INTERREG BSR 2014-2020 PROJECT TEST-4-SME

SERVICE PROVISION RULES

WP 4.1. BEST PRACTICE PROCEDURES FOR TESTING

OUTPUT O 4.1.

SERVICE PROVISION RULES

The service provision rules is a set of principles that competence centres and other cooperating laboratories will follow in providing testing services to electronics SMEs. The rules are aimed at reducing bureaucracy when using the service, speeding up processes, optimising costs and making the whole process of receiving testing services more SME-friendly.

1. Approach to the task and measures to be undertaken

Enhancement of capability of the testing laboratories and improvement of provided services can be achieved by a number of activities, e.g. acquiring modern equipment, employing qualified specialists, introducing high level management, etc. These measures, however, are not within the frame of this Project. Moreover, testing laboratories even if such improvements would be introduced will face a necessity to follow general principles of measurement and testing practices.

New electronic products developed by innovative companies located in the BSR will have to comply with the requirements of the worldwide recognized standards to enter the market. In the development phase of these products, it is important to comply with the basic standards' requirements in order not to make mistakes that can be difficult to repair later on. Testing of new products being developed is an important part of product development and must therefore be carried out in accordance with generally accepted metrological principles and good laboratory practice provisions.

Internationally accepted ways and means how to assure best practices of providing the testing and calibration services are expressed at International Standard ISO/IEC 17025 and other documents.

It must be pointed out that there is no other way to introduce new products into the market than to respect internationally recognised test and calibration rules. At the same time, it is also important to understand that many requirements of ISO/IEC 17025:2017 are recommendatory in nature and, therefore, the practice of testing and calibration services provided by laboratories can and must be flexible. ISO/IEC 17025:2017 is adhered to "risk-based thinking" principle, so that laboratories have more freedom and flexibility in terms of procedures, processes and documentation than it was permitted by the previous version of the standard ISO/IEC 17025:2005. On the other hand, the new version of the standard underlines that, as a result of the flexibility, responsibility for decisions lies with the laboratory which must justify its decisions. Also, it is also strongly recommended that the value of measurement result uncertainty be included in the reports, whereas the uncertainty of results in the 2005 version of the standard was usually presented at the request of the customer.

In the frame of Test 4 SME project, and through the provision of training of partner laboratories' and SME staff, services and advice to SME, we will comply with the basic principles of metrology, testing and calibration and good laboratory practice set forth in (ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories).

The main principles of measurement and testing practices expressed at ISO/IEC 17025:2017 are as follows:

- Impartiality and confidentiality;
- Responsibility for decisions and quality and reliability of the results;
- Well-developed documentation of laboratories' activities (Quality System);
- Use of reliable (validated) methods fitting purposes of testing/calibration activities;
- Use of certified reference materials and measurement devices calibrated against higher standards to ensure measurement traceability;
- Participation in inter-laboratory comparisons/ proficiency testing programs to enhance a validity of testing/calibration results;
- Evaluation/calculation of measurement uncertainties;
- Conformity assessment.

Principles listed above are usually the main requirements the testing laboratories shall follow to obtain accreditation. Most of the Project partners are not accredited laboratories and some of them do not seek for accreditation in the nearest future (which is quite a natural way of operating having in mind their emphasis on pre-testing services). Therefore, a wish to keep above statements of ISO/IEC 17025:2017 is aspirational. Nevertheless, to achieve goals of the Project, we must observe at least the main of them at reasonable level.

Maintaining the above-mentioned basic metrology principles will let to know the true state of the product development process, and thus help to avoid repetitive tests and product design errors. Moreover, it will help to acquire the skills and experience necessary for a later period of product certification. An orderly and traceable documentation system, the use of document templates is a good basis for an efficient administrative system that saves resources and time, helps to avoid bureaucratic confusion and reduces paperwork. In addition, the use worldwide accepted principles of measurements and testing procedures will contribute to effective co-operation between partner companies and laboratories, assist in the exchange information and facilitate international cooperation. Therefore, the product development process will be more efficient and less costly.

As the first step to ensure best service practice of testing and calibration we have developed laboratories' template documents following recommendations of ISO/IEC 17025:2017. Examples of these documents were gathered from all the partner laboratories involved in the project and sent to partners for discussions. The present version of the documents was accepted in the course of the Riga debate during the execution of this project. We recommend to be followed these documents for testing and calibration services as well as for reporting.

The documents are as follows:

- Test/calibration procedures
- Test Reports/Calibration Certificates
- Comprehensive Test Reports

It must be pointed out that, bearing in mind the recommendatory nature of ISO/IEC 17025:2017 and huge variety of testing and calibration experiments, the documents issued by the laboratories shall be most flexible to allow the laboratories to consider exclusivity of their experiment procedures and properly reflect daily laboratory work.

The documents have been prepared on the assumption that the laboratories have a set of documents describing their activities (ISO/IEC 17025:2017: *all activities of the laboratory shall be documented accurately, in order to trace back any experiment/management / equipment/business related activity carried out in the past (particularly, test and calibration procedures*).

The document **describing test/calibration procedures** shall be a detailed description of experiments and include, together with legal data regarding the laboratory and customer, the information of the experimental method applied, safety and laboratory's inner environmental issues, equipment used for measurement and testing, traceability and uncertainty as well as conformity assessment issues.

Test Reports and Calibration Certificates shall include legal information (name, status and address of the laboratory and customer, names and signatures of responsible persons), title and purpose of experiments, date of performed services. Short outline of the experiments, results, their traceability, uncertainty, conformity assessment and conclusions are shall be reflected. **Comprehensive (Full) Test Report** can be provided together or instead of short Test Report, or added as a supplement to short Test Report (it is up to agreement between the laboratory and customer).

2. The basic metrology terms used in the templates are as follows:

Uniformity of measurements includes uniformity of measurement units (SI) and technical and organizational means to ensure the same result of measurement performed at the equal conditions.

Testing is the determination of one or more of an object or product's characteristics.

Certification is the provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements. Certification is also known as third party conformity assessment.

Measurement uncertainty is a parameter characterizing the dispersion of the values attributed to a measured quantity. Uncertainty is often taken as the standard deviation (width of the Gaussian distribution taken at half height) of a state-of-knowledge probability distribution over the possible values that could be attributed to a measured quantity.

Traceability is a property of a measurement result whereby the result can be related to a reference measurement standard through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty.

Conformity assessment, also known as compliance assessment, is any activity to determine, directly or indirectly, that a process, product, or service meets relevant technical standards and fulfills relevant

The agreed templates of the Test/calibration procedures, Test Reports/Calibration Certificates and Comprehensive Test Reports are annexed.

ANNEX No 1

To be printed out on a head paper of the institution

TEST REPORT

No …….

ISSUED BY THE [full name and address of the testing institution and laboratory]

DATE OF THE ISSUE OF THE TEST REPORT

DATE (TIME PERIOD) OF TESTING

CUSTOMER [full name and address]

TESTING ITEM(S), including customer's identification No

ENVIRONMENTAL CONDITIONS (if relevant)

PURPOSE OF THE TEST

EQUIPMENT USED FOR THE TESTING

CHEMICAL SUBSTANCES AND REAGENTS USED FOR THE TESTING (if relevant)

TRACEABILITY ISSUES (list of calibrated equipment, CRM):

METHOD OF THE TEST (short description)

RESULTS: (short summary, including uncertainties of the numerical results and conformity assessment outcome).

Comprehensive Test Report can be added, if necessary.

REMARKS ON THE TEST RESULTS (if relevant)

THE TEST REPORT WAS WRITTEN BY

.....

(function) ..... (name, surname, signature)
.....

PERSON AUTHORIZING THE TEST REPORT:

…….....

(function) ……...

(name, surname, signature) ……...

ANNEX No 2

To be printed out on a head paper of the institution

COMPREHENSIVE TEST REPORT

No …….

ISSUED BY THE [full name and address of the testing institution and laboratory]

DATE OF ISSUE OF THE TEST REPORT

DATE (TIME PERIOD) OF TESTING

CUSTOMER (full name and address)

TESTING ITEMS (including customer's identification No)

PURPOSE OF THE TEST

ENVIRONMENTAL CONDITIONS (if relevant)

EQUIPMENT USED FOR THE TESTING

CHEMICAL SUBSTANCES AND REAGENTS USED FOR THE TESTING (if relevant)

TRACEABILITY ISSUES (list of calibrated equipment, CRM)

TEST PROCEDURE:

- Detailed description of the experiment
- Calculation/evaluation of the uncertainty of results

RESULTS OF THE TEST, including conformity assessment

SUPPLEMENTS (tables, graphs, photos, etc.), if necessary.

REMARKS ON THE TEST RESULTS (if relevant)

THE TEST WAS PERFORMED BY:

.....

(function) ..... (name, surname, signature)
.....

PERSON AUTHORIZING THE TEST REPORT:

…….....

(function) ……...

ANNEX No 3

To be printed out on a head paper of the institution

CALIBRATION CERTIFICATE

No …….

ISSUED BY THE [full name and address of the testing institution and laboratory]

DATE OF ISSUE

DATE (TIME PERIOD) OF CALIBRATION

DATE (TIME PERIOD) OF CALIBRATION (if relevant)

CUSTOMER

(name and address)

CALIBRATION ITEMS, including customer's identification No

ENVIRONMENTAL CONDITIONS (if relevant)

CALIBRATION METHOD

MEASUREMENT STANDARDS USED

MEASUREMENT TRACEABILITY / REFERENCE STANDARDS

CALIBRATION RESULTS , INCLUDING UNCERTAINTIES

REMARKS ON THE CALIBRATION RESULTS (if relevant)

CALIBRATION WAS PERFORMED :

.....

(function) ..... (name, surname, signature)
.....

PERSON AUTHORIZING THE CALIBRATION CERTIFICATE:

…….....

(function) ……...

ANNEX No 4

To be printed out on a head paper of the institution

TECHNICAL PROCEDURE

Name of the Institution **Name of the Laboratory**	**Technical procedure**	No. of edition: … , Date: … Number of pages: …
	No. and Title of the Document part of which is the Technical Procedure used for testing (from the Quality System or the Set of Documents of the Laboratory)	
	No. and Title of the Technical procedure	
Issued by the……. Approved by the……...		
Revised: (Dates and signatures)		
Method validation: based on (standard, recommendations of producer, laboratory's own method)		

1. INTRODUCTION

Short description of R&D area and/or product under development

2. AIM OF THE PROCEDURE

3. FIELD OF APPLICATION

4. DEFINITIONS AND ABBREVIATIONS

5. ESSENCE OF THE METHOD

Short description of the testing method

6. SAFETY ISSUES

7. INNER ENVIRONMENTAL CONDITIONS (if relevant)

8. REAGENTS AND MATERIALS (if relevant)

9. EQUIPMENT

10. TRACEABILITY ISSUES

- List of CRM used as reference materials at the experiment
- List of calibrated equipment, with indication of calibration institutions and higher standards against which they are calibrated

11. PROCEDURE DESCRIPTION

Thorough description of the experiment

12. CALCULATION/EVALUATION OF UNCERTAINTY OF MEASUREMENT RESULTS

13. CONFORMITY ASSESSMENT METHOD

14. REQUIREMENTS FOR PRESENTATION OF THE RESULTS

Shall including measurement uncertainties and conformity assessment outcome.

14. LITERATURE