |  | |
|  |  | if calculated net printed then preset tare value is printed as well |  |  |  | |
|  |  | 6.7.11 applies |  |  |  | |
|  |  | designation of preset tare by PT or complete word |  |  |  | |
|  |  | **Locking devices** | Existent casenoncochée Non-existent casenoncochée | | | |
| **6.10.1** |  | **Positions:** | | | | |
|  |  | only two stable positions |  |  |  | |
|  |  | weighing only in ‘weigh” position |  |  |  | |
| **6.10.2** |  | positions clearly shown |  |  |  | |

| **Requirement**  **R 76-1** | | **Testing procedures**  **R 76-2** |  | **PASSED** | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | **Multiple ranges** | Existent casenoncochée Non-existent casenoncochée | | | |
| **6.12** | |  | **Selection of weighing ranges:** |  |  |  | |
|  | |  | range in operation clearly indicated |  |  |  | |
|  | |  | selection from smaller to greater range possible at any load (manual) |  |  |  | |
|  | |  | selection from smaller to the following greater range (automatic) possible only for load ≥ Max*i* of smaller range |  |  |  | |
|  | |  | selection from a greater to a smaller range (manually) or to the smallest range (automatically) only |  |  |  | |
|  | |  | * at no load when zero or negative net value is indicated |  |  |  | |
|  | |  | * tare is cancelled automatically |  |  |  | |
|  | |  | * zero is set to ±0.25 *e*1 automatically |  |  |  | |
| **Selection between load receptors, transmitting and measuring devices** Existent casenoncochée Non-existent casenoncochée | | | | | | | |
| **6.13, 6.13.1**  **6.13.2**  **6.13.3**  **6.13.4** |  | | compensation for unequal no-load effect |  |  |  | |
| zero-setting without ambiguity and in accordance with 6.6 |  |  |  | |
| weighing impossible while selection |  |  |  | |
| combinations easyidentifiable |  |  |  | |
| **6.14** |  | | **“Plus and minus” comparator instruments** |  |  |  | |
| **6.14.1** |  | | **Distinction of zones:** | | | | |
|  |  | | “+” and “–” signs (analog indication) |  |  |  | |
|  |  | | by inscription (digital indication) |  |  |  | |
| **6.14.2** |  | | **Scale:** | | | | |
|  |  | | with at least one scale division, *d* = *e* on either side of zero and |  |  |  | |
|  |  | | value of *d* = *e* shown at either end |  |  |  | |
|  |  | | **Mechanical counting instruments with unit weigh receptor** | | | | |
| **7.5.1** |  | | **Scale:** | | | | |
|  |  | | with at least one scale division, *d* = *e* on either side of zero and |  |  |  | |
|  |  | | value of *d* = *e* shown on the scale |  |  |  | |
| **7.5.2** |  | | **Counting ratio:** | | | | |
|  |  | | shown clearly above each counting platform or |  |  |  | |
|  |  | | each counting scale mark |  |  |  | |
| **6.15** |  | | **Modes of operation:** |  | | | |
|  |  | | clearly identification of mode which is actually in operation |  |  |  | |
|  |  | | manual switching back to weighing mode in any mode and at any time possible |  |  |  | |
|  |  | | automatic selection of mode only within a weighing sequence |  |  |  | |
|  |  | | automatic switching back to the weighing mode at the end of the weighing sequence |  |  |  | |
|  |  | | zero indication after returning from switch-off condition |  |  |  | |
|  |  | | automatic check of zero position before returning from switch-off condition |  |  |  | |

## Instruments for direct sales to the public and price-computing and labelling instruments

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | **FAILED** | **Remarks** |
| --- | --- | --- | --- | --- | --- |
|  |  | **Miscellaneous checks (direct sales to the public)** |  |  |  |
| **6.7.4** |  | **Combined semi-automatic zero-setting device and semi-automatic tare-balancing device operated by the same key:** | | | |
|  |  | not allowed |  |  |  |
| **6.10.1** |  | **“Preweigh” position:** | | | |
|  |  | not allowed |  |  |  |
| **7.1.9** |  | **Counting ratio:** | | | |
|  |  | 1/10 or 1/100 (mechanical counting instrument) |  |  |  |
| **7.1.4** |  | **Impossibility of weighing during:** | | | |
|  |  | locking operation |  |  |  |
|  |  | adding or subtracting weights |  |  |  |
| **7.1.6** |  | **Auxiliary and extended indicating device:** | | | |
|  |  | not allowed |  |  |  |
| **7.1.8** |  | **When significant fault has been detected[[3]](#footnote-4) (electronic instruments):** | | | |
|  |  | visible or audible alarm provided for customer and |  |  |  |
|  |  | data transmission prevented |  |  |
|  |  | until user takes action or cause disappears |  |  |
|  |  | **Indication device (direct sales to the public)** |  |  |  |
| **7.1.1, 7.1.5** |  | **Primary indications to both vendor and customer:** | | | |
|  |  | two display sets, one vendor- and one customer display: Yes casenoncochée No casenoncochée | | | |
|  |  | one display set for vendor and customer Yes casenoncochée No casenoncochée | | | |
|  |  | weight |  |  |  |
|  |  | information about correct zero position |  |  |  |
|  |  | tare operation |  |  |  |
|  |  | preset tare operation |  |  |  |
|  |  | height of numerical figures displayed to the customer  ≥ 9.5 mm |  |  |  |
|  |  | **Instruments to be used with weights:** | | | |
|  |  | value of weights possible to distinguish |  |  |  |
|  |  | **Zero-setting device (direct sales to the public)** |  |  |  |
| **7.1.2** |  | **Non-automatic zero-setting:** | | | |
|  |  | only allowed when operated with a tool |  |  |  |
|  |  | **Tare device (direct sales to the public)** |  |  |  |
| **7.1.3** |  | not allowed on mechanical instrument with weights receptor |  |  |  |
|  |  | on instruments with one platform public can see whether:  - tare is in use |  |  |  |
|  |  | - tare setting is altered |  |  |  |
|  |  | only one tare shall be in operation at any given time |  |  |  |
|  |  | while tare or preset tare is in operation recalling of gross values is prohibited |  |  |  |

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **7.1.3.1** |  | **Non-automatic tare:** | | | | | |
|  |  | displacement of 5 mm at most *e* |  |  | |  | |
| **7.1.3.2** |  | **Semi-automatic tare:** | | | | | |
|  |  | reduction of value of tare not permitted and |  |  | |  | |
|  |  | canceling of tare effect only if no load on the receptor |  |  | |  | |
|  |  | **One of the following condition fulfilled:** | | | | | |
|  |  | tare value indicated permanently in a separate display |  |  | |  | |
|  |  | indicated with sign “–” when no load on the receptor |  |  | |  | |
|  |  | tare effect cancelled automatically when unloading after net weighing |  |  | |  | |
| **7.1.3.3** |  | **Automatic tare:** | | | | | |
|  |  | not allowed |  |  | |  | |
| **7.1.3.4** |  | **Preset tare:** | | | | | |
|  |  | indicated on separate display clearly differentiated from weight display |  |  | |  | |
|  |  | reduction of tare value not permitted and |  |  | |  | |
|  |  | canceling of tare effect only if no load on the receptor |  |  | |  | |
|  |  | impossible to operate if tare device in operation |  |  | |  | |
|  |  | cancelled at the same time as PLU if associated with PLU |  |  | |  | |
| **7.1.10** |  | **Self-service instruments:** with one set of scales or displays casenoncochée  two sets of scales or displays casenoncochée | | | | | |
|  |  | instrument has two sets of scales or displays |  |  | |  | |
|  |  | Primary indications shall include the product designation if a ticket is printed |  |  | |  | |
| **Price computing instruments and price scales**  **(direct sales to the public)** | | | | | | | |
| **7.2** |  | Requirements of 7.1 for direct sales to the public are met |  |  | |  | |
| **7.2.1** |  | **Supplementary primary indications (7.1.5)** | | | | | |
|  |  | unit price |  |  | |  | |
|  |  | price to pay |  |  | |  | |
|  |  | if applicable number, unit price and price to pay for non-weighed articles, price totals |  |  | |  | |
| **7.2.2**  **6.3**  **6.4.1-6.4.3** |  | **Price scales:** | | | | | |
| 6.3 and 6.4.1-6.4.3 |  |  | |  | |
| error of price scale |*W* × *U* – *P*| ≤ *e* × *U* |  |  | |  | |
| **7.2.3** |  | **Price computing:** | | | | | |
|  |  | multiplication of indicated weight and unit price as indicated |  |  | |  | |
|  |  | rounding to the nearest interval of price to pay |  |  | |  | |
|  |  | unit price: price/100 g or price/kg |  |  | |  | |
|  |  | **Indications of weights, unit price and price to pay visible:** | | | | | |
|  |  | while load on load receptor and for at least 1 s after stable weight indication or after any introduction of unit price |  |  | |  | |
|  |  | freezing for ≤ 3 s after removing load and not possible to introduce or change unit price (if indication has been stable before and would otherwise be zero) |  |  | |  | |
|  |  | printing weight, unit price and price to pay |  |  | |  | |
|  |  | **Stored in memory:** | | | | | |
|  |  | before printing |  |  | |  | |
|  |  | same data not to be printed twice for customer |  |  | |  | |

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **7.2.4** |  | **Additional functions for trade and management:** | | | | | |
|  |  | all transactions are printed for customer |  |  | |  | |
|  |  | they shall not lead to confusion |  |  | |  | |
| **7.2.4.1** |  | **Prices-to-pay (positive or negative) of non-weighed articles:** | | | | | |
|  |  | weight indication zero or |  |  | |  | |
|  |  | weighing mode inoperative |  |  | |  | |
|  |  | prices shall be shown on price-to-pay display |  |  | |  | |
|  |  | **Prices for more than one equal articles:** | | | | | |
|  |  | number of articles shown on weight display without being taken for a weight |  |  | |  | |
|  |  | price for one article shown on unit price display |  |  | |  | |
|  |  | supplementary display for number of articles and/or article prices |  |  | |  | |
| **7.2.4.2** |  | **Totalization of transactions on one or several tickets:** | | | | | |
|  |  | price total indicated on price-to-pay display and |  |  | |  | |
|  |  | printed accompanied by a special word or symbol and |  |  | |  | |
|  |  | reference to commodities whose prices are totalized if a separate ticket is issued for total |  |  | |  | |
|  |  | all prices-to-pay shall be printed and price total shall be the algebraic sum of these printed prices |  |  | |  | |
|  |  | **Totalization of transactions from linked instruments:** | | | | | |
|  |  | price-to-pay scale intervals of all connected instruments identical |  |  | |  | |
| **7.2.4.3** |  | **Instrument used by several vendors or to serve more than one customer  at the same time:** | | | | | |
|  |  | connection between transactions and vendor or customer identified |  |  | |  | |
| **7.2.4.4** |  | **Canceling previous transactions:** | | | | | |
|  |  | transaction is already printed: the price-to-pay cancelled shall be printed with comment |  |  | |  | |
|  |  | transaction not yet printed and displayed to customer: transaction clearly differentiated from normal transactions |  |  | |  | |
| **7.2.4.5** |  | **Printing additional information:** | | | | | |
|  |  | clearly correlated to transaction and |  |  | |  | |
|  |  | does not interfere with assignment of weight value to unit symbol |  |  | |  | |
|  |  | **Price labeling instruments** |  |  | |  | |
| **7.4** |  | requirements 7.1.8, 7.2.3 (paragraphs 1 and 5), 7.2.4.1 (paragraph 1) and 7.2.4.5 are met |  |  | |  | |
|  |  | **Display:** | | | | | |
|  |  | for weight |  |  | |  | |
|  |  | possibility to verify values of unit price and preset tare during the use of the instrument |  |  | |  | |
|  |  | **Printing:** | | | | | |
|  |  | prevention of printing below Min |  |  | |  | |
|  |  | labels with fixed values of weight, unit price and price-to-pay allowed provided weighing mode is inoperative |  |  | |  | |

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | | **FAILED** | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Mobile instruments used outside** | | | | | |
| **7.6.2** |  | means to indicate that the limiting value of tilting has been exceeded and to inhibit printout and data transmission |  |  | |  | |
|  |  | automatic zero-setting or tare balancing operation after each moving of the vehicle |  |  | |  | |
|  |  | Weighing windowExistent casenoncochée Non-existent casenoncochée | | | | | |
|  |  | indication when instrument is not in the weighing window and the printout and data transmission is inhibited |  |  | |  | |
|  |  | equipped with an appropriate protection system if the load measuring device is sensitive to moving or driving influences |  |  | |  | |
|  |  | prevention of wrong weighing results if the cardanic suspension system or load receptor comes into contact with the surrounding frame construction |  |  | |  | |
| **7.6.3** |  | **Other mobile instruments not to be used outside** with a leveling device and a level indicator | | | | | |
|  |  | the leveling device shall be operated easily without tools |  |  | |  | |
|  |  | appropriate inscription pointing the user to the necessity of leveling after each movement |  |  | |  | |

## Electronic weighing instruments

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** |  | **PASSED** | | **FAILED** | **Remarks** | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Disturbances** | |  |  | |  | |
| **6.1.3** |  | indication of significant faults in the display does not lead to confusion with other messages | |  |  | |  | |
| **6.1.4** |  | **Acting upon significant faults in case 6.1.3 b):** | | | | | | |
|  |  | instrument made automatically inoperative[[4]](#footnote-5), or | |  |  | |  | |
|  |  | visual or audible indication until user takes action or fault disappears1 | |  |  | |  | |
|  |  | **Display check** | |  |  | |  | |
| **6.1.5** |  | **Upon switch-on:** | | | | | | |
|  |  | signs of indication are active and non-active long enough to be checked by operator | |  |  | |  | |
|  |  | **External equipment** | |  |  | |  | |
| **6.1.5** |  | **Interfaces (mechanical, electrical, logical) do not allow:** | | | | | | |
|  |  | * functions and measurement data to be inadmissibly influenced by peripheral devices, or other connected instruments, or disturbances | |  |  | |  | |
|  |  | * displaying data which could be mistaken for a weighing result | |  |  | |  | |
|  |  | * falsifying weighing results (displayed, processed, stored) | |  |  | |  | |
|  |  | * changing adjustment factor or adjusting the instrument (except authorized cases) | |  |  | |  | |
|  |  | * falsifying displayed primary indications (direct sales) | |  |  | |  | |
|  |  | interfaces that do not fulfill 6.1.5 can be secured | |  |  | |  | |
|  |  | interfaces transmit data so that peripheral device can meet requirements | |  |  | |  | |
|  |  | metrologically relevant functions performed or initiated through the interface meet relevant requirements of R 76-1 | |  |  | |  | |

## Software-controlled digital devices and instruments

| **Requirement**  **R 76-1** | **Testing procedures**  **R 76-2** | **Requirement** | **PASSED** | **FAILED** | **Remarks** |
| --- | --- | --- | --- | --- | --- |
| **Software identification** | | | | | |
| **6.2.2** | AD + VFTSw | Software of a software-controlled non-automatic weighing instrument/component is clearly identified. |  |  |  |
| The software identification is a legally relevant parameter. |  |  |  |
| At least one part of the identification is dedicated to the legal purpose. |  |  |  |
| The identification is displayed on command, or during operation, or at start up, for a measuring instrument that can be turned off and on again. |  |  |  |
| If a measuring instrument or component has neither display nor printer or if the instrument facilitates remote verification, the identification is sent via a communication interface. |  |  |  |
| The software idenficiation is easily provided by the device for metrological controls or inspections. |  |  |  |
| **Correctness of algorithms and functions** | | | | | |
| **6.2.3** | AD + VFTSw | The measuring algorithms and functions of the non-automatic weighing instrument are appropriate and functionally correct for the given application |  |  |  |
| The measurement result is displayed or printed correctly. |  |  |  |
| No hidden or undocumented functions or parameters exist. |  |  |  |
| **Evidence and prevention of misuse** | | | | | |
| **6.2.4.1** | AD + VFTSw | The software of the non-automatic weighing instrument is protected agains any changes. |  |  |  |
| During processing, measurement data is protected and secured. |  |  |  |
| **Evidence of intervention** | | | | | |
| **6.2.4.2** | AD + VFTSw | The software is protected in such a way that evidence of any intervention is available. |  |  |  |
| The software is secured against unauthorized modification, loading, or changes by swapping the memory device. |  |  |  |
| If necessary for the purpose of verification, data containing evidence of an intervention is displayed or printed on command and, if applicable, transmitted to the verification software. |  |  |  |
| **6.2.4.3** | AD + VFTSw | All inputs from the user interface are handled by a protective interface. |  |  |  |
| Any function that can be activated by the user interface is clearly documented and not able to influence the legally relevant characteristics of the instrument. |  |  |  |
| **6.2.4.4** | AD + VFTSw | All inputs from communication interfaces are handled by a protective interface. |  |  |  |
| Any function that can be activated by communicationinterfaces is clearly documented and not able to influence the legally relevant characteristics of the instrument. |  |  |  |
| **6.2.4.4.1** | AD + VFTSw | Legally relevant parameters are secured and protected in such a way that evidence of an intervention shall be available. |  |  |  |
| If necessary for the purpose of verification, displaying or printing and if applicable, transmitting the current relevant parameter settings to the verification software is possible. |  |  |  |
| **6.2.4.5** | AD + VFTSw | Software protection comprises appropriate sealing by mechanical, electronic and/or cryptographic means, making an intervention evident. |  |  |  |
| **6.2.4.6** | AD + VFTSw | Audit trails and event counters are part of the legally relevant software and are secured and protected as such. |  |  |  |
| It is not possible to delete or inadmissible change the data of the event counter or audit trails and it is not possible to exchange the audit trails or the value of the event counter when the software is updated. |  |  |  |
| The weighing instrument or module is fitted with a checking facility to ensure that if an irregularity is detected, the non-automatic weighing instrument stops weighing and displays an error. |  |  |  |
| The audit trail contains at minimum the following information:   * time stamp of the event; * in the case of a software download:   + success / failure of the update procedure,   + software identification of the installed version,   + software identification of the previous installed version,   + time stamp of the event,   + identification of the downloading party if available * in the case of a parameter change:   + identification of the changed parameter;   + the old and new value of the changed parameter. |  |  |  |
| **Prevention of misuse of measurement data** | | | | | |
| **6.2.5** | AD + VFTSw | Measurement data is protected and secured against modification. |  |  |  |
| The weighing instrument/component is constructed in such a way that possibilities for unintentional, accidental, or intentional misuse are minimal. |  |  |  |
| Legally relevant software is secured against accidental or unintentional changes. |  |  |  |
| The presentation of the measurement results shall be unambiguous for all parties affected. |  |  |  |
| **Demands on the user** | | | | | |
| **6.2.6** | AD + VFTSw | The software of a measuring instrument is designed in such a way that no unreasonable demands are required from the user to obtain a correct measurement result. |  |  |  |
| **Detection of significant defects** | | | | | |
| **6.2.7.1** | AD + VFTSw | The software of the non-automatic weighing instrument appropriately acts upon any detected defect. |  |  |  |
| **Durability protection** | | | | | |
| **6.2.7.2** | AD + VFTSw | If durability is detected as being jeopardized, the software-controlled non-automatic weighing instrument either starts measures to ensure further durabilitydeactivates itself or generates an alarm and/or record in an error log. |  |  |  |
| **Information for remote verification** | | | | | |
| **6.2.7.3** | AD + VFTSw | If support of 6.2.7.1 or 6.2.7.2 is part of the remote verification procedure it is possible to transmit data containing information in this respect to the verification software. |  |  |  |
| **Specification and separation of legally relevant components and software modules and requirements for interfaces** | | | | | |
| **6.3.2** | AD | Legally relevant software modules or hardware components – are not inadmissibly influenced by another device or by other modules or components of the weighing instrument. |  |  |  |
| **Separation of components** | | | | | |
| **6.3.2.1.1** | AD | The components of the non-automatic weighing instrument that perform legally relevant functions are identified, clearly defined and documented. |  |  |  |
| **6.3.2.1.2** | AD | A legally relevant software-controlled component communicates with other components or devices through a protective interface. |  |  |  |
| It is not possible to inadmissibly influence the legally relevant software, parameters or measurement data through the communication interfaces |  |  |  |
| It has been demonstrated that the functions and data of the legally relevant components cannot be inadmissibly influenced by commands received via the interface. |  |  |  |
| There is an unambiguous assignment of each command to all initiated functions or data changes in the component. |  |  |  |
| **6.3.2.1.3** | AD | If software seals are used to prevent components from being exchanged and pairing parameters are part of the seal, then these pairing parameters are legally relevant and are secured and protected in such a way that evidence of an intervention is available. |  |  |  |
| **6.3.2.1.4** | AD | In case the authenticity and/or integrity check fails, or the other component is not available, the checking component appropriately acts upon this. |  |  |  |
| **6.3.2.1.5** | AD | If a component is shared by multiple components then all the components that share another component are unambiguously identified. |  |  |  |
| **6.3.2.1.6** | AD | In case the completeness of the measuring instrument cannot be visually checked 6.non-legally relevant software modules shall be prevented from calculation/presenting/spoofing the measurement result. |  |  |  |
| **6.3.2.1.7** | AD | In case legally relevant components with limited functionality and limited securing/protection capabilities are applied, they have limited access to the measurement data, i.e. they use the measurement data without modification or further processing. |  |  |  |
| The measurement data is prepared for transmission or storage for further processing by a component that can be fully secured and protected. |  |  |  |
| The measurement data is received or retrieved for further processing by a component that can be fully secured and protected. |  |  |  |
| **Separation of software modules** | | | | | |
| **6.3.2.2.1** | AD | The requirement applies to the legally relevant software part and it has been made identifiable as described in 6.2.2. |  |  |  |
| If the legally relevant software part communicates with other software parts, a protective software interface has been defined. |  |  |  |
| **6.3.2.2.2** | AD | All legally relevant software modules communicate with other modules through a protective interface. |  |  |  |
| It has been demonstrated that the functions and data of modules that are legally relevant cannot be inadmissibly influenced by commands received via the protective interface. |  |  |  |
| The legally relevant software modules and the protective interface are clearly documented. |  |  |  |
| All legally relevant functions and data domains of the software are described to enable a type evaluation authority to decide on correct software separation. |  |  |  |
| Measurement data is not made available to legally non-relevant modules prior to primary indication. |  |  |  |
| **6.3.2.2.3** | AD | There is an unambiguous assignment of each command to all initiated functions or data changes in the legally relevant software part. |  |  |  |
| Functions that are triggered through the software interface are declared and documented. |  |  |  |
| Only documented functions are activated through the protective software interface. |  |  |  |
| **6.3.2.2.3 (cont.)** | AD | The manufacturer has attested that no hidden or undocumented properties exist. |  |  |  |
| **6.3.2.2.4** | AD | Where the legally relevant software has been separated from the non-relevant software, the legally relevant software has priority using the resources over non-relevant software. |  |  |  |
| The legally relevant process is not inadmissibly interrupted by legally non-relevant software. |  |  |  |
| The measurement process (realised by the legally relevant software) is not delayed or blocked by other processes. |  |  |  |
| **Shared indications** | | | | | |
| **6.3.3** | AD + VFTSw | If a display or printout is used for both legally relevant and legally non-relevant information, the legally relevant information is always readable, and is clearly distinguishable from other information. |  |  |  |
| **Storage of data** | | | | | |
| **6.3.4.2** | AD + VFTSw | The stored measurement data include all relevant data necessary for future legally relevant use. |  |  |  |
| **6.3.4.3** | AD + VFTSw | The stored legally relevant data is protected by appropriate means to guarantee the authenticity and integrity. |  |  |  |
| The software that displays or further processes the measurement values and accompanying data checks the authenticity and integrity of the data after having read them from the storage. |  |  |  |
| The storing device ensures that if an irregularity is detected, the measurement data are discarded or marked unusable. |  |  |  |
| The storage device has sufficient permanency to ensure that the stored data are not corrupted under normal storage conditions. |  |  |  |
| **6.3.4.4** | AD + VFTSw | When, considering the application, data storage is required, measurement data are stored automatically. |  |  |  |
| A checking facility regularly checks the availability of the storage and in the case the storage device is not available no measurement is possible. |  |  |  |
| **6.3.4.5** | AD + VFTSw | There is sufficient memory storage for the intended application. |  |  |  |
| When the storage is full, the instrument can no longer be used for new legal measurements. |  |  |  |
| **6.3.4.6** | AD + VFTSw | When the data necessary for the calculation of the measurement result are relevant for legal purposes, measurement result relevant data included in the calcuation are automatically stored with the final value. |  |  |  |
| **6.3.4.7** | AD + VFTSw | Measurement data stored in a component to construct the measurement result is deleted if the next module or component state a proper completion of expected actions engaged. |  |  |  |
| The measurement result is deleted if the transaction is settled. |  |  |  |
| The measurement result is deleted if these data are printed by a printing device subject to legal control. |  |  |  |
| **Transmission via communication lines** | | | | | |
| **6.3.5.2** | AD + VFTSw | The transmitted measurement data include all data necessary for future legally relevant use. |  |  |  |
| **6.3.5.3** | AD + VFTSw | The transmitted data is protected by software means to guarantee the authenticity, integrity. |  |  |  |
| The software that displays or further processes the measurement data checks the authenticity and integrity of the measurement data received from a transmission channel. |  |  |  |
| If an irregularity is detected, the measurement data are discarded or marked unusable. |  |  |  |
| Means are provided whereby cryptographic keys used by cryptographic methods can only be input or read if a seal is broken. |  |  |  |
| **6.3.5.4** | AD + VFTSw | The measurement is not inadmissibly influenced by a transmission delay. |  |  |  |
| If network services become unavailable, no measurement data are lost. |  |  |  |
| If network sevices become unavailable, the measurement process is stopped to avoid the loss of measurement information. |  |  |  |
| **Compatibility of operating systems and hardware** | | | | | |
| **6.3.6.2** | AD + VFTSw | Hardware interfaces not equipped with a protective interface shall not be able to inadmissibly influence the legally relevant software, parameters or measurement data. |  |  |  |
| **6.3.6.3.2** | AD + VFTSw | The boot process ensures integrity and authenticity of the legally relevant software. |  |  |  |
| **6.3.6.3.3** | AD + VFTSw | If the processing of the chain of trust is interrupted, its integrity is preserved. |  |  |  |
| **6.3.6.3.4** | AD + VFTSw | The boot configuration is secured and protected. |  |  |  |
| **6.3.6.3.5** | AD + VFTSw | Booting via open interfaces is prohibited. |  |  |  |
| **Protection during use** | | | | | |
| **6.3.6.4.1** | AD + VFTSw | The operation of software that is not legally relevant does not inadmissibly influence the legally relevant application. |  |  |  |
| **6.3.6.4.2** | AD + VFTSw | The combination of legally relevant software and operating system ensures that the legally relevant indication is distinguishable from other information. |  |  |  |
| **6.3.6.4.3** | AD + VFTSw | The access control is configured in such way that the intended use cannot be inadmissibly influenced. |  |  |  |
| **6.3.6.4.4** | AD + VFTSw | The administration tasks of the legally relevant software are protected. |  |  |  |
| **6.3.6.5** | AD + VFTSw | Communication with legally relevant software is made via protective interfaces. |  |  |  |
| It has been demonstrated that the legally relevant software, parameters, and data of components that are legally relevant cannot be inadmissibly influenced by commands received via the protective interface. |  |  |  |
| **Testability and traceability** | | | | | |
| **6.3.6.6.1** | AD + VFTSw | The configuration of the operating system is identifiable. |  |  |  |
| The identifier shall be displayed on command or during operation and, if applicable, transmitted to the verification software by the measuring instrument. |  |  |  |
| **6.3.6.6.2** | AD + VFTSw | Legally relevant configuration settings of the operating system are protected, i.e. changes to the legally relevant configuration are traceable. |  |  |  |
| **6.3.6.7** | AD + VFTSw | The manufacturer has identified the hardware and software environment that is suitable. |  |  |  |
| Minimum resources and a suitable configuration management necessary to guarante the correct functioning of the legally relevant software have been declared by the manufacturer. |  |  |  |
| **6.3.6.8** | AD + VFTSw | Technical means have been provided in the legally relevant software to prevent operation, if the minimum resources or a suitable configuration are not met. |  |  |  |
| **Verified update** | | | | | |
| **6.3.7.1** | AD | A protection measure (i.e. physical or electronic seal that must be broken for the update to take effect) provides evidence of an intervention. |  |  |  |
| **Traced update** | | | | | |
| **6.3.7.2.2** | AD + VFTSw | The weighing instrument has a feature for the user or owner to express his consent before the update starts. |  |  |  |
| It is possible to enable and disable the feature. |  |  |  |
| **6.3.7.2.3** | AD + VFTSw | After initiation of the update procedure, the Traced Update of software runs automatically. |  |  |  |
| If some of the securing or protection measures of the weighing instrument are turned off to enable updating, they are turned on again immediately after update, independent of the result of the update process. |  |  |  |
| **6.3.7.2.4** | AD + VFTSw | During a Traced update, any existing protection measures are retained. |  |  |  |
| **6.3.7.2.5** | AD + VFTSw | Technical means are employed to guarantee the authenticity of the loaded software, i.e. that it originates from the owner of the certificate. |  |  |  |
| **6.3.7.2.6** | AD + VFTSw | Technical means are employed to ensure the integrity of the loaded software, i.e. that it has not been inadmissibly changed before loading. |  |  |  |
| **6.3.7.2.7** | AD + VFTSw | If the loaded software fails integrity test or authenticity test, the weighing instrument discards the new version and uses the previous version of the software or switches to an inoperable mode. |  |  |  |
| In this mode, the measuring functions are inhibited. It is only possible to resume the download procedure, or to show an error. |  |  |  |
| **6.3.7.2.8** | AD + VFTSw | An audit trail is employed to ensure that Traced Updates of legally relevant software are adequately traceable within the weighing instrument for subsequent verification and surveillance or inspection. |  |  |  |
| The audit trail contains at minimum the following information:   * success/failure of the update procedure; * software identification of the installed version; * software identification of the previous installed version; * time stamp of the event; * identification of the uploading party, i.e. the source of the update, if available. |  |  |  |
| An entry is generated for each update attempt regardless of the success. |  |  |  |
| The storage device that supports the Traced Update has a sufficient capacity to ensure the traceability of Traced Updates of legally relevant software between at least two successive verifications in the field/inspections. |  |  |  |
| After having reached the limit of the storage for the audit trail, it is ensured by technical means that further downloads are impossible without breaking a seal. |  |  |  |
| **6.3.7.2.9** | AD + VFTSw | If the audit trail has no more capacity, or the user or owner denies consent, the update procedure does not start at all. |  |  |  |
| **Remote Verification Capability** | | | | | |
| **6.3.8.1.1** | AD + VFTSw | The modules involved in the remote verification procedure are part of the legally relevant software and shall fulfil the relevant requirements. |  |  |  |
| **6.3.8.1.2** | AD + VFTSw | It is always possible to establish and ensure the integrity of the instrument to be verified. |  |  |  |
| **6.3.8.1.3** | AD + VFTSw | It is possible to establish the authenticity of the instrument, i.e. the instrument is uniquely identified and other means are provided to ensure authenticity. |  |  |  |
| **6.3.8.1.4** | AD + VFTSw | The instrument stores logging data, audit trails, and make these available for remote verification purposes. |  |  |  |
| **6.3.8.1.5** | AD + VFTSw | The instrument uses time stamps, provides evidence of an intervention, audit trails and has a facility for detection of significant defects for the purpose of remote verification. |  |  |  |
| **6.3.8.1.6** | AD + VFTSw | An ongoing measurement is influenced by remote verification or measurements are inhibited during the remote verification. |  |  |  |
| **6.3.8.1.7** | AD + VFTSw | The use of the verification procedure does not influence the compliance with other requirements. |  |  |  |
| Access to the verification procedures, specific test items or commands is available but is restricted if these influence compliance with other requirements. |  |  |  |
| **6.3.8.1.8** | AD + VFTSw | The software integrity of the instrument is not influenced by the remote verification procedure. |  |  |  |
| **6.3.8.1.9** | AD + VFTSw | There is a legally relevant interface for data extraction for remote verification purposes. |  |  |  |
| **6.3.8.1.10** | AD + VFTSw | Interfaces for remote verification are protected. |  |  |  |
| **6.3.8.1.11** | AD | Access rights to the instrument for remote verification data are described in the documentation. |  |  |  |
| **6.3.8.1.12** | AD + VFTSw | Provisions have been made to securely store the result of the remote verification in the measuring instrument. |  |  |  |
| This data is protected and secured. |  |  |  |
| The result of the remote verification contains, at least, a unique ID (at least identifying the verification authority). |  |  |  |
| The date of the verification is stored. |  |  |  |
| Stored results of the verification in the instrument comply with clause 6.3.4. |  |  |  |
| **6.3.8.2** | AD + VFTSw | If an instrument does not pass remote verification, it displays a permanent disqualification message. |  |  |  |
| **Direct extraction of test items** | | | | | |
| **6.3.8.4.1** | AD + VFTSw | When checking software integrity, the integrity measure (checksum, hash) is calculated immediately before transmitting the integrity measure to the remote verification software. |  |  |  |
| **6.3.8.4.2** | AD + VFTSw | Test items are uniquely identified. |  |  |  |
| The obtained test items are unambiguously linked to the measuring instrument to be verified. |  |  |  |
| **6.3.8.4.3** | AD + VFTSw | Relevant test items identified by the PG (see XXX) are available depending on the specific requirement to be tested. |  |  |  |
| **Connection requirements** | | | | | |
| **6.3.8.5** | AD + VFTSw | The connection to the remote verification software complies with 6.3.5. |  |  |  |

Use this page to detail remarks from the checklist

1. The test equipment (simulator or a part of a complete instrument) connected to the module shall be defined in the test form(s) used. [↑](#footnote-ref-1)
2. Please note that the class denominations used hereafter in this Recommendation do not include the oval around the number for improved clarity of the Type Evaluation Report Format’s text. [↑](#footnote-ref-2)
3. Checked by verifying the compliance with documents or by simulating faults; this check does not duplicate the disturbance tests 8.3.1-8.3.7 specified in R 76-2. [↑](#footnote-ref-4)
4. Checked by verifying the compliance with documents or by simulating faults; this check does not duplicate the disturbance tests 8.3.1-8.3.7 specified in R 76-2. [↑](#footnote-ref-5)