

Impact Echo Scanner » ASTM C1383-04 (Patented Technology by Olson)

Impact Echo Scanner (IES) investigations are performed on large structural members with smooth concrete such as slabs, walls, bridge decks, beams, pipes, etc. where shallow voids, honeycomb, cracking or delaminations are of primary concern.



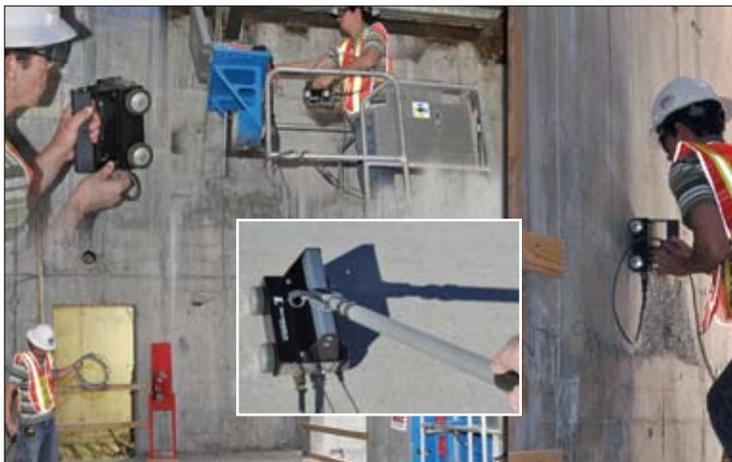
The **Impact Echo Scanning (IES)** system is designed for large area investigations of shallow voids, debonding/delamination, cracking or honeycomb often found between an overlay on a bridge deck or surrounding dense rebar mats. IES is commonly used in locating post-tensioning (PT) cables used in reinforcing various structures and determining duct grout condition. The scanning technology allows tracing of the PT cables through slabs and beams. An advantage of the IES method is that only one side of the structure needs to be accessible for testing.

The IES Method is based on the Olson Engineering patented technology of a rolling transducer and automated impactor for near-continuous Impact Echo based thickness and flaw scanning of structural concrete and pavements. Performed at slow walking speeds, test results are obtained every inch (25 mm) in a line and multiple lines can be combined for 2-D to 3-D displays of concrete thickness and locations of internal void, honeycomb, cracking, delamination, etc. The scanning method is capable of determining bottom echo thicknesses up to ~ 40 inches (1 m).

Features:

- Thickness accuracy ± 2% at high resolution when calibrated on a known thickness
- Thousands of tests can be performed per hour when “imaging” of internal concrete conditions is required
- System is compact, durable, and easily transported allowing for multiple tests per day
- Real-time waveform display while testing
- Software allows for more sophisticated processing
- English or Metric units can be used
- No coupling agents required for use of test head on concrete
- Works on cured, hardened concrete in air or on grade
- Works through paint and most types of bonded tile—checks tile bonding too
- Easy velocity calibration at known thickness
- Thickness maps are easily constructed from data

» Applicable On:	
Beams	
Bridge Decks	
Columns	
Dams	
Pavements	
Pipes	
Post-Tensioned Ducts	
Runways	
Slabs	
Tunnels	
Walls	
» Test For:	
Cracks	
Honeycomb	
Voids	
Delaminations	
Thickness	



Model	Advantages
IES Model	Allows for rapid Impact Echo testing of large areas
IES-M Model	Add a built-in microphone to collect acoustic information for shallow delamination detection, while collecting IES data

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Method

In IES investigations, an impactor is used to generate compressional waves that reflect back from the bottom of the tested member or from a discontinuity as sensed by a rolling displacement transducer. The response of the system is then measured by the receiver placed next to the impact point. Only one relatively smooth and clean surface needs to be accessible for rolling receiver coupling and solenoid impacting. Water can be applied to the surface to improve coupling of the receiver.

Data Collection

The user-friendly IES software is written and tested at Olson Instruments' corporate office in Colorado. We do not outsource any tech support questions and, should you require software support, we welcome your questions and comments.

Available Models

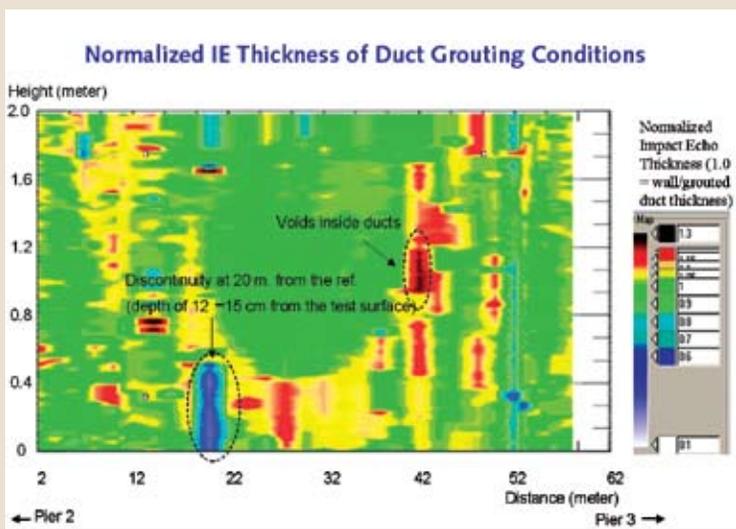
The Impact Echo Scanning system is available in two different models which can be run from Olson's Freedom Data PC or NDE 360 Platforms:

1. Impact Echo Scanner (IES)
2. Impact Echo Scanner with Microphone (IES-M)

The **IES Model** is the base model and can be operated from either the Freedom Data PC or the NDE 360. There are minor differences between operating this system with the Freedom Data PC vs. the NDE 360. The Freedom Data PC provides faster and more extensive processing capability and additional data storage space. The field-friendly NDE 360 is compact and lightweight. The IES data can be downloaded from the NDE 360 to a PC, allowing for the same post processing available with the Freedom Data PC.

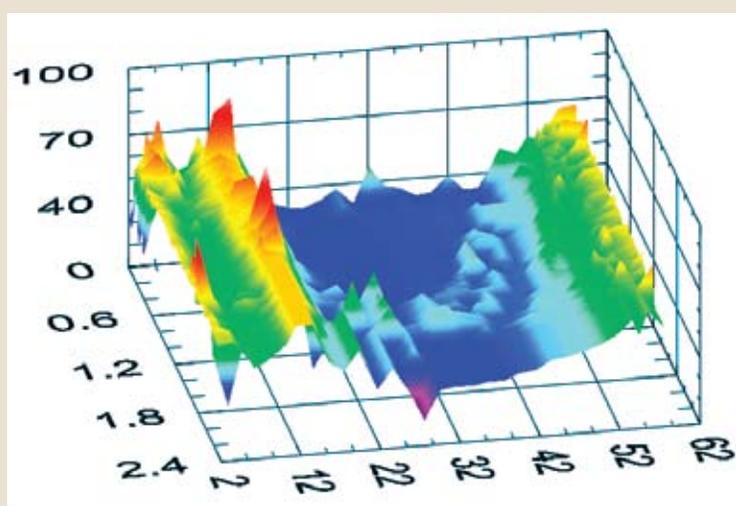
The **IES-M Model** includes a built-in microphone for situations where the user wishes to collect acoustic data simultaneously with IES data to detect deck delaminations. This system is an add-on test method for the Freedom Data PC platform only, purchased separately.

Data Example » 1

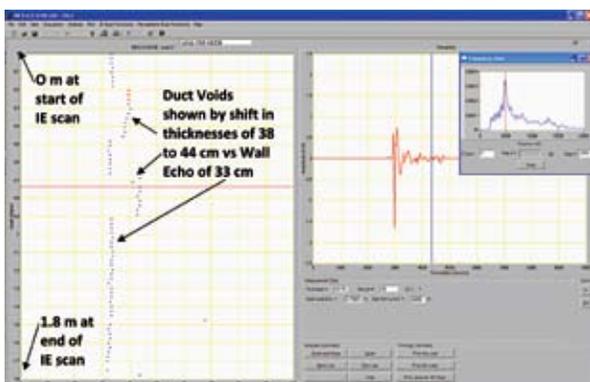


The results from IES tests using the portable rolling IE Scanner system are imaged in the above Tomogram. In the IES testing, the clearest indication of the presence of grouting defects is the apparent increase in the thickness due to a reduction in the IES resonant frequency as a result of the decrease in stiffness associated with a defect.

Data Example » 2



3-D IE Scan Display showing thickened end and possible thicker voided duct areas for 2 m tall wall over 62 m length with vertical thickness scale of 100 cm (1 m).



Sold only to US Government Agencies and Universities, as well as approved International sales. For consulting services, call 303.423.1212 for details.



Freedom Data PC or NDE 360 Required, Sold Separately




IES-M Model:
Freedom Data PC
Platform Only