



# Thermal Integrity Profiler (TIP)

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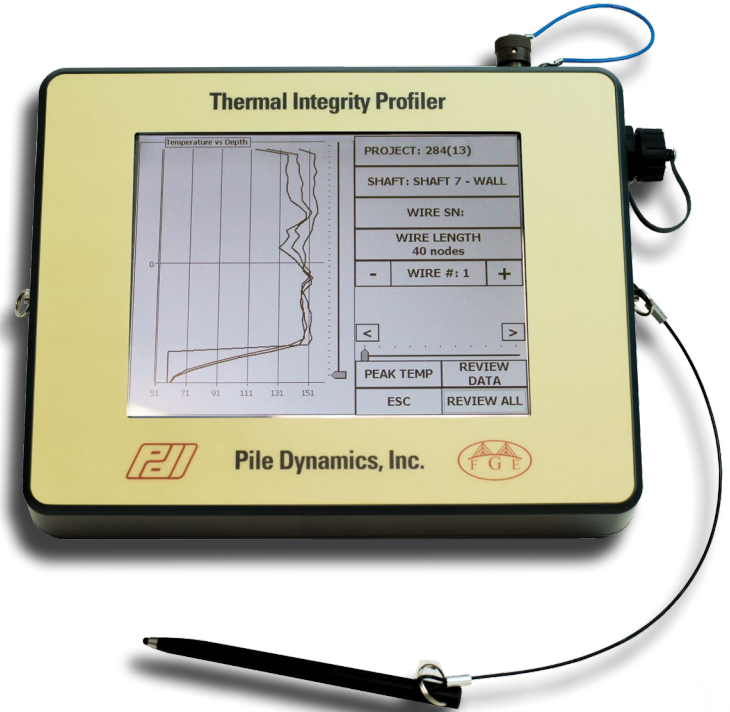
Next generation quality assurance to assess the quality of cast in place concrete foundations

### Innovative. Economical. Immediate.

The Thermal Integrity Profiler (TIP) uses heat generated by curing cement to assess the quality of cast in place concrete foundations such as drilled shafts, bored, augered cast-in-place (ACIP), continuous flight auger (CFA) and drilled displacement piles. The Thermal Integrity Profiler evaluates the concrete quality of the entire cross-section, including outside the reinforcing cage along the entire length, without maximum length limitations. TIP tests are typically completed within 48 hours of shaft casting- earlier than any other integrity evaluation of cast-in-place concrete foundations, and meets or exceeds the requirements of ASTM D7949- Standard Test Methods.

#### TIP Measurements:

- Estimate the shape of the shaft
- Determine the concrete cover
- Provide earliest shaft evaluation
- Save construction time with early evaluation
- Locate areas of concern
- Evaluate the degree of eccentricity of the reinforcing cage



The expected temperature at any location is dependent on the shaft diameter, mix design, time of measurement and distance to the center of the shaft.

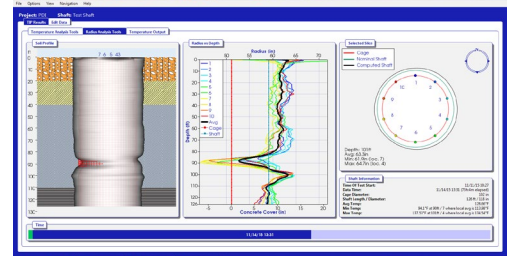
#### TIP results may include:

- Regions that are colder than normal indicating necks or inclusions, or poor concrete quality
- Regions that are warmer than normal indicating bulges



## TIP Technology Rewarded for Innovation

- 2012 MAGNET/ NASA Manufacturing Innovation Project Award
- 2013 NOVA Award from the Construction Forum
- 2013 Deep Foundations Institute C. William Bermingham Award for Innovation
- 2015 American Society of Civil Engineers Charles Pankow Award for Innovation



## Innovative Data Collection

TIP data is collected by the Thermal Wire® cables system which includes cables fitted with digital thermal sensors spaced along the cable length and Thermal Acquisition Ports (TAP). The Thermal Wire cables are attached to the reinforcing cage prior to concreting. In general, one cable is installed per each 305 mm (one foot) of shaft diameter. A TAP is connected to each Thermal Wire cable, and automatically samples data from that cable at user selected time intervals, typically every 15 minutes. Temperatures obtained throughout the concrete curing process are saved in each TAP, and may be viewed at any time after data collection begins. The temperature versus time history prior to the peak temperature is inspected to confirm uniform quality or spot potential anomalies.

A single Thermal Wire cable may be attached to a center rebar for small diameter augered cast-in-place or continuous flight auger piles.



## TIP Reporter Software

The TIP Reporter Software displays measured temperatures versus depth, and is mapped on cross sections of the shaft. This helps identify areas of concern such as potential over-pour bulges, necking, or cage alignment irregularities.

TIP Reporter also estimates the concrete cover along the entire length of the shaft. The temperature to radius conversion requires that the total shaft volume be input in the TIP Reporter software. Once the volume has been entered, the estimated effective shaft radius, reinforcement cage location and the concrete cover of the reinforcing cage can then be determined.

Pile Dynamics, Inc. (PDI) is the world leader in developing, manufacturing and supplying state of the art QA/QC products and systems for the deep foundations industry. The company is headquartered in Cleveland, Ohio, USA, with offices and representatives worldwide. For additional information visit us at [www.pile.com](http://www.pile.com) or contact [info@pile.com](mailto:info@pile.com) today.

- Evaluates concrete quality inside and outside of the reinforcing cage
- Accelerates construction with tests conducted during concrete curing
- Reveals necking or inclusions, bulges, variations in concrete cover, shape of shaft and cage alignment
- Thermal Wire® Cables can replace access tubes required for other testing methods