TESTING LABORATORY (CENTRE) SCOPE OF ACCREDITATION

Main Laboratory of Chepetsk Mechanical Plant, Joint-Stock Company (CMP JSC)
name of testing laboratory (centre)

1. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie no 8;
2. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 701;
3. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 715;
4. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 745A

address of place of business

Against the requirements of

General requirements to competence of testing and calibration laboratories GOST ISO/IEC 17025-2019
title and details of interstate or national standard establishing general requirements to competence of testing and calibration laboratories

No.	Documents establishing the examination (testing) and measuring rules and techniques	Item description	Code per OKPD 2	EAEU HS code	Measured characteristic (parameter)	Measuring range
1	2	3	4	5	6	7
1. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie no 8						
1	STK-30-2011 Uranium, Uranium Compounds and Alloys. Procedure of Photometric Measurements of Molybdenum Weight Percentage	Uranium metal, uranium alloys	-	-	Molybdenum (Mo) weight percentage	(0.005-12) %
2	Industry Standard (OST) 95 175-2003 Uranium and Uranium Compounds. Procedure of Peroxide-Precipitation Gravimetric Measurement of Uranium Content	Uranium metal, uranium alloys, uranium oxides, uranium salts	-	-	Uranium (U) weight percentage	(40-100) %
3	OST 95 830-2003 Uranium. Photometric Procedure of Nitrogen Impurity Content Measurement	Uranium metal, uranium alloys, uranium oxides	-	-	Nitrogen (N) weight percentage	(0.002-0.1) %
4	OST 95 832-2006 Uranium, Uranium Oxides, Uranium Alloys and Compounds. Carbon Impurity Measuring Procedures	Uranium metal, uranium alloys, uranium oxides, uranium compounds	-	-	Carbon (C) weight percentage	(0.001-2.0) %

1	2	3	4	5	6	7
5	OST 95 959-2003, photoelectron method Uranium. Spectral Atomic Emission Procedure of Impurity Content Measurement	Uranium metal, uranium alloys, uranium oxides	-	-	Aluminium (Al) weight percentage	(0.0003-0.1) %
					Boron (B) weight percentage	(0.00001-0.001) %
					Iron (Fe) weight percentage	(0.0003-0.3) %
					Silicon (Si) weight percentage	(0.0003-0.1) %
					Copper (Cu) weight percentage	(0.0001-0.01) %
					Nickel (Ni) weight percentage	(0.001-0.1) %
					Tin (Sn) weight percentage	(0.0003-0.1) %
					Lead (Pb) weight percentage	(0.0003-0.1) %
6	OI 001.398-96 Industry-Specific Guidelines. Zirconium-niobium alloys. Photometric Procedure of Niobium Measurement	Zirconium-based alloys, zirconium products	-	-	Niobium (Nb) weight percentage	(0.8-1.2) % (2.3-2.8) %
7	OI 001.433-98 Carbon. Procedure of Coulometric Analysis in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Carbon (C) weight percentage	(0.002-0.09) %
8	OI 001.434-2003 Chlorine. Procedure of Turbidimetric Measurement in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Chlorine (Cl) weight percentage	(0.002-0.2) %
9	OI 001.438-98 Fluorine. Measurement in Surface Layer of Zirconium Tubes' Material	Zirconium-alloy tubes	-	-	Fluorine-ion content on tubes' surface	(0.1-0.4) ug/cm^2
10	OI 001.439-98 Chlorine. Procedure of Turbidimetric Measurement in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Chlorine (Cl) weight percentage	(0.0007-0.003) %
11	OI 001.446-98 Uranium. Procedure of Ferrum-Phosphate-Vanadate Analysis in Process Products	Uranium ores, concentrates, process products and solutions	-	-	Uranium (U) weight percentage	(0.02-90.0) %
					Uranium (U) mass concentration	(0.01-100.0) g/dm^3
12	OI 001.458-99 Fluorine. Procedure of Photometric Measurement Using Perhydrolysis in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Fluorine (F) weight percentage	(0.00002-0.06) %
13	OI 001.459-99 Hafnium. Procedure of Inductively Coupled Plasma Atomic Emission Measurement of Content in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Hafnium (Hf) weight percentage	(0.002-0.1) %

1	2	3	4	5	6	7
14	OI 001.460-99 Iron. Tin. Niobium. Procedure of Inductively Coupled Plasma Atomic Emission Measurement of Content in Zirconium and Zirconium Alloys	Zirconium alloys	-	-	Tin (Sn) weight percentage	(0.03-2.0) %
					Iron (Fe) weight percentage	(0.01-0.5) %
					Niobium (Nb) weight percentage	(0.5-3.0) %
15	OI 001.472-2006 Carbon. Procedure of Infrared Absorption Measurement in Refractory Metals	Zirconium, zirconium alloys, products. Titanium, titanium alloys, products. Niobium, niobium alloys, products. Hafnium, hafnium alloys, products. Tantalum, tantalum alloys, products	-	-	Carbon (C) weight percentage	(0.002-0.2) %
16	OI 001.489-2006 Hydrogen. Procedure of Weight Percentage Measuring in Refractory Metals through High-Temperature Extraction	Uranium, uranium alloys. Zirconium, zirconium alloys, products. Titanium, titanium alloys. Niobium, niobium alloys. Hafnium, tantalum	-	-	Hydrogen (H) weight percentage	(0.00007-0.01) %
17	OI 001.490-00 Oxygen, nitrogen. Procedure of Weight Percentage Measurements in Rare, Refractory Metals through Reductive Melting	Zirconium, zirconium alloys, products. Titanium, titanium alloys, products. Niobium, niobium alloys, products. Hafnium, hafnium alloys, products. Tantalum, tantalum alloys, products	-	-	Oxygen (O) weight percentage	(0.007-0.5) %
					Nitrogen (N) weight percentage	(0.003-0.1) %
18	OI 001.544-2003 Uranium Isotope U-235. Procedure of Inductively Coupled Plasma Mass Spectrometric Analysis in Uranium and Uranium Compounds	Uranium, uranium alloys, uranium compounds	-	-	Apparent atomic fraction of uranium-235 isotope (U-235)	(0.1-1.0) %
19	OI 001.609-2005 Uranium. Procedure of Inductively Coupled Plasma Mass Spectrometric Measurement of Content in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Uranium (U) weight percentage	(0.0001-0.001) %
20	OI 001.611-2006 Uranium. Procedure of Concentration Measurements in Process Solutions	Process solutions	-	-	Uranium (U) mass concentration	(0.10-40) mg/dm^3

1	2	3	4	5	6	7
21	OI 001.621-2006 NT47 Alloy. Procedure of Inductively Coupled Plasma Optical Emission Spectral Measurement of Impurities' Content	NT-47 niobium alloy	-	-	Aluminium (Al) weight percentage	(0.006-0.03) %
					Iron (Fe) weight percentage	(0.006-0.06) %
					Silicon (Si) weight percentage	(0.01-0.03) %
					Copper (Cu) weight percentage	(0.006-0.035) %
					Nickel (Ni) weight percentage	(0.006-0.03) %
					Tantalum (Ta) weight percentage	(0.06-0.3) %
					Chromium (Cr) weight percentage	(0.006-0.03) %
22	OI 001.622-2006 NT-47 Alloy. Procedure of Inductively Coupled Plasma Optical Emission Spectral Measurement of Titanium and Tantalum Content	NT-47 niobium alloy	-	-	Titanium (Ti) weight percentage	(46.0-48.5) %
					Tantalum (Ta) weight percentage	(0.05-0.3) %
23	OI 001.649-2008, photoelectron method Hafnium. Spectral Atomic Emission Procedure of Impurity Content Measurement	Hafnium, hafnium dioxide, hafnium compounds	-	-	Aluminium (Al) weight percentage	(0.001-0.1) %
					Beryllium (Be) weight percentage	(0.0001-0.01) %
					Boron (B) weight percentage	(0.00003-0.001) %
					Tungsten (W) weight percentage	(0.003-0.3) %
					Iron (Fe) weight percentage	(0.001-0.1) %
					Calcium (Ca) weight percentage	(0.003-0.3) %
					Silicon (Si) weight percentage	(0.002-0.1) %
					Magnesium (Mg) weight percentage	(0.001-0.1) %
					Manganese (Mn) weight percentage	(0.0003-0.03) %
					Copper (Cu) weight percentage	(0.0003-0.03) %
					Molybdenum (Mo) weight percentage	(0.001-0.1) %
					Nickel (Ni) weight percentage	(0.001-0.1) %
					Niobium (Nb) weight percentage	(0.003-0.3) %
					Tin (Sn) weight percentage	(0.001-0.1) %
					Titanium (Ti) weight percentage	(0.001-0.1) %
					Chromium (Cr) weight percentage	(0.001-0.1) %
24	OI 001.650-2008 Zirconium. Procedure of Measurements in Hafnium Metal through Inductively Coupled Plasma Atomic Emission Spectrometry	Hafnium	-	-	Zirconium (Zr) weight percentage	(0.05-1.0) %
25	OI 001.651-2008 Potassium, Lithium. Procedure of Atomic Absorption Measurement in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Potassium (K) weight percentage	(0.001-0.1) %
					Lithium (Li) weight percentage	(0.0001-0.01) %

1	2	3	4	5	6	7
26	OI 001.653-2008 Potassium, Sodium. Procedure of Atomic Absorption Analysis in Hafnium Metal	Hafnium	-	-	Potassium (K) weight percentage	(0.001-0.08) %
					Sodium (Na) weight percentage	(0.001-0.08) %
27	OI 001.654-2008 Phosphorus. Procedure of Measurements in Niobium, Titanium and NT-47 Alloy through Inductively Coupled Plasma Atomic Emission Spectrometry	Niobium, NT-47 niobium alloy, titanium	-	-	Phosphorus (P) weight percentage	(0.004-0.01) %
28	OI 001.656-2008, photoelectron method Zirconium and Zirconium Alloys. Spectral Atomic Emission Procedure of Impurity Content Measurement	Zirconium, zirconium alloys, zirconium compounds	-	-	Aluminium (Al) weight percentage	(0.001-0.1) %
					Beryllium (Be) weight percentage	(0.0001-0.01) %
					Boron (B) weight percentage	(0.00003-0.001) %
					Iron (Fe) weight percentage	(0.001-0.1) %
					Cadmium (Cd) weight percentage	(0.00002-0.001) %
					Calcium (Ca) weight percentage	(0.002-0.1) %
					Silicon (Si) weight percentage	(0.001-0.1) %
					Manganese (Mn) weight percentage	(0.0001-0.01) %
					Copper (Cu) weight percentage	(0.0001-0.01) %
					Molybdenum (Mo) weight percentage	(0.001-0.1) %
					Nickel (Ni) weight percentage	(0.001-0.1) %
					Niobium (Nb) weight percentage	(0.006-0.3) %
					Tin (Sn) weight percentage	(0.001-0.1) %
					Lead (Pb) weight percentage	(0.001-0.1) %
					Titanium (Ti) weight percentage	(0.001-0.1) %
					Chromium (Cr) weight percentage	(0.001-0.1) %
29	OI 001.664-2008 Boron. Procedure of Inductively Coupled Plasma Atomic Emission Measurement of Weight Percentage in Zirconium-Niobium Alloys	Zirconium alloys	-	-	Boron (B) weight percentage	(0.05-0.5) %
30	OI 001.665-2008 Chlorine, Fluorine. Procedure of Weight Percentage Measurement in Hafnium and Hafnium-Based Alloys	Hafnium	-	-	Chlorine (Cl) weight percentage	(0.005-0.025) %
					Fluorine (F) weight percentage	(0.003-0.025) %
31	OI 001.690-2010 Niobium, Tin, Iron. Procedure of X-Ray Fluorescence Measurement of Weight Percentage in Zirconium Alloys	Zirconium alloys	-	-	Niobium (Nb) weight percentage	(0.6-2.8) %
					Tin (Sn) weight percentage	(0.7-2.0) %
					Iron (Fe) weight percentage	(0.1-0.5) %

1	2	3	4	5	6	7
32	OI 001.696-2010 Niobium. Procedure of Weight Percentage Measurement by Photometric Technique in Uranium Alloys	Uranium alloys	-	-	Niobium (Nb) weight percentage	(0.5-3.0) %
33	OI 001.697-2010 Zirconium. Procedure of Weight Percentage Measurement by Photometric Technique in Uranium Ware	Uranium alloys	-	-	Zirconium (Zr) weight percentage	(0.008-3.0) %
34	OI 001.722-2011 Nitrogen. Procedure of Weight Percentage Measurement in Zirconium, Hafnium, and Zirconium-and Hafnium-Based Alloys	Zirconium, zirconium alloys, hafnium, hafnium alloys	-	-	Nitrogen (N) weight percentage	(0.002-0.02) %
35	OI 001.814-2015 Fluorine, Chlorine. Procedure of Ion-Chromatographic Measurement in Various Products	Zirconium, zirconium alloys, zirconium tubes	-	-	Fluorine (F) weight percentage	(0.00005-0.06) %
					Chlorine (Cl) weight percentage	(0.00005-0.06) %
					Fluorine-ion content on tubes' surface	(0.1-1.0) ug/cm^2
		Water	-	-	Fluorine (F) mass concentration	(5-1000) ug/dm^3
					Chlorine (Cl) mass concentration	(5-1000) ug/dm^3
36	Measuring Procedure (MVI) 08-192-2009 Hafnium. Procedure of X-Ray Fluorescence Measurement of Weight Percentage in Zirconia	Zirconium dioxide	-	-	Hafnium (Hf) weight percentage	(0.0035-10.0) %
37	MVI 08-206-2011 Zirconium and Zirconium Alloys. Inductively Coupled Plasma Mass Spectrometric Measurement Procedure of Impurities' Weight Percentages	Zirconium, zirconium alloys	-	-	Vanadium (V) weight percentage	(0.0001-0.1) %
					Cobalt (Co) weight percentage	(0.0001-0.1) %
					Molybdenum (Mo) weight percentage	(0.0001-0.1) %
					Antimony (Sb) weight percentage	(0.0001-0.1) %
					Tantalum (Ta) weight percentage	(0.0001-0.1) %
					Tungsten (W) weight percentage	(0.0001-0.1) %
					Niobium (Nb) weight percentage	(0.001-0.1) %
38	MVI 08-209-2011 Titanium Alloys. Procedure of X-Ray Fluorescence Chemical Analysis	Titanium alloys	-	-	Aluminium (Al) weight percentage	(0.05-8.0) %
					Zirconium (Zr) weight percentage	(0.005-3.5) %
					Molybdenum (Mo) weight percentage	(0.005-6.0) %
					Vanadium (V) weight percentage	(0.02-6.0) %
					Silicon (Si) weight percentage	(0.04-0.40) %
					Iron (Fe) weight percentage	(0.02-1.50) %
					Chromium (Cr) weight percentage	(0.01-0.20) %
					Manganese (Mn) weight percentage	(0.005-0.10) %
					Nickel (Ni) weight percentage	(0.01-0.10) %
					Copper (Cu) weight percentage	(0.005-0.10) %
					Tin (Sn) weight percentage	(0.005-0.10) %
					Niobium (Nb) weight percentage	(0.02-0.10) %

1	2	3	4	5	6	7
39	MVI 08-208-2011 Zirconium Dioxide Stabilized with Yttrium Oxide. Zirconium Dioxide and Yttrium Oxide Analysis by Chelatometry	Zirconium dioxide	-	-	Zirconium dioxide (ZrO_2) weight percentage	(80.0-99.0) %
					Yttrium oxide (Y_2O_3) weight percentage	(4.0-17.0) %
40	MVI 08-212-2011 Yttrium, Zirconium. Procedure of X-Ray Fluorescence Measurement of Weight Percentage in Zirconium Dioxide	Zirconium dioxide	-	-	Yttrium (Y) weight percentage	(1.0-20.0) %
					Yttrium oxide (Y_2O_3) weight percentage	(2.0-25.0) %
					Zirconium (Zr) weight percentage	(55.0-74.0) %
					Zirconium dioxide (ZrO_2) weight percentage	(74.0-99.9) %
41	MVI 08-214-2012 Procedure. Hafnium. Procedure of X-Ray Fluorescence Measurement of Weight Percentage in Zirconium and Zirconium Alloys	Zirconium, zirconium alloys	-	-	Hafnium (Hf) weight percentage	(0.005-0.10) %
42	MVI 08-228-2013 Titanium and Titanium Alloys. Procedure of Elements' Weight Percentage Measurement by Inductively Coupled Plasma Atomic Emission Technique	Titanium, titanium alloys, titanium oxide	-	-	Aluminium (Al) weight percentage	(0.005-20.0) %
					Boron (B) weight percentage	(0.005-0.1) %
					Vanadium (V) weight percentage	(0.005-15.0) %
					Bismuth (Bi) weight percentage	(0.005-0.1) %
					Tungsten (W) weight percentage	(0.005-2.0) %
					Hafnium (Hf) weight percentage	(0.005-0.1) %
					Iron (Fe) weight percentage	(0.005-5.0) %
					Yttrium (Y) weight percentage	(0.005-0.1) %
					Cobalt (Co) weight percentage	(0.005-0.1) %
					Silicon (Si) weight percentage	(0.01-0.5) %
					Magnesium (Mg) weight percentage	(0.005-0.1) %
					Manganese (Mn) weight percentage	(0.005-2.0) %
					Copper (Cu) weight percentage	(0.005-0.1) %
					Molybdenum (Mo) weight percentage	(0.005-10.0) %
					Nickel (Ni) weight percentage	(0.005-0.1) %
					Niobium (Nb) weight percentage	(0.005-50.0) %
					Tin (Sn) weight percentage	(0.005-5.0) %
					Palladium (Pd) weight percentage	(0.005-0.1) %
					Ruthenium (Ru) weight percentage	(0.005-0.1) %
					Tantalum (Ta) weight percentage	(0.005-2.0) %
					Chromium (Cr) weight percentage	(0.005-5.0) %
					Zirconium (Zr) weight percentage	(0.005-5.0) %
43	State Standard (GOST) 12344, Section 5 Alloyed and high-alloyed steels. Carbon measurement techniques	Steel	-	-	Carbon (C) weight percentage	(0.02-1.2) %

1	2	3	4	5	6	7
44	GOST 12345, Section 7 Alloyed and high-alloyed steels. Sulphur measurement techniques	Alloyed and high-alloyed steels	-	-	Sulphur (S) weight percentage	(0.001-0.50) % (10-5000) ppm
45	GOST 12347, Section 2 Alloyed and high-alloyed steels. Phosphorus measurement techniques	Alloyed and high-alloyed steels	-	-	Phosphorus (P) weight percentage	(0.002-0.25) % (20-2500) ppm
46	GOST 12356, Section 3 Alloyed and high-alloyed steels. Titanium measurement techniques	Steel	-	-	Titanium (Ti) weight percentage	(0.10-2.6) %
47	GOST 12360, Section 4 Alloyed and high-alloyed steels. Boron measurement techniques	Alloyed and high-alloyed steels	-	-	Boron (B) weight percentage	(0.05-2.0) % (500-20000) ppm
48	GOST 17745 Steels and alloys. Gases' measurement techniques	Steel, iron-, nickel-, cobalt-, iron-nickel-based alloys	-	-	Nitrogen (N) weight percentage	(0.0005-0.8) % (5-8000) ppm
					Oxygen (O) weight percentage	(0.0005-0.2) % (5-2000) ppm
					Hydrogen (H) weight percentage	(0.00005-0.010) % (0.5-100) ppm
49	GOST 27417 Metal powders. Total oxygen content analysis through reduction extraction	Metal powders	-	-	Oxygen (O) weight percentage	(0.005-2.0) % (50-2000) ppm
50	GOST R 55079 Steel. Inductively-coupled plasma atomic emission analysis technique	Steel	-	-	Silicon (Si) weight percentage	(0.01-5.0) %
					Manganese (Mn) weight percentage	(0.01-5.0) %
					Chromium (Cr) weight percentage	(0.01-30) %
					Nickel (Ni) weight percentage	(0.01-30) %
					Cobalt (Co) weight percentage	(0.01-5.0) %
					Copper (Cu) weight percentage	(0.01-5.0) %
					Aluminium (Al) weight percentage	(0.01-5.0) %
					Molybdenum (Mo) weight percentage	(0.005-5.0) %
					Tungsten (W) weight percentage	(0.01-5.0) %
					Vanadium (V) weight percentage	(0.005-5.0) %
					Titanium (Ti) weight percentage	(0.005-5.0) %
					Zirconium (Zr) weight percentage	(0.01-0.50) %

1	2	3	4	5	6	7
51	X-MET 8000 X-ray fluorescence analyser Operation Manual	Metals and alloys, welded joints	-	-	Iron (Fe) weight percentage	(0.10-99) %
					Silicon (Si) weight percentage	(0.10-99) %
					Manganese (Mn) weight percentage	(0.10-99) %
					Copper (Cu) weight percentage	(0.10-99) %
					Nickel (Ni) weight percentage	(0.10-99) %
					Tin (Sn) weight percentage	(0.10-99) %
					Lead (Pb) weight percentage	(0.10-99) %
					Antimony (Sb) weight percentage	(0.10-99) %
					Titanium (Ti) weight percentage	(0.10-99) %
					Chromium (Cr) weight percentage	(0.10-99) %
					Zinc (Zn) weight percentage	(0.10-99) %
					Zirconium (Zr) weight percentage	(0.10-99) %
2. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 701						
52	OI 001.373-94 Zirconium Alloys. Procedure of Oxygen Content Neutron Activation Measurement	Zirconium, zirconium alloys, products	-	-	Oxygen (O) weight percentage	(0.03-0.17) %
		Hafnium, hafnium products				(0.02-0.09) %
		Niobium, niobium products				(0.003-0.6) %
53	GOST 28052, Section 4 Titanium and titanium alloys. Oxygen measurement techniques	Titanium, titanium alloys	-	-	Oxygen (O) weight percentage	(0.01-0.2) %
3. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 715						
54	GOST 1778 para.3.1 Steel. Metal micrographic techniques of detection of non-metallic inclusions	Steels, alloys	-	-	Existence of non-metallic inclusions by Sh-3, Sh-6 technique	(1-5) points
55	GOST 2246 Annex 1 Steel welding wire. Specification	Steel welding wire	-	-	Ferrite content (FCC)	(0.5-20) %
56	GOST 5639 para.3.3 Steels and alloys. Grain size detection and measurement techniques	Steels, alloys	-	-	Grain size	Number by scale from “-3” to “14”
57	GOST 6032 para.4.4-4.6, para.5 Corrosion-resistant steels and alloys. Intergranular corrosion testing techniques	Corrosion-resistant steels, iron-nickel-based alloys, welded joints, deposited metal of such	-	-	Intergranular corrosion resistance (IGC)	IGC susceptible – IGC resistant
					Corrosion damage maximum depth	(4-50) um

1	2	3	4	5	6	7
58	GOST 6032 para.4.4-4.6, para.7 Corrosion-resistant steels and alloys. Intergranular corrosion testing techniques	Corrosion-resistant steels, iron-nickel-based alloys, welded joints, deposited metal of such	-	-	Intergranular corrosion resistance (IGC)	IGC susceptible – IGC resistant
					Corrosion damage maximum depth	(4-50) um
59	GOST 10243 Steel. Macrostructure testing and assessment techniques	Steel	-	-	Macrostructure: Central porosity (CP)	(0-5) points
					Point heterogeneity (PH)	(0-5) points
					Total freckle-type segregation (TFTS)	(0-5) points
					Edge freckle-type segregation (EFTS)	(0-5) points
					Square segregation (SS)	(0-5) points
					Pipe segregation (PS)	(0-5) points
					Skin holes (SH)	(0-5) points
					Intergranular cracks (IC)	(0-5) points
					Layer-by-layer crystallization (LC)	(0-5) points
					Light strip (LS)	(0-5) points
					Other defects	Macrostructure heterogeneity; sinterskins; blowholes; flakes; lemon spots; foreign metal and slag inclusions; scale pits; pigeonholes; internal ruptures; forging cracks; cracks (grinding, etching, grinding-etching); light ring or square; frilling; increased or decreased etchability; cast structure residues; edge defects

1	2	3	4	5	6	7
60	OI 001.297-2007 Testing Procedure to Measure Corrosion Resistance of Specimens of Zirconium Alloy Products	Zirconium products, hafnium products	-	-	Specific weight gain of specimens after corrosion testing	(1-50) mg/dm^2
					Surface condition of specimens after corrosion test	Passed – failed
61	OI 001.298-89 Procedure of Grain Size Measurement in Zirconium Alloy Tubes	Zirconium-alloy tubes	-	-	Grain size	(0.002-1.0) mm
62	OI 001.299-2017 Channel Tubes of E125 Alloy. Procedure of Metal Micrographic Inspection of Structural Heterogeneity	Channel tubes of E125 alloy	-	-	Structural heterogeneity	No.(1-15)
63	OI 001.329-2005 Procedure of Metal Micrographic Inspection of Structural Condition of Tubes of Zirconium Alloys	Zirconium-alloy tubes	-	-	Structural condition (microstructure)	Partially recrystallized – fully recrystallized
64	OI 001.372-94 Zirconium. Procedure of Artificial Hydrogenation of Specimens of Zirconium Alloys to Measure Hydride Orientation Factor	Zirconium-alloy products	-	-	Hydrogenation duration	(1-100) h
65	OI 001.425-2004 Procedure of Measurements of Hydride Orientation Factor in Specimens of Tubes and Sheets of Zirconium Alloys through Image Digital Processing	Zirconium-alloy tubes, bars	-	-	Hydride orientation factor F_n	(0.1-0.8)
66	OI 001.518-2009 Procedure of Detection of Discontinuities, Inclusions and Phase Heterogeneities in Bar Body by Metal Micrographic Technique	Zirconium-alloy bars	-	-	Microstructure	No defects – admissible defects – inadmissible defects (1-12) points
67	OI 001.603-2005 Procedure of Zirconium-Alloy Pressed Bar Specimens' Inspection for Funnels by Metal Micrographic Technique	Zirconium-alloy bars	-	-	Funnels	Funnels – no funnels

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68	MVI 407-878 dd 09/04/2002 Guidelines. Welded Joints of Zirconium Alloys. Internal Defects' Dimensional Inspection	Welded joints	-	-	Defects	(0.05-1) mm No defects; crack(s); incomplete penetration(s); incomplete fusion(s); shrinkage porosity; hole(s); line(s) of pores; inclusion(s); cluster(s)
					Reduced area	(0.0025-1) mm
					Total reduced area	(0.0025-30) mm
69	MVI 407-879 dd 09/04/2002 Guidelines. Welded Joints of Stainless Steel Grades 06X18H10T (08X18H10T) (Ш,ВД). Weld Defects' Dimensional Inspection Procedure	Welded joints	-	-	Defects	(0.05-1) mm No defects; crack(s); incomplete penetration(s); inclusion(s); cluster(s)
					Spacing of inclusions (clusters)	(0.05-30) mm
					Sum of maximum dimensions of all detected inclusions and/or clusters	(0.05-30) mm
70	407-1408 dd 12/05/2010 Procedure of Intergranular Corrosion Depth Measurement in Metal Micrographic Inspection of Steel 06X18H10T (ШД, ВД) Products	Steel	-	-	Corrosion damage maximum depth	(4-50) um
71	407-1728 dd 18/09/2001 Guidelines. Welded Joints of Bi-Metal Adapters. Procedure of Inspecting Thickness of Diffusion Interface and Size of Internal Defects	Welded bi-metal adapters	-	-	Diffusion interface thickness	(2.0-600) um
					Size of internal defects	(2.0-600) um
72	407-2088 dd 03/12/2010 Guidelines. Zirconium-Alloy Tubes. Depth of Marking and Heat-Affected Zone Measuring Procedure	Zirconium-alloy tubes	-	-	Marking depth	(1-8) um
					Heat-affected zone (HAZ) depth	(6-60) um No HAZ

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73	MVI 07-2415 dd 03/12/2001 Guidelines. Cold-Drawn Wire of Zirconium Alloys. Procedure of Porosity Metal Micrographic Examination	Zirconium-alloy wire	-	-	Pores	No defects; pores no larger than 0.015 mm; single pore(s) larger than 0.015 up to 0.100 mm; crowd of pores
					Pores' spacing	(1.7-100) um
74	I-407/14830 Guidelines. Titanium-Alloy Wire Procedure of Surface Defects' Depth of Occurrence Measurements	Titanium and titanium-alloy wire	-	-	Surface defects' depth of occurrence	(0.010-1.000) mm
4. 427622, Rossiya, Resp. Udmurtskaya, g. Glazov, ul Belova, d. 7, zdanie korpusa no 745A						
75	OI 001.307-2000 Testing Procedure to Measure Tensile Properties of Zirconium-Alloy Tubes	Zirconium-alloy tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C longitudinally	(5-85) %
					Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C longitudinally	(5-85) %

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76	OI 001.325-2006 Testing Procedure to Measure Transverse Tensile Properties of Specimens of Zirconium-Alloy Tubes	Zirconium-alloy tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C transversely	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C transversely	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C transversely	(5-85) %
					Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C transversely	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C transversely	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C transversely	(5-85) %
77	OI 001.388-2000 Testing Procedure to Measure Tensile Properties of Zirconium-Alloy Tubes 4.5 to 7.0 mm in Diameter	Zirconium-alloy tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C longitudinally	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C longitudinally	(5-85) %

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78	OI 001.396-2000 Testing Procedure to Measure Tensile Properties of Specimens of Sheet-like Materials of Zirconium and Hafnium Alloys	Sheet-like materials (sheets, strips, plates, tapes) of zirconium and hafnium alloys	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C	(5-85) %
					Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C	(5-85) %
79	OI 001.397-2000 Testing Procedure to Measure Tensile Properties of Zirconium-Alloy Bars	Zirconium-alloy bars	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C	(5-85) %
					Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C	(5-85) %

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80	OI 001.468-2000 Testing Procedure to Measure Tensile Properties of Specimens of Zirconium-Alloy Tubes over 20 mm in Outer Diameter	Zirconium-alloy tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C	(5-85) %
					Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C	(49-833) N/mm^2 (5-85) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C	(5-85) %
81	OI 001.527-2001 Testing Procedure to Measure Impact Strength of U-Notch Specimens	Uranium alloys	-	-	Impact strength σ_{KCU}	(10-54) J/cm^2 (1.0-5.5) kgf·m/cm^2
82	OI 001.528-2001 Testing Procedure to Measure Tensile Properties of Cylindrical Specimens of Depleted Uranium	Uranium alloys	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(245-1961) N/mm^2 (25-200) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C	(1471-1961) N/mm^2 (150-200) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C	(3-20) %
					Reduction of area after fracture ψ at temperature of 20^{+15}_{-10} °C	(3-20) %
					Proportionality limit	(1471-1961) N/mm^2 (150-200) kgf/mm^2
83	OI 001.540-2002 Testing Procedure to Measure Tensile Properties of Specimens of Extremely Thin-Walled Zirconium-Alloy Tubes over 20 mm in Outer Diameter	Zirconium-alloy tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(343-637) N/mm^2 (35-65) kgf/mm^2

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84	OI 001.543-2003 Bend Test Procedure for Specimens of Sheet-like Zirconium-Alloy Materials	Sheet-like materials (sheets, strips, tapes) of zirconium alloys	-	-	Bend test at temperature of 20^{+15}_{-10} °C	No cracks – cracks
85	OI 001.618-2006 Testing Procedure to Measure Compressive Properties of Cylindrical Specimens of Uranium Alloys	Uranium alloys	-	-	Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C in compression	(1373-2452) N/mm^2 (140-250) kgf/mm^2
86	MVIs 08-175-2007 Strength Testing Procedure for Specimens from Welded Joints	Welded joints	-	-	Tensile strength $\sigma_в$ at temperature of (20±10) °C	(30-70) kgf/mm^2 (294-686) MPa
					Fracture location	Along the weld metal; along the base metal; along the heat-affected zone
					Defects at the specimen's fracture location	None; incomplete penetrations; cracks
87	GOST 1497 para.1.7-1.13, clause 2, clause 3, clause 4 Metals. Tensile testing techniques	Metals, metal products	-	-	Ultimate tensile strength $\sigma_в$	(196-1470) MPa (196-1470) N/mm^2 (20-150) kgf/mm^2
					Yield strength $\sigma_{0.2}$	(196-1470) MPa (196-1470) N/mm^2 (20-150) kgf/mm^2
					Elongation after fracture δ_5	(1-60) %
					Reduction of area after fracture ψ	(1-80) %
88	GOST 2999 Metals and alloys. Vickers hardness testing technique	Metals and alloys	-	-	Vickers hardness	(8-2000) HV
89	GOST 6996 clause 8, clause 9 Welded joints. Techniques of stress-strain behaviour measurement	Metals, alloys, welded joints, deposited metal of such	-	-	Ultimate tensile strength $\sigma_в$ at temperature of (20±10) °C	(98-1226) MPa (10-125) kgf/mm^2
					Bend angle at which crack forms in static bend test	(5-170) °
					Crack length	(2-10) mm
90	GOST 8694 Tubes. Flaring test technique	Seamless and welded metal tubes	-	-	Flaring test	No cracks and ruptures – cracks – ruptures

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91	GOST 8695 Tubes. Flattening test technique	Seamless and welded metal tubes	-	-	Flattening test	No cracks and ruptures – cracks – ruptures
92	GOST 9454 Metals. Technique of impact bend testing at low, room and elevated temperatures	Metals	-	-	Impact strength KCU at temperature of (20±10) °C	(30-200) J/cm^2 (3-20) kgf·m/cm^2
93	GOST 9651 Metals. Techniques of tensile test at elevated temperature	Metals	-	-	Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C	(49-784) MPa (49-784) N/mm^2 (5-80) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C	(49-686) MPa (49-686) N/mm^2 (5-70) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C	(5-80) %
					Reduction of area after fracture ψ at temperature of up to 400 °C	(5-85) %
94	GOST 10006 Metal tubes. Tensile testing technique	Seamless and welded metal tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(49-784) MPa (49-784) N/mm^2 (5-80) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of 20^{+15}_{-10} °C	(49-686) MPa (49-686) N/mm^2 (5-70) kgf/mm^2
					Elongation after fracture δ_5 at temperature of 20^{+15}_{-10} °C	(10-60) %
					Reduction of area after fracture ψ5 at temperature of 20^{+15}_{-10} °C	(15-80) %
95	GOST 10446 Wire. Tensile testing technique	Metal and alloy wire	-	-	Ultimate tensile strength $\sigma_в$ at temperature of 20^{+15}_{-10} °C	(49-686) MPa (49-686) N/mm^2 (5-70) kgf/mm^2
					Elongation after fracture δ at temperature of 20^{+15}_{-10} °C	(5-70) %
96	GOST 14759 Adhesives. Shear strength measurement technique	Epoxy resin	-	-	Breaking shear stress at temperature of (23±2) °C	(1-50) MPa
97	GOST 21981 Sealants. Technique of bond strength with metal measurement in peeling	Sealants	-	-	Bond strength with metal in peeling at temperature of (23±2) °C	(0.1-20.0) kN/m

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98	GOST 19040 Metal tubes. Technique of tensile test at elevated temperature	Seamless metal tubes	-	-	Ultimate tensile strength $\sigma_в$ at temperature of up to 400 °C	(98-784) MPa (98-784) N/mm^2 (10-80) kgf/mm^2
					Yield strength $\sigma_{0.2}$ at temperature of up to 400 °C	(98-686) MPa (98-686) N/mm^2 (10-70) kgf/mm^2
					Elongation after fracture δ_5 at temperature of up to 400 °C	(5-80) %
					Reduction of area after fracture ψ at temperature of up to 400 °C	(5-85) %

General Director, CMP JSC /the electronic document is signed with enhanced digital signature/ S.V. Chineykin