

Legal Metrology in Germany

(in view of the Measurement and Verification Act, effective as of 01.01.2015)

1. Organizational structure in LM	<p>1. According to the division of work within the Germany government the Ministry for Economic Affairs and Energy (BMWi) is responsible for metrology in general, representing the Central Metrology Authority). The ministry is responsible for the superordinate coordination of activities, related to the creation and operation of national metrology system of Federal Republic of Germany. On behalf of the German government it is responsible for:</p> <ul style="list-style-type: none">• supervising and coordinating the national German metrology system;• making proposals for the revision of the Units and Time act and the Measurement and Verification act. In addition the ordinance for the regulation of prepacked products is also in the area of responsibility of ministry;• supervising the German metrology institute, the Physikalisch-Technische Bundesanstalt (PTB);• providing the annual budget of PTB;• notifying German conformity assessment bodies, which operate on the basis of European legislation, to the European Commission;• approving conformity assessment bodies, which deal with nationally regulated instruments; <p>2. <u>Physikalisch-Technische Bundesanstalt (PTB)</u> was appointed as the German NMI, responsible for:</p> <ul style="list-style-type: none">• conducting fundamental and applied scientific research in scientific, industrial and legal metrology;• realizing and disseminating the units;• securing the uniformity of measurements, when third parties disseminate the units;• performing technology transfer;• consulting the German government, the federal governments and the verification authorities in terms of metrology;• contributing to the harmonization of the international metrology system;• supporting standardization in terms of metrology.
2. Units	The units of the International System of Units (SI) are applied in the Federal Republic of Germany.
3. Law on metrology	Units and Time act of 18 th July 2016 https://www.gesetze-im-internet.de/me_einhg/EinhZeitG.pdf Measurement and Verification act of 25 th July 2013 https://www.gesetze-im-internet.de/messeq/BJNR272300013.html

<p>4. List of MIs within the field of Legal Metrology or scope of state regulation</p>	<p>1. State regulation is carried out in LM, which applies to measurements:</p> <ul style="list-style-type: none"> – in conducting the trade and commercial transactions between a buyer (consumer) and seller (supplier, manufacturer, provider) based on measurement results; – in official actions; – in public interest. <p>In the above mentioned cases measuring instruments measuring the following quantities are regulated:</p> <ul style="list-style-type: none"> – length and combination of lengths (area); – mass; – temperature; – pressure; – volume; – measurement quantities related to the supply of electrical energy; – heat and cold in circulatory systems; – density or mass fraction or mass concentration or volume concentration of liquids; – density or mass fraction or mass concentration or volume concentration of other media than liquids; – other quantities concerning the supply of flowing gases and liquids; – sound level and derived quantities; – dose of ionizing radiation. <p>In some cases exceptions are specified, e. g. length measuring instruments up to 2 m.</p>
<p>5. Type approval (Conformity assessment)</p>	<p>5.1 Legal and technical requirements for type approval As legal metrology system of the Federal Republic of Germany has to cover measuring instruments covered by European legislation, where the principle of conformity assessment is applied since 2006, there was a decision by the German government to switch to this principle also for all other measuring instruments, which are regulated on the national level.</p> <p>Officially Germany stopped the so-called “old approach” consisting of type approval and initial verification by 31st December 2014 and started with conformity assessment (“new approach”) on 1st January 2015.</p> <p>5.2 Bodies, responsible for type approval There are no longer bodies being responsible for “type approval”. However, there are bodies responsible for “type examination”, which technically is the same as type approval, but different concerning the legal framework. More explanations are given under 7.2.</p> <p>5.3 Bodies, responsible for testing for type approval There are no longer bodies performing testing for type approval, but testing for type examination (see 7.2 and 7.3)</p> <p>5.4 Recognition of OIML certificates Germany is a full OIML member and Utilizer of the OIML Certification System. Detailed information can be found on the OIML webpage: https://www.oiml.org/en/oiml-cs/utilizers-and-associates/germany</p>
<p>6. Verification</p>	<p>6.1 Legal and technical requirements for periodic verification Requirements for verification arrangements are set Measurement and Verification Ordinance for measuring instruments listed in the MID and NAWID as well as for all other (nationally regulated) measuring instruments.</p> <ol style="list-style-type: none"> 1. After successful conformity assessment and registration of the corresponding measuring instrument at the German verification authorities periodical verification has to be applied according the time intervals given by the Measurement and Verification Ordinance. 2. Verification shall be carried out as long as a measuring instrument is operated. 3. The results of the verification can be certified by a certificate of verification and (or) shall be certified by applying a verification mark to the MI, or if this is not practicable to its casing. <p>6.2 Bodies for verification</p> <ol style="list-style-type: none"> 1. Verification shall be performed by German verification authorities, or 2. in case of utility meters, verification can be performed by state approved verification bodies. The approval is given by the local verification authority. After successful approval the state approved verification bodies are supervised by the verification authorities.

6.3 RVIs for 20 categories of MIs

1. Currently the general list of categories of MIs and RVIs is given in the Measurement and Verification Ordinance of 11.12.2014.
2. In the Federal Republic of Germany the following RVIs (years) are currently valid for the following 20 categories of MIs:

1. induction based Ferraris electricity meters	16
- single phase meters	16
- three phase meters	16
2. electronic electricity meters	8
- single phase meters	8
- three phase meters	8
3. diaphragm gas meters for households	8
4. mechanical water meters for households	6
5. heat meters	5
6. weights	4
7. non-automatic weighing instruments	1 or 4
8. automatic weighing instruments	1 or 3
9. truck scales	3
10 thermometers filled with liquid	15
11. clinical thermometers	-
12. thermometers in pipes and storage tanks	6
13. mechanical length measuring instruments	unlimited
14. capacity serving measures	unlimited
15. metal storage-jar	8
16. fuel dispensers	2
17. speed measuring instruments (e.g. speed radars)	1
18. taximeters	1
19. breath alcohol analyzers	0,5
20. grain moisture meters	1 or 2

6.4 Other national requirements for verification

MIs in the field of LM are subject to registration within two weeks after putting into use. Registration has to be done using the national web portal of the verification authorities:
https://www.eichamt.de/extranet/?rq_AppGuid=702996C6C6DE383A7ED74AA1DC382D5CA9E73198&rq_TargetPageGuid=AD41FE28A8C8DDBE7B9B32A821AFB5F2C3D9714C&rq_MenuGuid=BD139C515B35AF7483061EEC2525594EB3E03443&rq_TemplateKey=7374616765&rq_Lang=de#{1}

7.Conformity assessment for MIs**7.1 Brief description of the system**

The Federal Republic of Germany as a member state of the European Union had to implement the principles of conformity assessment for several kinds of products and in this context also for measuring instruments. The big difference compared with type approval and initial verification is

- the availability of several options (conformity assessment modules) for testing a manufacturer can choose from, especially also to take advantage of an already existing quality management system for the production of measuring instruments.
- the responsibility for the conformity of the measuring instrument with the legal framework: whereas a state takes over this responsibility when approving and initially verifying an instrument, using the principles of conformity assessment the manufacturer declares this conformity, based on testing results given by independent third party test laboratories.

The requirements on measuring instruments are given by:

1. Requirements for conformity assessment (CA) are given by the European Directive on Measuring Instruments (MID) 2014/32/EU and the Directive on Non-Automatic Weighing Instruments (NAWID) 2014/31/EU, which had to be transposed to German law by the Measurement and Verification act.
2. For non-European regulated measuring instruments requirements for conformity assessment have to be defined by the national Rule Determination Committee under the lead of PTB. All rules have to be published on the webpage of PTB. The 19 members of the committee are nominated by the BMWi.

	<p>7.2 Bodies for assessment of conformity with the type Assessment of conformity with the type means usually the testing of one single pattern of this type of measuring instrument (“type examination”). However, there are also other options, for example to have a supervision of the development of a measuring instrument including the development of a first pattern, by an independent third party testing laboratory.</p> <ol style="list-style-type: none"> 1. The PTB is responsible for conformity assessment of type for measuring instruments in general, with the exception of all those measuring instruments, where a sufficient number of other conformity assessment bodies is in place. 2. Other conformity assessment bodies can be approved by BMWi to perform conformity assessment activities, if they are successfully accredited (according to the ISO/IEC 17065 and ISO/IEC 17025) with the corresponding scope. <p>7.3 Bodies for assessment of conformity to type Assessment of conformity to type means usually the testing of each single measuring instrument which has been produced, by proving the conformity of each instrument with the type of the measuring instrument. However, there are also other options, for example to have the quality management system of the production of this kind of measuring instrument examined by an independent third party testing laboratory. In this case the manufacturer has to perform all the necessary testing of modules of the measuring instrument at several stages during the production process, so that every measuring instrument, which is produced is in conformity with the type of the corresponding measuring instrument.</p> <ol style="list-style-type: none"> 1. The conformity assessment bodies of the verification authorities are responsible for the conformity assessment to type of measuring instruments in general. 2. Other conformity assessment bodies can be approved by BMWi to perform conformity assessment activities, if they are successfully accredited (according to the ISO/IEC 17065 and ISO/IEC 17025) with the corresponding scope. <p>Only if all necessary conformity assessment modules have been finished successfully, the manufacturer is allowed to declare conformity with the legislation and is allowed to sell the instruments on the (European) market, without any other further testing being necessary. A measuring instrument being conformity assessed in one member state of the EU can be sold in all other member states in the EU without any other further testing, like e.g. initial verification. However, as the member states are free to decide on periodical verification in their country, the measuring instrument might be subject to periodical verification after some time.</p>
8.Prepackages	<p>8.1 Legal requirements for controlling prepackages State regulation applies to the content of prepackages between 10 g and 10 kg resp. 10 ml and 10 l.</p> <p>8.2 Documents, setting requirements for prepackages The regulation concerning prepackages is based on European Directives. There are several Directives, which regulate certain (little) aspects of prepacked goods. However, the basis for the regulation of prepackages is</p> <ul style="list-style-type: none"> - the European Directive 58/95/EC. <p>This Directive had to be transposed to German law, by establishing the</p> <ul style="list-style-type: none"> - Ordinance on prepacked goods of 5th July 2017. https://www.gesetze-im-internet.de/fertigpackv_1981/BJNR015850981.html <p>Currently this ordinance is under revision. The new version of this ordinance is expected to be published in 2020 and to enter into force with the beginning of 2021.</p> <p>8.3 Bodies, involved in control of prepackages In conducting state metrological supervision of compliance with requirements for prepackages, the German verification authorities are responsible for this free of charge to the customer. However, if the amount of goods is not in compliance with the legislation, the producer or the trader resp. importer has to cover the corresponding costs.</p> <p>8.4 Other national requirements for prepackages - Everything is covered by the ordinance on prepacked goods.</p>

<p>9. Metrological supervision</p>	<p>1.State metrological supervision shall be conducted by the German verification authorities to proof compliance with the requirements of technical regulations and standards in the form of random inspections resp. unscheduled inspections. The forum of the German verification authorities plans, organizes and coordinates the work of the verification authorities when conducting state metrological supervision.</p> <p>2. State metrological supervision is conducted by officials of the bodies of the verification authorities, who are verification officers.</p> <p>3. State metrological supervision shall be conducted to cover the following aspects:</p> <ul style="list-style-type: none"> - application of units; - application of regulated MIs; - performing verification of MIs; - meeting the requirements for prepackages; - meeting other requirements in cases, specified in legal acts. <p>The legal framework for state metrological supervision and market surveillance is given in the Measurement and Verification act.</p>
<p>10. Legal metrology practitioners</p>	<p>In the Federal Republic of Germany there are different bodies performing the tasks in legal metrology:</p> <ul style="list-style-type: none"> - conformity assessment bodies (PTB + 3 private bodies + 13 bodies of the verification authorities), about 130 people in total work in this area - verification authorities (13 regional bodies, having 68 verification offices in total distributed all over Germany), about 1500 people in total work in this area (1350 for verification, 50 for conformity assessment, 100 for state metrological supervision) - 320 state approved verification bodies for the verification of utility meters (electricity, water, gas, heat and cold), about 2300 people in total work in this area
<p>11. Sanctions</p>	<p>The catalog of non-conform behavior according the Units and Time act is given in §10 of this act. https://www.gesetze-im-internet.de/me_einhg/BJNR007090969.html This paragraph describes all cases of non-conform behavior in general.</p> <p>The catalog of non-conform behavior according the Measurement and Verification act is given in §60 of this act. https://www.gesetze-im-internet.de/messeg/BJNR272300013.html This paragraph describes all cases of non-conform behavior in general.</p> <p>The sanctions can be fixed by the corresponding verification authority, however, they have to follow general rules of the German government for different offences. The monetary maximum of sanctions is 50.000 Euros.</p>