



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Dirats Laboratories

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TESTING

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Table with 5 columns: FIELD OF TEST, ITEMS, MATERIALS OR PRODUCTS TESTED, SPECIFIC TESTS OR PROPERTIES MEASURED, SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED, *DETECTION LIMIT/ RANGE/ EQUIPMENT. Rows include tests for Chemical Analysis, Carbon/Sulfur Analysis, Nitrogen/Oxygen Analysis, Hydrogen Analysis, Atomic Absorption, X-Ray Diffraction, and XRF-ED Analysis.



FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	*DETECTION LIMIT/ RANGE/ EQUIPMENT
Chemical	Ni, Cu and Steel Alloys	Chemical Analysis	ICP-MS	PE Elan 6100DRC ICP-MS
Chemical	Metal Alloys	Differential Scanning Calorimeter	ASTM E794	Mettler Toledo Thermal Analyzer TGA/DSC 1 Star System
Chemical	Al and Cu Alloys	Electrical Conductivity using Electromagnetic Method	ASTM E1004	Magnatest FM-120 Conductivity Meter
Chemical	Feebly Magnetic Materials	Magnetic Permeability	ASTM A342	Severn Engineering Co. Permeability Indicator #3404
Chemical	Platings and Coatings	Coating Weight Determination	ASTM A90, A428, B137 and B767	Analytical Balance
Chemical	Powders	Determination of Flow Rate Of Metal Powders	ASTM B213	Hall Flowmeter funnel and Analytical Balance
Chemical	Powders	Wet and Dry Particle Size Distribution	ASTM B214	Ro-Tap Sieve Shaker
Chemical	Powders	Density	ASTM B311	Analytical Balance
Chemical	Powders	Light Scattering Particle Size Distribution	ASTM B822	Honeywell Microtrac SRA 150 Particle Size Analyzer
Chemical	Powders and Solids	Loss on Ignition, Organic Content and Acid Insolubles	Gravimetric Determination	Analytical Balance Analytical Furnace
Chemical	Free Flowing Metal Powders	Apparent Density Determination	ASTM B212	Hall Flowmeter funnel and Analytical Balance
Chemical	Non-Free Metal Flowing Powders	Apparent Density Determination	ASTM B417	Carney Flowmeter funnel and Analytical Balance
Chemical	Sintered Parts And Oil-Impregnated Bearings	Determination Of Density, Oil Content And Interconnected Porosity	ASTM B962 and B963	Analytical Balance



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Chemical	Carbon / Graphite Shapes	Bulk Density	ASTM C838	Analytical Balance
Chemical	Liquids	Kinematic Viscosity	ASTM D445 and D446	Viscometer, Temperature Bath
Chemical	Water	Chloride and Fluoride Ion	ASTM D512	Fisher Accumet Ion Analyzer
Chemical	Solids	Specific Gravity	ASTM D792	Analytical Balance
Mechanical – Metallurgical Exam	Metallics, Composites and Ceramics	Preparation of Specimens	ASTM E3	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Microetching	ASTM E407	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Macroetching	ASTM E340, E381	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Grain Size	ASTM E112, E930 and E1382	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metallics, Composites and Ceramics	Photomicrography	ASTM E883	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Depth of Decarburization	ASTM E1077	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Case Depth/ Carburization	ASTM E384	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Inclusion Content	ASTM E45, E1245	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Intergranular Attack	ASTM A262	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification

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Mechanical – Metallurgical Exam	Titanium Alloys	Alpha Case	GE P3TF19	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Metals	Grain Size	Acetate Replica of Etched Structure	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification/tape
Mechanical – Metallurgical Exam	Coatings and Platings	Thickness by Cross Section	ASTM B487	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification
Mechanical – Metallurgical Exam	Coatings and Platings	Microhardness of Coatings	ASTM B578	10 – 1000g load Instron Tukon 2100B Microindentation
Mechanical – Metallurgical Exam	Coatings and Platings	Adhesion	ASTM B571	Bend, Grinding Wheel, Sharp Instrument
Mechanical – Metallurgical Exam	Coatings and Platings	Wet Tape Adhesion	FED-STD-141 Method 6301	3M Tape
Mechanical - Environmental Testing	Metals, Coatings and Platings	Salt Spray	ASTM B117, FED-STD-141 Method 6061	AES MX-9200 and Auto Technology Salt Fog Corrosion Chamber
Mechanical - Environmental Testing	Metals, Coatings and Platings	Humidity	FED-STD-141 Method 6201, MIL-STD-753 Method 101 and MIL-STD-810	Thermotron and Blue M Humidity Chamber
Mechanical - Environmental Testing	Stainless Steel Parts	Chemical Passivation Treatments	ASTM A967	AES MX-9200 and Auto Technology Salt Fog Corrosion Chamber
Mechanical - Environmental Testing	Metals	Corrosion Susceptibility	ASTM A262 A, B, E	Olympus GX71 Metallurgical Microscope 25x – 1000x magnification and Struers Lectropol Bench Top Electrolytic Polisher-Etcher
Mechanical - Environmental Testing	Copper Alloys	Mercurous Nitrate	ASTM B14	Zeiss Discovery V12 Stereoscope and Nikon SMZ-10A Stereoscopic Wide Field Metallurgical Macroscopic
Mechanical	Metals	Metallo evaluations, Weld Geometry and Mechanical Properties	ASME Section IX, AWS D1.1, D1.2, D1.5, D17.1 and NAVSEA S9074-AQ- GIB-010/248	Various Metallographic and Mechanical Equipment



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Mechanical	Metals	Axial Fatigue	ASTM E606, E466	Instron and MTS servo-hydraulic testing machines
Mechanical	Metals	R Curve and Fracture Toughness	ASTM E399	Instron and MTS servo-hydraulic testing machines
Mechanical	Metals	Crack Growth DADN, Compliance, PD	ASTM E647	Instron and MTS servo-hydraulic testing machines
Non-Metallic Mechanical Testing	Coatings	Abrasion	ASTM D4060	Taber Abraser
Mechanical	Metal fasteners	Tensile Axial and Wedge	ASTM A370, E8, F606, F606M and MIL-STD-1312-8	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metal fasteners	Proof	ASTM A370, E8, F606, F606M and MIL-STD-1312-8	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metal fasteners	Single and Double Shear	F606, F606M and MIL-STD-1312-13	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metal fasteners	Hardness	F606, F606M and NASM 1312 Method 6	Scales A, B, C, E, F, G, 15N, 30N, 15T, and 30T Wilson Rockwell Series 2000 Hardness Tester
Mechanical	Metal fasteners	Creep, Stress Rupture	NASM 1312-6	Applied Test Systems Series 2330 Stress Rupture Machines with 20:1 Lever arm ratio, 3:1 Lever arm ratio and Applied Test Systems Series 2140 direct loader
Mechanical	Metal fasteners	Fatigue - Axial	ASTM E466, NASM 1312-11, 111	Instron and MTS servo-hydraulic testing machines
Mechanical	Metals	Rockwell and Superficial Hardness	ASTM A370, E18	Scales A, B, C, E, F, G, 15N, 30N, 15T, and 30T Wilson Rockwell Series 2000 Hardness Tester
Mechanical	Metals	Brinell Hardness	ASTM A370, E10	Detroit Testing Model 3000HBE Brinell Hardness Tester



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Mechanical	Metals	Microhardness Knoop & Vickers	ASTM E384	Instron Tukon 2100B Microindentation
Mechanical	Metals	Tension TS, YS, EL, RA	ASTM A370, E8, E8M, B557 and E345	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metals	Tensile Elevated Temperature	ASTM E21	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metals	Tensile Low Temperature	ASTM E21	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metals	Single and Double Shear	ASTM B565	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines
Mechanical	Metals	Bend	ASTM A370	Bend Tester
Mechanical	Metals	Ductility Bend or Flaring	ASTM E190, E290	Bend Tester, Flare Diameter
Mechanical	Metals	Charpy Impact and Izod	ASTM A370, E23	Tinius Olsen
Mechanical	Metals	Creep, Stress Rupture	ASTM E139, E292	Applied Test Systems Series 2330 Stress Rupture Machines with 20:1 Lever arm ratio or 3:1 Lever arm ratios and Applied Test Systems Series 2140 direct loader
Mechanical	Coated Plated Specimens	Hydrogen Embrittlement	ASTM F519	Type 1a specimen Applied Test Systems Series 2330 Stress Rupture Machines with 20:1 Lever Arm ratio
Mechanical	Metals	End Quench Hardenability – Jominy	ASTM A255	HRC Wilson Rockwell Series 2000 Hardness Tester
Mechanical	Sheet Metals	Superplastic Testing	ASTM E2448	MTS Electromechanical testing machines

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Mechanical	Thermal Spray Coatings	Adhesion Strength	ASTM C633	Tinius Olsen, Instron and MTS servo-hydraulic testing machines and MTS Electromechanical testing machines

Notes:

1. * = As Applicable
2. This scope is part of and must be included with the Certificate of Accreditation No. AT-1546



Vice President

