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Issue 2

# WELMEC

European cooperation in legal metrology

## **Automatic Catchweighing Instruments** Cross Reference Table 2004/22/EC vs. OIML R 51-1 Edition 2006 (E)



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# WELMEC

European cooperation in legal metrology

WELMEC is a co-operation 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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Automatic Catchweighing Instruments  
Cross Reference Table 2004/22/EC vs. OIML R 51-1 Edition 2006 (E)

Detailed analysis

**Notes:**

1. The column “Comments” indicates when necessary the relevant text of OIML R 51-1 and related explanations concerning the compliance with the relevant requirements in Directive 2004/22/EC.
2. The column “Conclusion” gives the conclusion on the compliance between OIML R 51-1 and the relevant requirements in Directive 2004/22/EC.

The indication “Covered” means that:

- the requirement of OIML R 51-1 is identical to the one of Directive 2004/22/EC; or
- the requirement of OIML R 51-1 is more severe than the one of Directive 2004/22/EC; or
- all the requirement of OIML R 51-1 fulfils requirements in Directive 2004/22/EC (even when Directive 2004/22/EC allows other alternatives),
- in case the requirement is not fully covered, a short statement explains what is covered.

The indication “Not Covered” means that the requirement in Directive 2004/22/EC is either not compatible with the relevant OIML R 51-1 requirement or not included in OIML R 51-1.

The indication “Not Relevant” means that the requirement in Annex I of Directive 2004/22/EC is not relevant for automatic catchweighing instruments.

The text in *italic* is an extract from the relevant clause of the OIML Recommendation.

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
<b>ANNEX 1</b>			
<p>1.1 Allowable Errors Under rated operation conditions and in absence of a disturbance, the error of measurement shall not exceed the maximum permissible error (MPE) value as laid down in the appropriate instrument-specific requirements.</p> <p>Unless stated otherwise in the instrument-specific annexes, MPE is expressed as a bilateral value of the deviation from the true measurement value.</p>	<p>T.4.3.1</p> <p>T.4.3.7</p> <p>2.5</p> <p>2.6</p> <p>4.1.1</p>	<p><b>Error (of indication) [VIM:1993, 5.20 [1]]</b> <i>Indication of an instrument minus the (conventional) true value of the mass.</i></p> <p><b>Maximum permissible error, MPE [VIM:1993, 5.21 [1]]</b> <i>Extreme value of an error permitted by specifications, regulations, etc. for a given instrument.</i></p> <p><b>Maximum permissible errors</b></p> <p><b>Maximum permissible errors for influence factor tests</b></p> <p><b>Rated operated conditions</b> <i>Electronic weighing instruments shall be so designed and manufactured that they do not exceed the maximum permissible errors under rated operating conditions.</i></p>	<p>Covered</p>





<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1 Edition 2006 (E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>1.3.2 (a) Mechanical environments are classified into classes M1 to M3 as described below</p> <p>M1: This class applies to instruments used in locations with vibration and shocks of low significance, e.g. for instruments fastened to light structures subject to negligible vibrations and shocks transmitted from local blasting or pile-driving activities, slamming doors, etc.</p> <p>M2: This class applies to instruments used in locations with significant or high levels of vibration and shock, e.g. transmitted from machines and passing vehicles in the vicinity or adjacent to heavy machines, conveyor belts, etc.</p> <p>M3: This class applies to instruments used in locations where the level of vibration and shock is high and very high, e.g. for instruments mounted directly on machines, conveyor belts, etc.</p> <p>(b) The following influence quantities shall be considered in relation with mechanical environments:</p> <ul style="list-style-type: none"> <li>- Vibration</li> <li>- Mechanical shock</li> </ul>		<p>According to Annex MI-006 Chapter I § 1.3, Annex I § 1.3.2 is not applicable</p>	<p>Not Relevant</p>

<p align="center"><b>Directive 2004/22/EC</b></p> <p align="center"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p align="center"><b>OIML R 51-1 Edition 2006 (E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>1.3.3 (a) Electromagnetic environments are classified into E1, E2 or E3 as described below, unless otherwise laid down in the appropriate instrument-specific annexes.</p> <p>E1: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in residential, commercial and light industrial buildings.</p>		<p>Definition.</p> <p>Tests and severity levels in 1.3.3 (b) below shall be applied for E1</p>	<p align="center">Covered</p>
<p>E2: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.</p>		<p>Definition.</p> <p>Tests and severity levels in 1.3.3 (b) below shall be applied for E2</p>	<p align="center">Covered</p>
<p>E3: This class applies to instruments supplied by the battery of a vehicle. Such instruments shall comply with the requirements of E2 and the following additional requirements</p> <ul style="list-style-type: none"> <li>- voltage reductions caused by energizing the starter-motor circuits of internal combustion engines,</li> <li>- load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.</li> </ul>	<p align="center">A.6.3.6</p>	<p><b><i>Electrical transient conduction for instruments powered from a road vehicle battery</i></b></p> <p><b><i>Conduction along supply lines of 12 V or 24 V road vehicle battery</i></b></p> <p><b><i>Applicable standards: ISO 7637-2:</i></b>  § 5.6.2: Test pulse 2a + b,  § 5.6.3: Test pulse 3a + 3b,  § 5.6.4: Test pulse 4.</p> <p><b><i>E3 is covered if test pulse 5, test level IV according to ISO 7637-2:2004(E) is used.</i></b></p>	<p>Covered on the provision that test pulse 5, test level IV according to ISO 7637-2:2004(E) is used.</p>

<p align="center"><b>Directive 2004/22/EC</b></p> <p align="center"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p align="center"><b>OIML R 51-1 Edition 2006 (E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>(b) The following influence quantities shall be considered in relation with electromagnetic environments:</p> <p>- voltage interruptions</p>	<p align="center">A.6.3.1</p>		<p align="center">Covered</p>
<p>- short voltage reductions</p>	<p align="center">A.6.3.1</p>		<p align="center">Covered</p>
<p>- voltage transients on supply lines and/or signal lines</p>	<p align="center">A.6.3.2</p>	<p><i>OIML D 11 (13.5). For E2 use severity level 3.</i> <i>OIML D 11 (12.4). For E2 use severity level 3.</i></p>	<p>Covered for E1. E2 covered on the provision that the relevant severity level specified in OIML D11 (2004) is used</p>
<p>- electrostatic discharges</p>	<p align="center">A.6.3.4</p>		<p align="center">Covered</p>
<p>- radio frequency electromagnetic fields</p>	<p align="center">A.6.3.5.1</p>	<p><i>OIML D 11 (12.1.1). For E1 use severity level 2.</i></p>	<p>Covered, although for E1 the severity level specified in OIML D11 (2004) can be used</p>
<p>- conducted radio frequency electromagnetic fields on supply lines and/or signal lines</p>	<p align="center">A.6.3.5.2</p>	<p><i>OIML D 11 (13.1.2). For E1 use severity level 2.</i></p>	
<p>- surges on supply lines and/or signal lines</p>	<p align="center">A.6.3.3</p>	<p><i>OIML D 11 (13.8). For E2 use severity level 3.</i> <i>OIML D 11 (12.5). For E2 use severity level 3.</i></p>	<p>Covered for E1. E2 covered on the provision that the relevant severity level specified in OIML D11 (2004) is used</p>

<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>1.3.4 Other influence quantities to be considered, where appropriate, are:</p> <p>- voltage variation</p>	<p style="text-align: center;">2.9.2 A.6.2.4 A.6.2.5 A.6.2.6 A.6.2.7</p>	<p><i>An electronic instrument shall comply with the appropriate metrological and technical requirements, if the voltage supply varies from the nominal voltage, <math>U_{nom}</math> (if only one voltage is marked on the instrument), or from the lower and upper limits of the voltage range,</i></p>	<p style="text-align: center;">Covered</p>
<p>- mains frequency variation - power frequency magnetic fields</p>			<p style="text-align: center;">Not covered</p>
<p>- any other quantity likely to influence in a significant way the accuracy of the instrument.</p>	<p style="text-align: center;">4.2.3  6.4.3  A.5.2</p>	<p><b>4.2.3 Warm-up time</b> <i>During the warm-up time of an electronic instrument there shall be no indication or transmission of the result of weighing, and automatic operation shall be inhibited.</i></p> <p><b>6.4.3 Warm-up test</b> <i>The warm-up test shall be performed in non-automatic (static) operation. A single static test load near maximum capacity shall be used.</i></p> <p><b>A.5.2 Warm-up</b> <i>This test is to verify that metrological performance is maintained in the period immediately after switching on. The method is to check that automatic operation is inhibited until a stable indication is obtained and to verify that zero and span errors ... comply with the requirements during the first 30 minutes of operation. Zero-tracking and automatic zero-setting shall be disabled, unless the zero-setting operates as part of every automatic weighing cycle. In this case this function shall be enabled or simulated as part of the test.</i></p>	<p style="text-align: center;">Covered</p>







<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1 Edition 2006 (E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>4 Discrimination and sensitivity A measuring instrument shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.</p>	<p>T.3.5 3.3.1 2.5.1 5.2.3</p>	<p><b>Quality of reading</b> <i>Reading of the primary indications shall be reliable, easy and unambiguous under conditions of normal use.</i></p> <p><b>2.5.1 Automatic operation</b> Instrument must satisfy mpes</p> <p>Reference to R76-1 for non-automatic (static) operation</p>	<p>Covered</p>
<p>5 Durability A measuring instrument shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer's instruction when in the environmental conditions for which it is intended.</p>	<p>4.1.4 A.7 2.10 6.5.3 T.3.7</p>	<p><i>The requirements in 4.1.1, 4.1.2 and 4.1.3 shall be met durably in accordance with the intended use of the instrument.</i></p> <p>This test is not applicable to classes XI and Y(I) instruments.</p> <p><i>When the instrument is subjected to the span stability test specified in A.7, the absolute value of the difference between the errors obtained for any two measurements shall not exceed the maximum span error. The maximum span error is equal to half the maximum permissible error for influence factor tests for a near maximum capacity load.</i></p> <p><i>The span stability test shall be conducted as described in A.7, applying the requirements given in 2.10.</i></p> <p><i>Ability of an instrument to maintain its performance characteristics over a period of use.</i></p>	<p>Covered</p>

<p style="text-align: center;">Directive 2004/22/EC</p> <p style="text-align: center;">Essential requirements of Annex I and Annex MI-006</p>	<p style="text-align: center;">OIML R 51-1 Edition 2006 (E)</p>	<p style="text-align: center;">Comments</p>	<p style="text-align: center;">Conclusion</p>
<p>6 Reliability A measuring instrument shall be designed to reduce as far as possible the effect of a defect that would lead to an inaccurate measurement result, unless the presence of such a defect is obvious.</p>	<p>3.2.2</p> <p>4.1.3</p> <p>4.2.2</p>	<p><b>Accidental breakdown and maladjustment</b> <i>An instrument shall be so constructed that an accidental breakdown or maladjustment of control elements likely to disturb its correct functioning cannot take place without its effect being evident.</i></p> <p><b>Disturbances</b> <i>Electronic instruments shall be so designed and manufactured that when exposed to disturbances, either:</i> a) <i>significant faults do not occur, i.e. the difference between the weight value indication due to the disturbance and the indication without the disturbance (intrinsic error) does not exceed 1 e;</i> <i>or</i> b) <i>significant faults are detected and acted upon. The indication of significant faults in the display should not be confusing with other messages that appear in the display.</i></p> <p><i>Note: A fault equal to or less than the value specified in T.4.3.9 (1 e) is allowed irrespective of the value of the error of indication.</i></p> <p><b>Acting upon a significant fault</b> <i>When a significant fault has been detected, the instrument shall either be made inoperative automatically or a visual or audible indication shall be provided automatically and shall continue until such time as the user takes action or the fault disappears.</i></p>	<p>Covered</p>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
7	Suitability			
7.1	A measuring instrument shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.	3.2.1	<b>Fraudulent use</b> An instrument shall have no characteristics likely to facilitate its fraudulent use.	Covered
		3.2.2	<b>Accidental breakdown and maladjustment</b> <i>An instrument shall be so constructed that an accidental breakdown or maladjustment of control elements likely to disturb its correct functioning cannot take place without its effect being evident.</i>	
		3.2.4	<b>Controls</b> <i>Controls shall be so designed that they cannot normally come to rest in positions other than those intended by design, unless during the manoeuvre all indication is made impossible. Keys shall be marked unambiguously.</i>	
7.2	A measuring instrument shall be suitable for its intended use taking account of the practical working conditions and shall not require unreasonable demands of the user in order to obtain a correct measurement result.	3.1	<b>An instrument shall be designed to suit the method of operation and the loads for which it is intended. It shall be of adequately robust construction to ensure that it maintains its metrological characteristics.</b>	Covered
7.3	The errors of a utility measuring instrument at flows or currents outside the controlled range shall not be unduly biased.		Automatic catchweighing instruments are not utility meters.	Not Relevant
7.4	Where a measuring instrument is designed for the measurement of values of the measurand that are constant over time, the measuring instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.		Automatic catchweighing instruments are not supposed to measure constant value of measurand.	Not Relevant

<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>7.5 A measuring instrument shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.</p> <p>7.6 A measuring instrument shall be designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. If necessary, special equipment or software for this control shall be part of the instrument. The test procedure shall be described in the operation manual.</p> <p>When a measuring instrument has associated software which provides other functions besides the measuring function, the software that is critical for the metrological characteristics shall be identifiable and shall not be inadmissibly influenced by the associated software.</p>	<p>3.1</p> <p>3.4.5</p>	<p><b><i>An instrument shall be designed to suit the method of operation and the loads for which it is intended. It shall be of adequately robust construction to ensure that it maintains its metrological characteristics.</i></b></p> <p><b><i>Software</i></b> <i>The legally relevant software used in the instrument must be present in such a form that alteration of the software is not possible without breaking a seal, or any change in the software can be signaled automatically by means of an identification code.</i></p> <p><i>The legally relevant software shall be adequately protected against accidental or intentional changes. Evidence of an intervention such as changing, uploading or circumventing the legally relevant software shall be available until the next verification or comparable official inspection.</i></p> <p><i>The software shall be assigned a fixed software identification (T.2.7.8.4). This fixed software identification shall be adapted in the case of every software change that may affect the metrological functions of the instrument.</i></p>	<p>Covered</p> <p>Covered except for the description of test procedure in the operation manual</p>



Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
8	Protection against corruption			
8.1	The metrological characteristics of a measuring instrument shall not be influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the measuring instrument.	4.2.4	<p><b>Interfaces</b>  <i>An electronic instrument may be equipped with interfaces permitting the coupling of the instrument to any peripheral devices or other instruments.</i></p> <p><i>An interface shall not allow the metrological functions of the instrument and its measurement data to be inadmissibly influenced by the peripheral devices (for example computers), by other interconnected instruments, or by disturbances acting on the interface.</i></p>	Covered
8.2	A hardware component that is critical for metrological characteristics shall be designed so that it can be secured. Security measures foreseen shall provide for evidence of an intervention.	3.2.6	<p><b>Securing</b>  <i>Means shall be provided for securing components, interfaces, device-specific parameters and preset controls to which access or adjustment is prohibited. National regulations may specify the securing that is required. On classes XI and Y(I) instruments, devices to adjust sensitivity (or span) may remain unsecured.</i></p> <p>...</p>	Covered





Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
8.5 For utility measuring instruments the display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.	3.4.4	<p><b>Data storage device (T.2.7.8.5)</b>  <i>The primary indications may be stored in a memory of the instrument or on external storage for subsequent use (e.g. indication, printing, data transfer, totalizing, etc.). In this case, the stored data shall be adequately protected against intentional and unintentional changes during the data transmission and/or storage process and shall contain all relevant information necessary to reconstruct an earlier measurement.</i></p> <p>Automatic catchweighing instruments are not utility meters.</p>	Not Relevant
9 Information to be borne by and to accompany the instrument			
9.1 A measuring instrument shall bear the following inscriptions: - manufacturer's mark or name - information in respect of its accuracy, plus, when applicable - information in respect of the conditions of use - measuring capacity - measuring range - identity marking - number of EC-type examination certificate or the EC design examination certificate - information whether or not additional devices providing metrological results comply with the provisions of this Directive on legal metrological control.	3.11.1	<p><b>Markings shown in full</b></p> <ul style="list-style-type: none"> <li>• name or identification mark of the manufacturer</li> <li>• name or identification mark of the importer (if applicable)</li> <li>• serial number and type designation of the instrument</li> <li>• maximum rate of operation (if applicable) in the form: ..... loads/min or units/min</li> <li>• maximum speed of load transport system (if applicable) in the form: ..... m/s or m/min</li> <li>• electrical supply voltage in the form: ..... V</li> <li>• electrical supply frequency in the form: ..... Hz</li> <li>• pneumatic/hydraulic pressure (if applicable) in the form: ..... kPa</li> <li>• adjustment range referred to set point (if applicable) in the form: ±..... g or % (of set point value)</li> <li>• temperature range (when not -10 °C to +40 °C)</li> <li>• software identification (if applicable)</li> </ul>	Covered except for the indication of presence of additional device.



<p align="center"><b>Directive 2004/22/EC</b></p> <p align="center"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p align="center"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p>9.4 Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals.</p>	<p align="center">3.11.3</p>	<p><i>Depending upon the particular use of the instrument, supplementary markings may be required on type approval by the metrological authority issuing the type approval certificate (for example: securing code, date of manufacture).</i></p> <p><i>Additional markings (for example, products) may be required on initial verification to specify types of packs and related weighing conditions.</i></p>	<p align="center">Not relevant</p>
<p>9.5 Unless specified otherwise in an instrument-specific annex, the scale interval for a measured value shall be in the form <math>1 \times 10^n</math>, <math>2 \times 10^n</math>, or <math>5 \times 10^n</math>, where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.</p>	<p align="center">3.3.2</p>	<p><i>The scale interval for weighing results (T.3.2) shall be in the form <math>1 \times 10^k</math>, <math>2 \times 10^k</math> or <math>5 \times 10^k</math> units in which the result is expressed, k being a positive or negative whole number or zero.</i></p>	<p align="center">Covered</p>
<p>9.6 A material measure shall be marked with a nominal value or a scale, accompanied by the unit of measurement used.</p>			<p align="center">Not Relevant</p>
<p>9.7 The units of measurement used and their symbols shall be in accordance with the provisions of Community legislation on units of measurement and their symbols.</p>	<p align="center">2.7</p>	<p><i>The units of mass to be used on an instrument are:</i></p> <ul style="list-style-type: none"> <li><i>• metric carat (ct);</i></li> <li><i>• milligram (mg);</i></li> <li><i>• gram (g);</i></li> <li><i>• kilogram (kg);</i></li> <li><i>• tonne (t).</i></li> </ul>	<p align="center">Covered</p>



<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>10.3 In the case of hard copy the print or record shall also be easily legible and non-erasable.</p>	<p>3.4.3</p>	<p><b>3.4.3 Printing device</b> <i>Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.</i></p>	<p>Covered</p>
<p>10.4 A measuring instrument for direct sales trading transactions shall be designed to present the measurement result to both parties in the transaction when installed as intended. When critical in case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of this Directive shall bear an appropriate restrictive information.</p>	<p>3.4.4</p>	<p><b>3.4.4 Data storage device (T.2.7.8.5)</b> <i>The primary indications may be stored in a memory of the instrument or on external storage for subsequent use (e.g. indication, printing, data transfer, totalizing, etc.).</i></p>	<p>Not covered directly, although some requirements are relevant</p>
<p>10.5 Whether or not a measuring instrument intended for utility measurement purposes can be remotely read it shall in any case be fitted with a metrologically controlled display accessible without tools to the customer. The reading of this display is the measurement result that serves as the basis for the price to pay.</p>	<p>3.4.3</p>	<p><b>3.4.3 Printing device</b> <i>Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.</i></p> <p><i>If printing takes place, the name or the symbol of the unit of measurement shall be either to the right of the value or above a column of values.</i></p> <p>Catchweighers could be used for direct sales in some instances, e.g. small front-end loader</p> <p>Automatic catchweighing instruments are not utility meters.</p>	<p>Not Relevant</p>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
11	Further processing of data to conclude the trading transaction			
11.1	A measuring instrument other than a utility measuring instrument shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when: - the measurement is non-repeatable and - the measuring instrument is normally intended for use in the absence of one of the trading parties.	3.4.4	<b>Data storage device</b> <i>The primary indications may be stored in a memory of the instrument or on external storage for subsequent use (e.g. indication, printing, data transfer, totalizing, etc.).</i>  Most of the time, the measurement is carried out in the absence of one of the trading parties.	Covered when the measuring instrument is fitted with a data storage device or a printer
11.2	Additionally, a durable proof of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded.	3.4.3	<b>3.4.3 Printing device</b> <i>Printing shall be clear and permanent for the intended use.</i>	
		3.4.4	<b>Data storage device</b> <i>The primary indications may be stored in a memory of the instrument or on external storage for subsequent use (e.g. indication, printing, data transfer, totalizing, etc.).</i>	Covered when the measuring instrument is fitted with a data storage device or a printer
		3.4.3	<b>3.4.3 Printing device</b> <i>Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.</i>  ... <i>Printing shall be inhibited if the stability criteria (3.4.1) are not fulfilled.</i>	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
<p>12 Conformity evaluation A measuring instrument shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of this Directive.</p>	<p>2.11</p> <p>6.1.5</p> <p>6.1.8</p>	<p><b>Indication or printout for test purposes (automatic operation)</b> <i>For category X instruments, practical means shall be provided in accordance with 6.1.8 for determining the mean error and the standard deviation of the error to demonstrate compliance with Tables 3 and 4, e.g. indications and/or print-outs of the mass (or the difference between the mass and a nominal set-point).</i></p> <p><i>For category Y instruments, practical means for determining the individual errors of weighings shall be provided in accordance with 6.1.7.2 to demonstrate compliance with Table 5.</i></p> <p><i>A control instrument (meeting the requirements in 6.1.5.1) for determining the conventional true value of the mass of each test load shall be available for testing. The control instrument may either be separate (an instrument other than the instrument being verified) or integral.</i></p> <p><i>The control instrument, whether separate or integral, shall ensure the determination of the conventional true value of the mass of each test load to an accuracy of at least one-third of whichever is the smaller of the appropriate maximum permissible errors for automatic weighing ...</i></p> <p><i>For category X instruments, indications and/or printouts of the weight values (or the difference between the weight value and a nominal set-point) shall be provided for each load for determining the mean error and the standard deviation of the error for each test. For this purpose the scale interval, d, shall not be greater than the appropriate limit for Table 4 multiplied by the class designation factor (x).</i></p>	<p>Covered</p>

<p style="text-align: center;">Directive 2004/22/EC</p> <p style="text-align: center;">Essential requirements of Annex I and Annex MI-006</p>	<p style="text-align: center;">OIML R 51-1 Edition 2006 (E)</p>	<p style="text-align: center;">Comments</p>	<p style="text-align: center;">Conclusion</p>
<b>Annex MI-006</b>			
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Definitions</p> <p><b>Automatic weighing instrument</b> An instrument that determines the mass of a product without the intervention of an operator and follows a predetermined programme of automatic processes characteristic of the instrument.</p> <p><b>Automatic catchweigher</b> An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material.</p> <p><b>Automatic checkweigher</b> An automatic catchweigher that subdivides articles of different mass into two or more subgroups according to the value of the difference of their mass and a nominal set-point.</p> <p><b>Weight labeller</b> An automatic catchweigher that labels individual articles with the weight value.</p> <p><b>Weight/price labeller</b> An automatic catchweigher that labels individual articles with the weight value, and price information.</p>			

<p align="center"><b>Directive 2004/22/EC</b></p> <p align="center"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p align="center"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>
<p><b>Automatic gravimetric filling instrument</b> An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk.</p> <p><b>Discontinuous totaliser (totalising hopper weigher)</b> An automatic weighing instrument that determines the mass of a bulk product by dividing it into discrete loads. The mass of each discrete load is determined in sequence and summed. Each discrete load is then delivered to bulk.</p> <p><b>Continuous totaliser</b> An automatic weighing instrument that continuously determines the mass of a bulk product on a conveyor belt, without systematic subdivision of the product and without interrupting the movement of the conveyor belt.</p> <p><b>Rail-weighbridge</b> An automatic weighing instrument having a load receptor inclusive of rails for conveying railway vehicles.</p>			
<p><b>Chapter I – Requirements common to all types of automatic weighing instruments</b></p>			
<p>1 Rated Operating Conditions The manufacturer shall specify the rated operating conditions for the instrument as follows:</p>	<p align="center">5.2.1</p>	<p><b><i>The application for type approval shall include documentation comprising:</i></b></p> <ul style="list-style-type: none"> <li><b><i>• metrological characteristics of the instrument;</i></b></li> <li><b><i>• a set of specifications for the instrument;</i></b></li> <li><b><i>• a functional description of the components and devices;</i></b></li> <li><b><i>• drawings, diagrams and general software information (if applicable), explaining the construction and operation; and</i></b></li> <li><b><i>• any document or other evidence that the design and construction of the instrument complies with the requirements of this Recommendation</i></b></li> </ul>	<p align="center">Covered</p>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
<p>1.1 For the measurand: The measuring range in terms of its maximum and minimum capacity.</p>	<p>T.3.1.1</p> <p>T.3.1.2</p> <p>T.3.1.3</p> <p>2.2.2</p> <p>2.2.1</p>	<p><b>Maximum capacity, Max</b> <i>Maximum weighing capacity, not taking into account the additive tare capacity.</i></p> <p><b>Minimum capacity, Min</b> <i>Value of the load below which the weighing result may be subject to an excessive relative error.</i></p> <p><b>Weighing range</b> <i>Range between the minimum and maximum capacities.</i></p> <p><b>Minimum capacity, Min</b> <i>Min shall be specified by the manufacturer.</i> <i>For category Y instruments, Min shall not be less than:</i> <i>Class Y(I): 100 e</i> <i>Class Y(II): 20 e for 0.001 g ≤ e ≤ 0.05 g, and 50 e for 0.1 g ≤ e</i> <i>Class Y(a): 20 e</i> <i>Class Y(b): 10 e</i> <i>Scales used for grading, postal scales and garbage weighers: 5 e</i></p> <p><b>Verification scale interval</b> <i>The verification scale interval and number of verification scale intervals, in relation to the accuracy class, are given in Table 1.</i></p>	<p>Covered</p>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
	<p>2.3.1</p> <p>2.3.3</p>	<p><b>Partial weighing range</b> Each partial weighing range (index, <math>i = 1, 2 \dots</math>) is defined by:</p> <ul style="list-style-type: none"> <li>• its verification scale interval <math>e_i</math>, <math>e_{i+1} &gt; e_i</math>;</li> <li>• its maximum capacity <math>Max_i</math>;</li> <li>• its minimum capacity <math>Min_i = Max_i - 1</math> (for <math>i = 1</math>, the minimum capacity is <math>Min_1 = Min</math>).</li> </ul> <p>The number of verification scale intervals <math>n_i</math> for each partial range is: <math>n_i = Max_i / e_i</math></p> <p><b>Maximum capacity of partial weighing ranges</b> With the exception of the last partial weighing range, the requirements in Table 2 shall be complied with, according to the accuracy class of the instrument.</p>	

<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>1.2 For the electrical supply influence quantities: In case of AC voltage supply: the nominal AC voltage supply, or the AC voltage limits.</p> <p>In case of DC voltage supply: the nominal and minimum DC voltage supply, or the DC voltage limits.</p>	<p>2.9.2</p>	<p><b><i>An electronic instrument shall comply with the appropriate metrological and technical requirements, if the voltage supply varies from the nominal voltage, <math>U_{nom}</math> (if only one voltage is marked on the instrument), or from the lower and upper limits of the voltage range, <math>U_{min}</math> and <math>U_{max}</math>, marked on the instrument at:</i></b></p> <ul style="list-style-type: none"> <li>• <b><i>AC mains voltage:</i></b> <ul style="list-style-type: none"> <li>- <b><i>lower limit is 85 % of <math>U_{min}</math>,</i></b></li> <li>- <b><i>upper limit is 110 % of <math>U_{max}</math>;</i></b></li> </ul> </li> <li>• <b><i>DC mains voltage, including rechargeable battery if the battery can be fully (re)charged during the operation of the instrument:</i></b> <ul style="list-style-type: none"> <li>- <b><i>lower limit is the minimum operating voltage,</i></b></li> <li>- <b><i>upper limit is 120 % of <math>U_{max}</math> (<math>U_{max}</math> is the voltage of a new or fully charged rechargeable battery of the type specified by the manufacturer);</i></b></li> </ul> </li> <li>• <b><i>DC battery supply, including non-rechargeable battery supply, and also including rechargeable battery supply if the batteries cannot be (re)charged during operation of the instrument:</i></b> <ul style="list-style-type: none"> <li>- <b><i>lower limit is the minimum operating voltage,</i></b></li> <li>- <b><i>upper limit is <math>U_{nom}</math>;</i></b></li> </ul> </li> <li>• <b><i>12 V or 24 V road vehicle battery supply:</i></b> <ul style="list-style-type: none"> <li>- <b><i>lower limit is 9 V (for a 12 V battery) or 16 V (for a 24 V battery),</i></b></li> <li>- <b><i>upper limit is 16 V (for a 12 V battery) or 32 V (for a 24 V battery).</i></b></li> </ul> </li> </ul>	<p>Covered</p>



Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
1.4 For other influence quantities (if applicable): The rate(s) of operation. The characteristics of the product(s) to be weighed.	3.2.5  6.1.4  2.9.3	<p><b>Tilt limiting device</b>  <i>An instrument mounted on a vehicle may be provided with a tilt limiting device which prevents the instrument from operating if the vehicle is tilted (longitudinally and transversely) above a predetermined value set by the manufacturer.</i></p> <p><b>Conditions of tests</b>  <i>The load transport system shall be set to its maximum speed, and if adjustable by the operator, also at a speed approximately midway through the operating range. If the speed is related to a particular product, the speed shall be set to the preset speed for that product. Zero shall be set at the start of each test sequence at a given load value.</i></p> <p><b>2.9.3 Tilting</b>  <i>Instruments which are not intended for installation in a fixed position and which do not have a leveling device and a level indicator shall comply with the appropriate metrological and technical requirements when tilted (longitudinally and transversely) by 5 %, or when tilted to a predetermined value selected by the manufacturer if the instrument is provided with a tilt limiting device which prevents the instrument from operating when tilted above this value.</i></p> <p>...</p>	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
	3.2.3	<p><b>Dynamic setting</b>  <i>An instrument may be fitted with a dynamic setting facility to compensate for the dynamic effects of the load in motion. This facility may operate over a weighing range relative to a setting weight value provided that when the facility is used for that weighing range and in accordance with the manufacturer's instructions, the maximum permissible errors are not exceeded.</i></p> <p>...</p>	
2			
3			
3.1	2.9.3	<p><b>2.9.3 Tilting</b>  <i>Instruments which are not intended for installation in a fixed position and which do not have a leveling device and a level indicator shall comply with the appropriate metrological and technical requirements when tilted (longitudinally and transversely) by 5 %, or when tilted to a predetermined value selected by the manufacturer if the instrument is provided with a tilt limiting device which prevents the instrument from operating when tilted above this value.</i></p> <p>...</p>	Covered

<p style="text-align: center;">Directive 2004/22/EC</p> <p style="text-align: center;">Essential requirements of Annex I and Annex MI-006</p>	<p style="text-align: center;">OIML R 51-1 Edition 2006 (E)</p>	<p style="text-align: center;">Comments</p>	<p style="text-align: center;">Conclusion</p>
<p>3.2 Adequate material handling facilities shall be provided to enable the instrument to respect the MPEs during normal operation.</p>	<p>3.2.3</p> <p>3.2.5</p> <p>3.2.7</p>	<p><b>Dynamic setting</b>  <i>An instrument may be fitted with a dynamic setting facility to compensate for the dynamic effects of the load in motion. This facility may operate over a weighing range relative to a setting weight value provided that when the facility is used for that weighing range and in accordance with the manufacturer's instructions, the maximum permissible errors are not exceeded.</i></p> <p>...</p> <p><b>Tilt limiting device</b>  <i>An instrument mounted on a vehicle may be provided with a tilt limiting device which prevents the instrument from operating if the vehicle is tilted (longitudinally and transversely) above a predetermined value set by the manufacturer.</i></p> <p><b>Sorting device</b>  <i>The sorting device of a category X instrument shall automatically divide loads into separate subgroups depending on their mass.</i></p>	<p>Covered</p>





<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p><b>Chapter II – Automatic Catchweighers</b></p> <p>1     <i>Accuracy Classes</i></p> <p>1.1   Instruments are divided into primary categories designated by: X or Y as specified by the manufacturer.</p> <p>1.2   These primary categories are further divided into four accuracy classes: XI, XII, XIII &amp; XIV and Y(I), Y(II), Y(a) &amp; Y(b) which shall be specified by the manufacturer</p>	<p>2.1</p> <p>2.1.1</p> <p>2.1.2</p>	<p><b>Accuracy classes</b> <i>Instruments are divided according to their use into two primary categories designated by: X or Y</i></p> <p><i>Category X applies only to checkweighers used to check prepacked products that are subject to the requirements of OIML R 87 [7].</i></p> <p><i>Category Y applies to all other automatic catchweighing instruments such as weigh-price labelers, postal and shipping scales, and instruments that weigh single loads of loose material.</i></p> <p><b>2.1.1 Category X</b> <i>The primary category is further divided into four accuracy classes: XI, XII, XIII and XIII</i></p> <p><i>The accuracy classes are supplemented by a factor (x) which is specified by the manufacturer. The value of (x) shall be <math>1 \times 10^k</math>, <math>2 \times 10^k</math>, or <math>5 \times 10^k</math>, k being a positive or negative whole number or zero.</i></p> <p><i>The primary category is further divided into four accuracy classes: Y(I), Y(II), Y(a), and Y(b)</i></p> <p><i>The use of a class for a particular application may be determined by national requirements.</i></p>	<p>Covered</p> <p>Covered but note that XIV is used in the Directive 2004/22/EC which is equal to XIII used in the OIML R51-1</p>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion
2 Category X Instruments				
2.1	Category X applies to instruments used to check prepackages made up in accordance with the requirements of Council Directive 75/106/EEC of 19 December 1974 on the approximation of the laws of the Member States relating to the making-up by volume of certain prepackaged liquids and of Council Directive 76/211/EEC of 20 January 1976 on the approximation of the laws of the Member States relating to the making-up by weight or by volume of certain prepackaged products.	2.1	<i>...Category X applies only to checkweighers used to check prepacked products that are subject to the requirements of OIML R 87 [7]...</i>	Covered
2.2	The accuracy classes are supplemented by a factor ( $x$ ) that quantifies the maximum permissible standard deviation as specified in paragraph 4.2.  The manufacturer shall specify the factor ( $x$ ), where ( $x$ ) shall be $\leq 2$ and in the form $1 \times 10^k$ , $2 \times 10^k$ or $5 \times 10^k$ , where $k$ is a negative whole number or zero.	2.1.1	<i>The primary category is further divided into four accuracy classes: XI, XII, XIII and XIIIII</i>  <i>The accuracy classes are supplemented by a factor (<math>x</math>) which is specified by the manufacturer. The value of (<math>x</math>) shall be <math>1 \times 10^k</math>, <math>2 \times 10^k</math>, or <math>5 \times 10^k</math>, <math>k</math> being a positive or negative whole number or zero.</i>  <i>See also 4.2 below.</i>	Covered
3	Category Y Instruments Category Y applies to all other automatic catchweighers.	2.1  2.1.2	<i>Category Y applies to all other automatic catchweighing instruments such as weigh-price labelers, postal and shipping scales, and instruments that weigh single loads of loose material.</i>  <i>The primary category is further divided into four accuracy classes: Y(I), Y(II), Y(a), and Y(b)</i>	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion																																																		
4	MPE																																																					
4.1	Mean error Category X / MPE Category Y instruments	2.5.1.1	<p><b>2.5.1.1 Category X instruments</b></p> <p><i>For a number of consecutive weighings of a net load, greater than or equal to the minimum capacity, Min, and less than or equal to the maximum capacity, Max, the maximum permissible mean (systematic) error shall be as specified in Table 3.</i></p>	Covered																																																		
	<table border="1"> <thead> <tr> <th colspan="8">Net Load (m) in verification scale intervals (e)</th> <th>Maximum permissible mean error</th> <th>Maximum permissible error</th> </tr> <tr> <th>XI</th> <th>Y(I)</th> <th>XII</th> <th>Y(II)</th> <th>XIII</th> <th>Y(a)</th> <th>XIV</th> <th>Y(b)</th> <th>X</th> <th>Y</th> </tr> </thead> <tbody> <tr> <td>0 &lt; m ≤ 50 000</td> <td></td> <td>0 &lt; m ≤ 5 000</td> <td></td> <td>0 &lt; m ≤ 500</td> <td></td> <td>0 &lt; m ≤ 50</td> <td></td> <td>± 0.5 e</td> <td>± 1 e</td> </tr> <tr> <td>50 000 &lt; m ≤ 200 000</td> <td></td> <td>5 000 &lt; m ≤ 20 000</td> <td></td> <td>500 &lt; m ≤ 2 000</td> <td></td> <td>50 &lt; m ≤ 200</td> <td></td> <td>± 1.0 e</td> <td>± 1.5 e</td> </tr> <tr> <td>200 000 &lt; m</td> <td></td> <td>20 000 &lt; m ≤ 100 000</td> <td></td> <td>2 000 &lt; m ≤ 10 000</td> <td></td> <td>200 &lt; m ≤ 1 000</td> <td></td> <td>± 1.5 e</td> <td>± 2 e</td> </tr> </tbody> </table>	Net Load (m) in verification scale intervals (e)								Maximum permissible mean error	Maximum permissible error	XI	Y(I)	XII	Y(II)	XIII	Y(a)	XIV	Y(b)	X	Y	0 < m ≤ 50 000		0 < m ≤ 5 000		0 < m ≤ 500		0 < m ≤ 50		± 0.5 e	± 1 e	50 000 < m ≤ 200 000		5 000 < m ≤ 20 000		500 < m ≤ 2 000		50 < m ≤ 200		± 1.0 e	± 1.5 e	200 000 < m		20 000 < m ≤ 100 000		2 000 < m ≤ 10 000		200 < m ≤ 1 000		± 1.5 e	± 2 e	2.5.1.2	<p><b>2.5.1.2 Category Y instruments</b></p> <p><i>The maximum permissible error for any load greater than or equal to the Min and less than or equal to the Max in automatic operation shall be as specified in Table 5.</i></p>	
Net Load (m) in verification scale intervals (e)								Maximum permissible mean error	Maximum permissible error																																													
XI	Y(I)	XII	Y(II)	XIII	Y(a)	XIV	Y(b)	X	Y																																													
0 < m ≤ 50 000		0 < m ≤ 5 000		0 < m ≤ 500		0 < m ≤ 50		± 0.5 e	± 1 e																																													
50 000 < m ≤ 200 000		5 000 < m ≤ 20 000		500 < m ≤ 2 000		50 < m ≤ 200		± 1.0 e	± 1.5 e																																													
200 000 < m		20 000 < m ≤ 100 000		2 000 < m ≤ 10 000		200 < m ≤ 1 000		± 1.5 e	± 2 e																																													
		A.3.9.2.2	<p><b>Indication with a scale interval greater than 0.2 e</b></p>																																																			

<p align="center"><b>Directive 2004/22/EC</b></p> <p align="center"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p align="center"><b>OIML R 51-1</b> <b>Edition 2006</b> <b>(E)</b></p>	<p align="center"><b>Comments</b></p>	<p align="center"><b>Conclusion</b></p>																																				
<p>4.2 Standard deviation</p> <p>Maximum permissible value for the standard deviation of a class X (x) instrument is the result of the multiplication of the factor (x) by the value in Table 2 below.</p> <table border="1" data-bbox="184 492 741 784"> <thead> <tr> <th>Net Load (m)</th> <th>Maximum permissible standard deviation for class X(1)</th> </tr> </thead> <tbody> <tr><td>m ≤ 50 g</td><td>0,48 %</td></tr> <tr><td>50 g &lt; m ≤ 100 g</td><td>0,24 g</td></tr> <tr><td>100 g &lt; m ≤ 200 g</td><td>0,24 %</td></tr> <tr><td>200 g &lt; m ≤ 300 g</td><td>0,48 g</td></tr> <tr><td>300 g &lt; m ≤ 500 g</td><td>0,16 %</td></tr> <tr><td>500 g &lt; m ≤ 1 000 g</td><td>0,8 g</td></tr> <tr><td>1 000 g &lt; m ≤ 10 000 g</td><td>0,08 %</td></tr> <tr><td>10 000 g &lt; m ≤ 15 000 g</td><td>8 g</td></tr> <tr><td>15 000 g &lt; m</td><td>0,053 %</td></tr> </tbody> </table> <p>For class XI and XII, (x) shall be less than 1 For class XIII, (x) shall be not greater than 1 For class XIV, (x) shall be greater than 1</p>	Net Load (m)	Maximum permissible standard deviation for class X(1)	m ≤ 50 g	0,48 %	50 g < m ≤ 100 g	0,24 g	100 g < m ≤ 200 g	0,24 %	200 g < m ≤ 300 g	0,48 g	300 g < m ≤ 500 g	0,16 %	500 g < m ≤ 1 000 g	0,8 g	1 000 g < m ≤ 10 000 g	0,08 %	10 000 g < m ≤ 15 000 g	8 g	15 000 g < m	0,053 %	<p>2.5.1.1 Table 4</p>	<p><i>The maximum permissible standard deviation of the error (random error) shall be as specified in Table 4, multiplied by the class designation factor (x).</i></p> <p>Figures of OIML table and MID table are the same</p>	<p>Covered</p>																
Net Load (m)	Maximum permissible standard deviation for class X(1)																																						
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<p>4.3 Verification scale interval - single interval instruments</p> <table border="1" data-bbox="184 971 833 1122"> <thead> <tr> <th colspan="2">Accuracy classes</th> <th>Verification scale interval</th> <th colspan="2">Number of verification scale intervals n = Max/e</th> </tr> <tr> <th colspan="2"></th> <th></th> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>XI</td> <td>Y(I)</td> <td>0.001 g ≤ e</td> <td>50 000</td> <td>—</td> </tr> <tr> <td rowspan="2">XII</td> <td rowspan="2">Y(II)</td> <td>0.001 g ≤ e ≤ 0.05 g</td> <td>100</td> <td>100 000</td> </tr> <tr> <td>0.1 g ≤ e</td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td rowspan="2">XIII</td> <td rowspan="2">Y(a)</td> <td>0.1 g ≤ e ≤ 2 g</td> <td>100</td> <td>10 000</td> </tr> <tr> <td>5 g ≤ e</td> <td>500</td> <td>10 000</td> </tr> <tr> <td>XIII</td> <td>Y(b)</td> <td>5 g ≤ e</td> <td>100</td> <td>1 000</td> </tr> </tbody> </table>	Accuracy classes		Verification scale interval	Number of verification scale intervals n = Max/e					Minimum	Maximum	XI	Y(I)	0.001 g ≤ e	50 000	—	XII	Y(II)	0.001 g ≤ e ≤ 0.05 g	100	100 000	0.1 g ≤ e	5 000	100 000	XIII	Y(a)	0.1 g ≤ e ≤ 2 g	100	10 000	5 g ≤ e	500	10 000	XIII	Y(b)	5 g ≤ e	100	1 000	<p>2.2.1 Table 1</p>	<p><b>Verification scale interval</b></p> <p><i>The verification scale interval and number of verification scale intervals, in relation to the accuracy class, are given in Table 1.</i></p> <p>Figures of OIML table and MID table are the same.</p>	<p>Covered</p>
Accuracy classes		Verification scale interval	Number of verification scale intervals n = Max/e																																				
			Minimum	Maximum																																			
XI	Y(I)	0.001 g ≤ e	50 000	—																																			
XII	Y(II)	0.001 g ≤ e ≤ 0.05 g	100	100 000																																			
		0.1 g ≤ e	5 000	100 000																																			
XIII	Y(a)	0.1 g ≤ e ≤ 2 g	100	10 000																																			
		5 g ≤ e	500	10 000																																			
XIII	Y(b)	5 g ≤ e	100	1 000																																			

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 Edition 2006 (E)	Comments	Conclusion																																		
4.4	<p>Verification scale interval - multi-interval instruments</p> <table border="1"> <thead> <tr> <th colspan="2">Accuracy classes</th> <th rowspan="2">Verification scale interval</th> <th colspan="2">Number of verification scale intervals <math>n = \text{Max}/e</math></th> </tr> <tr> <th></th> <th></th> <th>Minimum value<sup>(1)</sup> <math>n = \text{Max}/e(i+1)</math></th> <th>Maximum value <math>n = \text{Max}/ei</math></th> </tr> </thead> <tbody> <tr> <td>XI</td> <td>Y(I)</td> <td><math>0.001 \text{ g} \leq ei</math></td> <td>50 000</td> <td>–</td> </tr> <tr> <td>XII</td> <td>Y(II)</td> <td><math>0.001 \text{ g} \leq ei \leq 0.05 \text{ g}</math></td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td></td> <td></td> <td><math>0.1 \text{ g} \leq ei</math></td> <td>5 000</td> <td>100 000</td> </tr> <tr> <td>XIII</td> <td>Y(a)</td> <td><math>0.1 \text{ g} \leq ei</math></td> <td>500</td> <td>10 000</td> </tr> <tr> <td>XIII</td> <td>Y(b)</td> <td><math>5 \text{ g} \leq ei</math></td> <td>50</td> <td>1 000</td> </tr> </tbody> </table> <p>Where:  <math>i = 1, 2, \dots, r</math>  <math>i</math> = partial weighing range  <math>r</math> = total number of partial ranges</p> <p><sup>(1)</sup> For <math>i = r</math> the corresponding column of Table 3 applies with <math>e</math> replaced by <math>e_r</math></p>	Accuracy classes		Verification scale interval	Number of verification scale intervals $n = \text{Max}/e$				Minimum value <sup>(1)</sup> $n = \text{Max}/e(i+1)$	Maximum value $n = \text{Max}/ei$	XI	Y(I)	$0.001 \text{ g} \leq ei$	50 000	–	XII	Y(II)	$0.001 \text{ g} \leq ei \leq 0.05 \text{ g}$	5 000	100 000			$0.1 \text{ g} \leq ei$	5 000	100 000	XIII	Y(a)	$0.1 \text{ g} \leq ei$	500	10 000	XIII	Y(b)	$5 \text{ g} \leq ei$	50	1 000	2.2.1	<p><b>Verification scale interval</b>  <i>The verification scale interval and number of verification scale intervals, in relation to the accuracy class, are given in Table 1.</i></p>	Covered except when the accuracy class is XIII or Y(a) with $0.1 \text{ g} \leq e \leq 2 \text{ g}$
Accuracy classes		Verification scale interval	Number of verification scale intervals $n = \text{Max}/e$																																			
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		2.3	<p><b>Additional requirements for a multi-interval instrument</b></p>																																			
5	<p>Measurement Range</p> <p>In specifying the measurement range for class Y instruments the manufacturer shall take account that the minimum capacity shall not be less than:</p> <p>class Y(I): 100 e  class Y(II): 20 e for <math>0.001 \text{ g} \leq e \leq 0.05 \text{ g}</math>, and  50 e for <math>0.1 \text{ g} \leq e</math></p> <p>class Y(a): 20 e  class Y(b): 10 e</p> <p>Scales used for grading,  e.g. postal scales and garbage weighers: 5 e</p>	2.2.2	<p><i>Minimum capacity, Min</i>  <i>Min shall be specified by the manufacturer.</i></p> <p><i>For category Y instruments, Min shall not be less than:</i></p> <p><i>Class Y(I): 100 e</i>  <i>Class Y(II): 20 e for <math>0.001 \text{ g} \leq e \leq 0.05 \text{ g}</math>, and 50 e for <math>0.1 \text{ g} \leq e</math></i>  <i>Class Y(a): 20 e</i>  <i>Class Y(b): 10 e</i></p> <p><i>Scales used for grading, postal scales and garbage weighers: 5 e</i></p>	Covered																																		

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6	Dynamic Setting			
6.1	The dynamic setting facility shall operate within a load range specified by the manufacturer.	3.2.3	<i>An instrument may be fitted with a dynamic setting facility to compensate for the dynamic effects of the load in motion. This facility may operate over a weighing range relative to a setting weight value provided that when the facility is used for that weighing range and in accordance with the manufacturer's instructions, the maximum permissible errors are not exceeded.</i>	Covered
6.2	When fitted, a dynamic setting facility that compensates for the dynamic effects of the load in motion shall be inhibited from operating outside the load range, and shall be capable of being secured.	3.2.3	<i>...Once dynamic setting has taken place to give a weighing range over which the permissible errors are not exceeded, the instrument shall automatically take appropriate action for loads falling outside that range; for these loads, printout of the weight shall also be inhibited.</i>  <i>Instruments with dynamic setting available to the user (not secured in accordance with 3.2.6) shall have a facility to automatically and non-erasably record any adjustment of the dynamic setting, e.g. an event logger. The instrument shall be capable of presenting the recorded data.</i>	Covered

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7	Performance Under Influence Factors And Electromagnetic Disturbances			
7.1	The MPEs due to influence factors are:			
7.1.1	For category X instruments: - For automatic operation; as specified in Tables 1, and 2, - For static weighing in non-automatic operation; as specified in Table 1.	2.6.1	<p><i>For automatic operation:</i></p> <ul style="list-style-type: none"> <li>• the maximum permissible mean error shall be as specified in Table 3 for initial verification; and</li> <li>• the maximum permissible standard deviation of the error shall be as specified in Table 4 for initial verification multiplied by the class designation factor (x).</li> </ul> <p><i>For non-automatic (static) operation the maximum permissible errors shall be as specified in Table 6 for initial verification.</i></p> <p>Figures of MID Table 1 and Table 2 are the same than those of R 51 Table 3 and Table 4</p> <p>Figures of table 6 are the same than those of table 1</p>	Covered
7.1.2	For category Y instruments - For each load in automatic operation; as specified in Table 1, - For static weighing in non-automatic operation; as specified for category X in Table 1.	2.6.2	<p><b>2.6.2 Category Y instruments</b></p> <p><i>For automatic operation the maximum permissible errors for each load shall be as specified in Table 5 for initial verification.</i></p> <p><i>For non-automatic (static) operation the maximum permissible errors shall be as specified in Table 6 for initial verification.</i></p> <p>Figure of MID table 1 are the same than those of R 51 table 5.</p> <p>Figure of MID table 1 are the same than those of R 51 table 6.</p>	Covered



<p style="text-align: center;"><b>Directive 2004/22/EC</b></p> <p style="text-align: center;"><b>Essential requirements of Annex I and Annex MI-006</b></p>	<p style="text-align: center;"><b>OIML R 51-1</b> Edition 2006 (E)</p>	<p style="text-align: center;"><b>Comments</b></p>	<p style="text-align: center;"><b>Conclusion</b></p>
<p>7.3 Temperature range:</p> <ul style="list-style-type: none"> <li>- For class XI and Y(I) the minimum range is 5° C,</li> <li>- For class XII and Y(II) the minimum range is 15° C.</li> </ul>	<p>2.9.1.2</p>	<p><b><i>Special temperature limits</i></b></p> <p><b><i>An instrument for which particular limits of working temperature are stated in the descriptive markings shall comply with the metrological requirements within those limits. The limits may be chosen according to the application of the instrument.</i></b></p> <p><b><i>The ranges within those limits shall be at least equal to:</i></b></p> <ul style="list-style-type: none"> <li>• <b><i>5 °C for instruments of classes XI and Y(I);</i></b></li> <li>• <b><i>15 °C for instruments of classes XII and Y(II);</i></b></li> <li>• <b><i>30 °C for instruments of all other classes.</i></b></li> </ul> <p>See 1.3.1 of Annex I</p>	<p>Covered</p>