The World Leader in Pipe Joining Solutions

IDEALLY SUITED FOR

Power Generation
World Class Innovation
means that we’re solving your problem,
before you know you’ve got one.

World Class Partnership
means you’ve got the most experienced
and capable team in the industry working
to ensure your success.

For more than 85 years, Victaulic has led the
industry by developing innovative pipe joining
solutions that lower costs, reduce risk and compress
schedules; delivering real value to the owners,
engineers, contractors, and maintenance personnel
who have come to depend on them. Whether
you’re planning your next maintenance outage
or specifying your next facility, Victaulic ingenuity
and experience can protect your bottom line.

TABLE OF CONTENTS

2  Innovation
4  Partnership
6  Gas-fired
8  Coal-fired
10  Hydroelectric
12  Alternative
14  Pipe Joining Solutions
Globally Accepted

The American Society of Mechanical Engineers (ASME) established the B31 Pressure Piping Code Committees to promote safety in pressure piping design and construction around the globe, through published engineering criteria.

VICTAULIC STANDARD IPS COUPLINGS AND GROOVED FITTINGS:

- May be utilized on ASME B31.1 Power Piping Code applications within their published temperature and pressure parameters.
- Are manufactured from ductile iron that conforms to ASTM A-536 and ASTM A-395 specifications.
- Meet the requirements of ANSI/AWWA C-606 for use on grooved end fittings and pipe grooved in accordance with this standard.

For more information regarding the conformance of IPS grooved couplings and fittings to ASME B31.1 Power Piping Code, request document 26.06.
Vertically integrated, Victaulic controls the qualifying methods, design validation and manufacturing process of its compounds and components.

**Labor Management**

**Shorten Construction Schedules**

Victaulic estimates that jobs requiring welding applications demand up to 50% more man-hours on average over Victaulic no-flame piping solutions. Average construction costs can be reduced by as much as one-third when using Victaulic products.

**Simplify Maintenance**

A Victaulic coupling provides a union at every joint, allowing easy access to the system and flexibility for future system expansion. Maintenance, repair and operations (MRO) tasks such as replacing strainers or corrupt pipe sections, or adding a tee to expand or join piping systems are easily accomplished.

Learn more at www.victaulic.com/schedule and www.victaulic.com/maintenance
Performance Engineering

Solving the Industry's Toughest Piping Issues
Victaulic not only manufactures couplings for joining pipe, it also provides solutions for the industry's toughest challenges. Whether it's high pressures, extreme temperatures or abrasive services, Victaulic develops specialized solutions to address piping's most difficult systems.

At the Heart of a Victaulic Coupling is the Gasket
Victaulic boasts the largest and most experienced team of engineers in the industry. Utilizing the most advanced nonlinear finite element analysis, the research and development team predicts the performance of materials in different configurations to understand performance in field conditions. Vertically integrated, Victaulic controls the qualifying methods, design validation and manufacturing process of its compounds and components.

Learn more at www.victaulic.com/gaskettechnology

Safety

Owner's Perspective
Today, owners must pay attention to all aspects of safety related costs — from the safety records of their contractors, including hiring and subcontracting, to the decision of whether to shut down during inclement weather. Shutdowns create tremendous pressure to finish, and the probability of injury greatly increases.

Contractor's Competitive Advantage
Many owners are requiring construction bidders to have an Experience Modifier Rate (EMR) of 1.0 or lower. This rate has become the entry point for qualifying responsible contractors. By reducing hazards such as the open flames and toxic fumes associated with welding, contractors using Victaulic technology can reduce their EMR to the lower levels, eliminate indirect costs and significantly increase their profitability.

Learn more at www.victaulic.com/safety
Plan ahead and select experienced partners early.

Victaulic works with your business from design through installation to ensure your project is completed as efficiently as possible.

Design to Construction

**Estimating** – Victaulic provides no-cost value analysis, specification updates, drawing quotations, and bill of material cost comparisons.

- **Value Analysis** – such as accommodation of seismic and/or thermal movement and attenuation of noise and/or vibration
- **Specification Update** – ensuring proper specification of product for your situation
- **Cost Evaluation** – by material take-off, bill-of-material comparison or equipment connection package comparison.
- **Drawing Quotations** – can include pad and equipment layouts, pipe routing layouts, plan and section, layout and isometrics, cut sheets, bills-of-material, and job site visits

**2D, 3D and BIM Coordination Packages** – Available for download, Victaulic offers two and three-dimensional symbol and data packages to facilitate system design and layout, supporting a variety of top tier software providers.
Prefabrication Concepts can increase throughput by removing bottlenecks.

When incorporated into a project’s build strategy, the prefabrication of Victaulic systems in the fabrication shop can increase productivity beyond what is achievable in the field.

By removing bottlenecks associated with welding in a fabrication shop, Victaulic estimates that fab shop workers can groove and assemble Victaulic systems at the rate of 50 diameter inches per man-hour.

Virtual Truck Loading Software

Victaulic estimates that projects can save up to two-thirds on shipping costs because, unlike welded systems, Victaulic prefabricated parts can be laid flat for transportation.

Fabricate pipe at your convenience – Victaulic provides comprehensive cut sheets to simplify fabrication in the shop or in the field.

Empowered Service – An integrated supply chain is about process control, whether in-house or upstream, and access to information required by the customer when it’s needed. From sourcing of raw materials through production to delivery, Victaulic integration means best in class service throughout the life of your project.

Dependable Consistency – With five foundries and ten manufacturing facilities worldwide, Victaulic is uniquely positioned in the industry to leverage global capacities and logistics to meet the demands of global customers.

Bag & Tag, Coordinated Shipments – Victaulic will provide your package of couplings, valves and fittings, bagged and tagged by isometric or plan-and-section drawing along with pipe cut sheets. Delivery is made only when and where you need, minimizing material handling and storage.

Learn more at www.victaulic.com/projectmanagement
AEP COGENERATION PLANT  Plaquemine, Louisiana

When the contractors in Louisiana needed to update their instrument air lines, Vic-Press™ for type 304 stainless steel was selected. The stainless steel material provided a cleaner system, reducing maintenance associated with carbon steel piping and reducing long-term operational costs.

PORTLANDS ENERGY CENTER  Toronto, Ontario, Canada

Grooved-end couplings, valves and fittings were selected to join cooling, service, raw, and filtered water lines up to 12”/300mm. Vic-Press for small diameter stainless steel was installed on instrument air and plant air systems. Using the handheld pressing tool, installers were able to securely join air lines in seconds.

WEST KIMBERLY POWER  Broome; Halls Creek; Fitzroy Crossing; Derby; Western Australia

Due to tight construction schedules, Victaulic grooved piping solutions were chosen for the glycol and radiator water lines for these natural gas facilities and because these facilities are remotely located, ease of maintenance was also a concern to the engineers. Victaulic provides a union at every joint, facilitating maintenance and repairs.

KRAFTWERK STEAM POWER PLANT  Weener, Germany

One concern facing Weener Energie executives was the operation of their vacuum system. Because Victaulic grooved systems are comprised of individual connections, it allows easy access for quick maintenance. Victaulic was selected for use on potable water, vacuum, waste water, and fire protection services.

COMBIGOLFE IPP  Fos-sur-Mer, Marseilles, France

In order to protect the equipment such as turbines and transformers, wet, deluge and preaction systems were combined for this facility. Victaulic products were chosen for their quality, availability and speed of installation. Installation-ready couplings install 10 times faster than other pipe joining methods.

HOT SPRINGS POWER PLANT  Hot Springs, Arkansas, USA

With a union at every joint, Victaulic systems allowed contractors to keep up with the accelerated schedule of the Hot Springs plant. Victaulic grooved products and Vic-Press for stainless steel were used to connect instrument air, compressed air, de-ionized ice water, and chilled water systems within the facility.

For more on Victaulic gas-fired solutions visit www.victaulic.com/power
Coal-fired. Experience You Can Count On.
SO₂ emissions are reduced at First Energy’s W.H. Sammis plant using flue gas scrubber nozzles joined to the wet system using Victaulic Style 220 FGN couplings. The Style 220 is a single-bolt alloy coupling designed for simplicity and speed. In addition to being quick and easy to install, engineers at First Energy enjoyed savings from reduced labor and material costs due to their maintenance benefits.

Ash and pulverized coal present unique piping challenges due to their heat and their abrasive nature. Victaulic mechanical couplings were selected to join the combined 15 kilometers of coal and ash pipe at Hunan Yiyang Power because of their ability to accommodate system expansion and deflection caused by temperature fluctuations, as well as ease of maintenance.

When engineers at the Belchatow Power Plant needed to build additional capacity (858MW), they selected Victaulic couplings, valves, and fittings for their closed cycle cooling water, raw water, waste water, fire protection, and slurry water piping systems. Contractors were being held to a tight schedule and safety on the site was paramount to the owners.

When Tuscon Electric needed to build their new 750-megawatt plant, they called on the Victaulic to provide Style 152A expansion joints for their pneumatically conveyed coal powder lines. This large diameter coupling can accommodate up to 4 degrees of angular deflection, protecting a system from dynamic expansion and deflection.

Wisconsin Energy was facing increase demand and set out to construct the second largest power plant in North America. Victaulic Construction Piping Services (CPS) were utilized to review the plans and ensured that they were drawn to proper Victaulic specifications. Vic-Stix, prefabricated piping segments were delivered to the jobsite to minimize material handling.

Victaulic fire suppression couplings and devices were selected to protect assets at Springfield’s 250-megawatt plant. Galvanized Style 07 rigid couplings and fittings, as well as Series 705 butterfly valves are keeping Springfield’s systems secure and worry free.
Hydroelectric. Experience You Can Count On.
TYPICAL APPLICATIONS INCLUDE:

Auxiliary Cooling Water
Bearing Lube Oil Lines
Building Services
Chemical Cleaning Systems
Closed Cooling Water
Condensate Water Makeup
Condenser Water
Cooling (Circulating) Water
Cooling Tower Piping
Deionized Water
Demineralized Water
Drains
Fire Protection
Fish Bypass
Hydronic Heating
Instrument Air
Plant Utility (Service) Air
Penstock
Potable Water
Service Water
Turbine Cooling Water
Waste Water

For more on Victaulic **hydroelectric** solutions visit www.victaulic.com/power

**HOOVER DAM**  Boulder City, Nevada, USA

Engineers at the Hoover Dam chose Victaulic stainless steel, ductile iron and copper solutions when they needed to replace aging potable water and wastewater systems in 2003. The project was completed smoothly and on-time due to the ease and speed of installation afforded by Victaulic solutions.

**SOUTH FALLS GENERATING STATION**  Bracebridge, Ontario, Canada

144”/3650 mm Victaulic Depend-O-Lok expansion couplings were selected by Ontario Power when they decided to renovate their penstock line. Comprised of two housing segments and ten nuts and bolts, this solution was installed up to 70% faster than equivalent welding. With welding off the job-site safety was improved, weather delays were minimized, and the project was completed on-time.

**EISERNES TOR**  Portile de Fier, Romania

Victaulic Construction Piping Services (CPS) provided man-hour analysis for the cooling water and turbine cooling water piping renovation project, which began in 2004 and will be completed in 2014. With these detailed estimates, the contractor is able to ensure that construction stays on schedule and the plant will hit their long range target.

**HYDRO-QUEBEC BEAUAHARNOIS**  Beauharnois, Québec, Canada

With 38 generating units and an installed capacity of 1,755-megawatts, this run of the river station is one of the largest in the world. Faced with a large amount of ground movement, Victaulic Style 150 mover expansion joints and Style 75 couplings were installed on a 4–6/100–150 mm Schedule 80 PVC drainage system. Galvanized Style 150 mover joints along with Style 489 stainless steel couplings solved the problem on a stainless steel service air system.

**ROCKY REACH DAM**  Wenatchee, Washington, USA

Utilizing a first-of-its-kind juvenile fish bypass system, engineers at Rocky Reach ensured that young salmon and steelheads could continue on their way to the ocean. Victaulic Depend-O-Lok restrained couplings were used along the full length of the dam, eliminating the need to construct AWWA M11 harnesses for thrust control saving time and lowering costs.

**CANOE CREEK**  Vancouver Island, British Columbia, Canada

Victaulic couplings were installed in place of welded pipe joints on the penstock lines of this 5.5 megawatt run-of-the-river hydro facility. During construction, rain often fell heavily. Since Victaulic couplings could be installed in any weather condition, crews were able to proceed without costly delays, in spite of the B4 percent grade terrain.
Alternative. Experience You Can Count On.
For more on Victaulic alternative solutions visit www.victaulic.com/power

**TYPICAL APPLICATIONS INCLUDE:**

- Auxiliary Cooling Water
- Bearing Lube Oil Feed Lines
- Chemical Cleaning Systems
- Chemical Treatment Systems
- Closed Cooling Water
- Condensate Water Makeup
- Condenser Water
- Cooling (Circulating) Water
- Cooling Tower Piping
- Cooling Water Chemical Treatment
- Deionized Water
- Demineralized Water
- Drains
- Fire Protection
- Hydronic Heating System
- Instrument Air
- Nitrogen
- Plant Utility (Service) Air
- Potable Water
- Service Water
- Urea Systems
- Vacuum Lines
- Waste Water
- Water Washdown

**HAIYANG & SANMEN NUCLEAR PLANTS**

Haiyang, Shandong Province & Sanmen, Zhejiang Province, China

China National Nuclear Corporation and China’s State Nuclear Power Technology Corporation selected Victaulic Vic-Press stainless steel solutions for providing compressed air throughout their facilities for their speed and ease of installation. Specified by Westinghouse and The Shaw Group Inc., construction of these four Westinghouse AP1000 reactors are currently ahead of schedule.

**COFRENTE NUCLEAR PLANT**

Valencia, Spain

Cofrentes needed a dependable fire protection system installed in their storage buildings. Victaulic fire protection products were chosen due to their ease and speed of installation. The Victaulic FireLock NXT preaction fire protection system provided a complete solution, from sprinkler heads to valves, allowing for a more organized, less costly install.

**WOODLAND 3**

Modesto, California, USA

Galvanized Style 107H QuickVic® couplings were specified by Burns & MacDonnell to join the galvanized cooling water system to the (6) Wärtsilä reciprocating engines/generators, both for their ability to join galvanized pipe without damage to the galvanization layer, and for the high temperature tolerance provided by the Victaulic produced gaskets.

**SOLID WASTE AUTHORITY**

West Palm Beach, Florida, USA

When the SWA of West Palm Beach needed to replace their boiler, Victaulic grooved and Pressfit® couplings were selected for their speed and overall labor savings. For compressed and instrument air, service, demineralized and raw water, as well as urea and limestone slurry lines, Victaulic couplings, valves and fittings met the demands of the project as well as the rigors of the application.

**CENTRALE GEOTERMICA**

Pisa, Italy

Due to the large diameter piping, high temperatures and the need to frequently clean the piping system, General Electric required an innovative piping solution. Victaulic provided silicone gaskets suitable for up to 350°F/176°C and Vic-Rings to accommodate 30–66”/760–1670 mm pipe, providing a robust, high temperature solution with a union at every joint.

**LANAI POWER PLANT**

Honolulu, Hawaii, USA

Victaulic Vortex® fire protection can suppress fires in open, ventilated spaces making it the ideal choice to protect electric generator equipment, which do not typically provide for room integrity. Further, since the Victaulic Vortex system affords a minimal presence of water, it is better suited for the protection of electrical equipment and is safe for personnel.
VICTAULIC

Pipe Joining Solutions.

Complete solutions for the power generation industry

Victaulic continues to develop products to meet the rigorous demands and challenging environments of the power generation industry. Designed to make pipe joining faster, easier and more economical, Victaulic couplings, valves, fittings, and specialty products allow engineers to build complete piping systems from a single source.

Vic-Press™ for Schedule 10S Stainless Steel

This small diameter stainless steel system joins Schedule 10S pipe in just seconds using a hand-held pressing tool. Vic-Press systems are ideal for compressed air, instrument air, eye wash stations and a variety of other systems. Unlike welded systems Vic-Press is environmentally friendly completely eliminating the noxious fumes and hazardous conditions associated with welding.

FEATURES AND BENEFITS
- Uses standard Schedule 10S stainless steel pipe
- Sizes from ½"–2'/15–50 mm for pressures up to 500 psi/3450 kPa
- System includes couplings, valves, fittings and tools

Installation-ready Couplings

Victaulic installation-ready couplings use the same groove profile and have the same performance characteristics of original groove system couplings. Installing up to 90 percent faster than welded systems and in 50 percent less time than standard groove couplings.

FEATURES AND BENEFITS
- No loose parts to lose or drop; eliminates spare parts on job site
- The fastest way to mechanically join 2–8'/50–200 mm systems
- Bolt pad-to-bolt pad installation for visual verification of joint integrity

www.victaulic.com/power
Advanced Groove System (AGS)

Advance Groove System products are designed with a patented groove profile for large diameter, high pressure services. The two-piece coupling design for the full size range facilitates installation and maintenance when required.

FEATURES AND BENEFITS
- Sizes range from 14–60”/350–1525 mm for pressures up to 350 psi/2400 kPa
- Full line of couplings, fittings, valves and strainers
- Flexible and rigid couplings available
- Ideal for water and non-abrasive services

Depend-O-Lok

Victaulic Depend-O-Lok couplings join large diameter pipe using one of four basic designs; non-restrained, expansion, restrained, and restrained dynamic.

FEATURES AND BENEFITS
- Standard sizes range from 6–144”/150–3650 mm for pressures up to 400 psi/2750 kPa; Larger sizes and higher pressure requirements available as special order items
- Available for carbon steel, stainless steel, HDPE, pre-stressed concrete, and fiberglass

Grooved End Valves

Victaulic grooved end valves weigh one-third less than equivalent flange valves for easier handling and installation. Featuring ISO standard mounting flanges Victaulic grooved valves can accept most types of actuators.

FEATURES AND BENEFITS
- Grooved end valves available in butterfly, ball, check and plug configurations for carbon steel or stainless steel systems from 1½–24”/40–600 mm
- Valves available lined for severe services

Grooved End Fittings

Fittings with grooved ends weigh substantially less than flanged bends and install in one-third the time of weld bends. A variety of linings and coatings can be applied to grooved standard, 3D, 5D and 6D bends. Fittings with linings and coatings are not compromised during installation since no heat is generated during the joining process.

FEATURES AND BENEFITS
- Pre-groove bends eliminate on-site preparation and reduce scheduled maintenance time by up to 65%
- Available linings include rubber-lined, urethane-lined, ceramic-lined, and many others
Pipe Joining Solutions.

Complete solutions for the power generation industry

**Plain End Steel System**
Where pipe preparation is impractical or where a quick repair may be required the Victaulic plain end piping system is the choice of many installers. The plain end coupling has hardened, sharpened teeth that firmly grip the outside diameter (OD) of the pipe.

**FEATURES AND BENEFITS**
- No special pipe end preparation necessary
- Sizes from 1 – 12”/25 – 300 mm for pressures up to 750 psi/5175 kPa
- Full line of plain end fittings also available

**HDPE Plain End System**
Victaulic HDPE plain end products eliminate the need for special equipment and crews. Using standard socket wrenches HDPE couplings can be installed in a matter of minutes. No special pipe end preparation is required and once the coupling is installed you have visual verification of proper installation.

**FEATURES AND BENEFITS**
- Sizes from 2 – 20”/50 – 500 mm
- HDPE plain end couplings are stronger than the pipe they join
- Transition coupling available for joining HDPE to steel piping

**Expansion Joint Coupling**
Large diameter pulverized coal/limestone coupling with four degrees of deflection capability. Style 152A couplings can be utilized for expansion and contraction or rotation, or a combination of deflection, expansion, contraction, and rotation. Designed to be used in applications such as coal-fired generation facilities that require extreme angular deflection, contraction and/or expansion.

**FEATURES AND BENEFITS**
- Sizes range from 10 – 30”/250 – 780 mm

**Flue Gas Nozzle Coupling**
Style 220/221 FGN couplings provide a mechanical joint for joining shouldered alloy and fiberglass reinforced pipe (FRP) used in flue gas desulfurization vessels. Lightweight, single-bolt design makes installation easier and faster than traditional flanged connections. Eliminates over-tightening and possible “cracking” of nozzles.

**FEATURES AND BENEFITS**
- Available in 2 ½ or 4”/65 or 100 mm
- Allows 360 degree nozzle orientation while flanged only permits 90 degrees
- Simplified maintenance, reducing downtime due to plugging/cleaning of the nozzle
Fire Protection Systems

Victaulic was the first grooved piping system manufacturer to receive a UL Listing for use on fire protection systems. From our revolutionary FireLock NXT® devices to our full line of sprinkler products, Victaulic is a single source for fire protection systems.

Victaulic Vortex® Fire Suppression System

FEATURES AND BENEFITS
- Industry's first and only hybrid Nitrogen-Water fire suppression solution offering nearly zero wetting of protected areas
- Reduces clean-up costs and equipment replacement
- Green design that is safe for the environment and personnel
- Open Space effectiveness, room integrity not necessary
- Quick system recharge, minimal facility downtime
- No toxic agents

FireLock NXT Devices

FEATURES AND BENEFITS
- Lower operating pressure requirements
- Ultra-fast trip time and water delivery
- Dry, Deluge and Preaction

Vic-Press Tool

FEATURES AND BENEFITS
- The Vic-Press system requires a pressing tool designed for securing Vic-Press products onto standard, off the shelf Schedule 10S stainless steel pipe
- Battery operated; this tool comes with two 18v lithium ion batteries and 120v or 220v charging station

Pipe Preparation Tools

Victaulic has been in the tool business for over 65 years with the introduction of cut grooving tools in 1945 and roll grooving tools in the 1950’s.

Roll Grooving Tools

FEATURES AND BENEFITS
- Patented Enhanced Tracking Rolls avoid pipe walk-off
- Available in manual, field and shop models
- Direct groove pipe sized ¾–36”/20 – 1525 mm

Cut Grooving Tools

FEATURES AND BENEFITS
- Best method for pipe preparation on abrasive systems such as tailings, slurries and hydraulic fill lines
- Cut grooves maintain smooth inner flow path while removing less metal than threaded joints
- Direct groove pipe sized ¾–24”/20 – 600 mm

Hole Cutting Tools

FEATURES AND BENEFITS
- Permits hole placement where needed along the pipe line
- Hot tap unit allows tapping into steel pipe systems under pressures up to 500 psi/3450 kPa

Vic-Press Tool

FEATURES AND BENEFITS
- The Vic-Press system requires a pressing tool designed for securing Vic-Press products onto standard, off the shelf Schedule 10S stainless steel pipe
- Battery operated; this tool comes with two 18v lithium ion batteries and 120v or 220v charging station
Victaulic invented the grooved end system for pipe joining in 1925. More than 85 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 provide mechanical piping systems that lower costs, improve productivity, reduce risk and allows for system expansions.

Visit www.victaulic.com/power
- Searchable product and global project database
- Download product submittals and literature
- Piping software demos and modules
- Engineering support services