p-CAT™

Pipeline Condition Assessment Technology

The low-cost solution for **non-invasive and non-destructive** pressure pipeline condition assessment

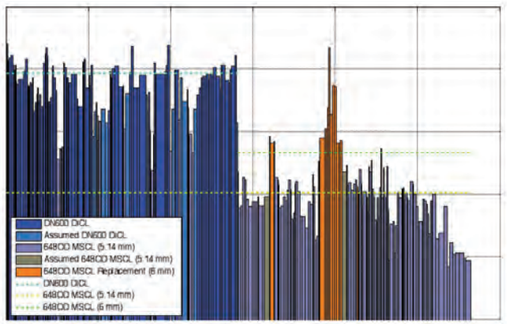
p-CAT™

pipeline condition assessment

HYDROMAX USA DELIVERS A LOW-COST SOLUTION FOR NON-INVASIVE, NON-DESTRUCTIVE PIPELINE CONDITION ASSESSMENT.

What is p-CAT?

- **p-CAT** is a non-invasive, non-destructive, reliable and safe method of performing pipe condition assessment while a system is in operation.
- It is often described as a pipe screening tool as long sections (many miles) can be quickly tested to identify small localized "hot spots" out of thousands of feet of pipe.
- The technology uses a unique patented and proven technique of inverse transient analysis to measure and determine the internal and external condition of pipelines.
- **p-CAT** can be applied to all metallic pipes, concrete and AC (asbestos cement). It has been developed through over 17 years of research and development by the University of Adelaide, Australia.



COST-EFFECTIVE FOR LARGE- AND SMALL-SCALE PIPELINE CONDITION ASSESSMENT

p-CAT is able to locate defects in your pipeline, limiting the repairs and replacements to only sections in need of attention, extending the life of your assets and deferring replacement.

NON-INVASIVE AND NON-DESTRUCTIVE TECHNOLOGY

p-CAT is suitable for all water and wastewater pressurized pipelines. During the process, it causes no disruption to the pipeline or operation as there is no invasive access to the main.

AVERAGE CONDITION VS. SUB-SECTIONAL CONDITION

Average wall thickness measured is simply the average wall condition between two test points.

Sub-sectional wall thickness is determined by separating the pipe section between two test points into sections down to 30 ft.

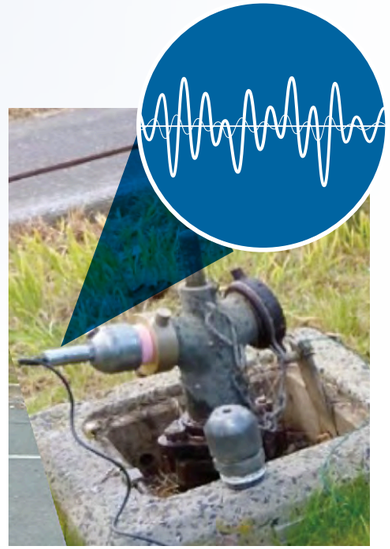
This more detailed analysis provided by p-CAT empowers engineers and owners to prioritize their rehabilitation/replacement budget.

p-CAT is suitable for all metallic, non-reinforced concrete and AC pipes.

HOW DOES p-CAT WORK?

A controlled pressure wave is injected into the pipeline and monitored by sensors installed on existing pipe fittings. The transient wave experiences partial reflection when it encounters any change in pipeline structure. These changes include known system components and other concerning issues related to pipe deterioration.

The pressure signal is analyzed by examining the response of the transient wave to the pipeline system to determine all anomalies.



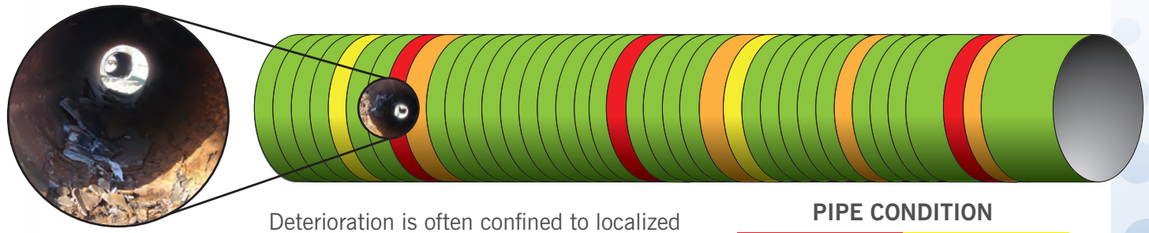
p-CAT analysis uses two main techniques:

- **Sub-Sectional Pipeline Condition Assessment**
  Assessing the level of pipe deterioration in a sub-section with resolutions down to 30 feet.
- **Localized Fault Detection**
  Identifies and provides analysis of significant anomalies such as gas pockets, blockages, the sealing status of valves and unknown pipeline features.

WHAT DOES p-CAT DETECT, MEASURE AND LOCATE?

- Internal cement lining loss (spalling)
- Wall loss measurement to < .01 in. wall accuracy
- Pipe material changes
- Cement matrix loss from AC pipes
- Internal blockages and restrictions
- Gas pockets
- Assessment of closed or partially closed valves
- Unknown connections

Pipe corrosion does not occur uniformly across a network. By locating the exact points at which the deterioration occurs, replacement and rehabilitation of pipelines can be limited to only those sections in need of attention.



Deterioration is often confined to localized sections that can total less than 2% of the entire pipeline.

PIPE CONDITION

High Priority	Low Priority
Medium Prioirty	No Action Req.

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