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# Concrete Integrity Testing with Impact Echo

## What is Impact Echo?

Detailed concrete inspection is vital to evaluate the integrity and the performance of any type of infrastructure. Impact Echo plays an important role in assessing the condition of concrete structural plates, such as slabs, walls, tunnel linings, decks and concrete pavements.

This method consists of generating a stress sound wave with a hammer or impactor on the concrete surface. This wave propagates through the concrete element and is reflected by internal air voids and external surfaces. A proper transducer records the reflected wave and the signal is analyzed in the time domain and in the frequency domain. On top of that, this technique is widely accepted as it is standardized in many of the world markets.

## Applications of Impact Echo

By analyzing this signal, we are able to detect the thickness of a concrete element. This is very useful for any kind of element that is accessible from only one side.

On the other hand, another powerful output is the ability to identify the presence of any subsurface defects or embedded objects and their location. Some types of internal defects that can be detected are honeycombs, delaminations, flaws, debondings and voids.

## Real case concrete inspection example

Retrofitting existing old buildings is always a challenging project. Accurate and reliable data is usually not available, as these buildings can be over 50 years old and as-built drawings were never developed or have been lost to time. An important task for the elaboration of the renovation project is the determination of the real thickness of the foundation slab and the retaining walls of the basement.

[Impact Echo](#) is a key non-destructive thickness assessment technique, and a very powerful tool for estimating the integrity of concrete in buildings.

In this video you can see how easy and quick is to perform a concrete integrity test on a parking lot slab on grade with our [Pundit PI8000](#) using the impact echo technique.

To improve data acquisition, PI8000 comes with a grid scan mode for onsite use over larger areas, but also with a spot scan mode to check specific locations in more detail.



Impact Echo grid mode on the PI8000 app

Learn more about concrete inspection with impact echo in our [Tech Hub](#).



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