

Advanced PE Industrial Piping Systems

-  **Chem Proline[®]**
PE 100-RC Piping System
by Asahi/America Single Wall Piping System
-  **Chem Prolok[™]**
by Asahi/America Double Wall Piping System
- **Poly-Flo[®]** Double Wall Piping System



Chem Proline[®] • Chem Prolok[®] • Poly-Flo[®]

Another
Corrosion
Problem
Solved.[™]



Certified to
NSF/ANSI/CAN 61-G




ASAHI/AMERICA[®]
Your Experts in Plastics[™]

www.asahi-america.com

Chemical Piping Solutions

Asahi/America, in cooperation with our partner, AGRU of Austria, presents Chem Proline®, Chem Prolok® and Poly-Flo® - the most advanced polyethylene (PE) chemical service piping systems on the market. Made from the latest evolution PE resin material, these state-of-the-art systems are designed to handle the most aggressive and corrosive chemical applications.



Chemical Piping System



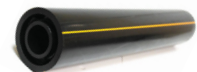
Chem Proline® - Single wall pipe, fittings and valves.



Chem Prolok® - Double wall pipe, fittings and leak detection.

Poly-Flo®

Poly-Flo® - Double wall pipe, fittings and leak detection.



Joining Methods

Chem Proline® is joined primarily with socket and butt fusion; electrofusion is also available where needed. Chem Prolok® and Poly-Flo® are joined with simultaneous butt fusion. These fusion joining methods are the most reliable joining systems available for all thermoplastic piping. Mechanical joints such as flanges, unions and threaded adapters are also available.



Anti-Leak Thread-Free Accessories

Back pressure regulators, relief valves, calibration columns, gauge guards and pulsation dampeners are all available with thread-free connections.



Specialty Fittings & Custom Fabrication

The standard fitting range is complemented by a wide variety of specialty fittings which are machined by Asahi/America from Chem Proline® PE bar and sheet stock.

We offer a wide variety of manufacturing capabilities for custom products including precision machining, system fabrication, final assembly, and engineering design. Our capabilities include valve boxes, headers, vessels, injection quills, assemblies and trays.



Features & Benefits

- Excellent chemical and corrosion resistance
- Available from stock in sizes 20 - 315mm (1/2" to 12")
- Fast installation and low cost of ownership
- UV resistant black
- NSF 61-G certified
- H2 ready for hydrogen applications
- Above or below ground installation



Certified to
NSF/ANSI/CAN 61-G



Material Properties

Asahi/America's Advanced PE systems shows no reduction in installed quality with high concentrations of sodium hypochlorite

- Superior stress cracking and abrasion resistance
- High creep rupture strength
- High pressure load resistance of 150psi at 68°F
- Wide temperature range (between -40°F - 140°F)
- Exceptional weldability
- High resistance to chemical attack
- High impact resistance and ductility

Chemical Resistance of Advanced PE

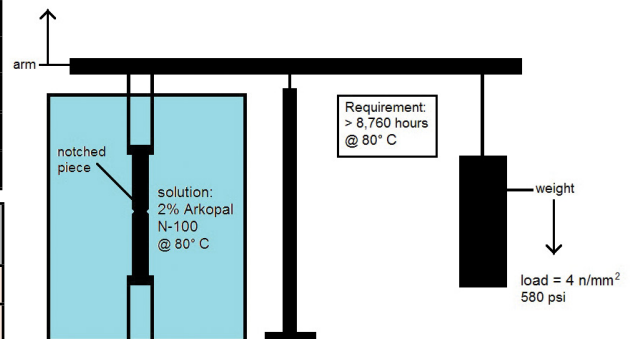
To enable the use of Advanced PE in new application areas, research by raw material suppliers has recently focused on a material property that is generally known as "resistance to slow crack growth" or "stress crack resistance." By means of process optimization in raw material production and special co-polymerization methods, the raw material suppliers have developed Advanced PE piping systems featuring outstanding stress crack resistance.

The main technical advantage of Advanced PE is the significantly higher resistance to slow crack growth. This is expressed by the requirements for the FNCT (full notch creep test) ISO 16770, which is greater than 8760 hours for Advanced PE in comparison to only 300 hours for PE 100 / PE 4710 resin.

Full Notch Creep Test (FNCT)

PE Class	Minimum Standard FNCT
PE 63	30 Hours
PE 80	100 Hours
PE 100	300 Hours
Advanced PE	8,760 Hours (1 year)

PE Class	Average Results FNCT Rupture time in hours
PE 63	7.5 Hours (2 samples)
PE 80	114 Hours (3 samples)
PE 100	533 Hours (5 samples)
Advanced PE	14,648 Hours (2 samples)



Full Notch Creep Test

Chemical Resistance of Advanced PE

Chemical Name	Chemical Symbol	Common Uses	Typical Concentrations / Conditions	Advanced PE Pipe Resistance	Advanced PE Valve	Special Considerations
Aqueous Ammonia	NH ₄ OH	Biocide Chloramination	19%	Resistant	PVC/EPDM	-
Sodium Hypochlorite (Bleach)	NaOCl	Biocide	up to 25%	Resistant	PVC/FKM	Vented Ball Valves
Sodium Hydroxide (Caustic)	NaOH	pH Adj./Corrosion Control	50%	Resistant	PVC/EPDM	-
Chlorine Gas - In Water	HClO	Biocide	< 3,500 ppm	Resistant	PVC/EPDM	-
Hydrochloric Acid	HCl	pH Adjustment	37%	Resistant	PVC/FKM	Vented Ball Valves
Hydrofluosilicic Acid	H ₂ SiF ₆	Fluoridation	50%	Resistant	PVC/EPDM	-
Hydrogen Peroxide	H ₂ O ₂	Oxidant	100%	Resistant	PVDF/PTFE	Diaphragm Valves
Peracetic Acid	CH ₃ CO ₃ H	Biocide	12%	Resistant	PVC/EPDM	-
Sulfuric Acid	H ₂ SO ₄	Raw Water Treatment & pH Adjustment	Up to 85%	Resistant	PVC/FKM	-

This data is for reference only. For specific application references, please contact Asahi/America's Engineering Department.

Advanced PE vs other Piping Systems

Asahi/America's proprietary advanced polyethylene resin provides the highest resistance to chemical attack.

Advanced PE vs PE 4710

- Over 800% more resistant to chemical crack propagation
- 40 times more stress crack resistant
- Requires no special bedding in buried applications
- Able to withstand point loads

Advanced PE vs PVC/CPVC

- No glued or threaded joints
- Greater ductility
- Reduced installation time, short cure times

Advanced PE vs FRP Pipe

- Better impact resistance
- Much shorter joint cure times

Advanced PE vs Plastic Lined Steel Pipe

- No flange/mechanical joints
- No metal corrosion issues

Advanced PE vs Metal Pipe

- Fusion joints are as strong as the pipe
- Non-metallic, no rust or corrosion

Advanced PE Piping Systems Supply Range

Chem Proline®

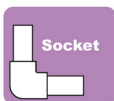
Pipe and Fittings

- 20 - 315mm (1/2" - 12") 150psi

Valves

- Type-21 Ball Valves: 20 - 110mm (1/2" - 4")
- Type-57P Butterfly Valves: 50 - 315mm (1-1/2" - 12")
- Type-14 Diaphragm Valves: 20 - 250mm (1/2" - 10")
- Ball Check Valves: 20 - 110mm (1/2" - 4")
- Regulator Valves, Relief Valves, Gauge Guards

Welding Methods



Chem Prolok®

Pipe and Fittings

- 1"x 3" through 12" x 16" 150psi x 45psi (Containment)

Leak Detection

- Complete range of leak detection available

Welding Methods



Poly-Flo®

Pipe and Fittings

- 1" x 1-1/2", 2" x 3" and 4" x 6" 150psi x 90psi (Containment)

Leak Detection

- Manual and probe detection options available

Welding Methods



Short Specifications



Chem Proline® pipe, molded fittings, valve end connectors and fabricated components shall be made of black polyethylene (PE) resin with a cell classification of PE445584C and shall conform to the material requirements according to PAS 1075. Valves shall be PVC or CPVC and shall be joined to the piping system by either a Chem Proline® PE end connector or an ANSI 150# flanged connection. System shall be SDR rated to 150psi at 68°F for general chemical service. System shall be joined by socket fusion, butt fusion and/or electrofusion.

Please contact Asahi/America Engineering for specific operating parameters for chemical service.



Chem Prolok® double contained pipe and fittings shall be made of black polyethylene (PE) resin with a cell classification of PE445584C and shall conform to the material requirements according to PAS 1075. Primary pipe shall be SDR rated to 150psi at 68°F. Secondary pipe shall be SDR11 rated to 150psi or SDR33 rated to 45psi at 68°F. System shall be joined by simultaneous butt fusion.

Poly-Flo®

Poly-Flo® double contained pipe and fittings shall be made of black polyethylene (PE) resin with a cell classification of PE445584C and shall conform to the material requirements according to PAS 1075. Primary pipe shall be SDR rated to 150psi at 68°F. Secondary pipe shall be SDR17 rated to 90psi at 68°F. System shall be joined by simultaneous butt fusion.

Please visit our web site: www.asahi-america.com for full detailed sample specifications.

Applications



Applications

- Bleach (sodium hypochlorite)
- Process chemical & waste
- Caustic
- Acids
- Industrial water
- pH range 1-14
- Horizontal directional drilling
- Burial without special backfill

Basic Design and Installation Considerations

Thermofusion

Properly trained installers are critical to overall system performance. Asahi/America recommends plastic pipe contractors maintain certifications according to DVS thermofusion guidelines. Asahi/America is proud to offer job site training according to DVS guidelines. Training should be conducted by authorized Asahi/America personnel a maximum of one week prior to beginning of installation.

Asahi/America Quick Tip:



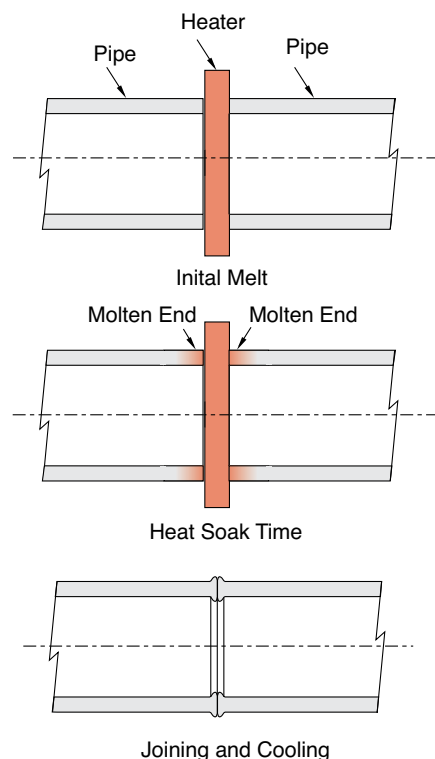
Chem Proline® may be joined by either socket, butt or electrofusion. When possible, butt fusion is the preferred method of joining because it minimizes stress in the welding zone. Union/O-ring and flanged/gasket connections may also be used. **Threaded joints should not be allowed.** Asahi/America recommends the use of their tools and will train and certify the installers just prior to the work.



Butt Fusion

Butt fusion thermally bonds pipe and fittings by heating the face of the components. Once elevated to the material specific melting temperatures, the component faces are pressed against each other.

Bench top welding tools are capable of welding up to the maximum size available in the piping system. Welding equipment up to 160mm (6") can often be used in hard-to-reach areas like elevated pipe runs.



Welding Equipment



Miniplast®

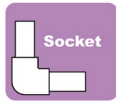
20-110mm (1/2" - 4")



Maxiplast®

50-160mm (1-1/2" - 6")

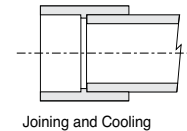
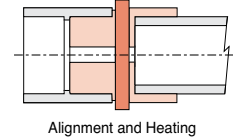
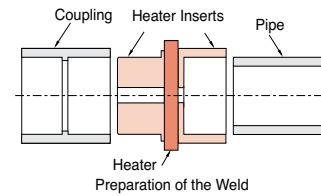
Basic Design and Installation Considerations



Socket Fusion

Socket fusion is done by heating the OD of the pipe and the socket of the fitting, then inserting the pipe into the socket of the fitting. Socket fusion can be done manually by hand or by the use of a bench tool. Hand socket welding usually for size 1" and under.

Socket fusion is available from 1/2" (20mm) - 4" (110mm).



Welding Equipment



Hand Held Socket

20 - 63mm (1/2" - 2")



Bench Socket

20 - 110mm (1/2" - 4")

Socket Fusion Cure Times:

Size		Advanced PE CURE TIME	PVC/CPVC Solvent Cement CURE TIME*
inch	mm		
1/2	20	2 minutes	6 - 48 hrs.
3/4	25	2 minutes	6 - 48 hrs.
1	32	4 minutes	6 - 48 hrs.
1-1/2	50	4 minutes	12 - 96 hrs.
2	63	6 minutes	12 - 96 hrs.
3	90	6 minutes	1 - 8 days
4	110	8 minutes	1 - 8 days

Note: For exact parameters, please consult equipment manuals.

* Source - ASTM-D2855



Electrofusion

Electrofusion thermally bonds pipe components by heating a section of the component and the electrofusion coupling.

Electrofusion uses electricity to heat an imbedded copper wire through resistance. Chem Proline's® imbedded wire is never exposed to media being transported.

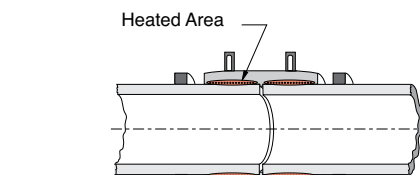
Fittings are available up to 315mm (12") and require the use of an electrical control device, which regulates voltage and current.

Welding Equipment

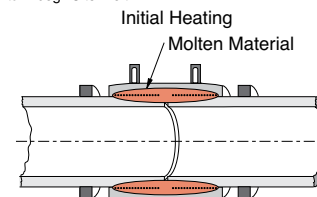


Polymatic

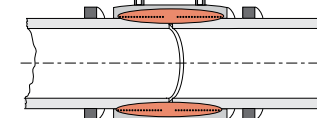
All sizes 20-315mm (1/2"-12")



The molten area increases and heat is transferred to the surface of the pipe, which in turn begins to melt.



Weld Forms



Completed Weld



Basic Design and Installation Considerations

Pressure Rating:

The design stress is based on the hydrostatic design basis (HDB) of the material.

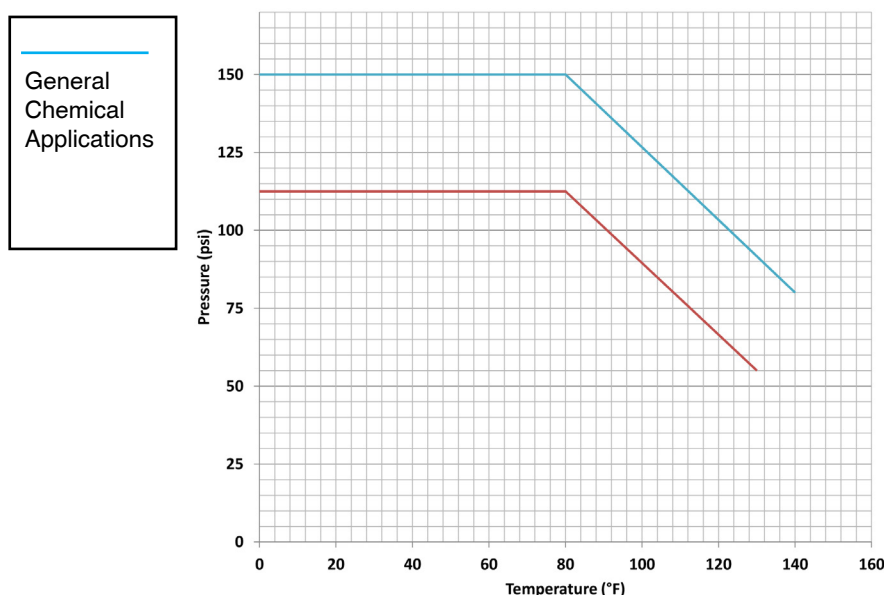
$$S = (\text{HDB}) / F$$

where F is a safety factor.

HDB is determined from testing the material according to ASTM D 2837 to develop a stress regression curve of the material over time. By testing and extrapolating out to a certain time, the actual hoop stress of the material can be determined.

Permissible operating pressure for Chem Proline® piping system is 150psi, but must be reduced at elevated temperatures. The chart below provides a recommended reduction factor based upon operating temperature.

Permissible Operating Pressure:



Designing for Expansion and Contraction:

All thermoplastic pipe expand and contract as the material temperature fluctuates. This must be managed properly to prevent failure and to maintain aesthetics. This is done by using proper pipe clips and restraints and/or by employing offsets and loops. The system should be installed within the limits of the material (maximum allowable stress) based on the conditions of service. Asahi/America's pipe engineering group can assist the designer with calculations in order to facilitate a proper installation.

Aesthetics is always an important factor in designing a thermoplastic piping system. All thermoplastic material expands and contracts approximately 12 times that of steel pipe. A properly designed and installed thermoplastic system will move within the limits of the design. This should be expected and not be perceived as a problem.

Thermoplastic material has excellent physical and mechanical properties especially ductility. The force (end load) generated by the material as a result of temperature induced expansion or contraction is relatively low as compared to metal piping systems. As such, there are several methods available to handle expansion and contraction. These methods all involve using predetermined, fixed points (anchors) and allowing the pipe to either move or be restrained (all within limits) between the fixed points.

Basic Design and Installation Considerations

Change of Length Due to Thermal Expansion:

Change in length due to thermal expansion must be considered if the temperatures during installation and operation are different.

Plastic has the property of expanding under heat.

The calculation of the change in length of Chem Proline® pipe is based on the following formula:

$$\Delta L = \alpha \cdot \Delta T \cdot L$$

ΔL = change in length due to temperature change [mm]

α = linear expansion coefficient [mm/m/K]

ΔT = difference in temperature [K]

L = pipe length [m]

The length change results from the difference between the installation temperature and the maximum and minimum pipe wall temperatures (installation, operation, shut-down).

Calculation of minimum straight length (following DVS 2210, part 1)

Changes in length are caused by a changing operating temperature.

Axial movement compensation should be provided outside of the installed pipes.

In many cases, the changes in the direction of the pipe layout can be used to compensate changes in the length.

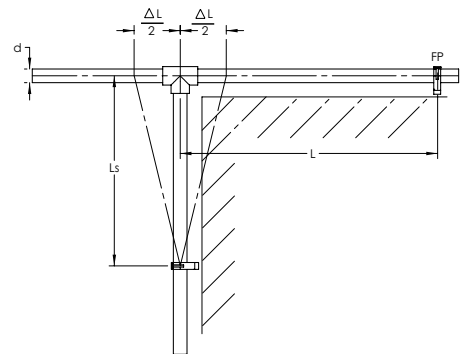
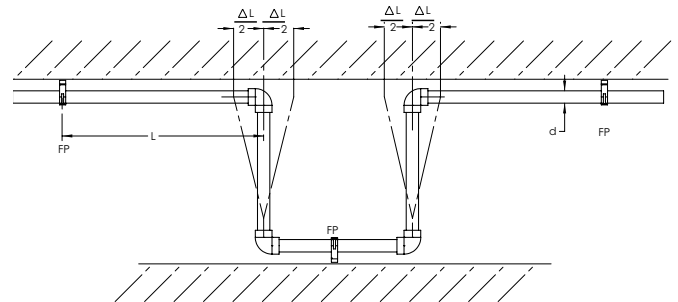
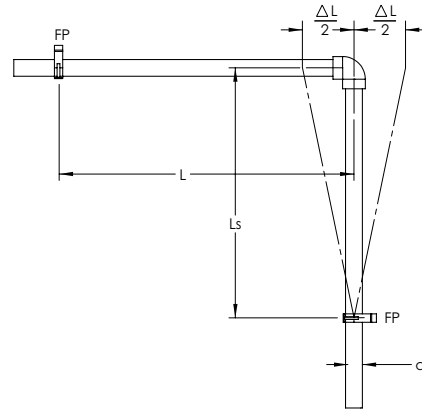
Prestressing method – Installation

For this method, it is required to enter $\Delta L/2$ to calculate the minimum straight length as part of the change in length as compensated by prestressing by $\Delta L/2$.

This means that, in practice, the bent side is already prestressed by half of the change in the length $\Delta L/2$.

Advantages of the prestressing method:

- The minimum straight length can be reduced
- Perfect installation during operation, as the expansion is hardly visible



The minimum straight length is based on the following:

$$L_s = C \cdot \sqrt{d_a \cdot \Delta L}$$

- L_s = minimum straight length [mm]
 d_a = pipe outside diameter [mm]
 ΔL = change in length [mm]
 C = material coefficient $C=26$ (PE)

Basic Design and Installation Considerations

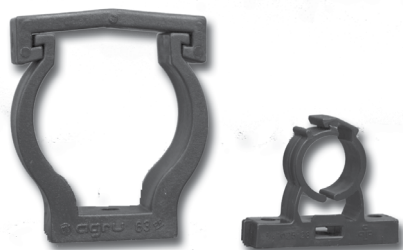
Anchors and Supports:

Chem Proline® must be properly installed in order to provide worry-free use. Support spacing is calculated by determining the material specific properties, ambient temperature, media temperature and specific gravity. The chart below shows recommended support spacing for Chem Proline®. It is also possible to continually support the system in a pipe tray and/or V-channel.

Support Spacing (feet):

Size		68°F	86°F	104°F	122°F	140°F	158°F	176°F
inch	mm							
1/2	20	3	2.5	2.5	2	2	2	2
3/4	25	3	3	2.5	2.5	2.5	2.5	2
1	32	3.5	3	3	3	3	2.5	2.5
1-1/2	50	4	3.5	3	3	3	3	3
2	63	4.5	4	4	3.5	3	3	3
3	90	5.5	5	4	4	4	3.5	3.5
4	110	6	5	5	4	4	4	4
6	160	7	6	6	5	5	4.5	4.5
8	200	7.5	7	6	6	5.5	5	5
10	250	8.5	7.5	7	6.5	6	6	5.5
12	315	9.5	8.5	8	7	7	6.5	6

Asahi/America Quick Tip:



Pipe Clips

It is recommended to use plastic pipe clips that hold the circumference of the pipe and prevent pinpoint stress. Pipe clips should be used as a secure support and guide only. Do not tighten down hard on the wall of the pipe as the pipe must be able to move through the support. Continuous support may also be used. **Metal clamps that contact the pipe are not recommended.**



Restraint Fitting

To handle expansion and contraction, a restrained system that limits the movement of the pipe is preferred over the use of loops and offsets. Restraint fittings should be used to protect fittings from excessive movement and to reduce the amount of movement between restraints.

Basic Design and Installation Considerations

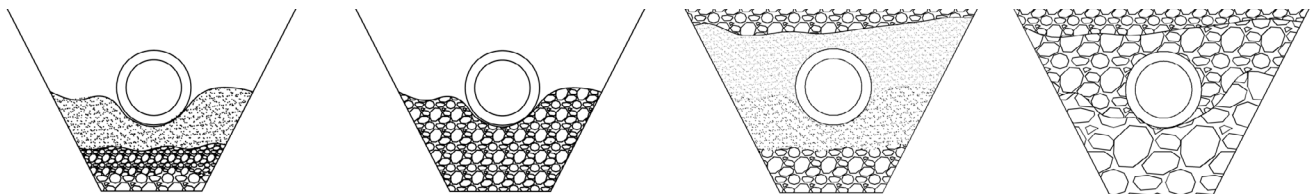
Burial Considerations:

The resin system used for Chem Proline®, Chem Prolok® and Poly-Flo® is extremely crack resistant. This provides a unique advantage when it comes to burying methods.

Typically, plastic piping should be protected from point loads like rocks in the ground by digging an extra wide trench and backfilling with sand to protect the pipe from point loads. This is not necessary with the Advanced PE system.

Chem Proline®, Chem Prolok® and Poly-Flo® provide additional benefits through advanced installation methods such as horizontal directional drilling (HDD) or direct burial trench installations.

Advanced PE exhibits exceptional resistance to slow crack growth and crack propagation, which allows installers to reuse excavated materials for covering the trench, as well as reduce the amount of ground preparation required before laying the system.



Typical Plastic Pipe Prep. Chem Proline® Pipe Prep. Typical Plastic Pipe Burial Chem Proline® Pipe Burial

Asahi/America Quick Tip:



While Chem Proline® is UV resistant and may be installed above ground outdoors, the heating effect of the sun on the black piping should be considered in the design. Painting the pipe white, or providing shade or a covering to shield it from direct sunlight will greatly reduce the amount of expansion and contraction.

Double wall piping should be considered in below-ground applications and over-head applications where personnel safety is a concern.

Best Practice Notice

Sodium Hypochlorite (NaOCl)

Doc no: BPN-001 Dated: August 27, 2019 (updated 2/11/20)

Sodium hypochlorite (bleach), is a difficult application for any piping system due to the decomposition byproducts. Our Chem Proline®, Chem Prolok®, and Poly-Flo® Advanced PE Piping Systems are installed in many sodium hypochlorite systems with success if the “BEST PRACTICES” are followed.



Sodium Hypochlorite – “BEST PRACTICES” for use with Advanced PE	
Temperature Liquid	80° F or lower
Pressure Liquid	≤ 80 psi
Concentration/pH	≤ 25 % , pH>11
Threaded connections	NOT recommended
Butt Fusion Fittings	Recommended
Socket Fusion Fittings	Should be avoided – there is a stress point at the pipe insertion depth which has the potential for stress cracking
Stagnant pipelines	Stagnant chemical in piping should be avoided. Install recirculation loops or plan to blow/wash out line not in use.
Tank fill lines	Bulk delivery tank fill pipelines should be flushed after use to remove residual NaOCl.
Ambient Temperature	Indoor installation with a controlled environment is recommended. Outdoor installations, shade from sun. Painting pipe white does provide some reflection to reduce temperature. Insulate in environments with extreme solar radiation.
Stress points on pipe minimized	Expansion loops: installed to allow pipe to expand/contract with temperature changes. Clamps: Plastic or metal with elastomeric barrier Restraints: installed to minimize pipe stress by thermal growth. Pipe Clips should be circumferential and not overtightened-piping should be free to move in pipe clip.



Best Practice Notice

Sodium Hypochlorite (NaOCl)

Doc no: BPN-001 Dated: August 27, 2019

Asahi/America can also provide our Ultra Proline Halar (ECTFE) piping for challenging Sodium Hypochlorite applications. Please reference literature online or contact Engineering at Asahi/America.

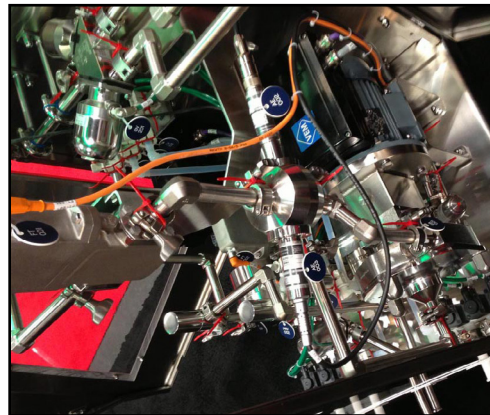
	Better	Best
System	Chem Proline® Advanced PE 	Ultra Proline® ECTFE 
Expected Life	>10 years	>50 years
Project Estimate	\$10,000	\$95,000

	Better	Best
Valves	Ball Valve 	Diaphragm Valve 
Notes	Vented ball	
Availability	Advanced PE: 4" and below ECTFE: 1" and below	Advanced PE: 2" and below ECTFE: 2" and below

Advanced PE References and Installs



Poly-Flo[®]

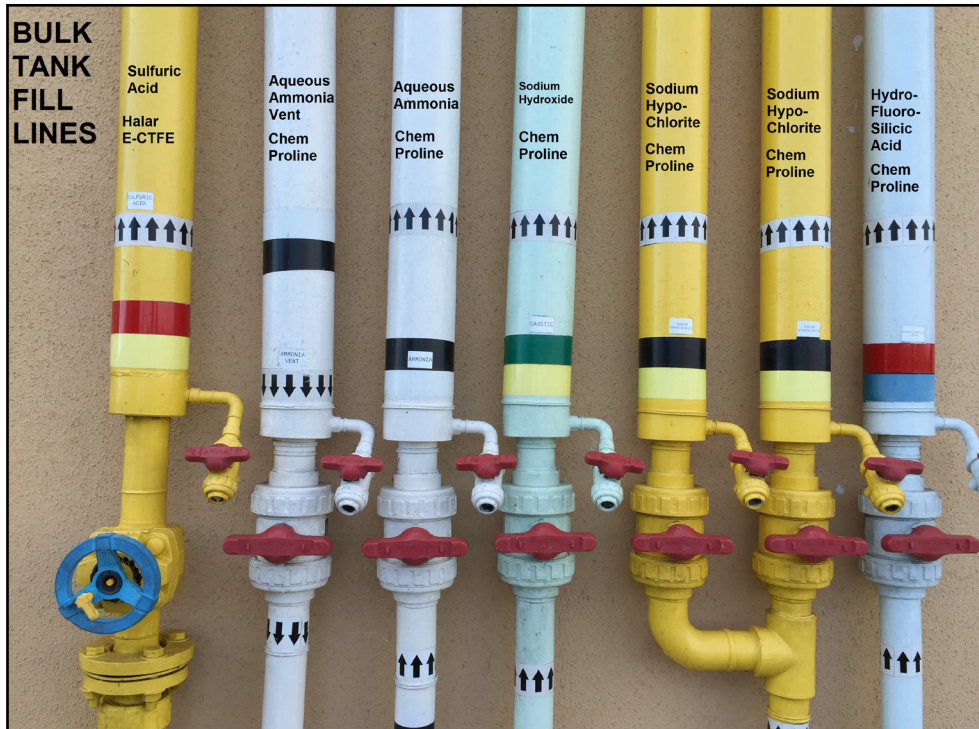


ASAHI/AMERICA INC. APPLICATION STORY



Water Treatment

Chem Proline® & Ultra Proline® specified for every application!



PROJECT SPOTLIGHT

New Project:
RO Water Plant
South Florida

Products Used:
Chem Proline® (Advanced PE)
Chem Prolok® (Advanced PE)

Ultra Proline® (Halar)

Project Date:
2012



PROBLEM:

A new RO water plant in south Florida was attempting to avoid a common problem facing many RO plants: leaking PVC/CPVC piping in the chemical feed system. The designer of this new plant had experienced this problem in previous projects and sought a solution that would allow the plant to operate eight chemical services without experiencing leaks to their system.

SOLUTION:

The plant found all their answers in one place. Asahi/America was able to provide them safe, cost-effective solutions for every chemical installed in the new plant. Chem Proline® single wall and Chem Prolok® double wall piping systems were installed for sodium hypochlorite, sodium hydroxide, hydrofluorosilicic acid, aqueous ammonia, anti-scalant, polymer and corrosion inhibitor. They specified Ultra Proline® Halar® single wall and DuoPro® Halar® x polypropylene double wall piping systems for sulfuric acid. One source, many solutions, one happy plant owner.



ASAHI/AMERICA, INC. APPLICATION STORY



Water Treatment

Chem Proline® goes underground in sodium hypochlorite service

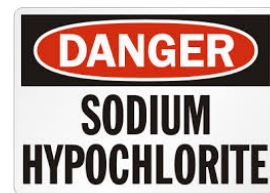


PROJECT SPOTLIGHT

New Project:
RO Water Plant
South Florida

Products Used:
Chem Proline® (Advanced PE)
Butt fusion

Project Date:
2012



PROBLEM:

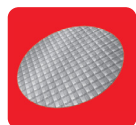
Leaks in underground sodium hypochlorite PVC lines were becoming a costly and potentially dangerous situation for a RO water plant in South Florida.

SOLUTION:

The plant found a sensible and safe solution in two-inch single wall Chem Proline® piping system joined using butt fusion. Chem Proline® Advanced PE material is stress crack resistant which allows it to be direct-buried without the need of having an extra large trench and special backfill. In addition, butt fusion eliminated the need for couplings and required one less weld per joint, saving the plant both time and money.



ASAHI/AMERICA INC. APPLICATION STORY



Semiconductor

Chem Proline® in 50% caustic service before and after



BEFORE



AFTER

PROJECT SPOTLIGHT

New Project:
Leaking CPVC
replacement

Products Used:
1/2" Chem Proline®
(Advanced PE) spool pieces

Project Date:
2015



PROBLEM:

An OEM needed to replace failing CPVC pipe spools in an existing enclosure without having to modify or redesign their entire system.

SOLUTION:

Asahi/America fabricated the exact spool pieces required in our Massachusetts facility. Made from 1/2" Chem Proline® pipe, fittings and valves, these custom spools were made to fit exactly to the OEM's existing configurations. Asahi/America was also able to provide special Chem Proline® machined tube fitting adapters to attach to the existing tubing runs coming out of the enclosure to the various points of use. The OEM was able to solve their leak problem without changing one existing design feature.



ASAHI/AMERICA, INC. APPLICATION STORY



Water Treatment

Chem Proline® and Chem Prolok® work inside & outside in CA



INSIDE



OUTSIDE

PROJECT SPOTLIGHT

Project:

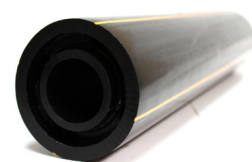
Replace leaking CPVC bleach piping in Vallejo, CA

Products Used:

Chem Proline® (Single Wall)
Chem Prolok® (Double Wall)

Project Date:

2013

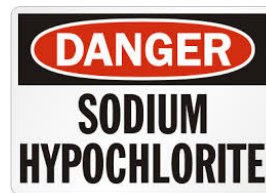


PROBLEM:

Sodium hypochlorite was causing CPVC pipe at a California plant to leak both indoors and outdoors. The plant need something versatile enough to perform in and out of direct sunlight.

SOLUTION:

The plant chose to go with Chem Proline® indoors and Chem Prolok® outdoors from Asahi/America. The black Advanced PE material has built-in UV resistance for outdoors above ground applications. The Advanced PE properties makes it the ideal material to use in sodium hypochlorite applications inside.



ASAHI/AMERICA INC. APPLICATION STORY



Oil and Gas

Chem Proline® handles hydrofracturing chemical blending application



**HYDROFRACTURING
CHEMICAL BLEND PLANT**



6" X 4" PUMP HEADER

PROJECT SPOTLIGHT

Project:
Hydrochloric acid blending plant

Products Used:
Chem Proline® (Advanced PE)
Actuated Valves

Project Date:
2012



PROBLEM:

A southwest hydrochloric acid blending plant explored all the options when planning their new hydrofracturing chemical blending system. The plant engineer looked at PTFE-lined steel, 316L SS and Chem Proline® Advanced PE.

SOLUTION:

After considering the cost of the material and the installation – it wasn't even close.

- For hydrochloric acid blended with solvents like benzene and xylene, Chem Proline® was the best choice for the application
- Chem Proline® was the least costly alternative
- Asahi/America's air-actuated Type-57P butterfly valves fit in perfectly with the piping - essential components of their automated system
- Asahi/America's fabrication shop provided the Chem Proline® main header for the two pumps and the flanged tank mixing tubes



ASAHI/AMERICA, INC. APPLICATION STORY



Water Treatment

Poly-Flo® Advanced PE double wall pipe shows its versatility



PROJECT SPOTLIGHT

New Project:

Zebra Mussel Abatement
Lake Huron, MI

Products Used:

Poly-Flo® Advanced PE
4" x 6" Double Containment
Pipe

Project Date:

2014



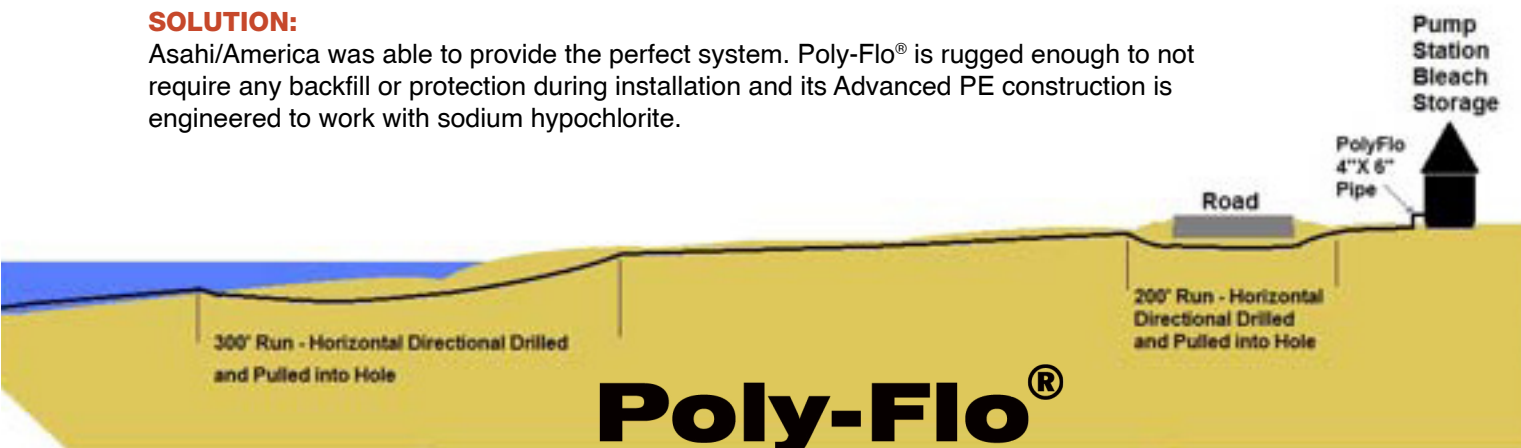
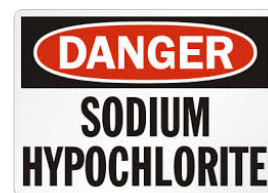
**HORIZONTAL DIRECTIONAL DRILLING
4 X 6 POLY-FLO® PIPE
PULLING HEADS**

PROBLEM:

Zebra mussel infestation is a problem that is affecting water treatment plants across the US, including the Great Lakes region. Zebra mussels clog system intake lines. The most cost-effective and safest way to treat this infestation is with sodium hypochlorite. This project also dictated that the system be buried via directional drilling into the lake bed.

SOLUTION:

Asahi/America was able to provide the perfect system. Poly-Flo® is rugged enough to not require any backfill or protection during installation and its Advanced PE construction is engineered to work with sodium hypochlorite.



ASAHI/AMERICA INC. APPLICATION STORY

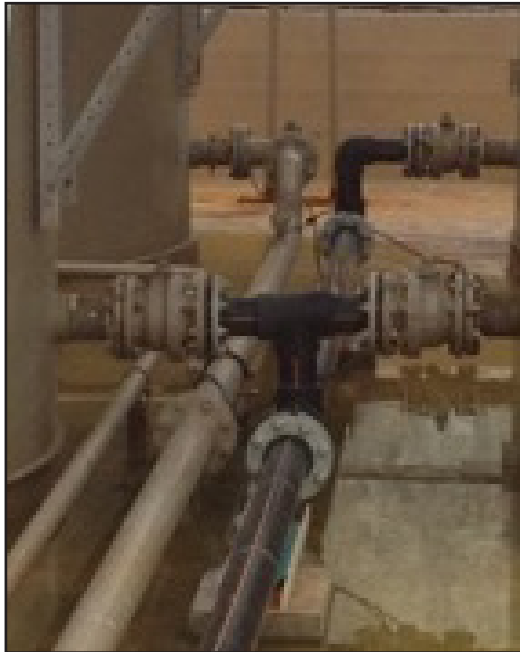


Oil and Gas

Chem Proline® installed in the oil field for hydrofracturing water treatment



**HYDROFRACTURING
WATER STORAGE PLANT**



PROJECT SPOTLIGHT

Project:

Hydrofracturing water collection and treatment in Texas

Products Used:

Chem Proline® (Advanced PE)

Project Date:

2013



PROBLEM:

Corroding steel pipes and leaking CPVC pipes in the Texas Barnett Shale Oil Field were costing the owner time and money in repairs and downtime. During hydrofracturing, the water must be collected on-site and is usually treated off-site. Remote locations and many of the chemicals used in the process make it a difficult application. Finding the proper piping for the application has been hard.

SOLUTION:

Chem Proline® Advanced PE offers corrosion resistance, UV resistance and superior crack resistance which combine to provide worry-free service to hydrofracturing companies. Chem Proline's® Advanced PE construction allows it to interact with the various chemicals used during the process. Its UV resistance allows it to be in direct sunlight without compromising its performance level. Its superior crack resistance ensures that the environment will be protected against any unwanted contamination from chemicals used during the process.



ASAHI/AMERICA, INC. APPLICATION STORY



Water Treatment

Chem Proline® conveys sodium hypochlorite in a mile-long tunnel



HORIZONTAL PIPE SUPPORTS



RESTRAINT FITTING

PROJECT SPOTLIGHT

Project:

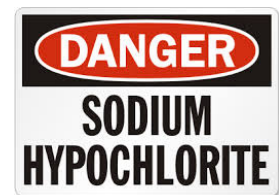
CSO hypochlorite line replacement in Atlanta, GA

Products Used:

Chem Proline® (Advanced PE)
2" - 8"

Project Date:

2013



PROBLEM:

Leaking PVC piping in sodium hypochlorite service for storm water overflow and treatment in downtown Atlanta, GA was leading to system failure, environmental concerns and costly repairs.

SOLUTION:

The city chose Chem Proline® Advanced PE piping to replace failing 8" PVC piping installed in the ceiling of a mile-long tunnel that ran beneath the city. Butt fusion and electrofusion joining were used to install the piping in difficult spots. Restraint fittings were used periodically as anchoring points. The system has been running leak-free since it was installed in 2013.





Installed pipe project list by application - other chemicals

Project Name - Location	Chemical Service	Year Installed	Replaced
Cami General Motors Ontario, CA	Process Waste Chem Prolok® D/C	2013	New Installation
Alcon Atlanta, GA	Process Waste Spent Solvent Drain	2013	New Installation
Mallinckrodt St. Louis, MO	UG Process Waste & Vent Piping	2014	New Installation
UTC Goodrich Cleveland, OH	30 – 37% Chromic Acid, 35% Sulfuric Acid - Balance Water	2013	New Installation
UTC Goodrich Cleveland, OH	7 – 9% Sodium Cyanide, 2% Sodium Hydroxide, 3% Cadmium Oxide, 6% Sodium Carbonate – Balance Water	2013	New Installation
UTC Goodrich Cleveland, OH	25% Nickel Sulfate – Balance Water	2013	New Installation
UTC Goodrich Cleveland, OH	Contaminated Groundwater Remediation	2013	New Installation
Oil Field Fracking Water Treatment	BTEX in Water Xylene, Benzene, Toluene	2012	New Installations
BAE Dry Dock San Francisco, CA	Natural Gas	2012	New Installation
City of Akron, OH WTP	Chlorine Dioxide Test Spools	2013	PVC
Anomatic, OH	93% Sulfuric Acid	2013	CPVC
Chemco California	93% Sulfuric Acid	2013	PVC
City of Westminster, CO WTP	20% Sodium Permanganate	2013 Test Spools	PVC
Town of Creston, IA	20% Sodium Permanganate	2015	PVC
Steag Chemical King Mountain, NC	30% Hydrogen Peroxide	2012	CPVC
Superior Energy Lafayette, LA	37% Hydrochloric Acid	2012	New Installation
City of Trussville, AL WWTP	37% Hydrochloric Acid	2014	New Installation
Brenntag Salt Lake City, UT	50% Sodium Hydroxide	2013	CPVC
City of Camas WTP Washington	30% Sodium Hydroxide	2014	PVC
Town of Creston, IA WTP	50% Sodium Hydroxide	2015	PVC
Clearwater, FL WTP	50% Sodium Hydroxide	2014	New Installation
City of Vallejo, CA WTP	50% Sodium Hydroxide	2013	PVC
City of Hialeah, FL RO WTP	50% Sodium Hydroxide	2012	New Installation
City of Portland, OR WWTP	40% Ferric Chloride	2013	Vinyl Tubing
City of Hialeah, FL RO WTP	19% Aqueous Ammonia	2012	New Installation
City of Hialeah, FL RO WTP	HFS Hydrofluorosilicic Acid	2012	New Installation
City of Hialeah, FL RO WTP	Anti-Scalant	2012	New Installation
City of Hialeah, FL RO WTP	Corrosion Inhibitor	2012	New Installation
City of Hialeah, FL RO WTP	Polymer	2012	New Installation

Another Corrosion Problem Solved.TM



ASAHI/AMERICA[®]

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