

Leaflet on the acceptance of results of external EMC tests

As per DIN EN 45501 (2015)

Version 1.0, 31.08.2021

Inhalt

Leaflet on the acceptance of results of external EMC tests.....	1
1. General.....	1
2. Requirements on the test laboratory.....	1
3. Tests (EU type examination certificates of nonautomatic weighing instruments).....	1
4. Performing the tests.....	2
5. EMC test report.....	2
6. Test protocols	3

1. General

External EMC test results according to standard DIN EN 45501:2015 or as per OIML recommendation R76 (2006) can be accepted by PTB within the scope of type examination certificates of weighing instruments or for parts or evaluation certificates of modules and peripheral devices of weighing instruments, provided the following conditions are fulfilled. Before performing the tests, however, PTB should be contacted in order to clarify critical points. Thus, unnecessary double testing may be avoided.

2. Requirements on the test laboratory

The test laboratory / test body or the manufacturer must have been accredited by an institution that is member of „ International Laboratory Accreditation Cooperation“ (ILAC). A copy of an accreditation certificate valid at the time of the tests shall be submitted.

Yet, there is no legal right of acceptance of EMC test results. PTB reserve their right of repeating the tests in any case.

3. Tests (EU type examination certificates of nonautomatic weighing instruments)

The standard EN 45501 prescribes the following tests:

- Voltage variations, A.5.4
- AC mains voltage dips and short interruptions, B.3.1
- Bursts, B.3.2
- Surge, B.3.3
- Electrostatic discharge, B.3.4
- Immunity to radiated electromagnetic fields, B.3.5 und B.3.6
- Disturbances in vehicle power supply networks, B.3.7

This list also applies to modules of nonautomatic weighing instruments as well as to automatic weighing instruments as per R51 (normative document as per Measuring Instruments Directive 2014/32/EU).

Tests on basis of different test standards will not be accepted.

4. Performing the tests

With the tests as per B.3 of EN 45501 and OIML R76 (2006) as well as per A.6.3 of OIML R51 (2006) an external device shall be connected to any electrically different interface of the equipment under test (5.4.2 of EN 45501 and OIML R76 (2006)). At least, though, a cable specified by the manufacturer, with a minimum length of 2 m (maximum 3 m) shall be connected. The indicator / analogue data processing device shall be adjusted thus that the minimum signal voltage per (verification) scale interval is set. The general concept is that not the indicator is object of the test, but a weighing instrument equipped with that indicator. That means that during the EMC tests a load receptor having a load cell with a maximum impedance shall be connected which has to be located so that it is exposed to the electromagnetic field while testing as per B.3.5 of EN 45501:2015 / OIML R76-1 (2006) or A.6.3.5 of OIML R51-1 (2006). The simplest solution would be a platform load cell or another load cell, which can be loaded with a small load (about 20 to 50 e / d). By no means there shall be a high frequency inductor (ferrite) on the cable or a similar shielding measure. Otherwise that measure would be part of the design and would have to be realised with all devices of that series. The cable between load receptor and indicator shall be located in parallel at the edge of the "uniform area" facing the antenna when performing the tests for susceptibility against electromagnetic fields as per IEC 610004-3. All other cabling (of interfaces) shall be located there as well. With regard to interfaces, the device has to be equipped with the maximum number of interfaces while there shall be cables on all connectors.

With automatic weighing instruments the tests as per OIML R51 (2006) shall be performed. As far as applicable new test pulse No. 5a according to ISO 7637-2 shall be applied when testing as per A.6.3.6.1 of OIML R51. When testing belt weighers (OIML R50) the minimum totalized load shall be totalized in case the indicated flowrate changes due to a disturbance if the displacement transducer is not of a (redundant) double / two channel design. As this leads to a huge testing effort, using a single channel displacement transducer is not recommended.

5. EMC test report

The EMC test report to be sent to PTB shall at least contain the following information:

- Information on accreditation of the EMC test lab performing the tests,
- List of the test equipment used, including the dates of the most recent calibrations, including date and name of the calibration laboratory
- Test standard that has been used,
- Exact description of equipment under test including accessories and device connected,
- Description of the test setup including photos or sketches; details as guiding of the cables shall be discernible. With the bursts and electrostatic discharges tests, the photos shall show that the minimum distances to walls of the laboratory and guiding structures have been kept.

- Description of the test procedure and the concrete environmental conditions,
- Evaluation of test results of each single test,
- With all EMC tests, the individual maximum deviation shall be noted (with HF test the frequency, the polarization – horizontal, vertical – and the radiated face of the device at this maximum deviation)
- Exposure time per frequency step (electromagnetic fields test). The exposure time depends on the reaction time of the weighing instrument, but it should be not less than 3 seconds.
- Date, time, temperature, relative humidity and barometric pressure during each single test,
- Only reports in German or English language can be accepted.

If results of EMC tests on nonautomatic weighing instruments are to be adopted for evaluation of an automatic weighing instrument, EN 45501 / OIML R76-1, T.5.5.6, last hyphen does not apply, i.e. even short time deviations of the indication due to disturbances are not acceptable. Otherwise the relevant test shall be repeated while the control program for generating the measuring value in automatic mode is running.

6. Test protocols

As a supplement to the test report the corresponding forms of OIML R76-2 or R51-2 shall be completely filled in for these tests (pages 24 to 32 of R76-2). Copies of the forms in PDF format can be downloaded for free from the OIML website www.oiml.org.