



CATALOGUE OF SERVICES



Republic of Serbia
Ministry of Economy
Directorate of Measures and Precious Metals

www.dmdm.gov.rs

SERVICES OF DMDM

I CALIBRATION.....	2
1. MASS	2
2. PRESSURE	2
3. LENGHT & ANGLE	3
4. ACOUSTICS	4
5. TIME, FREQUENCY & VELOCITY	5
6. VOLUME & FLOW	6
7. TEMPERATURE	8
8. HUMIDITY	10
9. ELECTIRICITY/DC VOLTAGE	10
10. ELECTIRICITY/DC RESISTANCE	11
11. ELECTIRICITY/DC CURRENT	11
12. ELECTIRICITY/AC VOLTAGE	12
13. ELECTIRICITY/AC CURRENT	12
14. ELECTIRICITY/AC POWER	13
15. ELECTIRICITY/ACTIVE ELECTRICAL ENERGY	14
16. ELECTIRICITY/REACTIVE ELECTRICAL ENERGY	14
17. ELECTIRICITY/PHASE ANGLE	15
18. ELECTIRICITY/CURRENT AND VOLTAGE WAVEFORM	15
19. ELECTIRICITY/CURRENT AND VOLTAGE WAVEFORM	16
20. ELECTIRICITY/HIGH AC VOLTAGE/VOLTAGE TRANSFORMER RATIO ERROR	16
21. ELECTIRICITY/HIGH AC VOLTAGE/VOLTAGE TRANSFORMER PHASE DISPLACEMENT	16
22. ELECTIRICITY/HIGH AC CURRENT/CURRENT TRANSFORMER RATIO ERROR	17
23. ELECTIRICITY/HIGH AC CURRENT/CURRENT TRANSFORMER PHASE DISPLACEMENT	17
24. ELECTIRICITY/CAPACITANCE	17
25. ELECTIRICITY/INDUCTANCE	18
26. PHYSICO – CHEMICAL QUANTITIES	18
27. MEASUREMENTS IN CHEMISTRY	19
28. PHOTOMETRY AND RADIOMETRY	19
II CERTIFIED REFERENCE MATERIALS	21
1. ORGANIC SOLUTIONS	21
III TESTING.....	22
1. MASS	22
2. FORCE	22
3. PRESSURE	22
4. LENGHT & ANGLE	22
5. ACOUSTICS	23
6. TEMPERATURE SENSORS	23
7. HEATING ENERGY	23
8. ACTIVE ELECTRICAL ENERGY	23
9. REACTIVE ELECTRICAL ENERGY	23
10. PHYSICO-CHEMICAL QUANTITIES	23
11. MEASUREMENTS IN CHEMISTRY	23
12. VOLUME OF LIQUIDS	24
13. OPTICAL QUANTITIES	24
IV VERIFICATION OF MEASURING INSTRUMENTS	24
V TYPE APPROVAL OF MESURING INSTRUMENTS.....	24
VI CONFORMITY ASSESSMENT.....	25
VII PRECIOUS METALS ARTICLES CONTROL	25
VIII EXPERT OPINIONS	27

SERVICES OF DMDM

I CALIBRATION

1. MASS					
Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
1/1	Mass	Weights	1 mg up to 100 mg	1.3 µg up to 2 µg	CMC
1/2	Mass	Weights	0.1 g up to 1 g	2 µg up to 4 µg	CMC
1/3	Mass	Weights	1 g up to 10 g	4 µg up to 8 µg	CMC
1/4	Mass	Weights	10 g up to 100 g	8 µg up to 22 µg	CMC
1/5	Mass	Weights	100 g up to 1 kg	1.3 µg up to 220 µg	CMC
1/6	Mass	Weights	1 kg up to 10 kg	0.22 mg up to 2.2 mg	CMC
1/7	Mass	Weights	10 kg up to 20 kg	2,2 mg up to 10 mg	CMC
1/8	Mass	Weights	20 kg up to 50 kg	10 mg up to 80 mg	CMC
1/9	Mass	Weights	50 kg up to 100 kg	80 mg up to 500 mg	CMC
1/10	Mass	Weights	100 kg up to 500 kg	0,5 g up to 8 g	CMC

2. PRESSURE					
Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
2/1	Pressure	Pressure	-0,95 bar до 0 bar	$1 \times 10^{-4} \times p_e + 1 \times 10^{-5}$ bar	ATS/*CMC

		gauges	0 bar до 1 bar	$1,5 \times 10^{-4} \times p_e + 3 \times 10^{-5} \text{ bar}$	
			1 bar до 35 bar	$1 \times 10^{-4} \times p_e + 30 \times 10^{-5} \text{ bar}$	
			0,2 bar до 40 bar	$1 \times 10^{-4} \times p_e$	
			40 bar до 1000 bar*	$1 \times 10^{-4} \times p_e$	
2/2	Pressure	Pressure balances	-0,95 bar до 0 bar	$1 \times 10^{-4} \times p_e + 1 \times 10^{-5} \text{ bar}$	ATS/*CMC
			0 bar до 1 bar	$1,5 \times 10^{-4} \times p_e + 3 \times 10^{-5} \text{ bar}$	
			1 bar до 35 bar	$1 \times 10^{-4} \times p_e + 30 \times 10^{-5} \text{ bar}$	
			0,2 bar до 40 bar	$1 \times 10^{-4} \times p_e$	
			40 bar до 1000 bar*	$1 \times 10^{-4} \times p_e$	

3. LENGHT & ANGLE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty ($k=2$)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
3/1	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. primary laser	633 nm	0.04 fm	CMC
3/2	Laser radiation	Frequency stabilized laser: optical frequency vs. primary laser	474 THz	24 kHz	CMC
3/3	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. primary laser	633 nm	1E-09	CMC
3/4	Length	Gauge blocks: interferometry	up to 100 mm	Q[20; 0,2L] nm L in mm	CMC/ATS
3/5	Length	Gauge blocks: mechanical comparison	up to 100 mm	Q[50; 0,5L] nm L in mm	CMC
3/6	Length	Line scales	up to 3000 mm	Q[202; 0,38L] nm L in mm	-
3/7	Angle	Optical polygons		0,2"	CMC
3/8	Angle	Rotary tables		0,2"	CMC
3/9	Angle	Autocollimators		0,2"	CMC
3/10	Angle	Angle gauge blocks		0,2"	CMC
3/11	Surface texture: roughness	Roughness standard: Type A Parameter: d	(0,01 up to 50) μm	Q[15; 15 d] nm d in μm	CMC
3/12	Surface texture: roughness	Roughness standard: Type C Parameters: R_a , R_q	(0,01 up to 15) μm	Q[10; 30 R_a] nm R_a in μm	CMC
3/12	Surface texture: roughness	Roughness standard: Type C Parameters: R_z , R_t , R_p , R_v	(0,04 up to 30) μm	Q[20; 40 R_z] nm R_z in μm	CMC

3/12	Surface texture: roughness	Roughness standard: Type C Parameter: RSm	(10 up to 500) μm	0,5 μm	CMC
3/13	Surface texture: roughness	Roughness standard: Type D Parameters: Ra, Rq	(0,01 up to 10) μm	Q[10; 40 Ra] nm Ra in μm	CMC
3/13	Surface texture: roughness	Roughness standard: Type D Parameters: Rz, Rt, Rp, Rv	(0,04 up to 30) μm	Q[20; 50 Rz] nm Rz in μm	CMC
3/21	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. comb generator	633 nm	1E-11	CMC
3/21	Laser radiation	Frequency stabilized laser: optical frequency vs. comb generator	474 THz	1E-11	CMC
3/22	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. comb generator	543 nm	1E-11	CMC
3/22	Laser radiation	Frequency stabilized laser: optical frequency vs. comb generator	551 THz	1E-11	CMC
3/23	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. comb generator	532 nm	1E-11	CMC
3/23	Laser radiation	Frequency stabilized laser: optical frequency vs. comb generator	563 THz	1E-11	CMC
3/24	Laser radiation	Frequency stabilized laser: vacuum wavelength vs. comb generator	(530 up to 800) nm	1E-11	CMC
3/24	Laser radiation	Frequency stabilized laser: optical frequency vs. comb generator	(375 up to 566) THz	1E-11	CMC

4. ACOUSTICS

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty [dB] (k=2)	Notice	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
4/1	Sound in air	Laboratory standard microphone LS1P (IEC61094-1)	31.5 Hz up to 12.5 kHz Pressure sensitivity level dB (re 1V/Pa)	(0,08 up to 0,13) dB	Primary pressure reciprocity calibration method IEC 61094-2	CMC
4/2	Sound in air	Laboratory standard microphone LS2aP	31.5 Hz up to 25 kHz Pressure sensitivity level dB (re 1V/Pa)	(0,085 up to 0,21) dB	Primary pressure reciprocity calibration	CMC

		(IEC61094-1)			method IEC 61094-2	
4/3	Sound in air	Working standard microphone WS2P, WS2F, WS2D (IEC61094-4)	250 Hz; 1000 Hz Pressure sensitivity level dB (re 1V/Pa)	0,1 dB	Comparison method IEC 61094-5	-
4/4	Sound in air	Working standard microphone WS1P, WS2P, WS1F, WS2F, WS1D, WS2D (IEC61094-4)	31,5 Hz up to 25 kHz Pressure sensitivity level dB (re 1V/Pa)	(0,12 up to 0,4) dB	Electrostatic actuator frequency response IEC 61094-6	-
4/5	Sound in air	Acoustic calibrator	1000 Hz Sound pressure level 94/124dB (re 20 μ Pa)	(0,09 up to 0,2) dB	Comparison method IEC 60942	-
4/6	Sound in air	Sound level meter	63 Hz up to 16 kHz Sound pressure level (re 20 μ Pa)	(0,11 up to 0,4) dB	IEC 61672 or IEC 651, IEC 804	-

5. TIME, FREQUENCY & VELOCITY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
5/1	Time Scale Differences	Local clock vs. UTC (DMDM)	-1 s \div +1 s	9 ns	CMC
5/2	Time Scale Differences	Local clock vs. predicted UTC (DMDM)	-1 s \div +1 s	47 ns	CMC
5/3	Time Scale Differences	Local clock vs. post-processed UTC (DMDM)	-1 s \div +1 s	20 ns	CMC
5/4	Time Scale Differences	Local (radio-synchronised) clock vs. UTC (DMDM)	0 s \div \pm 30 s	0,5 s	-
5/5	Frequency	Local frequency standard	5 MHz; 10 MHz	1E \div 13 Hz/Hz	CMC
5/6	Frequency	General frequency source (pulsed or squared signal)	1 Hz \div 3 GHz	1E \div 12 Hz/Hz	CMC
5/7	Frequency	General frequency source (sine signal)	1Hz \div 3 GHz	Q[1E-12, 2.6E-07/f] f in Hz	CMC

5/8	Time Interval	Period source	3,3 ns ÷ 10 s	0,6 ns	CMC
5/9	Time Interval	Rise/fall time source	0,7 ns ÷ 1s	0,6 ns	CMC
5/10	Time Interval	Pulse width source	1,6 ns ÷ 10 s	0,6 ns	CMC
5/11	Time Interval	Time difference source	1 ns ÷ 10 s	0,6 ns	CMC
5/12	Time Interval	Delay source	1ns ÷ 1 s	0,2 ns	CMC
5/13	Time Interval	Time interval meter	1 s ÷ 86400 s	0,3 s	-
5/14	Frequency	Local frequency standard (frequency instability)	1 MHz ÷ 20 MHz (Relative frequency difference <1E 11 Hz/Hz)	2E-13 Hz/Hz	-
5/15	Velocity	Speed meters	(0,1÷250) km/h	direct measurement: ≤ 0,05 km/h	-
5/16	Velocity	Speed meters	(30÷250) km/h	≤ 0,20 km/h	-

6. VOLUME & FLOW

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Notice	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
6/1	Volume of liquid	Pycnometers	(1 ÷ 100) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC
6/2	Volume of liquid	Single volume pipettes	(1 ÷ 200) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC
6/3	Volume of liquid	Graduated pipettes	(1 ÷ 50) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC
6/4	Volume of liquid	Volumetric flasks	(1 ÷ 10 000) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC
6/5	Volume of liquid	Burettes	(1 ÷ 100) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC
6/6	Volume of liquid	Graduated measuring cylinders	(5 ÷ 2 000) mL	0,015 %	Gravimetric method, liquid water, 20 °C	CMC

6/7	Volume of liquid	Proving tanks	(2 ÷ 1000) L	0,02 %	Gravimetric method, liquid water, 20 °C or 15 °C	CMC
6/8	Volume of liquid	Proving tanks	(5 ÷ 5 000) L	0,03 %	Volumetric method, liquid water, 20 °C or 15 °C	CMC
6/9	Volume of liquid	Standard overflow pipettes	(1 ÷ 500) L	0,02 %	Gravimetric method, liquid water, 20 °C	CMC
6/10	Volume of liquid	Standard test measures	(1 ÷ 20) L	0,03 %	Volumetric method, liquid water, 20 °C	CMC
6/11	Volume of liquid	Micropipettes or piston pipettes	(10 ÷ 20 000) μ L	(0,6 ÷ 0,2) %	Gravimetric method, liquid water, 20 °C	CMC
6/12	Volume of liquid	Piston Burettes	(0,1 ÷ 100) mL	(0,1 ÷ 0,02) %	Gravimetric method, liquid water, 20 °C	CMC
6/13	Volume of liquid	Dispensers	(0,01 ÷ 200) mL	(0,1 ÷ 0,02) %	Gravimetric method, liquid water, 20 °C	CMC
6/14	Liquid flow	Rotameters for measuring flow of liquids	(0,003 ÷ 150) m^3/h	4 %	Dynamic method of measuring volume and passed time	ATS
6/15	Gas flow	Turbine and rotary gas flow meters	(0,6 ÷ 10000) m^3/h	0,5 % for (0,6 ÷ 4) m^3/h ; 0,35 % for (4,5 ÷ 10000) m^3/h	Master meter method	CMC
6/16	Gas flow	Standard drum-type gas meters	(0,016 ÷ 25) m^3/h	0,2 %	Method of direct comparison with critical nozzles	-

7. TEMPERATURE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Notice	Calibration and measureme nt capabilities in BIPM data base or accreditatio n (ATS)
7/1	Temperature – Items used for defining ITS-90	Primary fixed- point cells – Triple point of water	0.01 °C	0.55 mK	Direct comparison	CMC
		Primary fixed- point cells - Triple point of mercury	-38.8344 °C	0.8 mK		CMC
		Primary fixed- point cells - Melting point of gallium	29.7646 °C	0.8 mK		CMC
		Standard platinum resistance thermometers and high temperature platinum resistance thermometers	-38.8344 °C	1 mK	Fixed point method	CMC
			0.01 °C	0.6 mK		CMC
			29.7646 °C	1 mK		CMC
			156.5985 °C	2.4 mK		CMC
			231.928 °C	2.2 mK		CMC
			419.527 °C	3 mK		CMC
			660.323 °C	5 mK		-
			981.78 °C	7 mK		-
7/2	Temperature – Items used for disseminating ITS-90	Resistance thermometers	-196 °C	16 mK	Comparison method/ liquid nitrogen	CMC
			-80 °C ÷ -20 °C	10 mK	Comparison method/ Halocarbon bath	CMC
			-40 °C ÷ 20 °C	9 mK	Comparison method/ Alcohol bath	CMC
			20 °C ÷ 90 °C	8 mK	Comparison method/ Oil Bath	CMC
			90 °C ÷ 250 °C	12 mK		CMC
			200 °C ÷ 420 °C	16 mK ÷ 37 mK	Comparison method/ salt bath	CMC
			420 °C ÷ 660 °C	37 mK ÷ 50 mK	Comparison method/ Furnace	-
			7/3	Temperature –	Thermocouples/	156,5985 °C

	Items used for disseminating ITS-90	Pure metals	231,928 °C	200 mK	method	CMC
			419,527 °C	80 mK		CMC
			660,323 °C	70 mK		CMC
			981,78 °C	80 mK		CMC
			1084,62 °C	100 mK		CMC
		Thermocouples/ Noble metals	419,527 °C	0,20 °C		CMC
			660,323 °C	0,25 °C		CMC
			981,78 °C	0,35 °C		CMC
			1084,62 °C	0,40 °C		CMC
7/4	Thermocouples/ Noble metals	100 °C ÷ 300 °C	0.37 °C	Comparison method /Furnace	CMC	
		300 °C ÷ 600 °C	0.37 °C ÷ 0.51 °C		CMC	
		600 °C ÷ 1 000 °C	0.51 °C ÷ 1 °C		CMC	
7/5	Thermocouples/ Base metals	100 °C ÷ 300 °C	0.51 °C	Comparison method/ Furnace	CMC	
		300 °C ÷ 600 °C	0.51 °C ÷ 0.87 °C		CMC	
		600 °C ÷ 1000 °C	0.87 °C ÷ 1 °C		CMC	
7/6	Liquid-in-glass thermometers	-80 °C ÷ -20 °C	20 mK	Comparison method/ Temperature bath	CMC	
		-40 °C ÷ 20 °C	16 mK		CMC	
		20 °C ÷ 90 °C	13 mK		CMC	
		90 °C ÷ 250 °C	18 mK		CMC	
7/7	Temperature sensors with display unit	-196 °C	16 mK	Comparison method/ Bath, furnace, dry well calibrators	CMC	
		-80 ÷ 420 °C	10 mK ÷ 40 mK		CMC	
		420 °C ÷ 1000 °C	0.4 °C ÷ 1 °C		-	
7/8	Other measurement services 1.Compensation wires for cold junction 2.Temperature indicators for resistors and thermocouples sensors, 3.Dry-well block calibrators	15 °C ÷ 30 °C	50 mK	Comparison method/ Bath, furnace, dry well calibrators	-	
		-200 °C ÷ 1500 °C	0.01 °C			
		-200 °C ÷ 660 °C	0.5 °C			
7/9		Radiation infrared thermometers – IC thermometers	20 °C ÷ 50 °C 50 °C ÷ 100 °C 100 °C ÷ 200 °C 200 °C ÷ 300 °C	0,8 °C 0,9 °C 1,1 °C 1,8 °C	ASTM E2847-2014	ATS

			300 °C ÷ 400 °C 400 °C ÷ 500 °C	2,3 °C 3 °C		
7/10		Radiation infrared thermometers – thermal imaging cameras	20 °C ÷ 50 °C 50 °C ÷ 100 °C 100 °C ÷ 200 °C 200 °C ÷ 300 °C 300 °C ÷ 400 °C 400 °C ÷ 500 °C	1,5 °C 1,8 °C 2,1 °C 3,6 °C 4,7 °C 6 °C	VDI/VDE 5585-2: 2021 method B or C	ATS

8. HUMIDITY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
8/1	Humidity	Dew point meters	dp : -40 °C ÷ 30 °C in air	0.2 °C	-
8/2		Relative humidity meters	RH : 13% ÷ 95% -10 °C ÷ 10 °C	(0,5-2) % rh	-
			RH : 11% ÷ 95% 10 °C ÷ 20 °C	(0,5-1,6) % rh	CMC
			RH : 10% ÷ 95% 20 °C ÷ 25 °C	(0,5-1,4) % rh	CMC
			RH : 10% ÷ 95% 25 °C ÷ 40 °C	(0,8-1,9) % rh	CMC
			RH : 10% ÷ 95% 40 °C ÷ 70 °C	(1-2,5) % rh	-

9. ELECTRICITY/DC VOLTAGE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
9/1	DC Voltage	Solid state voltage standards, standard cell	1,018 V 1 V 10 V	0,45 μV/V ÷ 1 μV/V	CMC
9/2		DC Voltage source, Calibrators (Multifunction calibrators)	0,01 V ÷ 1000 V	1,2 μV/V ÷ 38 μV/V	CMC
9/3		DC Voltmeters (Multimeters)	0,01 V ÷ 1000 V	1,2 μV/V ÷ 38 μV/V	CMC

9/4		Solid state voltage standards	1,018 V 1 V 10 V	0,12 μ V/V 0,12 μ V/V 0,04 μ V/V	CMC
9/5	DC Voltage Linearity	DC Voltmeters (Multimeters) Linearity	0 mV \div 100 mV 0,1 V \div 1 V 1 V \div 10 V	0,2 μ V 0,3 μ V 0,8 μ V	-

10. ELECTRICITY/DC RESISTANCE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
10/1	DC Resistance	Standard resistors	100 $\mu\Omega$ \div 1 G Ω	0,2 $\mu\Omega/\Omega$ \div 5000 $\mu\Omega/\Omega$	CMC
10/2		Resistance box	100 $\mu\Omega$ \div 1 G Ω	0,2 $\mu\Omega/\Omega$ \div 5000 $\mu\Omega/\Omega$	CMC
10/3		Resistance calibrators (Multifunction calibrators)	1 Ω \div 1 G Ω	3,76 $\cdot 10^{-5}$ Ω \div 2,9 $\cdot 10^6$ Ω	CMC
10/4		Resistance Bridge	0,1 m Ω \div 1 G Ω	0,2 $\mu\Omega/\Omega$ \div 5000 $\mu\Omega/\Omega$	CMC
10/5		Ommeters (Multimeters)	0,1 m Ω \div 1 G Ω	0,2 $\mu\Omega/\Omega$ \div 5000 $\mu\Omega/\Omega$	CMC

11. ELECTRICITY/DC CURRENT

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
11/1	DC Current	DC current generators	0,1 mA \div 30 A	1,3 nA \div 6 mA	CMC
11/2		DC current calibrators (Multifunction calibrators)	0,1 mA \div 30 A	1,3 nA \div 6 mA	CMC
11/3		DC Ampermeters (Multimeters)	0,1 mA \div 30 A	1,3 nA \div 6 mA	CMC

12. ELECTIRICITY/AC VOLTAGE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
12/1	AC Voltage	AC/DC transfer standards, thermal converters	10 mV ÷ 500 mV 10 Hz ÷ 1 MHz	17 μV/V ÷ 240 μV/V	CMC
12/2			0,5 V ÷ 5 V 10 Hz ÷ 1 MHz	10 μV/V ÷ 56 μV/V	CMC
			5 V ÷ 1000 V 10 Hz ÷ 1 MHz	13 μV/V ÷ 73 μV/V	CMC
			1 V, 10 MHz	70 μV/V	-
			1 V, 30 MHz	500 μV/V	
			2 V, 10 MHz	50 μV/V	
			2 V, 30 MHz	400 μV/V	
			3 V, 10 MHz	300 μV/V	
			3 V, 30 MHz	1500 μV/V	
			10 V, 10 MHz	300 μV/V	
			10 V, 30 MHz	2000 μV/V	
			20 V, 10 MHz	600 μV/V	
			20 V, 30 MHz	2000 μV/V	
12/3			AC Calibrators	10 mV ÷ 1000 V 10 Hz ÷ 200 kHz (200 kHz до 60 V)	
12/4	10 mV ÷ 20 V 200 kHz ÷ 1 MHz	0,23 mV/V ÷ 3,9 mV/V		CMC	
12/4	AC Voltmeters (Multimeters)	10 mV ÷ 1000 V 10 Hz ÷ 200 kHz (200 kHz до 60 V)	0,03 mV/V ÷ 1,4 mV/V	CMC	
		10 mV ÷ 20 V 200 kHz ÷ 1 MHz	0,23 mV/V ÷ 3,9 mV/V	CMC	

13. ELECTIRICITY/AC CURRENT

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
13/1	AC Current	AC current generators	1 mA ÷ 10 A 10 Hz ÷ 10 kHz	0,00042 mA/A ÷ 12 mA	CMC
13/2		AC current calibrators	1 mA ÷ 10 A 10 Hz ÷ 10 kHz	0,00042 mA/A ÷ 12 mA	CMC

		(Multifunction calibrators)			
13/3		AC Ampermeters (Multimeters)	0,22 mA ÷ 2,2 A 45 Hz ÷ 5 kHz	0,21 mA/A ÷ 0,58 mA/A	CMC
			0,05 A ÷ 100 A 50 Hz ÷ 60 Hz	0,08 mA/A ÷ 0,11 mA/A	CMC
13/4		Current transducers	0,22 mA ÷ 2,2 A 45 Hz ÷ 5 kHz	0,21 mA/A ÷ 0,58 mA/A	CMC
			0,05 A ÷ 100 A 50 Hz ÷ 60 Hz	0,08 mA/A ÷ 0,11 mA/A	CMC

14. ELECTRICITY/AC POWER

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)	
14/1	Active AC Power	Active power meters, one phase	0 W ÷ 1200 W (12 V ÷ 240 V, 0,05 A ÷ 5 A, 1 ÷ 0 i/c, 45 Hz ÷ 65 Hz)	66 µW/VA ÷ 80 µW/VA	CMC	
			0 W ÷ 48000 W (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0 i/c, 50 Hz to 60 Hz)	116 µW/VA ÷ 129 µW/VA	CMC	
14/2		Active power converters	0 W ÷ 1200 W (12 V ÷ 240 V, 0,05 A to 5 A, 1 ÷ 0 i/c, 45 Hz ÷ 65 Hz)	66 µW/VA ÷ 80 µW/VA	CMC	
			0 W ÷ 48000 W (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0 i/c, 50 Hz ÷ 60 Hz)	116 µW/VA ÷ 129 µW/VA	CMC	
14/3		Watt meters	0 W ÷ 1200 W (12 V ÷ 240 V, 0,05 A to 5 A, 1 ÷ 0 i/c, 45 Hz ÷ 65 Hz)	66 µW/VA ÷ 80 µW/VA	CMC	
			0 W ÷ 48000 W (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0 i/c, 50 Hz ÷ 60 Hz)	116 µW/VA ÷ 129 µW/VA	CMC	
14/4		Reactive AC power	Power meters, one phase	0 ÷ 48000 var (30 V ÷ 240 V, 0,05 A ÷ 100 A,	116 µvar/VA ÷ 129 µvar/VA	CMC

			1 ÷ 0 i/c, 50 Hz ÷ to 60 Hz)		
14/5		Power converters	0 ÷ 48000 var (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0 i/c, 50 Hz ÷ 60 Hz)	116 μvar/VA ÷ 129 μvar/VA	CMC
14/6	Apparent AC power	Power meters, one phase	6 VA ÷ 1200 VA (12 V ÷ 240 V, 0,05 A ÷ 5 A, 1 ÷ 0 i/c, 45 Hz ÷ 65 Hz)	43 μVA/VA ÷ 62 μVA/VA	CMC

15. ELECTRICITY/ACTIVE ELECTRICAL ENERGY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
15/1	Active electrical energy	One phase Reference Standard of active energy	0,4 Ws ÷ 4800000 Ws (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0.25 i/c, 50 Hz ÷ 60 Hz, 1 s ÷ 100 s)	116 μWh/VAh ÷ 129 μWh/VAh	CMC
15/2		Three phase Reference Standard of active energy	0,4 Ws ÷ 4800000 Ws (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0.25 i/c, 50 Hz ÷ 60 Hz, 1 s ÷ 100 s)	116 μWh/VAh ÷ 129 μWh/VAh	CMC

16. ELECTRICITY/REACTIVE ELECTRICAL ENERGY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
16/1	Reactive electrical energy	One phase Reference Standard of reactive energy	0,4 vars ÷ 4800000 vars (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0.25 i/c, 50 Hz ÷ 60 Hz, 1 s ÷ 100 s)	116 μvarh/VAh ÷ 129 μvarh/VAh	CMC

16/2		Three phase Reference Standard of reactive energy	0,4 vars ÷ 4800000 vars (30 V ÷ 240 V, 0,05 A ÷ 100 A, 1 ÷ 0.25 i/c, 50 Hz ÷ 60 Hz, 1 s ÷ 100 s)	116 μ varh/VAh ÷ 129 μ varh/VAh	CMC
------	--	---	---	---	-----

17. ELECTRICITY/PHASE ANGLE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
17/1	Phase angle	Phase angle generators	0° ÷ 360° (10 mV ÷ 350 V, 50 Hz ÷ 100 kHz)	0,04° ÷ 1,68°	CMC
17/2		Phase meters	0° ÷ 360° (1 Hz ÷ 100 kHz, 10 mV ÷ 350 V)	0,04° ÷ 1,68°	CMC

18. ELECTRICITY/CURRENT AND VOLTAGE WAVEFORM

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
18/1	Current and voltage waveform/ Current harmonics	Harmonics analysers	0,016 A ÷ 10 A	0,4 mA/A ÷ 2,9 mA/A (of fundamental)	CMC

19. ELECTRICITY/CURRENT AND VOLTAGE WAVEFORM

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
19/1	Current and voltage waveform/Main s frequency voltage fluctuations	Flicker meters	0,5 ÷ 10	0,05	CMC

20. ELECTRICITY/HIGH AC VOLTAGE/VOLTAGE TRANSFORMER RATIO ERROR

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
20/1	High AC voltage/ Voltage transformer ratio error	Voltage transformers	0 % ÷ 2 % (Primary voltage 100/√3 V ÷ 120/√3 kV Secondary voltage 100/√3 V, 110/√3 V, 100 V, 110 V, 120 V Frequency 50 Hz)	0,01 % ÷ 0,02 %	CMC

21. ELECTRICITY/HIGH AC VOLTAGE/VOLTAGE TRANSFORMER PHASE DISPLACEMENT

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
21/1	High AC voltage/ Voltage transformer phase displacement	Voltage transformers	0 mrad ÷ 30 rad (Primary voltage 100/√3 V ÷ 120/√3 kV Secondary voltage 100/√3 V, 110/√3 V, 100 V, 110 V, 120 V Frequency 50 Hz)	0,10 mrad ÷ 0,15 mrad	CMC

22. ELECTRICITY/HIGH AC CURRENT/CURRENT TRANSFORMER RATIO ERROR

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
22/1	High AC current/ Current transformers ratio error	Current transformers	0 % ÷ 2 % (Primary current 1 A ÷ 3000 A Secondary current 1A, 5A Frequency 50 Hz)	0,004 % ÷ 0,015 %	CMC

23. ELECTRICITY/HIGH AC CURRENT/CURRENT TRANSFORMER PHASE DISPLACEMENT

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
23/1	High AC current/Current transformers phase displacement	Current transformers	0 mrad ÷ 30 mrad (Primary current 1 A ÷ 3000 A Secondary current 1A, 5A Frequency 50 Hz)	0,03 mrad ÷ 0,13 mrad	CMC

24. ELECTRICITY/CAPACITANCE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
24/1	Impedance/ Capacitance	Fixed capacitors	0,01 nF ÷ 10000 nF (frequency 20 Hz to 2 MHz)	0,59 mF/F ÷ 8,07 mF/F	CMC
24/2		Capacitance meters, LCR meters, Capacitance bridge	1 Pf ÷ 1000 pF (frequency 100 Hz ÷ 1 MHz)	0,005 mF/F ÷ 0,26 mF/F	CMC

25. ELECTRICITY/INDUCTANCE

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
25/1	Impedance/ Inductance	Inductance bridge, LCR meter	0,1 mH÷10000 mH (frequency 100 Hz, 1 kHz)	0,2 mH/H ÷ 0,5 mH/H	CMC

26. PHYSICO – CHEMICAL QUANTITIES

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Notice	Calibration and measurement capabilities in BIPM data base (accreditation)
26/1	Density / Density of liquid	Hydrometers/ constant mass measuring instruments	600 kg/m ³ ÷ 1100 kg/m ³	(0.060 ÷ 0.080) kg/m ³	Direct comparison method	-
26/2			1100 kg/m ³ ÷ 1840 kg/m ³	0.080 kg/m ³	Direct comparison method	-
26/3			600 kg/m ³ ÷ 2000 kg/m ³	(0.060 ÷ 0.070) kg/m ³	Cuckow method (Hydrostatic weighing)	CMC
26/4		Density meters for laboratory use	600 kg/m ³ ÷ 1840 kg/m ³	0.080 kg/m ³	Comparison method	-
26/5		Portable density meters	600 kg/m ³ ÷ 1840 kg/m ³	0.080 kg/m ³	Comparison method	-
26/6		Hydrostatic balance for laboratory use	600 kg/m ³ ÷ 1840 kg/m ³	± 0.080 kg/m ³	Comparison method	-
26/7		Refractive index	Handheld and Abbe refractometers	(1.333 □ 1.532) <i>n_D</i>	0.00010 <i>n_D</i>	Direct comparison method
26/8	Automatic refractometers for laboratory use		(1.33299÷ 1.5320) for <i>n_D</i>	0.00010 <i>n_D</i>	Direct comparison method	-

27. MEASUREMENTS IN CHEMISTRY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Notice	Calibration and measurement capabilities in BIPM data base (accreditation)
27/1	Organic solutions / Concentration of sugar	Hydrometers for special purposes/ Saccharimeters	0 % ÷ 60 % (% Bx)	0,40 %	Comparison method	-
27/2	Organic solutions / Concentration of sugar	Handheld and Abbe refractometers	0 % Bx □ 95 % Bx	0,050 % Bx	Direct comparison method	-
27/3		Automatic refractometers for laboratory use	0 % Bx □ 95 % Bx	0.10 % Bx	Direct comparison method	-
27/4	Organic solutions / Concentration of alcohol	Glassware alcoholmeters	0 % ÷ 100 %	0.021 %	Comparison method	-
27/5	Organic solutions / Concentration of ethanol	Ethanol in water solutions	0,1 mg/g □ □ 8 mg/g	1,4 % (relative)	Gas chromatograp hy with flame- ionizing detection (HSGC-FID)	CMC
27/6	Gases / Ozone concentration	Ambient ozone analysers (photometers), with or without adjustment (calibration)	0 nmol/mol ÷ 1000 nmol/mol	Q[1.04, 0.0091 x(O ₃)] nmol/mol	Direct comparison method	
27/7		Ozone generators				

28. PHOTOMETRY AND RADIOMETRY

Service Number	Field/ Subfield of measurement and calibration	Object of calibration	Measurement range	Measurement uncertainty (k=2)	Notice	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
28/1	Luminous intensity	Standard luminous intensity lamps	(1 up to 10000) cd	2 %		CMC
28/2	Distribution of temperature	Lamps for distribution temperature	(2000 up to 3000) K	30 K		CMC
28/3	Correlation temperature	Light sources	(1500 up to 3200) K	60 K		CMC

28/4	Illuminance, illuminance responsivity	Illuminance meters, Photometers, Photodetectors	(0,05 up to 5000) lx	3 %		CMC
28/5	Transmittance, regular, spectral	Spectrally neutral material	(0,001 up to 0,1) (401 up to 1000) nm	(0,6 up to 2) %		CMC
28/6	Transmittance, regular, spectral	Spectrally neutral material	(0,1 up to 1) (401 up to 1000) nm	0,3 %		CMC
28/7	Luminous flux	Lamps for luminous flux	(400 up to 10000) lm	3 %		CMC
28/8	Luminance, Luminance responsivity	Luminance standards	(0,01 up to 5000) cd/m ²	2,5 %		CMC
		Luminance meters, Photometers	A/(cd/m ²)	3 %		CMC
28/9	Regular spectral transmittance	Neutral filters and solutions	(0,1 up to 1) (250 up to 359) nm	1 %		CMC
			(0,1 up to 1) 400 nm	0,6 %		
		Spectrophotometers, biochemical analyzers (photometers, colorimeters) ELISA readers	(0,001 up to 1) (200 up to 1000) nm	(0,5 up to 2) %		
28/10	Regular spectral reflectance	Reflectometers, reflection spectrophotometers	(280 up to 1000) nm	0,5 %	Provide traceability and procedure according to ISO 17025	-
28/11	Chromaticity coordinates	Color standards, Colorimeters	x=(0,1±0,7) y= (0,05±0,7)	x=0,01 up to 0,02 y= 0,01 up to 0,03	Provide traceability and procedure according to ISO 17025	-
28/12	Wavelength	Spectrally selective filters	(280 up to 1000) nm	± 0,3 nm	Provide traceability and procedure according to ISO 17025	-
28/13	Spectral responsivity of detectors	Radiation detector	(280 up to 1000) nm	(1 up to 3) %	Provide traceability and procedure according to ISO 17025	-

II CERTIFIED REFERENCE MATERIALS

1. ORGANIC SOLUTIONS					
CRM CODE	Description of CRM	Certified value	Measurement uncertainty (k=2)	Notice	Calibration and measurement capabilities in BIPM data base or accreditation (ATS)
DMDM-E01	Ethanol in water solutions , in 1 L bottles	Mass concentration of solution 0 g/L (concentration of ethanol in air at 34 °C 0 mg/L)	0,0001 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E02		Mass concentration of solution 0,2573 g/L (concentration of ethanol in air at 34 °C 0,10 mg/L)	0,0007 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E03		Mass concentration of solution 0,6432 g/L (concentration of ethanol in air at 34 °C 0,25 mg/L)	0,0014 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E04		Mass concentration of solution 1,0292 g/L (concentration of ethanol in air at 34 °C 0,40 mg/L)	0,0025 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E05		Mass concentration of solution 1,8011 g/L (concentration of ethanol in air at 34 °C 0,70 mg/L)	0,0043 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E06		Mass concentration of solution 2,4443 g/L (concentration of ethanol in air at 34 °C 0,95 mg/L)	0,0059 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E07		Mass concentration of solution 3,8594 g/L (concentration of ethanol in air at 34 °C 1,50 mg/L)	0,0092 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E08		Mass concentration of solution 5,0172 g/L (concentration of ethanol in air at 34 °C 1,95 mg/L)	0,012 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E09		Mass concentration of solution 1,2252 g/L (concentration of ethanol in air at 34 °C 0,48 mg/L)	0,0030 g/L	Provide traceability and procedure according to ISO 17025 and	-

				ISO 17034	
DMDM-E10		Mass concentration of solution 0,6126 g/L (concentration of ethanol in air at 34 °C 0,24 mg/L)	0,0015 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E11		Mass concentration of solution 0,6279 g/L (concentration of ethanol in air at 34 °C 0,244 mg/L)	0,0016 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-
DMDM-E12		Mass concentration of solution 1,2557 g/L (concentration of ethanol in air at 34 °C 0,488 mg/L)	0,0031 g/L	Provide traceability and procedure according to ISO 17025 and ISO 17034	-

Certification report for Reference Materials „[Ethanol in water solutions DMDM-EXX](#)“

III TESTING

1. MASS		
Measuring instruments	Method of testing	Accreditation
Non-automatic weighing instruments, class ① up to 1 kg	SRPS EN 45501:2009, SRPS EN 45501:2015, T.A.4.2, A.4.3, A.4.4, A.4.5, A.4.6, A.4.7, A.4.8, A.4.10, A.4.11, A.4.12, A.5.1, A.5.2, A.5.3, A.5.4, B.2, B.4	ATS
Non-automatic weighing instruments, class ② up to 10 kg		ATS
Non-automatic weighing instruments, class ③ and ④ up to 100 kg		ATS

2. FORCE		
Measuring instrument	Method of testing	Accreditation
Force measuring instrument at motor vehicles	Rulebook on Force measuring instrument at motor vehicles („Official Gazette of RS”, No. 66/14)	-

3. PRESSURE		
Measuring instruments	Method of testing	Accreditation
Tire pressure gauges for motor vehicles	Rulebook on Tire pressure gauges for tire pressure measurement („Official Gazette of RS”, No. 13/20)	-

4. LENGHT & ANGLE		
Measuring instruments	Method of testing	Accreditation
Material measures of length for general use	OIML R 35	-

Wire and cable length measuring machines	OIML R 66	-
Taximeters	OIML R 21	ATS
Automatic level gauges (magnetostrictive)	OIML R 85	-

5. ACOUSTICS

Measuring instruments	Method of testing	Accreditation
Sound level meters	OIML R 58 IEC 61672-2	-

6. TEMPERATURE SENSORS

Measuring instruments	Method of testing	Accreditation
Clinical thermometers	SRPS EN 12470-1,3,4,5	-
Resistance thermometers	SRPS EN 60751	-
Thermocouples	SRPS EN 60584	-

7. HEATING ENERGY

Measuring instrument	Method of testing	Accreditation
Calculation unit as a part of heat meters and cooling meters	SRPS EN 1434-5 OIML R75	-
Pair of temperature sensor as a part of heat meters and cooling meters	SRPS EN 1434-5 OIML R75 SRPS EN 60751	-

8. ACTIVE ELECTRICAL ENERGY

Measuring instruments	Method of testing	Accreditation
Static meters for active energy (classes 0,2S)	SRPS EN 62053-22:2008 (clause 7.3, 8.1, 8.2, 8.3.1, 8.3.2, 8.3.3, 8.4)	ATS
Electromechanical meters for active energy (class index A and B)	MID, SRPS EN 50470-2:2009 (clause 8.1, 8.7.5.3, 8.7.5.4, 8.7.7.2, 8.7.7.3, 8.7.7.4, 8.7.7.5, 8.7.7.7, 8.7.9.2, 8.7.9.3, 8.7.10)	ATS
Static meters for active energy (class index A, B and C)	MID, SRPS EN 50470-3:2009 (clause 8.1, 8.7.5.3, 8.7.5.4, 8.7.7.2, 8.7.7.3, 8.7.7.4, 8.7.7.5, 8.7.7.7, 8.7.9.2, 8.7.9.3, 8.7.10)	ATS

9. REACTIVE ELECTRICAL ENERGY

Measuring instruments	Method of testing	Accreditation
Static meters for reactive energy (classes 2 and 3)	SRPS EN 62053-23:2008 (clause 7.3, 8.1, 8.2, 8.3.1, 8.3.2, 8.3.3, 8.4)	ATS

10. PHYSICO-CHEMICAL QUANTITIES

Measuring instruments	Method of testing	Accreditation
Density meters for laboratory use	ISO 15212-1	-
Refractometers	Rulebook on the on refractometers used in the trade of goods and services ("Official Gazette of the Republic of Serbia", No. 65/2015)	

11. MEASUREMENTS IN CHEMISTRY

Measuring instruments	Method of testing	Accreditation
Ethanol in breath analysers	Rulebook on Ethanol in breath analysers ("Official Gazette of the Republic of	-

	Serbia", No. 124/2014)	
Moisture meters for cereal grains and oil seeds	Rulebook on the moisture measurements for cereal grains and oil seeds ("Official Gazette of RS", No. 96/2018)	-
Analysers for measuring protein content in cereals	Rulebook on the analysers for measuring protein content in cereals ("Official Gazette of RS", No. 96/2018)	-
Instruments for measuring vehicle exhaust emission	MID OIML R 99	-

12. VOLUME OF LIQUIDS		
Measuring instruments	Method of testing	Accreditation
Dynamic measuring systems for liquids other than water	OIML R 117-1	-

13. OPTICAL QUANTITIES		
Measuring instrument	Method of testing	Accreditation
Opacity meter	Rulebook on the Opacity meters "Official Gazette of RS", No. 15/15) ISO 11614:1999	-

IV VERIFICATION OF MEASURING INSTRUMENTS

Verification of measuring instruments, in accordance with the Law on Metrology („Official Gazette of RS” No. 15/16), performs authorized bodies for tasks of verification of measuring instruments, or Directorate of Measures and Precious Metals for those measuring instruments for which verification no authorized body exists.

More detailed data on authorized bodies and kinds of measuring instruments for which verification is authorized can be taken from the Registry of authorized bodies for verification of measuring instruments.

[EXCERPT FROM THE REGISTRY OF BODIES AUTHORIZED FOR VERIFICATION OF MEASURING INSTRUMENTS](#)

V TYPE APPROVAL OF MEASURING INSTRUMENTS

Kinds of measuring instruments for which must be issued a certificate of type approval are prescribed by the Regulation on kinds of measuring instruments for which verification is mandatory and intervals of their periodic verification („Official Gazette of RS”, No. 37/21 and No. 84/22).

No.	Kinds of measuring instruments
1.	Road and railway tanks with level measurement
2.	Automatic level gauges for measuring the level of liquids
3.	Measuring systems for compressed gas fuels for vehicles
4.	Tire pressure gauges
5.	Measuring instruments for measurement of motor vehicles braking force
6.	Breathalysers
7.	Moisture meters for cereal grains and oilseeds
8.	Analyzers for measuring protein content in grain

9.	Exhaust gas analyzers
10.	Refractometers used in the trade of goods and services
11.	Opacity meters (Smoke meters)
12.	Electricity meters of 0,2 accuracy class and electricity meters of reactive electric energy
13.	Measuring instruments for measurement of vehicles speed in traffic

VI CONFORMITY ASSESSMENT

The Directorate, as a designated body II 045, in accordance with the Appointment Decision, performs the service of conformity assessment for the following types of measuring instruments whose requirements are prescribed by the valid Rulebook on measuring instruments (Official Gazette of the RS, No. 3/18) and the Rulebook on Non-automatic scales ("Official Gazette of RS ", No. 29/18 and 90/23 – other regulations"):

- Water meters designed to measure the volume of clean, cold or heated water for use in home, business facilities and light industry (special requirements prescribed in Annex MI-001 of the Rulebook on measuring instruments);
- Gas meters and devices for volume conversion, designed for use in home, business facilities and light industry (special requirements prescribed in Annex MI-002 of the Rulebook on measuring instruments);
- Active electrical energy meters designed for use in home, business facilities and light industry (special requirements prescribed in annex MI-003 of the Rulebook on measuring instruments);
- Heat meters designed for use in home, business facilities and light industry (special requirements prescribed in annex MI-004 of the Rulebook on measuring instruments);
- Measuring systems intended for continuous and dynamic measurement of liquid quantities other than water (special requirements prescribed in Annex MI-005 of the Rulebook on measuring instruments);
- Automatic scales (automatic scales, automatic scales for individual measurement, automatic control scales, automatic scales with labeling, automatic scales with labeling of value of measured weight and price, automatic dosing scales, automatic scales with addition of discontinuous measurement results, automatic scales with addition of continuous measurement results, automatic scales for measuring the mass of rail vehicles in motion) (special requirements prescribed in Annex MI-006 of the Rulebook on measuring instruments);
- Taximeters (special requirements prescribed in Annex MI-007 of the Rulebook on measuring instrument);
- Materialized measures (materialized measures of length, catering vessels) (special requirements prescribed in Annex MI-008 of the Rulebook on measuring instruments);
- Dimension measuring instruments (length, surface and multi-dimensional measuring instruments) (special requirements prescribed in Annex MI-009 of the Rulebook on measuring instrument);
- Exhaust gas analysers (exhaust gas analysers, lambda), (special requirements prescribed in Annex MI-010 of the Rulebook on measuring instrument);
- Non-automatic scales (Rulebook on non-automatic scales).

VII PRECIOUS METALS ARTICLES CONTROL

In accordance with the Law on Control of Precious Metal Articles („Official Gazette of RS”, No. 47/2021), the Directorate of Measures and Precious Metals shall, and at the request of the manufacturer of precious metal articles, importers, representative, or owners of precious metal articles and other legal entities, provides the following services:

CONTROL ON PRECIOUS METALS ARTICLES

No.	SERVICES	INTENDED FOR
1.	Assessing compliance with the requirements for obtaining the mark of the manufacturer of precious metal articles, and issuing a Decision on the Mark of the Manufacturer of precious metal articles.	Manufacturers of precious metal articles, i.e. economic entities registered in accordance with the law governing the registration of economic entities.
2.	Assessing compliance with the requirements for obtaining the mark of the importer of precious metal articles, and issuing a Decision on the Mark of the Importer of precious metals articles.	Importers of precious metal articles, i.e. economic entities registered in accordance with the law regulating the registration of economic entities.
3.	Determining the required conditions for work facilities and hallmarking equipment for precious metal articles inside the business premises of the manufacturer or importer.	Manufacturers or importers of precious metal articles who wish to conduct testing and hallmarking of precious metal articles within their own business premises.
4.	Amendment of the Decision on the Mark of the Manufacturer, Mark of the Importer or Mark of the Representative of a Foreign Manufacturer.	Manufacturers, importers or representatives, who have undergone a change in their business that relates to the applicable Decision on the Mark of the Manufacturer, Mark of the Importer or Mark of the Representative.
5.	Sale of images showing the shape of hallmarks for indicating the degree of fineness of precious metal articles.	Manufacturers, importers or representatives of manufacturers of precious metal articles, as well as other economic entities.
6.	Determining the fineness by methods of quantitative chemical analyses: <ul style="list-style-type: none"> • for precious metals (gold and silver) • for precious metal alloys • for precious metal articles. 	Manufacturers, importers, or representatives for foreign manufacturers of precious metal articles, and citizens who own precious metal articles.
7.	Testing composition and fineness of precious metal test needles.	Manufacturers of precious metal articles.
8.	Testing and marking of precious metal articles (platinum, gold, palladium, silver).	Manufacturers, importers, or representatives for foreign manufacturers of precious metal articles, and citizens who own precious metal articles.
9.	Marking of precious metal articles with the Convention Mark for precious metal articles	Manufacturers of precious metal articles – for articles intended for export to countries which

	(Common Control Mark – CCM).	recognize the CCM.
10.	Registration with the Register of Purchasers (RP) and issuing a Decision on Registration with the RP.	Economic entities registered in accordance with the law regulating the registration of economic entities.
11.	Issuing a Decision about amendments/supplements to the Decision on Registration with the RP.	Economic entities registered with the Register of Purchasers.
12.	Issuing a Decision on removal from the RP.	Economic entities registered with the Register of Purchasers.

VIII EXPERT OPINIONS

Within the scope of its competencies and Law on Metrology "Official Gazette of RS" No. 15/2016, Law on Control of Precious Metals Articles "Official Gazette of RS" No. 47/21 Law on Time Calculation "Official Gazette of SCG", No. 20/2006, and upon request of stakeholders, the Directorate for Measures and Precious Metals issues expert opinions.

IX AUTHORIZATION

In accordance with the Law on Metrology ("Official Gazette of RS", No. 15/16), the Directorate of Measures and Precious Metals also performs tasks of authorization of business entities and other legal entities to perform tasks of verification of measuring instruments.