SCOPE OF ACCREDITATION

Federal Budgetary Institution
"State Regional Centre for Standardization, Metrology and Testing in Rostov Region" (FBI "Rostov CSM")
name of the legal entity or surname, name and patronymic
(if any) of the individual entrepreneur
344000, Rostov-on-Don, Sokolova Av. 58/173
344103, Rostov-on-Don, Dovatora Str. 265
site

Calibration of measuring instruments

RD
calibration imprint code

No.	Measurements, type (group) of measuring instruments	Metrological requirements		Note
		measurement range	uncertainty (error, class, category)	
344000, Rostov-on-Don, Sokolova Av. 58/173				
Measurement of geometric quantities				
1	Length measuring instruments: - metering orifice - set rings - plain gauges for shafts and holes - test sieves	 diam. (0,8 - 700) mm diam. (0,8 - 500) mm diam. (0,5 - 500) mm (0,01 - 300) mm	 U 0,046 % Er ±0,04 % U 1,2 µm Er ±(1 - 5) µm U 1,1 µm accuracy degree 6-8 U 29 % Er ±25 %	
2	Length measuring instruments - line standards: - measuring tapes - measuring scales - object micrometers	 (0 - 100) m (0 - 1000) mm (0 - 10) mm	 U 1,2 mm Er ±[0,30-0,15(L-1)] mm U 0,12 mm Er ±(0,1 - 0,2) mm U 1,39 µm Er ±(1,2 - 10) µm	
3	Length measuring instruments – measuring instrument: - vernier callipers, vernier height gauges, vernier depth gauges - micrometers - reference gauges for micrometers - tubular inside micrometers - fillet gauges	 (0 - 2500) mm (0 - 2000) mm (25 - 2000) mm (50 - 2000) mm (0 - 100) mm	 U 0,058 mm Er ±(0,05 – 0,1) mm U 2,3 µm Er ±(2 - 15) µm U 2,3 µm Er ±(2 - 4) µm U 4,1 µm Er ±(3 - 60) µm U 0,57 µm Er ±(0,5 - 40) µm	
4	Length measuring instruments – optical-mechanical devices: - reading microscopes - metallographic microscopes	 (0 - 9) mm (0,003 - 300) mm	 U 3,5 µm Er ±3 µm U 0,23 µm Er ±(0,2 - 50) µm	
5	Length measuring instruments – measuring systems - distance gauges	 (0,05 - 200) m	 U 1,2 mm Er ±[(1+1·10^{-6}D) - (30+1·10^{-6}D)] mm	
6	Surface finish measuring instruments: - standard finished samples (comparison) - profilograph-profilometers	 Ra (0,01 – 250) µm Rz (0,01 - 300) µm	 U 20 % Er -17 % U 14 %	

		(-250 – 250) µm	Er +12 % U 3,5 % Er ±3 %	
7	Thread measuring instruments: - gauges - thread gages	 up to M90, length 280 mm from M3 to M500 M60° D55°	 U 44 µm Precision 3 - 9 U 116 µm Precision 4 - 8 U 23″ Er ±20″ U 23″ Er ±20″	
8	Plane angle measuring instruments: - setsquares of all types - electronic levels	 (40 - 630) mm ±1500 µm /m	 U 2,9 µm Er ±(2,5 - 40) µm U 2,3 µm /m Er ±(2+0,01a) µm /m	
9	Nondestructive inspection aids: - ultrasonic flaw detectors - eddy current flaw detectors - standard samples for ultrasonic flaw detection	 (1 - 180) mm (0,4 - 10) MHz (0,3 - 1) mm (0,1 - 300) mm	 U 0,23 % Er ±(0,2 - 10) % Er ±0,5 % Er ±0,05 mm U 1,2 mm Er ±(1 - 15) % U 23 µm Er ±20 µm	
10	Coating thickness measuring instruments: - grindometers - applicators	 (0 - 150) µm (0 - 0,5) mm	 U 1,15 µm Er ±(1 - 10) µm U 1,15 µm µm Er ±(1 - 10) µm	
11	Means of measuring the length of the nanometer range: - measuring instrument for nanometer range - scanning probe microscopes - scanning electron microscopes	 $(1\cdot10^{-8} - 5\cdot10^{-6})$ m $(1\cdot10^{-9} - 1\cdot10^{-5})$ m $(1\cdot10^{-9} - 1\cdot10^{-2})$ m	 U $5\cdot10^{-9}$ m Er ±(1 - 10) % U $4\cdot10^{-9}$ m Er ±(1 - 5) % U $4\cdot10^{-9}$ m Er ±(1 - 5) %	
Measurement of mechanical values				
12	Mass measuring instruments: - reference weights, general purpose weights, special loads	$(1\cdot10^{-6} - 2000)$ kg	U 0,002 mg Er ±(0,006 - 1000000) mg	
13	Mass measuring instruments: - reference scales, laboratory scales, mass comparators, weighing devices	$(1\cdot10^{-6} - 50)$ kg	U 0,01 mg C special (I), C high (II), C medium (III)	
14	Mass measuring instruments: - non-automatic scales, batching scales, load meters, weighing devices, comparators	$(1\cdot10^{-2} - 100000)$ kg	U $4\cdot10^{-4}$ kg Er ±(0,5 - 3,0) e	
15	Grain unit scales	(720 - 820) g/l	U 4,62 g/l Er ±4 g/l	
16	Force measuring instruments: - force gauges, - force sensors - testing machines, presses and installations	 $(10 - 2\cdot10^{6})$ N $(10 - 2\cdot10^{6})$ N $(10 - 2\cdot10^{6})$ N	 U 0,28 % Er ±(0,24 - 2) % U 0,11 % Er ±(0,1 - 1) % U 1,16 % Er ±(1 - 3) %	
17	Torque measurement tools	(0,2 - 3000) N·m	U 2,31 % Er ±(2 - 6) %	

Measurement of flow parameters, flow rate, level, volume of substances				
18	Volume measuring instruments: - pipettors, volumetric glassware	(0,001 - 2000) cc	U 0,000060 cc	
19	Volume measuring instruments: - dose meters, volume measures	$(1\cdot10^{-4}$ - 200) m^3	U 0,11 % Er ±(0,1 - 2,5) %	
20	Volume measuring instruments: - vertical, horizontal, spherical, trench, casemate tanks and tanks on floating equipment	(3 - 200000) m^3	U 0,2 m^3 Er ±(0,1 – 0,25) %	
21	Dosing probes for determining the porosity of bread	27 cc	U 0,011 cc Er ±(0,01 - 2) cc	
Pressure measurements, vacuum measurements				
22	Pressure measuring instruments: - excessive pressure - absolute pressure - barometric pressure	 (0,04 - 60) MPa (-0,095 - 0,25) MPa (-0,095 - 25) MPa (0,133 - 1000) kPa (0,5 - 200) kPa	 U 0,023 % C (0,02 - 4) U 0,061 % C (0,05 - 4) U 0,061 % C (0,05 - 4) U 23 Pa Er ±(20 - 10000) Pa U 0,58 kPa Er ±(0,5 - 100) kPa	
Measurements of physical and chemical composition and properties of substances				
23	Fluid viscosity measuring instruments	$(4\cdot10^{-7}$ - $1\cdot10^{-1})$ m^2/s	U 0,30 %	
24	Density measuring instruments	(650 - 1840) kg/m^3 (0 - 100) % alcohol by volume (0 - 70) % mass fraction of sugar	U 0,10 kg/m^3 U 0,050 % alcohol by volume U 0,050 % mass fraction of sugar	
25	Mass spectrometers, chromatographs	mass concentration of component: $(1\cdot10^{-8}$ - 100) g/dm^3 mass fraction of component: $(1\cdot10^{-8}$ - 100) % molar fraction of component: $(1\cdot10^{-6}$ - 100) % molar concentration of component: $(1\cdot10^{-9}$ - 2) mol/dm^3	U 3,0 %	
26	Gas humidity measuring instruments	(5 - 95) %	U 0,60 %	
27	Humidity measuring instruments for solid and bulk materials and substances	(0,01 - 100) %	U 0,020 %	
28	Instruments for measuring the content of components in gaseous media	$(7\cdot10^{-3}$ - $2\cdot10^{3})$ mg/m^3 $(1\cdot10^{-6}$ - 99) % (40 - 2000) mg/m^3	U 5,0 % U 0,20 % U 5,0 %	
29	Instruments for measuring the specific electric conductivity (SEC) of liquids	$(1\cdot10^{-4}$ - 100) Cm/m	U 0,50 %	
30	pH, pX measuring instruments	(0 - 14) pH (1 - 7) pX	U 0,020 pH U 0,030 pX	
31	Analyzers of composition and properties of substances	mass concentration of component: $(1\cdot10^{-8}$ - 100) g/dm^3 mass fraction of component:	U 0,70 %	

		$(1\cdot10^{-8}$ - 100) % molar fraction of component: $(1\cdot10^{-6}$ - 100) % molar concentration of component: $(1\cdot10^{-9}$ - 2) mol/dm^3		
32	Gluten deformation gauges	(0 - 150,7) c.u.	U 0,58 c.u. Er ±(0,5 - 2,5) c.u.	
Thermophysical and temperature measurements				
33	Contact temperature measuring instruments	(-80 - 1200) °C	U 0,050 °C	
34	Contact-free temperature measuring instruments	(-20 - 1700) °C	U 1,0 °C	
Time and frequency measurements				
35	Time and frequency measuring instruments: - frequency synthesizers - counting-type frequency meters	 $(1\cdot10^{-2}$ – $37{,}5\cdot10^{9})$ Hz $(1\cdot10^{-2}$ – $37{,}5\cdot10^{9})$ Hz	 U $1{,}2\cdot10^{-9}$ Er $\pm1\cdot10^{-9}$ U $1{,}2\cdot10^{-10}$ Er $\pm(1\cdot10^{-10}$ - $1\cdot10^{-1})$	
Measurements of electrical and magnetic quantities				
36	Direct current measuring instruments (measurement) DC Ammeters	$(1\cdot10^{-7}$ - 50) A	U 0,00039 mA Er ± (0,005 - 5) %	
37	Direct current measuring instruments (measurement) Current clamps	(1 - 1000) A	U 0,36 A Er ±(1,5 - 5) %	
38	Measuring instruments for electromotive force and constant voltage (measurement) DC voltmeters, instability meters, voltage dividers, DC potentiometers, voltage comparators	$(1\cdot10^{-7}$ - $1\cdot10^{3})$ V	U 0,0039 mV Er ±(0,0005 - 5) %	
39	Alternating current measuring instruments (measurement) AC Ammeters	$(2\cdot10^{-5}$ - 50) A $(40$ - $2\cdot10^{4})$ Hz	U 0,00087 мA Er ±(0,1 - 4) %	
40	Alternating voltage measuring instruments (measurement) AC voltmeters, comparison devices	$(1\cdot10^{-4}$ - $1\cdot10^{3})$ V $(10$ - $1\cdot10^{6})$ Hz	U 0,029 mV Er ±(0,02 - 4) %	
41	Measuring instruments for electrical resistance (reproduction) Single-value electrical resistance measures	$(1\cdot10^{-3}$ - $1\cdot10^{12})$ Ohm	U 0,0035 % Er ±(0,0003 - 2) % 3 category	
42	Measuring instruments for electrical resistance (measurement) Electrical resistance meters, ohmmeters, DC bridges	$(1\cdot10^{-3}$ - $5\cdot10^{12})$ Ohm	U 0,0035 mOhm Er ±(0,002 - 100) %	
Radio electronic measurements				
43	Measuring instruments for amplitude modulation factor of RF oscillations	(0,1 - 100) %	U 1,7 % Er ±(1,5 - 5) %	
44	Frequency deviation measurement tools	$(1$ - $1\cdot10^{6})$ Hz	U 0,23 % Er ±(2 - 5) %	
45	Voltage measurement tools	$(10$ - $1\cdot10^{9})$ Hz	U 1,7 %	

		$(1\cdot10^{-4}$ - 1000) V	Er ±(1,5 - 15) %	
46	Measuring instruments for attenuation and phase shift	(5 - $1\cdot10^{7}$) Hz (0 - 360)º	U 0,11 % Er ±(0,1 - 0,5)%	
47	Measuring instruments for power of electromagnetic oscillations in coaxial and waveguide paths	($3,5\cdot10^{5}$ - $25,86\cdot10^{9}$) Hz ($1\cdot10^{-5}$ - $1\cdot10^{-2}$) W	U 4,6 % Er ±(4 - 25) %	
48	Measuring instruments for magnetic field strength, measuring antennas	9 Hz - 30 MHz	U 1,7 dB Er ±1,5 dB	
49	Measuring instruments for electric field strength, measuring antennas	($3\cdot10^{7}$ - $1\cdot10^{9}$) Hz	U 1,7 dB Er ±1,5 dB	
50	Measuring antennas	(1 - 40) GHz	U 2,3 dB Er ±2 dB	
Vibroacoustic measurements				
51	Measuring instruments for vibration displacement (vibration velocity), vibration acceleration	(1 - 15000) Hz (0,1 - 1000) m/s^2	U 3,5 % Er ±(3 - 20) %	
52	Measuring instruments for sound pressure in air	(20 - $2\cdot10^{4}$) Hz (20 - 140) dB	U 0,57 dB Er ±(0,5 - 1,5) dB	
Optical and optical-physical measurements				
53	Measuring instruments for color coordinates and chromaticity coordinates	X=2,5 - 109,0; Y=1,4 - 98,0; Z=1,7 - 107,0; x=0,004 - 0,734; y=0,005 - 0,834 whiteness 55 - 95 % gloss 0,5 - 70 g.u.	U 0,50 U 0,010 U 0,40 % U 0,60 g.u.	
54	IR spectrophotometers	(350 - 12800) cm^{-1}	U 0,20 cm^{-1}	
55	Measuring instruments for spectral, integral and reduced transmission factors	(0,001 - 0,1) (0,3 - 2,5) µm	U 0,0020	
56	Optical density measurement tools	(0,01 - 4,00) B	U 0,020 B	
57	Refractive index measuring instruments	(1,2 - 1,7)	U $5\cdot10^{-5}$	
58	Polarimeters, saccharimeters	(-41 - +41)º	U 0,010º	
59	Luxmeters	(1 - 200000) lx	U 6,9 % Er ±6 %	
Medical measuring instruments				
60	Biological sample analysis tools	glucose (0,6 - 55) mmol/l lactate (0,2 - 20) mmol/l protein (1 - 5) g/l density (1 - 1,03) g/ml cholesterol (100 - 400) mg/dl Ca^{2+} (0,1 - 6) mmol/l Na^{+}(15 - 200) mmol/l K^{+}(0,5 - 20) mmol/l Mg^{2+}(0,1 - 0,5) mg/dm^3 Cl^{-} (15 - 200) mmol/l Li^{+} (0,1 – 6) mmol/l urea (0,2 - 1,2) mmol/l leucocytes (0,1 - 150) 10^{9}/l RBC (0,02 - 15) 10^{9}/l haemoglobin	U 5,1 %	

Прошито, пронумеровано,
скреплено печатью

12 листов

цифрами

Должность

Подпись

26.05.2021 г.

М.П.