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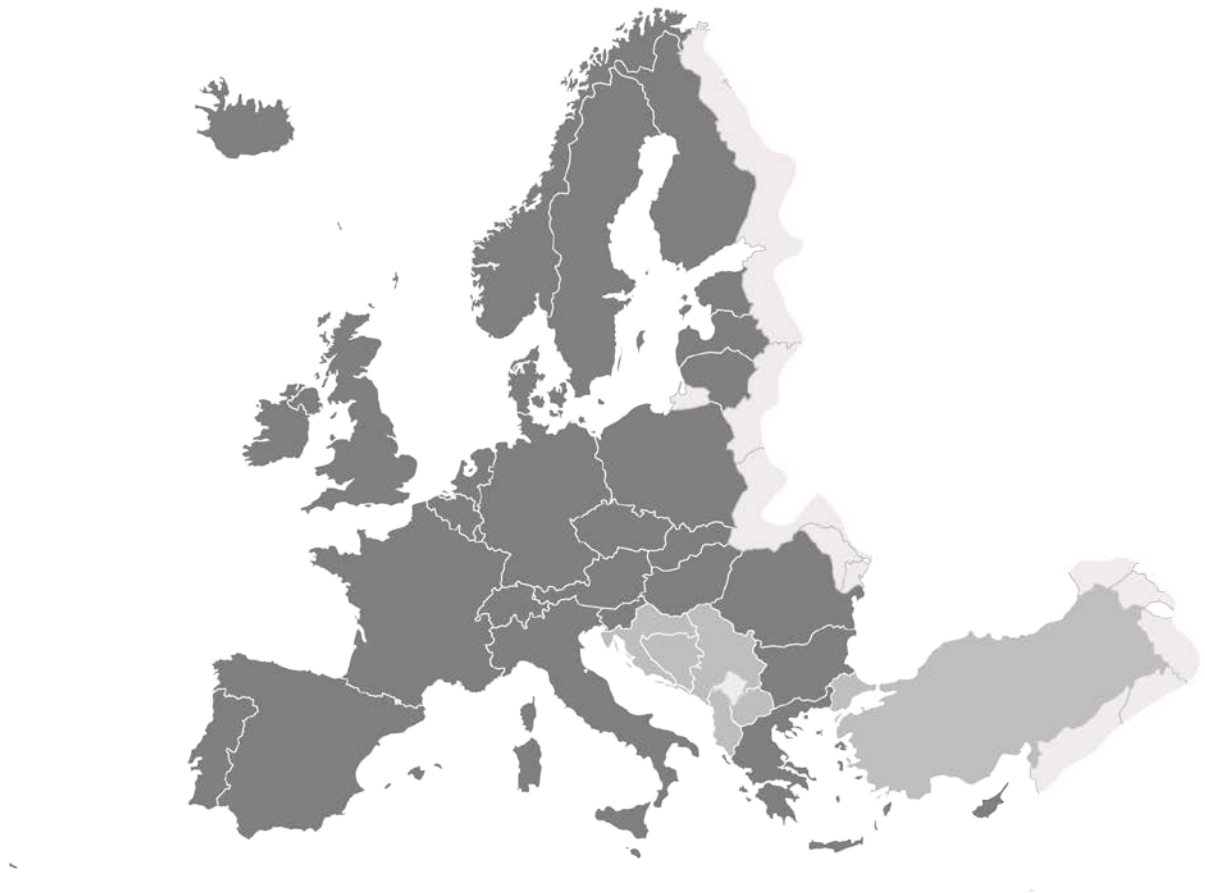
Measuring Instruments Directive 2004/22/EC
Automatic Catchweighers
Corresponding Tables
OIML R 51-1 – MID-006 II



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 EU 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 2006 (E)

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 (2006)	Comments	Conclusion
ANNEX 1				
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. Unless stated otherwise in the instrument-specific annexes, MPE is expressed as a bilateral value of the deviation from the true measurement value.	T.4.3.1	***Error (of indication) [VIM:1993, 5.20 [1]]*** *Indication of an instrument minus the (conventional) true value of the mass.*	Covered
		T.4.3.7	***Maximum permissible error, MPE [VIM:1993, 5.21 [1]]*** *Extreme value of an error permitted by specifications, regulations, etc. for a given instrument.*	
		2.5	***Maximum permissible errors***	
		2.6	***Maximum permissible errors for influence factor tests***	
		4.1.1	***Rated operated conditions*** *Electronic weighing instruments shall be so designed and manufactured that they do not exceed the maximum permissible errors under rated operating conditions.*	
1.2	Under rated operating conditions and in presence of a disturbance, the performance requirement shall be as laid down in the appropriate instrument-specific requirements. Where the instrument is intended to be used in a specified permanent continuous electromagnetic field the permitted performance during the radiated electromagnetic field-amplitude modulated test shall be within MPE.	4.1.3	***Electronic instruments shall be so designed and manufactured that when exposed to disturbances, either:*** ***a) 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; or*** ***b) 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.***	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
		4.1.6	*The requirements for disturbances in 4.1.3 may be applied separately to:* *• each individual cause of significant fault; and/or* *• each part of the electronic instrument.* *The choice of whether 4.1.3 a) or b) is applied is left to the manufacturer.*	
		4.2.2	*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.*	
1.3	The manufacturer shall specify the climatic, mechanical and electromagnetic environments in which the instrument is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking into account of the requirements laid down in the appropriate instrument-specific annexes.	5.2.1	***The application for type approval shall include documentation comprising:*** ***• metrological characteristics of the instrument;*** ***• a set of specifications for the instrument;*** ***• a functional description of the components and devices;*** ***• drawings, diagrams and general software information (if applicable), explaining the construction and operation; and*** ***• any document or other evidence that the design and construction of the instrument complies with the requirements of this Recommendation***	Covered

<table>
<tr><th>Directive 2004/22/EC
Essential requirements of Annex I and Annex MI-006</th><th>OIML R 51-1 (2006)</th><th>Comments</th><th>Conclusion</th></tr>
<tr>
<td>1.3.1 Climatic environments
The manufacturer shall specify the upper temperature limit and the lower temperature limit from any of the values in Table 1 unless otherwise specified in the Annexes MI-001 to MI-010, and indicate whether the instrument is designed for condensing or non-condensing humidity as well as the intended location for the instrument, i.e. open or closed.
<table>
<tr><td colspan="5">Temperature limits:</td></tr>
<tr><td>Upper temperature limit</td><td>30 °C</td><td>40 °C</td><td>55 °C</td><td>70 °C</td></tr>
<tr><td>Lower temperature limit</td><td>5 °C</td><td>-10 °C</td><td>-25 °C</td><td>-40 °C</td></tr>
</table>
</td>
<td>2.9.1.1

2.9.1.2</td>
<td>Temperature limits
If no particular working temperature is stated … an instrument … shall maintain its metrological properties within the following temperature limits:
–10 °C to +40 °C
Special temperature limits
An instrument … shall comply with the metrological requirements within those limits. The limits may be chosen according to the application of the instrument.
The ranges … shall be at least equal to:
• 5 °C for instruments of classes XI and Y(I);
• 15 °C for instruments of classes XII and Y(II);
• 30 °C for instruments of all other classes.
These values are the same than those specified in the specific annex MI-006 Chapter I §1.3 and Chapter II §7.3.</td>
<td>Covered except that:
Condensing / non-condensing and open / closed is not covered</td>
</tr>
</table>

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
1.3.2	(a) Mechanical environments are classified into classes M1 to M3 as described below 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. 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. 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. (b) The following influence quantities shall be considered in relation with mechanical environments: - Vibration - Mechanical shock		According to Annex MI-006 Chapter I § 1.3, Annex I § 1.3.2 is not applicable	Not Relevant
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.			
	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.		Definition. Tests and severity levels in 1.3.3 (b) below shall be applied for E1	Covered
	E2: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.		Definition. Tests and severity levels in 1.3.3 (b) below shall be applied for E2	Covered
	E3: This class applies to instruments supplied by the battery	A.6.3.6	***Electrical transient conduction for instruments***	Covered except that:

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
of a vehicle. Such instruments shall comply with the requirements of E2 and the following additional requirements - voltage reductions caused by energizing the starter-motor circuits of internal combustion engines, - load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.		***powered from a road vehicle battery*** ***Conduction along supply lines of 12 V or 24 V road vehicle battery*** ***Applicable standards: ISO 7637-2:*** *§ 5.6.2: Test pulse 2a + b,* *§ 5.6.3: Test pulse 3a + 3b,* *§ 5.6.4: Test pulse 4.* ***Electrical transient conduction via lines other than supply lines*** ***Applicable standards:*** *ISO 7637-3, § 4.5: Test pulses a and b.* Tests and severity levels in 1.3.3 (b) below shall be applied for E2, plus tests specified in A.6.3.6.	R51 does not cover load dump requirement – ISO 7637 Pulse 5
(b) The following influence quantities shall be considered in relation with electromagnetic environments:			
- voltage interruptions	A.6.3.1	*OIML D 11 (13.4). For E1 use severity level 2 and for E2 use severity level 3.*	Covered on the provision that the relevant severity levels specified in OIML D 11 (2004) are used
- short voltage reductions	A.6.3.1	*OIML D 11 (13.4). For E1 use severity level 2 and for E2 use severity level 3.*	
- voltage transients on supply lines and/or signal lines	A.6.3.2	*OIML D 11 (13.5). For E1 use severity level 2 and for E2 use severity level 3.* *OIML D 11 (12.4). For E1 use severity level 2 and for E2 use severity level 3.*	
- electrostatic discharges	A.6.3.4	*OIML D 11 (12.2). For E1 and E2 use severity level 3.*	
- radio frequency electromagnetic fields	A.6.3.5.1	*OIML D 11 (12.1.1). For E1 use severity level 2 and for E2 use severity level 3.*	
- conducted radio frequency electromagnetic fields on supply lines and/or signal lines	A.6.3.5.2	*OIML D 11 (13.1.2). For E1 use severity level 2 and for E2 use severity level 3.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
	- surges on supply lines and/or signal lines	A.6.3.3	*OIML D 11 (13.8). For E1 use severity level 2 and for E2 use severity level 3.* *OIML D 11 (12.5). For E1 use severity level 2 and for E2 use severity level 3.*	
1.3.4	Other influence quantities to be considered, where appropriate, are:			
	- voltage variation	2.9.2 A.6.2.4 A.6.2.5 A.6.2.6 A.6.2.7	*An electronic instrument shall comply with the appropriate metrological and technical requirements, if the voltage supply varies from the nominal voltage, U_{nom} (if only one voltage is marked on the instrument), or from the lower and upper limits of the voltage range,*	Covered
	- mains frequency variation - power frequency magnetic fields			Not covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
- any other quantity likely to influence in a significant way the accuracy of the instrument.	4.2.3 6.4.3 A.5.2 2.9.3 A.6.2.8	***4.2.3 Warm-up time*** *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.* ***6.4.3 Warm-up test*** *The warm-up test shall be performed in non-automatic (static) operation. A single static test load near maximum capacity shall be used.* ***A.5.2 Warm-up*** *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.* *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.* *...* ***A.6.2.8 Tilting***	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
	2.9.1.3	***Temperature effect on no-load indication*** *The indication at zero or near zero shall not vary by more than one verification scale interval for a difference in ambient temperature of 1 °C for instruments of classes XI and Y(I), and 5 °C for other classes.*	
	A.6.2.2	***Temperature effect on the no-load indication***	
	6.1.4 & A.5.8	***Speed of operation*** ***Alternative operating speeds***	
	2.8.1, 6.4.4 & A.5.7	***Eccentricity***	

	Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
1.4	When carrying out the tests as envisaged in this Directive, the following paragraphs apply:			
1.4.1	*Basic rules for testing and the determination of errors* Essential requirements specified in 1.1 and 1.2 shall be verified for each relevant influence quantity. Unless otherwise specified in the appropriate instrument-specific annex, these essential requirements apply when each influence quantity is applied and its effect evaluated separately, all other influence quantities being kept relatively constant at their reference value. Metrological tests shall be carried out during or after the application of the influence quantity, whichever condition corresponds to the normal operational status of the instrument when that influence quantity is likely to occur.	A.6.1.1 Annex A	***General requirements*** *The influence factor tests shall be applied to a complete instrument under normal operation in accordance with 6.4.5. Where it is not possible to apply influence factor tests to fully operational equipment in their normal operational state (i.e. where size and/or configuration of the instrument does not permit testing as a whole) the instrument may be subjected to influence factor tests under simulated operation. If simulated operation is not possible, the instrument may be subjected to influence factor tests under static conditions as specified in 6.4.5.1.* *Disturbances shall be applied to the instrument under static conditions. If the instrument cannot be subjected to disturbances under static conditions, then simulated operation may be permitted. The permissible effects of the disturbances, under these conditions, are specified for each test in A.6.3.* *When the effect of one influence factor is being evaluated, all other factors shall be held relatively constant, at a value close to normal.* Each test of the Annex A specifies when the “metrological test” has to be performed (after/during the application of the influence quantity).	Covered
1.4.2	*Ambient humidity* - According to the climatic operating environment in which the instrument is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic	A.6.2.3	***Damp heat, steady state - non-condensing*** *These tests are not applicable to classes XI and Y(I) instruments, or classes XII and Y(II) instruments where e is less than 1 gram.*	Covered except for the damp heat condensing test.

	Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
	(condensing) test may be appropriate. - The damp heat cyclic test is appropriate where condensation is important or when penetration of vapour will be accelerated by the effect of breathing. In conditions where non-condensing humidity is a factor the damp-heat steady state is appropriate.	4.1.2	***Influence factors*** *An electronic instrument shall comply with the requirements of 2.9 and shall also comply with appropriate metrological and technical requirements at a relative humidity of 85 % at the upper limit of the temperature range. Note: This is not applicable to an electronic instrument of classes XI and Y(I), and of classes XII and Y(II) if e is less than 1 g.*	
2	Reproducibility The application of the same measurand in a different location or by different user, all other conditions being the same, shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.	A.7 6.5.3	***Span stability test*** *This test is not applicable to classes XI and Y(I) instruments.*	Covered
		2.10	*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.* The reproducibility is demonstrated when performing all the tests prescribed in R 51-1.	
3	Repeatability The application of the same measurand under the same conditions of measurement shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.	T.3.6	The repeatability is demonstrated when performing all the tests prescribed in R 51-1.	Covered
4	Discrimination and sensitivity A measuring instrument shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.	T.3.5		Covered
		3.3.1	***Quality of reading*** *Reading of the primary indications shall be reliable, easy and unambiguous under conditions of normal use.*	
		2.5.1	***2.5.1 Automatic operation*** Instrument must satisfy mpes	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
	5.2.3	Reference to R76-1 for non-automatic (static) operation	
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.	4.1.4	*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.*	Covered
	A.7	This test is not applicable to classes XI and Y(I) instruments.	
	2.10	*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.*	
	6.5.3	*The span stability test shall be conducted as described in A.7, applying the requirements given in 2.10.*	
	T.3.7	*Ability of an instrument to maintain its performance characteristics over a period of use.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
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.	3.2.2	***Accidental breakdown and maladjustment*** *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.*	Covered
		4.1.3	***Disturbances*** *Electronic instruments shall be so designed and manufactured that when exposed to disturbances, either:* *a) 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;* *or* *b) 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.* *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.*	
		4.2.2	***Acting upon a significant fault*** *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	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 3.2.2 3.2.4	**Fraudulent use** An instrument shall have no characteristics likely to facilitate its fraudulent use. ***Accidental breakdown and maladjustment*** *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.* ***Controls*** *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.*	Covered
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	***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.***	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

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
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.	3.1	***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.***	Covered
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. 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.	3.4.5	***Software*** *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.* *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.* *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.*	Covered except for the description of test procedure in the operation manual
		2.11	***Indication or printout for test purposes (automatic operation)*** *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).* *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
		6.1.5	***Control instrument*** *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 ... be ... integral.* *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 in Tables 3 and 4, for category X instruments, and one-third of the appropriate maximum permissible errors in Table 5 for category Y instruments.*	
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	***Interfaces*** *An electronic instrument may be equipped with interfaces permitting the coupling of the instrument to any peripheral devices or other instruments.* *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.*	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	***Securing*** *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.* *...*	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
8.3	Software that is critical for metrological characteristics shall be identified as such and shall be secured. Software identification shall be easily provided by the measuring instrument. Evidence of an intervention shall be available for a reasonable period of time.	3.4.5	*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.* *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.* *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.* *...*	Covered
		3.2.3	*...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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
8.4	Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption.	3.2.6	***Securing*** *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.* *The introduction into the instrument of data that can influence the instrument's metrological properties or measurement results shall be prevented, e.g. by a protective interface (4.2.4).* *Components and preset controls may be secured by passwords or similar software means provided that any access to the secured controls or functions becomes automatically evident, e.g. by automatically updating a device-specific parameter the value of which at the time of the last verified setup had been durably marked on the instrument in accordance with the requirements of 3.11.4.* *An instrument may be fitted with a span adjustment device. External influence upon this device shall be practically impossible after securing.*	Covered
		3.2.3	***...*** *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
	3.4.4	***Data storage device (T.2.7.8.5)*** *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.*	
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.		Automatic catchweighing instruments are not utility meters.	Not Relevant

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
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	**Markings shown in full** • name or identification mark of the manufacturer • name or identification mark of the importer (if applicable) • serial number and type designation of the instrument • maximum rate of operation (if applicable) in the form: ..... loads/min or units/min • maximum speed of load transport system (if applicable) in the form: ..... m/s or m/min • electrical supply voltage in the form: ..... V • electrical supply frequency in the form: ..... Hz • pneumatic/hydraulic pressure (if applicable) in the form: ..... kPa • adjustment range referred to set point (if applicable) in the form: ±..... g or % (of set point value) • temperature range (when not -10 °C to +40 °C) • software identification (if applicable)	Covered except for the indication of presence of additional device.
		3.11.2	***Markings shown in code*** • *type approval sign* • *indication of the accuracy class, e.g. XI(0.5) or Y(a)* • *verification scale interval in the form: e = ...* • *actual scale interval in the form: d = ...* • *maximum capacity in the form: Max .....* • *minimum capacity in the form: Min .....* • *maximum additive tare in the form: T = +.....* • *maximum subtractive tare in the form: T = -.....*	
9.2	An instrument of dimensions too small or of too sensitive a composition to allow it to bear the relevant information shall have its packaging, if any, and the accompanying documents required by the provisions of this Directive suitably marked.			Not Relevant

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
9.3	The instrument shall be accompanied by information on its operation, unless the simplicity of the measuring instrument makes this unnecessary. Information shall be easily understandable and shall include where relevant: - rated operating conditions - mechanical and electromagnetic environment classes - the upper and lower temperature limit, whether condensation is possible or not, open or closed location - instructions for installation, maintenance, repairs, permissible adjustments - instructions for correct operation and any special conditions use - conditions for compatibility with interfaces, sub-assemblies or measuring instruments.	3.11.1	• maximum rate of operation (if applicable) in the form: ..... loads/min or units/min • maximum speed of load transport system (if applicable) in the form: ..... m/s or m/min • electrical supply voltage in the form: ..... V • electrical supply frequency in the form: ..... Hz • pneumatic/hydraulic pressure (if applicable) in the form: ..... kPa • adjustment range referred to set point (if applicable) in the form: ±..... g or % (of set point value) • temperature range (when not -10 °C to +40 °C)	Covered except for information (on its operation, installation, maintenance, repairs, permissible adjustments, correct operation), condensation, open or closed location.
		3.11.2		
		3.11.3	*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).* *Additional markings (for example, products) may be required on initial verification to specify types of packs and related weighing conditions.*	
9.4	Groups of identical measuring instruments used in the same location or used for utility measurements do not necessarily require individual instruction manuals.			Not Relevant
9.5	Unless specified otherwise in an instrument-specific annex, the scale interval for a measured value shall be in the form $1x10^n$, $2x10^n$, or $5x10^n$, where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.	3.3.2	*The scale interval for weighing results (T.3.2) shall be in the form 1×10^k, 2×10^k or 5×10^k units in which the result is expressed, k being a positive or negative whole number or zero.*	Covered
9.6	A material measure shall be marked with a nominal value or a scale, accompanied by the unit of measurement used.			Not Relevant
9.7	The units of measurement used and their symbols shall be	2.7	*The units of mass to be used on an instrument are:*	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
	in accordance with the provisions of Community legislation on units of measurement and their symbols.		*• metric carat (ct);* *• milligram (mg);* *• gram (g);* *• kilogram (kg);* *• tonne (t).*	
9.8	All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.	3.11.4	*Descriptive markings shall be indelible and of a size, shape and clarity that permit legibility under normal conditions of use.*	Covered
		3.12	*Verification marks*	
10	Indication of result			
10.1	Indication of the result shall be by means of a display or a hard copy.	3.3	***Indication of weighing results***	Covered
		3.4	***Digital indicating, printing and memory storage devices***	
10.2	The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the present result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.	3.3.1	***Quality of reading*** *Reading of the primary indications shall be reliable, easy and unambiguous under conditions of normal use.* *...* *The scales, numbering and printing shall permit the figures which form the results to be read by simple juxtaposition*	Covered
		2.4	***Auxiliary indicating device***	
		3.4.2	***Extended indicating device***	
		3.3.2	***Form of the indication*** *Weighing results shall contain the names or symbols of the units of mass in which they are expressed.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
10.3	In the case of hard copy the print or record shall also be easily legible and non-erasable.	3.4.3 3.4.4	***3.4.3 Printing device*** *Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.* ***3.4.4 Data storage device (T.2.7.8.5)*** *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.).*	Covered
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.	3.4.3	***3.4.3 Printing device*** *Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.* *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.* Catchweighers could be used for direct sales in some instances, e.g. small front-end loader	Not covered directly, although some requirements are relevant
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.		Automatic catchweighing instruments are not utility meters.	Not Relevant

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	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 3.4.3	***Data storage device*** *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.).* Most of the time, the measurement is carried out in the absence of one of the trading parties. ***3.4.3 Printing device*** *Printing shall be clear and permanent for the intended use.*	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.	3.4.4 3.4.3	***Data storage device*** *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.).* ***3.4.3 Printing device*** *Printing shall be clear and permanent for the intended use. Printed figures shall be at least 2 mm high.* *...* *Printing shall be inhibited if the stability criteria (3.4.1) are not fulfilled.*	Covered when the measuring instrument is fitted with a data storage device or a printer

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
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.	2.11	***Indication or printout for test purposes (automatic operation)*** *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).* *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.*	Covered
		6.1.5	*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.* *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 ...*	
		6.1.8	*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).*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
Annex MI-006			
Definitions **Automatic weighing instrument** 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. **Automatic catchweigher** An automatic weighing instrument that determines the mass of pre-assembled discrete loads (for example prepackages) or single loads of loose material. **Automatic checkweigher** 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. **Weight labeller** An automatic catchweigher that labels individual articles with the weight value. **Weight/price labeller** An automatic catchweigher that labels individual articles with the weight value, and price information.			

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
Automatic gravimetric filling instrument An automatic weighing instrument that fills containers with a predetermined and virtually constant mass of product from bulk. **Discontinuous totaliser (totalising hopper weigher)** 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. **Continuous totaliser** 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. **Rail-weighbridge** An automatic weighing instrument having a load receptor inclusive of rails for conveying railway vehicles.			

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
Chapter I – Requirements common to all types of automatic weighing instruments			
1 Rated Operating Conditions The manufacturer shall specify the rated operating conditions for the instrument as follows:	5.2.1	***The application for type approval shall include documentation comprising:*** ***• metrological characteristics of the instrument;*** ***• a set of specifications for the instrument;*** ***• a functional description of the components and devices;*** ***• drawings, diagrams and general software information (if applicable), explaining the construction and operation; and*** ***• any document or other evidence that the design and construction of the instrument complies with the requirements of this Recommendation***	Covered
1.1 For the measurand: The measuring range in terms of its maximum and minimum capacity.	T.3.1.1 T.3.1.2 T.3.1.3	***Maximum capacity, Max*** *Maximum weighing capacity, not taking into account the additive tare capacity.* ***Minimum capacity, Min*** *Value of the load below which the weighing result may be subject to an excessive relative error.* ***Weighing range*** *Range between the minimum and maximum capacities.*	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
	2.2.2	*Minimum capacity, Min* *Min shall be specified by the manufacturer.* *For category Y instruments, Min shall not be less than:* *Class Y(I): 100 e* *Class Y(II): 20 e for 0.001 g ≤ e ≤ 0.05 g, and 50 e for 0.1 g ≤ e* *Class Y(a): 20 e* *Class Y(b): 10 e* *Scales used for grading, postal scales and garbage weighers: 5 e*	
	2.2.1	***Verification scale interval*** *The verification scale interval and number of verification scale intervals, in relation to the accuracy class, are given in Table 1.*	
	2.3.1	***Partial weighing range*** *Each partial weighing range (index, i = 1, 2 ...) is defined by:* *• its verification scale interval e_i, $e_i + 1 > e_i$;* *• its maximum capacity Max_i;* *• its minimum capacity $Min_i = Max_i - 1$ (for i = 1, the minimum capacity is $Min_1 = Min$).* *The number of verification scale intervals n_i for each partial range is:* $n_i = Max_i / e_i$	
	2.3.3	***Maximum capacity of partial weighing ranges*** *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
1.2	For the electrical supply influence quantities: In case of AC voltage supply: the nominal AC voltage supply, or the AC voltage limits. In case of DC voltage supply: the nominal and minimum DC voltage supply, or the DC voltage limits.	2.9.2	***An electronic instrument shall comply with the appropriate metrological and technical requirements, if the voltage supply varies from the nominal voltage, U_{nom} (if only one voltage is marked on the instrument), or from the lower and upper limits of the voltage range, U_{min} and U_{max}, marked on the instrument at:*** ***• AC mains voltage:*** ***- lower limit is 85 % of U_{min},*** ***- upper limit is 110 % of U_{max};*** ***• DC mains voltage, including rechargeable battery if the battery can be fully (re)charged during the operation of the instrument:*** ***- lower limit is the minimum operating voltage,*** ***- upper limit is 120 % of U_{max} (U_{max} is the voltage of a new or fully charged rechargeable battery of the type specified by the manufacturer);*** ***• 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:*** ***- lower limit is the minimum operating voltage,*** ***- upper limit is U_{nom};*** ***• 12 V or 24 V road vehicle battery supply:*** ***- lower limit is 9 V (for a 12 V battery) or 16 V (for a 24 V battery),*** ***- upper limit is 16 V (for a 12 V battery) or 32 V (for a 24 V battery).***	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
1.3	For the mechanical and climatic influence quantities: The minimum temperature range is 30°C unless specified otherwise in the following chapters of this Annex. The mechanical environment classes according to Annex I, paragraph 1.3.2 are not applicable. For instruments which are used under special mechanical strain, e.g. instruments incorporated into vehicles, the manufacturer shall define the mechanical conditions of use.	2.9.1.1	***Temperature limits*** ***If no particular working temperature is stated in the descriptive markings of an instrument, this instrument shall maintain its metrological properties within the following temperature limits:*** ***–10 °C to +40 °C***	Covered
		2.9.1.2	***Special temperature limits*** ***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.*** ***The ranges within those limits shall be at least equal to:*** ***• 5 °C for instruments of classes XI and Y(I);*** ***• 15 °C for instruments of classes XII and Y(II);*** ***• 30 °C for instruments of all other classes.***	
		2.9.3	***2.9.3 Tilting*** *Instruments mounted on or incorporated in vehicles shall comply with the appropriate metrological and technical requirements when tilted (longitudinally and transversely) by 10 %, or when tilted to a lower predetermined value selected by the manufacturer, e.g. 3 %, if the instrument is provided with an automatic tilt limiting device which prevents the instrument from operating when tilted above this value.*	
		3.2.5	***Tilt limiting device*** *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
1.4 For other influence quantities (if applicable): The rate(s) of operation. The characteristics of the product(s) to be weighed.	6.1.4	***Conditions of tests*** *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.*	Covered
	2.9.3	***2.9.3 Tilting*** *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.* *...*	
	3.2.3	***Dynamic setting*** *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.* *…*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
2	Permissible effect of disturbances – Electromagnetic environment The required performance and the critical change value are given in the relevant Chapter of this Annex for each type of instrument.			
3	Suitability			
3.1	Means shall be provided to limit the effects of tilt, loading and rate of operation such that maximum permissible errors (MPEs) are not exceeded in normal operation.	2.9.3	***2.9.3 Tilting*** *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.* *...*	Covered
		3.2.3	***Dynamic setting*** *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.* *...*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
		3.2.5	***Tilt limiting device*** *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.*	
3.2	Adequate material handling facilities shall be provided to enable the instrument to respect the MPEs during normal operation.	3.2.7	*Sorting device* *The sorting device of a category X instrument shall automatically divide loads into separate subgroups depending on their mass.*	Covered
3.3	Any operator control interface shall be clear and effective.	3.3.1 (3.3, 3.2.4, 3.6.4, 3.6.5, 3.7.3, 3.9.4)	***Reading of the primary indications (T.1.10.1) shall be reliable, easy and unambiguous under conditions of normal use:*** ***• the overall inaccuracy of reading of an analog indicating device shall not exceed 0.2 e;*** ***• the figures, units and designations forming the primary indications shall be of a size, shape and clarity for reading to be easy.*** ***The scales, numbering and printing shall permit the figures which form the results to be read by simple juxtaposition (see T.4.2.1).***	Covered
3.4	The integrity of the display (where present) shall be verifiable by the operator.	4.2.1	***If the failure of an indicator can cause a false weight value indication then the instrument shall have a display test facility which is automatically initiated at switch-on of indication, e.g. display of all the relevant signs of the indicator in their active and non-active states for a sufficient time to be easily observed by the operator. This is not applicable for non-segmented displays, on which failures become evident, for example screen-displays, matrix-displays, etc.***	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
3.5	Adequate zero setting capability shall be provided to enable the instrument to respect the MPEs during normal operation.	***3.5***	***Zero-setting and zero-tracking devices*** *An instrument shall have one or more zero-setting devices and shall not have more than one zero-tracking device. These devices may be:* *• non-automatic;* *• semi-automatic; or* *• automatic.*	Covered
		3.6	***Tare device***	
3.6	Any result outside the measurement range shall be identified as such, where a printout is possible.	3.3.3	***3.3.3 Limits of indication*** *Category Y: There shall be no indication, printing, storing or transmission of weight values above Max + 9 e.* *Category X: There shall be no indication, printing, storing or transmission of weight values above Max + 9 e or Max + three times the maximum permissible standard deviation value as specified in Table 4, whichever is the greater.*	Covered
		3.10.3	***3.10.3 Printing*** *When price computing transactions performed by the instrument are printed, the weight value, unit price and price to pay shall all be printed.* *...* *Printing below minimum capacity shall not be possible.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
4	Conformity assessment The conformity assessment procedures referred to in Article 9 that the manufacturer can choose between are: For mechanical systems: B+D or B+E or B+F or D1 or F1 or G or H1. For electromechanical instruments: B+D or B+E or B+F or G or H1. For electronic systems or systems containing software: B+D or B+F or G or H1.			
Chapter II – Automatic Catchweighers				
1	*Accuracy Classes*			
1.1	Instruments are divided into primary categories designated by: X or Y as specified by the manufacturer.	2.1	***Accuracy classes*** *Instruments are divided according to their use into two primary categories designated by: X or Y* *Category X applies only to checkweighers used to check prepacked products that are subject to the requirements of OIML R 87 [7].* *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.*	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
1.2	These primary categories are further divided into four accuracy classes: XI, XII, XIII & XIV and Y(I), Y(II), Y(a) & Y(b) which shall be specified by the manufacturer	2.1.1	***2.1.1 Category X*** *The primary category is further divided into four accuracy classes:* *XI, XII, XIII and XIIII* *The accuracy classes are supplemented by a factor (x) which is specified by the manufacturer. The value of (x) shall be 1 × 10^k, 2 × 10^k, or 5 × 10^k, k being a positive or negative whole number or zero.*	Covered except that IV is used in the Directive 2004/22/EC instead of IIII
		2.1.2	*The primary category is further divided into four accuracy classes:* *Y(I), Y(II), Y(a), and Y(b)* *The use of a class for a particular application may be determined by national requirements.*	
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	***...****Category X applies only to checkweighers used to check prepacked products that are subject to the requirements of OIML R 87 [7]...*	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 ≤ 2 and in the form 1 x 10^k, 2 x 10k or 5 x 10k , where k is a negative whole number or zero.	2.1.1	*The primary category is further divided into four accuracy classes:* *XI, XII, XIII and XIIII* *The accuracy classes are supplemented by a factor (x) which is specified by the manufacturer. The value of (x) shall be 1 × 10^k, 2 × 10^k, or 5 × 10^k, k being a positive or negative whole number or zero.* See also 4.2 below.	Covered

<table>
<tr><th colspan="2">Directive 2004/22/EC
Essential requirements of Annex I and Annex MI-006</th><th>OIML R 51-1 (2006)</th><th>Comments</th><th>Conclusion</th></tr>
<tr><td>3</td><td>Category Y Instruments
Category Y applies to all other automatic catchweighers.</td><td>2.1
.</td><td>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.</td><td rowspan="2">Covered</td></tr>
<tr><td></td><td></td><td>2.1.2</td><td>The primary category is further divided into four accuracy classes: Y(I), Y(II), Y(a), and Y(b)</td></tr>
<tr><td>4</td><td colspan="4">MPE</td></tr>
<tr><td>4.1</td><td>Mean error Category X / MPE Category Y instruments
<table>
<tr><td colspan="8">Net Load (m) in verification scale intervals (e)</td><td>Maximum permissible mean error</td><td>Maximum permissible error</td></tr>
<tr><td>XI</td><td>Y(I)</td><td>XII</td><td>Y(II)</td><td>XIII</td><td>IY(a)</td><td>XIV</td><td>Y(b)</td><td>X</td><td>Y</td></tr>
<tr><td colspan="2">0 < m ≤ 50 000</td><td colspan="2">0 < m ≤ 5 000</td><td colspan="2">0 < m ≤ 500</td><td colspan="2">0 < m ≤ 50</td><td>± 0.5 e</td><td>± 1 e</td></tr>
<tr><td colspan="2">50 000 < m ≤ 200 000</td><td colspan="2">5 000 < m ≤ 20 000</td><td colspan="2">500 < m ≤ 2 000</td><td colspan="2">50 < m ≤ 200</td><td>± 1.0 e</td><td>± 1.5 e</td></tr>
<tr><td colspan="2">200 000 < m</td><td colspan="2">20 000 < m ≤ 100 000</td><td colspan="2">2 000 < m ≤ 10 000</td><td colspan="2">200 < m ≤ 1 000</td><td>± 1.5 e</td><td>± 2 e</td></tr>
</table></td><td>2.5.1.1

2.5.1.2

A.3.9.2.2 a)</td><td>2.5.1.1 Category X instruments
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.

2.5.1.2 Category Y instruments
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.

Indication with a scale interval greater than 0.2 e</td><td>Covered</td></tr>
</table>

<table>
<tr><th>Directive 2004/22/EC
Essential requirements of Annex I and Annex MI-006</th><th>OIML R 51-1 (2006)</th><th>Comments</th><th>Conclusion</th></tr>
<tr><td>4.2 Standard deviation
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.
<table>
<tr><th>Net Load (m)</th><th>Maximum permissible standard deviation for class X(1)</th></tr>
<tr><td>m ≤ 50 g</td><td>0,48 %</td></tr>
<tr><td>50 g < m ≤ 100 g</td><td>0,24 g</td></tr>
<tr><td>100 g < m ≤ 200 g</td><td>0,24 %</td></tr>
<tr><td>200 g < m ≤ 300 g</td><td>0,48 g</td></tr>
<tr><td>300 g < m ≤ 500 g</td><td>0,16 %</td></tr>
<tr><td>500 g < m ≤ 1 000 g</td><td>0,8 g</td></tr>
<tr><td>1 000 g < m ≤ 10 000 g</td><td>0,08 %</td></tr>
<tr><td>10 000 g < m ≤ 15 000 g</td><td>8 g</td></tr>
<tr><td>15 000 g < m</td><td>0,053 %</td></tr>
</table>
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</td><td>2.5.1.1
Table 4</td><td>The maximum permissible standard deviation of the error (random error) shall be as specified in Table 4, multiplied by the class designation factor (x).

Figures of OIML table and MID table are the same</td><td>Covered</td></tr>
<tr><td>4.3 Verification scale interval - single interval instruments
<table>
<tr><th colspan="2" rowspan="2">Accuracy classes</th><th rowspan="2">Verification scale interval</th><th colspan="2">Number of verification scale intervals n = Max/e</th></tr>
<tr><th>Minimum</th><th>Maximum</th></tr>
<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>XIIII</td><td>Y(b)</td><td>5 g ≤ e</td><td>100</td><td>1 000</td></tr>
</table></td><td>2.2.1
Table 1</td><td>Verification scale interval
The verification scale interval and number of verification scale intervals, in relation to the accuracy class, are given in Table 1.
Figures of OIML table and MID table are the same.</td><td>Covered</td></tr>
</table>

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

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
6	Dynamic Setting			
6.1	The dynamic setting facility shall operate within a load range specified by the manufacturer.	3.2.3	*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.*	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	*…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.* *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.*	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
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	*For automatic operation:* *• the maximum permissible mean error shall be as specified in Table 3 for initial verification; and* *• 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).* *For non-automatic (static) operation the maximum permissible errors shall be as specified in Table 6 for initial verification.* Figures of MID Table 1 and Table 2 are the same than those of R 51 Table 3 and Table 4 Figures of table 6 are the same than those of table 1	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	***2.6.2 Category Y instruments*** *For automatic operation the maximum permissible errors for each load shall be as specified in Table 5 for initial verification.* *For non-automatic (static) operation the maximum permissible errors shall be as specified in Table 6 for initial verification.* Figure of MID table 1 are the same than those of R 51 table 5. Figure of MID table 1 are the same than those of R 51 table 6.	Covered

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006		OIML R 51-1 (2006)	Comments	Conclusion
7.2	The critical change value due to a disturbance is one verification scale interval.	*T.4.3.9*	***Significant fault*** *Fault greater than the verification scale interval, e.* *A significant fault does not include:* *• faults arising from simultaneous and mutually independent causes in the instrument or in its checking facility;* *• faults that imply it is impossible to perform a measurement;* *• faults that are so serious they will inevitably be noticed by all those interested in the measurement; or* *• transitory faults that are momentary variations in the indications that cannot be interpreted, memorized or transmitted as a measurement result.*	Covered
		4.1.3	***4.1.3 Disturbances*** *Electronic instruments shall be so designed and manufactured that when exposed to disturbances, either:* *a) 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;* *or* *b) 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.* *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.*	

Directive 2004/22/EC Essential requirements of Annex I and Annex MI-006	OIML R 51-1 (2006)	Comments	Conclusion
7.3 Temperature range: - For class XI and Y(I) the minimum range is 5° C, - For class XII and Y(II) the minimum range is 15° C.	2.9.1.2	***Special temperature limits*** ***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.*** ***The ranges within those limits shall be at least equal to:*** ***• 5 °C for instruments of classes XI and Y(I);*** ***• 15 °C for instruments of classes XII and Y(II);*** ***• 30 °C for instruments of all other classes.*** See 1.3.1 of Annex I	Covered