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For compliance with the requirements of

GOST ISO/IEC 17025-2019 General requirements for the competence of testing and calibration laboratories

name and details of the interstate or national standard

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No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1. Calibration of measuring instruments								
1.1	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow, volume (in flow)	Verification setups for volume flow and liquid volume	0.001 to 2500 m ³ /h 0.001 to 4500 m ³ /h		U _{0.95} = 0.034 % ER ± (0.045 - 0.055) % U _{0.95} = 0.034 % ER ± (0.06 - 1.0) %	Direct comparison method using liquid flow standard. Comparison method using transfer standard along with liquid flow standard	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.2	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow, volume (in flow)	Verification setups for tube pistons, compact-provers	0.01 to 4500 m ³ /h		U _{0.95} = 0.029 % ER ± (0.05 - 0.1) %	Direct comparison method using liquid flow standard. Comparison method using transfer standard along with liquid flow standard	-
1.3	Measurement of flows, level, volume of substances; flow measuring instruments	Mass flow, mass (in flow)	Verification setups for mass flow and liquid mass	0.001 to 2500 t/h 0.001 to 4500 t/h		U _{0.95} = 0.033 % ER ± (0.04 - 0.05) % U _{0.95} = 0.033 % ER ± (0.06 - 1.0) %	Direct comparison method using liquid flow standard. Comparison method using transfer standard along with liquid flow standard	-
1.4	Measurement of flows, level, volume of substances; flow measuring instruments	Volume, mass (in flow)	Verification setups for volume flow and liquid mass	1960 to 3060 dm ³ 1000 to 3060 kg		U _{0.95} = 0.025 % ER ± (0.04 - 0.05) % U _{0.95} = 0.025 % ER ± (0.04 - 0.05) %	The method of direct comparison using liquid volume standard The method of direct comparison using liquid mass standard	-
1.5	Measurement of flows, level, volume of	Mass flow of liquid mixture	Verification setups for mass flow of liquids	0.01 to 300 t/h		U _{0.95} = 0.3 % ER ± (0.5 - 2.0) %	Method of direct comparison using GLM standard.	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	substances; flow measuring instruments	composing gas-liquid mixtures (GLM) Volume flow of gas composing GLM	composing GLM and volume flow of gas composing GLM, reduced to standard conditions	0.1 to 10000 m ³ /h		$U_{0.95} = 0.97 \%$ $ER \pm (1.0 - 5.0) \%$	Comparison method using comparator with along with GLM standard	
1.6	Measurement of flows, level, volume of substances; flow measuring instruments	Mass flow of liquid mixture composing GLM Volume flow of gas composing GLM	Measuring setups for mass flow of liquids composing gas-liquid mixtures (GLMs) and volume flow of gas composing GLM reduced to standard conditions	0.01 to 300 t/h 0.1 to 10000 m ³ /h		$U_{0.95} = 0.3 \%$ $ER \pm (1.5 - 2.5) \%$ $U_{0.95} = 0.97 \%$ $ER \pm (4.0 - 5.0) \%$	Method of direct comparison using GLM standard	-
1.7	Measurement of flows, level, volume of substances;	Volume flow, volume (in flow)	Verification setups for gas volume flow	$3 \cdot 10^{-4}$ to 72000 m ³ /h		$U_{0.95} = 0.2 \%$ $ER \pm (0.2 - 2.0) \%$	Direct comparison method using gas flow standard.	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	flow measuring instruments						Comparison method with using transfer standard along with gas flow standard	
1.8	Measurement of flows, level, volume of substances; flow measuring instruments	Mass flow, mass (in flow)	Verification setups for gas mass flow	$3.6 \cdot 10^{-4}$ to $6.3 \cdot 10^6$ kg/h		$U_{0.95} = 0.2 \%$ $ER \pm (0.2 - 0.5) \%$	Direct comparison method using gas flow standard. Comparison method using transfer standard along with gas flow standard	-
1.9	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow, volume (in flow)	Flow transducers, flow meters and volume meters for liquids	0.01 to 50 m ³ /h 2.5 to 500 m ³ /h 5 to 50 m ³ /h		$U(V)_{0.95} = 0.0273 \%$ $U(Q_v)_{0.95} = 0.0303 \%$ $ER \pm (0.07 - 5.0) \%$ $U(V)_{0.95} = 0.0273 \%$ $U(Q_v)_{0.95} = 0.0332 \%$ $ER \pm (0.07 - 5.0) \%$ $U(V)_{0.95} = 0.0349 \%$ $U(Q_v)_{0.95} = 0.0350 \%$ $ER \pm (0.07 - 5.0) \%$	Direct comparison method using liquid flow standard	

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
				50 to 500 m ³ /h		U(V) _{0.95} = 0.0354 % U(Q _v) _{0.95} = 0.0357 % ER ± (0.07 – 5.0) %		
				500 to 1000 m ³ /h		U(V) _{0.95} = 0.0357 % U(Q _v) _{0.95} = 0.0358 % ER ± (0.07 – 5.0) %		
				1000 to 1500 m ³ /h		U(V) _{0.95} = 0.0359 % U(Q _v) _{0.95} = 0.0359 % ER ± (0.07 – 5.0) %		
				1500 to 2000 m ³ /h		U(V) _{0.95} = 0.0359 % U(Q _v) _{0.95} = 0.0360 % ER ± (0.07 – 5.0) %		

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.10	Measurement of flows, level, volume of substances; flow measuring instruments		Flow transducers, flow meters and mass meters for liquids	0.01 до 50 t/h 2,5 до 500 t/h 5 до 50 t/h 50 до 500 t/h 500 до 1000 t/h 1000 до 1500 t/h 1500 до 2000 t/h		$U(M)_{0.95} = 0.0273 \%$ $U(Q_M)_{0.95} = 0.0303 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0263 \%$ $U(Q_M)_{0.95} = 0.0322 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0347 \%$ $U(Q_M)_{0.95} = 0.0348 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0354 \%$ $U(Q_M)_{0.95} = 0.0355 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0357 \%$ $U(Q_M)_{0.95} = 0.0353 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0357 \%$ $U(Q_M)_{0.95} = 0.0353 \%$ $ER \pm (0.05 - 5.0) \%$ $U(M)_{0.95} = 0.0358 \%$ $U(Q_M)_{0.95} = 0.0357 \%$ $ER \pm (0.05 - 5.0) \%$	Direct comparison method using liquid flow standard	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.11	Measurement of flows, level, volume of substances; flow measuring instruments	Mass flow liquid mixtures composing GLM Volume flow of gas composing GLM	Flow meters for gas-liquid mixtures	0.01 to 300 t/h 0.1 to 10000 m ³ /h		$U_{0.95} = 0.3 \%$ $ER \pm (2.0 - 2.5) \%$ $U_{0.95} = 0.97 \%$ $ER \pm (4.0 - 5.0) \%$	Method of direct comparison using GLM standard	-
1.12	Measurement of flows, level, volume of substances; flow measuring instruments	Percentage of volume of water in the volume of liquid mixture (volume fraction) Percentage volume of oil in the volume of liquid mixture (volume	In-line analyzers of fractional composition of oil and oil products	0.01 to 99.99 % 0.01 to 99.99 %		$U_{0.95} = 0.26 \%$ $ER \pm 5.0 \%$ $U_{0.95} = 0.26 \%$ $ER \pm 5.0 \%$	Method of direct comparison using GLM standard	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
		fraction) Percentage of gas volume in the GLM volume (volume fraction)		0.01 to 99.99 %		$U_{0.95} = 0.51 \%$ $ER \pm 5.0 \%$		
1.13	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow	Critical nozzles	$3 \cdot 10^{-4}$ to 2000 m ³ /h		$U_{0.95} = 0.1 \%$ $ER \pm (0.15 - 0.5) \%$	Direct comparison method using gas flow standard	-
1.14	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow, volume (in flow)	Flow transducers, flow meters, gas volume flow meters, rotameters, rheometers	$3 \cdot 10^{-4}$ to $1,6 \cdot 10^4$ m ³ /h		$U_{0.95} = 0.1 \%$ $ER \pm (0.2 - 5.0) \%$	Direct comparison method using gas flow standard	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.15	Measurement of flows, level, volume of substances; flow measuring instruments	Volume flow	Leakage calibrators	$3 \cdot 10^{-4}$ to $1 \text{ m}^3/\text{h}$		$U_{0.95} = 1.0 \%$ $ER \pm (1.0 - 5.0) \%$	Direct comparison method using gas flow standard	-
1.16	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Measuring metal standard tanks of the 1st class	2 to 1000 dm^3		$U_{0.95} = 0.01 \%$ $ER \pm 0.02\%$	Indirect measurement method using mass unit standard, density and temperature measuring instruments	-
1.17	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Measuring metal standard tanks of the 2nd class	2 to 5000 dm^3		$U_{0.95} = 0.025 \%$ $ER \pm (0.05 - 0.1) \%$	Direct comparison method using liquid volume standard	-
1.18	Measurement of flows, level, volume of	Volume, capacity	Technical metal measuring tanks of the 1st class	5 to 10000 dm^3		$U_{0.95} = 0.037 \%$ $ER \pm 0.2 \%$	Method of direct comparison using volume liquid standard	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	substances; volume measuring instruments							
1.19	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Horizontal tanks	0.3 to 10000 m ³ 3 to 10000 m ³		U _{0.95} = 0.07 % ER ± (0.2 - 0.25) % U _{0.95} = 0.07 % ER ± (0.2 - 0.25) %	Indirect measurement method (geometric method) using length and temperature measuring instruments Indirect measurement method (volumetric method) using volume, length, temperature and level measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.20	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Vertical tanks	0.3 to 160000 m ³		U _{0.95} = 0.07 % ER ± 0.1 %	Indirect measurement method (volumetric method) using volume, length, temperature and level measuring instruments. Indirect measurement method (geometric	Calibration can only be carried out outside the place of activity (at temporary work sites)

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
							method) using length and temperature measuring instruments	
1.21	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Vertical cylindrical reinforced concrete tanks	100 to 3000 m ³ 3000 to 5000 m ³ 5000 to 100000 m ³		U _{0.95} = 0.07 % ER ± 0.2 % U _{0.95} = 0.05 % ER ± 0.15 % U _{0.95} = 0.03 % ER ± 0.1 %	Indirect measurement method (volumetric method) using volume, length, temperature and level measuring instruments. Indirect measurement method (geometric method) using length and temperature measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.22	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Rectangular tanks	0.3 to 3000 m ³		U _{0.95} = 0.07 % ER ± (0.2 - 0.25) %	Indirect measurement method (geometric method) using length and temperature measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.23	Measurement of flows, level,	Volume, capacity	Ball (spherical) tanks	3 to 3000 m ³		U _{0.95} = 0.07 % ER ± 0.2 %	Indirect measurement method (geometric	Calibration can only be carried

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	volume of substances; volume measuring instruments						method) using length and temperature measuring instruments	out outside the place of activity (at temporary work sites)
1.24	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Trench buried steel tanks	500 to 10000 m ³		$U_{0.95} = 0.07 \%$ $ER \pm (0.2 - 0.25) \%$	Indirect measurement method (volumetric method) using volume, length, temperature and level measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.25	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Bulk vessel tanks	3 to 100000 m ³		$U_{0.95} = 0.07 \%$ $ER \pm (0.2 - 0.5) \%$	Indirect measurement method (geometric method) using length and temperature measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.26	Measurement of flows, level, volume of substances;	Volume, capacity	Tank trucks for liquid petroleum products	1 to 50 m ³		$U_{0.95} = 0.13 \%$ $ER \pm 0.4 \%$	Indirect measurement method (volumetric method) using volume, length, temperature and	Calibration can only be carried out outside the place of activity

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	volume measuring instruments						level measuring instruments	(at temporary work sites)
1.27	Measurement of flows, level, volume of substances; volume measuring instruments	Volume, capacity	Rail tank cars (tank wagons)	3 to 200 m ³		U _{0.95} = 0.1 % ER ± 0.3 %	Indirect measurement method (volumetric method) using volume, length, temperature and level measuring instruments	Calibration can only be carried out outside the place of activity (at temporary work sites)
1.28	Measurement of flows, level, volume of substances; level measuring instruments	Level	Level gauging systems	0 to 80 m		U _{0.95} = 0.06 mm ER ± (0.1 - 6) mm	Direct comparison method using length measuring instruments	-
1.29	Measurement of flows, level, volume of substances; level	Level	Level gauges and level transmitters	0 to 20 m 20 to 100 m		U _{0.95} = 0.12 mm ER ± (0.3 - 16) mm U _{0.95} = (4 - 16) mm ER ± (6 - 20) mm	Direct comparison method using length measuring instruments, level measuring instruments and coordinate-time	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
	measuring instruments						measuring instruments. Direct measurement method using level gauges. Indirect measurement method using mass measuring instruments, gauge pressure measuring instruments	
1.30	Measurement of flows, level, volume of substances; level measuring instruments	Level	Level signaling devices	0 to 20 m		$U_{0.95} = 0.12 \text{ mm}$ $ER \pm (0.3 - 16) \text{ mm}$	Direct comparison method using length measuring instruments, level measuring instruments and coordinate-time measuring instruments. Direct measurement method using level gauges. Indirect method Measurements using mass measuring instruments, gauge pressure measuring instruments	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.31	Measurements of physical-chemical composition and properties of substances; instruments for measuring water volume fraction	Volume fraction of water	Oil and petroleum product moisture meters and verification setups – 1 st class working standards	0.01 to 0.1 % wvf 0.1 to 10 % wvf 10 to 60 % wvf 60 to 99.9 % wvf		$U_{0.95} = 4 \cdot 10^{-3} \% \text{ wvf}$ $U_{0.95} = 1.4 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 3.5 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 8.4 \cdot 10^{-2} \% \text{ wvf}$ $ER \pm (0.01 - 0.1) \% \text{ wvf}$	Direct comparison method using standard volumetric moisture content (for moisture meters of oil and petroleum products). Comparison method using comparator along with volumetric moisture content standard (for verification setups)	-
1.32	Measurements of physical-chemical composition and properties of substances; instruments for measuring water volume fraction	Volume fraction of water	Oil and petroleum product moisture meters and verification setups – 2 nd class working standards	0.01 to 0.1% wvf 0.1 to 10 % wvf 10 to 60 % wvf 60 to 99.9 % wvf		$U_{0.95} = 9 \cdot 10^{-3} \% \text{ wvf}$ $U_{0.95} = 1.6 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 6 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 9.4 \cdot 10^{-2} \% \text{ wvf}$ $ER \pm (0.02 - 0.5) \% \text{ wvf}$	Direct comparison method using standard volumetric moisture content (for moisture meters of oil and petroleum products). Comparison method using comparator along with volumetric moisture content standard (for verification setups)	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.33	Measurements of physical-chemical composition and properties of substances; instruments for measuring water volume fraction	Volume fraction of water	Oil and petroleum product moisture meters (working measuring instruments)	0.01 to 0.1 % wvf 0.1 to 10 % wvf 10 to 60 % wvf 60 to 99.9 % wvf		$U_{0.95} = 1.9 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 2.5 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 8,5 \cdot 10^{-2} \% \text{ wvf}$ $U_{0.95} = 0.436 \% \text{ wvf}$ $ER \pm (0.05 - 2.5) \% \text{ wvf}$	Direct comparison method using volumetric moisture content standard	-
1.34	Measurements of physical-chemical composition and properties of substances; density measuring instruments	Density	In-line liquid density transducers	650 to 1200 kg/m ³		$U_{0.95} = 0.04 \text{ kg/m}^3$ $ER \pm (0.1 - 10) \text{ kg/m}^3$	Direct comparison method using liquid density standard in flow	-

No	Measurements	Measured value	Calibration object	Measurement range	Complementary parameters	Expanded measurement uncertainty	Calibration method/ procedure	Note
1.35	Measurements of physical-chemical composition and properties of substances; density measuring instruments	Density	Pycnometers, pycnometer systems, automatic density meters - working density standards	650 to 1200 kg/m ³		U _{0.95} = 0.05 kg/m ³ ER ± (0.1 - 0.2) kg/m ³	Direct comparison method using liquid density standard in flow	-

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for Metrology (VNIIM-VNIIR)

authorized person's position

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