

Price List of the Physikalisch-Technische Bundesanstalt (valid starting on 1 October 2021)**1 Range of Services**

The Physikalisch-Technische Bundesanstalt (PTB) levies charges based on Section 4.2 of its General Terms and Conditions of Business (AGBs) for the following services:

1. Dissemination of the legal units according to Section 6 para 2 No. 1 Units and Time Act (EinhZeitG),
2. Dissemination of legal time according to Section 6 para 2 No. 2 Units and Time Act (EinhZeitG),
3. Dissemination of the temperature scale according to the International Temperature Scale of the International Metre Convention according to Section 6 para 2 No. 3 Units and Time Act (EinhZeitG),
4. Performance of tests and examinations in the field of metrology according to Section 6 para 3 No. 2 Units and Time Act (EinhZeitG),
5. Conformity assessments of the Conformity Assessment Body according to Section 14 in conjunction with Section 6 Measures and Verification Act (MessEG),
6. Assessment of the conformity of measuring devices for the measurement of ionizing radiation according to Section 14 para 4 Measures and Verification Act (MessEG) in conjunction with Section 1 No. 13 Measures and Verification Ordinance (MessEV),
7. Conformity surveillance; initiation of corrective action; restricting, suspending or withdrawing certificates of conformity according to Section 19 paras 3 and 4 Measures and Verification Act (MessEG),
8. Testing of the standard devices and auxiliary test devices according to Section 47 para 2 Measures and Verification Act (MessEG),
9. Conformity assessments of the suitability of measuring instruments for the updating of software according to Article 40 para 3 No.1 b) Measures and Verification Ordinance (MessEV),
10. Provisional conformity assessments of the metrological suitability of the updated software according to Article 40 para 4 No. 3 Measures and Verification Ordinance (MessEV),
11. Conformity assessment procedures according to Section 13 paras 1 und 2 of the 11th Directive on Product Safety Act (Machinery Directive, ProdSV),
12. Reference measurement procedures within the scope of quality assurance of quantitative medical laboratory examinations according to Section 9 of the Medical Devices Operator Ordinance (MPBetreibV) in conjunction with the Directive of the German Medical Association ("*Bundesärztekammer*") for Quality Assurance of Medical Laboratory Examinations (RiliBÄK),
13. Making facilities, equipment, rooms, materials, software and know-how available as well as deploying staff, and
14. Orders for research and development.

2 Charges and Costs

2.1

For the frequently recurring services that are listed in Annex 2, the charge corresponds to the fixed prices listed in Annex 2. Should the estimated time which will have to be expended for an order exceed or fall short of the time which was taken as a basis for the calculation of the fixed price stated in Annex 2 by more than 15 percent, then the charge will, however, be calculated in accordance with Section 2.2. below, i.e., on the basis of the time that was actually expended for the order.

2.2

The charges for all services that are not listed in Annex 2 are based on the time expended for the order, multiplied by the hourly rates listed in Annex 1.

PTB will invoice the actual time arising in the subject areas that are involved in carrying out the order. In this process, all time shares of all persons involved in carrying out the order and from all subject areas involved will be taken into account. Necessary travel times – insofar as these fall within working hours or are specially compensated – and necessary waiting times – insofar as the customer is responsible for these – will be added.

The smallest invoiced unit is 15 minutes.

2.3

In addition to charges, PTB will also invoice costs according to Sections 4.1 and 4.3 of the General Terms and Conditions of Business of PTB (AGBs).

2.4

The amounts listed in Annexes 1 and 2 are net prices. They do not include VAT. Therefore, legal value-added tax (valid standard rate) has to be added to all charges and costs.

3 Entry into Force

3.1

This price list takes effect on 1 October 2021. All orders placed as of this date for services according to Section 1 above will be invoiced in accordance with this price list. Services which were ordered before this price list took effect are, as a matter of principle, invoiced according to the rates which were valid at the time the order was placed.

3.2

This price list will become invalid upon publication of a new price list.

Annex 1: List of hourly rates per subject area

Subject Area	Organizational Unit	Hourly rate (net) (without VAT)
1 Acoustics, Ultrasound and Acceleration	Velocity	160 €
	Sound	
	Acoustics and Dynamics	
2 Flowrate	Gas Flow	167 €
	Liquid Flow	
	Heat and Vacuum	
3 Electricity and Magnetism	Direct Current and Low Frequency	186 €
	High Frequency and Electromagnetic Fields	
	Electrical Energy Measuring Techniques	
	Quantum Electronics	
	Semiconductor Physics and Magnetism	
	Electrical Quantum Metrology	
4 Ionizing Radiation	Radioactivity	204 €
	Dosimetry for Radiation Therapy and Diagnostic Radiology	
	Radiation Protection Dosimetry	
	Neutron Radiation	

Subject Area	Organizational Unit	Hourly rate (net) (without VAT)
	Radiation Effects	
5 Length and Dimensional Metrology	Imaging and Wave Optics	169 €
	Quantum Optics and Unit of Length	
	Surface Metrology	
	Dimensional Nanometrology	
	Coordinate Metrology	
	Interferometry on Material Measures	
6 Mass and Derived Quantities	Mass	180 €
	Solid Mechanics	
7 Metrology in Chemistry and Material Properties	General and Inorganic Chemistry	188 €
	Biochemistry	
	Physical Chemistry	
	Analytical Chemistry of the Gas Phase	
8 Metrology in Medicine	Biomedical Magnetic Resonance	176 €
	Biosignals	
	Biomedical Optics	
9 Radiometry and Photometry	Photometry and Spectroradiometry	194 €
	Applied Radiometry	
	Radiometry with Synchrotron Radiation	

Subject Area	Organizational Unit	Hourly rate (net) (without VAT)
	X-ray Metrology with Synchrotron Radiation	
10 Thermometry	Detector Radiometry and Radiation Thermometry	176 €
	Temperature	
	Cryosensors	
11 Time and Frequency	Time and Frequency	156 €
12 Mathematics and Metrological Information Technology	Mathematical Modelling and Data Analysis	147 €
	Metrological Information Technology	
13 Physical Safety Engineering and Explosion Protection	Explosion Protection in Energy Technology	196 €
	Explosion Protection in Sensor Technology and Instrumentation	
	Fundamentals of Explosion Protection	
14 Other services	Scientific Instrumentation department	116 €
	Organizational units without any or with only little to medium technical equipment	
	Industrial Metrology	
	Legal Metrology, Conformity Assessment and Evaluations	

Annex 2: List of fixed prices per subject area and organizational unit

Subject Area	Organizational Unit	Service	Unit Price without VAT (net)
2 Flowrate	Heat and Vacuum	Ionization vacuum gauge, baked out, basic charge, 2 decades	1,837.00 €
		Ionization vacuum gauge, not baked out, basic charge, 2 decades	1,586.50 €
		Ionization vacuum gauge, additional decade	417.50 €
		Ionization vacuum gauge, additional decade below 1E-10 mbar	542.75 €
		Ionization vacuum gauge, additional decade above 1E-4 mbar	375.75 €
		Ionization vacuum gauge, additional gas, 2 decades	1,043.75 €
		Spinning rotor gauge, sigma eff., basic charge	1,377.75 €
		Spining rotor gauge, sigma eff., per additional gas	501.00 €
		Diaphragm vacuum gauge, FS 0.01 torr, 2 decades, 5 points per decade, basic charge	1,544.75 €
		Diaphragm vacuum gauge, FS 0.01 torr, 0.25 torr, 2 decades, 5 points per decade, basic charge	1,336.00 €
		Diaphragm vacuum gauge, FS 0.01 torr, 0.25 torr per additional gas, 2 decades	668.00 €
		Diaphragm vacuum gauge, FS 0.01 torr, 0.25 torr, additional decade	334.00 €
		Diaphragm vacuum gauge, FS 1, 10 torr, basic charge, 2 decades	1,169.00 €
		Diaphragm vacuum gauge, FS 1, 10 torr, per additional gas, 2 decades	501.00 €
		Diaphragm vacuum gauge, FS 1, 10 torr, additional decade	292.25 €
		Diaphragm vacuum gauge, FS 100 torr, 1 000 torr, basic charge, 3 decades	1,419.50 €
		Diaphragm vacuum gauge, FS 100 torr, 1 000 torr, per additional gas, 3 decades	793.25 €

		Diaphragm vacuum gauge, FS 100 torr, 1 000 torr, additional decade	250.50 €
		Diaphragm vacuum gauge, 1 torr, 30 Pa to 130 Pa with FRS5 in addition to the basic charge	375.75 €
		Diaphragm vacuum gauge, 10 torr, 30 Pa to 1300 Pa with FRS5 in addition to the basic charge	584.50 €
		Diaphragm vacuum gauge, 100 torr, 30 Pa to 10 000 Pa with FRS5 in addition to the basic charge	751.50 €
		Test leak (against vacuum), basic charge	1,336.00 €
		Test leak (against vacuum), per additional temperature or pressure	835.00 €
		Test leak (against vacuum), gas flow below 1e-9 mbar l/s, additional charge	835.00 €
		Test leak (against atmosphere), basic charge	835.00 €
		Test leak (against atmosphere), per additional temperature or pressure	334.00 €
		Test leak (against atmosphere), leakage element with pressure setting and measurement	1,336.00 €
3 Electricity and Magnetism	Direct Current And Low Frequency	Resistance standards	
		Processing of a process (calibration of one or several standards)	372.00 €
		Calibration of a standard resistor or current measuring resistor (at fixed power and temperature)	651.00 €
		Additional measurements performed on standard resistors (e.g., temperature dependence or power dependence) per measurement value	372.00 €
		Resistance standard/calibration CCC (cryo current comparator)	790.50 €
4 Ionizing Radiation	Radioactivity	Provision of activity standards	
		Activity standards as solutions or point sources of the following nuclides: H-3, C-14, Na-22, Cl-36, Mn-54, Fe-55,	1,020.00 €

		Co-57, Co-60, Ni-63, Sr-90, Tc-99, I-131, Ba-133, Cs-134, Cs-137, Eu-152, Pb-210, Am-241, and natural U and Th	
		Activity standards as solutions or point sources of the following nuclides: P-32, Cr-51, Co-56, Co-58, Fe-59, Zn-65, Sr-85, Y-88, Sr-89, Nb-93m, Cd-109, Sn-113, I-125, Sb-125, Ra-226	1,224.00 €
		Activity standards as solutions or point sources of the following nuclides: P-33, S-35, Ca-45, Se-75, Ru-103, Ru-106, Ag-110m, I-129, Ce-139, Ce-141, Pm-147, Ir-192, Au-198, Hg-203, Tl-204, Bi-207, Th-228	1,581.00 €
		Gaseous activity standards of the Rn-222 nuclide	
		in a vessel provided by the customer	1,071.00 €
		in a vessel provided by PTB	1,377.00 €
		Extra costs for special sources	
		Special deliveries and custom-made products	663.00 €
		Area sources	408.00 €
		Calibration of radioactive sources	
		Activity determination on an aqueous solution or a point source of a gamma-emitting radionuclide by means of semiconductor spectrometers	918.00 €
		Each additional radionuclide in the form of an aqueous solution or point source	51.00 €
		Activity determination on an aqueous solution of a gamma-emitting radionuclide by means of ionization chambers	969.00 €
		Activity and contamination determination on an aqueous solution of a gamma-emitting radionuclide by means of ionization chambers and semiconductor spectrometers	1,683.00 €
		Activity determination on an aqueous solution of a radionuclide by means of liquid scintillation counting	1,020.00 €
		Activity and contamination determination on an aqueous solution of a radionuclide by means of liquid scintillation and semiconductor spectrometers	1,836.00 €
		Determination of the surface emission rate on an area source of an alpha- or beta-emitting radionuclide	1,173.00 €

		Determination of the surface emission rate and activity on an area source of the Am-241 radionuclide	1,683.00 €
		Additional testing of compliance with class 1 criteria in accordance with ISO 8769	1,581.00 €
		Determination of the surface emission rate and activity on an area source of a beta-emitting radionuclide	3,264.00 €
		Additional testing of compliance with class 1 criteria in accordance with ISO 8769	1,581.00 €
		Determination of the surface emission rate and activity on an area source of a photon-emitting radionuclide	2,601.00 €
		Additional testing of compliance with class 1 criteria in accordance with ISO 8769	1,581.00 €
		Additional workload for shipping	
		to non-EU countries	408.00 €
4 Ionizing Radiation	Dosimetry for Radiation Therapy and Diagnostic Radiology	Calibration of standards in the measurement quantity <i>air kerma</i>	
		Calibration of standards, basic charge	2,244.00 €
		Calibration per radiation quality	306.00 €
		The fixed charge is calculated as follows: $K = (2244 \cdot n_i + 306 \cdot n_q)$ euros	
		where K are the total costs n _i is the number of detectors n _q is the number of radiation qualities	
		Calibration of standards in the measurement quantity <i>absorbed dose to water</i>	
		Calibration of standards, basic charge	2,244.00 €
		Calibration per radiation quality	408.00 €
		Additional effort for calibration at the accelerator, per radiation quality	408.00 €

		Effort for using additional accelerators	408.00 €
		The fixed charges are calculated as follows: $K = (2244 \cdot n_i + 408 \cdot n_q + Z)$ euros with $Z = (408 \cdot n_{qB} + 408 \cdot n_B)$ euros	
		where K are the total costs n_q is the total number of radiation qualities Z are the additional costs for calibrations at energies $E > 2$ MeV n_{qB} is the number of radiation qualities at energies $E > 2$ MeV n_i is the number of detectors to be calibrated n_B is the number of additional accelerators used	
		Calibration of detectors for the non-invasive measurement of the Practical Peak Voltage (PPV) on an X-ray facility	
		Calibration of a detector, basic charge	2,244.00 €
		Calibration per radiation quality	306.00 €
		The fixed charges are calculated as follows: $K = (2244 \cdot n_i + 306 \cdot n_q)$ euros	
		where K are the total costs n_i is the number of detectors n_q is the number of radiation qualities	
		Type examination of diagnostics dosimeters	
		Diagnostics dosimeters: charge for administrative processing	10,404.00 €
		Diagnostics dosimeters: technical testing of design and setup	1,428.00 €
		Diagnostics dosimeters: metrological testing, per radiation quality	306.00 €
		Testing of diagnostics dosimeters: temperature and air humidity	1,020.00 €
		Testing of diagnostics dosimeters: air pressure	612.00 €
		Testing of diagnostics dosimeters: operating voltage	612.00 €

		Testing of diagnostics dosimeters: software	5,100.00 €
		Testing of diagnostics dosimeters: electromagnetic compatibility	6,393.00 €
		Testing of diagnostics dosimeters: operating instructions	2,040.00 €
		Diagnostics dosimeters: revision of the type examination certificate (incl. modification of the set of certification documents)	1,836.00 €
		Diagnostics dosimeters: modification of the set of certification documents	1,224.00 €
4 Ionizing Radiation	Radiation Protection Dosimetry	Irradiation of dosimeters (photon and beta radiation)	
		Irradiation, basic charge	2,244.00 €
		Basic charge for irradiation E > 2 MeV, one photon energy	1,632.00 €
		Basic charge for irradiation E > 2 MeV, additional photon energy	969.00 €
		Irradiation of a dosimeter (E < 2 MeV)	102.00 €
		Irradiation of a dosimeter (photon energy > 2 MeV), per 0.5 mSv	510.00 €
		The fixed charges are calculated as follows: K = (2244+102*n1+D1+D2+510*n2) euros	
		where	
		K are the total costs	
		n1 is the number of irradiations (E < 2 MeV)	
		n2 is the number of irradiations (photon energy > 2 MeV)	
		D1 is the basic charge for irradiation with one photon energy (E > 2 MeV)	
		D2 is the basic charge for irradiation with an additional photon energy (E > 2 MeV)	
		Calibration of standards and dosimeters in quantities relevant to radiation protection for photon and beta radiation	
		Calibration, basic charge	2,244.00 €

	Calibration per radiation quality (E < 2 MeV)	306.00 €
	Calibration at an energy E > 2 MeV	1,632.00 €
	Calibration at an additional energy E > 2 MeV	969.00 €
	The fixed charges are calculated as follows: K = (2 244 + 306*n _q + B1 + B2) euros	
	where K are the total costs n _q is the number of radiation qualities (E < 2 MeV) B1 are the costs for calibration at an energy E > 2 MeV B2 are the costs for calibration at an additional energy E > 2 MeV	
	Calibration of beta sources for the secondary standard, type 2 (BSS2)	
	Administration and shipping: basic charge per calibration order	612.00 €
	Pm-147 source for BSS2: basic charge per calibration order	1,122.00 €
	Kr-85 source for BSS2: basic charge per calibration order	1,122.00 €
	Sr-90/Y-90 source for BSS2: basic charge per calibration order	5,304.00 €
	Pm-147 source for BSS2: per calibrated source	2,295.00 €
	Kr-85 source for BSS2: per calibrated source	2,295.00 €
	Sr-90/Y-90 source for BSS2: per calibrated source	10,659.00 €
	The fixed charges are calculated as follows: K = (612 + G _{Pm} + G _{Kr} + G _{Sr} + 2 295*n _{Pm} + 2 295*n _{Kr} + 10 659*n _{Sr}) euros	
	where K are the total costs G _{Pm} is the Pm-147 source for BSS2: basic charge per calibration order G _{Kr} is the Kr-85 source for BSS2: basic charge per calibration order G _{Sr} is the Sr-90/Y-90 source for BSS2: basic charge per calibration order n _{Pm} is the number of Pm-147 sources for BSS2 n _{Kr} is the number of Kr-85 sources for BSS2	

		n_{Sr} is the number of Sr-90/Y-90 sources for BSS2	
		Calibration of an HDR source or of an LDR seed in the measurement quantity <i>reference air kerma rate</i> (RAKR)	
		Calibration of a source	3,060.00 €
		Calibration of an additional source within the scope of <u>one</u> order	2,652.00 €
		Calibration of an ionization chamber in the measurement quantity <i>reference air kerma rate</i> (RAKR) (well-type ionization chamber)	
		Calibration with an LDR seed or an HDR source	1,938.00 €
		Calibration with one additional source (LDR or HDR) within the scope of <u>one</u> order	1,428.00 €
		Tests or work carried out to issue the type-examination certificate for an area dosimeter or a personal dosimeter	
		Basic charge for administrative work for type examination	6,120.00 €
		Test: Requirements placed on design and setup	1,428.00 €
		Test: Energy dependence and angular dependence	7,038.00 €
		Test: High-energy photons	0.00 €
		1.) Measurements carried out on the accelerator (Eph > 1.3 MeV) at <u>one</u> energy	1,428.00 €
		2.) Accelerator measurements carried out on the accelerator (Eph > 1.3 MeV) per additional energy	816.00 €
		Test: Linearity and coefficient of variation	6,528.00 €
		Test: Overload	408.00 €
		Test: Reusability	408.00 €

		Test: Response time	510.00 €
		Test: Warning thresholds	408.00 €
		Test: EMC	6,528.00 €
		Test: Apparative background	816.00 €
		Test: Climate	1,020.00 €
		Test: Maximum possible measuring time	1,020.00 €
		Test: Light	408.00 €
		Test: Water	408.00 €
		Test: Battery/operating voltage	612.00 €
		Influence: Neutron radiation	816.00 €
		Influence: Beta radiation	816.00 €
		Test: Software	5,100.00 €
		Test: Operating instructions	2,040.00 €
		Test: Coefficient of variation of a radioactive checking device	1,428.00 €
		Test: Influence of pulsed radiation	2,754.00 €
		Elaboration of a revision (incl. modification of the set of certification documents)	1,836.00 €
		Modification of the set of certification documents	1,224.00 €
4 Ionizing Radiation	Ion and Neutron Radiation	Irradiations and calibrations with neutrons or ions at PTB's ion accelerators	
		Calibration at the ion accelerator facility: basic charge per calibration certificate	2,244.00 €
		Calibration at the ion accelerator facility: basic charge per energy: preparation of the accelerator and assessment of the irradiation	1,020.00 €
		Irradiations with neutrons or ions at the ion accelerator facility: hourly charge for the accelerator	306.00 €
		Test and calibration of neutron area dosimeters for radiation protection with radionuclide neutron sources	
		Area dosimeters: basic test, basic charge per calibration certificate incl. determination of a calibration factor	2,448.00 €
		Area dosimeters: charge per additional correction factor	612.00 €

		Area dosimeters: charge for additional linearity test	408.00 €
		Area dosimeters: charge for subsequent measurement with a test source of the customer	408.00 €
		Irradiation of neutron dosimeters	
		Dosimeters: basic charge per result report	663.00 €
		Dosimeters: charge per individual irradiation with neutron sources	306.00 €
		Dosimeters: charge per individual irradiation: thermal field	306.00 €
5 Length and Dimensional Metrology	Interferometry on Material Measures	Fixed charges for gauge block calibration Gauge blocks according to EN 3650	
		Lengths up to 200 mm	
		Preparatory and finalizing work: charge per calibration certificate	169.00 €
		Calibration of the central length (by interferometry) Measurement uncertainty for l_c : $U = Q [20; 0.18]$ in nm, L in mm (for $\kappa = 2$), charge per gauge block	126.75 €
		Calibration of the thermal expansion coefficient for lengths from 60 mm to 100 mm (measurement by comparison): $U = 1.6 \times 10^{-7} \text{K}^{-1}$ to $1.1 \times 10^{-7} \text{K}^{-1}$, (for $\kappa = 2$), charge per gauge block	169.00 €
		Calibration of a gauge block set (by interferometry) 6 pairs according to DKD-R4-1, 1994 / EAL-G21, 1996 and EA-10/02, resp. Measurement uncertainty of the central length differences and of the deviations f_o and f_u from the central length: $U = 10 \text{ nm}$, (for $\kappa = 2$), charge per set	1,901.25 €
		Lengths from 200 mm to 1 000 mm	
		Preparatory and finalizing work: charge per calibration certificate	169.00 €

		Calibration of the central length (measurement by comparison) Measurement uncertainty for l_c : $U = Q [30; 0.12]$ in nm, L in mm (for $\kappa = 2$), charge per gauge block	676.00 €
		Calibration of the central length (measurement by comparison) Measurement uncertainty for l_c : $U = Q [30; 0.2]$ in nm L in mm (for $\kappa = 2$), charge per gauge block	507.00 €
		Calibration of the central length and of the thermal expansion coefficient (measurement by comparison) $U = 12 \times 10^{-8}K^{-1}$ to $3.6 \times 10^{-8}K^{-1}$, (for $\kappa = 2$), charge per gauge block	1,225.25 €
		Interferometric calibration of the central length Measurement uncertainty for l_c : $U = Q [22; 0.066]$ in nm, L in mm (for $\kappa = 2$), charge per gauge block	971.75 €
		Interferometric calibration of the central length and of the thermal expansion coefficient Measurement uncertainty: $U = 25 \times 10^{-9}K^{-1}$ to $6 \times 10^{-9}K^{-1}$, (for $\kappa = 2$), charge per gauge block	1,774.50 €
		Special measurements will be invoiced according to the amount of work involved. The stated measurement uncertainties require measuring surfaces of flawless quality.	
6 Mass and Derived Quantities	Mass – Realization of the Unit	Weights with uncertainties $\geq 1/3$ of the maximum permissible errors of class E1	
		Preparatory and finalizing work, per order	270.00 €
		Basic charge per test certificate/calibration certificate	180.00 €
		Weights from 1 mg to 500 mg, mass determination, per piece	405.00 €

	Weights from 1 mg to 500 mg, mass determination, 12 pieces	3,240.00 €
	Weights from 1 g to 1 kg, mass determination, per piece	225.00 €
	Weights from 1 g to 1 kg, mass determination, 13 pieces	1,845.00 €
	Weights from 1 g to 1 kg, volume determination, per piece	270.00 €
	Weights from 1 g to 1 kg, volume determination, 13 pieces	2,025.00 €
	Weights from 2 kg to 10 kg, mass determination, per piece	225.00 €
	Weights from 2 kg to 10 kg, volume determination, per piece	450.00 €
	Weights from 20 kg to 50 kg, mass determination, per piece	270.00 €
	Weights from 20 kg to 50 kg, volume determination, per piece	450.00 €
	Weights with uncertainties $\geq 1/3$ of the maximum permissible errors of class E2	
	Preparatory and finalizing work, per order	270.00 €
	Basic charge per test certificate/calibration certificate	180.00 €
	Weights from 1 mg to 500 mg, mass determination, per piece	135.00 €
	Weights from 1 mg to 500 mg, mass determination, 12 pieces	1,440.00 €
	Weights from 1 g to 1 kg, mass determination, 13 pieces	1,845.00 €
	Weights from 1 g to 1 kg, mass determination, per piece	225.00 €
	Weights from 2 kg to 10 kg, mass determination, per piece	225.00 €
	Weights from 20 kg to 50 kg, mass determination, per piece	270.00 €
	Weights with uncertainties $\geq 1/5$ of the maximum permissible errors of class E1	
	Preparatory and finalizing work, per order	270.00 €
	Basic charge per test certificate/calibration certificate	180.00 €
	Weights from 1 mg to 500 mg, mass determination, per piece	540.00 €
	Weights from 1 mg to 500 mg, mass determination, 12 pieces	4,140.00 €
	Weights from 1 g to 1 kg, mass determination, per piece	495.00 €
	Weights from 1 g to 1 kg, mass determination, 13 pieces	3,510.00 €
	Weights from 1 g to 1 kg, volume determination, per piece	450.00 €
	Weights from 1 g to 1 kg, volume determination, 13 pieces	4,410.00 €
	Weights from 2 kg to 10 kg, mass determination, per piece	495.00 €
	Weights from 2 kg to 10 kg, volume determination, per piece	810.00 €
	Weights from 20 kg to 50 kg, mass determination, per piece	495.00 €

		Weights from 20 kg to 50 kg, volume determination, per piece	495.00 €
6 Mass and Related Quantities	Solid Mechanics	Calibration of force measuring devices in accordance with EN ISO 376; direction of force: compression	
		Direction of force: compression ≤ 200 N	990.00 €
		Direction of force: compression ≤ 20 kN	1,080.00 €
		Direction of force: compression ≤ 200 kN	1,170.00 €
		Direction of force: compression ≤ 2 MN	1,575.00 €
		Direction of force: compression ≤ 5 MN	1,665.00 €
		Direction of force: compression ≤ 10 MN	1,980.00 €
		Direction of force: compression ≤ 16.5 MN	2,340.00 €
		Calibration of force measuring devices in accordance with EN ISO 376; direction of force: tension	
		Direction of force: tension ≤ 200 N	1,035.00 €
		Direction of force: tension ≤ 20 kN	1,170.00 €
		Direction of force: tension ≤ 200 kN	1,260.00 €
		Direction of force: tension ≤ 2 MN	1,755.00 €
		Direction of force: tension ≤ 5 MN	1,890.00 €
		Direction of force: tension ≤ 10 MN	2,475.00 €
		Direction of force: tension ≤ 16.5 MN	2,745.00 €
		Calibration of force measuring devices in accordance with EN ISO 376; direction of force: tension and compression	
		Direction of force: tension and compression ≤ 200 N	1,755.00 €
		Direction of force: tension and compression ≤ 20 kN	1,980.00 €
		Direction of force: tension and compression ≤ 200 kN	2,160.00 €
		Direction of force: tension and compression ≤ 2 MN	3,105.00 €
		Direction of force: tension and compression ≤ 5 MN	3,330.00 €
		Direction of force: tension and compression ≤ 10 MN	4,230.00 €
		Direction of force: tension and compression ≤ 16.5 MN	4,725.00 €
7 Metrology in Chemistry and Materials Properties	Physical Chemistry	Provision of test liquids: viscosity	

		Test liquid up to 20,000 B, 100 mL	1,128.00 €
		Test liquid up to 20,000 B, 250 mL	1,316.00 €
		Test liquid up to 20,000 B, 500 mL	1,504.00 €
		Test liquid up to 20,000 B, additional temperature measurement	188.00 €
		Test liquid up to 50,000 B, 100 mL	1,504.00 €
		Test liquid up to 50,000 B, 250 mL	1,692.00 €
		Test liquid up to 50,000 B, 500 mL	1,880.00 €
		Test liquid up to 50,000 A, additional temperature measurement	376.00 €
		Provision of test material: molten glass	
		Test material: molten glass G1 soda-lime glass	470.00 €
		Test material: molten glass G2 lead glass	470.00 €
		Test material: molten glass G3 Sprax tempered/toughened glass	470.00 €
		Calibration of capillary viscometers	
		Viscometer calibration class 0 - 0a, single capillaries	4,512.00 €
		Viscometer calibration class 0 - 0a, capillary pair	6,768.00 €
		Viscometer calibration class I - Ia, single capillaries	2,820.00 €
		Viscometer calibration class I - Ia, capillary pair	4,230.00 €
		Viscometer calibration class II - IVc, single capillaries	2,068.00 €
		Viscometer calibration class II - IVc, capillary pair	3,102.00 €
		Viscometer calibration class IVa - V, single capillaries	2,820.00 €
		Viscometer calibration class IVa - V, capillary pair	4,230.00 €
		Provision of test liquid: density	
		Test liquid: density	658.00 €
10 Thermometry	Temperature	Initial calibration of an SPRT according to ITS-90, range: TPW to Ga	1,320.00 €
		Repeat calibration of an SPRT according to ITS-90, range: TPW to Ga	1,144.00 €

		Initial calibration of an SPRT according to ITS-90, ranges: Hg to Ga <u>or</u> TPW-In	2,200.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Hg to Ga <u>or</u> TPW-In	1,848.00 €
		Initial calibration of an SPRT according to ITS-90, ranges: Ar to TPW, Hg to In, TPW to Sn <u>or</u> TPW to Zn	3,080.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Ar to TPW, Hg to In, TPW to Sn <u>or</u> TPW to Zn	2,464.00 €
		Initial calibration of an SPRT according to ITS-90, ranges: Ar to Ga <u>or</u> Hg to Sn	3,872.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Ar to Ga <u>or</u> Hg to Sn	3,080.00 €
		Initial calibration of an SPRT according to ITS-90, ranges: Hg to Zn <u>or</u> TPW to Al	4,048.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Hg to Zn <u>or</u> TPW to Al	3,256.00 €
		Initial calibration of an SPRT according to ITS-90, ranges: Ar to In, Ar to Sn, Ar to Zn <u>or</u> Hg to Al	5,104.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Ar to In, Ar to Sn, Ar to Zn <u>or</u> Hg to Al	4,048.00 €
		Initial calibration of an SPRT according to ITS-90, ranges: Ar to Al <u>or</u> TPW to Ag	6,424.00 €
		Repeat calibration of an SPRT according to ITS-90, ranges: Ar to Al <u>or</u> TPW to Ag	5,104.00 €

		Please note: During the initial calibration of an SPRT at fixed points, each fixed-point temperature is realized three times; during the repeat calibration, each fixed-point temperature is realized only twice.	
		Calibration of a temperature fixed-point cell, Hg, TPW or Ga	2,024.00 €
		Calibration of a temperature fixed-point cell, In, Sn or Zn	3,036.00 €
		Calibration of a temperature fixed-point cell, Al or Cu	3,652.00 €
		Calibration of a temperature fixed-point cell, Ag	4,356.00 €
		Calibration of a noble metal thermocouple of type S, R, Pt/Pd, Au/Pt (0 °C to 1,100 °C)	2,640.00 €
		Calibration of a noble metal thermocouple of type B (600 °C to 1,600 °C)	3,256.00 €
		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from -70 °C to 600 °C, incl. stability test	704.00 €
		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from -70 °C to 600 °C, without stability test	528.00 €
		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from -70 °C to 200 °C, 1 test point, first thermometer	176.00 €
		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from >200 °C to 600 °C, 1 test point, first thermometer	220.00 €
		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from -70 °C to 200 °C, 1 test point, additional thermometer	44.00 €

		Calibration of thermometers with the comparison procedure in stirred liquid baths in the temperature range from >200 °C to 600 °C, 1 test point, additional thermometer	88.00 €
13 Physical Safety Engineering, Explosion Protection	Fundamentals of Explosion Protection	Determination of the flash point	784.00 €
		Determination of flash point and fire point	833.00 €
		Safety characteristic dependent on temperature	2,058.00 €
		LEL, UEL, Pmax, dp/dtmax, explosion point	980.00 €
		R factor	686.00 €
		Ignition temperature LOC, MESG	1,176.00 €
		Sustained combustibility	686.00 €
		Estimation of safety characteristics	294.00 €
		Safety characteristics at higher initial pressures	2,597.00 €
		Retaining of technical documentation according to Directive 2014/34/EU, article 13 b) ii)	
		Retaining of basic file for 15 years	490.00 €
		Retaining of supplement to basic file	294.00 €
		Extension of retention period of basic file plus supplements for 5 years	196.00 €
13 Physical Safety Engineering, Explosion Protection	Explosion Protection in Sensor Technology and Instrumentation	QA approval according to Directive 2014/34/EU, Annexes IV/VII	
		General tasks	

		Audit at the location, per person and day	1,160.00 €
		English translation of certificate	174.00 €
		Initial certification	
		Processing of the order for initial certification in German	1,914.00 €
		Processing of the order for initial certification in English	2,842.00 €
		Surveillance audit	
		Processing of the order for surveillance audit in German	754.00 €
		Processing of the order for surveillance audit in English	1,102.00 €
		Repeat certification	
		Processing of the order for repeat certification in German	1,450.00 €
		Processing of the order for repeat certification in English	2,320.00 €
		Extension of the scope of certification	
		Processing of the order for an extension of the scope of certification in German	928.00 €
		Processing of the order for an extension of the scope of certification in English	1,363.00 €
14 Other services	Information Technology	Authenticated time synchronization	
		Granting of an access authorization for one year	232.00 €