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# WELMEC

**European cooperation in legal metrology**

## Guide for the testing of automatic catchweighing instruments

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# WELMEC

European cooperation in legal metrology

WELMEC is a cooperation between the legal metrology authorities of the Member States of the European Union and EFTA. This document is one of a number of Guides published by WELMEC to provide guidance to manufacturers of measuring instruments and to notified bodies responsible for conformity assessment of their products. The Guides are purely advisory and do not themselves impose any restrictions or additional technical requirements beyond those contained in relevant EC Directives. Alternative approaches may be acceptable, but the guidance provided in this document represents the considered view of WELMEC as to the best practice to be followed.

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# 1 Introduction

## 1.1 Scope

The guide describes the procedures suitable to be used when testing automatic catchweighing instruments. The document is based on the OIML recommendation R51 on automatic catchweighing instruments.

This guide gives additions to, or interpretations of, OIML R51 accepted by WELMEC members. This guide refers also to other WELMEC guides and especially those developed for non-automatic weighing instruments [NAWIs] and the WELMEC Type Approval Agreement. This document also describes the national regulations of some European Countries as far as the requirements influence the acceptance of test results.

This guide is mainly describing instruments with a transport system. Other (Class Y(y)) instruments will be added in a later stage.

The intention of the guide:

- It describes the terms and aspects that are important when automatic catchweighing instruments are tested for type approval;
- It describes test procedures that are clear and acceptable by national approval bodies;
- It functions as a reference in the description of the tests that have been carried out and of which the outcome is laid down in a certificate.

# 2 Terminology

For the purpose of this guide the following definitions apply:

**Family**
The range of versions of a weighing instrument based on the same type of indicator or weighing module. The concept of family mentioned here is for testing purposes only.

**Module**
Part of the weighing instrument necessary for obtaining the weighing result and any primary indication related to it. A module is capable of being tested separately and of having partial error limits $p_i$ assigned to it.

A device connected to a weighing instrument via a non-protective interface is regarded as a module. The connection needs to be secured and if nothing is connected to it the interface itself needs to be secured.

**Indicator**
Module that measures the analogue output of a load cell and converts it to the weighing result.

**Weighing module**
Module that includes the load transmission device (see WELMEC guide 2.4), the load cell(s) and a digital output adjusted in units of mass.

Note: In the case of an arbitrary digital output it is not considered to be a weighing module; it remains a load cell.

## 3 Written declaration

The manufacturer shall give to the testing authorities a written declaration including:

– Manufacturers name and address and also the authorised representative if applicable;

– That the OIML recommendation R51 has been adopted;

– Which class applies to the instrument, class X(x) or class Y(y) or both;

– That the automatic catchweighing instrument can not be disturbed or fraudulently manipulated via the protective interfaces (Article 4.2.4 of R51).

## 4 Equipment under Test (EUT)

To reduce the number of instruments to be tested, the range of instruments of a manufacturer can be grouped into families.

For the purpose of type evaluation/approval, a family shall consist of automatic catchweighing instruments, which have the same modules, i.e.:

- Type of indicator;
- Load cell (see 5.2).

For indicators we can mention:

- If the type of the indicator is changed in one or more of its legally relevant parts and new influence factor and disturbance tests are necessary, it is a new family.
- If only new disturbance tests are necessary, i.e. for another version of the cabinet of the indicator, it belongs to the same family.

### 4.1 Determining the mode of operating for influence factor tests

To determine if an instrument can be tested with static loads in non-automatic operation, see chapter 6.5.3 Influence factor tests of the OIML R51.

If an instrument can be tested with static loads in non-automatic operation, chapter 4.2 applies (category 1). If not, chapter 4.3 applies (category 2).

### 4.2 EUT category 1 (influence factor testing in non-automatic mode)

For the purpose of type evaluation/approval the same procedures can be used to combine tests for different versions as applied to non-automatic weighing instruments (modular approach as mentioned in R76).

For testing and certifying the modules, the following WELMEC guidelines can be used where applicable:

1. WELMEC 2, Common Application;
2. WELMEC 2.1, Guide for Testing Indicators;

3. WELMEC 2.2, Guide for Testing Point of Sale (POS) Devices;
4. WELMEC 2.3, Guide for examining Software of Non-Automatic Weighing Instrument;
5. WELMEC 2.4, Guide for Testing of Load Cells;
6. WELMEC 2.5, Guide for modular approach and testing of PCs and other digital peripheral devices;
7. WELMEC 7.1, Guide Software requirements on the Basis of the Measuring Instruments Directive.

Example 1: Where load cells having the same capacities belong to different versions, approval of the load cell with the best characteristics implies approval of the load cell with lesser characteristics. [For further elaboration on load cells, see WELMEC guide for testing of load cells]

Example 2: If the indicator has two different cabinets, both versions may need to be tested for EMC behaviour.

## 4.3 EUT category 2 (influence factor testing in automatic mode)

### 4.3.1 Considerations for determining the EUT

When determining the EUT, the following should be considered:

- During type-approval tests the manufacturer could specify the transport system. If the automatic catchweighing instrument passes the type-approval tests, all other transport systems are covered as well.
- The highest rate of operation needs to be tested and the smallest value of x.
- The highest number of verification scale intervals needs to be tested and the lowest value of μV/e. Remark: if the available resolution on the test unit allows to calculate if other combinations are within the MPE, then this is allowed.
- If it is not possible to combine the above mentioned parameters into one automatic catchweighing instrument version, then more than one sample needs to be tested, the principle being that the selected sample of instruments to be tested shall take in account all the parameters identified in this chapter.
- If the automatic catchweighing instrument has different functions, all legally relevant functions need to be tested for compliance with the technical requirements of Chapter 3 of OIML R51. For example, if the automatic catchweighing instrument has two different versions,
  - version A with a dynamic setting device but without price calculations, and
  - version B with price calculation but without a dynamic setting device,

  then, for both versions, compliance with the technical requirements of Chapter 3 and the requirements for electronic instruments of Chapter 4 of OIML R51 need to be examined. For test purposes, both versions can be combined in one EUT.

### 4.3.2 Determining the EUT

To determine the Equipment under Test, the following criteria apply:

Every family has to be tested as a complete instrument according to R51 or using the modular approach as mentioned in chapter 4.3.3.

The following criteria can be used to combine tests:

1. If different types of transport systems are used, the tests are performed on a automatic catchweighing instrument as specified by the manufacturer;
2. If for the different types, different speeds of operations are used, the tests will be carried out with the highest speed of operation. If the manufacturer specifies for the different types of automatic catchweighing instruments, different speeds of operation and different classes, the tests will be performed on the instrument with the highest speed of operation, smallest value of factor x and with the maximum number of verification scale interval or the smallest value of the input voltage per verification scale interval (µV/e). The tests need to be repeated for another type of automatic catchweighing instrument with a lower value of the factor x (higher accuracy).
3. If different dimensions of the weigh table are used, the manufacturer can choose the optimum weigh table in combination with the optimum tests loads.

### 4.3.3 Test considerations

The modular approach that is applied to NAWIs should also be applied to automatic catchweighing instruments as far as possible. For automatic catchweighing instruments that weigh dynamically, at least one sample has to be tested dynamically; dynamic tests cannot be completely abandoned or be replaced by simulation tests.

For testing and certifying the modules, the following WELMEC guidelines can be used where applicable:

1. WELMEC 2, Common Application;
2. WELMEC 2.1, Guide for Testing Indicators;
3. WELMEC 2.2, Guide for Testing Point of Sale (POS) Devices;
4. WELMEC 2.3, Guide for examining Software of Non-Automatic Weighing Instrument;
5. WELMEC 2.4, Guide for Testing of Load Cells (**for load cells for dynamic weighing applications refer to the Note below)**;
6. WELMEC 2.5, Guide for modular approach and testing of PCs and other digital peripheral devices;
7. WELMEC 7.1, Guide Software requirements on the Basis of the Measuring Instruments Directive.

**Note**: Load cells for dynamic weighing applications are neither covered by WELMEC 2.4 nor by OIML Recommendation (R60). In this case, when using the modular approach, it is therefore necessary to test at least one load cell dynamically. To conduct these tests a load transport system and the load transmission device have to be included in the test. An

acceptable solution for the error fractions $p_i$ for instruments incorporating the typical modules is given in the following table:

| **Performance criteria** | **Load cell (dynamically)** | **Indicator** |
|---|---|---|
| combined effect | 0.8 | 0.5 |
| temperature effect on no-load indication | 0.8 | 0.5 |
| power supply variation | - | 1 |
| damp heat | 0.8 | 0.5 |

If an instrument is tested dynamically, any other load cell may be used provided the following conditions are met:

- There is a respective OIML Certificate of Conformity (R60) or a test certificate (EN45501) issued for the load cell by a Notified Body responsible for type examination under Directive 90/384/EEC.
- The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC 2, Issue 3, 2000, Section 11), and any particular installation requirements. A load cell marked NH is allowed only if humidity testing to EN45501 has been conducted on this load cell.
- It is not a load cell with digital output.
- The characteristics of the replacement load cell such as $n_{lc}$ , Y, Z are the same or better than the load cell that is tested dynamically.
- The design of the load cells and the material are the same.
- No oil damper is used.

Load cells with different characteristics can only be used if additional dynamic testing has been performed.

It is allowed to change from one transport system to another transport system during type approval tests and combine the test results of the different transport systems to a best case specification under the condition that after the change of transport system:

- The number of scale intervals has not changed;
- The value of μV/e has not changed.

For example: if during the temperature tests, different transport systems are used for the different loads, the test results of those different combinations of test loads and transport systems may be combined to determine the lowest possible value of x. If a Notified Body combines tests then this should be clearly stated in the Test Report and the test data of the different tests should be included in the test report.

## 5 Test plan

It is important that the automatic catchweighing instrument is tested under normal conditions of use. To limit the number of tests, the automatic catchweighing instrument should, as far as possible, be tested under conditions that cover the maximum range of applications.

Where possible, tests should be performed on a complete instrument. Simulation tests should be the exception and not a way to avoid dynamic testing.

### 5.1 Test plan for category 1 instruments

For category 1 instruments, all tests as defined in OIML R51 have to be performed. If the manufacturer has an OIML R76 test report, or the modules have a Test Certificate issued by a Notified Body under the NAWI Directive 90/384/EEC, those test results should be utilised to determine compliance with the requirements and with agreement of the owner of the TC.

A complete instrument should be tested under the normal conditions of use for which the instrument is intended (R51-1, 5.2.2).

**Note**: The tests include a check to see if the automatic catchweighing instrument complies with the technical requirements as stated in OIML R51-1. If the test results or test certificates do not indicate that compliance with the technical requirements has been evaluated then the Notified Body should perform this test on the automatic catchweighing instrument.

### 5.2 Test plan for category 2 instruments

For category 2 instruments, the use of OIML R76 test report or the use of test certificates will not cover all the tests. Apart from the tests already performed on the modules, the following tests have to be performed on the complete instrument if applicable:

1. Range of dynamic setting, see OIML R51-1, article 3.2.3, A.6.3 and R51-2 article 2;
2. Accuracy of zero-setting, see OIML R51-1, article 3.3.1, A.6.4 and R51-2 article 3.5.2.2;
3. Stability of zero and frequency of automatic zero-setting, see OIML R51-1, article 3.3.1, A.6.5 and R51-2 article 3.4.2;
4. Accuracy of tare setting, see OIML R51-1, article 3.3.3, A.6.6 and R51-2 article 4.1.2;
5. Zero and span errors immediately after appearance of a stable indication, see OIML R51-1, article 4.2.3 and article A.6.2;
6. Eccentric loading, see OIML R51-1, article 2.8 and A.6.7;
7. Alternative speed of operation, see OIML R51-1, article 6.1.4 and A.6.8;
8. Temperature test, see OIML R51-1, article 2.9.1 and A.7.1;
9. Temperature effect on no load indication, if applicable, see OIML R51-1, article A.7.2;
10. Power variation test, see OIML R51-1, article 2.9.2 and A.7.4;
11. Tilting test, see OIML R51-1, article 2.9.3 and A.7.5;
12. In the case that the test certificate of the indicator does not state that the indicator can be used for an automatic catchweighing instrument, also the checklist has to be performed.

### 5.3 Test plan for weighing modules

For a weighing module (tested with transport system):

- which includes all mechanical parts with exception of the transport system, and
- which performs all relevant functions of an automatic catchweighing instrument,

the fractional error $p_i$ is assumed to be equal to 0.8. The transport system may then have $p_i = 0.5$.

The weighing module can have a test certificate. In this case, if another manufacturer (with agreement of the owner of the TC) uses this weighing module in his automatic catchweighing instrument, no additional dynamic tests need to be performed if the dynamic tests have been performed on the weighing module.

### 5.4 Peripheral equipment

With respect to peripheral equipment that can be connected to the automatic catchweighing instrument, the following requirements should be taken into account:

- In the case of protective interfaces (in the sense of R76-1 article 5.3.6.1):
  - Cables shall be connected to all input/output and communication lines;
  - Cable types and lengths shall be as specified in the manufacturer's authorised manual or as specified in the test certificate. If cable lengths longer than 3 metres are specified, testing with lengths of 3 metres is regarded as sufficient.
- In the case of non-protective interfaces:
  - Peripheral equipment shall be connected to these interfaces to demonstrate correct functioning of the system or sub-system and the non-corruption of weighing results.

    Exception: If the non-protective interface is intended for a reject mechanism, only the presence of a signal on the interface needs to be checked. If it functions correctly, the manufacturer can use <u>any</u> reject mechanism.

### 5.5 Indication for test purposes

An automatic catchweighing instrument that weighs in motion makes the use of overweights to determine the rounding error of the indication very difficult. For that purpose, an indication for test purposes is highly recommended. See also article 2.6 of OIML R51. Before the tests, it is a necessary step to verify if this indicating mode is suitable for establishing the measuring errors.

Acceptable solution: Indication with $d \leq 0.2e$.

## 6 Advice for initial verification

The following tests or checks shall be performed, if applicable, during the initial verification:

- Standard operation test in normal operation mode. This test will be performed with (pre-) packages at the (highest) operation speed according to the data plate.
- Effect of eccentric loading.
- Suitability for use.
- Securing of operations.
- Zeroing and tare devices (not for category 2 instruments).
- Indications of weighing results.
- Printing devices.
- Price computing instruments.
- Weigh or weigh-price labelling instruments.
- Descriptive markings.
- Verifications marks.
- Weighing performance testing during normal conditions of use (not during the temperature testing) shall include testing with a maximum length of test load and a minimum length of test load following each other in a sequence. The minimum distance between these two lengths of test loads shall also be tested in a sequence. [class Y(y)]
- Accuracy of net weighing. The instrument should be tested with the maximum specified tare on the data plate in action, with the object of determining the maximum net load together with the maximum tare load. (Note that the maximum permissible errors apply to net weighing). [class Y(y)]
- Dynamic setting.

To be aware of:

- Take into account the value of the tare weight of the product to be checked and take the MPE for the net load.
- The rate of operation in relation to the Maximum capacity of the automatic catchweighing instrument should be confirmed during verification.
- If the automatic weighing cycle of a catchweigher comprises two weighings, one weighing the Gross weight and the other weighing the Tare weight, the verification is carried out on the Net weight indication of the catchweigher.

- If a catchweigher is built with two weighing systems, the first weighing the Tare weight and the second weighing the Gross weight, the verification is carried out on the Net weight indication of the catchweigher. The verification method will be:
  - Determine from each package the “true” Tare weight
  - Feed each package through the complete weighing system (so through the tare and gross weighing system
  - Take the Net weight indication from the weighing system
  - Determine from each corresponding package the “true” Gross weight
  - Calculate the “true” Net weight
  - Calculate the errors by subtracting the Net weight indication from the “true” Net weight

## 7 Interpretations of OIML requirements

| | |
|---|---|
| General | For items that are not mentioned in the OIML R51 document, we refer to the OIML R76 document. |
| Article 2.3 | "Any load" can be Gross or Net depending on the operation of the instrument. |
| Article 2.5.1 | For static weighing in non-automatic operation the maximum permissible error for class X(x) instruments shall be as specified in Table 1 for initial verification. Not clear is which factor x the manufacturer can specify or, if a factor should be specified. To avoid confusion during verification, no class needs to be specified and the certificate shall state that the instrument only weighs statically. However the certificate should indicate whether or not for the value of e the table class X(x) . 1 or X(x) >1 can be used.<br>The criteria for a class X(x) instrument is calculated as follows:<br>• [mass of test load – MPME] . [mean value calculated on the sample] . [mass of test load + MPME]<br>• [standard deviation calculated on the sample] . MPS |
| Article 2.5.2 | The criterion for a class Y(y) is that all the weighing results have to be within the MPE. |
| Article 2.6 | This article refers to the scale interval for test purposes. Instead of e one should read d. Since reference is made to test purposes, this scale interval for test purposes should be in a special mode, for example a service mode. |
| Article 2.8 | The reference to art. 2.5 only refers to initial verification (and type approval testing) not to in-service testing.<br>The reference to article 6.2 should be 6.2 and 6.3. |
| Article 3.2.3 | This article refers to the dynamic setting device. It requires that the instrument will take appropriate action for loads falling outside that range. Appropriate actions for class X (x) instruments can be defined as follows:<br>• Reject the packages outside the range of dynamic setting<br>and<br>• Not use this value for the calculations of average and standard deviation.<br>For class Y(y) instruments appropriate action is not to produce a printout, i.e. the label.<br>This article also states that national prescription may determine the use. See chapter national requirements. |

| | |
|---|---|
| Article 3.3.1 | This article states that an automatic zero-setting device shall operate sufficiently often to ensure that the zero is maintained within 0.5 e.<br><br>This is tested by performing a test according to chapter 3, paragraph 3.4 of R51-2, immediately after zero setting and after a maximum interval close to the zero-setting but before a zero-setting. This test needs to be repeated immediately after the normal warm-up time [see A.6.5] |
| Article 3.3.1, A.6.5 and A.7.2. [note] | If the temperature effect on no-load indication is not tested, then it must be laid down in the type approval certificate that there <u>must always be an automatic zero setting device as part of the automatic weighing process of each cycle</u>. This means that it must not be possible to set the automatic zero setting at time intervals, because the permissible maximum time interval essentially depends on the effect which the temperature exerts on the no-load indication.<br><br>If the zero-setting device is not part of the automatic weighing process of each cycle, the maximum time interval for automatic zero setting must therefore be fixed in the type approval certificate and calculated as follows:<br><br><u>Conditions and calculation of the maximum time interval for automatic zero setting in accordance with R51</u><br><br>R51-1 section A.7.2 means:<br><br>(i) If there is a zero-setting belonging to each weighing cycle, the temperature effect on zero is not relevant.<br><br>(ii) If the instrument is not fitted with an automatic zero-setting device A.7.2 is valid, and the operator is responsible for the zero setting sufficiently often to ensure that the zero is maintained within 0.5 e.<br><br>(iii) If the instrument is fitted with an automatic zero-setting device with a changeable time-frequency of automatic zero setting, you have to look at 3.3.1 and A.6.5, but this test alone is not sufficient. The maximum frequency of automatic zero-setting shall be in accordance with the test results of A.7.2 and you can calculate:<br><br>a) <u>The maximum allowable zero-variation.</u><br>No. 3.3.1 gives the maximum allowable zero-<u>setting</u> error Ezsmax ≤ 0,25 e<br>maximum allowable zero-<u>checking</u> error Ezcmax ≤ 0,5 e so you can calculate the<br>maximum allowable zero-<u>variation</u> Ezcmax - Ezsmax = 0,25 e<br><br>b) <u>The maximum allowable rate of change of a steady ambient temperature.</u><br>It is given in all applicable OIML recommendations with 5°C per hour.<br><br>A.7.2 requires the maximum allowable zero-variation Ezmax per 5°C ≤ e |

| | |
|---|---|
| | With 5°C per hour for steady ambient temperature (b)<br>Ezmax per hour ≤ e<br>With maximum allowable zero-variation (a)<br>Ezmax per 0,25 h ≤ 0,25 e<br><u>That means:</u><br>An instrument, which needs the maximum allowable variation given in A.7.2, has a maximum frequency of automatic zero setting within 15 minutes.<br>Is the temperature effect on no-load indication shown by the test result of A.7.2 smaller, the maximum frequency of automatic zero setting can be increased proportionally.<br>With this maximum frequency the test A.6.5 shall be performed. |
| Article 3.4.2 | This article states the requirement on the indication of weighing results. This article does not define the requirements for the use of auxiliary indicating devices or extended indicating devices. If national regulations do not prescribe such requirements, the appropriate requirements of OIML R76 are used to determine if the instrument complies with this requirement when the instrument is equipped with an auxiliary indicating device or extended indicating device, see article 3.4 and article 4.4.3 of OIML R76-1. |
| Article 3.4.3 | This article states requirements for the limits of indications. When an instrument is classified in more than one class, the limits of indications should be calculated in such a way that the heaviest load can be measured. For example, the automatic catchweighing instrument has the following specifications:<br>• Load of 98 g and class $X_{(10)}$ ;<br>• Load of 100 g and class $X_{(2)}$.<br>• Max of 101 g<br>The limits of indication may now be Max + 3 * [0.3 * 10] instead of Max + 3 * [0.3 *2]. This is necessary because otherwise all loads above 101.74 gram can not be checked and the largest load allowed with a weight of 98 gram is 108.2 gram.<br>*[The example is extreme to make the point. Basically the instrument is allowed to indicate the load + tolerances it is checking]* |
| Article 3.4.4 | In normal mode of operation it is allowed to indicate the result of internal calculations (mean value and standard deviation) with a higher resolution than e. |

<table>
<tr><td rowspan="4">Article 3.8.1 – 3.8.3</td><td colspan="4">A practical solution for the descriptive marking is to adopt a table on the data plate. For example:</td></tr>
<tr><td>Types of packs</td><td>Class</td><td>Speed of transport system</td><td>Remarks</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Note that the descriptive marking has to be in the national language.</td></tr>
<tr><td>Article 4.2.2</td><td colspan="4">This article states requirements for reacting to significant faults. Since the checking facilities are purely optional, the documentation should contain information about the form of the reaction to the detection of the fault, in the display; confusion with other error messages, display blanking etc should be avoided.<br><br>No tests to trigger reactions are intended.</td></tr>
<tr><td>Article 4.2.4</td><td colspan="4">This article specifies the requirements for interfaces. To verify compliance with this requirement, no physical test procedure is available at the moment; therefore a specific declaration in the sense of R76-1, article 5.3.6.1 by the manufacturer is considered sufficient. This means that if an interface has once been declared as being protective in the sense of R76-1, article 5.3.6.1, the requirement of R51-1, article 4.2.4 is regarded as being met as well.</td></tr>
<tr><td>Article 4.3.4</td><td colspan="4">This article specifies requirements for the instrument while being tested. During most of the tests, the testing authorities need a weight value in the display. Normally the display value is presented after an automatic weighing operation. However, during for example the disturbance test it might be difficult to simulate or initiate a complete weighing operation. To be able to perform the tests, the testing authorities can require a continually updated weight indication; i.e. the automatic catchweighing instrument should have a non-automatic weighing mode with a weight indication either in units of mass or in counts.</td></tr>
<tr><td>Article 5.3.1</td><td colspan="4">Excluding 2.8 has to be excluding 2.9.</td></tr>
<tr><td>Article 6.5</td><td colspan="4">The number of test loads for the static tests may be one with the exception of the test describe in article 6.5.3.3.</td></tr>
<tr><td>Article 6.5.3.1</td><td colspan="4">Third paragraph: meant are the test loads, so only test loads greater than or equal to 50 kg may be tested statically in non-automatic mode.</td></tr>
<tr><td>Article 6.5.3.3</td><td colspan="4">In case of static weighing operation, the value of x is calculated with the test data obtained by performing the test according to article 6.5.3.3 but the value of s, used for the calculation of x, should be not lower than 0.5d.</td></tr>
<tr><td>Article 6.5.3.3</td><td colspan="4">For the maximum permissible error mentioned in the last sentence, the absolute value of the maximum permissible error is meant.</td></tr>
<tr><td>A.6.5 and A.7.2 [note]</td><td colspan="4">(see note concerning Article 3.3.1 above)</td></tr>
</table>

| | |
|---|---|
| A.7.1 and A.7.2 | In case the temperature effect on the no-load indication is combined with the static temperature test of article A.7.1, the zero-setting and zero-tracking devices should be disabled. |
| A.7.3 | The test should also be performed at maximum capacity as the test at minimum capacity is not appropriate. |
| R51-2, 7.6 | The note is meant for instruments (for weighing loose material) that shall be tested in static, non-automatic mode (see 6.5.3.1). |

## 8 National requirements

This chapter is meant for information purposes only. The manufacturer is free to choose whether or not and which requirements are used during the type-approval of his instrument.

### 8.1 Differences from OIML R51

| Countries | National requirements |
|---|---|
| Germany<br>The Netherlands | Digital peripheral equipment such as data storage devices subject to legal control is treated with the same conditions and requirements as for non-automatic weighing instruments. |

### 8.2 Choices made from OIML R51

| Countries | article of OIML R51-1 | National requirements |
|---|---|---|
| France | 2.2 | Classes where x > 1 are not allowed for legal for trade purposes |
| France | 2.3 | Class Y(b) are not allowed for legal for trade purposes |
| Germany<br>France<br>The Netherlands | 3.2.3 | The instrument shall have a facility for any access to dynamic setting to be automatically and non-erasable recorded. |

## 9 Contents of the OIML certificate of conformity

The OIML certificate of conformity should at least give the information necessary to fill in the compatibility sheets as used in the guide WELMEC 2 Common application.

## 10 Contents of the OIML test report

Information about the family of automatic catchweighing instruments if applicable.

When it is not possible to perform tests on a complete instrument, the reasons should be stated and the test set-up should be described.

## 11 Required documentation

Documentation required for OIML certification:

1 General description of type, explanations necessary to understand the functioning of the instrument

1.1 Intended purpose of use, kind of instrument (e.g. checkweigher, weigh price labeller)

1.2 General characteristics (manufacturer; Class, Max, Min, e, n, rate of operation, range of temperature, voltage ...) /3.8/

2 List of descriptions and characteristic data of all devices incorporated in the instrument

2.1 Means for securing components, controls etc. /3.2.4/
Place for application verification marks /3.9/

2.2 Adjustment devices /3.2.2, 3.2.3/

2.3 Indication or printout for test purposes /2.6/

2.4 Indication or printout for normal operation /3.4.4/

2.5 Printing devices /3.5/

2.6 Zero-setting, zero-tracking devices /3.3.1, 3.3.2/

2.7 Tare devices /3.3.3/

2.8 Preset tare devices /3.3.4/

2.9 Levelling device and level indicator, maximum value of tilt /2.9.3/

2.10 Functions of price-computing instruments /3.6/
Weigh price labellers /3.7/

2.11 Interfaces
- Type(s), intended use, immunity to external influences instructions /4.2.4/
- Peripheral devices presented to be connected for the disturbance tests /4.3.2/

2.12 Peripheral devices, e.g. printers, remote displays, that are to be included in the type approval certificate

2.13 Other devices or functions, e.g. for purposes other than determination of mass (not subject to conformity assessment)

3 Information concerning special cases

3.1 Subdivision of the instrument in modules - e.g. load cells, mechanical system, indicator, display - indicating the functions of each module and the fractions pi of the maximum permissible errors /5.2.3.4/
- See also point 8 -

3.2 Special operating conditions /4.1.1/

3.3 Reaction of the instrument to significant faults /4.2.2/

3.4 Functioning of the display after switch-on /4.2.1/

3.5 Any other special information

4 Conceptual designs, drawings and plans of components, sub-assemblies, electric circuits etc. in particular of:

- load receptor
- lever systems and material of the levers
- devices to apply the force to the load cells
- electrical connection elements, e.g. for connecting load cells to the indicator
- load cells, if not presented as modules under 3.1

indicator: block diagram
Schematic circuit
Keyboard with function assigned to any key

- drawing of the main plate
- samples of all intended printouts, see also point 2.5
- presentation of the instrument (drawing or photo) showing where verification and securing marks are to be applied
- cf. Points 2.1. Size not larger than 210 x 297 mm (DIN A4)

5 Declarations whether OIML R51-1 has been fully applied.

6 Results of tests performed by the manufacturer, on protocols from R51-2, including proof of competence.

7 Test reports from other laboratories, as per point 6.

8 Certificates of other type approvals or separate tests, relating to modules or other parts mentioned in the documentation, together with test protocols where possible - see also point 3.1.

## 12 Revisions of this guide

| Issue | Date | Significant changes from previous issue |
|---|---|---|
| 2 | Sep 2004 | National requirement for Germany listed in Section 8.2, relating to zero setting (3.3.1 etc), moved to Section 7 “Interpretations of OIML requirements”, as latest draft R51-1 includes it.<br><br>New map on front cover. |