# Acoustic Concrete Tester (ACT)

*For reliable determination of concrete thickness*

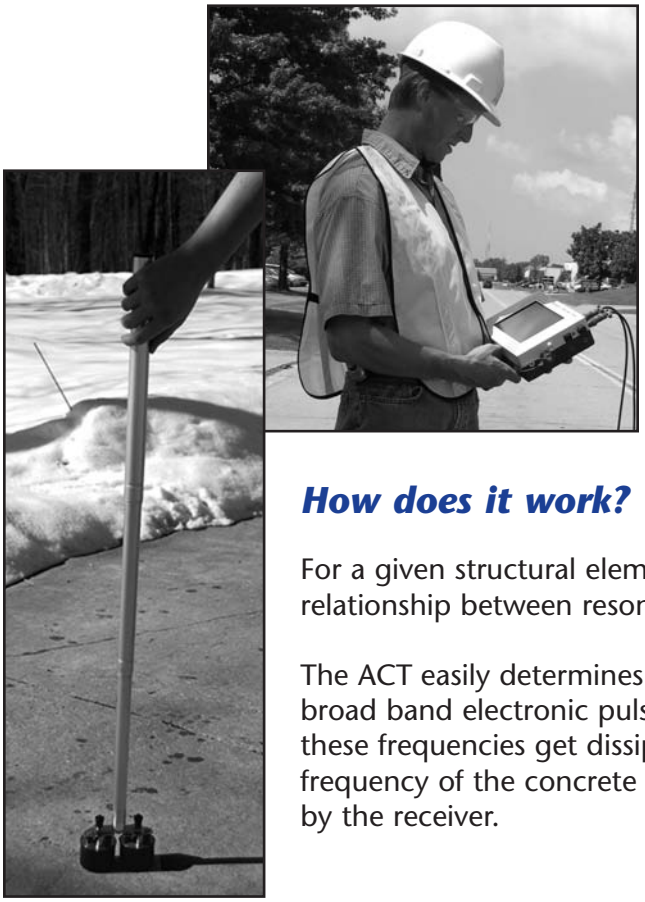
The Acoustic Concrete Tester determines the thickness of structural elements such as concrete pavements, slabs, retaining walls, tunnel liners, foundation footings, and more. In addition, the ACT may identify defects such as delaminations, spalls and horizontal flaws. The ACT tests structures as thin as 75 mm and as thick as 600 mm.

ACT uses sophisticated Ultrasonic Pulse Emission Technology to take the uncertainty out of concrete thickness determination. No need to manually generate an impact. No need to assume a wave speed. No need for coring.

**Testing with the ACT is easy:**

- Place two probes on the structure (directly or using the ACT Telescoping Pole)
- Touch ACT screen to generate signal
- Structure thickness is displayed in real time
- Concrete wavespeed is displayed in real time
- Test data is saved on a memory card for later printing and reporting

The ACT is light, has a high visibility screen and runs an entire day on its rechargeable battery.




## How does it work?

For a given structural element and material there is a one-to-one relationship between resonant frequency and thickness.

The ACT easily determines the resonant frequency. Its transmitter emits a broad band electronic pulse that contains all frequencies of interest. Most of these frequencies get dissipated, but the one matching the resonant frequency of the concrete element remains, is amplified and gets picked up by the receiver.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## Specifications

### Physical

Size: 75x175x235 mm
Weight: 2.2 kg
Display: Large backlit transflective VGA touch screen for any lighting conditions
Operating Temperature: 0 - 50˚ C
Storage Temperature: -20 - 65˚ C
Battery: internal, 8 hours duration, rechargeable with fast charger (3 hours)

### Electronic

Microprocessor PXA 225 XSCALE up to 400 MHz
Data storage on Flash card greater than 128 MB
Sampling digitizing frequency greater than 1 MHz (net frequency after DSP 192 KHz)
Sampling frequency accuracy within 0.01%

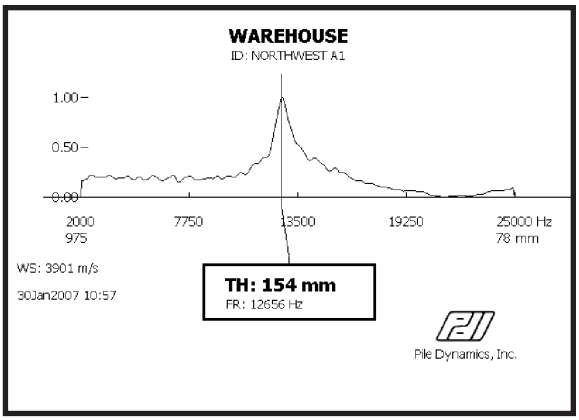
### Functional

Material resonant frequency from real time FFT.
Generates output graphs to illustrate reports.
Screen may be personalized with company logo.
Probes attach to ACT Telescoping Pole for convenient testing.

### Probes

Matched, interchangeable transceivers
Materials: Brass
Dimensions: 60 mm diameter, 45 mm length
Weight: 0.5 kg
Cable Length: 2.4 m
Wide brand transmission
Receiving Frequencies from 2 to 30 KHz

One year warranty




*Output graph showing a measured concrete thickness of 154 mm.*

*Telescoping Pole*

*Probes*

### The ACT Ultrasonic Technology

The ACT transmitter administers a broadband wave field to the concrete surface. The wave field, unlike the mechanical impact used in the impact Echo Method, is independent of the surface condition and includes all frequencies required to obtain a test result. This versatility makes it possible to use the same set of sensors to test structures with wide range of material properties and thickness.

The wave field generated by the ACT transmitter propagates through the concrete, setting up cyclical reflections in the structure. The ACT then processes the wave field using a high sampling rate, and converts it into the frequency domain using real time Fast Fourier Transform (FFT). This process identifies the resonant frequency corresponding to a period T of twice the travel time along the shortest path within the structure, or twice its thickness. The ACT displays the calculated thickness.

Discontinuities in the structure, like spalls, delaminations, or horizontal flaws are detected when the ACT identifies additional dominant frequencies.

The ACT actually measures the concrete wave speed of the structure. This eliminates the need to assume a wave speed or to core the structure to back calculate a wave speed. Avoiding wave speed assumptions makes ACT results exceptionally reliable, while avoiding coring makes its use feasible in a vast array of applications.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