

The New EN45501

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The Start

- EN45501 1992 was the harmonised standard for the purposes of the Directive 2009/23 for non-automatic weighing instruments. (originally 90/384)
- For many years it was used and understood by all businesses, notified bodies and market surveillance authorities.
- 2006- The new version of OIML R76 was published
- Need to bring the harmonised standard in line with the OIML Document.....

The journey

- Would have assumed that this was an easy task
- “Copy and paste” the R76 and the job would be completed....
- Early 2015 the standard was published by CEN
- Must be implemented in the member states by 13-08-2015
- This has been done in some member states -but not all

The arrival

- Has not been published in the Official Journal of the Commission
- Today it is still the 1992 Standard that is harmonised
- This will change after publication
- There will be a period of transition until April 20th 2016
- Same date as the new NAWI Directive
- After that all new equipment must be to the new standard

Unless.....

Unless.....

- Existing type approvals can be used until their expiration.
- They DO NOT have to be replaced to meet the requirements of the new standard
- The new NAWI Directive prescribes the format of the Declaration of Conformity (Annex IV)
- Must make references to the relevant harmonised standards used or references to other technical specifications
- We must decide a solution to this problem

What is in the new standard ?

- New definitions
- Introduction of the modular approach and the development of the concept of families
- New requirements on portable and mobile instruments
- Important new requirements for software
- Changes to the verification test
- Increase to 10v/m for the RFI test
- Introduction of the conducted immunity test
- Introduction of the surge test

New Definitions

Number of new definitions

- T.1.2.11- **Mobile instrument**-instrument mounted on or incorporated in a vehicle
- T.1.2.12- **Portable instrument**-instrument used for weighing road vehicles
- T.2.2- **Module**- much clearer definition. Lists the modules for which a parts or evaluation certificate can be given

Figure 1 is useful in explaining what elements compose a specific module

New Definitions

T.2.3.5-Protective Interface

- Interface (hardware and/or software) which only allows the introduction of such data into the data processing device of an instrument, module or electronic component, which cannot be corrupted
- Important new definition
- Guide 7.2 only talks about a protective software interface

New Definitions

- T.2.8
- T.2.8.1-Legally relevant software
- T.2.8.2-Legally relevant parameter
- T.2.8.3-Type specific parameter
- T.2.8.4-Device specific parameter
- T.2.8.5-Long term storage of measurement data
- T.2.8.6-Software identification
- T.2.8.7-Software separation
- These definitions are the same as those in the Guide 7.2.
- Important to see that the ideas are notions are becoming consistent

Introduction of the modular approach and the development of the concept of families

- **T.3.5 Family**
- identifiable group of weighing instruments or modules belonging to the same manufactured type that have the same design features and metrological principles for measurement (for example the same type of indicator, the same type of design of load cell and load transmitting device) but which may differ in some metrological and technical performance characteristics (e.g. Max, Min, e , d , accuracy class, etc.).
- The concept of a “family” primarily aims to reduce the testing required at type examination. It does not preclude the possibility of listing more than one family in one Certificate

Introduction of the modular approach and the development of the concept of families

- 3.10.2- Modules
- Recognises the existing status- the manufacturer may define and submit modules
- Note: Figure 1
- Requirements as to apportioning errors
- This is illustrated in Table 8 for the examples on T.2.2 and Figure 1
- Compatibility of Modules

Introduction of the modular approach and the development of the concept of families

- **3.10.4 Testing of a family of instruments or modules**
- Number of instruments must be sufficiently representative but their number must be minimised
- Approval of the most sensitive instrument implies approval of instruments with lower characteristics
- For any family, at least the variant with the highest number of verification scale intervals (n) and the variant with the smallest verification scale interval, e , shall be selected as EUTs.

Introduction of the modular approach and the development of the concept of families

- If the highest accuracy class of a family has been tested it is sufficient for only partial tests on a lower class to take place
- Examples of other features to be consider- housings/load receptors- temperature and humidity ranges-instrument functions-indications etc
- Summary of relevant metrological characteristics
- Acceptable solution

Requirements for portable and mobile instruments

- These requirements are new (4.18)
- Requirement to define the following characteristics
 - a- warm up procedures
 - b-limiting value of any tilting
 - c-special requirements for weighing liquids
 - d-any special positions for the load receptor
 - e- any detectors or sensors

Requirements for portable and mobile instruments

- New requirements for instruments used in outside locations
- Warnings that the limiting value of the tilt has been reached
- Zero setting /tare balancing shall occur after each movement of the vehicle
- Portable weighbridges shall be identified as such

Software

- Important new requirements (5.5)
- Goes beyond Guide 2.3 - defines requirements for both embedded software and instruments with loadable or programmable legally relevant software
- Hardware requirements are in table 14
- Shows the documentation and tests that must be carried out on hardware

Software

- 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.
- Legally relevant software shall be regarded as sufficiently protected if it cannot be changed with common software tools such text editors
- An example of a solution is a CRC 16 with a hidden polynomial

Software

- When there is associated software which provides other functions besides the measuring function(s), the legally relevant software shall be identifiable and shall not be inadmissibly influenced by the associated software
- Notion of software separation
- Legally relevant software shall be identified as such and shall be secured. Its identification shall be easily provided by the device for metrological controls or inspections.
- Uses the term identification

Software

- List of documents that must be provided when making applications
- Extra requirements for data storage devices
- Must include all data to recall an earlier weighing
- Adequately protected against intentional or accidental change
- The data shall be stored automatically
- Stored data sets can only be displayed or printed on a device subject to legal control

Changes to the verification test

- These will have an effect on all of us and are good news
- A 4.6.1 -Tare test-subtractive tare shall be one test between 1/3rd and 2/ 3rd maximum tare
- Previously this was two tare tests
- A 4.8 -Discrimination test. This now only applies to type approval and does not need to be completed at initial verification

Changes to the verification test

- Repeatability A.4.10- This now needs to be completed at approximately 80% of maximum load
- Three weighing's for class III and IIII and six weighing for class II and 1
- Additional tests for portable weighbridges A.4.13
- Examine the conformity to the requirements for the mounting surface
- Establish the installation and perform tests to establish conformity to metrological requirements

OTHER NEW TYPE APPROVAL TESTS

- B 3.3 -Surge- This a new test where the risk of significant influence surges can be expected
- Applicable to power lines, communication lines, and other control lines
- Consists of exposing the instrument to surges
- B3.5- 10v/m- Immunity to radiated electromagnetic fields
- B 3.6-Immunity to conducted radio -frequency fields
- B3.7- Special Requirements for instruments from raod vehicles or external 12v or 24v batteries

Markings

- The markings are outlined in Section 7 of the standard
- Markings are not part of the essential requirements
- Purely advisory
- Note the footnote 7- all of the markings will change upon the introduction of the new directive