

A man in a blue shirt and safety glasses is working on a large industrial machine. He is looking intently at a component of the machine. The machine has several vertical metal shafts and a large, ribbed cylindrical part. The background shows a factory setting with a concrete ceiling and metal beams.

MECHANICAL TECHNOLOGY & TESTING

Powertech
The Power of Trust. The Future of Energy.

MECHANICAL PERFORMANCE



Tensile testing



Environmental testing

Powertech's clients have to ensure that new components and systems will perform as designed under field conditions, which subject the equipment to vibration, thermal cycling, and corrosion. Electric utilities, too, need to know that components such as conductors, connectors, tower anchor bolts, surge arresters, and insulators meet specifications for tensile strength and fatigue performance.

Powertech's Mechanical Technology and Testing Group has extensive experience in many areas of mechanical testing—from research and development to consulting to failure analysis. We work closely with clients in the electric utility, automotive, electronics, and other industries to verify the performance of prototypes in advance of product release and also conduct failure analyses when problems arise.

Powertech's Mechanical Technology and Testing Laboratory conducts tests to evaluate the performance of a wide variety of materials, components, and systems. The laboratory performs testing for vibration/shock, environmental, combined vibration and environmental (HALT/HASS), tension, compression, and impact to simulate in-service conditions or other specifications. Tests are typically conducted according to

industry standards and custom, non-standard tests are a specialty.

Powertech has the capabilities for on-site mechanical field investigations of equipment and structures such as hydroelectric installations, rotating machinery, and bridges. With its long history in the industry, the Mechanical Technology and Testing Group can utilize its R&D skills to help clients determine what tests to conduct and, if necessary, to develop new advanced test methods.

Powertech's mechanical engineers and technologists provide expert evaluation of test results and recommendations for solutions. The Mechanical Technology and Testing Group also conducts integrated test programs through collaboration with Powertech's in-house High Voltage, High Current, High Power, Applied Materials, and Asset Management Labs.



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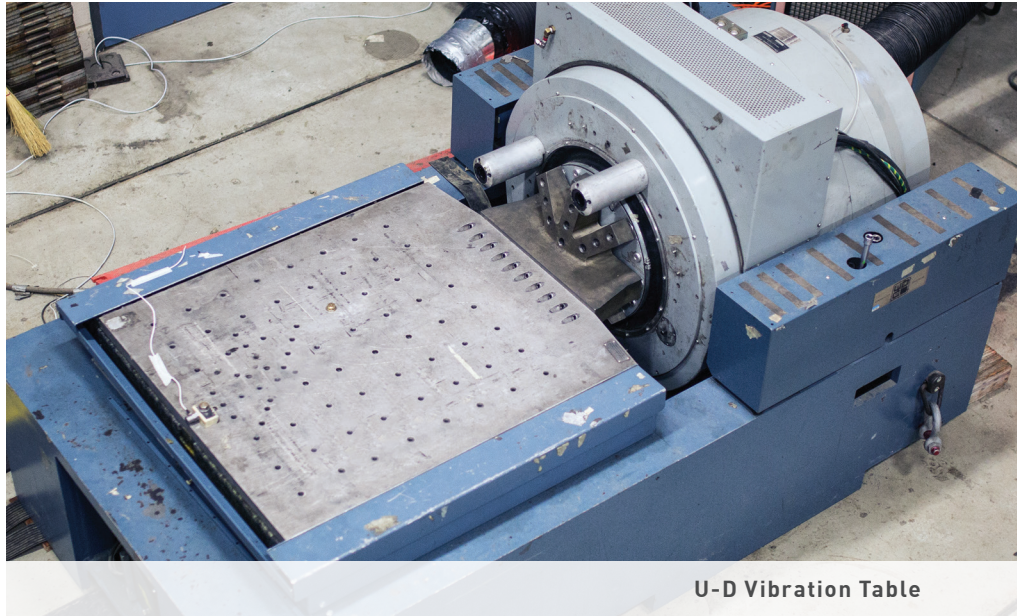
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Composite Bearing Testing



SERVICES



Fatigue testing



U-D Vibration Table

Testing

Powertech offers a full range of mechanical testing services, including:

Research and Development

To meet specialized needs, the Mechanical Testing Group can work with clients to develop and demonstrate new, advanced test methods.

Vibration and Shock

- Vibration testing (sine wave or random vibration profiles up to 13,500 lbf)
- Shock testing (up to 118 g)
- Transport simulation
- Drop testing

Environmental

- Environmental testing, including thermal cycling with humidity
- Combined vibration/environment testing (“shake and bake”)
- Pressurized gaseous environment tension and fatigue testing (up to 10,000 psi)
- Temperature-controlled mechanical testing

Tensile Testing

- Tension, compression, bend testing (up to 440,000 lbf)
- Fatigue testing (up to 55,000 lbf)
- Charpy impact testing
- Large-scale tension/compression load frame (up to 40 feet in length)

Other

- Custom-designed or nonstandard mechanical testing
- Design optimization: modal analysis, FEA simulation
- On-site vibration and shock measurement and monitoring
- Facilitate witnessing of product certification

CAPABILITIES

An extensive variety of testing and analytical capabilities.

Tests can be conducted in accordance with standards set by ANSI, ASTM, CEA, CSA, DNV, IEC, IEEE, ISO, NACE, MIL, SAE, and others. With experience in making adaptations for custom projects, the lab can also meet specialized requests for non-standard tests or setups.

Vibration and Shock

EQUIPMENT	SPECIFICATIONS	TESTS
Unholtz-Dickie Electro-Dynamic Vibration Table	Force capability: 60 kN (13,500 lbf) Frequency range: 5-2,000 Hz	<ul style="list-style-type: none"> • Sine wave or random vibration profiles • Resonance frequency search
Ling Dynamics Electro-Dynamic Vibration Table	Force capability: 33.4 kN (7,500 lbf) Frequency range : 5-2,000 Hz	<ul style="list-style-type: none"> • Sine wave or random vibration profiles • Resonance frequency search

Environmental

EQUIPMENT	SPECIFICATIONS	TESTS
Envirotronics Environmental Chamber	Temperature range: -73°C to +177°C Humidity range: 20 to 95% RH Interior dims: 46" W x 49" D x 60" H	<ul style="list-style-type: none"> • Temperature and humidity cycling • Temperature accelerated aging • Combined thermal and vibration (HALT and HASS)
Custom Walk-in Environmental Chamber	Temperature range: -50°C to +70°C Interior dims: 105" W x 144" D x 96" H	<ul style="list-style-type: none"> • Temperature and humidity testing • Temperature accelerated testing

Tensile, Compression, Fatigue, Impact & Structural

EQUIPMENT	SPECIFICATIONS	TESTS
Tinius Olsen Test Frame	Capacity: 1,800 kN (400,000 lbf) Testing speed: 0-76 mm/min	<ul style="list-style-type: none"> • Tensile, compression, and flexural tests
Satec Impact Tester	Capacity: 25 – 300 ft-lb	<ul style="list-style-type: none"> • Charpy and Izod impact tests
Instron Servo Hydraulic Dynamic Testing Equipment	Capacity: 245 kN (55,000 lbf)	<ul style="list-style-type: none"> • Linear and compression tests • Torsion tests
MTS Criterion Electromechanical Test Equipment	Capacity: 100 kN (22,500 lbf)	<ul style="list-style-type: none"> • Tensile, compression, and flexural tests
Long Bed Tensile Load Frame	Capacity: 2000 kN (440,000 lbf)	<ul style="list-style-type: none"> • Tensile and creep tests up to 19m length
Floor anchor pads	Capacity: various depending on specific test requirements.	<ul style="list-style-type: none"> • Custom tests of full scale sub-structures such as crossarms, towers

STRUCTURAL, VIBRATION/SHOCK, AND TENSILE TESTING



Tensile testing



Full-scale load testing of sub-structures



Cable and shackle testing



Long bed tensile test frame

FOCUS ON: COMPOSITE BEARING TESTING

Powertech specializes in accelerated wear and friction testing for self-lubricating bearings. In fact, it is the only lab in the world with the unique expertise to conduct life testing of self-lubricating bearings for hydroelectric plants for the United States Army Corps of Engineers.

This background also has direct application for assessment of bearing performance in other fields such as the marine industry, wind turbines and other rotating equipment.

Testing is performed using our in-house custom universal load frame. Bearing properties such as static and dynamic coefficients of friction, wear rate, and operating temperature are continuously monitored and reported during testing under wet and dry conditions.



Bearing accelerated wear and friction testing

SELECTED CLIENTS



THE POWERTECH ADVANTAGE

PowerTech Labs Inc. is one of the largest testing and research laboratories in North America, situated in beautiful British Columbia, Canada. Our 11-acre facility offers 15 different testing labs for a one-stop-shop approach to managing utility generation, transmission and distribution power systems.



PowerTech is home to a broad range of scientists, engineers, and technical specialists, with capabilities in electrical testing, cable condition assessment, mechanical and materials engineering, software technologies, power system studies, chemical analysis, gas systems engineering, and smart utility services. These skilled researchers have decades of collective and real-world experience and often work in cross-departmental teams to investigate, diagnose and solve complex problems.

As an independent, third-party testing facility, we adhere to the **highest** laboratory (**ISO 17025**), quality (**ISO 9001**) and environmental

(**ISO 14001**) management standards. Many of our scientists and engineers chair or participate in various standards committees within their fields of expertise. Additionally we have the capabilities to derive and develop **non-standard testing** methods and setups required to test product prototypes and perform forensic analysis.

Outside of the utilities industry, PowerTech provides routine **testing** capabilities, product **development**, research and **consulting** services to support an array of industrial-type operations, electrical equipment manufacturers and automotive original equipment manufacturers.

