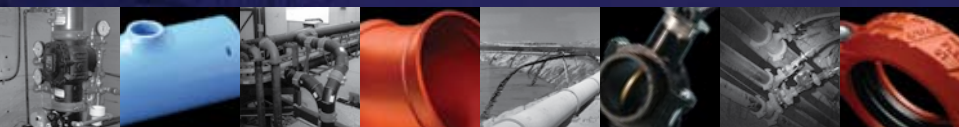




Pipe Joining Solutions



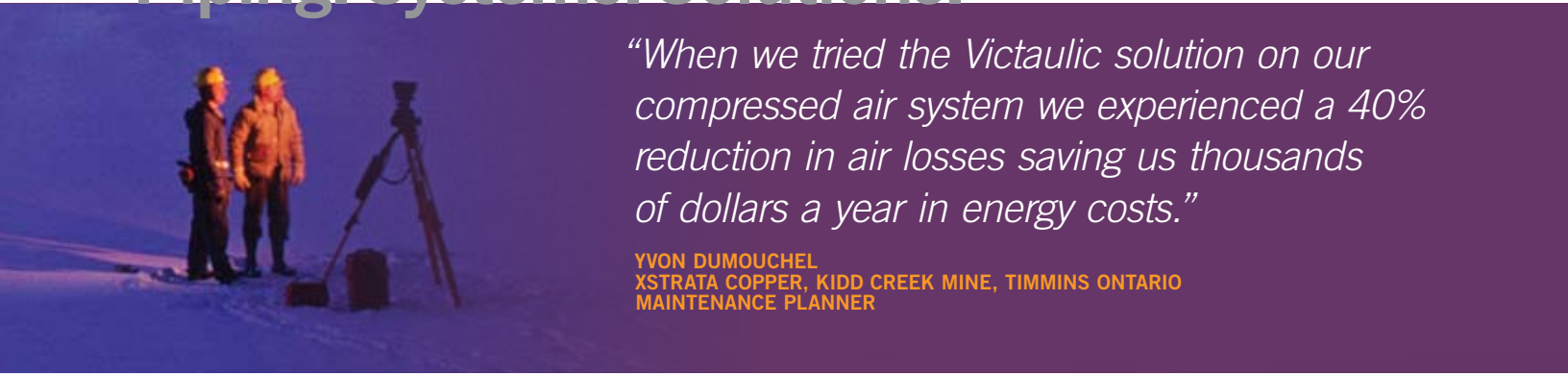
IDEALLY SUITED FOR THE

Mining Market

- High pressure solutions
- Abrasive services solutions
- Piping systems that are scalable and reusable
- No flame, quick install joining methods
- Reduces downtime and costs


Piping. Systems. Solutions.

Piping. Systems. Solutions.



“When we tried the Victaulic solution on our compressed air system we experienced a 40% reduction in air losses saving us thousands of dollars a year in energy costs.”

YVON DUMOUCHEL
XSTRATA COPPER, KIDD CREEK MINE, TIMMINS ONTARIO
MAINTENANCE PLANNER





MINING

No where but Victaulic can you find unique solutions and a comprehensive product line specifically designed for the mining market. Victaulic engineers listen to the unique needs of mining industry professionals, whether its high pressure or abrasive services, and design solutions to fit any need.

MINE OWNERS

Total installed cost for Victaulic piping systems can be as much as 30% lower when factoring in materials combined with fewer man hours required to install.

SPECIFYING ENGINEERS AND SYSTEM DESIGNERS

Achieve unparalleled design versatility with more choices during the design phase, including system scalability for future expansion.

PIPING INSTALLERS

Piping systems specified with Victaulic products are easier and quicker to assemble than other pipe joining methods.

MINING MAINTENANCE PERSONNEL

Victaulic products expedite ongoing maintenance and service checks while reducing personal risk on the job, resulting in reduced downtime and a safer work environment.



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Since 1925, Victaulic has been the benchmark of mechanical piping systems innovation.

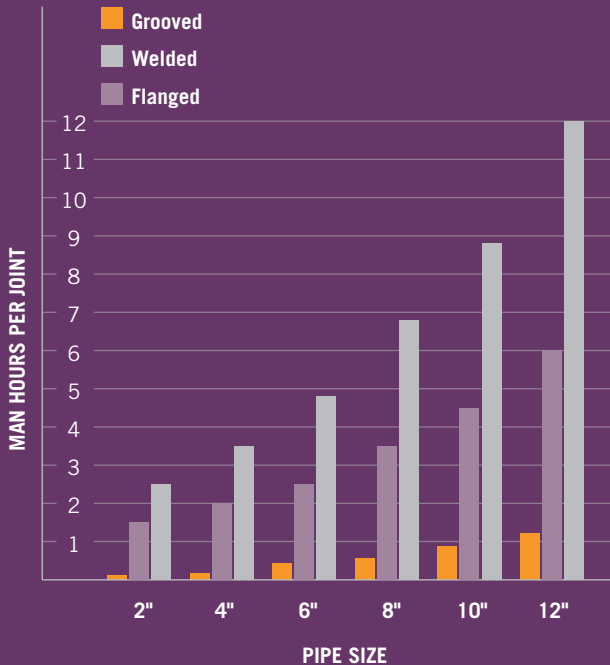
VICTAULIC

Pipe Joining Technologies

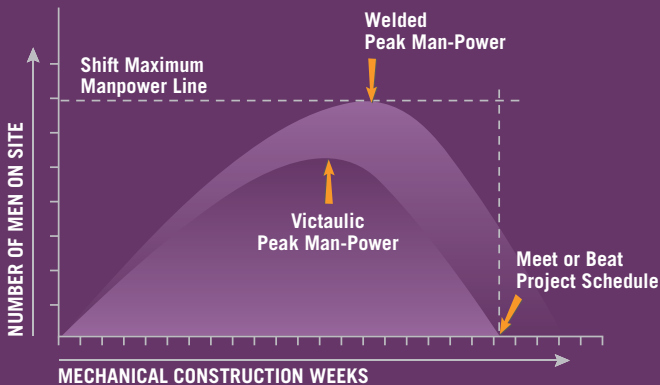
Benefits that save time and conserve valuable resources

Quicker, easier installations

3 TO 5 TIMES FASTER TO INSTALL



Lower total installed cost



Improved safety

NO FLAME JOINING METHOD

With no flame or joint compounds involved and less time needed for installation of Victaulic joining products, operations personnel have fewer personal risks on the job. Plus, Victaulic "installation-ready" technology means no loose parts to drop.

Labor savings

EASIER MAINTENANCE AND SYSTEM EXPANSION

Performing regular maintenance on a piping system due to normal wear and tear of system components requires fewer personnel. Using Victaulic products allows easier access to the system thus neutralizing labor shortages that mining operations frequently encounter.

Design versatility

MORE OPTIONS AND EASILY ACCOMMODATES SYSTEM CHANGES

System retrofits and expansions are completed twice as fast because components can be taken apart and reassembled more easily compared to other joining methods, resulting in reduced system down time.

Plus, Victaulic joining methods offer deflection capabilities that allow pipe to be deployed over uneven surfaces.

Performance engineered

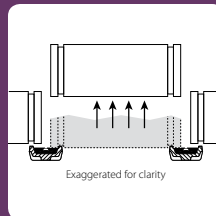
To meet the wide range of service requirements in the mining industry Victaulic manufactures specially compounded gaskets to meet the most demanding service needs.



Benefits of the grooved system

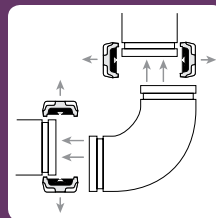
The Victaulic grooved system for joining pipe is three to five times faster to install than welding and is easier and more reliable than threading or flanging pipe resulting in less installation time and easier replacement of piping components.

Plus, our new line of installation-ready couplings is twice as fast as existing groove couplings. With no loose parts to disassemble the coupling quickly stabs on to the pipe to create the most efficient joint on the market today.



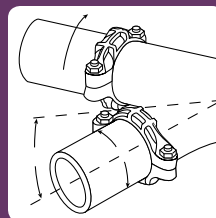
EACH JOINT IS A UNION

Removal of two couplings permits removal of pipe section for replacement, cleaning or servicing. Easy future add-on, change or renovation of pipe to distribute internal wear from abrasives or slurries.



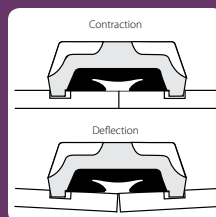
SYSTEM MAINTENANCE AND EXPANSION

Coupling disassembly provides easy access for maintenance or system expansion. Victaulic butterfly valves provide "dead-end" shut-off service to isolate equipment.



ALIGNMENT EASE

The grooved system allows full rotation of the pipe and system components before tightening so that proper alignment can be achieved.



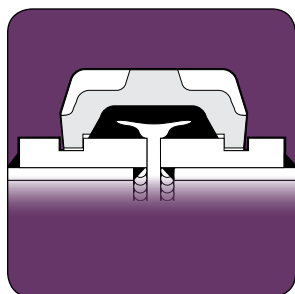
FLEXIBILITY

The Victaulic grooved end solution accommodates expansion, contraction, or deflection and enables designing that takes advantage of these built-in system features.



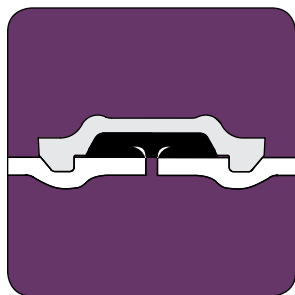
Grooved systems for mine piping

Vic-Ring



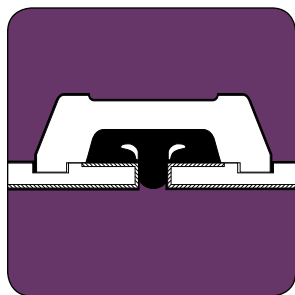
Maintaining full pipe wall thickness is extremely important in abrasive mining applications such as slurry and tailing lines. The Victaulic Vic-Ring coupling system provides the benefits of the grooved system without compromising the full wall thickness of the pipe. More than 50% faster and easier to install than similar sized flanged joints, Vic-Ring couplings are available in a variety of configurations and sizes to meet pressure and service requirements. Plus, Vic-Ring couplings also allow for up to ½"/12.7 mm of linear movement at each joint.

AGS



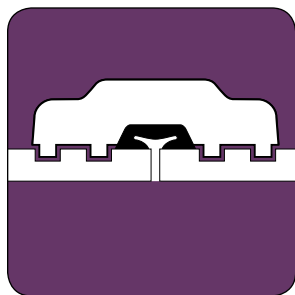
The patented Advanced Groove System (AGS) for 14–24"/350–600 mm pipe is the fastest and most reliable way to join large diameter pipe. The AGS groove is wider and deeper than standard grooved systems and as a result can handle higher end loads and pressures. The two-piece housing of the coupling reduces handling and installation time. The AGS system consists of a full line of couplings, fittings, valves and accessories.

High pressure piping solutions



High pressure backfill piping systems can be difficult to design and build underground. For systems with pressures of 2500 psi/17235 kPa or less Victaulic has the HP-70ES (EndSeal) system. With a different groove profile and gasket than standard product, HP-70ES couplings are specifically designed to handle the higher pressures found in systems pumping solids.

Double-grooved technology

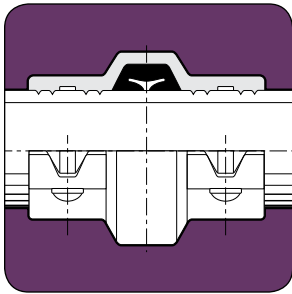


To accommodate high working pressures Victaulic developed the double groove pipe system. The Style 808 coupling joins cut groove pipe for systems with working pressures up to 4,000 psi/27000 kPa. The double groove system offers the highest pressure rating of any mechanical joining system on the market today.



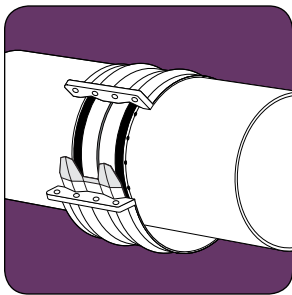
Pipe joining technologies for mine piping

HDPE piping systems



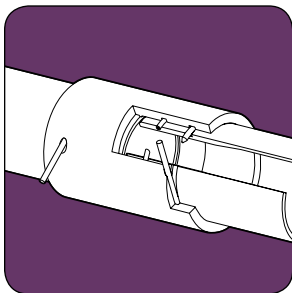
This plain end system is the fastest and easiest method for joining HDPE pipe. Requiring no special pipe end preparation and with 50% fewer steps needed for installation, Victaulic HDPE couplings reduce installation time. Without special equipment or additional crews, Victaulic HDPE products provide a union at every joint and give users the ability to rotate pipe to extend pipe life.

Depend-O-Lok® piping systems



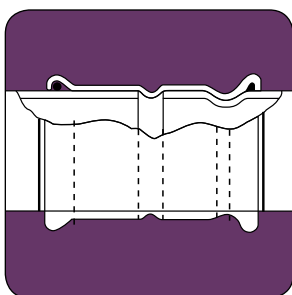
The ultimate in pipe versatility, Victaulic Depend-O-Lok (DOL) products can be designed to meet the pressure and service requirements of any mining piping system. For restrained systems, DOL couplings can reduce installation times by as much as 75%. Requiring just three bolts and nuts to complete the joint compared to 72 for restrained flange joints, DOL is clearly an economical choice for large diameter systems.

Aquamine® reusable PVC products



Where pipe needs to be both portable and reusable, Victaulic Aquamine PVC pipe couplings, valves and fittings are ideal. Easy to install, disassemble and then re-deploy as needed, Victaulic Aquamine products are ideal for leaching lines as well as water supply and dewatering lines. Victaulic Aquamine couplings can be installed in a matter of seconds.

Pressfit®*



For small diameter applications, from ½–2"/13–50mm, there is no faster method for joining stainless steel pipe than Victaulic Pressfit. The Pressfit system assembles in seconds using a handheld pressing tool and is ideal for compressed air, eye wash stations, and other small diameter applications.

* Not for use with metric sized pipe.

VICTAULIC

Mine Piping Solutions

Complete solutions for the mining industry

Victaulic continues to develop products to meet the rigorous demands of the mining industry. Designed to make pipe joining faster, easier and more economical Victaulic products allow mining customers to build complete piping systems from a single source.



COUPLINGS

- Available to join ¾–42"/20–1050mm piping systems
- Rigid and flexible couplings
- Ideal for piping over uneven surfaces
- 75% fewer bolts than flanged components
- Provides easy access to piping systems—reduces downtime by as much as 50%



FITTINGS

- Various styles of elbows, tees, crosses, wyes, laterals, adapters, nipples, caps, plugs and reducers are available for superior design flexibility
- Cut groove fittings provide a smooth flow path on the I.D. (inside diameter) of the pipe
- Pre-grooved ends for on-site productivity



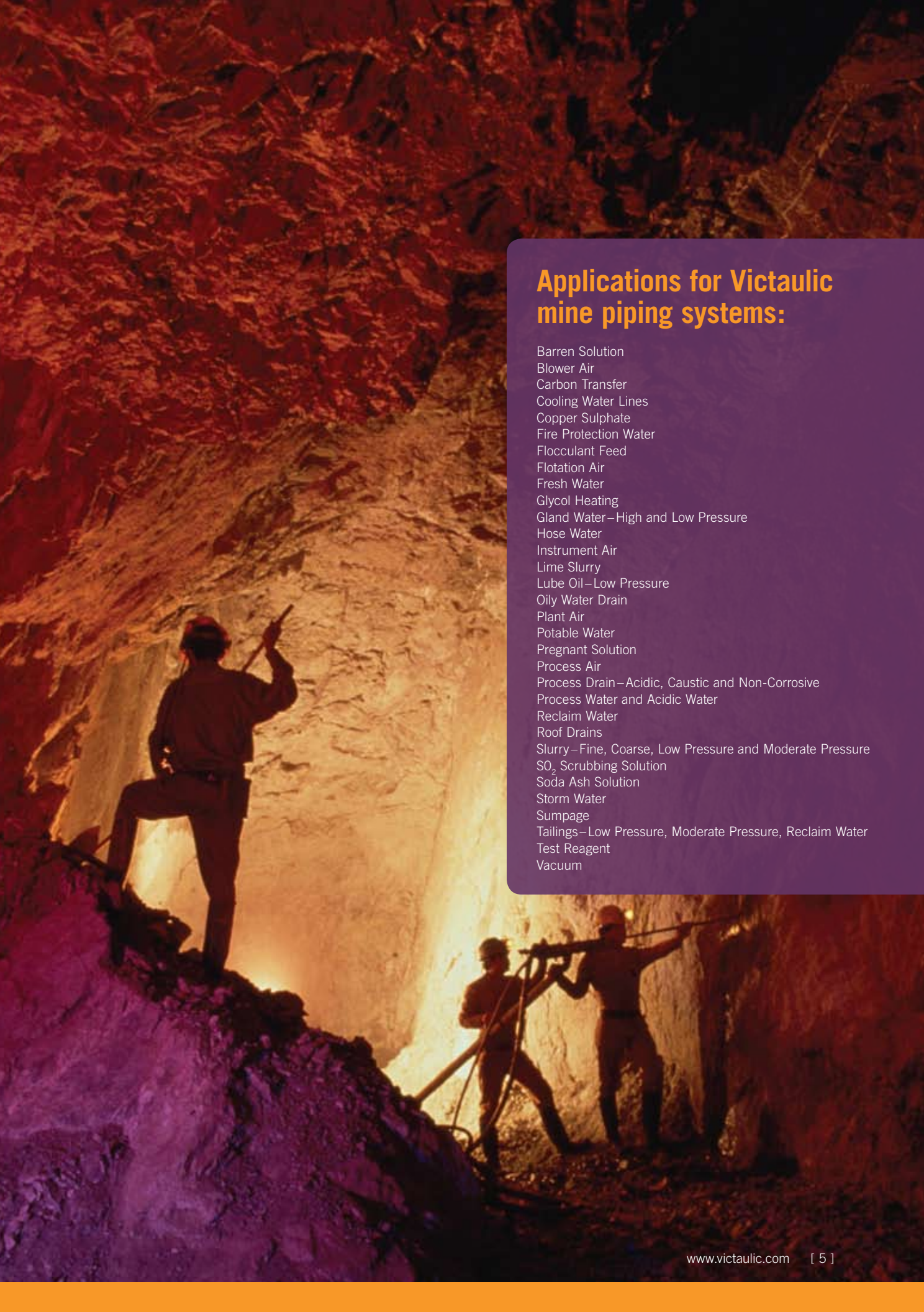
VALVES

- A full line of butterfly, check, ball and plug valves are available
- A variety of wear-resistant materials and coatings are available for specific piping application requirements
- Superior flow characteristics allow for reduced pipe sizes, reducing overall system cost



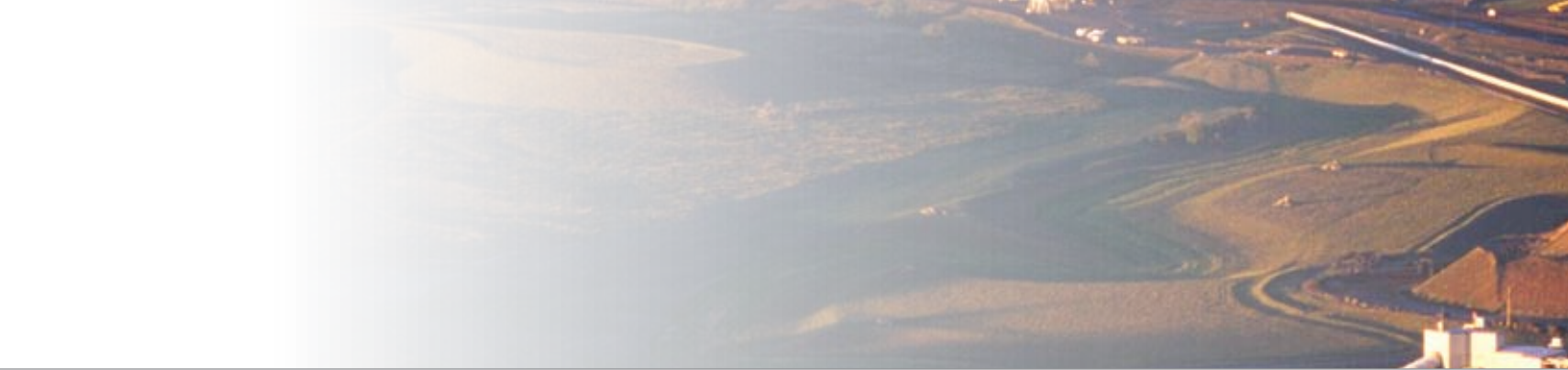
HOLE CUT PRODUCTS

- Gaskets are molded to conform to the O.D. (outside diameter) of the pipe and are of a pressure responsive design
- Hole cut products are mounted to the pipe using either a locating collar or a toe and heel design
- Victaulic offers a line of easy-to-operate hole cutting tools
- Eliminates fire hazard since only a wrench is required when installing Victaulic hole-cut products



Applications for Victaulic mine piping systems:

- Barren Solution
- Blower Air
- Carbon Transfer
- Cooling Water Lines
- Copper Sulphate
- Fire Protection Water
- Flocculant Feed
- Flotation Air
- Fresh Water
- Glycol Heating
- Gland Water—High and Low Pressure
- Hose Water
- Instrument Air
- Lime Slurry
- Lube Oil—Low Pressure
- Oily Water Drain
- Plant Air
- Potable Water
- Pregnant Solution
- Process Air
- Process Drain—Acidic, Caustic and Non-Corrosive
- Process Water and Acidic Water
- Reclaim Water
- Roof Drains
- Slurry—Fine, Coarse, Low Pressure and Moderate Pressure
- SO₂ Scrubbing Solution
- Soda Ash Solution
- Storm Water
- Sumpage
- Tailings—Low Pressure, Moderate Pressure, Reclaim Water
- Test Reagent
- Vacuum



AGS (ADVANCED GROOVE SYSTEM)

- Advanced Groove System couplings feature a two-piece housing for faster, easier installations
- For systems from 14–24"/350–600mm and pressures up to 350 psi/2400 kPa
- Rigid or flexible couplings available



PLAIN END PIPING SYSTEM FOR STEEL

- Designed for use on Schedule 40 steel pipe
- Coupling jaws conform to pipe and provide greater pipe contact for positive grip
- No special pipe end preparation required



PLAIN END PIPING SYSTEM FOR HDPE PIPE

- Designed for HDPE pipe from SDR 7.2 to 35
- Teeth bite into the OD of the pipe for the full pipe circumference
- Couplings are pressure rated to the pipe rating
- Sizes from 2–20"/50–500mm



DEPEND-O-LOK

- Couplings to any size to meet any service requirement
- Flexible, Expansion and Restrained coupling configurations
- FluidMaster provides a reliable joint for slurry systems



AQUAMINE REUSABLE PVC PRODUCTS

- Synthetic rubber O-ring provides chemical resistance for a wide range of services
- High impact resistant PVC pipe and coupling provide strong piping components
- Spline assembly combines maximum strength by engaging into grooves in both the coupling and the pipe
- Thickened pipe end provides joint reinforcement and security
- Lightweight, reusable design makes Aquamine ideal for a wide variety of water services



MINING SPECIALTY PRODUCTS

- Specifically designed for the demands of the mining market
- Style 926 mining spigot mechanical outlet is the fastest and easiest way to run pipe from the tailings line into the pond
- No. 36 Vic-Blast developed as a fast, economical dust suppression device



VIC-RING

- Maintains full wall thickness of the pipe
- Allows linear movement up to 1/2"/13mm at each joint
- Sizes up to 144"/3650mm and pressures up to 750 psi/5175 kPa



PRESSFIT

- Revolutionary method for joining small diameter pipe (not available for metric size systems)
- Installs in seconds using hand-held pressing tool
- Designed for stainless steel Schedule 5 pipe from 1/2"–2"
- Ideal for compressed air, eye wash stations, instrument air, etc.



PIPE PREPARATION TOOLS

- Cut and Roll grooving tools available for field, shop or manual grooving
- Grooves are cold formed eliminating fire hazards associated with welding
- Hole cutting and pipe cut-off tools also available



FIRE SAFETY PRODUCTS

- Victaulic was the first grooved manufacturer approved for use on fire protection systems
- Complete system of couplings, fittings, valves, sprinklers and specialties available
- Approved by fire protection agencies worldwide
- Storage sprinklers ideal for dust suppression

VICTAULIC ABOVE GROUND APPLICATIONS:

Metal Mines



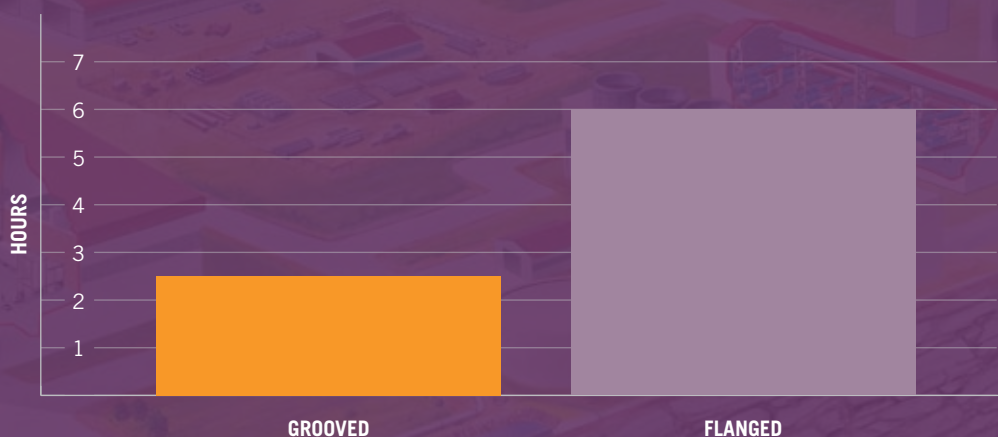
Cut plant downtime in half

Profitable mining operators are able to minimize downtime thereby keeping production rates high. No matter how efficient the operation, routine maintenance and downtime are part of everyday life. The question really is— **“How do I minimize the time required to do the maintenance I need to keep the plant running?”**

For mine piping systems, there is only one choice that will keep downtime to an absolute minimum—the Victaulic system. Most Victaulic couplings can be dismantled by removing only two bolts and nuts as opposed to eight bolts and nuts for the same sizes in flanged systems. When replacing a flange, the installer must scrape off the old gasket and replace it with a new gasket. With the Victaulic method, simply perform the maintenance work and replace the coupling using the existing gasket and coupling.

Piping systems converted from flanged to grooved have experienced significant time and cost savings. For example, a recent planned system shutdown in a large mine that was scheduled for six hours due to the engineer’s previous experience with flanged systems turned into less than three hours with a Victaulic system—totaling more than 50% in savings.

Reduce downtime







TAILINGS LINES AND POND

Tailings lines often require running pipe great distances over uneven surfaces. Frequently the pipe is required to “snake” around a bend as shown to the left. With the deflection capabilities of Victaulic couplings, custom b-end fittings can be eliminated.

Victaulic also manufactures a special collar outlet product for pumping tailings into the pond. The Style 926 outlet cuts pipe assembly time in half as compared to competitive outlet products.



LARGE DIAMETER PIPING

Most large diameter piping in mines is used for abrasive services. Maintaining full wall thickness and accessibility to the system are important. Victaulic offers two distinct methods for large diameter systems in mines:

- Depend-O-Lok products are custom built to meet specific system requirements. Available in unrestrained, restrained or expansion-type configurations, Depend-O-Lok couplings can be designed to accommodate the pressure and service needs of any system.
- Vic-Ring couplings have the same benefits of the standard grooved pipe coupling. The wall thickness of the pipe is maintained due to an externally mounted ring that acts as a seat for the coupling.



PROCESS PIPING

Process piping within a mine is critical to the ongoing operation and profitability of a mine. Downtime, whether scheduled or unplanned, is extremely expensive. With a union at every joint, Victaulic joining systems are the ideal choice for regular maintenance on any type of system.





VICTAULIC ABOVE GROUND APPLICATIONS:

Coal Mines

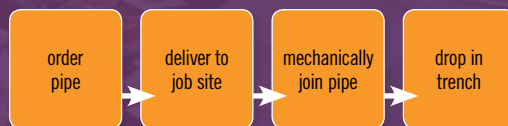
Solving the industry's toughest piping issues

Victaulic has been a leading innovator of mine piping products to make joining and replacing pipe faster, easier and more economical. Since each system has different service requirements a "one size fits all" solution is not practical. To address many of the issues found in today's mine systems Victaulic has developed a variety of solutions.

HDPE systems

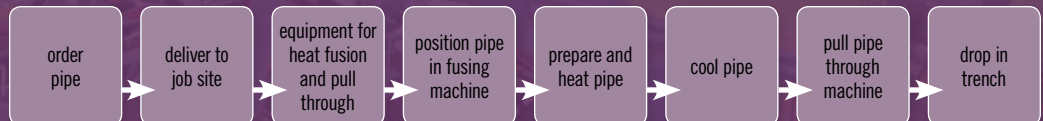
For example, HDPE systems from Victaulic require half the steps of fused systems. And with no special equipment required to install, the system can be assembled using a standard wrench. This plain end system allows you to easily rotate pipe to extend the life of the piping.

VICTAULIC HDPE SYSTEM



Now, more than ever, time equals money. Since work is a process, the fastest way to save money is to reduce the number of steps. This flow chart is an example of how Victaulic HDPE products can streamline the installation process.

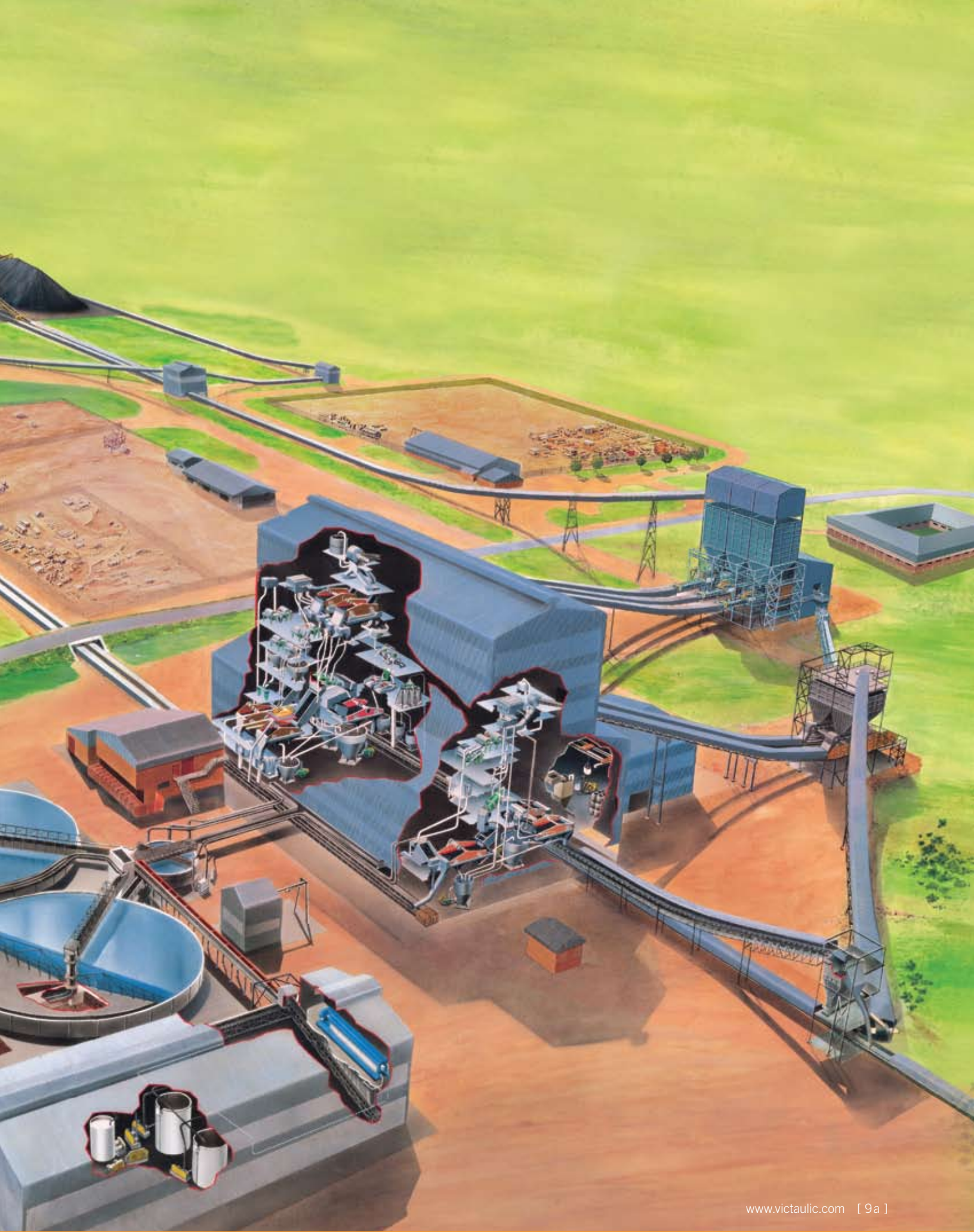
TRADITIONAL HEAT FUSING



Abrasive services

Abrasive services like coal ash require a joining system that provides durability and ease of maintenance. Long radius grooved end fittings can be rubber lined to extend the life of the system while minimizing downtime when worn pipe needs to be replaced. In one example a change out that was budgeted for six hours for a flanged system was switched out in less than three hours using grooved system components.

Now Victaulic has introduced the installation-ready line of couplings that install 50% faster than standard grooved couplings. With no loose parts to disassemble and then re-assemble this patented design reduces handling, improves site safety and speeds installation.





PREP PLANT PIPING

The abrasive media traveling through a Coal Prep plant means frequent change-out or rotation of pipe to extend the life of the system. Since HDPE couplings provide a union at every joint the system can be accessed quickly when regular system maintenance is required. Victaulic plain end HDPE products are the fastest and most economical method for minimizing downtime during scheduled and unscheduled outages.



PROCESS WATER/AIR

Reliable, worry-free service is essential when running process lines in a mining operation. Downtime for any reason is extremely expensive. With more than 80 years of proven reliability Victaulic products are ideally suited for this critical service. System designers have the ability to design the system with either rigid or flexible joints as needed.



RUBBER LINED ELBOWS

Abrasive media is the most demanding piping application in any mining operation. Excessive wear, particularly at changes of direction, reduces the life of a system while increasing the frequency and amount of maintenance required. Rubber lined elbows from Victaulic extend the life of the system thus reducing the amount of change-out required. When maintenance is needed grooved joints are the fastest and easiest system for replacement of worn pipe.



VICTAULIC UNDERGROUND APPLICATIONS:

Metal Mines

SAFETY FIRST

Victaulic systems provide no flame joining method

Safe, reliable piping systems are a necessity for all mining operations. Mine piping systems must provide a steady stream of water and air to and from underground operations.

In mining plant operations, acid or cyanide leaks can have fatal consequences. Victaulic mechanical joints have been used on cyanide and acid lines in mines all around the world since its early beginnings in 1925.

Victaulic joining technologies do not require any hot works or flames thus eliminating workers' exposure to potentially harmful fumes. In addition, our products are lighter, faster and easier to install than flanged components.

Known for innovative piping solutions, Victaulic takes safety in piping systems to a whole new level. Our exclusive "installation-ready" line of couplings allows installers to join systems without disassembling the coupling. Simply stab the coupling on one pipe end, bring the other pipe end in, and tighten the bolts and nuts. It's that simple. No more potential to drop loose parts creating the opportunity for injuries and lost work time.

Installation-ready couplings

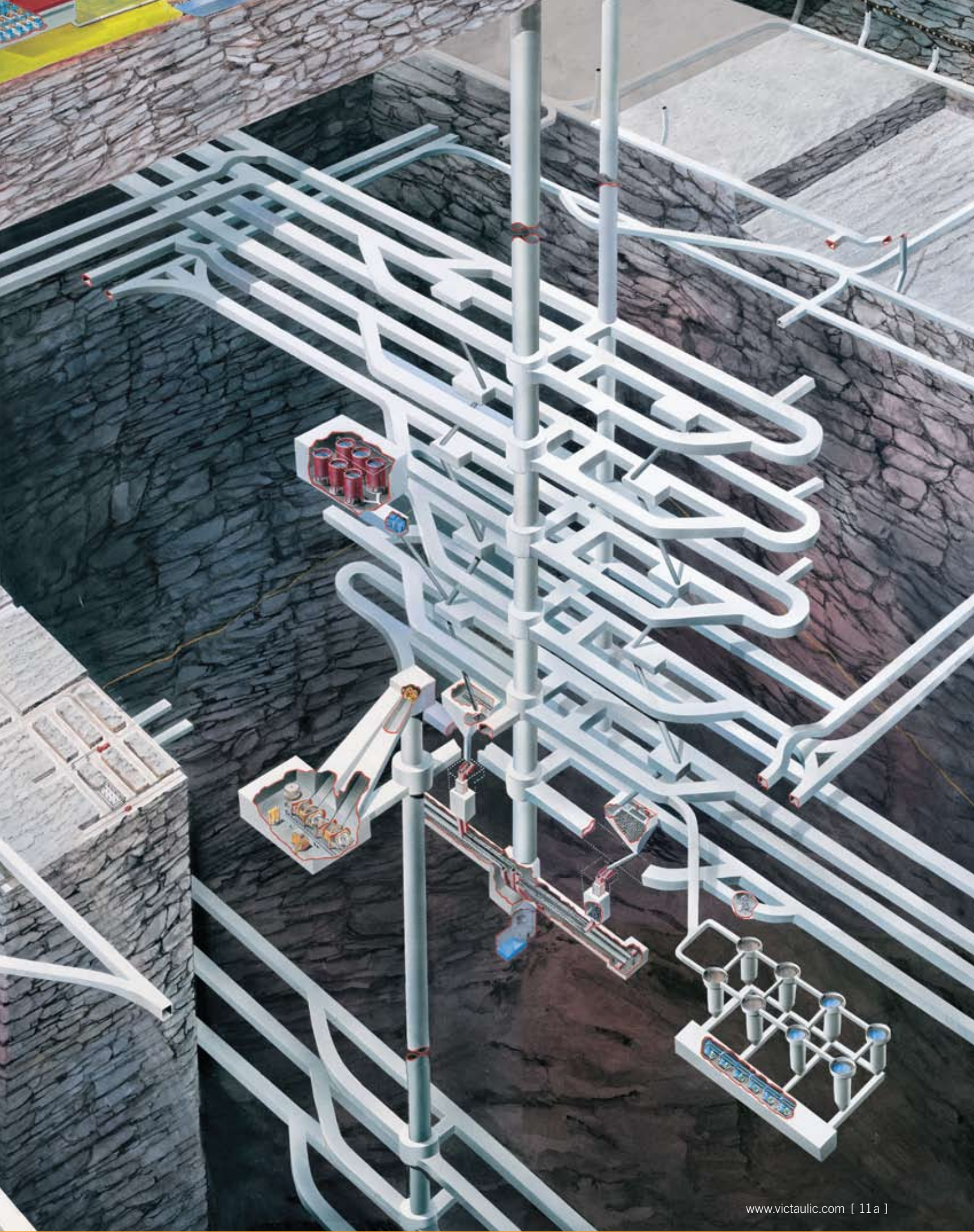


LUBE IT

STAB IT

JOIN IT

DRIVE IT





PRESSURE REDUCING STATIONS

Piping water from the bottom of a mine to the surface under high pressure is difficult and time consuming. To reduce pressure on the way to the surface many mines utilize pressure-reducing stations. Victaulic provides a full line of couplings, fittings, and valves with the pressure capacity for this type of service. With Victaulic couplings requiring 30% to 50% less time to install, assembly and maintenance is economical for both mine owners and operators alike.



DEWATERING LINES

Dewatering lines are typically at high pressure and are deployed over uneven surfaces. Victaulic flexible couplings provide deflection capabilities that can reduce the need for fittings by up to 25% when compared to other joining methods. And with working pressures of up to 1,000 psi/6900 kPa, Victaulic flexible couplings can reduce the number of pressure reducing stations required.



AIR LINES

Air loss in mines is a hidden cost that most operations acknowledge but do little to prevent. By using Victaulic couplings with pre-lubed gaskets, air losses can be virtually eliminated thereby reducing energy costs. Just a small leak of less than an 1/8"/3mm can lead to 8 million cubic feet of lost air annually.

In recent tests completed on site and under real world conditions, the cost savings experienced by using pre-lubed gaskets added up to thousands of dollars in energy savings.



BACKFILL

Environmental friendly mining companies are investing time and effort to backfill underground operations to return the land to its original condition. Sand and paste backfill operations are demanding and require high pressure piping systems. Victaulic offers two options for backfill systems: the Style 808 double groove coupling handles pressures up to 4,000 psi/27500 kPa; or for lower pressure systems, the Style HP-70ES EndSeal coupling is available up to 2,500 psi/17235 kPa.



FIRE PROTECTION

In 1952 Victaulic was the first company to receive approval for a grooved coupling in fire protection services. Today Victaulic manufactures a complete line of fire protection products that includes couplings, fittings, valves, sprinklers, devices and accessories, all approved and designed to provide the highest level of protection. A new line of FireLock NXT® devices feature a single set point for rapid response to fires. And large orifice FireLock® automatic sprinklers provide coverage to the large spaces found in underground mining operations.



VICTAULIC UNDERGROUND APPLICATIONS:

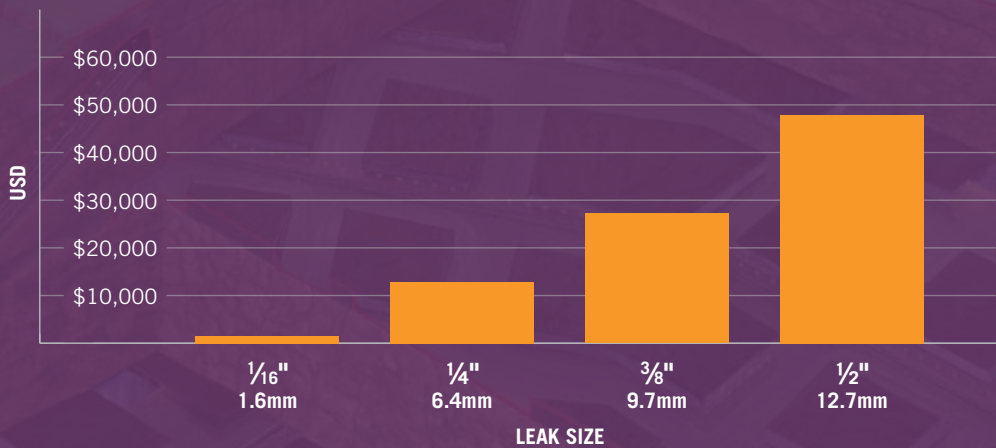
Coal Mines

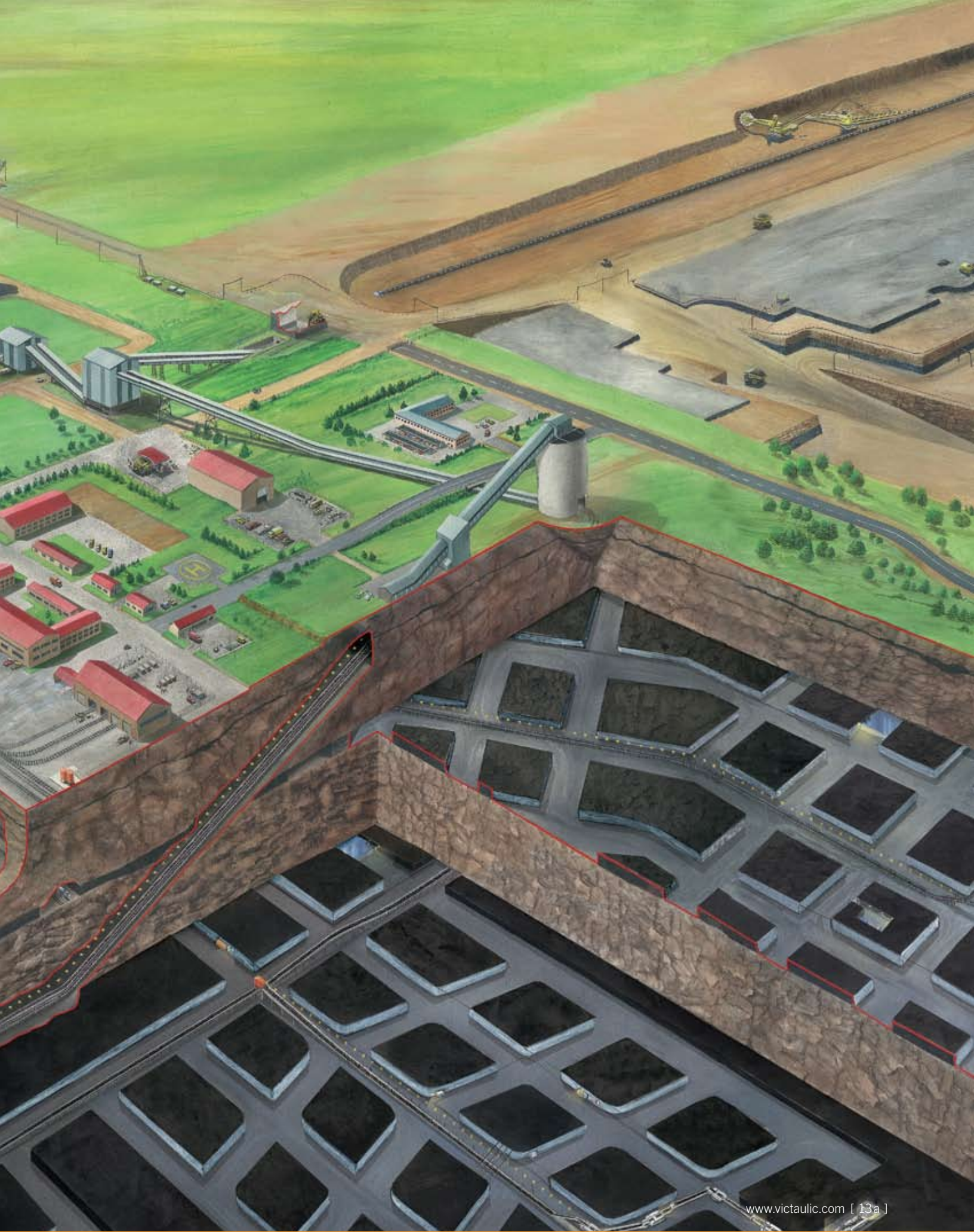
Reduce energy costs by as much as 30%

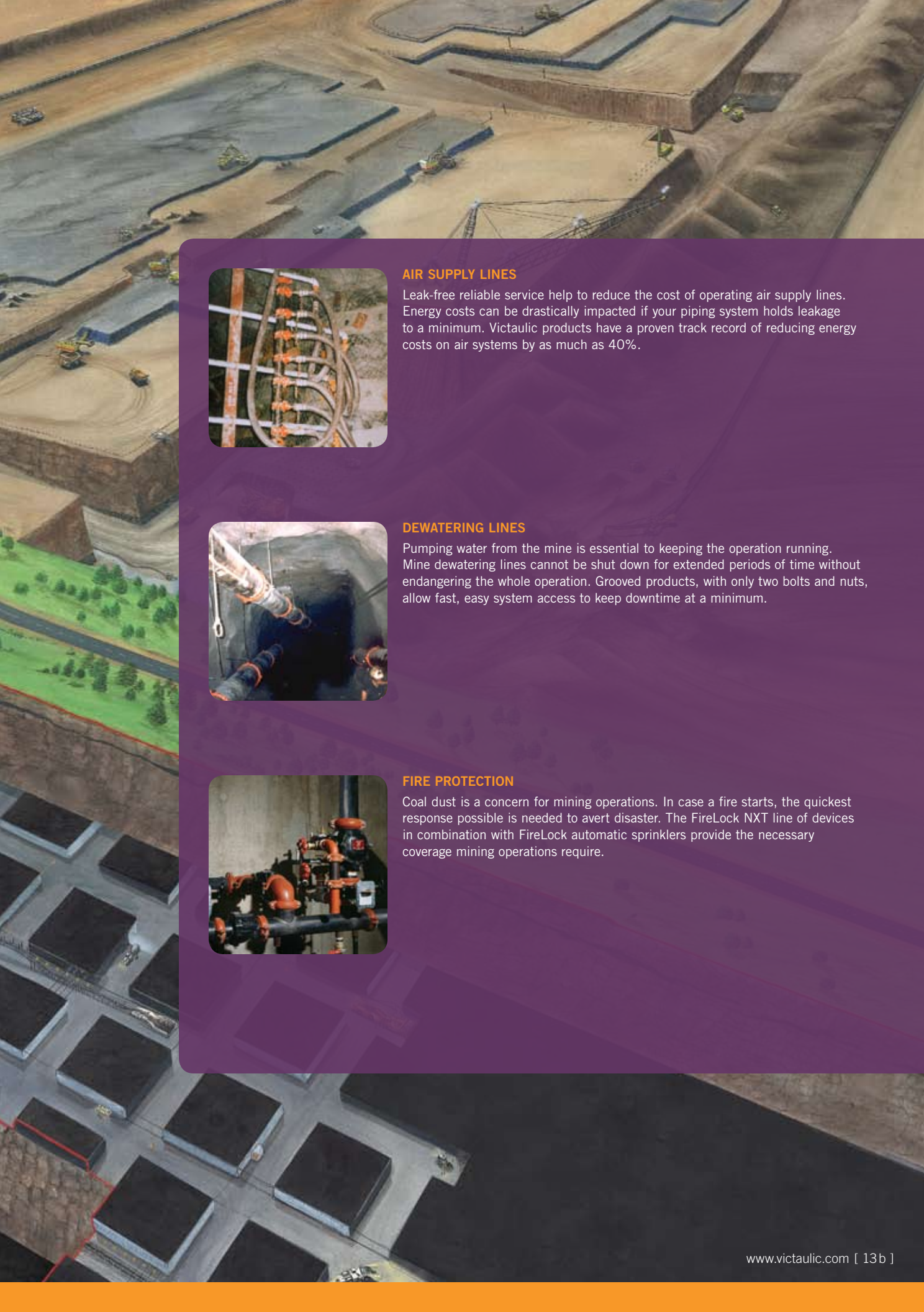
Equipment connected to compressed air lines need a steady pressurized flow of air to operate properly. Oftentimes the smallest leak can lead to significant air loss adding to energy costs and creating the need for larger pumps. In fact, 15%–30% of all energy costs in a mine are spent on air lines.

The Victaulic grooved piping system significantly impacts the energy costs of compressed air systems in mines. Using a pre-lubricated nitrile gasket specifically designed to meet the requirements of compressed air systems, the Victaulic grooved system can reduce air loss in a typical system leading to energy savings totaling more than 40%. In a recent study in a typical mine during a six-month period, energy savings totaled more than \$2 million.

Compressed air loss







AIR SUPPLY LINES

Leak-free reliable service help to reduce the cost of operating air supply lines. Energy costs can be drastically impacted if your piping system holds leakage to a minimum. Victaulic products have a proven track record of reducing energy costs on air systems by as much as 40%.



DEWATERING LINES

Pumping water from the mine is essential to keeping the operation running. Mine dewatering lines cannot be shut down for extended periods of time without endangering the whole operation. Grooved products, with only two bolts and nuts, allow fast, easy system access to keep downtime at a minimum.



FIRE PROTECTION

Coal dust is a concern for mining operations. In case a fire starts, the quickest response possible is needed to avert disaster. The FireLock NXT line of devices in combination with FireLock automatic sprinklers provide the necessary coverage mining operations require.

Piping. Systems. Solutions.

Victaulic invented the grooved end system for pipe joining in 1925. More than 80 years later, Victaulic continues to lead the industry with pipe joining innovations and solutions around the world. With offices and manufacturing facilities in Europe, Asia, the US and Canada, and a worldwide network of sales and service representatives, Victaulic works closely with engineers, contractors and owners to design and install mechanical piping systems that lower costs, improve productivity, reduce risk and provide for total system expansion.



Visit www.victaulic.com

- Searchable product and global project database
- Download product submittals and literature
- Piping software demos and modules
- Engineering support services

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