

## TESTING AND CALIBRATION LABORATORY ACCREDITATION PROGRAM (LAP)

### Scope of Accreditation

Accredited Laboratory No. 576

**Legal Name of Accredited Laboratory:** **BC Hydro**

Location Name or Operating as (if applicable): Powertech Labs Inc.

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<b>SCC File Number:</b>	15669
<b>Accreditation Standard(s):</b>	ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories
<b>Fields of Testing:</b>	Chemical/Physical Electrical/Electronic Mechanical/Physical
<b>Program Specialty Area:</b>	Environmental Testing (ET)
<b>Initial Accreditation:</b>	2005-01-13
<b>Most Recent Accreditation:</b>	2021-12-23
<b>Accreditation Valid to:</b>	2025-01-13

*Remarque: La présente portée d'accréditation existe également en français, sous la forme d'un document distinct.*

*Note: This scope of accreditation is also available in French as a separately issued document.*

## **CONSTRUCTION**

### **Road and Railway & Civil Constructions:**

#### **Dams**

USACE CERL TR 99/104	Greaseless Bushings for Hydropower Applications
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## **ELASTOMERS AND PROTECTIVE AND COATINGS**

### **Paints, Varnishes, Inks, Coatings, and Allied Products:**

ASTM B117	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
ISO 9227	Corrosion tests in artificial atmospheres - Salt spray tests

### **Plastics, Resins and Rubbers:**

ASTM D412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension Only for: 9, test method A
ASTM D572	Standard Test Method for Rubber - Deterioration by Heat and Oxygen Only for: 10.2 and 10.4
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D785	Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials Only for: 11, procedure A, Rockwell Hardness Scale R & M
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness Only for: 3.0 and 9.2
ASTM D3418	Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry Only for: 10.2 For Glass Transition

## **ELECTRICAL PRODUCTS AND ELECTRONIC PRODUCTS**

### **Communications Equipment and Systems:**

#### **Components and Assemblies**

DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems Only for: Clause 6 Vibration tests, except for Table 9 Extreme vibration strain
IEC 60068-2-27	Environmental Testing – Part 2-27: Tests - Test Ea and guidance: Shock
IEC 60068-2-6	Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)
IEC 60068-2-64	Environmental testing - Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance
IEC 60945	Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results Only for: Clause 8.7 Vibration
IEC 61373	Railway applications - Rolling stock equipment - Shock and vibration tests

#### **Power and Signal Distribution Equipment**

OpenADR VEN	OpenADR Alliance Virtual End Node (VEN) Certification Test
OpenADR VTN	OpenADR Alliance Virtual Top Node (VTN) Certification Test

#### **Telecommunications Equipment**

AeroMACS RCT WMF-T25-006	WiMAX Forum® AeroMACS Radio Conformance Tests
AeroMACS PCT WMF-T25-008	WiMAX Forum® Test Suite Structure and Test Purposes (TSS&TP) Specification

#### **Components and Assemblies:**

##### **Conductors**

ASTM B1008	Standard Test Method for Stress-Strain Testing for Overhead Electrical Conductors
CAN/CSA C61089	Round wire concentric lay overhead electrical stranded conductors Only for: Annex B
DS/EN 50182	Conductors for overhead lines – Round wire concentric lay stranded conductors Only for: Annex C
IEC 61089	Round wire concentric lay overhead electrical stranded conductors Only for: Annex B
IEC 61395	Overhead Conductors – Creep test procedures for stranded conductors

##### **Electrical Rotating Machines**

IEEE 1043	IEEE Recommended Practice for Voltage Endurance Testing of Form-Wound Bars and Coils
IEEE 1310	IEEE Recommended Practice for Thermal Cycle Testing of Form-Wound Stator Bars and Coils for Large Rotating Machines

IEEE 1553	IEEE Standard for Voltage Endurance Testing of Form-Wound Coils and Bars for Hydrogenerators
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### Insulators

ANSI/NEMA C29.1	American National Standard for Test Methods for Electrical Power Insulators Only for: Clause 4.2 Low-Frequency Dry Flashover Voltage Tests Clause 4.3 Low-Frequency Wet Flashover Voltage Tests Clause 4.4 Low-Frequency Dry Withstand Voltage Tests Clause 4.5 Low-Frequency Wet Withstand Voltage Tests Clause 4.7 Impulse Flashover Voltage Tests Clause 4.8 Impulse Withstand Voltage Tests Clause 4.9 Radio-Influence Voltage Tests Clause 5.2 Combined Mechanical- and Electrical-Strength Test (Suspension Insulators)
ANSI/NEMA C29.2A	American National Standard for Insulators Wet Process Porcelain and Toughened Glass – Distribution Suspension Type Only for: Clause 8.3.4 Combined Mechanical and Electrical-Strength Test
ANSI/NEMA C29.2B	American National Standard for Insulators - Wet Process Porcelain and Toughened Glass – Distribution Suspension Type Only for: Clause 8.3.4 Combined Mechanical and Electrical-Strength Test
CSA C411.1	AC suspension insulators Only for: Clause 6.13 Electromechanical failing load test
IEC 60383-1	Insulators for overhead lines with a nominal voltage above 1000V Part 1: Ceramic or glass insulator units for a.c. systems - Definitions, test methods and acceptance criteria Only for: Clause 18 Electromechanical failing load test (type and sample test)

### Switches and Controls

ANSI/NEMA C37.54	Indoor Alternating Current High-Voltage Circuit Breakers Applied as Removable Elements in Metal-Enclosed Switchgear -Conformance Test Procedures Only for: Clause 3.5 Lightning Impulse Withstand Voltage Tests Clause 3.6 Continuous Current Carrying Tests Clause 3.8 Load Current Switching Tests Clause 3.9 Short Time Current Carrying Tests Clause 3.10 Short-Circuit Current Tests Clause 6.2 Power Frequency Withstand Voltage Tests
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ANSI/NEMA C37.55	<p>Switchgear - Medium Voltage Metal-Clad Assemblies - Conformance Test Procedures</p> <p>Only for: Clause 5.5.2 Power-Frequency Withstand Voltage Tests            Clause 5.5.3 Lightning Impulse Withstand Tests            Clause 5.7 Continuous Current Test            Clause 5.8 Short-Time Withstand Current Test            Clause 5.9 Momentary Withstand Current Test</p>
ANSI/NEMA C37.57	<p>Metal-Enclosed Interrupter Switchgear Assemblies - Conformance Testing</p> <p>Only for: Clause 4.5.2 Power-Frequency Withstand Voltage Tests            Clause 4.5.3 Lightning-Impulse Withstand Test            Clause 4.7 Continuous Current Test            Clause 4.8 Short-Time Withstand Current Test            Clause 4.9 Momentary Withstand Current Test</p>
ANSI/NEMA C37.58	<p>Indoor AC Medium-Voltage Switches for Use in Metal-Enclosed Switchgear - Conformance Test Procedures</p> <p>Only for: Clause 4.5 Lightning Impulse Withstand Test            Clause 4.6 Continuous Current Test            Clause 4.7.2 Momentary Withstand Current Test            Clause 4.7.3 Short-Time Withstand Current Test            Clause 4.9 Load-Switching Current Test (If Rated)</p>
CSA C22.2 No. 31	<p>Medium Voltage Metal-Clad Assemblies</p> <p>Only for: Clause 6.1 Temperature            Clause 8.5.1 Dielectric strength tests            Clause 8.5.2 Impulse tests            Clause 8.5.3 Corona-extinction tests            Clause 8.5.4 Short-circuit withstand rating</p>
CSA-C22.2 No. 253/ UL 347	<p>Medium-Voltage AC Contactors, Controllers, and Control Centers</p> <p>Only for: Clause 6.2.201 Impulse withstand tests            Clause 6.2.202 Power-frequency voltage withstand tests            Clause 6.5 Temperature Rise Test            Clause 6.6 Short-Time, Momentary and Peak Withstand Current Bus Tests            Clause 6.102 Make and Break Capacity Test            Clause 6.103 Overload Test            Clause 6.104 Fault Interruption Test            Clause 6.202 Short Time Capability</p>
IEC 60282-1	<p>Standard High-voltage fuses - Part 1: Current-limiting fuses</p> <p>Only for: Clause 7.4.5 Power-frequency voltage dry tests            Clause 7.6 breaking tests            Clause 7.5 temperature-rise tests and power-dissipation measurement            Clause 7.7 tests for time-current characteristics</p>

IEC 60282-2	<p>Standard High-voltage fuses - Part 2: Current-Expulsion fuses</p> <p>Only for: Clause 8.4.5 power-frequency voltage dry tests</p> <p>Clause 8.6 breaking tests</p> <p>Clause 8.5 temperature-rise tests</p> <p>Clause 8.7 time-current characteristics tests</p>
IEC 62271-1	<p>High-voltage switchgear and controlgear –Part 1: Common specifications for alternating current switchgear and controlgear</p> <p>Only for: Clause 7.2 Power-frequency voltage tests</p> <p>Clause 7.4 Resistance measurement</p> <p>Clause 7.5 continuous current tests</p> <p>Clause 7.6 Short-time withstand current and peak withstand current tests</p>
IEC 62271-111/ IEEE C37.60	<p>High-voltage switchgear and controlgear - Part 111: Automatic circuit &amp; reclosers and fault interrupters for alternating current systems up to 38 kV</p> <p>Only for: Clause 6.2 Dielectric tests</p> <p>Clause 6.4 Measurement of the resistance of circuits</p> <p>Clause 6.5 Temperature-rise tests</p> <p>Clause 6.6 Short time withstand current and peak withstand current tests</p> <p>Clause 6.101 Line charging current and cable charging current interruption tests</p> <p>Clause 6.102 Making current capability</p> <p>Clause 6.103 Rated symmetrical interrupting current tests</p> <p>Clause 6.106 Partial discharge (corona) tests</p> <p>Clause 6.111.3 Simulated surge arrester operation test</p> <p>Clause 6.112 Condition of recloser/FI after each test of 6.101, 6.103 and 6.104</p>
IEEE 386	<p>IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems above 600 V</p> <p>Only for: Clause 7.6 Short-time current test</p> <p>Clause 7.7 Switching test</p> <p>Clause 7.8 Fault-closure test</p>

IEEE C37.09	<p>Standard Test Procedure For AC High-Voltage Circuit Breakers Rated On A Symmetrical Current Basis</p> <p>Only for: Clause 4.1 Maximum voltage tests</p> <p>Clause 4.2 Power Frequency</p> <p>Clause 4.3 Continuous Current-Carrying Tests</p> <p>Clause 4.4.3 Power Frequency Withstand Voltage Tests</p> <p>Clause 4.4.4 Full-wave lightning impulse withstand voltage tests</p> <p>Clause 4.4.5 Impulse voltage test for interrupters and resistors</p> <p>Clause 4.4.6 Chopped wave lightning impulse withstand voltage tests</p> <p>Clause 4.4.7 Switching impulse voltage withstand tests</p> <p>Clause 4.5 Standard operating duty (standard duty cycle)</p> <p>Clause 4.6 Interrupting time</p> <p>Clause 4.7 TRV</p> <p>Clause 4.8 Short-circuit current interrupting</p> <p>Clause 4.9.1 Load current switching test conditions</p> <p>Clause 4.9.2 Load current endurance switching test</p> <p>Clause 4.12 Out-of-phase switching current</p>
IEEE C37.09a	<p>Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis Amendment 1 - Capacitance Current Switching</p> <p>Only for: Clause 4.10 Capacitance current switching tests</p>
IEEE C37.20.2	<p>Standard for Metal-Clad Switchgear</p> <p>Only for: Clause 6.2.1 Dielectric tests</p> <p>Clause 6.2.2 Rated continuous current tests</p> <p>Clause 6.2.3 Momentary withstand current tests</p> <p>Clause 6.2.4 Short-time withstand current tests</p> <p>Clause 6.2.5 Auxiliary equipment primary disconnecting device momentary current withstand test</p>
IEEE C37.20.3	<p>Standard for Metal-Enclosed Interrupter Switchgear</p> <p>Only for: Clause 6.2 Dielectric tests</p> <p>Clause 6.5 Temperature-rise tests</p> <p>Clause 6.6 Short-time withstand current and peak withstand current tests</p> <p>Clause 6.14.1 Test for bus-bar insulation</p>
IEEE C37.20.4	<p>IEEE Standard for Indoor AC Switches (1 kV to 38 kV) for Use in Metal-Enclosed Switchgear</p> <p>Only for: Clause 6.6 Short-time withstand current and peak withstand current (formerly momentary) tests</p> <p>Clause 6.13 Fault-making test</p> <p>Clause 6.14 Load-switching current test</p> <p>Clause 6.15 Cable-charging current switching test (optional)</p> <p>Clause 6.16 Unloaded-transformer switching test (optional)</p> <p>Clause 6.17 Direct-acting fuse-tripping current test (optional)</p>
IEEE C37.20.7	<p>IEEE Guide for Testing Metal-Enclosed Switchgear Rated Up to 38 kV for Internal Arcing Faults</p> <p>Only for: 5 Arcing Fault</p>

IEEE C37.23	<p>Metal-Enclosed Bus</p> <p>Only for: Clause 6.2.1.1 Power Frequency Withstand Voltage Tests          Clause 6.2.1.2 Lightning impulse withstand voltage tests          Clause 6.2.1.3 Test for bus-bar insulation, bus-joint insulation, and bus-tap insulation          Clause 6.2.2 Continuous-current          Clause 6.2.3 Momentary withstand current          Clause 6.2.4 Short-time withstand current</p>
IEEE C37.30.1	<p>Standard Requirements for AC High-Voltage Air Switches Rated Above 1000 V</p> <p>Only for: Clause 8.1.1 Power frequency withstand voltage tests          Clause 8.1.2 Lightning impulse dry withstand voltage tests          Clause 8.1.3 Power frequency and lightning impulse open gap withstand voltage tests          Clause 8.1.4 Switching impulse voltage test of switches rated 362 kV and above          Clause 8.2 Temperature rise tests          Clause 8.3 Short-time Withstand Current Tests          Clause 8.4 Fault-making current test          Clause 8.7 Corona tests</p>
IEEE C37.30.4	<p>IEEE Standard for Test Code for Switching and Fault Making Tests for High-Voltage Interrupter Switches, Interrupters or Interrupting Aids Used on or Attached to Switches Rated for Alternating Currents Above 1000 V</p> <p>Only for: Clause 8.1 Switching Tests          Clause 8.2 Fault-making current test</p>
IEEE C37.41	<p>ANSI/IEEE Standard Design Tests for High-Voltage (&gt;1000 V) Fuses and Accessories</p> <p>Only for: Clause 8.2 Power-frequency dry-withstand voltage tests          Clause 8.3 Power-frequency wet-withstand voltage tests on outdoor devices          Clause 8.5 Lightning impulse-withstand voltage tests          Clause 9 Interrupting tests          Clause 10 Radio-influence tests          Clause 11 Temperature-rise tests          Annex A.4 Short-time withstand current tests for disconnecting switches          Annex A.5 Load-break tests</p>
IEEE C37.42	<p>IEEE Standard Specifications for High-Voltage (&gt; 1000 V) Expulsion-Type Distribution-Class Fuses, Fuse and Disconnecting Cutouts, Fuse Disconnecting Switches, and Fuse Links, and Accessories Used with These Devices</p> <p>Only for: Clause 3.3.1 Dielectric tests          Clause 3.3.2 Interrupting [breaking]          Clause 3.3.5 Short-time current tests for disconnecting cutouts          Clause 3.3.6 Temperature-rise tests</p>



IEEE C37.45	IEEE Standard for Design Test Specifications for High Voltage (> 1000 V) Distribution Class Enclosed Single-Pole Air Switches Only for: Clause 8.1 Dielectric tests Clause 8.3 Short-time current tests Clause 8.4 Temperature-rise tests
IEEE C37.46	Specifications for High-Voltage (>1000 V) Expulsion and Current-Limiting Power Class Fuses and Fuse Disconnecting Switches Only for: Clause 4.1 Dielectric tests Clause 4.2 Interrupting [breaking] Clause 4.4 Temperature-rise
IEEE C37.66	IEEE Standard Requirements for Capacitor Switches for AC Systems (1 kV to 38 kV) Only for: Clause 6.2 Insulation (dielectric) tests Clause 6.3 Short-time current tests Clause 6.4 Rated fault-making current tests Clause 6.5 Operating duty tests
IEEE C37.74	Standard Requirements for Subsurface, Vault, and Pad-Mounted Load-Interrupter Switchgear and Fused Load-Interrupter Switchgear for Alternating Current Systems up to 38 kV Only for: Clause 6.7.2 Dielectric tests Clause 6.7.3 Continuous current test Clause 6.7.4 Short-circuit withstand current tests Clause 6.7.5 Switching tests Clause 6.7.6 Thermal runaway test Clause 6.7.7 Partial discharge tests Clause 6.7.8 DC withstand voltage test
IEEE/IEC 62271-37-013	IEEE/IEC International Standard for High-voltage switchgear and controlgear -- Part 37-013: Alternating-current generator circuit-breakers Only for: Clause 6.2.2.1 Rated power frequency withstand voltage (dry) Clause 6.2.6.2 Lightning impulse voltage test Clause 6.2.12 Sound level tests Clause 6.5 Temperature rise test Clause 6.6 Short-time withstand current and peak withstand current tests Clause 6.103 System-source short-circuit current making and breaking tests Clause 6.104 Load Current Breaking Tests Clause 6.105 Generator-source short-circuit current making and breaking tests Clause 6.106 Out-Of-Phase Current Switching Tests
ASTM F855	Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment Only for: Clause 12.3 Electrical short circuit capacity (Clamp) Clause 25.2 Electrical short circuit capacity (Ferrule)

IEEE 837	Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment Only for: Clause 7.2 Electromagnetic force (EMF) test Clause 8.2 Fault-making current test
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### Transformers

ASTM D3612	Standard test Method for Analysis of Gases Dissolved in Electrical Insulating Oil by Gas Chromatography Except for: Propane and Propylene
IEC 61869-1	Instrument transformers - Part 1: General requirements Only for: Clause 7.2.2 Temperature-rise test Clause 7.2.3 Impulse voltage withstand test on primary terminals Clause 7.2.4 Wet test for outdoor type transformers Clause 7.3.1 Power-frequency voltage withstand tests on primary terminals Clause 7.3.2 Partial discharge measurement Clause 7.3.4 Power-frequency voltage withstand tests on secondary terminals Clause 7.3.6 Verification of markings Clause 7.4.1 Chopped impulse voltage withstand test on primary terminals
IEC 61869-3	Instrument transformers - Part 3: Additional requirements for inductive voltage transformers Only for: Clause 7.2.2 Temperature-rise test Clause 7.2.3 Impulse voltage withstand test on primary terminals
IEEE C57.12.90	Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers Only for: Clause 5 Resistance measurements Clause 6 Polarity and phase-relation tests Clause 7 Ratio tests Clause 8 No-load losses and excitation current Clause 9 Load losses and impedance voltage Clause 10 Dielectric tests Clause 11 Temperature-rise tests Clause 12 Short circuit tests Clause 13 Audible sound emissions
IEEE C57.12.91	Standard Test Code for Dry-Type Distribution and Power Transformers Only for: Clause 5 Resistance measurements Clause 6 Polarity and phase relation tests Clause 7 Ratio tests Clause 8 No load losses and excitation current Clause 9 Load losses and impedance voltage Clause 10 Dielectric tests Clause 11 Temperature tests

	<p>Clause 12 Short circuit tests</p> <p>Clause 13 Audible Sound Level Measurements</p>
IEEE C57.13	<p>Standard Requirements for Instrument Transformers</p> <p>Only for: Clause 8.2 Impedance excitation, and composite error measurements</p> <p>Clause 8.3 Polarity</p> <p>Clause 8.4 Resistance measurements</p> <p>Clause 8.6 Partial discharge measurement</p> <p>Clause 8.9 Measurement of Open-Circuit Voltage of Current Transformers</p> <p>Clause 9.3 Impedance measurements</p> <p>Clause 9.4 Polarity</p> <p>Clause 10.2 Impedance measurements</p> <p>Clause 10.3 Polarity</p> <p>Clause 11.2 Temperature rise tests</p> <p>Clause 11.4 Partial discharge measurement</p> <p>Clause 12.2 Current transformer temperature rise tests</p>

#### **Wiring and Related Products**

HD 629.1-S3	<p>Test Requirements for accessories for use on power cable of rated voltage from 3,6/6(7,2) kV up to 20,8/36(42) kV – Part1: Accessories for cables with extruded insulation</p> <p>Exception: Table 14</p>
EN 61442	<p>Test methods for accessories for power cables with rated voltages from 6 kV (<math>U_m = 7,2</math> kV) up to 36 kV (<math>U_m = 42</math> kV)</p> <p>Only for:</p> <p>Clause 4 AC voltage tests</p> <p>Clause 6 Impulse voltage tests</p> <p>Clause 7 Partial discharge test</p> <p>Clause 9 Heating cycle voltage test</p> <p>Clause 9.4 Immersion test for outdoor terminations</p> <p>Clause 10 Thermal short-circuit test (screen)</p> <p>Clause 11 Thermal short-circuit test (conductor)</p> <p>Clause 12 Dynamic short-circuit test</p> <p>Clause 13 Humidity and salt fog tests</p> <p>Clause 14 Impact test at ambient temperature</p>

### **ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY**

#### **Environmental:**

##### **Soil/Sediment (PCB in Soil)**

ACTP 6	Polychlorinated Biphenyls (PCB) in Soil by Gas Chromatography [BC ENV, EPA 3570, EPA 3665A, EPA 3620C, EPA 8082A] Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Total PCB
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**Soil/Sediment (EPH in Soil)**

ACTP 22	Extractable Petroleum Hydrocarbons (EPH) in Solids by GC/FID [BC ENV, EPA 3570] EPHs10-19 EPHs19-32
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**Soil/Sediment (Metals in Soil)**

ACTP 25	Strong Acid Leachable Metals (SALM) in Soil by ICP-OES [BC ENV, EPA 6010D] Aluminum Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Manganese Mercury Molybdenum Nickel Selenium Silver Strontium Sulphur Thallium Thorium Tin Titanium Tungsten Uranium Vanadium Zinc
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**Soil/Sediment (PAH in Soil)**

ACTP 14	Polycyclic Aromatic Hydrocarbons (PAH) in Soil by GC-MS [BC ENV, EPA 3570, EPA 3630C, EPA 8270D] Acenaphthene, Acenaphthylene,
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	<p>Anthracene,          Benzo(a)anthracene,          Benzo(a)pyrene,          Benzo(b+)fluoranthene,          Benzo(k)fluoranthene,          Benzo(g,h,i)perylene,          Chrysene,          Dibenz(a,h)anthracene,          Fluoranthene,          Fluorene,          Indeno(1,2,3-cd)pyrene,          1-Methylnaphthalene,          2-Methylnaphthalene,          Naphthalene,          Phenanthrene,          Pyrene</p>
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**Water (Inorganic)**

ACTP 8	pH in Water and Soil by Electrometry [BC ENV, APHA 4500-H+]
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**Water (Organic – PCB in Water)**

ACTP 7	<p>Polychlorinated Biphenyls (PCB) in Water by Gas Chromatography          [BC ENV, EPA 3511, EPA 3665A, EPA 3620C, EPA 8082A]          Aroclor 1242          Aroclor 1248          Aroclor 1254          Aroclor 1260          Total PCB</p>
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**Water (Organic – EPH in Water)**

ACTP 23	<p>Extractable Petroleum Hydrocarbons (EPH) in Water by GC/FID          [BC ENV, EPA 3511]          EPHw10-19          EPHw19-32</p>
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**Water (Organic – PAH in Water)**

ACTP 15	<p>Polycyclic Aromatic Hydrocarbons (PAH) in Water by GC-MS          [BC ENV, EPA 3630C, EPA 3511, EPA 8270D]          Acenaphthene,          Acenaphthylene,          Acridine,          Anthracene,          Benzo(a)anthracene,          Benzo(a)pyrene,          Benzo(b+)fluoranthene,          Benzo(k)fluoranthene,          Benzo(g,h,i)perylene,          Chrysene,          Dibenz(a,h)anthracene,          Fluoranthene,</p>
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	<p>Fluorene,          Indeno(1,2,3-cd)pyrene,          1-Methylnaphthalene,          2-Methylnaphthalene,          Naphthalene,          Phenanthrene,          Pyrene,          Quinoline</p>
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**Occupational Health and Safety:**

**Asbestos**

ACTP 10	<p>Test Method for the Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM)          [NIOSH 9002, EPA 600/R-93/116 Standard, Clauses 2.1, 2.2, 2.3]</p>
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**Silica**

ACTP 12	<p>Respirable Particulate and Silica Analysis by FT-IR          [NIOSH 0600, NIOSH 7602]</p>
ACTP 27	<p>Respirable Particulate and Silica Analysis by XRD          [NIOSH 0600, NIOSH 7500]</p>

**MACHINERY**

**Boilers, Pressure Vessels and Piping:**

ISO 7866	<p>Gas cylinders - Refillable seamless aluminium alloy gas cylinders - Design, construction and testing          Only for: Annex B Test method to determine the sustained-load cracking resistance of aluminium alloy gas cylinders</p>
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**Transportation, Agricultural and Construction Vehicles and Components:**

**Automobiles, Light Trucks, Vans & Trailers**

ANSI HGV 2	<p>Compressed hydrogen gas vehicle fuel containers          Only for: Clause 11.3 Leak Test          Clause 12.4 Burst Test          Clause 12.5 Cycle Test          Clause 18.3.2 Ambient Cycling Test          Clause 18.3.3 Environmental Test          Clause 18.3.4 Extreme Temperature Cycling          Clause 18.3.5 Hydrostatic Burst Test          Clause 18.3.6 Flaw Tolerance Test          Clause 18.3.7 Drop Test          Clause 18.3.8 Fire Test          Clause 18.3.9 Accelerated Stress Rupture Test          Clause 18.3.10 High Strain Rate Impact Test          Clause 18.3.11 Permeation Test</p>
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	<p>Clause 18.3.12 Boss Torque Test          Clause 18.3.13 Hydrogen Gas Cycling Test          Clause 18.3.14 Leak Before Break Test          Clause 18.5.2 Ambient Cycling Test          Clause 18.5.3 Hydrostatic Burst Test          Clause 18.5.4 Container test for performance durability          Clause 18.5.5 High strain rate impact test          Clause 18.5.6 Permeation test          Clause 18.5.7 Container test for expected on-road performance</p>
ANSI HGV 3.1	<p>Fuel system components for compressed hydrogen gas powered vehicles          Only for: Clause 5.3 Hydrostatic strength          Clause 5.4 Leakage          Clause 5.5 Excess torque resistance          Clause 5.6 Bending moment          Clause 5.7 Continuous operation          Clause 5.8.1 Salt spray exposure          Clause 5.9 Ultraviolet resistance of external surfaces          Clause 5.10 Automotive fluid exposure          Clause 5.12 Abnormal electrical voltages          Clause 5.13 Vibration resistance          Clause 5.15 Insulation resistance          Clause 5.16 Pre-cooled hydrogen exposure          Clause 8.4.1 Leakage          Clause 8.4.2 Continuous operation          Clause 10.4.1 Continuous operation          Clause 10.4.2 Operating torque          Clause 11.4.1 Automatic valve          Clause 11.4.2 Automatic container valve          Clause 13.4.3 Insulation resistance          Clause 14.4.1 Hydrostatic strength          Clause 14.4.2 External leakage          Clause 14.4.3 Continuous operation          Clause 14.4.4 Pressure impulse          Clause 15.4.1 Hydrostatic strength          Clause 15.4.2 Continuous operation          Clause 15.4.3 Opening and reseating characteristics</p>
ANSI/CSA HGV 4.4	<p>Breakaway devices for compressed hydrogen dispensing hoses and systems          Only for: 2.2 Leakage          2.3 Hydrostatic Strength          2.4 Separation Test          2.5.1 Oxygen Aging Test          2.6 Electrical Conductivity          2.7.1 Deformation          2.7.2 Strength Tests - Impact Test          2.7.3 Drop Test          2.8.1 Pressure Cycle Test</p>
ANSI HPRD 1	<p>Thermally activated pressure relief devices for compressed hydrogen vehicle fuel containers          Only for: 7.2 Pressure Cycling          7.3 Accelerated Life          7.4 Thermal Cycling          7.6 Automotive Fluid Exposure</p>

	<p>7.7 UV exposure  7.8.1 Atmospheric exposure (oxygen ageing)  7.10 Impact due to drop and vibration  7.11 Leakage  7.12 Bench top activation  7.13 Flow capacity  7.14 High Pressure activation and flow rate</p>
ANSI NGV 2	<p>Compressed natural gas vehicle fuel containers  Only for: Section 11.3 Leak Test  Section 12.4 Burst Test  Section 12.5 Cycle Test  Section 19.3 Ambient Cycling Test  Section 19.4 Environmental Test  Section 19.5 Extreme Temperature Cycling  Section 19.6 Hydrostatic Burst Test  Section 19.7 Composite Flaw Tolerance Test  Section 19.8 Drop Test  *Section 19.9 Bonfire Test  Section 19.10 Accelerated Stress Rupture Test  *Section 19.11 Penetration Test  Section 19.12 Permeation Test  Section 19.13 Natural Gas Cycling Test  Section 19.14 Leak Before Break Test</p>
ANSI NGV3.1/ CSA 12.3	<p>Fuel System Components for Natural Gas Powered Vehicles  Only for: 5.2 Hydrostatic Strength  5.7.2 Salt spray exposure – Salt spray test only  5.8.2 Atmospheric Exposure Test - Oxygen Aging  5.11 Vibration resistance  5.14 Ultraviolet Resistance of External Surfaces  5.15 Automotive fluid exposure</p>
ANSI PRD 1	<p>Pressure relief devices for natural gas vehicle (NGV) fuel containers  Only for: 7.7 UV resistance  7.10.2 Impact due to drop and vibration – vibration  7.14.1 Atmospheric exposure - Oxygen Aging</p>
ANSI/CSA HGV 4.10	<p>Standards For Fittings for compressed hydrogen gas and hydrogen rich gas mixtures  Only for: 2.3 External Leak Test  2.4 Hydrostatic Burst Test  2.5 Hydraulic Cyclic Endurance Test  2.6 Gas Cyclic Endurance Test  2.8 Explosive Decompression  2.9 Make or Break Test  2.10 Thermal Shock</p>
CSA B51 Part 2	<p>High-Pressure Cylinders for the On-board Storage of Natural Gas as a Fuel for Automotive Vehicles  Only for: Clause 14.12 Hydrostatic Pressure Burst Test</p>
EC 79	<p>Implementing Regulation (EC) No 79/2009 of the European Parliament and of the Council on type-approval of hydrogen-powered motor vehicles Annex IV  Only for: Part 2, Para. 4.2.1 Burst test  Part 2, Para. 4.2.2 Ambient temperature pressure cycle test  Part 2, Para. 4.2.3 Leak-before-break (LBB) performance test  *Part 2, Para. 4.2.4 Bonfire test</p>



	<p>*Part 2, Para. 4.2.5 Penetration test  Part 2, Para. 4.2.6 Chemical exposure test  Part 2, Para. 4.2.7 Composite flaw tolerance test  Part 2, Para. 4.2.8 Accelerated stress rupture test  Part 2, Para. 4.2.9 Extreme temperature pressure cycle test  Part 2, Para. 4.2.10 Impact damage test  Part 2, Para. 4.2.11 Leak test  Part 2, Para. 4.2.12 Permeation test  Part 2, Para. 4.2.13 Boss torque test  Part 2, Para. 4.2.14 Hydrogen gas cycling test  Part 3, Para. 4.1.1.2(b) Hydrogen compatibility test (non-metallic materials)  Part 3, Para. 4.1.2 Ageing test  Part 3, Para. 4.2.1 Corrosion resistance test (Test a only)  Part 3, Para. 4.2.2 Endurance  Part 3, Para. 4.2.3 Hydraulic pressure cycle test  Part 3, Para. 4.2.4 Internal leakage test  Part 3, Para. 4.2.5 External leakage test</p>
ISO 11114-4	<p>Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents -Part 4: Test methods for selecting steels resistant to hydrogen embrittlement  Only for: Section 5.1 (Method A) – Disc test  Section 5.3 (Method C) - Test method to determine the resistance to hydrogen assisted cracking of steel cylinders</p>
ISO 11119-3	<p>Gas cylinders - Refillable composite gas cylinders and tubes - Design, construction and testing - Part 3: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450L with non-load-sharing metallic or non-metallic liner  Only for: 8.5.1 Proof pressure test  8.5.3 Cylinder burst test  8.5.4 Ambient cycle test  8.5.6 Environmental cycle test  8.5.7 Environmentally assisted stress rupture test  8.5.8 Flaw test  8.5.12 Permeability test  8.5.13 Torque test on cylinder neck boss  8.5.15 Leak test  8.5.16 Pneumatic cycle test</p>
ISO 17268	<p>Gaseous hydrogen land vehicle refuelling connection devices  Only for: Section 7 Design Verification Tests Procedures</p>
SAE J2600	<p>Compressed hydrogen surface vehicle fueling connection devices  Only for: Section 5 Type (Design Verification) Tests</p>
UNECE R110	<p>Uniform provisions concerning the approval of:  I. Specific components of motor vehicles using compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system  Annex 3A, Appendix A  Only for: Para. A.6 Leak Before Break Test  Para. A.7 Extreme Temperature Cycling  Para. A.10 Leak Test</p>

	<p>Para. A.11 Hydraulic Test          Para. A.12 Hydrostatic pressure burst test          Para. A.13 Ambient temperature pressure cycling          Para. A.14 Acid environment test          *Para. A.15 Bonfire test          *Para. A.16 Penetration tests          Para. A.17 Composite flaw tolerance tests          Para. A.18 High temperature creep test          Para. A.19 Accelerated stress rupture test          Para. A.20 Impact damage test          Para. A.21 Permeation test          Para. A.25 Boss torque test          Para. A.24 (a) Pressure relief device requirements - 24 hr temperature and pressure hold          Para. A.24 (b) Pressure relief device requirements - Pressure Cycling          Para. A.27 Natural gas cycling test</p>
<p>UNECE R134</p>	<p>Uniform provisions concerning the approval of motor vehicles and their components with regard to the safety-related performance of hydrogen-fuelled vehicles (HFCV)          Only for: Para. 5.1 Verification tests for baseline metrics          Para. 5.2 Verification tests for performance durability (sequential hydraulic tests)          Para. 5.3 Verification test for expected on-road performance (sequential pneumatic tests)          Para. 5.4 Verification test for service terminating performance in fire          Para. 9.3.2.1 Rupture test in batch testing          Para. 9.3.2.2 Ambient temperature pressure cycling test in batch testing          Annex 3, Para. 2 Test procedures for baseline performance metrics          Annex 3, Para. 3 Test procedures for performance durability          Annex 3, Para. 4 Test procedures for expected on-road performance          Annex 3, Para. 5 Test procedures for service termination performance in fire          Annex 4, Para. 1.1 Pressure cycling test          Annex 4, Para. 1.2 Accelerated life test          Annex 4, Para. 1.3 Temperature cycling test          Annex 4, Para. 1.5 Vehicle environment test          Annex 4, Para. 1.7 Drop and vibration test          Annex 4, Para. 1.8 Leak test          Annex 4, Para. 1.9 Bench top activation test          Annex 4, Para. 1.10 Flow rate test          Annex 4, Para. 2.1 Hydrostatic strength test          Annex 4, Para. 2.2 Leak test          Annex 4, Para. 2.3 Extreme temperature pressure cycling test          Annex 4, Para. 2.4 Salt corrosion resistance test          Annex 4, Para. 2.5 Vehicle environment test          Annex 4, Para. 2.6(a) Atmospheric exposure test (oxygen)          Annex 4, Para. 2.7 Electrical tests          Annex 4, Para. 2.8 Vibration test          Annex 4, Para. 2.10 Pre-cooled hydrogen exposure test</p>
<p>ISO 19880-3</p>	<p>Gaseous hydrogen - Fueling stations - Part 3: Valves          Only for: 5 General test methods          6 Check valves          7 Excess flow valves</p>

	<p>8 Flow control valves</p> <p>9 Hose breakaway devices (Except for 9.2.13 Twisting test)</p> <p>10 Manual valves</p> <p>11 Pressure safety valves (PSV)</p> <p>12 Shut-off valves</p>
UN GTR No. 13	<p>Global technical regulation on hydrogen and fuel cell vehicles Part II</p> <p>Only for: Para. 5.1.1 Verification tests for baseline metrics</p> <p>Para. 5.1.2 Verification tests for performance durability (hydraulic sequential tests)</p> <p>Para. 5.1.3 Verification test for expected on-road performance (pneumatic sequential tests)</p> <p>Para. 5.1.4 Verification test for service terminating performance in fire</p> <p>Para. 6.2.2 Test procedures for baseline performance metrics</p> <p>Para. 6.2.3 Test procedures for performance durability</p> <p>Para. 6.2.4 Test procedures for expected on-road performance</p> <p>Para. 6.2.5 Test procedures for service terminating performance in fire</p> <p>Para. 6.2.6.1.1 Pressure cycling test</p> <p>Para. 6.2.6.1.2 Accelerated life test</p> <p>Para. 6.2.6.1.3 Temperature cycling test</p> <p>Para. 6.2.6.1.5 Vehicle environment test</p> <p>Para. 6.2.6.1.7 Drop and vibration test</p> <p>Para. 6.2.6.1.8 Leak test</p> <p>Para. 6.2.6.1.9 Bench top activation test</p> <p>Para. 6.2.6.1.10 Flow rate test</p> <p>Para. 6.2.6.2.1 Hydrostatic strength test</p> <p>Para. 6.2.6.2.3 Extreme temperature pressure cycling test</p> <p>Para. 6.2.6.2.4 Salt corrosion resistance test</p> <p>Para. 6.2.6.2.5 Vehicle environment test</p> <p>Para. 6.2.6.2.6(a) Atmospheric exposure test (oxygen)</p> <p>Para. 6.2.6.2.7 Electrical tests</p> <p>Para. 6.2.6.2.8 Vibration tests</p> <p>Para. 6.2.6.2.10 Pre-cooled hydrogen exposure test</p>

## **METALLIC ORES AND PRODUCTS**

### **Articles of Metal:**

#### **Cast, Forged, Welded or Pressed Metal Components**

ASTM E18	Standard Test Methods for Rockwell Hardness of Metallic Materials
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## **NON-METALLIC MINERALS AND PRODUCTS**

### **Petroleum Refinery Products (including asphalt materials, petrochemicals, fuels and lubricants):**

#### **Fuels and Lubricants**

ASTM D4059	Standard Test Method for Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography [ACTP 4]
ASTM D664	Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration [ACTP 16]
ASTM D7042	Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity) [ACTP 17]
ASTM D7596	Standard Test Method for Automatic Particle Counting and Particle Shape Classification of Oils Using a Direct Imaging Integrated Tester [ACTP 13]
ASTM D4739	Standard Test Method for Base Number Determination by Potentiometric Hydrochloric Acid Titration [ACTP 19]
ASTM D5185	Standard Test Method for Multielement Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES) [ACTP 20]

Number of Scope Listings: 107

**Notes:**

**AeroMACS:** Aeronautical Mobile Airport Communication System

**ACTP:** Internal Powertech Labs Inc. Procedure (Applied Chemistry Test Procedure)

**ASME:** American Society of Mechanical Engineers

**ASTM:** ASTM International, previously American Society for Testing and Materials

**BC ENV:** British Columbia Environmental Laboratory Manual

**CSA:** Canadian Standards Association

**DNVGL:** Det Norske Veritas (Norway) and Germanischer Lloyd (Germany)

**EC:** European Environment Agency

**EPA:** United States Environmental Protection Agency

**IEC:** International Electrotechnical Commission

**IEEE:** Institute of Electrical and Electronics

**NIOSH:** National Institute for Occupational Safety and Health (USA)

**UNECE:** United Nations Economic Commission for Europe

**UN GTR:** United Nations Global Technical Regulations

**USACE:** United States Army Corps of Engineers

(\*): These tests are performed in a temporary location (Justice Institute of BC (JI), 13500 256 St, Maple Ridge, BC V4R 1C9; Or Dewdney Creek North PIT #7004 (Off Coquihalla highway, Carolin Mines exit, between Hope and Coquihalla summit).



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Publication on: 2021-12-23