SCHEDULE 1 Regulations 2(1) and 14

ESSENTIAL REQUIREMENTS

1. The essential requirements are the relevant requirements relating to beltweighers contained in Annex I and MI-006, as set out in this Schedule.

Definitions

2. In this Schedule—

"climatic environments" means the conditions in which beltweighers may be used.

"critical change value" means the value at which the change in the measurement result is considered undesirable;

"disturbance" means an influence quantity having a value within the limits specified in the appropriate requirement but outside the specified rated operating conditions of the beltweigher. An influence quantity is a disturbance if for that influence quantity the rated operating conditions are not specified;

"influence quantity" means a quantity that is not the measurand but that affects the result of measurement;

"measurand" means the particular quantity subject to measurement; and

"rated operating conditions" means the values for the measurand and influence quantities making up the normal working conditions of an instrument.

Allowable Errors

3.—(1) Under rated operating conditions and in the absence of a disturbance, the error of measurement shall not exceed the maximum permissible error (MPE) value as set out in paragraph 18.

(2) MPE is expressed as a bilateral value of the deviation from the true measurement value.

(3) Under rated operating conditions and in the presence of a disturbance, the performance requirement shall be as set out in paragraph 21(2).

(4) Where the beltweigher 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.

(5) The manufacturer shall specify the climatic and electromagnetic environments in which the instrument is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking account of the requirements in this Schedule.

(a) Climatic environments: The manufacturer shall specify the temperature range of the beltweigher. The minimum temperature range is 30°C and shall be within the upper temperature limit of 70°C and the lower temperature limit of -40 °C. The manufacturer shall indicate whether the beltweigher is designed for condensing or non-condensing humidity as well as the intended location for the instrument, i.e. open or closed.

(b) Electromagnetic environments—

(i) Electromagnetic environments are classified into classes E1, E2 or E3 as follows—

E1: This class applies to beltweighers used in locations with electromagnetic disturbances corresponding to those likely to be found in residential, commercial and light industrial buildings.

E2: This class applies to beltweighers used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.

E3: This class applies to beltweighers supplied by the battery of a vehicle. Such beltweighers shall comply with the requirements of E2 and the following additional requirements—

(aa) voltage reductions caused by energising the starter-motor circuits of internal combustion engines;

(bb) load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.

(ii) The following influence quantities shall be considered in relation with electromagnetic environments—

(aa) voltage interruptions;

(bb) short voltage reductions;

(cc) voltage transients on supply lines and/or signal lines;

(dd) electrostatic discharges;

(ee) radio frequency electromagnetic fields;

(ff) conducted radio frequency electromagnetic fields on supply lines and/or signal lines;

(gg) surges on supply lines and/or signal lines.

(6) Other influence quantities to be considered, where appropriate, are—

(a) voltage variation;

(b) mains frequency variation;

(c) power frequency magnetic fields; and

(d) any other quantity likely to influence in a significant way the accuracy of the instrument.

(7) When carrying out the tests as envisaged in these Regulations, the following paragraphs apply—

(a) Basic rules for testing and the determination of errors—

(i) Essential requirements specified in paragraphs (1) to (4) shall be verified for each relevant influence quantity. 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.

(ii) 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.

(b) Ambient humidity—

(i) According to the climatic operating environment in which the beltweigher is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic (condensing) test may be appropriate;

(ii) 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.

Reproducibility

4. The application of the same measurand in a different location or by a 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.

Repeatability

5. 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.

Discrimination and Sensitivity

6. A beltweigher shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.

Durability

7. A beltweigher shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer, provided that it is properly installed, maintained and used according to the manufacturer's instruction when in the environmental conditions for which it is intended.

Reliability

8. A beltweigher 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.

Suitability

9.—(1) A beltweigher shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.

(2) A beltweigher 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) Where a beltweigher is designed for the measurement of values of the measurand that are constant over time, the instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.

(4) A beltweigher shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.

(5) A beltweigher 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.

(6) When an 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.

(7) Means shall be provided to limit the effects of tilt, loading and rate of operation such that MPEs are not exceeded in normal operation.

(8) Adequate material handling facilities shall be provided to enable the instrument to respect the MPE during normal operation.

(9) Any operator control interface shall be clear and effective.

(10) The integrity of the display (where present) shall be verifiable by the operator.

(11) Adequate zero setting capability shall be provided to enable the instrument to respect the MPEs during normal operation.

(12) Any result outside the measurement range shall be identified as such, where a printout is possible.

Protection against corruption

10.—(1) The metrological characteristics of a beltweigher 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 instrument.

(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) Software that is critical for metrological characteristics shall be identified as such and shall be secured.

(4) Software identification shall be easily provided by the beltweigher.

(5) Evidence of a software intervention shall be available for a reasonable period of time.

(6) 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.

Information to be borne by and to accompany the beltweigher

11.—(1) A beltweigher shall bear the following inscriptions—

(a) manufacturer's mark or name;

(b) information in respect of its accuracy;

plus, when applicable:

(c) information in respect of the conditions of use;

(d) measuring capacity;

(e) measuring range;

(f) identity marking;

(g) number of the EC-type examination certificate or the EC design examination certificate; and

(h) information whether or not additional devices providing metrological results comply with the provisions of these Regulations.

(2) The beltweigher shall be accompanied by information on its operation, unless the simplicity of the beltweigher makes this unnecessary. Information shall be easily understandable and shall include where relevant—

(a) rated operating conditions;

(b) electromagnetic environment classes;

(c) the upper and lower temperature limit, whether condensation is possible or not, open or closed location;

(d) instructions for installation, maintenance, repairs, permissible adjustments;

(e) instructions for correct operation and any special conditions of use; and

(f) conditions for compatibility with interfaces or measuring instruments.

(3) Groups of identical beltweighers used in the same location do not necessarily require individual instruction manuals.

(4) The scale interval for a measured value shall be in the form 1 x 10^n, 2 x 10^n or 5 x 10^n, where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.

(5) 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.

(6) All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.

Indication of result

12.—(1) Indication of the result shall be by means of a display or hard copy.

(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 presented 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) In the case of hard copy the print or record shall also be easily legible and non-erasable.

Further processing of data to conclude the trading transaction

13.—(1) A beltweigher shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when—

(a) the measurement is non-repeatable; and

(b) the beltweigher is normally intended for use in the absence of one of the trading parties.

(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.

Conformity evaluation

14. A beltweigher shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of these Regulations.

Rated Operating Conditions

15. The manufacturer shall specify the rated operating conditions for the beltweigher as follows—

(a) for the measurand:

(i) the measuring range in terms of its maximum and minimum capacity;

(b) for the electrical supply influence quantities:

(i) in the case of AC voltage supply: the nominal AC voltage supply, or the AC voltage limits;

(ii) in the case of DC voltage supply: the nominal and minimum DC voltage supply, or the DC voltage limits;

(c) for the mechanical quantities:

(i) for beltweighers which are used under special mechanical strain, e.g. instruments incorporated into vehicles, the manufacturer shall define the mechanical conditions of use;

(d) for other influence quantities (if applicable):

(i) the rate(s) of operation;

(ii) the characteristics of the product(s) to be weighed.

Accuracy Classes

16. Beltweighers to which these Regulations apply are divided into three accuracy classes, as follows – 0.5, 1 and 2.

Measurement Range

17.—(1) The manufacturer shall specify the measurement range, the ratio between the minimum net load on the weighing unit and the maximum capacity, and the minimum totalised load.

(2) The minimum totalised load Σ min shall not be less than

(i) 800 d for class 0.5,

(ii) 400 d for class 1,

(iii) 200d for class 2,

where d is the totalisation scale interval of the general totalisation device.

MPE

18. The MPE applicable to a beltweigher shall be as set out in Table 1.

Table 1

Accuracy class	*MPE for totalised load*
0.5	± 0.25%
1	± 0.5%
2	± 1.0%

Speed of the belt

19. The speed of the belt shall be specified by the manufacturer. For single-speed beltweighers, and variable-speed beltweighers having a manual speed setting control, the speed shall not vary by more than 5% of the nominal value. The product shall not have a different speed than the speed of the belt.

General Totalisation Device

20. It shall not be possible to reset the general totalisation device to zero.

Performance under influence factors and electromagnetic disturbance

21.—(1) The MPE due to influence factors, for a load not less than Σ min shall be 0.7 times the appropriate value specified in Table 1 of this Schedule, rounded to the nearest totalisation scale interval (d).

(2) The critical change value due to a disturbance shall be 0.7 times the appropriate value specified in Table 1, for a load equal to Σ min, for the designated class of beltweigher, rounded up to the next higher totalisation scale interval (d).