



Republika e Kosovës
Republika Kosova - Republic of Kosovo
Qeveria - Vlada - Government

*Ministria e Industrisë, Ndërmarrësisë dhe Tregtisë - Ministarstvo Industrije,
Preduzetništva i Trgovine - Ministry of Industry, Entrepreneurship and Trade*

ADMINISTRATIVE INSTRUCTION (MIET) No. 03/2024
ON TECHNICAL – METROLOGICAL REQUIREMENTS FOR DESIGNATION OF
CONFORMITY ASSESSMENT BODIES FOR SPECIFIC AREAS OF LEGAL
METROLOGY

Minister of the Ministry of Industry, Entrepreneurship and Trade

Pursuant to Article 35, paragraph 3 and paragraph 7 of Law No. 06/L-037 on Metrology (Official Gazette of the Republic of Kosovo No. 7/8 May 2018, Annex 12 of Regulation (QRK) No. 14/2023 on the Areas of Administrative Responsibility of the Office of Prime Minister and Ministries and Article 38, paragraph 6 of the Regulation No. 09/2011 of Rules and Procedures of the Government (Official Gazette No. 15/ 12.09.2011), issues the following:

ADMINISTRATIVE INSTRUCTION (MIET) No. 03/2024 ON TECHNICAL – METROLOGICAL REQUIREMENTS FOR DESIGNATION OF CONFORMITY ASSESSMENT BODIES FOR SPECIFIC AREAS OF LEGAL METROLOGY

Article 1

Purpose

This Administrative Instruction shall determine the assessment procedures, and technical-metrological conditions for designation of conformity assessment bodies in the applicable areas of legal metrology.

Article 2

Scope

The provisions of this Administrative Instruction shall apply to the designated bodies for conducting conformity assessment, respectively verifying the legal measuring instruments and official measurements for specific areas of legal metrology throughout the territory of the Republic of Kosovo.

Article 3

Definitions

1. Expressions used in this Administrative Instruction have the following meanings:
 - 1.1. Kosovo Metrology Agency(KMA);
 - 1.2. Conformity Assessment Bodies(CAB);
 - 1.3. Government of the Republic of Kosovo (GRK);
 - 1.4. Ministry of Internal Affairs (MIA);
 - 1.5. The International Organization of Legal Metrology-OIML;
 - 1.6. The European Cooperation in Legal Metrology-WELMEC;

Article 4

Application procedure

Legal entities interested in applying for designation to perform tasks in accordance with the areas defined under Article 13 of this Administrative Instruction may apply after the publication of the public call by KMA.

Article 5

Documentation accompanying the application for designation

1. Legal entities applying for designation, in addition to the criteria set out in the relevant Administrative Instruction concerning the Manner of Designation of Conformity Assessment Bodies, shall possess the necessary documents, such as:

- 1.1 Business registration certificate with accompanying documentation;
- 1.2 Certificate of accreditation according to the etalon SK ISO/IEC 17020 issued by a National Accreditation Body;
- 1.3 Procedures for verification of measuring instruments from the designation area for which it applies
- 1.4 User and maintenance manual for devices used for the verification of measuring instruments;
- 1.5 Proof of the professional qualifications of the person responsible for performing metrology tasks in the specified area;
- 1.6 Proof that the applicant is not involved in activities that may conflict with the independence and impartiality of conformity assessment activities - a declaration of impartiality and confirmation that he/she is independent in the conformity assessment work;
- 1.7 A notarized copy of the notification permit of the responsible person;
- 1.8 If the responsible person is not a citizen of the Republic of Kosovo, he/she must provide proof of residence permit from the Ministry of Internal Affairs;
- 1.9 The employment contract with the responsible person, valid for at least 1 year;
- 1.10 A list of instruments-etalons for the verification of measuring instruments, with technical data of the instruments-etalons, including the recalibration timeframe;
- 1.11 Certificates of calibration of instruments (standards) in the area of designation, issued by KMA laboratories that have established a quality management system according to the SK EN ISO/IEC 17025 standard and have achieved professional competency, or an accredited laboratory or National Metrology Institute (NMI);
- 1.12 Certificate from the Kosovo Police for the legal person and natural person that he/she is not under investigation related to the activity they exercise (with a valid term);
- 1.13 The certificate from the criminal records, issued by the court (with a valid term);
- 1.14 Tax verification confirming that there are no outstanding tax liabilities or other tax obligations to the TAK;

- 1.15 Certificate from the competent court that the legal entity is not is not undergoing bankruptcy proceedings; for entities registering for the first time, this is not mandatory;
- 1.16 Insurance policy or bank guarantee in the amount of 10,000.00 € to compensate for damages incurred during their work and towards third parties;
- 1.17 A declaration that the income of management and personnel is not affected by the number of verifications performed.

Article 6

Technical - metrological requirements for designation of conformity assessment bodies

- 1. Legal entities shall fulfil the technical-metrological requirements determined in this Administrative Instruction, such as:
 - 1.1 Relevant etalons and technical equipment;
 - 1.2 Suitable premise for verification of measuring instruments
 - 1.3 Necessary professional staff.
- 2. Requirements referred to in subparagraphs 1.1 and 1.2 of this Article shall be defined in annexes to this Administrative Instruction.

Article 7

Staff

- 1. The legal entity shall have at least two employees who discharge measuring instrument verification tasks.
- 2. One of the employees shall have professional university qualifications, whereas the other employee shall have completed at least the technical-professional secondary education in order to be able to conduct the verification of measuring instruments and metrological duties for the designated area.
- 3. The responsible person should have a university degree in the field of physics, machinery, communication, electrical engineering, chemistry, and general technology.
- 4. Employees according to paragraph 1 and the responsible person as per paragraph 3 of this Article must possess training certificates in designation and have at least 1 year of work experience in the same area.
- 5. The responsible person must be familiar with the legislation in the area of metrology, OIML recommendations, WELMEC guidelines, and methods of verification of measuring instruments covering the designated area.

Article 8

Obligations of designated bodies

1. In order to verify the legal measuring instruments, the designated bodies shall:
 - 1.1. Exercise activity from the designated area professionally and continuously, in compliance with the rules and decision for designation;
 - 1.2. Notify KMA within 7 (seven) days of any change in designation conditions in relation to the work premises, instruments, staff and documentation and report whenever requested by KMA;
 - 1.3. After notifying the changes according to paragraph 1.2, the conformity assessment bodies (CAB) must not implement the changes without receiving a confirmation from KMA;
 - 1.4. Present the required documents when requested during monitoring by metrological supervision and the CAB designation commission.
 - 1.5. Provide KMA with the work report on a quarterly basis with regards to the legal measuring instruments verifications performed and general annual report not later than 31 January of the subsequent year whenever requested by KMA;
 - 1.6. Provide the metrological supervision with all necessary information and required documents;
 - 1.7. Adhere to the rules from the field of metrology concerning the designation granted;
 - 1.8. Verification certificates issued by the designated body shall be signed by the responsible person;
 - 1.9. Not engage in the production, import, sale or servicing of measuring instruments from the designated area;
 - 1.10. Adhere to the manner and amount of payment of verification costs according to the AI on Metrological Services Fees.
2. Designated bodies must possess evidence of the measurements and verifications carried out.
3. Designated bodies shall be obliged to store legal measuring instruments verification documentation in soft and hard copy for not less than eight (8) years.
4. Designated bodies shall regularly settle liabilities for public benefits up to 15 December each year and provide KMA with proof issued by TAK proving the settlement of these liabilities at the end of the year.
5. Proof from the Tax Administration of Kosovo (TAK) that the designated body staff has an employment relationship with the designated body and effectively covers the tax and pension contributions, according to the declarations foreseen.

6. After the issuance of a decision on designation, the body designated for conformity assessment in specific areas of legal metrology must cover the procedure costs according to AI on the amount and the payment procedure for services in metrology.

Article 9

Monitoring of conformity assessment bodies in specific areas of legal metrology

1. For the implementation of the criteria in accordance with the requirements of the Administrative Instruction (GRK) on the Manner of Designation of Conformity Assessment Bodies and the technical-metrological requirements specified in this Administrative Instruction, the CABs shall be monitored by Metrological Supervision.
2. Violations identified by Metrological Supervision must be addressed to the CAB Designation.
3. If it is confirmed that the designated bodies have acted contrary to legal provisions and the designation decision, the Designation Commission shall recommend to the Minister the adoption of measures in accordance with the Administrative Instruction on the Manner of Designation of Conformity Assessment Bodies.

Article 10

Measures against nominated bodies

The designated body, against which measures have been taken according to paragraph 3 of Article 9, cannot submit a new designation application within the timeline of 3 (three) years from the date of revocation of decision.

Article 11

Validity period of the decision

The validity period of the appointment decision on conformity assessment bodies for legal measuring instruments shall be two years.

If the validity period of the accreditation certificate is shorter than the period specified in the Administrative Instruction mentioned above, then the validity of the appointment decision shall be until the expiration of the accreditation certificate's validity period.

Article 12

Repealing provisions

Upon the entry into force of this Administrative Instruction, the Administrative Instruction (MTI) No. 12/2020 on Technical–Metrological Requirements for Designation of Conformity Assessment Bodies for Applicable Areas of Legal Metrology shall be repealed.

Article 13

Annexes

1. Annexes 1 to 22 shall be an integral part of this Administrative Instruction:

- 1.1. Appendix 1 on verification of legal measuring tools of length and angle;
- 1.2. Appendix 2 on verification of automatic legal measuring instruments for the level of fluids in stationary tanks (containers) (AMR);
- 1.3. Annex 3 on verification of legal measuring instruments for horizontal and vertical cylindrical tanks;
- 1.4. Annex on verification of legal measuring instruments for water meters and/or water flow meters;
- 1.5. Annex 5 on verification of legal measuring instruments for thermal energy;
- 1.6. Annex 6 on verification of legal measuring instruments and legal measuring systems for measuring the level of fluids other than water;
- 1.7. Annex 7 on verification of legal measuring instruments for verification of instruments indicating the volume;
- 1.8. Annex 8 on verification of legal measuring instruments for gas flow volume (gas meter);
- 1.9. Annex 9 on verification of legal measuring instruments which correct the flown gas volume (correctors);
- 1.10. Annex 10 on verification of legal measuring instruments of mass;
- 1.11. Annex 11 on verification of legal measuring instruments for measuring the moisture of grains and seeds for oil production (moisture meters);
- 1.12. Annex 12 on verification of legal measuring instruments for verification of thermometers;
- 1.13. Annex 13 on verification of legal measuring instruments for manometers, vacuum meters, manuvaccummeters, pressure measuring instrument converters, blood pressure measuring instruments, tire pressure measuring instruments (pressure measuring instruments);
- 1.14. Annex 14 on verification of legal measuring instruments for verification of electricity meters;
- 1.15. Annex 15 on verification of legal measuring instruments of measuring transformers;
- 1.16. Annex 16 on verification of legal measuring instruments used for verification of electricity installations;
- 1.17. Annex 17 on verification of legal measuring instruments of instruments for measuring the level of ethyl alcohol in respondent breath;
- 1.18. Annex 18 on verification of legal measuring instruments for taximeters;
- 1.19. Annex 19 on verification of legal measuring instruments for speed in road traffic;
- 1.20. Annex 20 on verification of measuring instruments in Vehicle Technical Inspection Centres;
- 1.21. Annex 21 on verification of legal measuring instruments for tachograph and speed limiter;
- 1.22. Annex 22 on control of pre-package products.

Article 14
Entry into force

This Administrative Instruction shall enter into force seven (7) days after its publication in the Official Gazette of the Republic of Kosovo.

Rozeta Hajdari

Minister

04.07.2024

ANNEXES 1

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR LENGTH AND ANGLE

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 35-1, OIML R 35-2, OIML R 35-3 and OIML R 66.

1. ETALONS AND INSTRUMENTS

1.1. Etalons for verification of measuring instruments may be:

- measuring tape,
- measuring ruler.

Measuring uncertainty of the measuring tape and measuring ruler shall be at least twice as smaller as the maximum permissible error of the length measuring instrument.

1.2. Instruments for testing measuring instruments may be:

- instruments for verification of the measuring instrument for length with measuring tape, where the relative measuring uncertainty of the instrument for the verification of measuring instrument of length with measuring tape cannot be greater than $\pm 0.01\%$.
- instrument for verification of solid measuring instruments for length, where the relative measuring uncertainty of the instrument for verification of solid measuring instruments for length cannot be greater than $\pm 0.01\%$.
- instrument for verification of measuring instruments for rail width and height, measuring uncertainty of the instrument for verification of measuring instruments of rail width and height should be at least twice smaller than the error permitted in the measuring instrument for length.

1.3. Auxiliary instruments used for verification of measuring instruments shall consist of the:

- spirit level for bringing the instruments for verification of measuring instruments and measuring instruments in horizontal position, sensitivity of spirit level for bringing instruments for verification of measuring instruments and measuring instruments in horizontal position should be at least 0,01 mm/m;
- carrier, stool and holder of measuring instrument and etalon - holder, stool and holder of measuring instrument and etalon may be made of various ways, but they should enable the establishment of etalon or measuring instrument at the proper position, provided that most reliable measurement results are achieved;
- means for removing grease and cleaning etalons and measuring instruments, means for removing grease from etalons may be alcohol or light gasoline, whereas means for cleaning may be soft cloths, brushes with soft bristles and the like;
- means for protection of measuring surfaces of etalon and measuring instruments, means for protection of measuring surfaces of etalon and measuring instruments may be Vaseline fat or oil;

– auxiliary means that are integral part of the instrument for verification of measuring instrument, which is characteristic of any instrument that depends on its purpose.

1.4. Thermometer with 0.1 °C graduation for measuring the temperature of work environment air.

1.5. Hygrometer with 0.1 % graduation for measuring relative air humidity in the work environment.

Etalons and instruments referred to in point 1.1.; 1.2.; level referred to in point 1.3.; 1.4 and 1.5., should be calibrated and other measuring instruments should be verified or calibrated.

2. PREMISES AND REQUIREMENTS

2.1. Conformity assessment body shall have the work premise that fulfils the following conditions:

- be clean, dry and sufficient for unhindered verification;
- must have sufficient premise for placing necessary instruments;
- must be protected from the direct impact of sunlight;
- be equipped with furniture for placing verification measuring instruments;
- the sources of the vibration cannot affect the accuracy of the measurements within premises and its surroundings,
- no thermometer for measuring the air temperature should be available in the premise,
- no hygrometer for measuring the air relative humidity should be available in premise,
- be equipped with heat sources for uniform heating of the work premise and air conditioners, where necessary.

2.2. Work environment in the work premises should be within the range from 18°C to 22°C.

2.3. Air relative humidity at the work premises should be within the range from 50% to 60%.

2.4. Thermometer and hygrometer should be placed at the wall of the premises so that they are 10 cm to 15 cm away from the wall, and a height of 150 cm to 170 cm from the floor.

2.5. Heating sources of the premises should be at least 1,5 m distance from instruments, namely from the location of verification and should enable the uniform heating of the premises.

ANNEX 2

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF AUTOMATIC LEGAL MEASURING INSTRUMENTS FOR MEASUREMENT OF FLUID LEVELS IN STATIONARY (AMR) RESERVOIRS (CONTAINERS)

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 85-1-2 and OIML R 85-3.

1. ETHALONS AND INSTRUMENTS

1.1. Laboratory verification:

1.1.1. Testing containers (cup) filled with testing fluid

1.1.2. Measuring program for automatic controls of accuracy, sensitivity and hysteresis, i.e. adequate manual direction for regulating testing fluids level.

1.1.3. Laser interferometer with linear optics and program support for measuring realistic level height.

1.1.4. Temperature meter with a calibration of 0,1°C and an accuracy of $\pm 0,5^{\circ}\text{C}$

1.1.5. Air pressure meter.

1.1.6. Callipers.

1.2. Site verification:

1.2.1. Measuring bars (measuring band).

1.2.2. Thermometers with 0.1 °C calibration for measuring air temperature in working environments.

1.2.3 Hygrometer with 0.1 % calibration for measuring air humidity in working environments

1.2.4. Laptops with program support installed to verify program versions of measuring station.

Etalons under item 1.1 and 1.2 must be calibrated.

2. PREMISES AND REQUIREMENTS

2.1. The conformity assessment body must have working premises where laboratory verification is performed which must fulfil the following requirements:

- be clean, dry and have sufficient room for unhindered verification;
- sufficient premise for placement of necessary instruments;
- protected from direct sunlight exposure;
- equipped with furniture for placement of measuring instruments tested;
- have natural lightning and electrical lightning;
- the sources of the vibration cannot affect the accuracy of the measurements within premises and its surroundings;
- there should be a thermometer for measuring air temperature in the premises;

- There should be a hygrometer for measuring relative humidity of the air;
- must be equipped with a heating source for uniform heating of working premises and air conditioner, as needed.

2.2. The working environment temperature in working stations (laboratories) must be between 18 °C to 25 °C.

2.3. Relative humidity of the working stations (laboratories) must be from 50% to 60%.

2.4. The thermometer and hygrometer must be placed in the wall, whereby their distance from the wall must be 10cm to 15 cm, and the height from the floor must be 1.5m and 1.7m

2.5. Heating sources must be at least 1.5 m away from the instruments, namely from where verification is performed, and must enable uniform heating of the premises.

ANNEX 3

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR HORIZONTAL AND VERTICAL CYLINDRICAL TANKS

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology): OIML R 71, OIML R 80.1, OIML R 95 and OIML R 125.

Tanks (containers) within the meaning of this annex are categorized in the following measuring methods:

1. Vertical cylindrical tanks, if measuring is done with optical triangulation method;
2. Vertical cylindrical tanks, if measuring is done with the optical referral line method
3. Vertical cylindrical tanks, if the measuring is done with the strapping method
4. Vertical cylindrical tanks, if the measuring is done with the method of measuring the internal electro-optical distance e
5. Horizontal cylindrical tanks.

1. Vertical cylindrical tanks, if measuring is done with the method of optical triangulation

1.1. ETALONS AND INSTRUMENTS

- 1.1.1. Electronic theodolites, 2 pieces, accuracy 2×10^{-4} [g] grades with necessary instruments.
 - 1.1.2. Validated program for preparing the volume chart.
 - 1.1.3. Measuring band 25 m.
 - 1.1.4. Depth measuring instrument of 25 m.
 - 1.1.5. Thermometer with calibration of 0,2 °C.
 - 1.1.6. Contact thermometer with calibration of 0,2 °C.
 - 1.1.7. Laser instruments for theodolites.
 - 1.1.8. Ultrasound measuring instrument of wall thickness.
 - 1.1.9. Flow meter, maximum measuring uncertainty of 0.2%.
 - 1.1.10. Auxiliary instruments must be according to the manufacturer's guidelines.
- Etalons and measuring instruments must be calibrated.

1.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have office premises, sufficient premise for etalons and instruments, and also sufficient premise for safe storage of documentation

2. Vertical cylindrical tanks, if the measuring is done with the method of optical referral line

2.1. ETALONS AND INSTRUMENTS

- 2.1.1. Instruments for measuring vertical deviation.
 - 2.1.2. Validated program for preparing the mass chart.
 - 2.1.3. Measuring band 25 m.
 - 2.1.4. Depth measuring instrument of 25 m.
 - 2.1.5. Thermometer with division 0,2 °C.
 - 2.1.6. Contact thermometer with division of 0,2 °C.
 - 2.1.7. Laser instruments for theodolites.
 - 2.1.8. Ultrasound measuring instrument of wall thickness.
 - 2.1.9. Flow meter, maximum measuring uncertainty 0,2%.
 - 2.1.10. Auxiliary instruments must be according to the manufacturer's instructions.
- Etalons and measuring instruments must be calibrated.

2.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have office premises, sufficient premise for etalons and instruments, and also sufficient premise for safe storage of documentation

3. Vertical cylindrical tanks, if the measuring is done with the strapping method

3.1. ETALONS AND INSTRUMENTS

- 3.1.1. Validated program for preparing the mass table.
- 3.1.2. Measuring tape of 25 m.
- 3.1.3. Depth measuring instrument of 25 m.
- 3.1.4. Spiral scale.
- 3.1.5. »Step-over«.
- 3.1.6. Strapping adjuster
- 3.1.7. Thermometer with division 0,2 °C.
- 3.1.8. Contact thermometer with division of 0,2 °C.
- 3.1.9. Ultrasound measuring instrument of wall thickness.
- 3.1.10. Flow meter, maximum measuring uncertainty 0,2%.
- 3.1.11. Auxiliary instruments must be according to the manufacturer's instructions, as auxiliary instruments is the scaffold for measuring the tanks perimeter.
- 3.1.12. Etalons and measuring instruments must be calibrated.

3.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have office premises, sufficient premise for etalons and instruments, and also sufficient premise for safe storage of documentation.

4. Vertical cylindrical tanks, if the measuring is done with the method of measuring the internal electro-optical distance

4.1. ETALONS AND INSTRUMENTS

- 4.1.1. Validated program for preparing the mass table.

4.1.2. Measuring device EODR (electro-optical distance ranging instrument), accuracy 10^{-4} [g] grade

4.1.3. Laser instruments– must be in accordance with IEC 825 and could be a component of the measuring device EODR.

4.1.4. Standard bars – must be with a length of 2 meters and does not change in length more than ± 0.02 mm.

4.1.5. Measuring tape of 25 m.

4.1.6. Depth measuring instrument of 25 m.

4.1.7. Thermometer with graduation $0,2$ °C.

4.1.8. Contact thermometer with graduation of $0,2$ °C.

4.1.9. Ultrasound measuring instrument of wall thickness.

4.1.10. Flow meter, maximum measuring uncertainty $0,2\%$.

4.1.11. Auxiliary instruments must be according to the manufacturer's instructions.

4.1.12. Etalons and measuring instruments must be calibrated.

4.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have office premises, sufficient premise for etalons and instruments, and also sufficient premise for safe storage of documentation.

5. Horizontal cylindrical tanks

5.1. ETALONS AND INSTRUMENTS

5.1.1. Extensometer.

5.1.2. Validated program for preparing the mass table.

5.1.3. Measuring tape of 25 m.

5.1.4. Measuring tape of 2 m or more.

5.1.5. Measuring bar of 3 m, with millimetre division.

5.1.6. Leveller or pendulum, or theodolites with standard bar.

5.1.7. Thermometer with division $0,2$ °C.

5.1.8. Flow meter, maximum measuring uncertainty $0,2\%$.

5.1.9. Auxiliary instruments must be according to the manufacturer's instructions.

5.1.10 Etalons and measuring instruments must be calibrated.

5.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have office premises, sufficient premise for etalons and instruments, and also sufficient premise for safe storage of documentation.

ANNEX 4

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS OF WATER METERS AND/OR WATER FLOW MEASURING INSTRUMENTS

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology OIML R 49-1, OIML R 49-2 and OIML R 49-3.

For the purpose of this Annex, the measuring instruments are divided into these categories:

1. Water meters
2. Water flow measuring devices.

1. Water meters

1.1 ETALONS AND INSTRUMENTS

1.1.1. The instruments for verification of water meters, with accompanying control instruments such as: manometer, thermometer, flow meter, scale, measuring vessel, etc.

1.1.2. Manometer for water pressure measuring in the input of the verification line with a maximum allowed error of $\pm 5\%$.

1.1.3. Water heaters heating water to a minimum operating temperature of $60\text{ }^{\circ}\text{C}$ (if hot water meters are verified).

1.1.4. Thermometer with division of $00.1\text{ }^{\circ}\text{C}$ for measuring the working premises temperature. Etalons and instruments under item 1.1.1. 1.1.2. and 1.1.4 must be calibrated.

1.1.5. Device for verification of water meter must allow for verification of the water meter with the volumetric or gravimetric method.

1.1.6. The instruments for verification of the water meter must have the following metrological features:

- the maximum permissible error of measuring the water volume, which during the verification passes through the water meter, must not be greater than one fifth ($1/5$) of the maximum permissible error of the tested water meter.
- maximum permissible water pressure error during verification should not be greater than $\pm 10\%$
- Maximum water pressure uncertainty should not exceed $\pm 5\%$ of the measured value.
- Maximum water temperature uncertainty should not be greater than $\pm 1\text{ }^{\circ}\text{C}$.

1.1.7. The meter verification instruments can be automatic, with different bypass lines, valves, flow limiters and the like, so:

- changes in water pressure during verification period of the water meter should not be greater than:

- a) 5% for flows $Q_{\min} \leq Q < Q_t$, and for $Q_1 \leq Q < Q_2$

- b) 10% for flows $Q_t \leq Q < Q_{\max}$ and for $Q_2 \leq Q < Q_3$
 - changes in water flows during the verification of the water meter should not be greater than:
 - a) 2,5% for flows $Q_{\min} \leq Q < Q_t$, and for $Q_1 \leq Q < Q_2$
 - b) 5% for flows $Q_t \leq Q < Q_{\max}$ and for $Q_2 \leq Q < Q_3$
 - water temperature changes during water meter verification must not be more than $\pm 5^\circ\text{C}$
 - water temperature during verification of the water meter is in the borders of:
 - a) $(20 \pm 5)^\circ\text{C}$, for verification of the water meter for cold water.
 - b) $(50 \pm 5)^\circ\text{C}$, for verification of the water meter for hot water.
 - water pressure at the entry of the water meter, during the verification of the water meter, should not be higher than the allowed working pressure for the verified type of water meter.
 - water pressure at the exit of the water meter, during verification, must not be lower than 0,03 MPa (0,3 bar)

1.1.8. Allows individual verification of water meters or range verification:

- the features of each water meters can be presented
- there is no interaction between water meters
- water pressure in each water meter is sufficiently high to prevent cavitations.

1.1.9. Every verification of the water meter must be supervised.

1.1.10. In each moment during the verification of the water meter can be measured, namely internal losses of pressure to be supervised.

1.1.11. During the verification of the water meter, the working requirements determined by the water meter tested must be met at all times

1.1.12. Ensures that during the verification of the water meter, there is no air in the verification system

1.1.13. If the metering vessel of the water meter verification instruments is separated into several chambers, the partition walls must be solid enough to ensure that the chamber volume does not change by more than 0.5%, depending on whether the adjacent chambers are full or empty

1.1.14. The testing system fulfils other technical requirements of the measuring device manufacturer, which is included in the verification system of the water meter verification instruments.

1.2. PREMISES AND REQUIREMENTS

1.2.1. The conformity assessment body must have working premises that fulfil the following conditions:

- must be clean, dry and have sufficient room for unhindered verification of measuring instruments
- must have sufficient premise for placement of necessary instruments
- must be protected from direct exposure to sunlight
- must be equipped with furniture for the placement of the measuring device that is verified

- have natural lightning and electrical lightning
- the sources of the vibration cannot affect the accuracy of the measurements within the premises and the surrounding areas
- the premises must have a controlling thermometer for measuring the water temperature, and must be equipped with heating sources for uniform heating of working premises, and air conditioning, when needed.

1.2.2. The working environment temperature in working stations must be between 15 °C to 25 °C.

1.2.3. Relative humidity of the working environment must be in the borders between 45% to 75%,

1.2.4. Pressure in the working premises must be in the borders between 800mbar to 1060 mbar.

1.2.5. The thermometer for measuring the air temperature at the working environment must be in the wall of the premises for verification of water meter, so as to have the wall in a distance of 10cm to 15 cm, and at a height of 1.5m and 1.7m from the floor.

1.2.6. Heating sources of the area for verification of water meters must be at least 1.5m away from the instrument, i.e. from the place where the verification of water meters is conducted, and must allow for uniform heating of areas for verification of measuring devices.

1.2.7. The walls of the verification area must be covered in ceramic tiles or coated with oil paint in a height of at least 1.5 m from the floor.

1.2.8. The floor of the verification area must with ceramic tiles or with anti-slip floor, with an incline toward the wastewater removal hole.

1.2.9. The floor of the area for water meter verification instruments must have wooden bars or a perforated rubber cover, in case of water spilled during verification of water meters

1.2.10. In the verification area there could be any water supply system, but if several verification cycles of water meters are performed, there cannot be any obstacles that would be in contradiction with the requirement under Item 1.1. and the technical requirements of the manufacturer of the water meter verification instruments.

1.2.11. the water supply system must be such so as not to allow for oscillation of water pressure in water intake by the instruments for verification of water meters.

1.2.12. Water intake in the measuring instruments for verification of water supply system must be such as to ensure water is minimum disturbed.

1.2.13. Water drain must be such so as to allow for the simultaneous intake of the entire water amount from the measuring container without blocking or slowing down the drainage.

1.2.14 Premise for retention of documentation

2. Water flow measuring instruments

2.1. ETALONS AND INSTRUMENTS

2.1.1. Etalons that can be used:

- measuring containers of etalons with smaller volume that allows for verification of one-minute flow for the maximum flow of the

water flow measuring instruments– maximum uncertainty of the measuring $\pm 0,05\%$

- reference curved tube (prover)

- Standard piston tube (compact prover) – with maximum measuring accuracy of $\pm 0,03\%$

- comparative measuring instruments(master measuring instruments) with a container of minimum value that allows for verification of one-minute flow for the maximum flow of the water flow measuring instruments- with maximum measuring uncertainty $\pm 0,1 \%$.

2.1.2. Thermometer with calibration that is not higher than $0,1 \text{ }^{\circ}\text{C}$.

2.1.3. Chronometer

2.1.4. The etalons and instruments must be calibrated

2.2. PREMISES AND REQUIREMENTS

2.2.1 The conformity assessment body must have working premises that fulfil the following conditions:

- must have sufficient premise for placement of instruments

- must be protected of direct sunlight exposure

- must be equipped with furniture for placement of documentation

- must have natural and electrical lightning

- must have premise for office work.

ANNEX 5

REQUIREMENTS TO BE MET BY CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS OF THERMAL ENERGY

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 75-1, OIML R 75-2 and OIML R 75-3.

1. ETALONS AND INSTRUMENTS

1.1. Necessary instruments for verification of thermal energy measuring instruments:

–measurement table for verification with integrated meters for measuring thermal energy, or flow measuring instruments as a subset of thermal energy measuring instruments, with water at temperature $(50 \pm 5) ^\circ \text{C}$

- the weighing instrument with the appropriate container for determining the volume (or mass) which passes through the flow measuring instruments that are tested.

1.2. The accuracy of the etalons should ensure that the errors in the measurement process are equal to or less than 1/3 of the maximum permissible error value of the measuring instrument being tested.

1.3. The application of the weighing instrument relates to the place where the weighing instrument is located and is valid only under the requirements specified in the calibration. The weighing instrument calibration period is one year.

1.4. The minimum and maximum size of the weighing instrument must be marked on the weighing instrument, which is confirmed upon approval of the place of verification.

1.5. The minimum allowable weighing size is 5 kg. Between the minimum $m_{\min}$ and the maximum $m_{\max}$ weighing size, the error must not exceed the following value:

$$P_{\text{dop}} = \pm [10 + 0,2(m - 5)].$$

- m , is the weighing size in kg,
- P_{dop} , is the error allowed in g.

1.6. The weighing instrument container must be constructed in such a way that the amount of heat retainer that evaporates during the verification does not exceed 1/5 of the error allowed by the respective amount of weighing.

1.7. The weights must be of the appropriate accuracy class, by which it can be verified that the accuracy of the weighing instrument is within the permissible limits of error.

1.8. Regulated temperature baths should be operated in such a way that in the temperature range between $40 ^\circ \text{C}$ and $130 ^\circ \text{C}$, within the verification field, temperature fluctuations after reaching the right temperature should not be higher than $\pm 0.02 \text{ K}$. The depth of the working premise of the bathroom should be equal to or greater than 200 mm.

1.9. Platinum resistance thermometer for temperature measurements of bathrooms with regulated temperature must be constructed so

that the measurement errors are equal to or less than ± 0.02 K and the difference shown in the temperature range between 40 ° C and 130 ° C is not higher than ± 0.02 K per year. Platinum resistance thermometer should be calibrated every two years.

1.10. System for verification of the calculation unit as a subset of thermal energy measuring instruments.

1.11. Etalon test resistors must be calibrated every two years. The temperature coefficient of the test resistors of the etalon should not be higher than ± 1 ppm / K. The resistance difference of resistors should not be greater than ± 10 ppm / year.

1.12. Calibrated instruments for monitoring the conditions of the work environment with the possibility of recording data (thermometer for measuring air temperature with a separation of 0.1 ° C).

1.13. For hot water volume measurement for verification purposes, the weighing instrument may be replaced with flow measuring instruments (or with some flow measuring instruments) if this measuring instrument is constructed in such a way that the expected difference in measurement errors of the volume in the whole measuring range is not greater than ± 0.2 % per year, and if the accuracy of the comparative flow measuring instruments is verified with the help of the weighing instrument at least once a month and for this notes must be kept. The measurement ranges of the flow measuring comparator (or measuring comparators) are defined in the test site approval report.

1.14. Only weighing instruments can be the etalons for determining the volume of hot water flowing through the measuring test instruments and for monitoring the flow measuring instrument, which are connected to the thermometers for the correction of density and thermal coefficient. The authorized entity may use one or more weighing instruments for this purpose.

1.15 The etalons under point 1.1 with the accompanying instruments must be calibrated.

2. PREMISES AND REQUIREMENTS

2.1. The conformity assessment body must have the working premise that must meet the following conditions:

- be clean, dry and sufficient premise for unhindered verification of measuring instruments
- must have sufficient premise for placing instruments
- must be protected from the direct impact of sunlight
- the sources of the vibration cannot affect the accuracy of the measurements within premises and its surroundings
- be equipped with furniture for placing the measuring instruments that are being tested
- provide premise for storing documentation
- the instrument for monitoring the conditions of the work environment must be placed in the working premises
- have natural lighting as well as electric lighting

- be equipped with heat sources for uniform heating of the work premise, air conditioner, when necessary.

2.2. The temperature of the work environment in the work premises should be in the range of 20 ° C to 25 ° C.

2.3. The premise heating sources for the verification of thermal energy measuring instruments must be at least 1.5 m away from the instruments, i.e. from the place where the verifications of the measuring instruments are made and must enable uniform heating of the premise for the verification of thermal energy measuring instruments.

ANNEX 6

REQUIREMENTS TO BE MET BY CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS AND LEGAL MEASURING SYSTEMS FOR MEASUREMENT OF QUANTITIES OF VARIOUS LIQUIDS OTHER THAN WATER

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology in force: OIML R 81, OIML R 117, OIML R 81 ann, OIML R 105, OIML R 119, OIML R 120 and OIML R 105ann.

Measuring instruments and systems for measuring the quantities of different liquids other than water are categorized in the following areas:

1. Instruments for measuring the volume of alcohol, soft drinks, beer, milk.
2. Aggregates for refuelling motor vehicles
3. Aggregates for refuelling motor vehicles with LPG
4. Measuring systems in tankers for milk and other items in the food industry
5. Measuring systems in fuel tankers, in places for loading tankers, tank-wagons and tankers on ships.
6. Measuring systems in tankers and stationary measuring systems for LPG
7. Volume measuring instruments not found in the measuring system
8. Temperature compensators.

1. Instruments for measurement of volume of alcohol, soft drinks, beer, milk

1.1. ETALONS AND INSTRUMENTS

- 1.1.1. The following can be used for verification of measuring instruments:

- etalon measuring container with the smallest volume that enables verification of one minute flow for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.05\%$
- reference curved tube prover
- Standard piston tube compact prover - maximum measurement uncertainty $\pm 0.03\%$
- measuring comparator (master measuring instrument) with a container with a minimum volume that enables one-minute flow verification for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.1\%$.

- 1.1.2. Thermometer whose graduation should not be greater than 0.1°C .

- 1.1.3. Chronometer.

Etalons from point 1.1.1. and 1.1.2; must be calibrated

1.2. PREMISES AND REQUIREMENTS

1.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

1.2.2. The temperature of the work environment during the verification should be in the range from 0 ° C to 35 ° C.

2. Aggregates for refuelling motor vehicles

2.1. ETALONS AND INSTRUMENTS

2.1.1. Etalon measuring containers of 5 litres, 10 litres, 20 litres, 50 litres, and 100 litres for flows up to 100 litres / min - maximum measurement uncertainty $\pm 0.05\%$.

2.1.2. Thermometer whose graduation should not be greater than 0.1 ° C.

2.1.3. Chronometer .

Etalons from point 2.1.1. and 2.1.2 must be calibrated.

2.2. PREMISES AND REQUIREMENTS

2.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

2.2.2. The temperature of the work environment during the verification of the flow measuring instruments should be in the range from 0 ° C to 35 ° C.

3. Aggregates for refuelling motor vehicles with LPG

3.1. ETALONS AND INSTRUMENTS

3.1.1. For verification of measuring instruments that can be used:

- etalon measuring containers of at least 20 litres with the instrument for emptying the etalon container - maximum measurement uncertainty $\pm 0.1\%$

- measuring comparator (master measuring instrument) with a container with a minimum volume that enables one-minute flow verification for the maximum flow of the aggregate for refuelling with LPG - maximum measurement uncertainty $\pm 0.2\%$.

- Measuring comparator (master meter) with the possibility of adjusting the flows according to which the flow measuring instrument is verified, with maximum uncertainty $\pm 0.2\%$

3.1.2. Thermometer graduation of which should not be greater than 0.1 ° C.

3.1.3. Chronometer.

3.1.4. Etalons from point 3.1.1. must be calibrated

3.2. PREMISES AND REQUIREMENTS

3.2.1. The conformity assessment body should have premise for office work, storage of etalons and documentation:

3.2.2. The temperature of the work environment during the verification of the current measuring instruments should be in the range from 0 ° C to 35 ° C.

4. Measuring systems in tankers and sustainable measuring systems for milk and other items in the food industry

4.1. ETALONS AND INSTRUMENTS

4.1.1. The following can be used for verification of measuring instruments:

- etalon measuring container with the smallest volume that enables verification of one minute flow for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.05\%$
- reference curved tube prover or standard piston tube compact prover - maximum measurement uncertainty $\pm 0.03\%$
- measuring comparator (master metering instrument) with a container with a minimum volume that enables one-minute flow verification for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.1\%$.

4.1.2. Thermometer graduation of which should not be greater than $0,2\text{ }^{\circ}\text{C}$.

4.1.3. Chronometer.

4.1.4. Etalons from point 4.1.1. must be calibrated.

4.2. PREMISES AND REQUIREMENTS

4.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

4.2.2. The temperature of the work environment during the verification of the flow measuring instruments should be in the range from

$0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$.

5. Measuring systems in fuel tankers and in sites for loading in tankers, tanker-wagons and tankers on floaters

5.1. ETALONS AND INSTRUMENTS

5.1.1. The following can be used for verification of measuring instruments:

- one or more etalon measuring containers with the smallest volume that enables verification of one minute flow for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.05\%$
- reference curved tube prover or standard piston tube compact prover - maximum measurement uncertainty $\pm 0.03\%$
- measuring comparator (master measuring instrument) with a container with a minimum volume that enables one-minute flow verification for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.1\%$.

5.1.2. Thermometer whose graduation should not be greater than $0,2\text{ }^{\circ}\text{C}$.

5.1.3. Chronometer.

5.1.4. Etalons from point 5.1.1. must be calibrated.

5.2. PREMISES AND REQUIREMENTS

5.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

5.2.2. The temperature of the work environment during the verification of the flow measuring instruments should be in the range from

$0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$.

6. Measuring systems in tankers and stable measuring systems for LPG

6.1. ETALONS AND INSTRUMENTS

6.1.1. The following can be used for verification of measuring instruments:

- etalon measuring containers with the smallest volume that enables verification of one minute flow for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.05\%$
- reference curved tube prover with maximum uncertainty $\pm 0.03\%$
- or standard piston tube compact prover with maximum measuring uncertainty $\pm 0.03\%$
- measuring comparator (master measuring instrument) that enables one-minute flow verification for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.2\%$.
- Measuring comparator (master meter) with the possibility of adjusting the flows according to which the flow measuring instrument is verified, with maximum uncertainty $\pm 0.2\%$

6.1.2. Thermometer graduation of which should not be greater than $0,2\text{ }^{\circ}\text{C}$.

6.1.3. Chronometer .

6.1.4. Etalons from point 6.1.1. must be calibrated.

6.2. PREMISES AND REQUIREMENTS

6.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

6.2.2. The temperature of the work environment during the verification of the flow measuring instruments should be in the range from $0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$.

7. Volume measuring instruments not found in the measuring system

7.1. ETALONS AND INSTRUMENTS

7.1.1. The following can be used for verification of measuring instruments:

- etalon measuring containers with the smallest volume that enables verification of one minute flow for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.05\%$
- measuring comparator (master measuring instrument) with a container with a minimum volume that enables one-minute flow verification for the maximum flow of the measuring system - maximum measurement uncertainty $\pm 0.1\%$.

7.1.2. Thermometer graduation of which should not be greater than $0,1\text{ }^{\circ}\text{C}$.

7.1.3. Chronometer.

Etalons from point 7.1.1. must be calibrated.

7.2. PREMISES AND REQUIREMENTS

7.2.1. The conformity assessment body must have the premise for office work, for storing etalons and documentation:

7.2.2. The temperature of the work environment during the verification of the flow measuring instruments should be in the range from $0\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$.

8. Temperature compensators

8.1. ETALONS AND INSTRUMENTS

8.1.1. Equipped with electric motor transmission and two meter heads with etalon to show both compensated and uncompensated quantities.

8.1.2. Mercury thermometers with measuring range from -38°C to $+10^{\circ}\text{C}$ and from 0°C to 50°C with a minimum separation of 0.1°C to control the temperature generated.

8.1.3. Temperature bath with generated temperature indicators.

8.1.4. Thermometer with graduation of 0.5°C .

8.1.5. Etalons from points 8.1.1.; 8.1.2 and 8.1.4 must be calibrated.

8.2. PREMISES AND REQUIREMENTS

The conformity assessment body must have the premise for verification of temperature compensators that must meet the following conditions:

8.2.1. be clean and have enough premise for unhindered verification of indicator instruments, sufficient premise to place the necessary instruments, protected from direct sunlight.

8.2.2. no vibration sources in the surrounding premise that could affect the accuracy of the measurements.

8.2.3. be equipped with shelves or cabinets for placing the verified instruments and for placing the verified indicative instruments.

8.2.4. The control thermometer for measuring the air temperature of the work environment with a measuring range from 15°C to 25°C , with a minimum separation of 0.1°C , must also be in the premise.

8.2.5. have natural and electric lighting.

8.2.6. The temperature of the work environment during the verification of temperature compensators should be in the range of 15°C to 25°C .

ANNEX 7

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR THE VERIFICATION OF INSTRUMENTS INDICATING VOLUME

Specific requirements contained in this annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 117.

1. ETALONS AND INSTRUMENTS

1.1. Instrument for verifying the functionality of computers - electronic meters (described by the manufacturer)

1.2. Oscilloscope.

1.3. Measuring instrument simulator (pulse generator) - fluid flow simulator.

1.4. Electro-motor transmission instruments and meter with etalon head.

1.5. Thermometer with graduation of 0.5 ° C for measuring the air temperature in the work environment.

1.6. Instruments must be verified or calibrated.

The computer verification group of the indicating instrument (electronic meters) consists of instruments from points 1.1, 1.2, 1.3 and 1.5.

The group for verification of the meter of the indicator instrument (meter with mechanical head) consists of instruments from points 1.4. and 1.5.

2. PREMISES AND REQUIREMENTS

2.1. The conformity assessment body must have a working premise which must meet the following requirements:

- be clean, dry and must have sufficient premise for unhindered verification,
- must have sufficient premise for placing necessary instruments,
- must be protected against the impact of direct sun light,
- have furniture for placing the measuring instruments that are being tested,
- have natural and electric lighting,
- the sources of the vibration cannot affect the accuracy of the measurements within premises and its surroundings,
- in the work premise should be the thermometer for measuring air temperature,
- be equipped with heat sources for uniform heating of the work premise, air conditioner, when necessary.

- 2.2. The environment temperature in the work premise should be in the range of 18 ° C to 22 ° C.
- 2.3. Thermometers should be placed on the wall of the premise, so that they are 10 cm to 15 cm away from the wall, and at a height of 150 cm to 170 cm from the floor.
- 2.4. Sources for premise heating should be at least 1.5 m away from the instruments, i.e. from the place where the verifications are performed and should enable uniform heating of the premise.

ANNEX 8

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEANS OF MEASURING THE FLOW OF GAS VOLUME (GAS METER)

The special requirements of this Annex are defined and applied in accordance with the effective recommendation of the International Organization of Legal Metrology: OIML R 137-1-2.

1. ETALONS AND INSTRUMENTS

1.1. Etalons for gas meter verification can be:

- bell-prover instruments for verifying gas meters
- instruments with control gas meters (with etalon) for verification of gas meters,
- gas test nozzle with critical nozzles,
- instrument for verification of gas meters with temperature compensation.

1.2. The bell-prover instrument for gas meter verification consists of:

- measuring part with auxiliary instruments,
- test line with gas meter placement table,
- measuring tool for measuring and regulating air flow.

1.2.1. The measuring part with auxiliary instruments consists of:

- cylindrical shaped bell, the upper base of which is closed while the lower base is open,
- stepped rod, reinforced at the side of the bell,
- cross-cutting container circular or ring shaped filled with water or low-density mineral oil and open at the top,
- rectangular rails that ensure proper vertical movement of the bell,
- the wheel located at the top and bottom of the bell that slides across the rectangular rails,
- counterweight that determines the pressure of the air under the bell,
- steel rope or steel chain connecting counterweight and bell ,
- the pulley on which the steel rope or steel chain is placed,
- the tube through which air from premise enters under the bell or through the bell it exits the test line,
- the valve which when switched to "open" position enables the bell to be filled with air ,
- reinforced reference point at the top of the container,
- thermometer for measuring the air temperature under the bell,
- thermometer for measuring the temperature of water or mineral oil in a container.

1.2.2. The test line with the gas meter placement table consists of:

- inlet valves,
- pipeline,
- table for placing the gas meter,
- manometer for measuring air pressure in the test line,

- manometers for measuring the pressure drop in each gas meter tested,
- thermometer for measuring air temperature near the test line,
- thermometer for measuring air temperature in the test line,
- outlet valve.

1.2.3. The measuring instrument for measuring and regulating the air flow consists of:

- one or more rotameters with marked graduation
- one or more valves for regulating air flow,
- closing rotameter,
- valve for selecting air flow which has marked scales,
- valve for regulating the selected air flow.

1.2.4. Bell, scale and the container must be made of rust-resistant metal material or alloy (stainless steel, zinc, copper, etc.).

1.2.5. The bell volume should be: 50, 100, 150, 200, 300, 400, 500, 600, 800, 1000, 1500, 2000 or 5000 dm³.

1.2.6. The maximum flow expressed in m³ / h that can be achieved with the bell type instrument is determined by the equation: $Q_{max} = 25 V$ - for visual reading, or $Q_{max} = 70 V$ - for automatic reading - where V is the bell volume in m³.

1.2.7. An instrument whose bell has a volume of 1000, 1500, 2000 or 5000 dm³ is allowed to generate a flow twice as large as that specified in paragraph 1.2.6.

1.2.8. The bell type instrument must be so constructed that the pressure of the air under the bell, depending on the position of the bell (the depth of immersion of the bell in the liquid with which the container is filled) does not change by more than ± 20 Pa (20 Pa = 0.2 mbar),

1.2.9. The bell and the verification line must be impermeable (no side leakage) even during the highest working pressure of the bell type instrument

1.2.10. The values of divisions and numerical signs on the bell rod, depending on the volume of the bell, are given in this table:

Bell volume, in dm ³	Maximum partition values, in dm ³	Numerical signs, in dm ³
50	1	10
10, 150, 200, 300	5	50
400, 500, 600, 800, 1000, 1500	10	100
2000	20	200
5000	50	500

1.2.11. The dividing lines must be clearly and evenly drawn. The line with the longest length should be marked:

- every fifth line - if the graduation value is 1, 10 and 20 dm³
- every second line - if the graduation value is 5 and 50 dm³.

1.2.12. The distance between the dividing lines should not be less than 1.5 mm and should be equal.

1.2.13. Scaled bell rod which indicates the volume of air under the bell, the error of which must not be greater than:

- $\pm 0,2\%$ of the volume according to the bell scale, for each interval bounded by the zero graduation line or the last line of the bell scale and by any number marked with the bell scale graduation line.
- $\pm 0,4\%$ of the volume according to the bell scale, for each interval bounded by two adjacent numbers marked with bell graduation lines (except zero dividing line and the last dividing bell graduation line).

1.2.14. The gas meter placement table must contain elements for quick connection of the gas meter to the test line.

1.3. The instruments with gas meter controller (etalon) for gas meter verification consists of:

- operational part (working)
- test lines
- measuring tool for measuring and regulating air flow.

1.3.1. The test line consists of:

- inlet valve
- control gas meter (etalon)
- pipeline
- manometer for measuring the pressure at the verified and control gas meter (etalon) at the reference point
- thermometer for measuring the air temperature in the verification line before or after the gas meter
- thermometer for measuring the air temperature in the verification line before or after the gas meter tested
- outlet valve.

1.3.2. The test line may have:

- manometer for measuring the pressure drop from the verified and control gas meter (etalon)
- manometer for measuring the pressure drop in the verified gas meter
- manometer for measuring the pressure drop in the control gas meter (etalon).

1.3.3. Measuring tools for measuring and regulating air flow consist of:

- pulse transmitter, which is most often mounted on the control gas meter (etalon)
- the demonstration part
- valve.

1.3.4. More than one gas meter can be placed in the test line of the instrument with the control gas meter (etalon). In this case, for each verification gas meter there must be a manometer for measuring the air pressure in the verification line in front of each gas meter or at the reference point. The air temperature in the verification line is measured before the first gas meter and after the last gas meter.

1.3.5. If G 250 gas meters are tested, and the largest instrument with a control gas meter (etalon), up to five etalon gas meters can be tested, placed separately or in parallel on the test line.

1.3.6. Instruments with control gas meters (etalon) in which the fan blows air along the verification line must also have the container for calming the flow and to equalize the air temperature. The container is mounted right behind the fan.

1.3.7. The test line of the instrument with control gas meter (etalon) must be impermeable (no side leakage) during over-pressures or sub-pressures expected during gas meter verification or during sub-pressures or over-pressure of 1 kPa (1 kPa = 10 mbar), if the sub-pressures or larger expected over-pressures are smaller.

1.3.8. As a control gas meter (etalon) the following is used:

- liquid gas meter, for verification of liquid gas meter, bellows gas meter and rotary piston gas meters

- rotary piston gas meter, for verification of rotary piston gas meter, bellows gas meter and turbine gas meter

- turbine gas meter, for verification of rotary piston gas meter and turbine gas meter.

1.3.9. For the gas meter to be used as a controller (etalon), it must meet these conditions:

- the average relative error curve of the gas meter (expressed in percentage) in the function of the flow from Q_{min} to Q_{max} must be found within the range in which the average relative error is less than $\pm 1\%$

- the relative error of the gas meter (expressed in percentage) for separate measurements during the same flow must not deviate more than $\pm 0.1\%$ from the average relative error of the gas meter (expressed in percentage) for that flow.

1.3.10. The curve of the average relative errors of the gas meter (expressed in percentage) in the function of the flow from Q_{min} to Q_{max} is determined through the average relative errors of the gas meter (expressed in percentage) obtained from at least 12 different flows.

1.3.11. The average relative error of the gas meter (expressed in percentage) for the series of measurements during a given flow is obtained by this formula:

$$WME = \frac{\sum_{i=1}^n (k_i \times E_i)}{\sum_{i=1}^n k_i},$$

$$me: k_i = \frac{Q_i}{Q_{max}}, \text{ p\"er } Q_i \leq 0.7 \times Q_{max}$$

$$k_i = 1.4 - \frac{Q_i}{Q_{max}}, \text{ p\"er } 0.7 \times Q_{max} \leq Q_{max}$$

where:

E_i – is the relative gas meter error (expressed in percentage) obtained for the Q_i flow

k_i – Q_i flow coefficient

n – the number of measurements during a given flow.

The smallest number of measurements for the calculation of the average relative error of the gas meter (expressed in percentage) during a given flow is ≥ 3

1.4. The critical nozzle instrument for gas meter verification consists of:

- test lines
- blocks with critical nozzles
- operative part.

1.4.1. As an operating part, a vacuum pump is used, which must have such characteristic as to achieve sufficient air flow and such a vacuum to achieve a critical air flow in the individual critical nozzle, where Mach number is $Ma = 1$.

1.4.2. The test line consists of:

- inlet valve
- pipelines
- pressure sensors for measuring the pressure drop in each verified gas meter
- pressure drop sensors for measuring pressure drop along the measuring line
- temperature sensor at the input of the verification line
- temperature sensor at the output of the verification line
- atmospheric pressure sensor
- atmospheric pressure humidity sensor
- outlet valves.

1.4.3. The critical nozzle block consists of:

- critical nozzle connected in parallel
- output valves for certain nozzles
- the pressure sensor at the inlet critical nozzle
- temperature sensor at the inlet of the critical nozzle.

In verification lines and blocks with critical nozzles, no side flow is required.

1.4.4. Each critical nozzle must meet the requirements that certain flows after verification of the nozzle must not deviate more than $\pm 0.5\%$ from the average flow value for that nozzle.

1.4.5. The average value of the nozzle flow is determined by a series of measurements of a given

$$Q = \frac{1}{n} \times \sum_{i=1}^n Q_i$$

flow according to the expression:

where:

Q , m^3/h - is the average value of the whisk flow,

Q_i , m^3/h – flow rate in the nozzle, at $20^\circ C$, 1000 mbar, $j = 0\%$ (dry air) obtained from the i -measurement

n – the number of measurements of a given flow, which has value $n \geq 3$

1.5. The instrument for verification of gas meters with temperature compensation consists of:

- operative part
- test line with control gas meter (etalon)
- chamber for regulating the gas meter verification temperature.

1.5.1. A fan or vacuum pump is used as an operating part.

1.5.2. The verification line consists of:

- inlet valve (air pressure regulator can be installed behind it)
- pipelines

- pressure sensors on tested and control gas meters (etalon)
- heat exchanger (inside and outside the chamber)
- thermometer for measuring the air temperature at the inlet of the first gas meter and at the output of the last gas meter tested as well as at the control gas meter (etalon)
- flow meter (control gas meter or critical nozzle block).

1.5.3. If a critical nozzle block is installed in the temperature-correcting gas meter verification line, it must meet the provisions of this annex.

1.5.4. The gas meter verification temperature control chamber must meet the following conditions:

- the chamber must be constructed in such a way that the difference between the highest and lowest temperature during the measurement is not above $\pm 2^{\circ}\text{C}$
- the temperature adjustment range should be from -20°C to $+50^{\circ}\text{C}$.

1.6. The maximum permissible errors displayed by the measuring tool for measuring and regulating the air flow in the instruments are $\pm 5\%$.

1.7. To measure the pressure in bell type instruments, the following pressure meters must be used:

- manometers in the shape of the letter U
- inclined manometers
- pressure sensors.

1.8. Manometers used must have a degree of accuracy 1, i.e. measurement errors in use must not be greater than $\pm 1\%$ of the measured pressure.

1.9. Laboratory glass thermometers with a graduation value not exceeding 0.1°C shall be used to measure the temperature of the instruments.

1.10. In addition, other types of thermometers may be used if, in terms of accuracy, they comply with the thermometers referred to in this paragraph.

1.9. Etalons must be calibrated.

2. PREMISE AND REQUIREMENTS

2.1. The conformity assessment body must have the working premise for the verification of the gas meter, which must meet the following conditions:

- be clean, dry and must have sufficient premise for unhindered verification
- have enough premise to place the necessary instruments
- must be protected from the direct impact of sunlight
 - in and around premise vibration sources must not affect the accuracy of the measurement
- have premise for the placement of measuring instruments which are verified
- there should be three control thermometers in the premise to measure the air temperature
- have natural and electric lighting
- be equipped with heat sources for uniform heating of the work premise, air conditioner, when necessary.

2.2. Work environment temperature during verification should be within the range of 15 °C to 25 °C and during operation should not fluctuate more than 2 °C.

2.3. Thermometer should be placed at the wall of the premises so that they are 10 cm to 15 cm away from the wall, and at a height of 150 cm to 170 cm from the floor . Differences in air temperature at designated locations in the workpremise should not be greater than 1 °C.

2.4. Heating sources must be at least 1.5 m away from the instruments, i.e. from the place where the verification is performed.

ANNEX 9

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS WHICH CORRECT THE FLOWN GAS VOLUME (CORRECTORS)

The special requirements of this Annex shall be defined and implemented in accordance with the effective recommendation of the International Organization of Legal Metrology, i.e. OIML R 137-1-2.

1. ETALONS AND DEVICES

1.1. The device for the verification of the corrector must have the following:

1.1.1. Apparatus for generating and measuring pressure which is a device with weights, pressure with manometer or pressure calibrator (digital manometer):

- the maximum error when measuring the pressure must not be greater than $\pm 0.2\%$ of the measured pressure,
- if the apparatus for generating and measuring pressure are designed as counteractive, then a device for measuring atmospheric pressure must be in place as well,
- the maximum error in measuring atmospheric pressure should not be greater than ± 100 Pa.

1.1.2. Thermostatic device (thermostat) for measuring temperature:

- the thermostatic device must be designed in such a way that the difference between the highest and the lowest temperature during the measurement is not higher than 0.2 K, respectively 0.2 °C,
- thermometers are used to measure the temperature and the graduation value in these thermometers should not be greater than 0.1 °C.

1.1.3. Apparatus with which gas flow is simulated:

- the apparatus with which the gas flow is simulated is the engine, the output shaft of which can be easily adapted to different types of correctors or generators with electric impulses,
- the apparatus with which the gas flow is simulated must have the measuring instrument for reading the complete rotations of the corrector shaft, respectively the total number of impulses sent.

1.1. Thermometers (at least three) with a graduation of 0.1 °C for measuring the air temperature of the working environment.

2. SPACES AND REQUIREMENTS

2.1. The conformity assessment body must have a working space for the verification of the corrector which meets the following conditions:

- be clean, dry and have sufficient space for unimpeded verification of measuring instruments,
- have sufficient space to place the necessary devices,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,

- have space for placement of the correctors to be verified,
- have space for placement of correctors that have been verified,
- have natural and electric lighting,
- have three control thermometers to measure the air temperature,
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner.

2.2. The air temperature in the working space for corrector verification must be measured with at least three thermometers, the minimum graduation of which must not be greater than 0.1 °C. Thermometers shall be placed on three walls of the working space, at a distance of 10 cm to 15 cm from the wall, and a height of 150 cm to 170 cm above the floor. Differences in air temperature at designated locations in the working space should not be greater than 1°C. The temperature in the working space must not change more than 2°C during the work. The working space temperature should be in the range of 15° C to 25° C.

2.3. Heating sources must be at least 1.5 m away from the devices, i.e. from the place where the verification is performed, and must enable equal heating of the space.

ANNEX 10

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 50-1, OIML R 106-1, OIML R 50-2, OIML R 106-2, OIML R 51-1, OIML R 107-1, OIML R 51-1, OIML R 107-2, OIML R 51-2, OIML R 111-1, OIML R 76-1, OIML R 111- 2, OIML R 76-2 and OIML R 112.

Instruments for mass flow measurement are distributed in the following fields:

1. Weights of classes F1, F2, M1, M2, M3 of accuracy and of weight up to 20 kg,
2. Weights of classes M1, M2, M3 of accuracy and of weight from 50 kg to 500 kg and 1000 kg,
3. Non-automatic weighing instrument of accuracy class (I),
4. Non-automatic weighing instrument of accuracy class (II),
5. Non-automatic weighing instruments of accuracy classes (III) and (IIII), with a maximum measurement of up to 9000 kg,
6. Non-automatic weighing instruments of accuracy classes (III) and (IIII), with a maximum measurement of over 9000 kg,
7. Automatic weighing instrument with a maximum measurement of up to 9000 kg,
8. Automatic weighing instrument with a maximum measurement of over 9000 kg.

1. Weights of accuracy classes F1, F2, M1 and of weight up to 20 kg

1.1. ETALONS AND DEVICES

1.1.1. Metrological set of weights:

- of weights with a nominal mass from 1 mg to 20 kg,
- of weights with which verification is performed must be at least of a higher class than the verified weight,
- of weighing instruments which must meet the following conditions:
 - a) the stability of the weighing instrument during repeated measurement of the same weight under unchanged conditions should be at one-third of the minimum graduation of the weighing instrument,
 - b) the value of the minimum graduation of the weighing instrument must not be greater than one third of the maximum permissible weight error which is verified.

All weights and weighing instruments used to verify other weights must be calibrated.

1.1.2. Auxiliary devices:

- thermometer with a graduation of at least 0.1°C for measuring the temperature in the working space to be verified,
- hygrometer with a graduation of 0.1% for measuring the relative humidity in the working space,
- manometer with a graduation of 0.1 mbar for measuring the atmospheric pressure of the working space,
- weights, weighing instruments, thermometer, hygrometer and manometer must be calibrated.

1.2. SPACES AND REQUIREMENTS

1.2.1. The conformity assessment body must have a working space that meets the following conditions:

- be clean, dry and have sufficient space for unimpeded verification of weights,
- have sufficient space to place the devices and weighing instruments,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,
- have furniture - space to place the weights to be verified and those that have been verified,
- thermometer, hygrometer and manometer must be placed in the space in order to measure the environment air temperature, humidity and pressure,
- have electric lighting,
- have separate space with entrance from the anteroom or with double doors for verification of weights of accuracy classes F1 and F2,
- be equipped with heat sources for uniform heating of the working space and with air conditioner.

1.2.2. The temperature in the working environment must be in the range of 18 °C to 25 °C.

1.2.3. Weights must be verified in stable environment conditions.

Allowed change of environment conditions:

Weight class	Temperature change during verification
F1	±1.5°C per hour, maximum ± 2°C in 12 hours
F2	± 2 °C per hour, maximum ±3,5 °C in 12 hours
M1	± 3 °C per hour, maximum ±5 °C in 12 hours

Weight class	Temperature change during verification
F	40% to 60% maximum ± 15% in 4 hours

2. Weights of accuracy classes M1, M2, M3 and weight from 50 kg to 500 kg and 1000 kg

2.1. ETALONS AND DEVICES

2.1.1. Metrological set of weights:

- of at least of accuracy class F2 for verification of accuracy classes M1, M2, M3 and nominal mass from 20 kg to 500 kg and 1000 kg,
- the weighing instruments used must meet the following conditions:

a) the stability of the weighing instrument during repeated measurement of the same weight under unchanged conditions should be at one-third of the minimum graduation of the weighing instrument,

b) the value of the minimum graduation of the weighing instrument must not be greater than one third of the maximum permissible weight error which is verified.

All weights and weighing instruments used to verify other weights must be calibrated.

2.1.2. Auxiliary devices:

- thermometer with a graduation of at least 0.1°C for measuring the temperature in the working space and verifying other weights,
- hygrometer with a graduation of 0.1% for measuring relative humidity in the working space,
- manometer with a graduation of 0.1 mbar for measuring the atmospheric pressure of the working space,
- weights, weighing instruments, thermometer, hygrometer and manometer must be calibrated.

2.2. SPACES AND REQUIREMENTS

2.2.1. The conformity assessment body must have a working space that meets the following conditions:

- be clean, dry and have sufficient space for unimpeded verification of weights,
- have sufficient space to place the devices and weighing instruments,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,
- have furniture - space to place the weights to be verified and those that have been verified,
- thermometer, hygrometer and manometer must be placed in the working space in order to measure the temperature, humidity and pressure in the working space,
- have electric lighting,
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner.

2.2.2. The temperature in the working environment must be in the range of 18°C to 27°C.

2.2.3. Weights must be verified in stable environment conditions.

Allowed change of environment conditions:

Weight class	Temperature changes during verification
M1	$\pm 3 \text{ }^{\circ}\text{C}$ per hour, maximum $\pm 5 \text{ }^{\circ}\text{C}$ in 12 hours

3. Non-automatic weighing instruments of accuracy class (I)

3.1. ETALONS AND DEVICES

3.1.1. Set of weights:

- should be of accuracy class E2 for weighing instrument with a graduation of »e« having a value of $0,001 \text{ g} \leq e$ and with a nominal mass of 1 mg to 200 g, and a total mass of 500 g.

Specified weights and weight groups must be calibrated.

3.1.2. Auxiliary devices:

- spirit level of accuracy class at least II,

- magnifier with a 10 times magnification,
- thermometer with graduation of at least 0.1°C for measuring the temperature in the working space,
- hygrometer with graduation of 0.1% for measuring relative humidity in the working space,
- manometer with graduation of 0.1 mbar for measuring the atmospheric pressure of the working space.
- weights, thermometer, hygrometer and manometer must be calibrated.

3.2. SPACES AND REQUIREMENTS

3.2.1. The conformity assessment body must have a working space that meets the following conditions:

- be clean, dry and have sufficient space for unimpeded verification of weighing instruments,
- have sufficient space to place the devices and weighing instruments,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,
- have furniture - space for placing mass flow meters for verification.
- thermometer, hygrometer and manometer must be placed in the working space in order to measure the temperature, humidity and pressure in the working space,
- have electric lighting,
- be built as a separate space with entrance from the anteroom or with double doors for verification of weighing instruments of accuracy class I,
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner,

3.2.2. The temperature in the working environment must be in the range of 20 °C to 25 °C for the weighing instrument of accuracy class II.

4. Non-automatic weighing instruments of accuracy class (II)

4.1. ETALONS AND DEVICES

4.1.1. Set of weights:

- of accuracy class F1 for weighing instruments with a graduation of »e« having a value of 1 mg $<e \leq 100$ mg and with a nominal mass of 1 mg up to at least 5 kg and a total mass of 20 kg,
- of accuracy class F2 for weighing instruments with a graduation of »e« having the value 0,1 g $<e < 1$ g, a nominal mass of 1 mg up to at least 5 kg and a total mass 10 kg.
- Specified weights and weight groups must be calibrated.
- Weights of lower class of accuracy can be replaced with the same amount of weights of higher class of accuracy.

4.1.2. Auxiliary devices:

- spirit level of accuracy class at least II,
- magnifier with 10 times magnification,
- thermometer with graduation of at least 0.1°C for measuring the temperature in the working space,
- hygrometer with graduation of 0.1% for measuring relative humidity in the working space,

- manometer with graduation of 0.1 mbar for measuring the atmospheric pressure of the working space,
- weights, thermometer, hygrometer and manometer must be calibrated.

4.2. SPACES AND REQUIREMENTS

4.2.1. The conformity assessment body must have a working space that meets the following requirements:

- be clean, dry and have sufficient space for unimpeded verification of weighing instruments,
- have sufficient space to place the devices and weighing instruments,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,
- have furniture - space to place the mass flow meters to be verified and those that have been verified,
- thermometer, hygrometer and manometer must be placed in the working space in order to measure the temperature, humidity and pressure in the working space,
- have electric lighting,
- be built as a separate space with entrance from the anteroom or with double doors for verification of weighing instruments of accuracy class II,
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner.

4.2.2. The temperature in the working environment must be in the range of 20°C to 25°C for the weighing instrument of accuracy class II.

5. Non-automatic weighing instruments of accuracy classes (III) and (IIII) with a maximum measurement of up to 9000 kg

5.1. ETALONS AND DEVICES

5.1.1. Metrological set of weights:

- of accuracy class M1 for weighing instruments with a graduation of »e« having a value of ≥ 1 g, a nominal mass of 1 g up to 20 kg and a total mass of 2000 kg,
- of accuracy class M1 for electromechanical weighing instruments with a nominal mass of 100 mg x 10 pieces up to 500 g x 10 pieces.

Specified weights and weight groups must be calibrated.

Weights of lower accuracy class can be replaced with the same amount of weights of higher accuracy class.

5.1.2. Auxiliary devices:

- spirit level of accuracy class at least II,
- magnifier with 10 times magnification,
- thermometer with graduation of at least 0.1 °C for measuring the temperature in the working space,

- hygrometer with graduation of 0.1% for measuring relative humidity in the working space,
- manometer with graduation of 0.1 mbar for measuring the atmospheric pressure of the working space,
- thermometer, hygrometer and manometer must be calibrated.

5.2. SPACES AND REQUIREMENTS

5.2.1. The conformity assessment body must have a working space that meets the following requirements:

- be clean, dry and have sufficient space for unimpeded verification of weighing instruments,
- have sufficient space to place the devices and weighing instruments,
- be protected from direct sunlight,
- vibration sources must not affect the accuracy of the measurement in and around the space,
- have furniture - space to place the mass flow meters to be verified and those that have been verified,
- thermometer must be placed in the working space in order to measure the air temperature,
- have electric and/or natural lighting,
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner.

5.2.2. The temperature in the working environment must be in the range of 18 °C to 27 °C for the weighing instrument of accuracy classes III and IIII.

6. Non-automatic weighing instruments with maximum measurement over 9000 kg

6.1. ETALONS AND DEVICES

6.1.1. Metrological set of weights:

- of accuracy class M1 with nominal mass of 20 kg to 500 kg and a total mass of 20000 kg,
- of accuracy class M1 with a nominal mass of 200 g x 10 pieces up to 5 kg x 10 pieces,
- standardized cart for verification of railway weighing instruments (weighed on an weighing instrument with a value of the verification graduation ten times less than the value of the verification graduation of the railway weighing instrument).
- Specified weights and weight groups must be calibrated.

6.1.2. Auxiliary devices:

- spirit level of accuracy class at least II,
- magnifier with 10 times magnification,
- thermometer with graduation of at least 0.1°C for measuring the temperature in the working space,
- hygrometer with graduation of 0.1% for measuring relative humidity in the working space,
- manometer with graduation of 0.1 mbar for measuring the atmospheric pressure of the working space,
- thermometer, hygrometer and manometer must be calibrated,
- magnifier with 10x magnification,
- thermometer with graduation of 1°C for measuring the environment temperature,

- thermometer must be calibrated.

6.2. SPACES AND REQUIREMENTS

6.2.1. The conformity assessment body must have a working space that meets the following requirements:

- be clean, dry and have sufficient space to place the devices,
- have an office for persons responsible for verification.

6.2.2. The temperature in the working environment during verification must be in the range of 0 °C to 35 °C.

7. Automatic weighing instruments of maximum measurement up to 9000 kg

7.1. ETALONS AND DEVICES

7.1.1. Metrological set of weights:

- of accuracy class E2, for weighing instruments, with review graduation »e« of which the value is $0,001 \text{ g} \leq e$, with a nominal mass of 1 mg to 200 g, with a total mass of 500 g,
- of accuracy class F1, for weighing instruments, with review graduation »e« of which the value is $1 \text{ mg} < e \leq 100 \text{ mg}$, with a nominal mass of 1 mg up to a minimum of 5 kg, and a total mass of 20 kg,
- of accuracy class F2, for weighing instruments, with review graduation »e« of which has the value $0,1 \text{ g} < e < 1 \text{ g}$, with a nominal mass of 1 mg up to a minimum of 5 kg, and a total mass of 10 kg
- of accuracy class M1, for weighing instruments, with review graduation »e« of which has the value $\geq 1 \text{ g}$, with nominal mass 1 g up to 20 kg, with total mass 2000 kg
- of accuracy class M1, for electromechanical weighing instruments with nominal mass 100 mg x 10 pieces up to 500 g x 10 pieces
- soft chains for verifying automatic weighing instruments with band.

Certain weights and weight groups must be calibrated.

7.1.2. Auxiliary devices:

- spirit level of at least accuracy class II
- Magnifier with 10x magnification
- thermometer for measuring the temperature in the working space, with a graduation of at least 0.1 °C
- hygrometer for measuring relative humidity in the workspace with 0.1% graduation.
- manometer for measuring the atmospheric pressure of the working space, with a graduation of 0.1 mbar
- Thermometer, hygrometer and manometer must be calibrated.

7.2. SPACES AND REQUIREMENTS

7.2.1. The conformity assessment body must have the working space that must meet the following requirements:

- have sufficient space for placing the devices

– have an office for the work of persons responsible for verification.

7.2.2. The temperature of the working environment during the verification should be between 0°C and 35 °C.

8. Automatic weighing instruments with maximum measurement over 9000 kg

8.1. ETALONS AND DEVICES

8.1.1. Metrological set of weights:

- of accuracy class M1, with nominal mass 20 kg to 500 kg, with total mass 20000 kg
- of accuracy class M1, with a nominal mass of 200 g x 10 pieces up to 5 kg x 10 pieces
- standard cart for verification of weighing instruments for measuring vehicles on move (measured with weighing instruments with a value of the verification graduation ten times less than the value of the verification graduation for the measurement of a vehicle on move).

Weights and weight groups must have valid calibration certification.

8.1.2. Auxiliary devices:

- holders for placing measuring devices
- spirit level of at least accuracy class II
- Magnifier with 10x magnification
- thermometer with graduation 1 °C for measuring the temperature of the working space.
- The thermometer must be calibrated.

8.2. SPACES AND REQUIREMENTS

8.2.1. The conformity assessment body must have the working space that must meet the following requirements:

- have sufficient space to place the devices
- have an office for the work of responsible persons.

8.2.2. The temperature of the working environment during the verification should be in the range 0 °C to 35 °C.

ANNEX 11

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR MEASURING THE MOISTURE OF GRAINS AND SEEDS FOR OIL PRODUCTION (MOISTURE METERS)

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology OIML R 59.

1. REFERENCE SUBSTANCES, DEVICES

- 1.1. Cereal and seed grain samples for oil production (hereinafter referred to as »samples«) - reference substances;
- 1.2. Thermometer with a graduation of 0.1 °C or better for measuring the air temperature in the working environment;
- 1.3. Hygrometer with a graduation of 0.1% or better for measuring the relative humidity of the air in the working environment;
- 1.4. Samples should be verified, while other measuring devices should be verified or calibrated;

2. SPACES AND REQUIREMENTS

- 2.1. The conformity assessment body must have the working space that must meet these conditions;
 - 2.1.1. be clean, dry and with sufficient space for unimpeded verification;
 - 2.1.2. have sufficient space to place the necessary devices;
 - 2.1.3. be protected from the direct sunlight;
 - 2.1.4. ensure that dust, water vapor and aggressive gases do not penetrate into it;
 - 2.1.5. have furniture for placing the measuring instruments to be verified;
 - 2.1.6. have both natural and electric light;
 - 2.1.7. have the entrance door worked so as not to affect the environmental conditions;
 - 2.1.8. vibration sources must not affect the accuracy of measurements in and around space;
 - 2.1.9. the thermometer for measuring air temperature should be in space
 - 2.1.10. the hygrometer for measuring the relative humidity of the air should be in the space;
 - 2.1.11. be equipped with heating/cooling sources for uniform heating of the working space;
 - 2.1.12. have a coolant for storing samples;
 - 2.1.13. The temperature in the working environment should be in the range of 20 °C to 23 °C;
 - 2.1.14. The relative humidity of the air in the workspace should be in the range of 33% to 55%;
 - 2.1.15. Thermometers and hygrometers should be placed on the wall of the space so that they are 10 cm to 15 cm away from the wall, and a height of 150 cm to 170 cm above the floor;
 - 2.1.16. The space heating/cooling sources must be at least 1.5 m away from the devices, i.e. from the place where the verifications are made and must enable uniform heating of the space;

ANNEX 12

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR VERIFICATION OF THERMOMETERS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R-7, OIML R-114 and OIML R-115.

1. Thermometers are divided into areas as follows:

- 1.1. Liquid-in-glass thermometers;
- 1.2. Aneroid thermometer;
- 1.3. Digital thermometers;
- 1.4. Thermometers with Resistor Pt.;
- 1.5. Thermocouples. TC;
- 1.6. Infrared Thermometers;
- 1.7. Medical (human) thermometers. Aneroid, digital, Infrared.

2. Liquid-in-glass thermometers

2.1. ETALONS AND DEVICES

2.1.1. Temperature etalon.

2.1.2. The calibrated temperature etalon shall be the thermometer whose measuring safety is less than or equal to the value of the highest absolute permissible error of the tested thermometer.

2.2. The devices for reproducing the given temperatures, depending on the measuring area of the tested thermometer, can be:

2.2.1. Device for reproducing ice melting temperature that achieves a temperature of 0 °C with a maximum permissible error of ± 0.01 °C.

2.2.2 Bathrooms with thermostat (water, oils, sand, Alcohol, Air. Triple points of secondary water), which reach the set temperature in some measuring areas and have:

- quite large volume and sufficient depth for immersion of standard thermometers and testing thermometers.

- possibility to maintain a constant temperature in the range of ± 0.01 °C

- temperature deviation of less than or equal to ± 0.05 °C in the whole working space and in all working requirements (when the thermometers are immersed in the bathroom).

2.3. Calibrated or verified chronometer with an accuracy of 0.1 s/h.

2.4. Calibrated or verified device for monitoring working environment conditions (temperatures from 0 °C to + 50 °C with accuracy $\pm$

0,2 °C or better, Pressure meter for measuring atmospheric pressure from 950 hPa to 1050 hPa with accuracy $\pm 0,5$ hPa or better and relative humidity from 20% to 95% relative humidity with accuracy $\pm 4\%$ relative humidity or better) with data recording capability.

2.5. Etalons must be calibrated, while other measuring instruments verified or calibrated.

3. SPACES AND REQUIREMENTS

3.1. The conformity assessment body must have the space where only the verification can be performed and the space where the repair of measuring instruments is performed.

3.2. The space for verification of thermometers should:

3.2.1. be clean, dry and with sufficient space for unimpeded verification of meters

3.2.2. have sufficient space to place the necessary devices

3.2.3. be protected from the direct sunlight

3.2.4. have furniture for placing measuring devices

3.2.5. have furniture for placing the measuring instruments to be tested

3.2.6. have both natural and electric lighting

3.2.7. vibration sources must not affect the accuracy of measurements in and around space

3.2.8. in the working space must be placed the device for monitoring the working environment conditions of the measuring areas and the accuracy defined in point 2.4 of this Annex

3.2.9. be equipped with heat sources for uniform heating of workspace and if necessary with air conditioning.

3.2.10. The temperature in the working environment should be in the range of 18 °C to 25 °C, while the change of the temperature of the working environment during the verification of the thermometers should not be greater than 1 °C.

3.2.11. The space heating sources must be at least 1.5 m away from the devices, respectively from the place where the verification is performed, they must enable uniform space heating.

4. Medical (human) thermometers

4.1. ETALONS AND DEVICES

4.1.1. Standard calibrated glass thermometer or digital thermometer with platinum resistant probe with an accuracy of ± 0.02 °C or greater, in the range of + 30 °C to + 45 °C.

4.1.2. Water bath with thermostat verified with working range from +30 °C to +45 °C with maximum horizontal and vertical gradient ± 0.03 °C and with better stability or equal to ± 0.03 °C in duration of 10 minutes.

4.1.3. Centrifuge for human thermometers filled with liquid achieving centrifugal acceleration of 600 m / s².

4.1.4. The chronometer must be calibrated or verified.

4.1.5. Suitable place for placing human thermometers that are verified in the bathroom with a thermostat.

4.1.6. Calibrated or verified equipment for monitoring the working environment conditions must be by accuracy in point 2.4 of this annex.

SPACES AND REQUIREMENTS

5. Spaces and Requirements that the conformity assessment body must possess

5.1. The conformity assessment body must have a space where only verification can be performed and must be separate from other spaces.

5.2. The space for verification of thermometers should:

5.2.1. be clean, dry and with sufficient space for unimpeded verification of measuring instruments

5.2.2. have sufficient space to place the necessary devices

5.2.3. be protected from the direct sunlight

5.2.4. have furniture for placing measuring instruments

5.2.5. have furniture for the placement of meters to be verified

5.2.6. have natural and electric lighting

5.2.7. vibration sources must not affect the accuracy of measurements in and around space

5.2.8. in the working space for verification should be placed the device for monitoring the environmental conditions according to the accuracy defined in point 2.4. of this Annex

5.2.9. have the front door worked so that it does not affect the environment requirements in the verification area.

5.2.10. be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioning.

5.2.11. The temperature in the working environment should be in the range of 18 °C to 25 °C, while the change of the temperature of the working environment during the verification of the thermometers should not be greater than 1 °C.

5.2.12. The space heating sources must be at least 1.5 m away from the devices, respectively from the place where the verification is performed and must enable uniform heating of the space and if necessary have an air conditioner.

ANNEX 13

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR MANOMETERS, VACUUMMETERS, MANO- VACCUM METER, PRESSURE GAUGE CONVERTERS, BLOOD PRESSURE MEASURING DEVICES, TIRE PRESSURE MEASURING DEVICE (PRESSURE GAUGES)

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R-23. OIML R-148 and OIML R-149.

1. ETALONS AND DEVICES

1.1. The equipment-etalons needed to verify the pressure gauges are:

- pressure gauge, precision manometer 0.025%, pressure pump or vacuum pumps with pressure gauge converter or any other pressure etalon, depending on the type of pressure gauge for which authorization is required.
- appropriate devices and tools for checking, repairing and verifying pressure gauges, such as: various switches, connecting elements, adapters, keys and the like.

1.2. To verify the measuring blood pressure device, the following are needed:

- precision etalon: ± 0.5 mmHg or better
- chronometer
- hand pump with release valve
- strong metal container with a volume of 500 ml, respectively 100 ml
- containers for receiving and holding leaked mercury.

1.3. To verify the estimate of the absolute pressure gauge the following is needed:

- precision etalon 0.01 % FS or better
- vacuum container
- vacuum container with necessary accessories

1.4. To verify the pressure gauge converters without the indicating device the following is also needed:

- etalon for verifying electrical (voltage) pressure gauges with an accuracy of 0.025% FS or better..

1.5. Thermometer with a graduation of 0.1 °C for measuring the air temperature of the working environment.

1.6. Hygrometer with a graduation of 0.1% for measuring the relative humidity of the working environment.

1.7 Barometer with 0.1 mbar graduation, for measuring the air pressure in the working environment.

The etalons with which the pressure measuring instruments are verified must be calibrated.

2. PREMISE AND REQUIREMENTS

2.1. The conformity assessment body must have a working space for the verification of pressure gauges which must meet the following conditions:

- be clean, dry and with sufficient space for unimpeded verification and verification of pressure gauges.
- to have sufficient space for placing the necessary devices
- be protected from the direct sunlight
- vibration sources must not affect the accuracy of measurements in space and around
- have furniture for the placement of meters to be verified
- there should be a thermometer in the space to measure the air temperature
- in the space should be the hygrometer for measuring the relative humidity of the air
- have natural and electric lighting
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner.

2.2. The temperature of the working environment in the workspace should be in the range of 18 °C to 28 °C.

2.3. The space heating sources for the verification of the pressure gauge must be at least 1.5 m away from the devices, respectively from the place where the verification of the pressure gauges is performed and must enable uniform heating of the space for the verification of the pressure gauge.

ANNEX 14

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR THE VERIFICATION OF ELECTRICITY METERS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology: OIML R 46-2 and OIML R 46-3.

1. ETALONS AND DEVICES

1.1. Meter verification device (etalon with wattmeters and/or etalon meters).

The etalon wattmeters installed in the device shall be as follows:

- at least accuracy class 0.2 and rated current 5 A or 1 A - if installed in the device for verification of meters of accuracy class 2 and 3 (A)
- at least accuracy class 0.1 - if installed in the metering verification device of accuracy class 0.2 S, 0.5 S, 0.5 and 1 (A, B, C).

The etalon meters installed in the device shall be as follows:

- Etalon meters must be at least of accuracy class 0.2 of - if installed in the device for verification of meter of accuracy class 2 and 3 (A).
- The standard meters must be at least of accuracy class 0.05 - if they are installed in the device for verification of meters of class 0.2 S, 0.5 S, 0.5 and 1 of accuracy (A, B, C).

1.2. Time measuring device.

1.3. Control measuring devices (ammeters, voltmeters, similar frequency meters).

For periodic inspection of ammeters, voltmeters and frequency meters installed in the control devices, there must be a control measuring device to verify their accuracy class of at least 0.2 (if the verification is performed with the power-time method).

1.4. Meter insulation verification device

The meter insulation verification device must have a power of at least 500 VA, and a voltage range of 2000 V, or 4000 V when the voltage has a sinusoidal form. The voltage setting must be uninterrupted from 0 V to 2000 V respectively 4000 V, in which case the voltage is measured with a voltmeter of at least accuracy class 1.5.

1.5. Sources of supply.

The supply sources of the meter verification device, during the change of the supply voltage of $\pm 10\%$ and the frequency of $\pm 1\%$ from the nominal values, at the output connections of the meter verification device, must provide the reference requirements (in terms of the sum of voltage, current and frequency, the shape of voltage and current waves, the sequence of phases and the balance of voltage and current) in accordance with the measurement requirements for the accuracy class and the type of meters being tested. The time for voltage regulation must not be longer than 0.5 s.

In case of change of supply source load from idle shaft work up to 75% of nominal load, change of stable voltage must not be greater than $\pm 0,1\%$, respectively $\pm 0,05\%$ of nominal range of the measurement, during which the voltage adjustment time must not be longer than 1 s.

1.6. Holders for placing measuring devices.

Meter holders should allow the meters to stand in a vertical position.

During the lower measured voltage range of the meter verification device and during the larger number of meters that can be placed in the holder, the voltage drop across the voltage circuits of the holder on which the meters are placed shall no longer be greater than:

- 0,1% of the nominal value of the meter voltage - when the meters of the active accuracy class 2 electricity and the meters of reactive electricity of accuracy class 2 and 3 (A) are placed in the holder

- 0.015% of the nominal value of the meter voltage - when the meters of active electricity of class 0,2 S; 0.5 S; 0.5 and 1., of accuracy (B, C) are placed in the holder.

1.7. Thermometer with a graduation of at least 0.1 °C for measuring the temperature in the working space.

1.8. Hygrometer with a graduation of at least 0.1% for measuring the relative humidity of the air in the working space.

Etalons and devices in items 1.1; 1.2; 1.3; 1.4; 1.7. and 1.8 must be calibrated.

Or automatic digital measurement system with the following parameters:

2. The automatic digital test measurement system enables simultaneous calibration and verification of electricity meters with multiple positions (5; 10; 20;...). Through this test measurement system, inductive, electronic, multifunctional electronic, transformer metering groups, multi-quadrant with active/reactive energy/power registers of accuracy classes (3; 2; 1; 1%; 0.5; 0.5%; 0.5S; 0.2; 0.2S) can be tested.

2.1. The testing device system should consist of:

- 3 integrated voltage sources VIS – 400; VIS – 1200; VIS – 2600; Voltage range 30....350V;
- 3 integrated current sources CIS – 600; CIS – 1600; CIS – 3000; CIS – 3600; current range 1mA120A....160A;
- the current and voltage control unit Control Unit ACU – 3000;.....
- working etalon, reference etalon with accuracy class 0.02%, type of current up to 120 A; 160A,
- automatic executive software based on Windows® version of the last years

2.2. The control software must have:

- Fully compliance with IEC, MID, INMETRO, ANSI, JJG and other standards
- Exceptional flexibility and easy operation
- Integration with generation and traceability systems

- Automatic and manual testing modes
- Automatic generation of verification reports, exporting to TXT, Excel, or other types of individual data
- Inclusion of all types of meters and test definitions in the software libraries
- Versions in multiple languages
- Protocol interoperability: IEC 62056-21 (old IEC 1107), DLMS, EDL, MODBUS, DL/T 645 and others as required
- ONE BUTTON mode for production volumes

2.3. Counter-testing table must have:

- Rack for placing electricity meters with multiple positions (5; 10; 20; 40; ...)
- each position must have an error calculator
- each position must have photocells for scanning, reading measurement results
- each position must have the optical port probe for reading OPTO - port
- each position must have the current transformer CTS - 120; CTS – 160; CTS – 200;
- the measurement system must have a closed-loop I-P link connection (positions are interdependent)
- it must be multi-tariff, up to 16 tariffs
- It must have a hand-held terminal – HHT terminal for reading meter data

2.4. Key technical and metrological specifications:

- The three-phase reference etalon/working etalon must be integrated into the test bench for meter testing.
- The reference etalon must have a typical accuracy of $\pm 0.01\%$ @ PF=1 for all measurement functions throughout its operating range, with a maximum worst-case accuracy of $\pm 0.02\%$ @ PF ≥ 0.5 . This worst-case accuracy specification includes stability variables, power factors, traceability uncertainty, and testing system errors.
- It must have a unique design that makes it unsurpassable in its ability to accurately measure values in “real-world” scenarios.
- The reference etalon must include an exclusive analogue-to-digital signal converter combined with electronically compensated input voltage and current transformers known for their research and a hermetically sealed reference. This combination ensures the highest level of accuracy, stability, and skill offered in a portable three-phase etalon.
- The Harmonic Analysis option allows for the analysis of loads up to the 64th harmonic order. An integrated Comparator option provides automatic calculation of test results for the meters being tested.
- Current range $3 \times 1 \text{ mA} \dots 120 (200)\text{A}$ (1) automatic range
- Voltage range $3 \times 30 \dots 630\text{V}$; $3 \times 30 \dots 525\text{V}$ @60Hz; with automatic switching
- Automatic range $3 \times 30 \dots 525 \text{ V}$ @50 Hz
- Auxiliary power range $3 \times 60 \dots 630\text{V}$ with automatic scaling

- Fundamental frequency of 40 ... 70 Hz (2)
- Power factor range
- Operating temperature range -20°C ... +70°C
- Relative humidity range 0 ... 95%, non-condensing

2.5. Measurement modes

- 2-wire active and reactive mode
- 3-wire active mode
- True or interconnected 3-wire reactive mode
- 3-wire apparent
- 4-wire active mode
- True or interconnected 4-wire reactive mode
- 4-wire apparent
- Metering functions in four quadrants, three-phase, simultaneous measurement of energy (active, reactive, apparent), power (active, reactive, apparent), voltages, currents, power factors, phase angles, harmonics
- Power/energy accuracy typical accuracy: $\pm 0.01\%$ @ PF=1
- Worst-case accuracy: $\pm 0.02\%$ @ PF ≥ 0.5
- Current accuracy $\pm 0.014\%$ (140 ppm)
- Voltage accuracy $\pm 0.01\%$ (100 ppm)
- Long-term power/energy drift year 1: $\pm 0.0028\%$ / five years of 1: $\pm 0.0062\%$ / ten years of 1: $\pm 0.0088\%$
- Current drift $\pm 0.0021\%$ in the first year
- Voltage drift $\pm 0.0014\%$ in the first year
- Angle accuracy $\pm 0.006^\circ$
- Temperature drift +20 °C ... +30 °C none -20 °C ... +70 °C $\pm 0.0005\%/^\circ\text{C}$ (± 5 ppm/ $^\circ\text{C}$)
- BNC screen port input with 150 Ω pull to 5V, clamped at 5.7V port speed
- Minimum pulse width 200 ns, maximum repetition rate 20 Hz
- Output type - open collector, clamped at 27V
- Default value of BNC pulse output 0.00001 Wh/pulse but can be reprogrammed
- Maximum output frequency 2.1 MHz (minimum pulse width 200 ns)
- Optional display
- Other possible features (optional) Integrated Comparator, Harmonic Analysis
- Operating range. Specified range from 10 mA to maximum current.
- Operating range. Specified range from 45 to 65 Hz.

The etalons and equipment under point 2.4 must be calibrated.

3. SPACES AND REQUIREMENTS

3.1. The conformity assessment body must have the working space that must meet the following conditions:

- be clean, dry and with sufficient space for unimpeded verification
- have sufficient space for placing the necessary devices
- be protected from the direct sunlight
- have shelves, carts or panels for placing the meters to be tested
- have horizontal-antistatic floor.
- have natural and electric lighting
- vibration sources must not affect the accuracy of measurements in and around space
- there should be a thermometer in the space to measure the air temperature
- there should be a hygrometer in the space for measuring the relative humidity of the air
- have the entrance door worked so that it does not affect the change of environmental conditions in the verification space.
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioning.

3.2. The temperature in the working environment should be in the range of 21 °C to 25 °C.

3.3. The relative humidity of the air in the workspace should be in the range of 25 to 75%.

3.4. Thermometers and hygrometers should be placed on the wall of the working space so that they are at least 10 cm to 15 cm away from the wall, and of a height of 150 cm to 170 cm above the floor.

3.5. The space heating sources must be at least 1.5m away from the devices, respectively from the place where the verification is performed and must enable uniform heating of the space.

3.6. Verification should be performed with the most precise equipment, depending on the accuracy class of the measuring instrument

ANNEX 15

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS OF MEASURING TRANSFORMERS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable standards of the International Electrotechnical Commission: IEC 60044-1 and IEC 60044-2.

1. ETALONS AND DEVICES

1.1. Device for measuring the errors.

Measuring bridges (analogue or digital) can be used as devices for measuring the errors.

1.2. Etalon transformers, etalon resistor and voltage dividers.

1.2.1. The following can be used for the verification of electricity measuring transformers:

- etalon electricity transformers.
- electricity/power comparators.

1.2.2. The following can be used for the verification of voltage measuring transformers:

- etalon voltage transformers
- capacitive etalon voltage divider for voltages above 300 kV.

1.3. Load

1.3.1. The actual load of the measuring transformer consists of:

- standard electricity load
- Error measuring device
- ammeter, if locked
- input and output conductors between the secondary winding of the etalon electricity transformer and the error measuring device.

1.3.2. The real load of the voltage measuring transformer consists of:

- standard voltage load
- error measuring device
- voltmeter, if locked.

1.4. Measuring instrument for measuring the electricity, voltage and frequency.

1.5. Equipment for the production of electricity, respectively voltages.

1.6. The device for installing the electricity, respectively voltages.

1.7. Thermometer with graduation 0.1 °C for measuring the air temperature in the working space.

1.8. Hygrometer with graduation 0.1% for measuring the relative humidity of the air in the working space.

Etalons under points 1.1, 1.2. and 1.3, must be calibrated, whereas the other meter devices must be verified or calibrated.

2. SPACES AND REQUIREMENTS

2.1. The conformity assessment body must have the working space that must meet the following conditions:

- be clean, dry and with sufficient space for unimpeded verification
- have sufficient space for placing the necessary devices
- be protected from the direct sunlight
- have natural and electric lighting
- vibration sources must not affect the accuracy of measurements in and around space
- there should be a thermometer in the environment to measure the air temperature
- there should be a hygrometer in the space for measuring the relative humidity of the air
- have the entrance door worked so that it does not affect the change of environmental conditions in the working space.
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioning.

2.2. The temperature of the working environment should be in the range of 18 °C to 28 °C.

2.3. The relative humidity of the air in the workspace should be in the range of 45% to 75%.

2.4. Thermometers and hygrometers should be placed on the wall of the working space so that they are at least 10 cm to 15 cm away from the wall, and a height of 150 cm to 170 cm above the floor.

2.5. The space heating sources must be at least 1.5 m away from the device, respectively from the place where the verification is performed and must enable uniform heating of the space.

ANNEX 16

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS USED FOR THE VERIFICATION OF ELECTRICITY INSTALMENTS

The specific requirements contained in this Annex are determined and applied in compliance with the standard EN 61557.

1. ETALONS AND DEVICES

- 1.1. The one-way voltage generator (1 mV to 1000 V).
- 1.2. Alternating voltage generator (1 mV up to 1000 V) with frequency up to 1 kHz.
- 1.3. One-way electricity generator (1 mA to 10 A).
- 1.4. Alternating electricity generator (1 mA to 10 A) with frequency up to 1 kHz.
- 1.5. One-way voltage measuring instrument (0.1 mV up to 1000 V).
- 1.6. Alternating voltage measuring instrument (0.1 mV up to 1000 V) with frequency up to 1 kHz.
- 1.7. One-way electricity measuring instrument (1mA to 1 A).
- 1.8. Alternating electricity measuring instrument (1mA to 1 A) with frequency up to 1 kHz.
- 1.9. Resistance measuring instrument (0.1 Ω to 1 G Ω).
- 1.10. One-way high voltage measuring instrument (1 to 10 kV).
- 1.11. Digital frequency measuring instrument (0 Hz to 10 kHz).
- 1.12. Time measuring instrument (1ms to 100 s).
- 1.13. Etalon resistors (0.1 Ω to 1 T Ω).
- 1.14. Thermometer with graduation 0.1 °C for measuring the air temperature of the working environment.
- 1.15. Hygrometer with graduation 0.1% for measuring the relative humidity of the working environment.

The etalons used for verification must be calibrated, whereas the other measuring instruments shall be verified and calibrated.

The best measuring ability of the etalons and measuring instruments for each measuring quantity and for a certain range, determined by estimating the contribution amount of certain components of the measurement uncertainty, must be less than the permissible measurement error of that measured size of the verified measuring instrument.

2. SPACES AND REQUIREMENTS

2.1. The conformity assessment body must have the working space that must meet the following requirements:

- be clean, dry and with sufficient space for unimpeded verification

- have sufficient space for placing the necessary device
- be protected from the direct sunlight
- have furniture for placing measuring instruments to be tested
- have natural and electric lighting
- have the entrance door worked so that it does not affect the change of the working environment.
- vibration sources must not affect the accuracy of measurements in and around space
- ensure that dust, water vapor and aggressive gases do not penetrate into it
- there should be a thermometer in the space to measure the air temperature
- there should be a hygrometer in the space for measuring the relative humidity of the air
- be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioning.

2.2. The temperature of the working environment should be in the range of 21 °C to 25 °C.

2.3. The relative humidity of the air in the workspace should be in the range of 30% to 70%.

2.4. Thermometers and hygrometers should be placed on the wall of the working space so that they are at least 10 cm to 15 cm away from the wall, and a height of 150 cm to 170 cm above the floor.

2.5. The space heating sources must be at least 1.5 m away from the equipment, respectively from the place where the verification is performed and must enable uniform heating of the space.

ANNEX 17

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS OF DEVICES FOR MEASURING THE LEVEL OF ETHYL ALCOHOL IN RESPONDENTS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology OIML R 126.

1. ETALONS AND DEVICES

1.1. Cylinders with corresponding ethyl alcohol reference solution, with precisely determined concentration.

1.2. Compartment, respectively the device for the preparation of the reference concentration of the vapor of ethyl alcohol in the air, if the verification is performed with the so-called wet method.

1.3. Gas flow meter (if verification is performed with the so-called dry method).

1.4. The usual equipment of the chemical-physical laboratory as well as all the equipment necessary for safe operation and use of gas cylinders (manometers, similar reducing valves) when using dry reference gas in cylinders.

1.5. Standard thermometer with measuring range from 0 °C to + 35° C with the smallest separation of 0.1 °C to monitor the reference solvent temperature.

1.6. Thermometer with a separation of 0.1 °C for measuring the air temperature of the working environment.

1.7. Hygrometer with separation of 0.1% for measuring the relative humidity of the working environment.

Reference materials should be verified, the etalon thermometer should be calibrated, and all other measuring devices with which the ethylometers are verified should be verified or calibrated.

2. SPACES AND REQUIREMENT

2.1. The workspace for verifying ethylometers must meet the following conditions:

- be clean, dry and have sufficient space for unimpeded verification of the measuring instrument
- have sufficient space for placing the necessary devices
- be protected from the direct sunlight
- vibration sources must not affect the accuracy of measurements in and around space
- ensure that dust, water vapor and aggressive gases do not penetrate into it
- have furniture for the placement of ethylometers to be tested
- have natural light and electric lighting
- in the space should be the thermometer for measuring air temperature
- in the space should be the hygrometer for measuring the relative humidity of the air

- have the entrance door worked so that does not to affect the change of environmental conditions in the working space.
 - be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioning.
- 2.2. The temperature of the working environment should be in the range of 18 °C to 25 °C.
- 2.3. The relative humidity of the air in the workspace should be in the range of 30% to 70%.
- 2.4. Thermometers and hygrometers should be placed on the wall of the working space so that they are at least 10 cm to 15 cm away from the wall, and a height of 150 cm to 170 cm above the floor.
- 2.5. The space heating sources must be at least 1.5 m away from the equipment, respectively from the place where the verification is performed and must enable uniform space heating.

ANNEX 18

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR TAXIMETERS

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology OIML R 21.

1. ETALONS AND DEVICES

- 1.1.1. Equipment / Etalon for verifying the route travelled.
- 1.1.2. Equipment / Etalon for verifying the vehicle measuring instrument.
- 1.1.3. Equipment / Etalon equipment for verifying the time measuring device in the taximeter.
- 1.1.4. Equipment for verification and refilling of air pressure in pipes.
- 1.1.5. Other testing tools and equipment according to the instructions of the taximeter manufacturer.
- 1.1.6. Thermometer with 0.1 °C graduation for measuring the air temperature of the working environment with the possibility of maintaining and recording the air temperature.
- 1.1.7. Hygrometer with 0.1% graduation for measuring the relative air humidity of the working environment with the possibility of maintaining and recording the relative air humidity.
- 1.2. The etalons used for the verification of taximeters must be calibrated, including other auxiliary equipment.

2. SPACES AND REQUIREMENTS

- 2.1. Space for verification of taximeters should meet the following requirements:
 - the polygon (track) must be at least 20 m long. This is required in case the CAB does not possess the measuring cylinders.
 - be clean, dry and non-slippery.
 - in the space and around it, sources of vibration must not affect the accuracy of the measurements
 - the setting conditions in which the taximeters are verified must be in accordance with international recommendations
- 2.2. The temperature of the working environment should be in the range of 18 °C to 28 °C.
- 2.3. The relative air humidity in the workspace should be in the range of 30% to 80%.
- 2.4. The space heating sources must be at least 1.5 m away from the device, respectively from the place where the verification is performed and must enable uniform space heating

ANNEX 19

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR SPEED IN ROAD TRAFFIC

The specific requirements contained in this Annex shall be determined and applied in compliance with the applicable recommendations of the International Organization of Legal Metrology (OIML R91).

1. ETALONS AND EQUIPMENT

- 1.1. Signal generator - 1 μ Hz up to 50 MHz; 1 mV up to 10 V (cetv. i sin).
- 1.2. Digital frequency meter - 1 MHz up to 35 GHz.
- 1.3. Pulse meter - 0 up to 100 000.
- 1.4. VF measuring instrument with power from - 1 μ W to 3 W; 100 MHz up to 35 GHz.
- 1.5. Time measuring device - 1 ns up to 100 s.
- 1.6. Etalon equipment for verification of Doppler and laser measuring instruments with speed - 30 km/h up to 200 km/h (simulated speed).
- 1.7. The conformity assessment body must have the testing and measuring equipment as well as the equipment according to the instructions of the manufacturer of the speed measuring instrument.
- 1.8. Thermometer with 0.1 °C graduation for measuring the air temperature of the working environment.
- 1.9. Hygrometer with 0.1% graduation for measuring the relative air humidity of the working environment.

The etalons used must be calibrated, while other measuring instruments must be verified or calibrated.

2. SPACES AND REQUIREMENTS

- 2.1. The conformity assessment body must have the space where the verification of the speed measuring instrument is performed.
- 2.2. Space for verifying the speed measuring instrument should meet the following requirements:
 - be clean, dry and with sufficient space for unimpeded verification of the speed measuring instrument
 - have sufficient space for placing the necessary device
 - be protected from the direct sunlight
 - have furniture for placing speed measuring instruments to be tested
 - have natural and electric lighting
 - the thermometer for measuring the air temperature should be in the space
 - the hygrometer for measuring the relative air humidity should be in the space

- have the entrance door worked so that it is possible to control the entrance to this space
 - vibration and shock sources must not affect the accuracy of measurements in the space and around
 - be equipped with heat sources for uniform heating of the working space and, if necessary, with air conditioner
 - ensure that dust, water vapor and aggressive gases do not penetrate into it.
- 2.3. temperature of the working environment should be in the range of 21 °C to 25 °C.
- 2.4. The relative air humidity in the workspace should be in the range of 40% to 70%.
- 2.5. The space heating sources must be at least 1.5 m away from the equipment, respectively from the place where the verification is performed and must enable uniform space heating.

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE
VERIFICATION OF LEGAL MEASURING INSTRUMENTS IN THE VEHICLE
TECHNICAL CONTROL CENTERS

1. ETALONS AND DEVICES

1.1 Measurement etalons for verifying the accuracy of brake force in cylinders used for testing the braking force of wheel discs on vehicles; Mechanical or electronic gauge (half-shaft gauge) with dimensions and shape suitable for specific types and weights of measuring instruments for measuring the braking force of vehicles and appropriate mass/weights of accuracy class M2, namely with the measuring arm equipped with a manometer, dynamometer, or electronic force converter, providing data on the braking force in the range from 0 to 40 kN;

1.2 Measurement etalons for verifying the pressure measuring device in vehicle tires; The accuracy class of the gauge should be $\pm 0.025\%$ FS with a measuring range above 4 bar with various accessories, including a pressure pump up to 30 bar.

1.3 Measurement etalons for verifying the accuracy of the measuring device for testing the maximum allowed load on vehicle axles,

1.4 Measurement etalons for verifying the accuracy of the measuring device for controlling vehicle noise; a minimum Class II device with a sound pressure level at the outlet of 94 dB or better.

1.5 Measurement etalons for verifying the accuracy of the intensity and direction controllers of lights: (0-120,000) cd with a minimum measurement accuracy of Light intensity $\pm 4\%$;

1.6 Measurement etalons for verifying the accuracy of the measuring device for controlling the depth of tire profiles.

1.7 Measurement standards for verifying measuring instruments for measuring the volume of emitted gas components from motor vehicles.

The gas calibrator must have the following characteristics:

- Carbon monoxide (CO), - (0-5)% vol,
- Carbon dioxide (CO₂), - (0-16)% vol,
- Oxygen (O₂), - (0-21)% vol,
- Hydrocarbons (HC) - (0-2000) ppm vol
- Propane/Hexane, equivalent factor (C₃H₈/C₆H₁₄) - (0.490 ... 0.540)%
- Nitrogen (N₂) - other part

Resolution:

- (CO), - 0.01% vol
- (CO₂) - 0.1% vol
- (O₂), - 0.01 vol per band (smaller than 4)% vol
- 0.1 vol for range (greater than 4)% vol

2. Spaces and requirements that the conformity assessment body must possess

- 2.1 Be clean, dry and with sufficient surface for the placement of devices, as well as for unimpeded verification of measuring instruments with cylinders;
- 2.2 Environment requirements to be stable and suitable for measurement
- 2.3 Be protected from the direct sunlight;
- 2.4 There should be no vibration source in the space and around that would affect the accuracy of the measurements;
- 2.5 Have sufficient natural and electric lighting;
- 2.6 Have a thermometer for measuring the environment temperature with 0.1 °C graduation;
- 2.7 Have a hygrometer for measuring the relative air humidity with 0.1% graduation;
- 2.8 Devices for this purpose must be placed in the working spaces intended for verification of measuring instruments and this space cannot be used for any other activity;
- 2.9 The temperature of the working environment for the verification of measuring instruments should be in the range of 10 °C to 30 °C;
- 2.10. Heat sources in the working spaces for verification must be away from the devices, respectively from the place where the verification is performed at a distance of at least 1.5 m and must create the possibility of linear heating of the entire space.
- 2.11. The etalons used must be calibrated, while other measuring instruments must be verified or calibrated.

ANNEX 21

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE VERIFICATION OF LEGAL MEASURING INSTRUMENTS FOR TACHOGRAPHS AND SPEED LIMITER

1.1 ETALONS AND DEVICES

1.2 Appropriate control equipment in accordance with the instructions of the manufacturer;

1.2.1 Handheld device for tachograph verification - suitable for mobile and in-vehicle use with suitable and updated software according to the required criteria. This device serves to determine the characteristic coefficient of the vehicle “W” and the tachograph constant “K”, measurement of time and measurement of the distance traveled measured between two reference points, where at least it meets the requirements to verify analogue-type tachographs;

1.2.2 Tachograph sheet recording control device with fields marked for permissible error limits (templates as instructed by the tachograph manufacturer) and magnifier for tachograph sheet reading;

1.2.3 Manometer for measuring tire pressure;

1.2.4 Device for measuring effective wheel perimeter;

1.2.5 Measuring tape in length of 30 meters;

1.2.6 Verification seal and seal printing device;

1.2.7 Guidelines (manuals) for verification of tachographs;

1.2.8 Personal computer with printer;

1.2.9 Only the equipment which are owned by the body that applies for conformity assessment and possess the relevant evidence according to the applicable legislation can be used for the verification of the tachograph.

1.2.10. The etalons used must be calibrated, while other measuring instruments must be verified or calibrated.

2 The facility, space, ancillary equipment and requirements that the conformity assessment body must possess

2.1 The conformity assessment body must have a facility and space for verification, placement of parts and equipment, recording of verification data of tachographs which are:

2.1.1 In accordance with technical standards and norms;

2.1.2 Must possess proof (consent) from the competent body for connection to public roads, in accordance with the legal provisions of the law on roads;

2.1.3 Have sufficient space for measuring instruments, devices and archived documentation with all documentation related to the work of the designated body, as well as staff, to be placed in order for staff to be allowed to move freely;

2.1.4 Have sufficient space for placing the verified tachographs, have at least two work tables with a length of 120 cm, with

respective chairs, at least one shelf to place the devices and instruments for verification as well as the tachograph data.

2.1.5 The working space should have a thermometer for measuring air temperature with 0.1°C graduation;

2.1.6 The working space should have a hygrometer for measuring relative air humidity with 0.1% graduation;

2.1.7 The temperature of the working space should be in the range of 18 to 28 degrees;

2.1.8 The relative air humidity in the working space should be in the range of 30% to 80%.

2.2 Testing road (testing range) or testing cylinders;

2.2.1 The verification place must have a road (testing road). In the absence of a verification range, it can be done with the help of testing cylinders or rollers;

2.2.2 The verification place must have a modern road surface (asphalt, concrete or other materials, which ensures a minimum quality of the concrete or asphalt layer);

2.2.3 The dimensions of the verification range must be according to the technical norms and standards set especially for this issue in case it is without test cylinders (rollers).

2.2.4 When the verification place has a track with verifying measurement cylinders or rollers, the dimensions of the track must have dimensions according to the conditions for use of cylinders;

2.2.5 The width of the range track used for verification without verification cylinders must be at least 3 meters. The track should be placed horizontally longitudinally on the ground with a tolerance $\pm 2\%$;

2.2.6 Direct exit from the verification place (verification range) in the public traffic space must be made possible by allowing the connection of the vehicle to the traffic in an unobstructed and safe way;

2.2.7 The place intended for verification must be at the same address and space for which the body is appointed, respectively not further than 50 meters and must be clearly signalled regarding the manoeuvres for the verification of the vehicle;

2.2.8 The place intended for verification is available (there are no barriers to access) during working hours, and if the verification is performed in public spaces or public roads, it must possess proof (consent) from the competent body, in accordance with the legal provisions of the law on roads;

2.3 Channel, slider or weightlifter (crane);

2.3.1 The verification place must have a channel, slider or weightlifter which is used during the tachograph verification operation, the length, width must be adequate to the distance of the axles of the motor vehicle in which the tachograph is placed;

2.3.2 The length, width and capacity of the load, to be suitable for the distance between the wheels of motor vehicles in which the tachographs are verified / tested is located outside the public traffic area and inside or adjacent to the object intended for verification / testing of the tachograph;

2.3.3 Direct exit from the channel, slider or weightlifter to public traffic areas should enable safe access of the vehicle to traffic;

2.4 Relevant space (place) for receiving and parking the vehicle;

2.4.1 The verification place must have trouble-free access to the vehicle, in which it is possible for the vehicle to move from the track to the channel, to the slide or weightlifter.

2.4.2 The direction of vehicle movement and location for its parking must be clearly marked in the verification place.

2.4.3 The parking of the vehicle must be outside the public space and this space must be large enough to be able to park at least one vehicle of the size of a motor vehicle which is equipped with a tachograph.

2.4.4 That is available (no barriers to access) during business hours.

2.5 Evidence that the designated body has the appropriate facility and space to carry out the activities for which it is applying, either owned or rented, including the verification range, devices and tools necessary for verification (verification cylinders, channel, slider or weightlifter (crane)).

ANNEX 22

REQUIREMENTS TO BE MET BY THE CONFORMITY ASSESSMENT BODY FOR THE CONTROL OF PRE-PACKAGES PRODUCTS

1. ETALONS AND DEVICES

1.1 Non-automatic weighing instruments with testing graduation »e« which has the value of = 0.01g, with maximum capacity max = 10200g and minimum 1g

1.2. Densitometer with accuracy class $\pm 0.001 \text{ g/cm}^3$ and with readability 0.0001 g/cm^3

1.3. Thermometer for measuring liquids with $0.1 \text{ }^\circ\text{C}$ graduation or better,

1.4. Stainless steel metal pycnometer with precise cap with nominal volume 50 ml and 100ml

1.5. Glass pycnometer with thermometer (Gay-Lussac)

-Pycnometer thermometer with 0.2°C graduation and range from 10°C to 30°C

1.6. Volumetric glass container and lid -set of glass containers with nominal volume: 100; 250; 500; 1000 ml, and with accuracy class A

1.7. Have a computer and monitor with accompanying equipment, printer;

1.8. Etalons from points 1.1; 1.2; 1.3; 1.4; 1.5; and 1.6 must be calibrated

2. Spaces and requirements that the conformity assessment body must possess

2.1. The conformity assessment body must have space for pre-packaging product control, placement of parts and devices as well as space for storage of documentation;

2.2. Anti-vibration table for weighing instruments with drawer, metal construction, work surface with a minimum thickness of 28 m;

2.3. Porcelain tile separated from the surface of the table with quartz sand for vibration depreciation;

2.4. Table construction with square steel tube painted with resin epoxy with high resistance in corrosion, with the possibility of levelling.

2.5. Fixed table with dimensions suitable for work;

2.6. Thermometer for measuring air temperature with 0.2°C graduation

2.7. Have a hygrometer for measuring relative air humidity with 0.1% separation.

2.8. set of sieves with no. 1, 2, 3, 4, 5, 6,

2.9. degassing equipment,

2.10. Water bath,

2.11. a set of F2 weights from 5g to 10kg

2.12. different accessories.

