

First Look

by Jeff Griffin ■ Senior Editor

Laser Profiler Provides Detailed Pipe Specs

A new laser profiling technology that adds new dimensions to conventional pipe inspection methods is now available in the United States.

The CoolVision laser profiler measures the interior ovality of any type of pipe to assist in accurately verifying the overall condition of an existing pipeline or to confirm that installation of new pipe meets ovality specifications, said Jerry Botts, managing partner of Botts Consulting Group, LLC, exclusive representative for marketing CoolVision in the United States and portions of Europe.

"The CoolVision laser profiler uses a fixed optical triangulation system that includes a dedicated CCTV [closed-circuit television] camera mechanically linked to a fixed position relative to the laser light providing continuous, highly-accurate data not subject to parallax," Botts said.

The laser profiler is not intended to replace conventional CCTV inspections, said Botts, but to complement them by gathering data about pipe ovality, slopes and other information that are beyond the capabilities of standard CCTV methods.

CoolVision equipment currently available can be used in pipe with inside diameters from 8 through 36 inches with plans to add systems for larger sizes of pipe.

How it works

The CoolVision profiler is mounted on four stainless-steel wheels and can either be pulled behind a conventional pan-and-tilt CCTV camera to take profile and video surveys simultaneously or pulled through pipe independent of the camera system. With two distance encoders and a sophisticated telemetry system, it is not necessary for the CoolVision unit to be centered in the pipe. Survey data is transmitted to a survey ground station by coaxial cable.

"Recording and storing 2,000 measurement points per laser profile at speeds of 30 frames per second, CoolVision can create a complete three-dimensional profile of a pipeline and measurement observations with a .25 percent degree of precision and is 99.9 percent repeatable," Botts continued. "The capability of creating a more accurate and continuous record of a pipeline interior gives CoolVision the edge over every other laser technology."

A key to the effectiveness of the system is the CoolVision 3D Viewer software which combines video and laser information to create a three-dimensional profile of inspected pipelines.

Botts points out that quality of reports developed from information gathered by other laser profilers are dependent on the accuracy and repeatability of the equipment and that knowledge of the analyst is a primary influence on conclusions reached from evaluation of CCTV inspection data.

"The software used by CoolVision precisely calculates information gathered," Botts emphasized. Data collected is transmitted via the internet to CoolVision where they are processed and reports are returned to clients within 48 hours of receipt of data. The reports have a high-degree of accuracy and are not evaluations and interpretations."

Botts summarizes the benefits of the laser profiler into two primary areas:

New Construction – Because ovality plays such an important role in the design life and capacity of a pipe, testing is very important. A CoolVision laser profiler can be passed through the pipeline to test the ovality to make sure the newly placed pipe

can meet the design criteria. Mandrel testing – the familiar "go, no-go" test has limitations and often results in construction delays. By using the CoolVision laser profiler instead, reports are available in interactive DVD or written formats to document locations of any deficiencies.

And unlike mandrel testing, which has been based on nominal pipe dimensions, CoolVision data are based on measurements of actual dimensions.

Rehabilitation – Testing of ovality in an existing pipeline is especially important when designing rehabilitation projects. For example, lining designs take into consideration the ovality to ensure the proper thickness will meet the actual field design requirements.

Utilizing the CoolVision laser profiler prior to rehabilitation can establish a baseline to compare with tests made after lining is complete in order to confirm the thickness of the repair. Following a pipebursting installation, a laser profiler can be passed through the pipeline to test ovality and determine whether the newly-placed pipe meets design criteria.

In addition to CoolVision, the Botts Consulting Group markets MilliM add-on hardware that fits most CCTV inspection cameras and enables accurate measurements of defects, joint tolerances or gaps, and cracks with precision accuracy to .10 mm.

CoolVision was developed by Colmatec Inc., Lavel, Quebec, and the technology has been successfully used in that Canadian province for four years.

Botts Consulting Group, Altamonte Springs, FL, is the exclusive CoolVision consultant in the United States. CoolVision laser profilers are manufactured and distributed in the U.S. by Aries Industries, Waukesha, WI, and RS Technical, Petaluma, CA.

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