



HELLENIC INSTITUTE OF METROLOGY

**CATALOG OF SERVICES AND PRICES OF
THE HELLENIC INSTITUTE OF METROLOGY**

JANUARY 2008

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SERVICE POLICY OF EIM

EIM, the National Metrology Institute of Greece, provides services according to its responsibilities and its objectives as stated in its founding law (Law 2231/1994).

The services are specified under strict conditions and requirements of technical competence, reliability and transparency according to international standards, agreements and responsibilities.

The services provided by EIM aim at:

- The support of the national metrological system of the country by providing measurement traceability to the national standards of Greece, which are maintained in the laboratories of EIM.
- The support of the national metrological system of the country by providing knowledge and know-how in the field of metrology, which contribute to the economy and the society.
- Covering the needs in metrology and calibration at the higher level of accuracy.
- The promotion of metrology and measurement science.
- The contribution to the quality of products and services and its continuous improvement.

The main objective of the services is not the profit. Income from services should cover part of the operating expenses of EIM by making optimal use of the resources provided to EIM by the Greek State.

The services are not competitive against other metrological institutes or laboratories, especially from the private sector, since they are offered under terms and conditions, which are in agreement with the terms of funding national infrastructures in the country.

The prices and the cost of the services of EIM:

- Are determined with transparent and non-competitive terms against calibration laboratories and other parties.
- Indicate the level of technical and scientific competence of the staff, the technical capabilities of its infrastructure the level of their expertise and their reliability.
- Promote conditions of a fair and a transparent environment in metrological services in the country.
- Provide a reference level for the prices and the technical competence of metrological services in the country.

The terms and the priorities of the services are determined in a transparent way by using appropriate hierarchy criteria aiming at the optimum use of resources and the efficiency of the services.

The services are under continuous control regarding the satisfaction of quality requirements and clients' requests and needs.

1. FRAMEWORK AND TERMS OF THE SERVICES

1.1. Groups of services

The services of EIM are provided under the Law 2231/94 and they are organized in three main groups:

1. Calibration services of metrological equipment
2. Measurement services for type approval of equipment of measurements
3. Metrological support services

Each of the service group includes sub-groups, which further include individual services fully described in the following chapters of this catalog.

1.2. Information and communication

Information regarding the services is provided through telephone, fax and the website as follows:

HELLENIC INSTITUTE OF METROLOGY (EIM)
Industrial Area of Thessaloniki, Sindos
57 022 THESSALONIKI
Tel.: +30 - 2310 – 569 999, Fax: +30 - 2310 – 569 996, e-mail: mail@eim.gr

1.3 Organisation of the Service System

All the services are covered by the management system of EIM, which meets quality and technical requirements of the ISO 17025, ISO 9001:2000 standards, as well as requirements of the legislation and the laws applied to the operation of EIM.

Requests for services are submitted in written form. Each request may include different services either within the same period of time or within a year. In any case, the services are introduced into the planning of services of EIM, which is applied on a short-time basis as well as on an annual basis. Clients are encouraged to contact EIM by the end of each year in order to make an arrangement with EIM for the annual plan of the requested services.

The short term and the long term performance of the service system are under control by the use of appropriate quantitative indicators. Complaints, as well as recommendations, suggestions and proposals for improvements are mostly welcome to be submitted in written form at any time. Feedback provided by third parties is processed according to specific procedures.

1.4. Framework of Cooperation

1.4.1. Cost of services

The cost of each service is determined by:

- A. The service price according to:
 1. The explicit price corresponding to the respective service code in chapters 2, 3 and 4 of the catalog.
 2. The required workload in man-hours and a unit charge per man-hour, which is specified by the Management Council of EIM.
- B. The amount of the discount, according to the criteria of chapter 5 of the catalog.
- C. The amount of additional expenses, if any, covered by the client and defined in par.1.4.2 of the catalog.

1.4.2. Additional expenses

Additional expenses are paid by the clients for services provided by EIM on-site, such as:

1. Transportation and insurance of the equipment of EIM that is used for calibration services and measurements carried out outside EIM.
2. Transportation of the staff of EIM, which is involved in the services.
3. Special charge per man-day, which is:
 - 40 €/man-day for services provided within a distance of 40 km from EIM and 100 €/man-day if the services are provided during the weekend or in holidays.
 - 160 €/man-day for services provided within a distance higher than 40 km from EIM and 250 €/man-day if the services are provided during the weekend or in holidays.

1.4.3. Terms and Conditions

The clients who receive calibration services have to:

1. Make all the necessary arrangements and pay for the transportation, as well as the respective insurance, of their equipment to be calibrated to and from the premises of EIM.
2. Provide the necessary means and resources for the safe loading and reloading of:
 - Their equipment to be calibrated, such as big weight standards, volume standards, etc.
 - The standard equipment of EIM when used out of the premises of EIM.
3. Provide the necessary information for the implementation of services.
4. Provide the necessary means and resources, when required according to the financial offer of EIM, for the implementation of services in their premises, such as:
 - Technicians and/or labor to support on site measurements.
 - Constructions and other technical work necessary for adjustments.
5. Meet the terms and conditions of the respective offers of EIM.

1.4.4. Terms of payment

1.4.4.1. Calibration fees are paid before the delivery of the calibration certifications to the client.

1.4.4.2. Payment of the participation fees in training and know how transfer programs organised by EIM is made after the completion of the programs and the issue of the certificates.

1.4.4.3. Payment of the fees for other services of metrological support is made according to the terms and the conditions of the respective offers or contracts.

1.4.5. Planning of Services and Priorities

An annual plan for calibration services is conducted by EIM at the end of each year in cooperation with all interested parties. The calibration services are offered according to the following priorities:

1. At the highest level of priorities stand services included in the annual plan.
2. At the second level of priorities, stand calibration services corresponding to standards of high level of accuracy and specialisation.
3. At the third level, stand calibration services to the Calibration Laboratories, not included in the annual plan.
4. At the fourth level stand, other services provided to any third party upon request.

The basic criterion to determine the planning and the priorities of the services is the optimum use of the means and the resources of EIM and the consistent satisfaction of the clients.

2. SERVICES OF CALIBRATION

2.1. MASS CALIBRATION SERVICES (CAL-MAS)

Determination of Mass and Conventional Mass of standard weights with Uncertainty Equal to 1/3mpe of Accuracy E1 class of OIML R111 (2005)**

Standard weights calibration (without volume definition)		
Code	Description/ Width	Price(€)
CAL-MAS-100	Standard fee for calibration of individual weight standards	100 (€)
CAL-MAS-101	Individual weight standards of 1 kg	100 (€ / piece)
CAL-MAS-102	Individual weight standards different from 1 kg	Review
CAL-MAS-111	Set of 13 pieces of weight standards 1 g – 1 kg	900 (€/set)
CAL-MAS-112	Set of 25 pieces of weight standards 1 mg – 1 kg	2.200 (€/set)
CAL-MAS-113	Σετ of 29 pieces of weight standards 1 mg – 10 kg	2.700 (€/set)

Method of calibration: Automatic comparison with reference standards from stainless steel according to a weighing scheme (the dissemination of mass scale in the range 1mg... 1 kg in EIM), under the condition that the density of the weight standard to be calibrated is known.

Determination of Mass and Conventional Mass and Volume of weight standards with Uncertainty Equal to 1/3mpe of the Accuracy of E1 class of OIML R111 (2005)**

Standard weights calibration (with volume definition)		
Code	Description/ Width	Price(€)
CAL-MAS-150	Standard fee for calibration of individual weight standards	100 (€)
CAL-MAS-151	Individual weight standards of 1 kg	150 (€ / piece)
CAL-MAS-152	Individual weight standards different from 1 kg	Review
CAL-MAS-161	Set of 13 pieces of weight standards 1 g – 1 kg	1.600 (€/set)
CAL-MAS-162	Set of 25 pieces of weight standards 1 mg – 1 kg	2.800 (€/set)
CAL-MAS-163	Σετ of 29 pieces of weight standards 1 mg – 10 kg	3.500 (€/set)

Method of calibration: Volume determination of the weight standard to be calibrated by hydrostatic weighing and automatic comparison with reference standards from stainless steel according to a weighing scheme (the dissemination of mass scale in the range 1mg... 1 kg in EIM). It is noted that volume termination takes place only for weight standards with mass values higher than 1 g, according to OIML-R 111.

Determination of Conventional Mass - Calibration of weight standards with Uncertainty Equal to 1/3mpe of the Accuracy of E2 class of OIML R111 (2005)**

Code	Description/ Width	Price (€)
CAL-MAS-200	Standard fee for calibration of individual weight standards	80 (€)
CAL-MAS-201	1 mg – 500 mg	45 (€ / piece)
CAL-MAS-202	1 g – 1 kg	40 (€ / piece)
CAL-MAS-203	2 kg, 5 kg, 10 kg	55 (€ / piece)
CAL-MAS-204	20 kg	80 (€ / piece)
CAL-MAS-205	50 kg	100 (€ / piece)
CAL-MAS-211	Calibration of set of E2 Weight Standards	<i>Depending on the number of pieces</i>
CAL-MAS-212	Calibration of Individual E2 Weight Standards	<i>Depending on the number of pieces</i>

Method of calibration: Automatic comparison of the standard to be calibrated in one by one with the reference standard from stainless steel in 6 ABBA cycles.

Conventional Mass** - The mass of a hypothetical weight reference standard with density 8.000 kg/m³ which at a temperature of 20 °C with density of air 1,2 kg/m³ produces a force capable to balance the weight standard weight to be calibrated (OIML-R 33).

Determination of Conventional Mass - Calibration of weight standards with Uncertainty Equal to 1/3mpe of the Accuracy F1/F2 class, OIML R111 (2005)**

Code	Description/ Width	Price(€)
CAL-MAS-300	Standard fee for calibration of individual weight standards	80 (€)
CAL-MAS-301	1 mg – 500 mg	35
CAL-MAS-302	1 g – 1 kg	30
CAL-MAS-303	2 kg, 5 kg, 10 kg	40
CAL-MAS-304	20 kg	60
CAL-MAS-305	50 kg	80
CAL-MAS-306	100 kg, 200 kg	180
CAL-MAS-311	Calibration of set F1/F2 Weight Standards	<i>Depending on the number of pieces</i>
CAL-MAS-312	Calibration of Individual F1/F2 Weight Standards	<i>Depending on the number of pieces</i>

Method of calibration: Automatic comparison one by one with standards of reports from stainless steel with 4 circles weighing ABBA, without setting.

Definition of Conventional Mass - Calibration of standards weights with Uncertainty Equal to 1/3mpe of the Accuracy M class, OIML R111 (2005)**

Code	Description/ Width	Price(€)
CAL-MAS-400	Standard fee for calibration of individual weight standards	80 (€)
CAL-MAS-401	1 mg – 500 mg	30 (€ / piece)
CAL-MAS-402	1 g – 1 kg	35 (€ / piece)
CAL-MAS-403	2 kg, 5 kg, 10 kg	50 (€ / piece)
CAL-MAS-404	20 kg	65 (€ / piece)
CAL-MAS-405	50 kg	160 (€ / piece)
CAL-MAS-406	500 kg	200 (€ / piece)
CAL-MAS-411	Calibration of M Weight Standard	<i>Depending on the number of pieces</i>

Method of calibration: Automatic comparison of the weight standard to be calibrated in one by one with a reference weight standard from stainless steel with 4 ABBE cycles, without setting.

Determination of Conventional Mass - Calibration of standards weights with nominal values non Multiples or Submultiples of 1kg and Relative Uncertainty $\geq 1, 5$ ppm**

Code	Description/ Width	Price(€)
CAL-MAS-500	Standard fee for calibration of individual weight standards	80 (€)
CAL-MAS-501	1 mg – 1kg	40 (€ / piece)
CAL-MAS-502	2 kg, 5 kg, 10 kg	50 (€ / piece)
CAL-MAS-503	20 kg	70 (€ / piece)
CAL-MAS-504	50 kg	90 (€ / piece)
CAL-MAS-511	Calibration of Weight Standards	<i>Depending on the number of pieces</i>

Method of calibration: Automatic comparison of the weight standard to be calibrated in one by one with a reference weight standard from stainless steel with 4 ABBE cycles, without setting.

Conventional Mass** - The mass of a hypothetical weight reference standard with density 8.000 kg/m^3 which at a temperature of $20 \text{ }^\circ\text{C}$ with density of air $1,2 \text{ kg/m}^3$ produces a force capable to balance the weight standard weight to be calibrated (OIML-R 33).

Determination of Conventional Mass - Calibration of weight standards with nominal values non-Multiples or Submultiples of 1kg and Relative Uncertainty ≥ 5 ppm**

Code	Description/ Width	Price(€)
CAL-MAS-600	Standard fee for calibration of individual weight standards	80 (€)
CAL-MAS-601	1 mg – 1kg	30 (€ / piece)
CAL-MAS-602	2 kg, 5 kg, 10 kg	40 (€ / piece)
CAL-MAS-603	20 kg	55 (€ / piece)
CAL-MAS-604	50 kg	75 (€ / piece)
CAL-MAS-610	Calibration of Weight Standard	<i>Depending on the number of pieces</i>

Method of calibration: Automatic comparison of the weight standard to be calibrated in one by one with a reference weight standard from stainless steel with 4 ABBE cycles, without setting.

Determination of prices for calibration of weight standards

The calibration price of a set of weight standards calibration or a group of individual weight standards with N pieces is calculated as follows:

$$[\text{Price}] = [\text{Standard fee}] + N * [\text{Price/ piece}]$$

Calibration of non-automatic Electronic Balances (only upon special review)

Code	Range	Price (€/scale)	
CAL-MAS-801	0 – 200 g	from 220	Depending upon the readability and the method
CAL-MAS-802	0 – 10 kg	from 250	
CAL-MAS-803	0 – 60 kg	from 300	
CAL-MAS-804	0 – 120 kg	from 600	
CAL-MAS-805	higher than 120 kg	Upon special technical Review	

Method: The applied method is according to the technical procedure “*Calibration of Non Automatic Electronic Balances*” which is described in the Technical Guideline of EIM (MM-MA-01a), published in Febr.2003 or to other suitable method.

(CAL-MAS-850) Calibration of weighing systems in industrial processes

Calibrations are carried out only after special review, while the service prices are determined according to the use of resources.

(CAL-MAS-999) Mass calibration services upon special review

Note: Calibration services of weight balances are provided only in special occasions and after review.

Conventional Mass** - Mass of supposed standard weight of report, density 8.000 kg/m³ Which in temperature of 20 °C and density of air 1,2 kg/m³ practices force capable to balance to the calibrated standard weight (OIML-R 33).

2.2 FORCE CALIBRATION SERVICES (CAL-FOR)

Calibration services of force sensors (load cells, rings) in tension and/or compression

Sensors with indicators, rings		
Code	Range (kN)	Price (€)
CAL-FOR-110	0.5, 1, 2, 5	630
CAL-FOR-120	10, 20, 50, 100	700
CAL-FOR-130	200, 500, 1000	930
CAL-FOR-140	1500, 2000	1.070
CAL-FOR-150	3000, 5000	1.150

Electronic sensors or settings with compatible interface		
Code	Range (kN)	Price (€)
CAL-FOR-111	0.5, 1, 2, 5	530
CAL-FOR-121	10, 20, 50, 100	600
CAL-FOR-131	200, 500, 1000	750
CAL-FOR-141	1500, 2000	870
CAL-FOR-151	3000, 5000	950

Calibration services of force sensor (load cells, rings) in tension and compression

Sensors with indicators, rings		
Code	Range (kN)	Price (€)
CAL-FOR-210	0.5, 1, 2, 5	1.150
CAL-FOR-220	10, 20, 50, 100	1.270
CAL-FOR-230	200, 500, 1000	1.700
CAL-FOR-240	1500, 2000	2.000
CAL-FOR-250	3000, 5000	2.100

Electronic sensors or settings with compatible interface		
Code	Range (kN)	Price (€)
CAL-FOR-211	0.5, 1, 2, 5	950
CAL-FOR-221	10, 20, 50, 100	1.100
CAL-FOR-231	200, 500, 1000	1.370
CAL-FOR-241	1500, 2000	1.600
CAL-FOR-251	3000, 5000	1.700

Method of calibration: The calibration is carried out according to ISO 376:2004, its amendment or other equivalent according to client's requirement by use of the following force machines:

- Machine of dead charge of force in the range of 50 N - 5 kN (age-group of precision until 00)
- Machine of dead charge of force in the range of 1 kN – 110 kN (age-group of precision until 00)
- Machine of increase of lever in the range 10 kN - 1100 kN (age-group of precision until 00)
- Hydraulic machine of force in the range 200 kN - 5000 kN (age-group of precision until 05)

(CAL-MAS-999) Force calibration services upon special review

Notes:

1. The term "Calibration of electronic sensors" implies the calibration of the value of measurement in mV/V by the use of electronic setting of the Force Laboratory of EIM.
2. The term "standard interface" implies the communication capability of the sensor to be calibrated with the Force Manager program of the Force Laboratory of EIM.
3. The client should provide the mountings required for the adjustment of the load cells to be calibrated to the Force Machine of EIM in force calibration in tension mode.

2.3 FLOW CALIBRATION SERVICES (CAL- FLO)

Calibration of gas flow meters by the use of reference standards

Measurement Range: **0,5 – 430 L/h (flow standards of piston type)**

Measurement Range: **600 – 130000 L/h (flow standards - bell provers)**

Code	Type	Price (€)
CAL-FLO-101	Rotameters	400
CAL-FLO-102	Gas Meters of diaphragm type	540
CAL-FLO-103	Mass Flow Controllers	550
CAL-FLO-104	Primary Flow Meters	480
CAL-FLO-105	Soap-film Flow Meters	400
CAL-FLO-106	Wet Gas Meters	540

Method: Calibration by comparison in the flow system of the primary standard of EIM by conducting three (3) measurements in five (5) points of the measurement scale.

Note: The above services are offered according to the proposed method of EIM for the calibration in five points. If the calibration is desirable in less or more than 5 points, the price is determined according to a standard fee and a charge per each point, as follows:

CAL-FLO-101: 100 € + 60 € / point

CAL-FLO-102: 140 € + 80 € / point

CAL-FLO-103: 150 € + 80 € / point

CAL-FLO-104: 130 € + 70 € / point

CAL-FLO-105: 100 € + 60 € / point

CAL-FLO-106: 140 € + 80 € / point

Calibration of liquid flow meters by the use of primary standards

Measurement range: **2,5 – 70000 kg/h (use of weighing method)**

Measurement range: **30 – 90000 L/h (use of volumetric method)**

Code	Type	Price (€)
CAL-FLO-201	Electromagnetic water flow meters	540

Method: Calibration by comparison in the flow system of the primary standard of EIM by conducting three (3) measurements in five (5) points of the measurement scale.

Code	Type	Price (€)
CAL-FLO-202	Turbine Meters	700

Method: Calibration by comparison in the flow system of the primary standard of EIM by conducting two (2) measurements in ten (10) points of the measurement scale.

Flow Calibration Services in the client's premises

These services are undertaken after technical review. The service price is determined according to the use of required manpower and resources of EIM.

(CAL-FLO-999) Flow calibration services upon special review

2.4. VOLUME CALIBRATION SERVICES (CAL-VOL)

Calibration of glass volumetric flasks and devices (gravimetric method)

Code	Range	Price (€)
CAL-VOL-101	1ml – 5 L	150

Calibration of metal volumetric vessels and devices (gravimetric method)

Code	Range	Price (€)
CAL-VOL-201	0 – 20 L	250
CAL-VOL-202	20 L – 100 L	400
CAL-VOL-203	100 L – 200 L	550

Calibration of metal volumetric vessels (volumetric method)

Code	Range	Price (€)
CAL-VOL-301	0 – 20 L	200
CAL-VOL-302	20 L – 100 L	330
CAL-VOL-303	100 L – 200 L	450
CAL-VOL-304	200 L and more	It is defined after special review

(CAL-VOL-999) Volume calibration services upon special review

2.5. PRESSURE CALIBRATION SERVICES (CAL- PRE)

Calibration for positive relative/ differential pressure and direct reading

Code	Range	Accuracy	Price (€)
CAL- PRE -101	0 to 70 barg (air or nitrogen)	Less than 0,6% fs	130
CAL- PRE -102		between 0,6% and 0,1% fs	155
CAL- PRE -103	0 to 700 barg (oil)	Better than 0,1% fs	180

Calibration for negative (or combination positive/negative) pressure, relative/ differential pressure and direct reading

Code	Range	Accuracy	Price (€)
CAL- PRE -201	-0,9 to 70 barg (nitrogen)	Less than 0,6% fs	190
CAL- PRE -202		between 0,6% and 0,1% fs	220
CAL- PRE -203		Better than 0,1% fs	250

Calibration for relative/ differential pressure by electric exit

Code	Range	Accuracy	Price (€)
CAL- PRE -301	0 to 70 barg (air or nitrogen)	Less than 0,6% fs	140
CAL- PRE -302		between 0,6% and 0,1% fs	180
CAL- PRE -303	0 to 700 barg (oil)	Better than 0,1% fs	200

Calibration for negative (or combination positive/negative) pressure, relative/differential pressure with electrical exit

Code	Range	Accuracy	Price (€)
CAL- PRE -401	-0,9 to 70 barg (nitrogen)	Less than 0,6% fs	210
CAL- PRE -402		between 0,6% and 0,1% fs	230
CAL- PRE -403		Better than 0,1% fs	260

Calibration of Pressure calibrators

Positive relative pressure			
Code	Range	Price (€)	
CAL- PRE -501	0 to 70 barg (air or nitrogen) 0 to 1400 barg (oil)	220 € + 160 €/ additional module	

Negative (or combination positive/negative) relative pressure			
Code	Range	Price (€)	
CAL- PRE -502	-0,9 to 70 barg (nitrogen)	280 € + 200 €/ additional module	

Calibration for absolute pressure and direct reading

Code	Range	Accuracy	Price (€)
CAL- PRE -601	0 until 70 bara (nitrogen)	Less than 0,6% fs	190
CAL- PRE -602		between 0,6% and 0,1% fs	220
CAL- PRE -603		Better than 0,1% fs	250

Calibration for absolute pressure with electrical exit

Code	Range	Accuracy	Price (€)
CAL- PRE -701	0 to 70 bara (nitrogen)	Less than 0,6% fs	210
CAL- PRE -702		between 0,6% and 0,1% fs	230
CAL- PRE -703		Better than 0,1% fs	260

Calibration of pressure balances and dead weight testers

pressure balances with a system piston- εμβόλου: range 0-70 barg (air) and 0-1400 barg (oil)		
Code	Calibration parameters	price
CAL- PRE -801	Mass and active area of a system piston/ εμβόλου	900 € + 35 € /disc mass+750 €/ additional piston
CAL- PRE -802	Produced pressure	900 € + 750 €/ additional piston

Calibration of vacuum sensors *

Code	Range	Price
CAL- PRE -901	10 ⁻³ to 1000 mbar	550 € for two scales, classification value of 10 (6 points) + 100 € each additional scale classification value of 10 (3 points)

Calibration method: (CAL-PRE-100 to CAL-PRE-700)

The calibrations are carried out according to the directives *DKD-R 6-1: Calibration of Pressure Gauges (2003)* and *EA-10/17: Guidelines on the calibration of electromechanical manometers (2002)* by the selection of the number of circles and calibration points according to the following criteria:

- Accuracy less than 0,6% fs: 1 increased & 1 decreased series of measurements at 5 points
- Accuracy between 0,6%-0,1% fs: 2 increased & 1 decreased series of measurements at 9 points
- Accuracy better than 0,1% fs: 2 increased & 2 decreased series of measurements at 9 points

Calibration method (CAL-PRE-800)

The method is according to the Directive *EAL-G26 "Calibration of Pressure Balances" (1997)*.

(CAL-PRE-999): Calibration services upon special review.

Special terms and conditions:

1. Calibration is not undertaken unless the equipment to be calibrated can be connected with measuring standards of the Pressure Laboratory.
2. The medium (either oil or gas), used for the calibration, is selected by the Pressure Laboratory, unless there is a specific request by the client.
3. The Pressure Laboratory does not proceed in regulation, unless otherwise requested by the client.
4. Undertaking of calibration of vacuum sensors by the Pressure Laboratory only if the sensors to be calibrated are clean.

2.6. TEMPERATURE–HUMIDITY CALIBRATION SERVICES (CAL- TEM)

Calibration of liquid-in-glass thermometers in the range from 80 °C to 270 °C

Code	Type	Price (€)
CAL-TEM-101	Thermometers of smaller graduation scale	0,5 °C or bigger
CAL-TEM-102		0,2, 0,1 or 0,05 °C
CAL-TEM-103		0,02 or 0,01 °C
CAL-TEM-104	Control of thermometers in	one (1) point
CAL-TEM-105		three (3) points

Method: Calibration by comparison in baths by the use of 2 Pt100 (CAL-TEM-101) or 2 SPRT (remainder services) as standards.

Calibration of digital thermometers in 5 points in the range from -80 °C to 1200 °C

Code	Temperature	Distinctive faculty	Price
CAL-TEM-201	Until 300 °C	0,1 °C or higher	120 € + 20 € / extra point
CAL-TEM-202	Until 550 °C		140 € + 30 € / extra point
CAL-TEM-203	Until 1200 °C		170 € + 35 € / extra point
CAL-TEM-204	Until 450 °C	0,01 °C or higher	220 € + 35 € / extra point

Method: Calibration by comparison in baths and furnaces by the use of 2 Pt100 (CAL-TEM-201, 202, 203) or 2 thermocouples of type R (CAL-TEM-203) or 2 SPRT (CAL-TEM-204) as standards.

Calibration of thermocouples of Base Metals (K,J,N,...) by electrical measurements in the range from -80 °C to 1200 °C

Code	Calibration	Temperature	Price
CAL-TEM-301	At 5 points	to 300 °C	145 € + 20 € / extra point
CAL-TEM-302		to 550 °C	180 € + 30 € / extra point
CAL-TEM-303		to 1200 °C	215 € + 35 € / extra point

Method: Calibration by comparison in baths (CAL-TEM-301) and furnaces (CAL-TEM-302, 303) by the use of 2 Pt100 (CAL-TEM-301) or 2 thermocouples of type R (CAL-TEM-302, 303) as standards and multimeters for electrical measurements.

Calibration of thermocouples of Noble Metals (R, S, B, T ...) by electrical measurements in the range from -80 °C to 1200 °C

Code	Calibration	Price
CAL-TEM-401	At 5 points	to 300 °C
CAL-TEM-402		to 550 °C
CAL-TEM-403		to 1200 °C
CAL-TEM-404	Directly to the fixed points of ITS 90	150 € / point (Sn, Zn) and 200 € / point (Al, Ag, Cu)

Method: Calibration by comparison in baths (CAL-TEM-401) and furnaces (CAL-TEM-402,403) by the use of 2 Pt100 (CAL-TEM-401) or 2 thermocouples of type R (CAL-TEM-402,403) as standards and multimeters for electrical measurements. Determination of ITS 90 fixed points by the use of standard cells (CAL-TEM-404).

Calibration of platinum resistance sensors (PRT – Pt100) by measuring electrical resistance

Calibration of industrial or standard platinum sensors in up- to 5 points (-80 ... +450 °C)		
Code	Method	Price
CAL-TEM-501	Comparative calibration in baths by the use of 2 SPRT as standards and bridge resistance for the measurement of the electric tendency.	250 € + 40 € / extra point
Calibration of standard platinum resistance thermometers (SPRT) directly in the fixed points of ITS 90		

CAL-TEM-502	Determination of fixed points of ITS 90 by the use of standard cells	200 € / point (Ar, Hg) 100 € / point (H ₂ O, Ga) 200 € / point o (In, Sn, Zn) 300 € / point (Al, Ag)
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Notes: The fixed points of the ITS 90 scale correspond to the phase equilibrium temperature values of specific substances as follows:

Ar	Hg	H ₂ O	Ga	In	Sn	Zn	Al	Ag
-189,3°C	-38,8 °C	0,01 °C	29,8 °C	156,6 °C	231,9 °C	419,5 °C	660,3 °C	961,8 °C

The calibration of SPRT's according to ITS 90, is carried to in one or more of the following areas:

- H₂O – Ag: calibration in the fixed points H₂O, Ga, Sn, Zn, Al, Ag
- H₂O – Al: calibration in the fixed points H₂O, Ga, Sn, Zn, Al
- H₂O – Zn: calibration in the fixed points H₂O, Ga, Sn, Zn
- H₂O – Sn: calibration in the fixed points H₂O, Ga, In, Sn
- H₂O – In: calibration in the fixed points H₂O, Ga, In
- H₂O – Ga: calibration in the fixed points H₂O, Ga
- Hg – Ga: calibration in the fixed points Hg, H₂O, Ga

Measuring devices of relative humidity and temperature

Calibration for <i>relative humidity (RH)</i> in up- to 5 different points for one point of temperature.		
Code	Method	Price
CAL-TEM-601	Calibration by comparison in a chamber under controlled conditions by the use of a standard Pt100 as reference standard.	170 €+30 €/extra RH point+130 €/extra temperature (for same RH points)
Calibration for the parameter <i>temperature</i> in 5 points		
CAL-TEM-602	Calibration by comparison in a chamber under controlled conditions by the use of a standard Pt100 as reference standard.	120 € + 30 € / extra point of temperature
Calibration of instruments for measurement of dew point in 5 points		
CAL-TEM-603	Calibration by comparison in a chamber under controlled conditions by the use of a reference standard of dew point measurement	200 € + 50 € / extra point
Calibration of dew point measuring instruments (-30 °C to + 90 °C) by the standard humidity generator		
CAL-TEM-604	Realization of dew point by the use of standard humidity generator	120 € / measurement point

Laboratory furnaces, temperature chambers, baths, incubators etc

Laboratory furnaces, temperature chambers, baths, incubators etc (on site calibrations)		
Code	Method	Price
CAL-TEM-701	Determination of temperature profile in several geometrical points (min 9 points)	150 € + 30 € / geometrical point for one temperature + 100 € extra temperature value
CAL-TEM-702	Calibration of temperature and relative humidity sensors	150 € + 30 €/ value of temperature + 40 € / value of humidity + 30 € / sensor

Note: The number points is such that the distance between 2 successive points is less than 1 m.

Calibration of Furnaces with isothermal block (dry block calibrator)

Code	Range	Method	Price (€)
CAL-TEM-801	to 350 °C	Calibration by use of 2 Pt100 according to the requirements of the standard EA-10/13	550
CAL-TEM-802	to 1200 °C		800

(CAL-TEM-999) Calibration services upon special review.

2.7. DIMENSIONAL CALIBRATION SERVICES (CAL- DIM)

Calibration of gauge blocks

Code	Type	Price	
CAL-DIM-100	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-110	gauge blocks 0 – 100 mm	Calibration of central length, flatness and parallelism [by interferometry] (ISO 3650) (grade K, 0) Uncertainty: $\{(25^2+0,41^2L^2)^{0.5}$ (nm), L in mm}	200 € + 25 € /piece
CAL-DIM-120		Block to block calibration by comparison for central length, flatness and parallelism(ISO 3650) (grade K,0,1,2), Uncertainty: $\{(50^2+L^2)^{0.5}$ (nm), L in mm}	150 € + 20 € / piece
CAL-DIM-121		Calibration by comparison with 9 gauge blocks for central length, flatness and parallelism (ISO 3650) (grade 0,1,2), Uncertainty: $\{(100^2+L^2)^{0.5}$ (nm), L in mm}	100 € + 20 € / piece
CAL-DIM-130	gauge blocks 100 – 1000 mm	Calibration by use of contact sensors and interferometry (ISO 3650), uncertainty: $\{(200^2+L^2)^{0.5}$ (nm), L in mm}	150 € + 70 € / piece
CAL-DIM-131	Rods 0 – 1000 mm	Calibration/measurement by use of contact sensors and interferometry, Uncertainty: $\{(400^2+L^2)^{0.5}$ (nm), L in mm}	150 €+70 € / piece

Calibration of angle gauge blocks and objects

Code	Type	Price	
CAL-DIM-200	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-210	Angle blocks	Use of rotary table and autocollimator	150 €+70 €/piece
CAL-DIM-220	Optical polygons (12 sides)		700 €/ piece
CAL-DIM-221	Optical polygons (24sides)		1.400 €/ piece
CAL-DIM-222	Other Optical polygons		Upon review
CAL-DIM-230	Protractors	Use of angle table	120 €/ piece

Calibration cylinder, spheres, rings and Straightness standards

Code	Type	Price	
CAL-DIM-300	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-310	Diameter measurements	Use of Mahr 828	100 €+50 €/piece
CAL-DIM-311	Roundness, Straightness, squareness measurements	Use of Talyrond 290	120 €/piece
CAL-DIM-320	Straightness standards (Knife Edges)	Use of Talyrond 290	120 €/piece
CAL-DIM-330	Cylinders	Use of Mahr 828 and Talyrond 290	350 €/piece

Calibration of flatness and roughness of standards and objects

Code	Type	Price	
CAL-DIM-400	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-410	Optical flats	Use of monochromatic light	50 € +200 €/piece
CAL-DIM-415	Optical parallel	Calibration by use of monochromatic light and comparator	100 € + 200 €/piece
CAL-DIM-420	Surface flatness	On site calibration by use of laser	from 760 €/piece

		interferometer	
CAL-DIM-430	Surface roughness	Calibration with stylus instrument (-250 µm to +250 µm) vertically on the surface	100 € + 150 €/piece

Calibration of laser dimensional measurements

Code	Type	Method	Price
CAL-DIM-510	Laser 633 nm	By comparison to the iodine stabilized He-Ne laser	550 € / piece
CAL-DIM-511	Laser 543 nm	By comparison to the iodine stabilized He-Ne laser	550 € / piece

Calibration of rulers and microscales

Code	Type	Price	
CAL-DIM-600	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-610	Line scales	Use of microscope up-to 200X100 mm	(50 €+10 €/point)/ piece
CAL-DIM-620	High accuracy rulers (glass scales)	Use of microscope up-to 200 mm	150 € / piece
CAL-DIM-621	Rulers 0 – 200 mm		50 €+10 €/piece
CAL-DIM-630	Rulers 200 - 2000 mm	Use of laser interferometer	150 € / piece

Calibration of measuring instruments

Code	Type	Price	
CAL-DIM-700	Standard calibration fee	Defined per each individual service	
Code	Type	Method	Price
CAL-DIM-710	Levels	Use of rotary table	30 €+50 €/piece
CAL-DIM-711	Square Levels	Use of rotary table and measurement of straightness, parallelism and squareness	100 € + 100 € / piece
CAL-DIM-720	Calipers 0 – 300 mm	Use of gauge blocks	70 €+50 €/piece
CAL-DIM-721	Calipers 300 – 1000 mm		80 € + 100 € / piece
CAL-DIM-730	Micrometers	Measurements in one axis UMM	50 € + 100 € / piece
CAL-DIM-731	Depth gauge		50 €+10 €/piece
CAL-DIM-732	Fillers	Measurements in one axis UMM	100 € + 50 € / piece
CAL-DIM-740	2-Dimensional measurements	Use of CMM in two (2) dimensions	100 € + (from 200 € /piece) depending on number of measurements
CAL-DIM-741	3-Dimensional measurements	Use of CMM in three (3) dimensions	
CAL-DIM-750	Dimensional measurements (length, angles, etc)	Use of optical microscope up-to 200 mm X 100 mm	
CAL-DIM-760	Angles	Use of Talyrond 290 or CMM	100 €+90 €/piece

Mechanical comparators of gauges blocks and CNC machines

Code	Type	Method	Price
CAL-DIM-810	Gauge blocks mechanical comparators	On site calibration by use of gauge blocks	500 € / piece
CAL-DIM-820	CNC machines	On site calibration by use of laser interferometer	From 1000 € / piece

(CAL-DIM-999) Calibration services upon special review.

2.8. ELECTRICAL CALIBRATION SERVICES (LOW FREQUENCIES CAL-ELF)

Calibration for Resistance

<u>Calibration of standard resistors in one or more values of current and temperature.</u>				
Temperature: 23 °C±0,01 °C (oil resistors), 23 °C±0,5 °C (air resistors)				
Code	Range	Uncertainty	Method	Price
CAL-ELF-101	100μΩ to <1Ω	1- 3 ppm	Comparison with standard resistance by use of Bridge Comparator of current and Range Extender. Max value of current: 10A	180 €+ 60 € extra current value + 100 €/extra temperature value
CAL-ELF-102	0,1Ω - 10 kΩ	1 ppm	Comparison with standard resistance by use of Bridge Comparator of current	150 € + 40 €/extra current value + 70 €/extra temp. value
CAL-ELF-103	1Ω - 10 kΩ in steps of decade	Min 0,005 ppm	Comparison with the primary standard (Quantum Hall Effect), by use of Cryogenic bridge	400 € + 100 € / extra temp. value
CAL-ELF-104	1Ω - 100 MΩ	> 10 ppm	Comparison with standard resistance by use of multimeter	100 € + 50 €/ extra temp. value

<u>Calibration of Resistance standards in one value of voltage and one temperature</u>				
Temperature: 23 °C±0,01 °C (oil resistors), 23 °C±0,5 °C (air resistors)				
Code	Nominal value	Uncertainty	Method	Price
CAL-ELF-105	$\frac{>10 \text{ k}\Omega - 100 \text{ M}\Omega}{\text{M}\Omega}$	2 - 6 ppm	Comparison with standard resistance by use of potentiometer method	150 €+40 €/extra voltage value+70 €/extra temp. value

<u>Calibration of Resistance standards in two values of voltage and one temperature</u>				
Temperature: 23 °C±0,5 °C				
Code	Nominal value	Uncertainty	Method	Price
CAL-ELF-106	$\frac{>100 \text{ M}\Omega - 1 \text{ T}\Omega}{\text{T}\Omega}$	10 - 200 ppm	Comparison with standard resistance by use of modified Wheatstone bridge	180 €+70 €/ extra voltage value+100 €/ extra temp. value
CAL-ELF-107	$\frac{>1 \text{ T}\Omega - 100 \text{ T}\Omega}{\text{T}\Omega}$	200 -600 ppm		200 €+70 €/extra voltage value+100 € /extra temp.value
CAL-ELF-108	$\frac{>100 \text{ T}\Omega - 10 \text{ P}\Omega}{\text{P}\Omega}$	>0,3%		180 €+70 €/extra voltage value+100 € / extra temp. value

<u>Measurement of Resistance of Surface Insulation according to the standard ELOT EN 1081:1998</u>			
Code	Uncertainty	Method	Price
CAL-ELF-110	>1% depends on the conditions of measurement (on site measurements)	On site measurements in one voltage value and in 5 points of surface.	400 € + 200 € / 5 extra points

<u>Calibration of Decade Resistances (calibration in one temperature).</u>				
Temperature: 23 °C±0,5 °C				
Code	Range	Uncertainty	Method	Price
CAL-ELF-120	1Ω -100 MΩ	>20 ppm	Use of resistance calibrator	120 € +40 €/extra decade

<u>Calibration of Resistance calibrators</u>				
Temperature: 23 °C±0,5 °C				

Code	Range	Uncertainty	Method	Price
CAL-ELF-130	1Ω -100 MΩ	>1 ppm	Comparison with standard resistor by use of multimeter	150 € + 50 €/ extra resistance

Calibration of Resistance Bridge for current comparison to measure Resistance

Temperature: 23 °C±0,5 °C

Code	Range	Uncertainty	Method	Price
CAL-ELF-140	1Ω -10 kΩ	>1 ppm	Calibration for the ratio 10:1. Measurement of standard resistance	700 €
CAL-ELF-141			Linearity of the bridge for the ratio from 10 Ω to 100 Ω	500 €
CAL-ELF-142			Calibration for the ratio 1:1 Measurement of standard resistance	300 €

Calibration of DC voltage standards

Calibration of Zener standards in one value of voltage and one temperature value

Temperature: 23 °C±0,5 °C

Code	Range of measurement	Uncertainty	Method	Price
CAL-ELF-201	10 V, 1,018V	0,2 ppm	Min 20 measurements points in 10 days by comparison with group of 4 Zener Standards	350 €

Calibration DC OF Report Standards

Lower possible uncertainty: It depends on the to calibration appliance

Code	Range	Method	Price
CAL-ELF-202	1V -10V	Comparison with the primary Josephson standard (only upon request)	From 520 €/ voltage value

Calibration of digital volt- meters

Lower possible uncertainty: It depends on the to calibration appliance

Code	Range	Method	Price
CAL-ELF-203	100mV -10 V	Comparison with the primary standard Linearity of one scale. 20 measurement points for two voltage polarities.	350 €+200 € /linearity in other scale

Calibration of calibrators DC voltage ⇒ see Multifunction Calibrator CAL-ELF-701,702,751,752

Calibrations for Voltage ratio

Calibration of voltage divider

Code	Range	Uncertainty	Method	Price
CAL-ELF-251	1:10 and 1:100	0,5 ppm	Ratios 1000 V:10 V , 100 V: 10 V voltage input max 1000 V comparison with standard divider	400 €

Calibration appliances as for the size of Capacity

Calibration of standard capacitors

Code	Range	Uncertainty	Method	Price
CAL-ELF-301	10pF -100 nF	>1 ppm	Calibration in one frequency value frequency:1 kHz, 1,452 kHz Comparison with standard capacitor and use of bridge	200 €+80 € /extra value of frequency
CAL-ELF-302	1 aF - 10 μF	>10 ppm	Calibration in one frequency and one temperature value. Frequency: 10 Hz to 100 kHz.	160 €+ 60 € / extra value of frequency

			Use of Bridge	
CAL-ELF-303	0,01fF - 9,9999F	>0,05%	Calibration in one value of frequency. Frequency:20 Hz to 1MHz calibration with counter LCR .	120 € + 50 € / extra value of frequency
CAL-ELF-304	0,1fF - 100mF	>0,15%	Calibration in one frequency value. Frequency:5 Hz to 13MHz calibration with LCR meter	120 € + 50 € / extra value of frequency

Calibration of decade capacitors				
Code	Range	Uncertainty	Method	Price
CAL-ELF-305	1 pF - 10 μF	> 10 ppm	Calibration of 1 st decade in one frequency and temperature value. Frequency: 10 Hz to 100 kHz. Calibration by the use of Bridge	250 €+ 60 € / extra frequency value+100 € / extra decade
CAL-ELF-306	0,01fF - 9,9999F	>0,05%	Calibration of the first decade in one value of frequency. Frequency:20 Hz to 1MHz calibration with counter LCR.	170 €+ 50 € / extra frequency value+90 € /extra decade
CAL-ELF-307	0,1fF - 100mF	>0,15%	Calibration of the first decade in one value of frequency. Frequency:5 Hz έως 13MHz calibration with counter LCR .	170 €+50 € /extra frequency value + 90 € / extra decade

Calibration of Bridge comparison Capacity				
Code	Range	Uncertainty	Method	Price (€)
CAL-ELF-308	1 pF - 1 μF	> 7 ppm	Frequency values 50 Hz, 100 Hz, 400 Hz, 1 kHz, 1,452 kHz Use of standard capacitors	800
CAL-ELF-309	1 pF - 1 μF	-	In 5 frequency values different from CAL-ELF-308	1.000

Calibration of Counters LCR				
Code	Range	Uncertainty	Method	Price (€)
CAL-ELF-310	1 pF - 100 μF	> 100 ppm	Frequency values 50 Hz, 100 Hz, 400 Hz, 1 kHz, 5 kHz Use of standard capacitors	500
CAL-ELF-311	1 pF - 100 μF	> 100 ppm	In 5 frequency values different from CAL-ELF-310	700

Calibrations of appliances as for the factor loss

Calibration of Standard capacitors				
Code	Range	Uncertainty	Method	Price
CAL-ELF-351	0 - 0,1	>8X10 ⁻⁶	Calibration in one frequency and one temperature value Frequency: 10 Hz to 100 kHz. Use of bridge	160 €+60 € / extra frequency value

Calibrations of appliances as for the size of DC Intensity

Calibration of digital Ampere- meters				
Code	Range	Uncertainty	Method	Price
CAL-ELF-401	1μA - 10A	>0,2 ppm	Calibration with reference generator in temperature 23°C± 0,5°C. (number of measurement per scale depends on the calibrated device)	From 60 €
CAL-ELF-402	10A - 100A	depends on the device	Measurement with resistance shunt	Upon review.

Calibration of calibrators DC voltage ⇒ see Multifunction Calibrator) CAL-ELF-703, CAL-ELF-753

Calibrations AC/DC transfer

<u>Calibrations that concern AC/DC difference</u>					
Method: Comparison with AC/DC standard standard. Temperature: 23 °C. Range: 10 Hz- 1 MHz					
Code	Device	Range	Uncertainty	Measurement points	Price
CAL-ELF-501	AC/DC voltage transfer standards	2 mV-1000 V	>0,2 ppm	Upon request	Upon review
CAL-ELF-502	AC/DC voltage transfer standard, Fluke 792A	2 mV-1000 V	>0,2 ppm	350	2000
CAL-ELF-503	AC/DC voltage transfer standard Fluke 5790	10 mV - 1000 V	>0,2 ppm	250	1800
CAL-ELF-504	AC/DC voltage transfer standard, 1395A	0,45V, 1V, 3V, 6V	>0,2 ppm	5 frequency values	890

<u>Calibration that concern AC/DC difference</u>					
Method: Comparison with AC/DC standard. Temperature 23 °C. Frequency: 1 MHz έως 100 MHz					
Code	Device	Range	Uncertainty	Measurement points	Price
CAL-ELF-505	AC/DC voltage transfer standard Standards in high frequency values	500 mV-30 V	>40 ppm	Upon request	Upon review

<u>Calibrations that concern AC/DC difference</u>					
Method: Calibration with generator in temperature 23°C± 0,5°C. The number of measurement points per scale depend on the device.					
Code	Device	Range	Uncertainty	Measurement points	Price
CAL-ELF-506	Digital AC Volt-meters	100mV - 1000 V	15 - 2600 ppm	Upon request	From 40 €
CAL-ELF-507	Digital AC current meters	10 mA - 20A	70 - 190 ppm	Upon request	From 40 €

<u>Calibrations for AC Voltage</u>					
Method: Comparison of DC reference values of the device under calibration with a digital Multimeter to calculate the AC Voltage function characteristics. Temperature 23 °C. Frequency: 10 Hz to 1 MHz Comparison with standard report AC/DC transfer					
Code	Device	Range	Uncertainty	Measurement points	Price
CAL-ELF-508	AC/DC Standards, Fluke 5790	10 mV-1000 V	>0,2 ppm	250	300

Calibration of calibrators' AC Voltage and AC Volume ⇒ See multifunction calibrators CAL-ELF-700, 750.

Calibrations of digital multimeters for the following parameters:

- DC Voltage: 10 μV to 1200V
- DC Current: 2μA to 10A
- AC Voltage: 1mV to 750V, 10Hz to 100kHz
- AC Current: 2μA to 10A, 10Hz to 20kHz
- Resistance: 10Ω to 100MΩ

- Frequency: 10Hz to >100MHz

Method: According to EA-10/15 procedure. (Temperature 23°C±0,5°C).			
Code	Appliance for calibration	Uncertainty	Price
CAL-ELF-601	3 ½ digits	Depending on the device	50 € +30 €/per parameter
CAL-ELF-602	4 ½ digits		50 € +40 €/ per parameter
CAL-ELF-603	5 ½ digits		50 € +50 €/ per parameter
CAL-ELF-604	6 ½ digits		50 € +60 €/ per parameter
CAL-ELF-605	7 ½ digits		50 € +70 €/ per parameter
CAL-ELF-606	8 ½ digits		50 € +80 €/ per parameter

Calibrations of Multifunction Calibrators of High Accuracy

Method: Measurement with Reference Multimeter (Temperature 23°C± 0,5°C)					
Code	Type	Range	Uncertainty	Measurement points	Price
CAL-ELF-701	DC Voltage	10 μV-1200V	>2 ppm	First scale-5 points of measurement	70 € +40 €/ extra scale
CAL-ELF-702		1 V - 20V	>2 ppm	Control of linearity-10 measurement points	70 € +40 €/ extra scale
CAL-ELF-703	DC Volume	2μA - 10A	>2 ppm	First scale-5 points of measurement	70 € +40 €/ extra scale
CAL-ELF-704	AC Voltage	1mV - 750V, 10Hz-100kHz	>15 ppm	First scale-5 measurement points	70 € +40 €/ extra scale
CAL-ELF-705	AC Volume	2μA - 10A, 20Hz - 10kHz	>60 ppm	First scale-5 measurement points	70 € +40 €/ extra scale
CAL-ELF-706	Resistance	0,1Ω - 100MΩ	>1 ppm	First scale-5 measurement points	70 € +40 €/ extra scale
CAL-ELF-707	Frequency	10Hz - >100MHz		All the scales-2 measurement points	70 €
CAL-ELF-749	Regulation				100 €

Calibrations of Multifunction Calibrators of Low Accuracy

Method: Measurement with reference multimeter (Temperature 23°C± 0,5°C)					
Κωδικός	Parameter	Range	Uncertainty	Measurement points	Price
CAL-ELF-751	DC Voltage	10 μV - 1200V	>10 ppm	First scale-5 measurement points	30 € +20 €/ extra scale
CAL-ELF-752		1 V - 20V	>10 ppm	Linearity control-10 measurement points	30 € +20 €/ extra scale
CAL-ELF-753	DC Volume	2μA - 10A	>10 ppm	First scale-5 measurement points	30 € +20 €/ extra scale
CAL-ELF-754	AC Voltage	1mV-750V, 10Hz-100kHz	>100 ppm	First scale-5 measurement points	30 € +20 €/ extra scale
CAL-ELF-755	AC Volume	2μA - 10A, 20Hz -10kHz	>100 ppm	First scale-5 measurement points	30 € +20 €/ extra scale
CAL-ELF-756	Resistance	0,1Ω - 100MΩ	>10 ppm	First scale-5 measurement points	30 € +20 €/ additional scale
CAL-ELF-757	Frequency	10Hz- >100MHz		All the scales-2 measurement points	30 €
CAL-ELF-799	Regulation				100 €

Calibrations of Temperature Simulators

Calibrations of Temperature Simulators					
Measurements: 15 points of measurement in the whole scale of temperature					
Code	Parameter	Range	Uncertainty	Method	Price
CAL-ELF-801	DC Voltage	-100°C to 1500°C	>0,1°C	Thermocouple with compensation of cold junction. Measurement with reference thermocouple to ice temperature	200 €
CAL-ELF-802		-100°C to 1500°C	>0,1°C	Voltage measurement	150 €
CAL-ELF-803	Resistance	-100°C to 500°C	0,004°C	Thermocouple with compensation of cold junction. Resistance measurement	250 €

Calibrations of Temperature Bridges as for the size of Resistance

Method: Calibrations with Standard Resistance (10 points of measurement/ scale of measurement)			
Code	Range of measurement	Uncertainty	Price
CAL-ELF-851	10Ω to 500Ω	>2ppm	250 € + 120 €/ extra scale of measurement or channel of input +50 €/ extra measurements

Calibration that concern Energy

Size: Electric Energy and Force					
Code	Device	Range	Uncertainty	Method	Price
CAL-ELF-901	Reference Standard of energy/power, verification of energy meters	until 115 kVA one phase: until 38 kVA	>0,02% (k=1.0,0.8c) >0,1% (k=0.5i)	Voltage: 48V-320 V, Volume: 2mA-120A Frequency: 45-65 Hz. 4w/3Φ- 3w/3Φ	From 1100 €
CAL-ELF-902	Power Comparator				From 1300 €
CAL-ELF-903	Power Standard	until 115 kVA one phase: until 38 kVA	>0,009% (k=1.0)	Voltage: 48V -320 V, Volume: 2mA- 120A Frequency: 45-65 Hz.	From 600 € upon review
CAL-ELF-904	Force gauge-Watt-meter	until 38 kVA	>0,02%		From 500 € upon review

Size: DC Voltage and energy					
Code	Device	Range	Uncertainty	Method	Price
CAL-ELF-905	Reference Standard of energy/power, verification of energy meters	1 V - 10 V	1 ppm	Calibration by use of multifunction calibrator	80 €
CAL-ELF-906	Energy meter	115 kVA	0,04%	Voltage: 48V- 320 V, Volume: 2mA-120A k: -1 until +1 Frequency:45-65 Hz. Comparison with reference standards	From 50 € upon review

Size: Error Ration, phase displacement					
Code	Device	Range	Uncertainty	Method	Price
CAL-ELF-907	Current Transformer	±0,050, ±100,0'	>4x10 ⁻⁵ 0,5'	Comparison with the Primary Standard. Linearity of one scale. 20	From 100 € upon review

				points of measurement f	
CAL-ELF-908	Voltage Transformer	$\pm 0,050,$ $\pm 100,0'$	$> 1 \times 10^{-6}$ $0,5'$	Linearity in other scale. 20 points of measurement.	From 100 € upon review
CAL-ELF-909	Phase meter				From 300 €

Special Calibrations

Code	Appliance for calibration	Price
CAL-ELF-951	Transfer Standard Multifunction Wavetek 4950 (calibration)	1615 €
CAL-ELF-952	Electronic indicators of loadcells (calibration)	300 €
CAL-ELF-953	Electronic indicators of dynamo- cells (calibration+ regulation)	400 €
CAL-ELF-954	Data loggers	300 €

(CAL-ELF-999) Calibration services upon special review

2.9. TIME- FREQUENCY CALIBRATION SERVICES(CAL-TFR)

Calibration of Time Standards and Instruments

Code	Description	Price
CAL-TFR-101	Rubidium Frequency Standard Racal 9475	From 350 €
CAL-TFR-102	Cesium Time Standard	From 1.470 €

Calibration of Time Standards and Instruments

Code	Description	Price
CAL-TFR-201	Simple Chronometers	From 90 €
CAL-TFR-202	Calibration of counters (any model) based on Time (Measurement of difference phase from the primary standard of time & frequency - range of measurement 10 MHz)	From 160 €

Calibration of Devices for Speed Control of Vehicles

Κωδικός	Description	Τιμή
CAL-TFR-301	Lidars (in EIM)	250 €
CAL-TFR-302	Piezoelectric and closed loop systems (on site - 2 systems per day)	200 €

(CAL-TFR-999) Calibration services upon special review

2.10. ELECTRICAL CALIBRATION SERVICES (HIGH FREQUENCIES, CAL-EHF)

Calibration of Oscilloscopes

Method: By use of Wavetek 9500, according to EA-10/07 & VDI/VDE/DGQ/DKD 2622 Blatt 4			
Code	Device	Range	Price
CAL-EHF-101	Oscilloscopes (2 channels)	BW<60 MHz	150 € +30 €/extra channel and 30 € / extra time base
CAL-EHF-102		60 MHz<BW<200 MHz	180 € +30 €/ extra channel and 30 € / extra time base
CAL-EHF-103		200 MHz<BW<500 MHz	210 € +30 €/ extra channel and 30 € / extra time base
CAL-EHF-104		BW>500 MHz	250 € +30 €/ extra channel and 30 € / extra time base
CAL-EHF-105		Characteristics	Upon review

Calibrations concerning reflection coefficient

Devices: 1-port termination			
Code	Range	Method	Price
CAL-EHF-201	-1 until 1	45 MHz - 26,5 GHz, 3,5mm, N-type Electrical calibration by use of network analyzer	From 100 €

Calibrations concerning reflection and transmission coefficients

Devices: Attenuators and set of exactly similar attenuators of fixed value- (2-port)			
Code	Range	Method	Price
CAL-EHF-250	-	Standard calibration fee	70 €
CAL-EHF-251	0 dB -60 dB	45 MHz - 26,5 GHz, up-to 30 frequencies, electrical calibration. Measurement with network analyzer.	50 €
CAL-EHF-252	0 dB -60 dB	45 MHz - 26,5 GHz-30, up-to 30 frequencies, electrical calibration with network analyzer	60 €

Appliance of calibration: splitter –(3-port)

Code	Range	Method	Price
CAL-EHF-253	Type N	45 MHz - 18 GHz. Electrical characterization, inspection of connectors, calculation of equivalent reflection coefficients with network analyzer	From 300 €
CAL-EHF-254	3,5 mm	45 MHz - 26,5 GHz. Electrical characterization, inspection of connectors, calculation of equivalent reflection coefficients with network analyzer	From 300 €

Note: the standard calibration fee is assigned for each attenuator of group of attenuators, which do not make a set of similar attenuators.

Calibrations of generators

Method: According to the instructions of the manufacturers				
Code	Device		Range	Price (€)
CAL-EHF-301	Generator of sinusoidal signals	Tektronix SG-503	250 kHz-250 MHz	From 300
CAL-EHF-302	Central unit of sweep oscillator	HP 8350B		From 380
CAL-EHF-303	Portable generator	HP 85640A	300 kHz until 2,9 GHz	from 380
CAL-EHF-304	Signal generator	Wiltron 6769B	Until 26,5 GHz	After review
CAL-EHF-305		Markoni 2022C	10 kHz - 1 GHz	After review
CAL-EHF-306	Synthesized signal generator	HP 8673E	2 - 18 GHz	After review
CAL-EHF-307	High power sweep generator	HP 83623B	0,01 - 20 GHz	After review
CAL-EHF-308	Synthesized / sweep generator	HP 83623L	0,01 - 20 GHz	After review

CAL-EHF-309		HP 83752A	0,01 - 20 GHz	Upon review
CAL-EHF-310	Calibration Generator	Tektronix PG506	-	From 380
CAL-EHF-311	Time Mark Generator	Tektronix TG-501	-	From 180
CAL-EHF-312	Function Generator	Tektronix FG-504	-	From 180

Calibrations of counters

Method: According to the instructions of the manufacturers				
Code	Device		Price	
CAL-EHF-400	Universal Counter	HP 5334A HP 5335A HP 5345A	320 € for basic configuration	
CAL-EHF-405		HP 5334A HP 5335A HP 5345A	380 € for basic configuration and extra option for extension frequency range up-to 1,3 GHz	

Method: According to the instructions of the manufacturers				
Code	Device		Range	Price
CAL-EHF-410	Frequency counter		Dagatron 7013	From 160 €
CAL-EHF-411	Pulse and CW frequency counter		EIP 585C	until 20 GHz 440 €
CAL-EHF-412	Microwave frequency counter		Agilent 5350B	440 €
CAL-EHF-413	Pulse / Microwave frequency counter		Agilent 5361B	until 26,5 GHz 440 €
CAL-EHF-414	Frequency counter, power meter and digital multimeter		Agilent 53148A	From 320 €
CAL-EHF-415	Frequency counter and power meter		Agilent 53151A	From 465 €

Note: the price 320 € of the service CAL-EHF-414 includes only the calibration of the frequency counter. The calibration of the power meter and the digital multimeter are not included.

Calibrations concerning RF power

Method: Effective efficiency (comparison with calibrated standard by microcalometer), reflection coefficient by use of Network Analyzer - Range of measurement: 0,8 - 1 . Uncertainty: 0,9-1,5 %				
Code	Description		Price	
CAL-EHF-500	Standard due of calibration		1000 €	
Code	Device	Range	Price	
CAL-EHF-501	Coaxial Power Standards	TEGAM/ WEINSCHEL F1119, 1109N	10 MHz-18 GHz	10 €/ Frequency specified points(*)
CAL-EHF-502			Upon review in non-specified points(*)	
CAL-EHF-503		TEGAM/ WEINSCHEL 1807A	10 MHz-18 GHz	10 €/ Frequency in specified points
CAL-EHF-504			Upon review in non-specified points	
CAL-EHF-505		TEGAM/ WEINSCHEL F1117AC	50 MHz-26,5 GHz	10 €/ Frequency in specified points
CAL-EHF-506			Upon review in non-specified points	
CAL-EHF-507	Thermistor Mounts	HP 478A	10 MHz-10 GHz	10 €/ Frequency in specified points
CAL-EHF-508			Upon review in non-specified points	
CAL-EHF-509		HP 8478B	10 MHz-18 GHz	10 €/ Frequency in specified points
CAL-EHF-510			Upon review in non-specified points	

Method: Frequency Response, Reflection coefficient, Effective Efficiency, Measurement with reference power meter - Range of measurement: 0,8 – 1. Uncertainty: 1,5 - 3,0 %				
Code	Device		Range	Price
CAL-EHF-521	Power Sensors	HP 8481D	10 MHz-18 GHz	From 220 €
CAL-EHF-522		HP 8481A	10 MHz-18 GHz	From 220 €
CAL-EHF-523		HP 8485D	50 MHz-26,5 GHz	From 220 €
CAL-EHF-524		IFR 6923	10 MHz-26,5 GHz	From 220 €
CAL-EHF-525		HP 8483A	100 kHz έως 2 GHz	From 220 €

CAL-EHF-526		HP 8485A	50 MHz-26,5 GHz	From 220 €
CAL-EHF-527		IFR 6913	10 MHz-26,5 GHz	From 220 €
CAL-EHF-528		HP E4413A	50 MHz-26,5 GHz	From 220 €
CAL-EHF-529	Thermistor Mount	HP 478A	10 MHz-10 GHz	From 220 €
CAL-EHF-530	Thermistor Mounts (TEGAM/WEINSCHTEL F1109N) by use of secondary standard		10 MHz-18 GHz (in more than 24 specified points)	From 220 €
CAL-EHF-531	Thermistor Mounts (TEGAM/WEINSCHTEL F1116) by use of secondary standard		0,1 MHz-10 MHz (in more than 9 specified points)	From 220 €

Method: Zero check, power measurement, reference power level, functionality check. Measurement with reference power meter and range calibrator.

Code	Device	Range	Price
CAL-EHF-540	Power meters HP 435B, HP 436A, HP 4418A, HP EPM441A, IFR 6970	30 kHz until 26,5 GHz	From 240 €

Note: The frequency points are specified by EIM.

Calibration of Spectrum Analysers

Method: According to the instructions of the manufacturer by the use of standard generators, sensors and power meters, oscilloscopes and frequency counters - **Range:10 Hz – 26,5 GHz**

Code	Device	Description	Price
CAL-EHF-601	Portable Spectrum Analysers	Calibration for basic configuration	From 350 €
CAL-EHF-602	Portable Spectrum Analysers	Calibration for basic configuration and additional options	Upon review
CAL-EHF-603	Spectrum Analysers	Calibration for basic configuration	From 700 €
CAL-EHF-604	Spectrum Analysers	Calibration for basic configuration and additional options	Upon review

Special calibrations

Code	Device	Method	Price
CAL-EHF-951	Attenuators HP 350D	Use of calibrator and multimeter	250 €

(CAL-EHF-999) Calibration services upon special review

3. SERVICES FOR TYPE APPROVAL OF MEASURING DEVICES

EIM provides services and issues the respective reports of results, according to the law 2231/94 (article 1, paragraph 4), for the type approval of measuring devices. The reports of these services are submitted to the notified body, which is responsible for granting type approval. These services are provided by the laboratories of EIM as follows.

Code	Measurement Field	Price
TAP-MAS-100	Mass	After review
TAP-DEN-100	Density	After review
TAP-ELF-100	Electrical Low Frequencies	After review
TAP-EHF-100	Electrical Higher Frequencies	After review
TAP-FOR-100	Force	After review
TAP-FLO-100	Flow of liquids	After review
TAP-VOL-100	Volume	After review
TAP-TOR-100	Momentum	After review
TAP-PRE-100	Pressure	After review
TAP-TEM-100	Temperature	After review
TAP-DIM-100	Dimensional	After review
TAP-OPT-100	Optical- Photometry	After review
TAP-ACO-100	Audits	After review
TAP-TFR-100	Time- Frequency	After review

4. SERVICES OF METROLOGICAL SUPPORT (MES)

(MES-TKT) Training and Know- how transfer

MES-TKT-110: Training in open seminar

Description: Seminars of 7 to 8 hours/day in subjects assigned by EIM are organised in EIM and outside EIM for participants from different organizations.

Price: 300 € / day of participant

MES-TKT-120: Training in closed seminar in the facilities of EIM

Description: Seminars of 7 to 8 hours/day in subjects assigned by EIM are organised in EIM for participants coming from the same organization.

Price: 300 € / day of participant

MES-TKT-121: Training in closed seminar in the facilities of the client.

Description: Seminars of 7 to 8 hours/day in subjects assigned by EIM are organised in the facilities of the client participants coming from the same organization.

Price: 300 € / day of participant + extra cost for transportation, accommodation, etc.

MES-TKT-130: Training in closed or opened seminar funded by programs

Description: Seminars of 7 to 8 hours/day in several subjects in metrology and related areas.

Price: Determined according to the status and the rules of the programs

MES-TKT-140: Specialized training and know- how transfer

Description: Training and transport of highly specialized know-how and applications in subjects assigned according to special review of needs and requirements.

Price: 500 €/day of participant + extra cost for transportation, accommodation (for on-site)

(MES-CON) Consulting Services

MES-CON-210: Special consulting services in specialized subjects of metrological and laboratory support.

Description: Specialized support in subjects of:

- Selection and evaluation of laboratory equipment based on metrological needs and requirements
- Uncertainty balances and calculation of measurement uncertainties
- Development of measurement procedures and processes
- Laboratory organization and management
- Interpretation and analysis of measurement results
- Evaluation, inspection and auditing of laboratories, according to the requirements of standards

Price: 80 € / man-hour + extra cost for transportation, accommodation (for on-site)

MES-CON-220: Consulting Services with demonstration of measurements

Description: Support and transfer of know-how in limited number of participants of the client.

Price: 300 € / day of participant

(MES-INT) Services for Proficiency Testing– Coo laboratorial Measurements

MES-INT-310: Multilateral Inter-laboratory Measurement Schemes

Description: Schemes of inter-laboratory comparison measurements with the participation of at least two laboratories.

Price: Determined upon review

MES-INT-311: Multilateral Inter-laboratory Measurement Schemes (in mechanical measurements)

Description: Schemes of inter-laboratory comparison measurements with the participation of at least two laboratories in the field of mechanical measurements.

Price: Determined upon review

MES-INT-312: Multilateral Inter-laboratory Measurement Schemes (in physical measurements)

Description: Schemes of inter-laboratory comparison measurements with the participation of at least two laboratories in the field of physical measurements.

Price: Determined upon review

MES-INT-313: Multilateral Inter-laboratory Measurement Schemes (in electrical measurements)

Description: Schemes of inter-laboratory comparison measurements with the participation of at least two laboratories in the field of electrical measurements.

Price: Determined upon review.

MES-INT-320: Bilateral Inter-laboratory Measurement Schemes

Description: Bilateral inter-laboratory measurement scheme between the client laboratory and one of the laboratories of EIM.

Price: Determined upon review.

MES-INT-321: Bilateral Inter-laboratory Measurement Schemes (in mechanical measurements)

Description: Bilateral inter-laboratory measurement scheme between the client laboratory and one of the laboratories of EIM in the field of mechanical measurements.

Price: Determined upon review.

MES-INT-322: Bilateral Inter-laboratory Measurement Schemes (in physical measurements)

Description: Bilateral inter-laboratory measurement scheme between the client laboratory and one of the laboratories of EIM in the field of physical measurements.

Price: Determined upon review.

MES-INT-323: Bilateral Inter-laboratory Measurement Schemes (in electrical measurements)

Description: Bilateral inter-laboratory measurement scheme between the client laboratory and one of the laboratories of EIM in the field of electrical measurements.

Price: Determined upon review.

5. DISCOUNTS IN SERVICE PRICES

5.1. Calibration Services

5.1.1. Discounts for Groups of Similar Instruments

Discounts are provided for the calibration of measurement instruments, which are calibrated at the same time: a) simultaneous in groups in the same measurements range and points, b) or/and through procedures which lead to scale economies of laboratory operation. The discount is determined according to the number of instruments, which meet the previous criteria as follows:

Number of instruments	Discount
From 2 up-to 4	10%
From 5 and higher	15%

It is noted that this discount is not provided for calibrations of sets of instruments and standards for which the catalog price is determined by a fixed calibration fee and a unit price per piece.

5.1.2. Discounts for Adjustment and Recalibration

Discount is provided for adjustment and recalibration after initial calibration. The amount of discount is 40% of the price of the calibration service, according to the catalog.

5.1.3. Scale Discounts based on Amount of Services

Scale discounts are provided according to the amount of the total service cost per each individual as follows.

Scale for total service cost of offer (€)	Amount of discount (€)	Scale discount (%)	Scale discount (€)	Total (cumulative) discount of offer (€)
0 – 3.000	0	0	0	0
3.000-6.000	6.000	10	300	300 € for offer of 6.000 €
Higher than 6.000		15		

Note:

As an example, the discount for an offer of calibration services of 20.000 € total, is determined as follows:

1. In the scale 3.000 – 6.000 $= (3000 * 10\%) = 300$ €
2. In the scale 6.000 – 20.000 $= (14.000 * 15\%) = 2.100$ €

In this respect:

1. The total discount amounts to 2.400 €
2. The final total cost to 17.600 €

An offer is considered to be supplementary of a previous offer (basic offer), if it is submitted while the execution of the previous offer is in progress. In this case, the supplementary offer follows the terms and conditions of the previous-basic offer.

5.2. Services for Type Approval

Discounts are provided according to the criteria of par.5.1.

5.3. Services of Metrological Support

5.3.1. Training Seminars (MES-TKT-110, 120, 121)

For any extra participation/day from the same organization in any seminar of the same cycle is provided discount 20%.

Note:

As an example, an Organization participates in a cycle of 3 open seminars of EIM of one (1) day each one with 9 days of participations. The total cost to be paid is calculated as follows:

- Cost of 1st participation/day: 300 € (MES-TKT-110)
- Cost of the rest of participations (2st, 3st,...9st): 240 €/day of participation

5.3.2. Training- Know- how transfer (MES-TKT-140)

Discounts are provided according to the criteria of par.5.1.

5.3.3. Consulting Services

Discounts are provided according to the criteria of par.5.1.

5.4 Discounts in Contracts

Discounts are provided for services offered according to contracts. The discounts are determined by the Management Council of EIM according to:

1. The initial total cost of the contract.
2. The period of the contract.
3. The Service Policy of EIM.

5.5 Discounts to Accredited Laboratories of the Country

Discount of the amount **30%** is provided to laboratories, which participate in inter-laboratory measurement schemes organized by EIM in the framework of their accreditation.