Mass and Related Quantities, Russian Federation,

VNIIM (D.I. Mendeleyev Institute for Metrology, Rosstandart),
VNIIMS (All-Russian Scientific Research Institute for Metrological Service, Rosstandart),
VNIIFTRI (All-Russian Scientific Research Institute of Physical Technical and Radiotechnical Measurements, Rosstandart),
SNIIM (Siberian Scientific Research Institute for Metrology, Rosstandart), and
VNIIR (All-Russian Scientific Research Institute for Flow Metering, Rosstandart).

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	Instrument or Artifact	Instrument Type or Method	Minimum value	Maximum value	Units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	Comments	Service provider	NMI internal identifier
Mass	Mass standards	Subdivison method	1	100	mg			0.6 to 1.2	µg	2	95%	No	The volume of the mass standards is known	VNIIM	2
Mass	Mass standards	Subdivison method	0.1	1	g			1.2 to 2.0	µg	2	95%	No	The volume of the mass standards is known	VNIIM	3
Mass	Mass standards	Subdivison method	1	10	g			2 to 5	µg	2	95%	No	The volume of the mass standards is known	VNIIM	4
Mass	Mass standards	Subdivison method	10	100	g			5 to 10	µg	2	95%	No	The volume of the mass standards is known	VNIIM	5
Mass	Mass standards	Subdivison method	0.1	1	kg			10 to 50	µg	2	95%	No	The volume of the mass standards is known	VNIIM	6
Mass	Mass standards	Direct comparison	1	1	kg			50	µg	2	95%	No	The volume of the mass standards is known	VNIIM	1
Mass	Mass standards	Multiplication method	1	20	kg			0.05 to 3.0	mg	2	95%	No	The volume of the mass standards is known	VNIIM	7
Mass	Mass standards	Calibration method	500	500	kg			5.0	g	2	95%	No	Temperature and humidity measured	SNIIM	8

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Force: tension and compression	Force transducers	Direct loading, deadweight	10	1000	kN			0.002	%	2	95%	Yes		VNIIM	01
Force: tension and compression	Force transducers	Direct loading, deadweight	2	100	kN			0.002	%	2	95%	Yes		VNIIM	02
Force: tension and compression	Force transducers	Direct loading, deadweight	0.1	5	kN			0.002	%	2	95%	Yes		VNIIM	03
Force: tension and compression	Force transducers	Direct loading, deadweight	10	200	N			0.002	%	2	95%	Yes		VNIIM	04
Force: tension	Force measuring device	Reference force transducers	5	50	kN			0.01	%	2	95%	Yes		VNIIM	11
Force: tension	Force measuring device	Reference force transducers	10	100	kN			0.01	%	2	95%	Yes		VNIIM	12
Force: tension	Force measuring device	Reference force transducers	20	200	kN			0.01	%	2	95%	Yes		VNIIM	13
Force: tension	Force measuring device	Reference force transducers	50	500	kN			0.01	%	2	95%	Yes		VNIIM	14
Force: tension	Force measuring device	Reference force transducers	100	1000	kN			0.01	%	2	95%	Yes		VNIIM	15
Force: compression	Force measuring device	Reference force transducers	10	100	kN			0.01	%	2	95%	Yes		VNIIM	21
Force: compression	Force measuring device	Reference force transducers	20	200	kN			0.01	%	2	95%	Yes		VNIIM	22
Force: compression	Force measuring device	Reference force transducers	50	500	kN			0.01	%	2	95%	Yes		VNIIM	23
Force: compression	Force measuring device	Reference force transducers	100	1000	kN			0.01	%	2	95%	Yes		VNIIM	24
Force: compression	Force measuring device	Reference force transducers	200	2000	kN			0.05	%	2	95%	Yes		VNIIM	25

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
Class	**Instrument or Artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**Units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Comments**	**Service provider**	**NMI internal identifier**
Force: compression	Force measuring device	Reference force transducers	300	3000	kN			0.05	%	2	95%	Yes		VNIIM	26
Force: compression	Force measuring device	Reference force transducers	400	4000	kN			0.05	%	2	95%	Yes		VNIIM	27
Force: compression	Force measuring device	Reference force transducers	500	5000	kN			0.05	%	2	95%	Yes		VNIIM	28
Force: tension and compression	Force transducers	Lever-type amplification	40	2000	kN			0.05	%	2	95%	Yes		VNIIM	31
Viscosity	Capillary viscometers	Flow due to gravity	0.001	0.003	mm^2/s^2	Temperature	20 °C	0.1	%	2	95%	Yes		VNIIM	1
Viscosity	Capillary viscometers	Flow due to gravity	0.01	0.3	mm^2/s^2	Temperature	20 °C	0.2	%	2	95%	Yes		VNIIM	2
Viscosity	Capillary viscometers	Flow due to gravity	1	100	mm^2/s^2	Temperature	20 °C	0.3	%	2	95%	Yes		VNIIM	3
Viscosity	Newtonian liquids	Reference liquids	1.2	6.0	mm^2/s	Temperature	20 °C	0.2	%	2	95%	Yes		VNIIM	4
Viscosity	Newtonian liquids	Reference liquids	10	600	mm^2/s	Temperature	20 °C	0.25	%	2	95%	Yes		VNIIM	5
Viscosity	Newtonian liquids	Reference liquids	1000	10000	mm^2/s	Temperature	20 °C	0.4	%	2	95%	Yes		VNIIM	6
Viscosity	Newtonian liquids	Reference liquids	20000	100000	mm^2/s	Temperature	20 °C	0.5	%	2	95%	Yes		VNIIM	7
Viscosity	Newtonian liquids	Reference liquids	0.9	4.8	mPa s	Temperature	20 °C	0.2	%	2	95%	Yes		VNIIM	8
Viscosity	Newtonian liquids	Reference liquids	8	480	mPa s	Temperature	20 °C	0.25	%	2	95%	Yes		VNIIM	9
Viscosity	Newtonian liquids	Reference liquids	800	7900	mPa s	Temperature	20 °C	0.4	%	2	95%	Yes		VNIIM	10
Viscosity	Newtonian liquids	Reference liquids	16000	90000	mPa s	Temperature	20 °C	0.5	%	2	95%	Yes		VNIIM	11
Gauge pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	5E+04	1E+07	Pa			8E-06 to 2E-05		2	95%	Yes	Working fluid: aviation kerosene	VNIIM	1

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
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Gauge pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	1E+07	6E+07	Pa			5E-05		2	95%	Yes	Working fluid: oil	VNIIM	2
Gauge pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	6E+07	2.5E+08	Pa			5E-04		2	95%	Yes	Working fluid: oil	VNIIM	3
Negative gauge pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	-9.5E+04	4E+04	Pa			20	Pa	2	95%	No		VNIIM	4
Gauge pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	4E+04	6.3E+05	Pa			2E-04		2	95%	Yes		VNIIMS	5
Gauge pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	2.5E+08	1.6E+09	Pa			3E-04		2	95%	Yes	Working fluid: oil	VNIIFTRI	6
Absolute pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	2.7E+02	1.3E+05	Pa			6.7	Pa	2	95%	No		VNIIM	7
Absolute pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	1.3E+05	7.2E+05	Pa			5 to 36	Pa	2	95%	No		VNIIM	8

Calibration or Measurement Service			Measurand Level or Range			Measurement Conditions/Independent Variable		Expanded Uncertainty							
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Differential pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard	0.1	100	Pa	Line pressure, p_{line}	1E+05 Pa	0.1	Pa	2	95%	No	Working fluid: ethanol	VNIIM	9
Differential pressure: liquid medium	Pressure measuring device, standard pressure generator	Direct comparison with standard	100	5E+03	Pa	Line pressure, p_{line}	1E+05 Pa	0.34	Pa	2	95%	No	Working fluid: water	VNIIM	10
Differential pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard, crossfloat	5E+03	4E+04	Pa	Line pressure, p_{line}	1E+05 Pa	1.1	Pa	2	95%	No		VNIIM	11
Absolute pressure: gas medium	Pressure measuring device, standard pressure generator	Direct comparison with standard	1E-03	1E+03	Pa			1E-04 to 6.6	Pa	2	95%	No		VNIIM	12
Absolute pressure: gas medium	Vacuum gauge	Direct comparison with standard	1E-07	1E-03	Pa			7E-09 to 4E-05	Pa	2	95%	No		VNIIM	13
Hardness	Primary hardness reference block	Rockwell A, C (with diamond indenter) according to ISO 6508:3 and GOST 9013	According to ISO 6508:1 and GOST 9013	According to ISO 6508:1 and GOST 9013	HR	Preliminary test force	98.07 N	3.0E-01	HRC	2	95%	No	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-01
						Total test force	588.4 N to 1471 N								
Hardness	Primary hardness reference block	Rockwell N (with diamond indenter) according to ISO 6508:3 and GOST 22975	According to ISO 6508:1 and GOST 22975	According to ISO 6508:1 and GOST 22975	HRN	Preliminary test force	29.4 N	5.0E-01	HRN	2	95%	No	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-02

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						Total test force	147.1 N to 441.3 N								
Hardness	Primary hardness reference block	Rockwell B (with ball indenter) according to ISO 6508:3 and GOST 9013	According to ISO 6508:1 and GOST 9013	According to ISO 6508:1 and GOST 9013 According to ISO 6508:1 and GOST 22975	HRB	Preliminary test force	98.07 N	4.0E-01	HRB	2	95%	No	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-03
						Total test force	980.7 N								
Hardness	Primary hardness reference block	Rockwell T (with ball indenter) according to ISO 6508:3 and GOST 22975	According to ISO 6508:1 and GOST 22975	According to ISO 6508:1 and GOST 9013 According to ISO 6508:1 and GOST 22975	HRT	Preliminary test force	29.4 N	6.0E-01	HRT	2	95%	No	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-04
						Total test force	147.1 N to 441.3 N								
Hardness	Primary hardness reference block	Vickers (HV1 to HV3) according to ISO 6507:3 and GOST 2999	According to ISO 6507:1 and GOST 2999	According to ISO 6507:1 and GOST 2999	HV	Total force	9.81 N to 29.42 N	12.0E-01	%	2	95%	Yes	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-05
Hardness	Primary hardness reference block	Vickers (HV5 to HV100) according to ISO 6507:3 and GOST 2999	According to ISO 6507:1 and GOST 2999	According to ISO 6507:1 and GOST 2999	HV	Total force	49.03 N to 980.7 N	10.0E-01	%	2	95%	Yes	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-06
Hardness	Primary hardness reference block	Brinell (HB 2.5/187.5) according to ISO 6506:3 and GOST 9012	According to ISO 6506:1 and GOST 9012	According to ISO 6506:1 and GOST 9012	HB	Total force	1839 N	10.0E-01	%	2	95%	Yes	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-07

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Hardness	Primary hardness reference block	Brinell (HB5/750 - HB 10/3000) according to ISO 6506:3 and GOST 9012	According to ISO 6506:1 and GOST 9012	According to ISO 6506:1 and GOST 9012	HB	Total force	7355 N to 29420 N	8.0E-01	%	2	95%	Yes	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-08
Hardness	Primary hardness reference block	Shore D (with diamond-tipped impact body) according to GOST 23273	According to GOST 8.426	According to GOST 8.426	HSD	Height of fall of the impact body	19.0 mm	12.0E-01	HSD	2	95%	No	Approved on 30 May 2005	VNIIFTRI	VNIIFTRI-09
Gas flow speed	Air speed instrumentation	Thermal, ultrasonic, vane anemometers	0.5	25	m/s	Fluid	air	0.5	%	2	95%	Yes	Flow in open or close wind tunnel Approved on 27 January 2014	VNIIM	255
						Temperature	15 °C to 25 °C								
						Pressure	95 kPa to 105 kPa								
						Relative humidity	50% to 80%								
Gas flow speed	Air speed instrumentation	Pitot static tubes, thermal, ultrasonic, vane anemometers	10	100	m/s	Fluid	air	0.55 to 1.0	%	2	95%	Yes	Flow in open or close wind tunnel Approved on 27 January 2014	VNIIM	255
						Temperature	15 °C to 25 °C								
						Pressure	95 kPa to 105 kPa								
						Relative humidity	50% to 80%								
Density of liquid	Liquid	Hydrostatic weighing	600	1000	kg/m^3	Fluid	liquid	0.010 to 0.013	kg/m^3	2	95%	No	Approved on 28 March 2014	VNIIM	2302
						Temperature	20 °C								
						Pressure	101325 Pa								
						Viscosity	up to 1000 mPa s								
Density of liquid	Liquid	Hydrostatic weighing	1000	2000	kg/m^3	Fluid	liquid	0.013 to 0.028	kg/m^3	2	95%	No	Approved on 28 March 2014	VNIIM	2302
						Temperature	20 °C								
						Pressure	101325 Pa								

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						Viscosity	up to 1000 mPa s								
Flowrate volume (low pressure gas)	Gas flow meters	Critical nozzles, vortex, turbine, ultrasonic, rotary meters, etc.	0.12	4	m^3/h	Gas	air	0.25	%	2	95%	Yes	Approved on 18 March 2015	VNIIR	VNIIR-13.01
						Pressure	96 kPa to 104 kPa								
						Temperature	15 °C to 25 °C								
						Pipe size	DN 10, DN 25								
Flowrate volume (low pressure gas)	Gas flow meters	Critical nozzles, vortex, turbine, ultrasonic, rotary meters, etc.	100	800	m^3/h	Gas	air	0.2	%	2	95%	Yes	Approved on 18 March 2015	VNIIR	VNIIR-13.02
						Pressure	96 kPa to 104 kPa								
						Temperature	15 °C to 25 °C								
						Pipe size	DN 50 to DN 200								
Flowrate volume (low pressure gas)	Gas flow meters	Critical nozzles, vortex, turbine, ultrasonic, rotary meters, etc.	4	160	m^3/h	Gas	air	0.2	%	2	95%	Yes	Approved on 18 March 2015	VNIIR	VNIIR-13.03
						Pressure	96 kPa to 104 kPa								
						Temperature	15 °C to 25 °C								
						Pipe size	DN 25 to DN 100								
Flowrate volume (low pressure gas)	Gas flow meters	Critical nozzles	1	100	m^3/h	Gas	air	0.15	%	2	95%	Yes	Approved on 31 May 2017	VNIIR	VNIIR-13.04
						Pressure	96 kPa to 104 kPa								
						Temperature	15 °C to 25 °C								
						Pipe size	< DN100								