

GCTS is committed to designing accurate testing systems by integrating innovative software engineering with advanced hardware. GCTS systems perform at the highest levels of reliability, providing efficient systems that satisfy customer needs and expectations.

► **PLT-2W**  
**Wireless Point Load Test System**



- **Accurate**  
(better than 0.05%)
- **High Productivity**  
(Automatic Gaging & Testing)
- **100 kN Load Capacity**
- **Compact, Light Wight (< 16 kg)**
- **Ergonomic Shield Protection**
- **Test App for Mobile Devices**  
(iOS, Android, Windows)
- **Ultrasonic Velocity Option**
- **Available Fixtures and Apps for:**
  - **Unconfined Compression Test**
  - **Indirect Tension (Brazilian) Test**
  - **Brinell Hardness Test**

**DESCRIPTION**

The Point Load Test is performed on core rock specimens or irregular rock fragments to obtain the point load strength index and unconfined compressive strength of the rock. This test does not require costly specimen preparation and is a quick, simple test. The failure load P and the distance between platens D are measured to obtain the uncorrected point load strength  $P/D^2$ . A correction is applied to account for the specimen size and shape, and the unconfined compressive strength is obtained from a correlation equation. Depending on the specimen geometry, three types of tests can be performed: diametral, axial, and irregular lump.

The GCTS Wireless Point Load Testing System is a convenient test system that has been designed for ease of transportation, increased productivity, optimum mass production, and maximum precision.

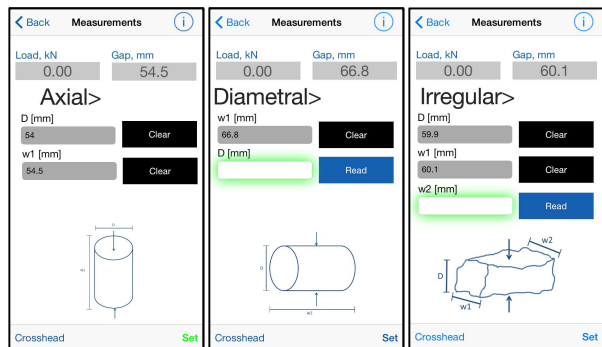
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The GCTS PLT-2W is an apparatus made of high-strength anodized aluminum that incorporates digital technology to increase precision and ease of use while reducing its size and weight. The apparatus weighs less than 16 kg and the standard unit can apply loads up to 100 kN (22.5 kips).

A high precision load sensor with accuracy better than 0.05% is used to measure the applied load, allowing this unit to perform tests according to ASTM D5731 on specimens with failure loads as low as 1 kN. A displacement sensor is also included to automatically measure specimen dimensions as required to calculate the Corrected Point Load Strength Index.

The data acquisition electronics are safely located inside a metal housing and uses Bluetooth to wirelessly connect to a mobile device (iOS, Android, or Windows). An iPod Touch and the GCTS Point Load Test Application software are included with the PLT-2W.

Three different specimen shapes can be tested – diametral, axial, and irregular. The application can be set to perform tests with each specimen type and shows the user exactly which dimensions must be measured. All dimensions can be measured using the application by placing the specimen in the cell in the direction specified by the application and applying a small load. The application will automatically read the specimen dimension and record it. Once all measurements have been made, the point load test will automatically begin.

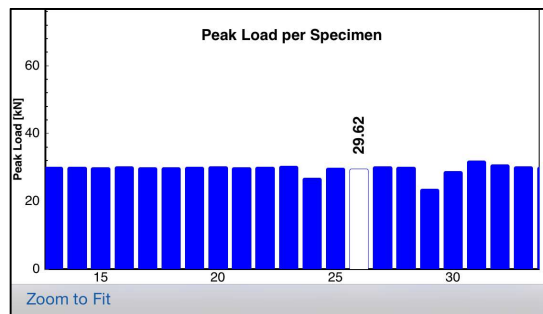


### Specimen Geometries

The GCTS PLT App displays and graphs in real time the current load as well as the load rate and other calculated parameters to aid in the performance of the test as recommended by the applicable test standard. With the optional ultrasonic platens, the compressional (P) wave velocity is also automatically measured and displayed on the mobile device before reaching the failure load. The average P wave velocity is automatically saved along with the average point load index to provide an additional correlation with the sample unconfined compressive strength and modulus.

The application can be set to use custom polynomial equations for the calculation of the unconfined compressive strength as a function of the Point Load Index. During and after testing, the application will automatically calculate and display the average Point Load Strength Index, Peak Load, and Unconfined Compressive Strength for the sample.

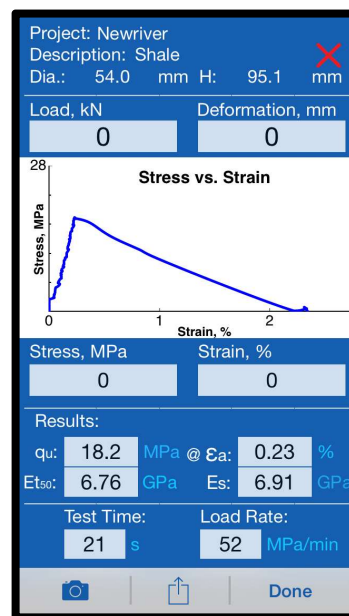
After the specimen fails, all data is recorded, and a new test will automatically begin. If all samples have a dimension that is the same, the application can be set to use that.



### Typical Results Display Point Load Test

Test results are automatically averaged and can be easily retrieved within the same App as each individual specimen or in a combined bar graph. Abnormal results can be directly deleted from this bar graph or from the individual specimen result display. All collected data can be e-mailed directly from the GCTS PLT App to your desktop to be filed, printed or exported to Microsoft™ Word or Excel.

Optional fixtures and application programs are available to perform unconfined compression and indirect tension (Brazilian) tests on rock specimens. These applications also allow for automatic data acquisition and report generation.



### Unconfined Compression Typical Results Display

The Unconfined Compression App measures the rock strength and calculates the tangent modulus at 50% of the peak stress ( $E_{t50}$ ) as well as the secant modulus. In order to obtain the correct strain data, the ULT App automatically corrects the data to account for the frame deformation (virtual infinite stiffness) and will graph the stress-strain curve in real-time. If fitted with the ultrasonic platen, p-wave velocity is also recorded automatically.

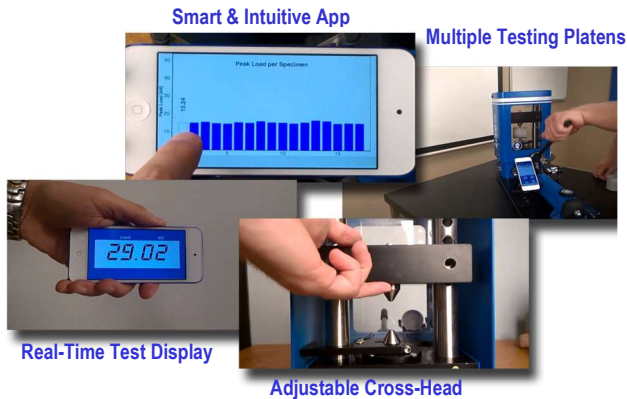
for each test. At the end of the test, the App allows the user to take a picture of the failed specimen which is saved with the test data.

Another option for the GCTS Wireless Point Load Testing System is a set of ultrasonic platens for the measurement of P-wave velocity. This gives a more accurate correlation between the point load index and the unconfined compressive strength.

The standard PLT-2W also includes a Quick-Connect port to use an external pressure source to automatically apply test loads or deformation at constant rates, eliminating the need to manually stroke the system hand pump.

The best quality of the PLT-2W is that it costs the same as previous models but with all the instrumentation and data acquisition options included in the base price. The PLT-2W offers the lowest Life Cycle Cost of any device in the market today.

To see a demonstration **video** of the PLT-2W operation please visit our web page at [www.gcts.com](http://www.gcts.com) and go to the **Rock / Point Load Test** menu.

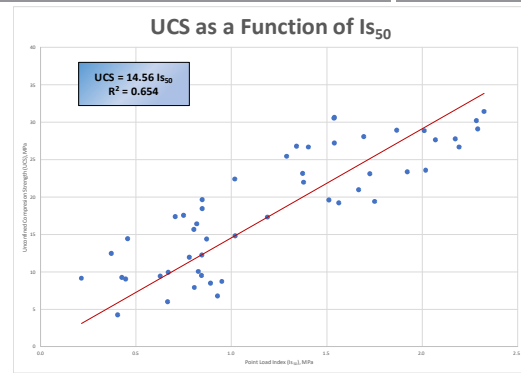


## OPTIONS

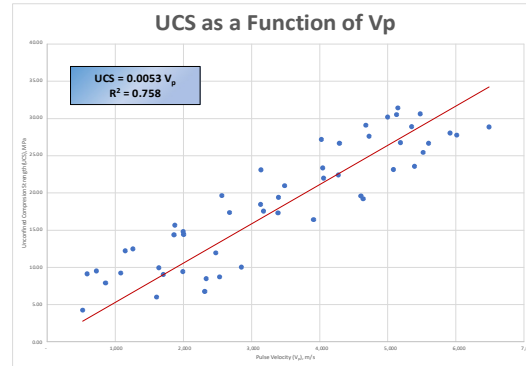
- PLT-2W-CASE Carrying Case
- PLT-UHQ Unconfined Compression Load Platens and Software
- RIT-B-NX Indirect Tension Testing Apparatus for Rocks
- PLT-BRINELL Brinell Hardness Test Platens
- PLT-PUMP Automatic EM Pump

## SPECIFICATIONS

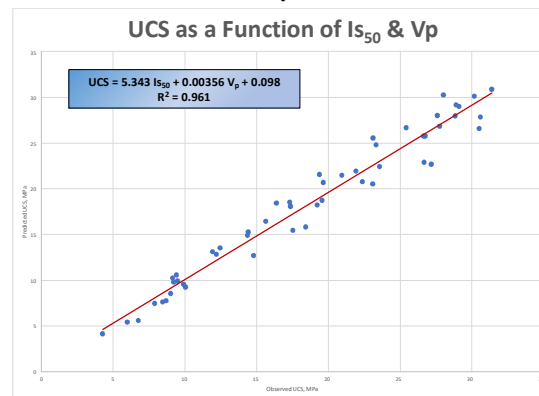
- Max. Daylight Opening
  - Horizontal: 100 mm (4 inch)
  - Vertical: 125 mm (5 inch)
- Load Capacity: 100 kN (22.5 kips)
- Displacement Stroke: 50 mm (2 inch)
- Precision: 0.05%
- Interface: iOS, Android, Windows Mobile
  - Power Internal: 4 AA batteries (40 hours of continuous operation)
  - External: 5 VDC (USB 2.0 Micro-AB connector) @ 500mA
- Dimensions: 48 x 23 x 41 cm (19 x 9 x 16 inch)
- Net Weight: 16 kg (36 lbs.)
- Shipping Weight: 35 kg (76 lbs)
- Operating Temperature: 0 - 54°C (32 - 130°F)
- Warranty: One (1) year parts and labor.



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PLT results with embedded ultrasonic transducers

## RELEVANT STANDARDS

- ASTM D5731 Standard Test Method for Determination of the Point Load Strength Index of Rock
- ASTM D7012 Standard Test Methods for Compressive Strength and Elastic Moduli of Intact Rock
- ASTM D3967 Standard Test Method for Splitting Tensile Strength of Intact Rock Core Specimens
- ASTM E10 Standard Test Method for Brinell Hardness
- ISRM Suggested Method for Determining Point Load Strength
- ISRM Suggested Method for Determination of the UCS of Rock
- ISRM Suggested Method for Determining Indirect Tensile Strength by the Brazil Test



**Unconfined Compression  
Load Platens**



**RIT-B-NX Indirect Tension  
Testing**



**GCTS Point Load Tester:  
PLT-2W**



**Carrying Case**