VICTAULIC

GALVANIZED PRODUCT LINE

The fastest, safest and easiest way to join corrosion resistant piping systems
Many systems require corrosion protection which can be achieved using coatings, or a variety of materials and finishes such as stainless steel and galvanizing. Victaulic provides a full line of galvanized products that offer economical corrosion resistance for the following systems:

- Plant Air
- Drain Lines
- Fire Protection Systems
- Condenser Water
- Domestic Water
- Utility Water
- Waste Water

QuickVic® couplings are assembled onto pipe without disassembling the bolts, nuts and housings. This installation-ready, patented design reduces handling and speeds installation. Available in sizes from 2–8" /50–200mm

Fittings are supplied with grooved or shouldered ends to permit fast installation without field preparation.

A two-piece housing and a wedge-shaped groove delivers pressure ratings up to 350 psi/2400 kPa, depending on size and wall thickness, for sizes ranging from 14–60/350–1525 mm
Nothing competes with grooving galvanized pipe.

**WELDING GALVANIZED**

Welding galvanized pipe can be as much as 10 times slower than installing grooved products, and requires a certified welder to perform the job. The process of welding, especially in the case of galvanized pipe, releases chemical agents in the form of hazardous fumes which can cause dangerous and long lasting effects to workers health. Health issues are also linked to the over-exposure to ultraviolet and infrared radiation, as well as intense visible light that is produced by the electric arc in the welding process.

Welding requires extensive downtime when rework or access to the system is needed for maintenance. This downtime is extremely minimal when working with a grooved system.

**THREADED GALVANIZED.**

Threading pipe is not only time consuming, but has been known to leak. Maintenance on threaded systems is difficult and often requires complete replacement of the joint.

**FLANGED GALVANIZED.**

Flanges must first be threaded or welded on to the pipe prior to being galvanized. The pickling process can become quite problematic and result in the distortion of the flanges. The zinc build up on the flange faces may also cause installation problems and leaks. Many times the flange face needs to be ground down to provide a proper sealing surface. Any rework in the system requires more than 2/3 the time needed when utilizing a grooved system.

**Alternative Methods**

- **Stage pipe and fittings**
  - Fabricate pipe spools with flanges for field joints
  - Assemble system to ensure correct fit
  - Disassemble system
  - Transport to galvanizing plant
- **Install system**
  - Unload pipe spools
  - Transport back to location
  - Galvanize pipe spools
  - Pickle pipe spools

**Grooved Method**

- **Stage pipe and fittings**
  - Fabricate pipe spools with grooved ends
  - Install system with pre galvanized products
Grooved Technology & Galvanized Process.

Using grooved technology by Victaulic for a galvanized system creates multiple benefits:

- Union at every joint
- Time savings
- Ease of maintenance
- Cost Savings
- Meets the requirements of multiple approval agencies

Safety at the Core.

By using Victaulic galvanized products to join your galvanized system you will maintain corrosion resistance, all the while upholding safety at the jobsite. Victaulic joining methods eliminate the toxic fumes and light exposure hazards that are exponentially increased when using other joining methods for galvanized pipe. Re-work is reduced and in many cases completely eliminated. When system expansions and maintenance are required, Victaulic helps to minimize both time and cost constraints.
INDUSTRIAL PROJECT REFERENCES

OIL, GAS & CHEMICAL
Pemex Marine Region Northeast – Ciudad del Carmen, Mexico
Lyondell Chemical – LaPorte, Texas
Bayer Chemical – Baytown, Texas
DuPont – Laporte, Texas
DuPont – Beaumont, Texas
Dow (Roman Haas) – LaPorte, Texas
Dow – Freeport, Texas
Dow – Seadrift, Texas
BP – Texas City, Texas
Dow – Taft, Louisiana
Monsanto – Luling, Louisiana
BASF – Geismer, Louisiana
Georgia Pacific – Port Hudson, Louisiana
Total – Bayport Texas
Tesoro – California
Marathon Pump Alley Deluge – Detroit, Michigan
Eastman Everlok – Kingsport, Tennessee
IOCAL Naphtha – Haryana, India
Caltex Crude Wharf Upgrade – Brisbane, Queensland, Australia
GS Caltex Heavy Oil Upgrade No. 2 – Yeosu, Korea
SAGGAS (Sagunto Regasification Plant) – Sagunto, Spain

GENERAL INDUSTRIAL
Springfield Power Plant – Springfield, Illinois, United States
Chrysler Kenosha Engine – Kenosha, Wisconsin
Toyota Paint, Top Coat & Final Contract – Cambridge, Ontario, Canada
Gumi, Philips/ LG LCD Plant – Daegu, South Korea
Hyundai Motor Manufacturing – Montgomery, Alabama
Amcor Stage 1 – South Australia, Australia
Amcor Glass Bottling Plant – South Australia, Australia
The Eaton Automotive Plant – Bielsko-Biala, Poland
Dow Chemical – Red Deer, Alberta, Canada
Celltrion Biopharmaceutical Plant – Incheon, Korea
Samsung SDI’s 4th PDP Line – Yangsan City, Korea
GS Caltex Heavy Oil Upgrade No.2 – Yeosu, Korea
ST Microelectronics – Johor, Malaysia
Colgate Palmolive Plant – Morristown, Tennessee
GTAA cogeneration Plant – Mississauga, Ontario

MUNICIPAL
George W. Kuhn Drain – Madison Heights, Michigan

SHIPBUILDING
City Wismar & Cape Mollini – Warnemünde, Germany
COMMERCIAL PROJECT REFERENCES

HVAC

Esplanade Theatre on the Bay – Singapore
Fu Hsing School Building – Taipei, Taiwan
Hsin Kong C1 Building – Taipei, Taiwan
Temerloh Hospital – Temerloh, Pahang, Malaysia
The Comtech – Singapore
Calpine 717 Texas – Houston, Texas
Superdome – New Orleans, Louisiana
Citizens Bank Park – Philadelphia, Pennsylvania
Wimbledon Center Court – London, United Kingdom
Siemens – Düsseldorf, Germany
One Hanson Place – Brooklyn, New York, United States
China Overseas Square – Beijing, China
Safeco Field, Mariners Stadium – Seattle, Washington
Jin Mao Tower – Shanghai, China
Burj Al-Arab & Jumeirah Beach Hotel – United Arab Emirates
Petco Park, San Diego Padres Ball Park – San Diego, California
San Jose Joint Library – San Jose, California
Europa Center – Berlin, Germany
Grand Melia – Jakarta, Indonesia
Mid Valley Megamall – Kuala Lumpur, Malaysia
Pentagon – Washinton, DC, United States
Reliant Energy Plaza – Houston, Texas
San Li TV Building – Taipei, Taiwan
Menara Kuala Lumpur – Kuala Lumpur, Malaysia
Palmitve Building – Chicago, Illinois
Reliant Stadium – Houston, Texas
The Gateway – Singapore
Singapore Mass Rapid Transit – Singapore
Tuntex Kaohsiung – Kaohsiung, Taiwan
Metro Downtown Transit Center – Houston, Texas
Niagara Fallsview Casino Resort – Niagara Falls, Canada
Singapore Management University – Singapore
Centro Comercial Rivas – Madrid, Spain
Gainsborough Studios – London, United Kingdom

FIRE PROTECTION

One Potomac Yard – Arlington, Virginia
Airbus Assembly Plant – Broughton, Wales
UBC Life Sciences Centre – Vancouver, British Columbia
Centro Commerciale – Novara, Italy
Millenium Tower – Wien, Austria
Europark – Salzburg, Austria
LG CNS IT Center – Seoul, Korea
Singtel Data Center – Singapore
Central Shopping Mall at Clarke Quay – Singapore
Panoramahaus Dornbirn – Dornbirn, Austria
55 Allen Plaza (Ernst & Young) – Atlanta, Georgia
Hilton Hotel Southlake – Southlake Texas
Choongwae Dangjin Factory – Dangjin, Korea
President Hotel and Rapid Transit Station – Taipei, Taiwan
HQB Hackesches Quartier – Berlin, Germany

President International HQ Building – Taipei, Taiwan
Incheon International Airport – Incheon, Korea
Matrix Corporation – South Plainfield, New Jersey
Stationnement Place – Quebec City, Quebec, Canada
Metro Warszawskie – Warszaw, Poland
São Paulo Football Club Stadium – São Paulo, SP Brazil
Cafferata Fireworks – Nistelrode, The Netherlands
ProLogis Gdansk – Gdansk, Kokszki, Poland
Johnson Controls – Siemianowice Slaskie, Poland
Suzhou Science and Culture Arts Center
Allegheny County Morgue – Pittsburgh, Pennsylvania
Sony Center – Berlin, Germany
Western Grocers – Calgary, Alberta
Pacific Financial Building – Taipei, Taiwan
Kanyon Levent – Istanbul, Turkey
Zlote Tarasy – Warszawa, Poland
DeMoulas Distribution Center – North Andover, Massachusetts
Carrefour – Rybnik, Poland
Jupiter Pitesti – Pitesti, Romania
GS Caltex HOU No.2 project is constructing the second plant that converts heavy oil into cleaner-burning transportation fuels such as gasoline and diesel. The unit close to the refinery's plant in Yeosu, Korea completed in 2007 at a cost of $1.6 billion. Also GS Caltex Corporation has a plan to build a third plant to process heavy oil into transportation fuels in near future.

Victaulic provides total solutions to its fire fighting, tank, water spray and straight piping lines around the tank. Welding galvanized pipe is extremely difficult and potentially dangerous as it generates noxious fumes. With the cold formed grooving process there are no hazardous flames or noxious fumes. Additionally anytime maintenance is required access to the system is as simple as removing two bolts and nuts from any coupling in the pipeline. Since each joint is a union you have multiple points of access for any system maintenance or expansion.

**GS Caltex Heavy Oil Upgrade No. 2**

- Yeosu, Korea

GS Caltex HOU No.2 project is constructing the second plant that converts heavy oil into cleaner-burning transportation fuels such as gasoline and diesel. The unit close to the refinery's plant in Yeosu, Korea completed in 2007 at a cost of $1.6 billion. Also GS Caltex Corporation has a plan to build a third plant to process heavy oil into transportation fuels in near future.

Victaulic provides total solutions to its fire fighting, tank, water spray and straight piping lines around the tank. Welding galvanized pipe is extremely difficult and potentially dangerous as it generates noxious fumes. With the cold formed grooving process there are no hazardous flames or noxious fumes. Additionally anytime maintenance is required access to the system is as simple as removing two bolts and nuts from any coupling in the pipeline. Since each joint is a union you have multiple points of access for any system maintenance or expansion.

**MARKET:**
Industrial

**VICTAULIC:**
- Speed of installation
- Ease of maintenance
- Simplicity and clean look of the Victaulic system

**OWNER:**
GS Caltex

**CONTRACTOR:**
GS Construction

**ENGINEER/CONSULTANT:**
GS Construction

**COMPLETED DATE:**
2007

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water and Form</td>
<td>Galvanized Carbon Steel</td>
<td>Max. 10”</td>
</tr>
</tbody>
</table>

www.victaulic.com
PS-IND.79  477B REV C  © REGISTERED TRADEMARK OF VICTAULIC – © COPYRIGHT 2007 VICTAULIC
Sagunto’s Regasification Plant project has been ongoing since 2003, with multiple tanks being commissioned throughout the process. Welding is the most common pipe joining method on LNG projects. However, in 2010 the construction team on site, understanding the advantages of using Victaulic galvanized and stainless steel product line, decided to replace the pre-existing stainless steel pipe joined by welding with Victaulic’s galvanized products. In addition Victaulic was used on the tank’s fire protection system.

Victaulic solutions provided many benefits on this project. Most crucial to the contractor was that installation of the plant water line could be done while the plant was in full operation. By using Victaulic’s grooved system this task was completed both safely and in a timely manner. This also allowed for cost savings on the overall project.

### Specifications:

<table>
<thead>
<tr>
<th>Services</th>
<th>Pipe Materials</th>
<th>Pipe Size Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Water</td>
<td>Galvanized Carbon Steel</td>
<td>¾’ – 6’/26 – 168 mm</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Carbon Steel and Galvanized Carbon Steel</td>
<td>2’ – 10’/60.3 – 273.0 mm</td>
</tr>
</tbody>
</table>
In early 2009, construction will be completed on the City of Springfield, Illinois
250 megawatt (MW) pulverized coal-feed power generation station. This is
one of many projects on which Foster Wheeler has installed the Victaulic
Style 152A expansion joint coupling on pulverized coal feed lines due to the
outstanding performance and reliability of the product.

The Victaulic Style 152A expansion joint couplings were installed in
conjunction with Style 77 flexible couplings on the pulverized coal feed piping,
accommodating for up to four degrees of deflection, as well as expansion,
contraction and rotation. The Style 152A provides an easily maintainable
system that requires no pipe windows and protects the integrity of the system.

In addition, galvanized Victaulic Style 07 rigid couplings and fittings, as well as
Series 705 butterfly valves were installed on the fire water lines.

### Specifications:

<table>
<thead>
<tr>
<th>Services</th>
<th>Pipe Materials</th>
<th>Pipe Size Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulverized Coal Feed Lines</td>
<td>Cut Grooved Carbon Steel</td>
<td>18&quot;/450 mm</td>
</tr>
<tr>
<td>Fire Water</td>
<td>Galvanized Carbon Steel</td>
<td>10&quot;/250 mm</td>
</tr>
</tbody>
</table>
STX Europe, formerly Aker Yards, is an international shipbuilding company based in Norway. As the largest shipbuilding company in Europe and the fourth-largest firm in the world, STX requires that all vessels meet the highest of global industry standards.

In 2006, construction was completed on two containerships - Cape Mollini and City Wismar. Because Victaulic products meet stringent global approval standards, the Victaulic grooved pipe joining method was specified and installed on the ship's galvanized carbon steel drinking water, sea cooling water and fire protection lines.

**City Wismar & Cape Mollini**

Warnemünde, Germany

STX Europe, formerly Aker Yards, is an international shipbuilding company based in Norway. As the largest shipbuilding company in Europe and the fourth-largest firm in the world, STX requires that all vessels meet the highest of global industry standards.

In 2006, construction was completed on two containerships - Cape Mollini and City Wismar. Because Victaulic products meet stringent global approval standards, the Victaulic grooved pipe joining method was specified and installed on the ship's galvanized carbon steel drinking water, sea cooling water and fire protection lines.

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking Water</td>
<td>Galvanized Carbon Steel</td>
<td>1 – 8”/25 – 200 mm</td>
</tr>
<tr>
<td>Sea Cooling Water</td>
<td>Galvanized Carbon Steel</td>
<td>2 – 12”/50 – 300 mm</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Galvanized Carbon Steel</td>
<td>2 – 10”/50 – 250 mm</td>
</tr>
</tbody>
</table>

**MARKET:**

Shipbuilding

**VICTAULIC SOLUTIONS:**

Reliability

Total Installed Cost

Meets Global Approvals

Ease & Speed of Installation

Lightweight Product

**OWNER:**

Schoeller Holding

Limassol

Cyprus

**CONTRACTOR:**

STX Europe (Formerly Aker Yards)

**ENGINEER/CONSULTANT:**

Aker Operation

**COMPLETED DATE:**

2006
Centro Comercial Rivas, located on Rivas Vaciadamadrid in Madrid, Spain required an innovative piping solution for their mechanical room. In order to supply heating and cooling systems to eleven roof tops, the piping system was a critical element to the success of this project.

The Victaulic grooved piping system was chosen for this project due to ease of maintenance, speed of installation and the technical support offered by Victaulic. Victaulic grooved couplings, fittings, Vic-300 MasterSeal™ Butterfly Valves, check valves, strainers and balancing valves were utilized on the mechanical room piping system. The grooved products, installed on galvanized pipe, allowed the team to avoid welding, thereby avoiding noxious fumes associated with welding.

### SPECIFICATIONS:

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Water</td>
<td>Galvanized</td>
<td>2 – 10” / 60.3 – 273 mm</td>
</tr>
<tr>
<td>Chilled Water</td>
<td>Galvanized</td>
<td>2 – 10” / 60.3 – 273 mm</td>
</tr>
</tbody>
</table>

**MARKET:** HVAC

**VICTAULIC SOLUTIONS:** Ease of Maintenance, Speed of installation, Technical support

**OWNER:** LUALCA Inmobiliaria

**CONTRACTOR:** WORESMAR SA

**ENGINEER/CONSULTANT:** AGUIRRE Asociados

**COMPLETED DATE:** 2006
During stage one of the new Amcor Glass Bottling Plant in South Australia, the project team required an innovative piping solution.

Amcor utilized the Victaulic roll grooved system on the compressed air, cooling water and vacuum lines and the cut grooved system on the cullett / process water lines.

The ease and speed of installation of the Victaulic system allowed the team to meet the accelerated construction schedule. Since there is a union at every joint with the grooved system, maintenance crews are able to reduce downtime associated with maintenance.

<table>
<thead>
<tr>
<th>SPECIFICATIONS:</th>
<th>PIPE MATERIALS:</th>
<th>PIPE SIZE RANGE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed Air (Hot, Cold, Wet &amp; Dry)</td>
<td>Galvanized</td>
<td>4” – 10”/114,3 – 273 mm</td>
</tr>
<tr>
<td>Cullett/Process Water</td>
<td>Galvanized</td>
<td>6” – 8”/168,3 – 219,1 mm</td>
</tr>
<tr>
<td>Cooling Water</td>
<td>Galvanized</td>
<td>4” – 10”/114,3 – 273 mm</td>
</tr>
<tr>
<td>Vacuum</td>
<td>Galvanized</td>
<td>4” – 8”/114,3 – 219,1 mm</td>
</tr>
</tbody>
</table>
During stage one of the new Amcor Glass Bottling Plant in South Australia, the project team required an innovative piping solution. Amcor utilized the Victaulic roll grooved system on the compressed air, cooling water and vacuum lines and the cut grooved system on the cullett / process water lines. The ease and speed of installation of the Victaulic system allowed the team to meet the accelerated construction schedule. Since there is a union at every joint with the grooved system, maintenance crews are able to reduce downtime associated with maintenance.

### Colgate-Palmolive Plant

The Colgate-Palmolive Plant located in Morristown, Tennessee is the new site for the Colgate-Palmolive’s oral care manufacturing operations. With a construction schedule of 2½ months and a facility of 220,000 sq ft/2,043 m², the owner mandated that the piping system should be maintained internally without having to involve expensive third party service contractors.

Victaulic was chosen for use on the compressed air services and chilled and domestic water systems because of its ability to maintain a fast track schedule within the required budget. Victaulic was also able to demonstrate its superior pipe joining technology over other grooved manufacturers.

Products used on this project included stainless steel, carbon steel and galvanized coupling fittings and valves as well as 14"/350 AGS products on the chilled water lines. The Victaulic bag and tag services were utilized when ordering product.

### Specifications:

<table>
<thead>
<tr>
<th>Services</th>
<th>Pipe Materials</th>
<th>Pipe Size Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed Air</td>
<td>Lightwall Stainless Steel</td>
<td>2½ – 4&quot;/60 – 100 mm</td>
</tr>
<tr>
<td>Chilled Water</td>
<td>Carbon Steel</td>
<td>2½ – 14&quot;/60 – 350 mm</td>
</tr>
<tr>
<td>Domestic Water</td>
<td>Galvanized Steel</td>
<td>2½ – 6&quot;/60 – 150 mm</td>
</tr>
</tbody>
</table>

**Market:** Industrial

**Victaulic Solutions:** Ability to compress schedules and demonstrate superior performance over other grooved manufacturers.

**Owner:** Colgate Palmolive

**Contractor:** Interstate Mechanical

**Engineer/Consultant:** Austin Company

**Completed Date:** December 2006
Braunkohlebagger 260

Garzweiler - Grevenbroch, Germany

The Braunkohlebagger 260 Mine in Garzweiler - Grevenbroch, Germany needed a fire protection system for the retrofit of their 20 year-old brown coal excavator.

VICTAULIC galvanized couplings were chosen for their speed of installation and rubber gasket components that provided vibration attenuation within the piping system.

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Protection</td>
<td>Galvanized</td>
<td>1½&quot; – 3&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(48.3 mm – 88.9 mm)</td>
</tr>
</tbody>
</table>

**MARKET:**
Mining

**VICTAULIC SOLUTIONS:**
Speed of installation, vibration attenuation

**OWNER:**
RWE-Power

**CONTRACTOR:**
Fischer Rohrbau

**ENGINEER/CONSULTANT:**
RWE-Power

**COMPLETED DATE:**
2004
IOCL Naphtha

IOCL Naphtha is a cracker plant that is being built to produce butane and propylene for the production of plastic granules (polypropylene and polyethylene) at the Panipat Refinery in Haryana, India. When looking at the different options to install the piping system, the owners and engineers soon decided that using the Victaulic system provided a better method of joining the galvanized pipe than welding.

The Victaulic pipe joining system is quick, easy and safe to install and without the use of special tools or certified installers. Choosing Victaulic eliminated the need for hot works, which simplified the health and safety requirements on site. Welding galvanized pipe creates hazardous fumes that can be completely avoided by using Victaulic couplings that are installed using a standard wrench. Using the Victaulic system provides an accessible union at every joint, which allows for faster, easier access to the system for future maintenance or system expansions.

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Protection</td>
<td>Galvanised steel</td>
<td>2 – 8'/60.3 – 219.1 mm</td>
</tr>
</tbody>
</table>

**MARKET:**

Oil

**VICTAULIC:**

Ease and speed of installation
No hotworks needed
Ability to easily retrofit
Ease of maintenance
Installation time savings
Safety

**OWNER:**

Indian Oil Corporation LTD

**CONTRACTOR:**

Tecnimont / L&T

**ENGINEER/CONSULTANT:**

Engineers India LTD

**COMPLETED DATE:**

Fall 2009
Located in the heart of the city at the intersection of two key Istanbul municipalities (Beşiktaş and Şişli), Kanyon is one of the most important residential and commercial projects not only in Turkey but also in Europe. Kanyon features homes with balconies, offices that integrate cohesively with work and pleasure and much more, all fused together with a unique approach to retail and entertainment in one extraordinary architectural shell.

In an effort to exceed national and international earthquake regulations, Victaulic was selected as the ideal pipe joining method for its ability to accommodate for seismic activity.

Victaulic Fire Protection systems and HVAC systems were used throughout the structure. Fire protection products included devices, sprinkler heads and accessories while the HVAC system was used on the cooling towers.

| SPECIFICATIONS: |
|-----------------|-----------------|------------------|
| SERVICES:       | PIPE MATERIALS: | PIPE SIZE RANGE: |
| Fire Protection | Carbon Steel    | 2 1/2 – 8" / 73,0 – 219,1 mm |
| Cooling Tower   | Galvanized      | 10 – 20" / 273,0 – 508,0 mm |

MARKET:
Fire Protection and HVAC

VICTAULIC SOLUTIONS:
Speed of installation
Ability to accommodate seismic movement

OWNER:
Eczacıbaşı Topluluğu and İş Gayrimenkul Yatırım Ortaklığı Joint Venture

CONTRACTORS:
DEMTA

ENGINEER/CONSULTANT:
ARUP

COMPLETED DATE:
2006
Safeco Field
Mariners Stadium
Seattle, Washington

The start of the Major League Baseball season was the critical deadline for this stadium project. Working on a fast-track schedule, Safeco Field had to be completed in time for the Seattle Mariners to take the field on Opening Day. This meant finding innovative ways to reduce the time required to complete this project.

As a vertically integrated manufacturer with its own galvanizing facilities, Victaulic was able to expedite material for the 24" (610,0mm) galvanized roof drain system under big league deadlines. To meet the imposed stringent deadlines, Victaulic was also specified and installed on all the waterlines.

<table>
<thead>
<tr>
<th>SPECIFICATIONS:</th>
<th>PIPE MATERIALS:</th>
<th>PIPE SIZE RANGE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>Galvanized Grooved</td>
<td>4&quot; – 16&quot; (114,3 mm – 406,4 mm)</td>
</tr>
<tr>
<td>Domestic Water</td>
<td>Copper</td>
<td>2&quot; – 6&quot; (60,3 mm – 168,3 mm)</td>
</tr>
<tr>
<td>Heating Water</td>
<td>Carbon Steel</td>
<td>2&quot; – 8&quot; (60,3 mm – 219,1 mm)</td>
</tr>
</tbody>
</table>

MARKET:
HVAC

VICTAULIC SOLUTIONS:
Fast-track construction schedule

OWNER:
King County

CONTRACTOR:
WA Botting

ENGINEER/CONSULTANT:
Flack & Kurtz

COMPLETED DATE:
July 1999
The President Hotel and Rapid Transit Station is located in the Xinyi District of Taipei. Because this local landmark rises 31 stories into the sky a piping system which could provide a safe, reliable solution for accommodating seismic movement was required.

Victaulic grooved end piping systems were chosen for use in this landmark high rise because of their ability to accommodate stresses caused by seismic movement as well as accommodate expansion, contraction and deflection of the pipelines. By installing Victaulic, the use of expansion joints throughout the building was not necessary.

On the 14 to 24 inch piping system, Victaulic provided the Advanced Grooved System (AGS) line of products. AGS provides unmatched strength and reliability on large diameter piping system. Because of its unique two-piece coupling design, the joint assembly is faster and easier thereby compressing the construction schedule.

### MARKET:
HVAC

### VICTAULIC SOLUTIONS:
Reliability of AGS large diameter piping system
Compressed the schedule
Accommodates expansion, contraction and deflection

### OWNER:
Uni-President Corporation

### CONTRACTORS:
YUAN LIH ELECTRICAL ENGINEERING CO., LTD.
GO-IN Engineering Co., Ltd.

### COMPLETED DATE:
2009

### SPECIFICATIONS:

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall Drainage</td>
<td>Galvanized Carbon Steel</td>
<td>2 – 8”/60.3 – 219.1 mm</td>
</tr>
<tr>
<td>HVAC</td>
<td>Galvanized Carbon Steel</td>
<td>2 – 24”/60.3 – 610.0 mm</td>
</tr>
</tbody>
</table>
Choongwae Dangjin Factory
Dangjin, Korea

Choongwae is the world’s leading pharmaceutical and healthcare company based in Korea. Since its foundation in 1945, the company has extended its business to many pharmaceutical sectors. In order to meet the need of development, Choongwae invested over $100 million to build its new factory in Dangjin. Choongwae Dangjin factory has an area of 31,931m² and total building floor area is 42,160m², which is about 13 times the size of a football field. The factory consists of 6 five-story buildings for manufacturing general medicine, aseptic medicine, liquid medicine and solid formulation medicine. With a production capacity of up to 150 million pieces per year, Choongwae Dangjin factory has become one of the biggest pharmaceutical factories in Korea.

There were several challenges during construction, with the primary concern being an 8-month construction schedule. Additionally, as a pharmaceutical factory, the project needed to satisfy international standards and meet jobsite safety and environmental requirements. The owner and contractor also required the most reliable and highest quality product to meet the demands of high pressure systems. Compared with other pipe joining methods such as flanging and welding, the Victaulic mechanical pipe joining system was ideal for countering these challenges and was installed on the project’s Fire Protection (FP) system and cooling water system.

MARKET:
HVAC and Fire Protection

VICTAULIC SOLUTIONS:
Speed of installation
Ease of installation
Time Savings
Safety

OWNER:
JW Pharmaceutical

CONTRACTOR:
GS Engineering & Construction

ENGINEER/CONSULTANT:
Humantech Korea

COMPLETED DATE:
March 2010

SPECIFICATIONS:

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling, Chilled and Hot water</td>
<td>Galvanized Steel</td>
<td>2 – 24&quot;/50 – 600 mm</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Galvanized Steel</td>
<td>2 – 8&quot;/50 – 200A</td>
</tr>
</tbody>
</table>

www.victaulic.com
The Gateway

Singapore

The Gateway, a thirty-seven story twin-tower office building in Singapore, required an innovative piping solution. Condenser riser water pipe lines needed to accommodate the lateral building movement due to wind load. Also, because the piping was being installed in tight spaces, welding was not allowed due to fire hazards.

The Victaulic grooved system was the perfect choice for this project since the couplings can be oriented in any direction when tightening. This is extremely valuable when working in tight spaces. The grooved system eliminated the need for a fire watch, and utilizing flexible couplings allowed the designers to accommodate for the piping movement.

Victaulic products with galvanized finish were used to inhibit external corrosion on the condenser water and fountain water lines.

<table>
<thead>
<tr>
<th>SPECIFICATIONS:</th>
<th>PIPE MATERIALS:</th>
<th>PIPE SIZE RANGE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condenser Water</td>
<td>Galvanized</td>
<td>16 and 18' / 406.4 – 457.0 mm</td>
</tr>
<tr>
<td>Fountain Water</td>
<td>Galvanized</td>
<td>8 and 10' / 219.1 – 273.0 mm</td>
</tr>
</tbody>
</table>
The Eaton Automotive Plant located in Bielsko-Biala, Poland produces spare parts for various car models and is the largest American automotive plant in southern Poland. Eaton Corporation is the global leader in fluid power systems and services for industrial, mobile and aircraft equipment; electrical systems and components for power quality; automotive engine air management systems, powertrain solutions and specialty controls for performance and intelligent truck drivetrain systems for safety and fuel economy.

The Eaton plant was looking to install both a wet and dry fire protection sprinkler system. A cost savings analysis provided by Construction Piping Services, combined with the complete range of fire protection products turned the investor towards using Victaulic. After receiving positive feedback, the contractor accepted Victaulic. The fire protection sprinkler system was installed on carbon steel; galvanized pipes.

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES:</th>
<th>PIPE MATERIALS:</th>
<th>PIPE SIZE RANGE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Fire Protection</td>
<td>Carbon Steel - Galvanized Pipes</td>
<td>1 1/2 – 10&quot;/48,3 - 273,0 mm</td>
</tr>
<tr>
<td>Sprinkler Installation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MARKET:**
Industrial

**VICTAULIC SOLUTIONS:**
Speed and ease of installation

**OWNER:**
Eaton Automotive - United States

**CONTRACTORS:**
Mutimon Polska Sp. z.o.o.

**ENGINEER/CONSULTANT:**
Wikatech - Bipromet

**COMPLETED DATE:**
March 2006
Menara Kuala Lumpur in Malaysia is a highly innovative combination of retail, leisure, entertainment and hi-tech center for telecommunications. The building serves as the country’s main telecommunications and multimedia broadcasting tower.

It is one of the tallest concrete towers in the world at 1380 ft (421 M) and also one of the tallest telecommunications towers in the world.

Victaulic grooved Style 77 flexible couplings were utilized on the riser pipes in order to provide angular deflection due to structure movement and sway from high wind loads. This allowed piping designers to include reliable joints for the potable water lines. Additionally, the flexible couplings used on the project accommodate seismic movements.

### SPECIFICATIONS:

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Protection Riser</td>
<td>Galvanized</td>
<td>2½&quot; – 8&quot; (73 mm – 219,1 mm)</td>
</tr>
<tr>
<td>Potable Water</td>
<td>316 Stainless Steel</td>
<td>¾&quot; – 8&quot; (26,9 mm – 219,1 mm)</td>
</tr>
</tbody>
</table>
Amcor Glass built a new glass bottling plant in South Australia. The owners required an innovative piping system that would allow them to have less downtime when performing maintenance.

Victaulic was used on compressed air, vacuum, cooling, and process water systems throughout the plant. The Victaulic grooved system not only provided ease of maintenance due to a union at every joint, but also shortened the up-front construction time.

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>PIPE MATERIALS</th>
<th>PIPE SIZE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed Air (Hot, Cold, Wet and Dry)</td>
<td>Galvanized</td>
<td>4 – 10’/114.3 – 273.0 mm</td>
</tr>
<tr>
<td>Cullet/Process Water</td>
<td>Galvanized</td>
<td>6 – 8’/168.3 – 219.1 mm</td>
</tr>
<tr>
<td>Cooling Water</td>
<td>Galvanized</td>
<td>4 – 10’/114.3 – 273.0 mm</td>
</tr>
<tr>
<td>Vacuum</td>
<td>Galvanized</td>
<td>4 – 8’/114.3 – 219.1 mm</td>
</tr>
</tbody>
</table>
Mechanical pipe joining technology originated in 1925 when Victaulic designed the first grooved end pipe joining system for water and air service piping. Recognized for its design capability and speed of assembly, Victaulic grooved end pipe joining technology transformed the piping industry, leading to dramatic gains in productivity. That's why among specifying engineers, owners and contractors around the world, Victaulic is the preferred mechanical system solution for new construction, retrofit and maintenance.

Visit www.victaulic.com for more information.