

Products in Applications

PermaLock® Mechanical Tapping Tee and small hole technology help gas utilities safely reduce excavation and restoration costs.



Photos courtesy of Omega Tools Inc.

In today's economy, the need to reduce costs and find more efficient methods of completing day-to-day tasks is more important than ever before. For gas utilities and distribution companies, mechanical fittings and small hole technology may be the perfect combination for addressing these needs. Together, they may offer savings totaling thousands of dollars per installation.

As with any industry, the natural gas industry is faced with a variety of problems every day. A key ingredient to managing and operating efficiently is to identify these problems, prioritize them, and work on the solution. One of the major problems facing most utilities is how to reduce excavation and restoration costs without sacrificing the safety of employees and customers.

Utilizing conventional techniques, today's excavation and restoration costs are estimated at over one billion dollars annually. Currently, maintenance and construction practices often require large open excavations averaging 3 feet by 4 feet, followed by the removal and disposal of unwanted pavement and soils.

These excavations are commonly performed using large and expensive pieces of equipment such as backhoes, dump trucks, pavement breakers, shoring equipment, steel plates, tamping equipment, backfill material, temporary paving material and barricades. Additionally, major excavations can cause traffic congestion and be hampered by municipality restrictions and construction moratoriums.



PRODUCT: PermaLock® Mechanical Tapping Tee (PMTT)

The Elster Perfection PermaLock Mechanical Tapping Tee offers gas line installers a unique combination of safety, integrity and speed when connecting a service line to a gas main. PermaLock tapping tees can be installed in as little as five minutes without the need for expensive fusion equipment. The simplicity of its installation procedure eliminates the need for extensive training and multiple-person crews. PermaLock tees can be installed in all weather conditions without shutting down the main.



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Small hole technology

Small hole technology is nothing more than performing a normal utility task in an 18" diameter cored hole. Although small hole technology has been around in some form since the mid-1960s, the process truly came into its own in the 21st century. With the help of the Gas Technology Institute and the support of major utilities across the country, the long-term goal of utilities and contractors is to complete any task currently being performed in a conventional 3" x 4" hole, 18" in diameter.

Applications for small hole technology are growing every year. At one time (not very long ago), small hole practice was clearly limited to doing simple leak repair work, low-pressure service cutoffs and maybe corrosion work in the area of attaching anodes. The world of small hole technology has emerged to provide much greater benefits than what those small hole practices were able to deliver just a decade ago.

In today's world, street coring and the core restoration practice have become the impetus for achieving impressive budgetary benefits associated with small hole technology as compared to the old process (no coring). In fact, the savings are now so abundant that utilities invested in this new approach are doing as much work as possible through the 18" diameter openings. Pavement restoration costs, permit costs, and community aggravation costs can plummet when small hole technology is used to its full advantage. Savings with this innovative approach are simply limited by the number of processes (tasks) available to be performed through the 18" diameter excavation.

In the past few years, the number of processes that are commercially available to the small hole technology implementer has grown rapidly. Current capabilities include performing low-pressure and elevated pressure joint repairs; applying commercial clamps on pin hole leaks,

encapsulating a broad range of leak styles; corrosion protection processes; service installations and service renewals; and service terminations on low pressure and elevated pressure. Steel systems, cast iron systems and polyethylene systems can all be worked on through the cored holes. With this forward growth, more and more infrastructure providers are looking for how their products can be handled through these small openings, and therefore the envelope of opportunity is expanding rapidly.

Some tasks currently being performed through these small holes are:

- Steel main repairs
- Curb valve installations
- New and replacement services
- Service cut-offs
- Anode and test station installations
- Underground utility verification.

Material savings

To truly realize the full cost benefit of small hole technology, one must incorporate the use of mechanical fittings into the process. The cost benefit of mechanical fittings can stand on its own, but combined with the excavation and restoration savings of a small hole process, the savings can be significant.

Mechanical fittings for polyethylene mains have been saving utilities money on overall installation costs since the mid-1970s, when the first "stab" or mechanical fitting was introduced. Soon thereafter, the mechanical tapping tee was introduced, revolutionizing the gas industry. A mechanical tapping tee offers gas service crews a unique combination of speed, economy and security when connecting polyethylene service lines to a gas main. Surface preparation time is significantly reduced and the cool down time associated with fusion methods is completely eliminated. A mechanical tapping tee can typically be installed in less than ten minutes in either a



Electrofusion on a 2" x 1" pipe:

- Installation time – 80 min
- Labor rate – \$46/hr.
- Total labor - \$61.32
- Material – \$17.25/tee

Total cost of labor plus material:

\$78.57

PermaLock® device on a 2" x 1" pipe:

- Installation Time – 15 min.
- Labor rate – \$46/hr.
- Total labor – \$11.50
- Material – \$26.95/tee

Total cost of labor plus material:

\$38.45

conventional or small hole excavation.

Mechanical tapping tees for use on polyethylene mains are available in sizes ranging from 1 ¼" IPS through 8" IPS with outlet sizes ranging from ½" CTS through 2" IPS. The full encirclement tee is designed to ensure an easy-to-install, reliable gas tight connection. The tee features a ratchet-style cutter assembly that not only creates a large port for gas flow, but also securely locks the tee into the gas main preventing any movement, rotation or loosening of the connection.



Photos courtesy of Omega Tools Inc.

Additionally, the cutter's locking sleeve is designed for minimal protrusion into the main, allowing for efficient pigging of the line.

The cost savings of using a mechanical tapping tee can be rapidly realized. To the left is a simple analysis comparing a mechanical tapping tee to a typical electrofusion tapping tee.

Using these estimated figures provided by a major utility in the northeast, the cost savings per 2" service installation would be \$40.12. Combine the savings of using small hole technology and mechanical fittings, and even the smallest utilities can realize significant savings.

Tooling

As with micro-surgery for the body, the tools and procedures developed for small hole technology are specialized and designed to operate as a complement to each other for accomplishing a total

task (process). Some of the most recent endeavors include performing service renewals and new service installations. The latest tooling enables the installation of the Elster Perfection PMTT's as well as various forms of electrofusion tees, though the greatest cost savings can be realized by utilizing a mechanical outlet on the electrofusion tees like the Permasert® PMTT.

Small hole tools generally consist of standard extension handles that engage pneumatic heads of one style or another; quick release handles for pickup and placement manipulations; and torque handles to generate torque force. Numerous attachments in the form of specialized sockets and manipulation devices are used to accomplish specific tasks. In the case of the Elster Perfection PMTT, two light drive extension handles are used with specialized attachments and sockets to place and hold the top section of the tee to the main while the

Utilities report that excavation and restoration can account for more than 80% of the total cost of a job.

lower saddle is held in place with a specialized saddle form. Then, using a socket extension system, the cap screws are torqued into position. Once the tee is secured to the main with the bolts, the punch is driven down using the medium drive extension handle with the hex key socket. The cap is installed using the universal cap installer. The service pipe is installed using a small hole pipe manipulation tool. Final pressure testing is accomplished with the extension tester assembly.

Conclusion

The 21st century has brought unprecedented financial demands on utilities; demands that simply cannot be met without the support of their critical suppliers. Small hole technology and the use of mechanical fittings as part of the process is a perfect example of how major cost savings can be realized safely and efficiently.

About Elster Group

A world leader in advanced metering infrastructure, integrated metering, and utilization solutions to the gas, electricity and water industries. Elster's systems and solutions reflect over 170 years of knowledge and experience in measuring precious resources and energy.

Elster provides solutions and advanced technologies to help utilities more easily, efficiently and reliably obtain and use advanced metering intelligence to improve customer service, enhance operational efficiency, and increase revenues. Elster's AMI solutions enable utilities to cost-effectively generate, deliver, manage, and conserve the life-essential resources of gas, electricity, and water.

Elster has over 7,500 staff and operations in 38 countries in North and South America, Europe, and Asia.

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