



**Water & Waste Water
Engineered "No Shutdown" Piping Solutions**
Hot / Wet Tapping + Line Stopping + Valve Inserting

We Work Best Under Pressure

With more than 75 years of experience, TEAM Industrial Services is the recognized leader for keeping critical piping systems flowing during tie-ins, maintenance, retrofitting, repair alterations, emergencies and new construction. Our broad array of services and patented technologies are often essential to the successful uninterrupted operation of waterworks and wastewater industries throughout the world. TEAM engineers and produces field service solutions, equipment and fittings resulting in uninterrupted water transportation and supply to end-users.

TEAM has designed, developed and manufactured the most complete and time-tested Hot / Wet Tap and Line Stop equipment inventory in the world. We have achieved numerous industry firsts and maintain our position at the forefront of technology and best practices. Our sales, engineering, manufacturing and field personnel draw from decades of experience and wisdom to provide you with solutions for any type of piping problem, without shutdown or interruption of service.

With more than 8,000 employees and 220 locations in 40 countries, when you work with TEAM you have the local support needed for routine services, as well as the backing of a global organization for planning and completing the most complex projects. Our Hot / Wet Tapping and Line-Stopping services are available 24 hours a day, 365 days a year.

Responsible Water Management Has Never Been More Important

As the leader in the field of Hot / Wet Tapping, Line Stopping and Valve Inserting, TEAM has developed unique solutions for many “no-shutdown” piping situations. TEAM’s Engineering Department uses the latest design technology to analyze and develop solutions to meet customers’ requirements. Our engineers and field staff have a history of combining Hot / Wet Tap and Line Stop processes and developing new technologies on short notice to keep your systems on-stream and operational. Put TEAM to the test and you will see why “We work best, under pressure.”

Potable Water Application

The reliable delivery of clean drinking water to hospitals, hotels, schools, restaurants, commercial buildings, factories and large residential areas has never been more important than it is today. Any disruption of service can have an enormous financial impact and present potential health and safety risks. TEAM’s Hot / Wet Tapping, Line Stopping and Valve Inserting technologies can ensure continuous system flow and service during piping system repairs or modifications.

Wastewater Application

As the Earth’s population grows and resources become scarcer, more emphasis is being placed on responsible waste water management and environmental protection. TEAM’s Tapping and Line Stopping applications can effectively eliminate the unnecessary discharge of waste water, solids and wet weather event overflow into the environment. Maintaining continuous pipe system flow through our temporary or permanent bypass eliminates shutdowns and drain-downs of large sections of the system, and can also prevent a potentially disastrous system back-up.

HISTORY

Tapping technology dates back to the Roman Empire, when aqueducts were accessed by driving wooden wine taps into free-flowing distribution systems. Over the years, the technology has continued to evolve.

For more than 75 years, TEAM has endeavored to foster the evolution of this technology. The result of this effort is the most complete and reliable Hot / Wet Tap and Line Stop equipment inventory in the world.

TEAM’s acquisition of Furmanite brings together two companies known for substantial Hot / Wet Tapping & line stopping capabilities. Our position in the waterworks and wastewater industries is second to none with roots from both organizations that date back to the 1940’s with heritage company’s known as Advance Valve Installations, IPSCO and Marbo. Invaluable lessons learned during this long and rich heritage help ensure your critical projects are executed safely and successfully in an efficient manner.

From simple, small diameter Hot / Wet Taps, Line Stops and Valve Insertions, to the most technically challenging under pressure utility modifications and repairs of all types including high pressure and/or large diameter pipeline relocations.



An early tapping operation powered by a steam engine.



An original tapping crew prepares for a 48" tap.

Hot / Wet Tapping

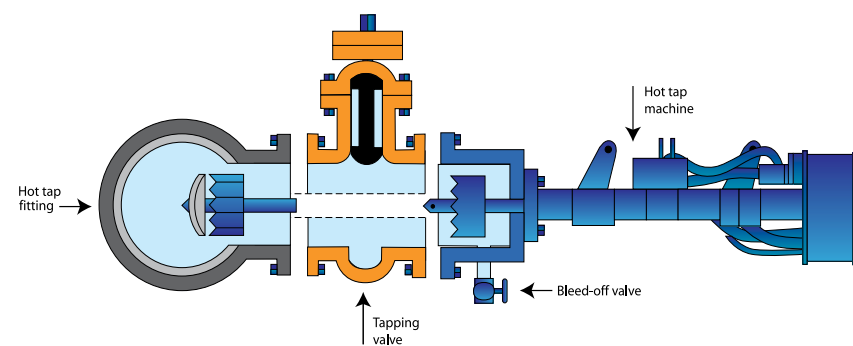
Technology

Hot / Wet Tapping uses a pressure-containing drilling machine to cut a hole in an operating pipe, creating a new branch connection from the original line. This process is done without any spillage or interruption of flow. TEAM performs Hot / Wet Tap Services ranging from 1/2" (12.50 mm) to 84" (2134 mm), with pressure ratings to 3200 psi and temperatures to 700°F as standard on all types of pipe. Special applications are available on request.

The components for a typical Hot / Wet Tap application include: a fitting designed to contain system pressure, a valve used to control the new connection, and a drilling machine used to make the Hot / Wet Tap. Following is the basic procedure used to perform a Hot / Wet Tap:

Basic Procedure

- Install fitting and valve on existing pipeline
- Install Hot / Wet Tap machine
- Perform Hot / Wet Tap through the open valve (special device retains the "coupon" removed during the operation)
- Cutter assembly retracted
- Tapping valve closed
- Hot / Wet



Concrete Pipe Tapping Sequence

Performing Hot / Wet Taps on prestressed concrete cylinder piping is a specialized practice, and great care needs to be taken. Proper planning, preparation and training are essential to ensure a successful project. TEAM has been tapping concrete pressure pipe longer than any other company. We have developed and refined many of the techniques and procedures used to perform concrete pressure pipe taps around the world.

Hot / Wet Taps and Line Stop Contract Services are Used In The Following Common Applications, All Performed Without Shutdown, Flow Interruption or Loss of Service.

- + Hot / Wet Taps for new pipe connections (tie-ins/ branch connections)
- + New valve installations – Line Stops or Insertions
- + Probe, sampling line or meter installations
- + Pipe relocations
- + Pipe repair
- + Branch pipe termination
- + Pipe section replacements
- + Concrete wall, tank and reservoir Hot / Wet Taps
- + Wastewater and sewer (force mains) bypass
- + Hydrant Lead connections or replacements



36" Hot / Wet Tap cutter, coupon and pilot drill



Removal of coupon



84" x 60" Wet tap and 84" Line Stop



16"x16" Tap on cast-iron pipe



60" Hot / Wet Tap preparation



30" Hot / Wet Tap on ductile iron pipe



60" Tap on SP-12 concrete pipe



48" concrete Hot / Wet Tap coupon



Concrete tapping sleeve mounted



Sleeve grouted and tightened around pipe



Chipping gun removes mortar coating



Concrete scored and removed



Steel cylinder and concrete wires exposed



Cutting torch removes reinforcing steel wires



Gland installed and sleeve pressure-tested



Tap performed

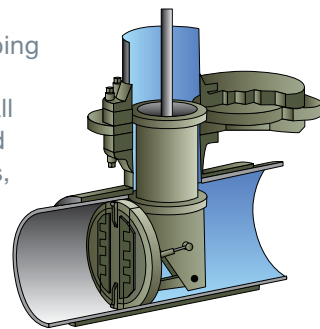
Line Stopping

Line Stop technology was first developed by the engineering group of the Standard Oil Company in the 1930s as a means of isolating sections of pipeline between valves so that large sections of pipe would not need to be drained. TEAM was the first to apply this technology to other markets, and was the first to adapt the process specifically for the water and wastewater industries.

TEAM has been using this technology in field longer than any other company.

What is Line Stopping?

Line Stopping is a means of temporarily stopping Line Stopping can be used to isolate piping systems for repairs, alteration or relocations all without shutdown or loss of service to the end users. If used in conjunction with bypass lines, product flow can be continued around the isolated section of the one-way feed pipes under repair.



Basic Procedure

- Install Line Stop fitting and perform Hot / Wet Tap application as described on previous pages
- Line Stop equipment is installed on the temporary tapping valve and the valve is opened
- Line stop head enters the pipeline through the Hot / Wet Tap connection
- Temporary seal is achieved and pipeline flow is stopped
- Repair, alteration or relocation is performed
- Line Stop head is removed from the pipe via the Hot / Wet Tap connection
- Temporary valve is closed and the Line Stop equipment is removed
- Completion plug is installed on the tapping machine
- Tapping machine is installed on the temporary tapping valve
- Valve is opened, completion plug is installed in the branch of the Line Stop fitting and locked in position
- Line Stop equipment and temporary tapping valve are removed from the Line Stop fitting
- Blind flange is installed on the Line Stop fitting



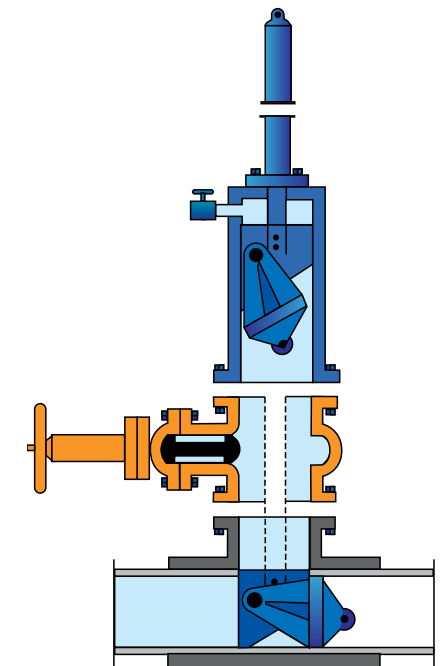
FOLDING HEAD SYSTEM Sequence of 36" (ND 900mm) folding head installed in steel cylinder reinforced concrete test pipe

Folding-Head Line Stops

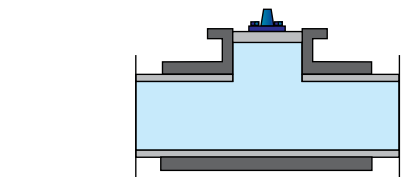
The folding-head Line Stop System, which utilizes a reduced branch fitting, is a cost-effective method of Line Stopping. TEAM uses the folding-head line stop on large diameter water/wastewater systems as well as lower pressure applications in the transmission, oil, gas and process piping markets. Sizes range from 14" X 10" (356 mm X 254 mm) to 93" X 54" (2362 mm X 1372 mm) with pressure typically less than 150 psi. Larger sizes will be quoted and are available upon request.

Pivoting Head Line Stops

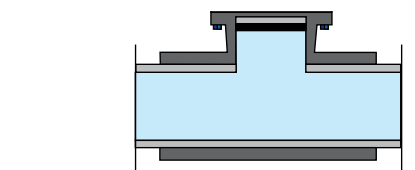
The Pivoting Head Line Stop is the original method used for Line Stopping. TEAM has employed this process within the water and wastewater industry for over 50 years. It requires a full size Hot / Wet Tap to be made and generally provides a very positive shutdown, regardless of abnormalities or deposits and build-ups on the inside of the pipe. Pivoting Head Line Stops are generally used on smaller diameter Line Stop applications, as well as in high-pressure transmission water pipelines (above 150 PSI). Pivoting Head Line Stops are available from 3"-48" and to pressures up to, and exceeding, 1000 psi.



Line Stop head in position



Completion plug installed



Blind flange installed



72" Line Stop



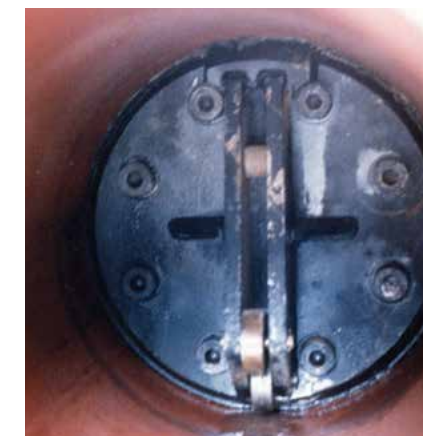
36" force main line stop with internal 24" bypass



16" Line Stop



12" Line Stop on cast iron water main



24" pivoting head installed in pipeline



24" Line Stops (valve cut in)

InsertValve™

TEAM's patented InsertValve™ delivers value, reliability and performance second to none. This field proven valve installs under pressure, eliminating the need for line shut downs in the event of planned or emergency valve cut-ins.

Designed for a wide range of line sizes and types, the InsertValve's wedge gate seats on the valve body, not the pipe bottom. This unique and advantageous feature prevents the seat from coming into contact with the cut pipe edges to significantly extend valve life. TEAM InsertValve™ can be repaired under pressure.

TEAM's InsertValve™ is available in 4-inch thru 12-inch sizes with handwheel and gear operators. InsertValve™ have been tested and proven to deliver reliable service at pressures ranging from vacuum to 250 psig and temperatures to 180°F. Unlike other valve insertion designs that are derived from Line stop technology, the InsertValve™ is designed to handle full water and wastewater system hydraulic forces that are typically applied. Rugged InsertValve™ can be orientated in virtually any position on a variety of pipe types including ductile iron, cast iron, steel, and PVC.

TEAM's extensive network of branch offices and authorized installation contractors insures professional installation services by trained and certified technicians. In addition, piping system owners also have the option of purchasing a turnkey installation system to self perform installations, and make repairs to InsertValve™ in their piping system and make repairs by adding InsertValves™ in their piping system resulting in a valve that meets or exceeds recognized industry requirements and complies with all health and safety regulations. TEAM InsertValve meets or exceeds most recognized industry standards, along with local health and safety regulations.



An InsertValve installation under full line pressure.



InsertValves on AC pipe for main control and hydrant replacement preventing asbestos fibers becoming airborne



An InsertValve with position indicator plate. Valve can be fitted with gear or handwheel operators.



The InsertValve can be installed in any orientation on any type of pipe material.

A Real Valve, Inserted Under Full Line Pressure

- + Meets ANSI/AWWA C515 material standards
- + Installs on a full range of pipe sizes and types
- + Valve permanently restrained to the pipe to maintain pipe integrity
- + Provides instant isolation zones for security and peace of mind
- + Eliminates backflow contamination, purging and bac-t hits
- + Allows for removal/ replacement of downstream pipe at any time
- + Enables in-line, under pressure repair of all moving parts
- + Ensures clean valve seat after installation process

Manufacturing

Tapping and Line Stop Sleeves

TEAM is the manufacturer and worldwide distributor of the highest quality Tapping and "Close-Sure" Flanged Line Stop fittings and sleeves available on the market today. These Tapping and Line Stop sleeves are available in a variety of sizes and design configurations for Hot / Wet Tapping and Line Stopping applications. Fittings are available for size-on-size or reduced-branch applications from 2" (50 mm) to 102" (2362 mm). Custom designed fittings are available on request.



Basic Procedure

Because every Tapping and Line Stopping project presents a unique set of operating conditions, it is necessary to choose the tapping sleeve design style carefully. A few things to consider:

- The material of the pipe being tapped
- The size of the hole being cut in relation to the size of the main header and how much reinforcement needs to be added around the branch connection
- The soil and environmental conditions in the area where the work is being performed
- The design pressures, temperatures and the potential for large surges or pressure fluctuations

Close-Sure Completion Plug

One of the most interesting elements of a line stop is the recovery of the valve from the live piping. TEAM's Close-Sure Completion Flange and Completion Plug System allow for the removal of the temporary tapping valve without shutting down the system or interrupting flow. The Close-Sure Completion Flange is now considered to be the industry standard, having been successfully employed for nearly 50 years.

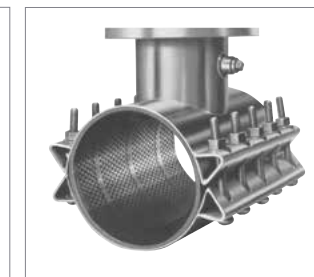
Our fittings are designed and manufactured in accordance with AWWA, ANSI and ASME standards. Other codes are met on request.



Service saddle



Steel-bodied mechanical joint-tapping sleeve



Stainless steel tapping sleeve



TEAM Line-Stop sleeve



Tapping sleeve for concrete pressure pipe



Top Gland top seal tapping sleeve



Mechanical joint line-stop fitting installation

Line Stopping and Tapping Machines

Flostop II System

TEAM has developed the most advanced, lightweight and durable Hot / Wet Tapping and line stopping system currently available to the water/ wastewater industries. TEAM's FloStop II offers industry accepted cylindrical rubber sealing elements or traditional pivoting heads. Line stops can be performed on 4" (100 mm) to 12" (300 mm) lines, with pressures to 250 psi. This easy-to-use, cost-competitive system not only meets but exceeds most industry requirements and specifications.

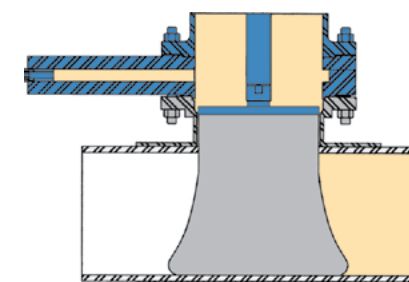
The FloStop II package is available for purchase by municipalities or contractors who wish to perform their own Hot / Wet Taps or Line Stops from 4"-12". FloStop II has many unique design features that make it the most rugged, intuitive and fail-safe system on the market. It is hands down the choice of contractors. We consider this an important endorsement from people who are spending their own hard earned capital and are looking for a long-term investment.

Let us show you why the FloStop II system is the most dependable Tapping and Line Stopping equipment available on the market today.

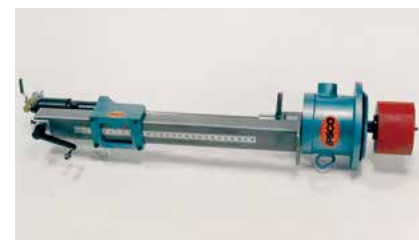


12" (ND 300mm) FloStop II pivoting head Line Stop on water main. Pressures to 250 psi (17 bar).

Top Right: Cylindrical rubber line stop machine assembled with valve and fitting. Cylindrical rubber stopper is in Line Stop position. Pressures to 100 psi (7 bar).



TEAM's FloStop II heavy-duty Line Stop fittings are available in sizes 4" (ND 100mm) to 12" (ND 300mm). 4" (ND 100mm), 6" (ND 150mm), and 8" (ND 200mm) fittings are stainless steel. 10" (ND 250mm) and 12" (ND 300mm) are carbon steel.



Model IP-142 water main Hot / Wet Tapping machine



FloStop II pivoting head Line Stop equipment with optional bypass

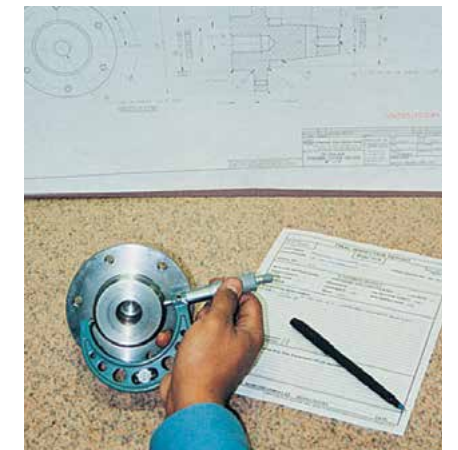


Quality Assurance

TEAM has successfully implemented the ISO 9001 Quality Management System. The scope of TEAM's certificate includes the design and production of specialized Hot / Wet Tapping, Line Stopping and leak repair equipment for piping systems in refineries, chemical plants, public utilities, onshore and offshore pipelines, and gas transmission and distribution systems.

Engineering

TEAM's in-house design and engineering department provides the flexibility to meet your specific requirements. Our engineering departments review all orders, standard or special, to ensure that proper design codes, manufacturing tolerances and safety factors are met in accordance with AWWA, ANSI and ASME codes.



CUSTOM APPLICATIONS
Like this installation of 24" butterfly valve during tapping operation.

TEAM[®] Putting Safety First

At TEAM, there is absolutely nothing more important than the safety of our employees and customers. We are continuously developing, enforcing, evaluating and improving upon our safety policies and procedures. We know that safety is also very important to our customers, and we strive to be the safest provider possible. As a result, TEAM has an impressive safety record in this industry — thereby adding tremendous value to all our technical and engineering services.

TEAM experts are available 24 hours a day, 7 days a week, 365 days a year.

Find your local contact at TeamInc.com.