



# Trenchless Technology Center *Newsletter*

M A R C H 2 0 1 4

## RESEARCH HIGHLIGHT: TTC Is Expanding Its Pressure Testing Capabilities

Pressure pipe applications in the municipal, industrial and energy sectors represent one of the largest areas of future growth for the trenchless industry. Companies are developing new enabling technologies and products, which provide cost-effective solutions to extending the service life of millions of miles of ferrous and non-ferrous pipes that transport liquids and gases under pressures, ranging from 40 to 80 psi for wastewater force mains to several hundreds of psi for transmission pipes used in the energy sector. They serve the testing needs associated with the development of these new products. The Trenchless Technology Center has been expanding its static and cyclic pressure testing capabilities, adding new test bays, test apparatuses and instrumentations. At the present time, the TTC is capable of undertaking short-term static pressure tests up to 2,000 psi, with the goal of upgrading the facilities to handle 5,000 psi burst tests by the end of the summer. In terms of cyclic testing, the TTC is now equipped to conduct ASTM D2992-12 (Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for Fiberglass Pipe and Fittings), which calls for applying 15 million pressure cycles at a rate of 25 cycles per minute (Procedure 'A'). Several customized pressure testing rigs aimed performing non-standardize tests to examine the liner-host pipe interaction at locations of holidays/ring breaks were also developed. These pressure testing capabilities augment the extensive suite of standardized and custom tests performed at the TTC's laboratories on a regular basis by our well-trained technical staff. A partial list of test protocols performed by the TTC is given in Table 1.



Figure 1. Experimental setup of a long-term static pressure test



Figure 2. Long-term cyclic pressure

Thermoplastics /Thermosetting Materials		Cementitious Materials	
Flexural Properties	ASTM D 638	Compressive Strength	ASTM C 109
Tensile Properties	ASTM D 790	Flexural Strength	ASTM C 348
Tensile / Flexural Creep	ASTM D 2990	Static Modulus of Elasticity	ASTM C 469
Hardness	ASTM D 2240	Bond Strength of Epoxy Systems	ASTM C 882
Glass Transition by DSC	ASTM E 1356	Setting Time of Cement Mortar	ASTM C 807
Buckling Resistance	ASTM F 1216	Sulfate Expansion	ASTM C 1012
Density and Specific Gravity	ASTM D 792	Drying Shrinkage	ASTM C157
Parallel Plates	ASTM D 2412	Chemical-Resistant	ASTM C 307
Chemical Resistance	ASTM D 543 /	Water Absorption of Mortars	ASTM C 1403
Pickle Jar Test / ASTM D 1538 / ASTM F 1216		Rapid Freezing and Thawing	ASTM C 666

Table 1. Partial List of Standard Tests Performed at the TTC Laboratories



## Municipal Forum Updates

The TTC will begin its Spring Municipal Forum series on March 14 in Long Beach, Calif. The next forums will take place in Bloomington, Minn., on March 20; Boston, on March 26; Columbus, Ohio on May 6; and Shreveport, La., on May 15. Registration is available under "Municipal Forums" on our website at [ttc.latech.edu](http://ttc.latech.edu).

The Municipal Users' Forum for Trenchless Technology provides municipalities with high-caliber technical seminars focusing on local trenchless technology issues to help solve regional water and sewer problems. The TTC works with a local municipal representative along with national and international industry

experts to organize a one-day workshop in numerous locations across North America to review and discuss specific trenchless technologies that are of regional interest. The industry experts address each topic through a vetted presentation that addresses the technology in a non-product specific presentation. The forums are non-profit and participant fees are targeted to keep municipality costs reasonable and help offset most of the direct forum expenses.

Municipalities and industry experts interested in hosting or participating in a forum can learn more about the program by visiting our website at [ttc.latech.edu](http://ttc.latech.edu) or by contacting Teresa Fletcher [fletcher@latech.edu](mailto:fletcher@latech.edu) or Dr. Robert McKim [mckim@latech.edu](mailto:mckim@latech.edu).

## Industry Advisory Board

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## Student Chapter Activities

The Louisiana Tech University NASTT/AGC Student Chapter recently sent a group of 15 students to the 2014 UCT Conference. The students spent four days attending demonstrations, technical presentations, conversing with colleagues and browsing the exhibit hall, eager to absorb as much as they could while there. They also contributed to the event by aiding the conference staff during the technical presentations.

In the exhibit hall, students helped represent the Trenchless Technology Center (TTC) booth. They rotated in teams of three to four members, discussing TTC research and interacting with visitors. They also attended some of the technical demonstrations presented by companies such as Perma-Liner and LMK Technologies.

Researchers Fernando Puno and Sean Foster attended the conference to demonstrate and discuss the TTC's technological developments. Corey Hardaway, TTC Staff, and Ashikul Islam, Research Associate, were also in attendance to manage the booth and students and answer questions about the TTC. Professor Rob McKim and Director Erez Allouche offered insights into the TTC's research: past, present, and future.

During the conference, the TTC hosted a lunch for its Industry Advisory Board members. Dr. Erez Allouche provided an informative update of the TTC's current and future research, projects and activities.



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### Trenchless Technology Center

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