CTS-02V4

Concrete Test and Surveyor

CONCRETE TESTER AND SURVEYOR

CTS-02V4

- **Measures the Compressive Strength of Concrete with Greater Precision and Speed**
- **Non-Destructive Testing Tool for Concrete Structures**

The CTS-02v4 is a nondestructive concrete tester that estimates the compressive strength and structural integrity of concrete. The compressive strength is estimated by the mechanical impedance based on the waveform of impact force when the concrete is hammered.

Detects:

- Deterioration (Plasticity) of Concrete Surface
- Delamination, Void and Honeycomb Near Concrete Surface
- Weakness of Aggregate on Concrete Surface

Features:

- Estimates Compressive Strength of Concrete (Normal Concrete and High Strength Concrete)
- Easy USB Connection and Data Transfer
- 0.5 Second Results Display
- Mean Score of Results in Multiple Hammering Can Be Obtained at Each Measurement Point

Applications:

- Municipalities and Other Government Organizations that Control and Regulate Concrete Structures
- Civil Engineering and Construction
- Concrete Manufacturers
- Secondary Concrete Product Manufacturers
- Concrete Test and Surveying Companies
- Concrete Maintenance, Repair and Reinforcement Companies

CTS-02v4 vs. Rebound Hammer:

- Higher degree of accuracy
- Automatic correction for measured data outside the mean (+/- 20%)
- No need to polish the testing surface
- No indentation/damage left on concrete surface
- Data and results are saved internally - no mistakes or misreading of data

CTS-02v4 Specifications

Body Size	108 mm X 169 mm X 42 mm (Outshoot is not included)
Hammer Weight	380 grams
Waveform Measurements	Sampling Clock: 0.5 microseconds, Measuring Time: 2 milliseconds
Power Supply	Four Size AA Batteries (12 hours of Continual Usage)
Connection to PC	USB connection. CTS-02V4 works as the USB device.
Measurements Data	Recordable up to approx. 500,000 data
Accessories	Hammer (including Code)/USB Cable/Strap/Dedicated Storage Case/Batteries

NITTO

NITTO CONSTRUCTION CO., LTD.

Concrete Test and Surveyor

Fundamental Principles of Measuring

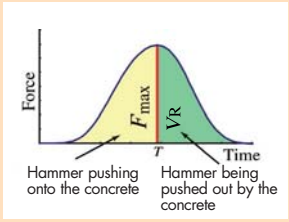
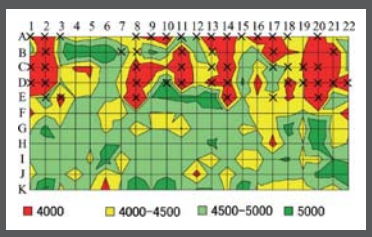


Diagram of impact waveform force

The figure shows the waveform of impact force when the concrete is hammered. The waveform is measured by the built-in sensor in the hammer and can be divided into two sections. The first half of the waveform in the lead up to the peak of impact force shows the condition that the hammer is pushing onto the concrete surface. Under such condition, the first half of the waveform will be progressed plastic deformation followed by elastic deformation on the concrete surface. The latter half of the waveform shows the condition that the elastically deformed concrete surface pushes back the hammer and comes back to the origin. Only the elastic characteristics are reflected in the latter half of the waveform. Focusing on this point, the concrete strength that is not influenced by deterioration of the concrete surface can be measured. Based on the ratio between the first and the latter halves, the degree of the deterioration on the concrete surface can be found. (Patent No. JP 3691477)

Hammering test of the actual concrete structure (X represents the point judged as abnormal)

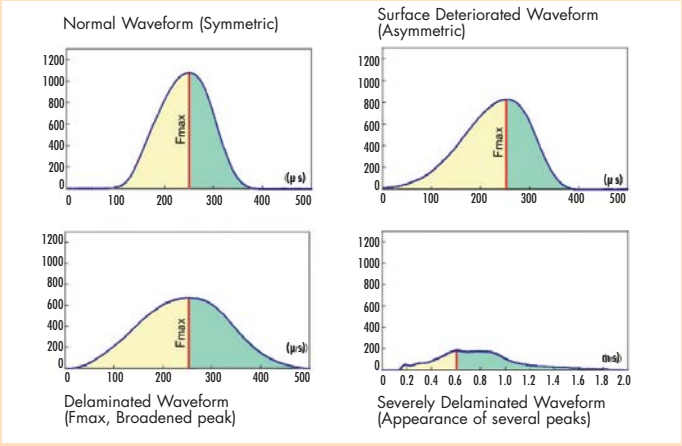


Contour map showing the reactive side of mechanical impedance index value

CTS-02v4 tests and analyzes the entire concrete structure surface

X shown in the photo above represents the point judged as abnormal by the hammering test of the actual concrete structure. The contour map shows the planar distribution for the measurement results of the corrected reactive side of mechanical impedance index value. The estimation with the concrete tester is found to be almost consistent with the result of the hammering test. Once the data is transferred to PC, you can draw the estimated value of strength, degree of deterioration and degree of delamination of the concrete structure. By keeping the distance between the measurements points constant, it is possible to draw the contour map of the concrete structure.

Examples of Measured Waveform



Measuring Method

Simply hammer the concrete surface to test concrete condition. The results will be displayed immediately after hammering. In order to estimate the concrete strength, the mean score and its ±20% range are calculated after hammering at the same measurement position on the concrete.

When hammering beyond twenty points, the new mean score will be calculated and displayed. Any data points outside ±20% range of the mean are automatically invalidated. All measurements are stored in the internal memory.

Examples of Operation Screen

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