



Keyhole Technology  
Collaboration

## Keyhole Technology



# Keyhole Technology Newsletter

September 2004

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A newsletter for Keyhole Technology Research Collaboration Project participants and manufacturers

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## Utilicor *Minicor*™

This article was submitted by Utilicor.

Equally at home on the road as its truck-mounted, big brother, and employing the same robust, hydraulic coring equipment, the 48" wide *Minicor*™ skid steer mountable rotary cutting unit from Utilicor Technologies can also be effectively used on sidewalks or in other confined spaces where larger truck-mounted machines won't fit.

Weighing 700 lbs. (1500 lbs. fully loaded with water) and equipped with a universal quick attach coupler system, the *Minicor*™ is designed to fit most Bobcat, Caterpillar, Case, New Holland, John Deere, Gehl, Kubota, Mustang, Daewoo, JCB models and other loaders or skid steers with a Rated Operating Capacity of 1400 lbs. or more and a hydraulic flow rate of at least 8 GPM.

The quick-connect hydraulic hose and electrical hookup will let you "plug and play" and be ready to core in minutes. The large 100-gallon tank will allow you to core a day's work on a single tank of water. Simple orbital flow regulated coring controls with back pressure and down pressure gauges make for easy and accurate coring operations and its robust, heavy-duty, welded steel construction will ensure many years of dependable use.

The Utilicor Minicor (top right, middle right) features a removable door which reduces slurry and splash.

The Utilicor portable core lift device (bottom right) weighs 60 pounds, and can lift a core up to 400 pounds. It utilizes a worm drive style winch and folds to a compact size for storage and transport.



Highlights from our next issue include:

### Keyhole workshops

TXU

Alagasco

Questar

### Cold weather grout

### Grounding of keyhole tools

### Timberline squeeze-off tool

## Southwest Gas Keyhole Demo

Southwest Gas conducted a keyhole demonstration on Thursday, February 12, 2004 on Washington Street in Phoenix, Arizona. The City of Phoenix and surrounding jurisdictions were invited to attend the demonstration and evaluate the processes performed, in the hopes of gaining greater acceptance for keyhole work in the Phoenix area.

The keyhole work at the demonstration began with coring a 12-inch diameter section of the pavement, vacuum excavation, and then sampling of the coating from the pipe excavated through the

keyhole. Utilicor performed the coring and a Pacific-Tek vacuum truck was used to excavate down to the pipe. A long-armed tool was used to sample the pipe coating. A Trenton coating was then applied over the scraped pipe using new keyhole tooling and patches developed by Trenton Corporation. MBW representatives performed the soil compaction using the Soil Compaction Supervisor. The core was finally replaced by Utilicor.

Above left: Utilicor coring unit

Above right: Core extracted from ground

Right: Core replaced in street



## MBW Soil Compaction Supervisor

This article was submitted by MBW.

*On February 12, 2004 Southwest Gas sponsored a keyhole demonstration for the City of Phoenix, AZ, and surrounding cities. Tri-Pacific Inc. was invited to participate in the reinstatement process to demonstrate the MBW Soil Compaction Supervisor (SCS) to monitor soil compaction levels throughout the process.*

After removing the 12" asphalt core, excavation was completed to depth of about five feet, exposing the gas main where a patch was installed by the gas company contractor. The gas main was then bedded in sand and the sensor connected to the Soil Compaction Supervisor (SCS) was placed on the bedding sand. The first lift of back fill was placed. Backfill for this keyhole was native clay material with a moisture content of 12%. Since a pneumatic tamper was to be used for soil compaction, it was suggested that the depth compacted be limited to a maximum of 8" per lift.

The Compaction Supervisor was started as the compaction process began and monitored the compaction of the first through final lift, alerting personnel when each lift was properly compacted.

Data was stored in the SCS to indicate:

- Date of compaction
- Start time of lift
- Duration of compaction process on each lift
- Type of compaction equipment used on each lift (percussion or vibratory)
- Pass/fail status of each lift

All lifts on this excavation were completed normally and showed a "pass" on the SCS. This information was then downloaded to a computer for storage and/or printing. To verify the results of the SCS, the City of Phoenix had their soil engineer per-

form a sand cone density analysis on the final lift. After careful testing and cross checking to verify their data they announced that the density achieved was 98.7%.

Both Southwest Gas and local city officials were very pleased with the results of the testing and the keyhole demonstration and city officials see many applications for their own uses as well as that of Southwest Gas.



MBW's Soil Compaction Supervisor

## Perfection Offers Keyhole Solutions

Perfection Corporation now offers solutions for utilities that are utilizing keyhole technology. This process involves ground level gas service line maintenance and installation through small diameter openings (usually 18" or less) known as keyholes, saving both time and money by improving efficiencies versus current industry practices.

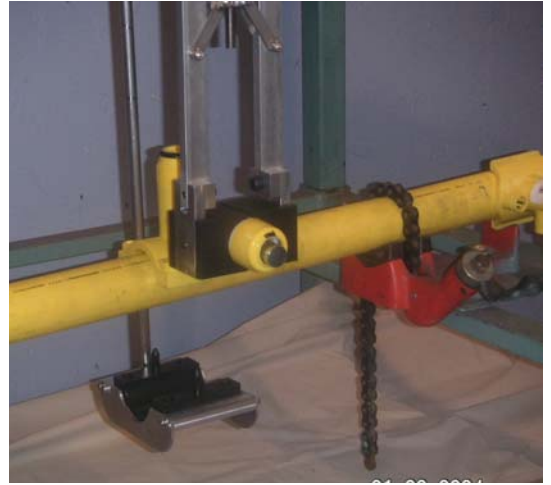
In 1976, Perfection introduced the Permasert mechanical coupling. The Permalock Mechanical Tapping Tee (PMTT) followed in 1987 as a joint development effort between Perfection and Niagara Mohawk, Syracuse, NY. Perfection now offers a complete line of main to meter fittings for natural gas, propane and potable water distribution systems.

Perfection's PMTT and Permasert mechanical fittings, along with specialized tooling from Omega/SerVac allows utilities to realize the benefits of keyhole technology. According to the manufacturer, excavation time and surface preparation is reduced

and cool down time is eliminated. Additionally, keyhole installations with Perfection products dramatically reduce labor and restoration costs. The low profile PMTT can be installed in as little as ten minutes using Omega's keyhole tooling.

The PMTT is available in main sizes ranging from 1 1/4" IPS through 8" IPS and outlet sizes ranging from 1/2" CTS through 2" IPS. The PMTT is a full encirclement tapping tee that features a patented ratchet-style cutter assembly. Additionally, the cutter's locking sleeve is designed for minimal protrusion onto the main, to allow for pigging of the line.

For further information on Perfection's PMTT, Permasert or their full array of natural gas, propane, or potable water products please visit the Perfection website at [www.perfectioncorp.com](http://www.perfectioncorp.com) or call customer service at 800-544-6344.



Above: Perfection tees and installation tools.

## Installation of Electrofusion Tees Through a Keyhole

UGI, located in Pennsylvania, has begun to install electrofusion tees through keyholes. Omega Tools, also located in Pennsylvania, has developed and provided the tools needed for the installations. Great Western, an Omega Tools licensed contractor, has been performing the installations.

On a recent job in Lancaster, Pennsylvania, a main renewal took place and 13 electrofusion services were installed. The installations took place at North Walnut and Bridge Street in Lan-

caster.

355 feet of a new 2-inch IPS PE main was inserted into a 3-inch steel main. Next, thirteen 1/2-inch services were installed. This was accomplished by first cutting windows into the 3-inch steel main where the tees were to be installed. Next the new PE main was scraped and prepared for electrofusion. Then, each of the thirteen new service tees was inserted into position on the main and electrofused into place; saving time, pavement restoration and money.



Electrofusion of service tee onto main.

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### *Contact List Updates*

The new contact person for the Keyhole RC Project at Nicor Gas is:

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***If someone in your organization would like to obtain a copy of the keyhole newsletter, please contact Jim Otzko at 847-768-0523 or send an email to james.otzko@gastechnology.org***

***Have a question? Register for the Q&A Board on the Keyhole website!***

**Q&A:** Please register for the new **Question and Answer Board** on the keyhole website at [www.gtiservices.org](http://www.gtiservices.org). Participants can post questions on keyhole related issues and read about issues other utilities face.

## Mechanical In-Line Stopper

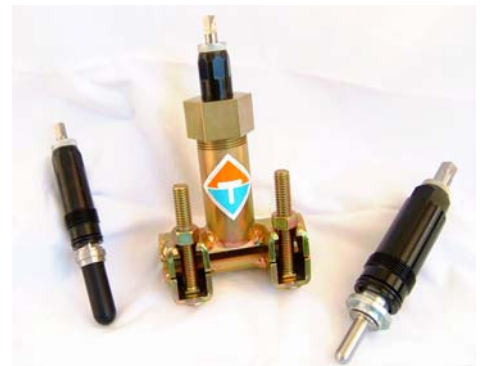
Advanced Valve Technologies (AVT) is currently in the testing stages of their new Curb-Stop (patent pending) mechanical in-line stopper to be installed through keyholes on steel services. The Curb-Stop consists of a rubber stopper and a mechanical fitting. The stopper can be installed through a keyhole and then turned down into the tee to stop the flow of gas.

The keyhole Curb-Stop will have the capability to be installed on both new and existing steel services, from 3/4 -inches to 2-inches in diameter. It can be installed in the "open" position and later used as a credit shut-off device or a line-stop fitting for the temporary stopping of gas flow in services. It is for use on systems up to 60 pounds (use on higher pressure is being investigated).

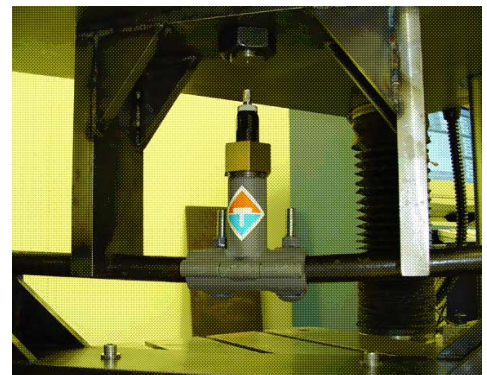
Because of its location on the service and the shape of its stem, the AVT curb-stop is more tamper-resistant than traditional curb valves.

It could be installed during the winter and not utilized until service is allowed to be turned off (due to the requirement not to shut off customers during cold months). The Curb-Stop comes with a security pentagon key. According to the manufacturer, installation could be completed by one person in less than an hour.

AVT states that both time and cost savings would be achieved through use of this stopper. Mike Arioli of Michcon performed test installations of the prototype keyhole Curb-Stops. An installation was completed in 20 minutes. In terms of cost savings, the average cost of a traditional service shut-off is \$1800. According to AVT, installing a Curb-Stop through a keyhole is estimated to cost \$500 on average, including labor. AVT estimates that the cost of the keyhole Curb-Stop installation would run about one third to one quarter of the cost of a traditional service shut-off.



AVT Curb-Stop mechanical in-line stopper



Testing of Advanced Valve Technologies Curb-Stop in the GTI labs.