



THE ROBERT M. BUCHAN
DEPARTMENT OF MINING

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**Commercial Test Charges for
Rock Mechanics Analyses**
(Effective as of April 1, 2023)

Test Description **Charge Rate**
(\$Cdn)

(1) Unconfined Compression

- a) includes determination of sample bulk density, unconfined compressive strength (S_c), static Young's Modulus (E) and static Poisson's ratio (μ) parameters \$350/test
- b) same test but without determination of static Young's Modulus and Poisson's ratio parameters \$300/test
- c) determination only of dynamic Young's Modulus and Poisson's ratio parameters from core pieces using sonic velocity measurements \$85.00/test
- d) UCS with static Modulus determinations, as for part (a), plus dynamic modulus determination as per part (c) \$360.00/test

(2) Triaxial Confined Compression

- determination of triaxial confined compression strength for a single level state of confinement (ASTM Method A) \$350/test
- includes determination of triaxial confined compression strength including stress/strain and Young's Modulus determination for one single confinement stress level failure test (ASTM Method B) \$400/test
- multi-stage triaxial testing (minimum of 3-4 confinement stress levels per sample specimen) with no Modulus determination \$700/test

(3) Brazilian Indirect Tensile Strength

- determination of indirect tensile strength (S_t) of rock using prepared wafer specimens (ten sample tests per core length) \$150/core length

(4) Point Load Index Test

- determination of Point Load Index (I_p) values from rock core of minimum length/diameter size at (1.5/1) (either diametral or axial core orientation) \$65/test

(5) Direct Shear Test

- determination of direct shear strength parameters for core or uncut lump fragments of rock
- initial shear and full residual shear envelope assessed per specimen (minimum ten residual shear cycles per specimen)

tested)

-test charges negotiable, dependent on sample size

\$1450/sample

(6) Basic Friction Angle (Tilt Table) Test

-determination of basic (minimum) friction angle of sawed core sections, prepared by diametral or axial cutting of core sections and testing on a tilt table apparatus

\$75/sample

Note:

All quoted charges are not subject to HST. Due to the special standing of the University, billing for contract service work such as this does not require that any HST charges be levied on billing.

Information for sample size provision and additional (optional) sample analyses:

Tests (1) and (2): Samples supplied as core will be prepared for testing through a process of diamond sawing and end lathing to manufacture test samples exhibiting final length-to-diameter aspect ratios ranging between 2.25-to-1 and 2.5-to-1. In order to accommodate wastage of specimens during sample cutting, as-received lengths of intact core exceeding length-to-diameter ratios of at least 3-to-1 are required for each test.

For test 1(c): Samples to be supplied as core must exhibit minimum length-to-diameter aspect ratio of 1-to-1 and will be prepared for sonic velocity testing through a process of diamond sawing and end lathing

Test (3): For Brazilian (tensile) test samples, similar as-received core lengths are required as for Tests (1) and (2) for each test. Samples will be cut into wafers (up to ten per sample, at thicknesses approximating 1.5 cm each) that will be tested to provide tensile strength estimations for each.

Test (4): For point load tests, each test will utilize one piece of core, sized at a minimum length-to-diameter ratio of 1.5-to-1, that can be tested either by diametral loading or by axial loading. Point load test data will be determined according to as-received specimen diameter values (I_s) and converted to 50 mm diameter equivalent point load strength values (I_{s50}).

Test (5): Samples for direct shear testing should have minimum total lengths of 15 cm in order that adequate confinement can be achieved for each test sample section.

Test (6): Basic friction angle (internal angle of friction) parametric values determined using diamond-sawed sections of core or rock that can be irregular lump fragments or core materials (cut either perpendicular or parallel to the core axis) that must have a minimum contact surface area of at least 1775 mm^2 (2.75 in^2). Tilt table testing is conducted in accordance with procedures established by the Materials Engineering and Research Laboratory, Denver, Colorado (USBR-6258-09).

Sample Shipping Address:

The Robert M. Buchan Department of Mining
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25 Union Street
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Attention:

Perry Ross (613-985-6463) or Larry Steele (613-453-7603)