

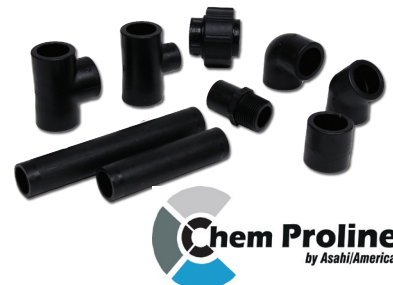
# Industrial Piping Systems

- **Chem Proline<sup>®</sup>**

Single Wall Piping System

- **Chem Prolok<sup>®</sup>**

Double Wall Piping System



Chem Proline<sup>®</sup> Single Wall Piping - Chem Prolok<sup>®</sup> Double Wall Piping  
Fittings - Valves

**Another  
Corrosion  
Problem  
Solved.<sup>™</sup>**



[www.asahi-america.com](http://www.asahi-america.com)



Chem Proline® is a highly advanced crack resistant polyethylene piping system designed for the harshest liquid chemical applications. Made from the latest generation of PE resin, Chem Proline® pipe and fittings possess the greatest resistance to "slow crack growth." Chem Proline® is a lower cost alternative to PVC, C-PVC, metal, FRP and lined steel piping systems.



A complete system that includes pipe, fittings, valves, leak detection, injection quills and chemical feed skids, Chem Proline® has a design life expectancy of up to 50 years. Asahi/America's thermally fused Chem Proline® uses no glues and features minimal threaded connections. Asahi/America's Chem Proline® is UV resistant and can be installed above or below ground using socket, butt or electrofusion joining methods.

Chem Proline's® pH capability ranges from 1-14, with pressures up to 150 psi and temperatures up to 140°F. Available in pipe sizes up to 315mm (12"), Chem Proline® is ideally suited for use in facilities that have liquid process pressure or drainage systems and is suitable for a wide variety of applications like bleaching/disinfecting/oxidizing chemicals, bases, acids, blended chemicals and process waste systems.

### Features & Benefits

- Excellent chemical and corrosion resistance
- Available in sizes 20 - 315mm (1/2" to 12")
- Fast installation, low cost of ownership
- Constructed from specially engineered high-density polyethylene (HDPE) resin
- UV resistant black

### Supply Range

#### Standard Materials:

PE Polyethylene

#### Pipe and Fittings

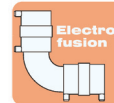
- 20 - 315mm (1/2" - 12") 150 psi

#### Valves

Materials: PVC, C-PVC with Chem Proline® End Connectors

- Type-21 Ball Valves: 20 - 110mm (1/2" - 4")
- Type-57 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, Calibration Columns, Gauge Guards

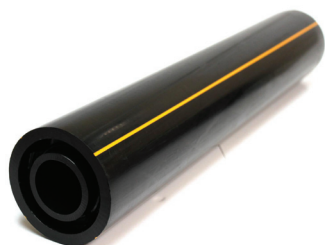
#### Welding Methods



### Ideal Applications

- pH range 1-14
- Bleach (sodium hypochlorite)
- Process Chemical & Waste
- Caustic
- Acids
- Industrial Water
- Horizontal Directional Drilling

## Chem Prolok® - Double Wall Piping System



Introducing Chem Prolok®, the newest addition to Asahi/America's family of double containment environmental piping lines. Chem Prolok® is a new revolutionary double wall piping system offered in either Chem Proline® x PE 100 or Chem Proline® x Chem Proline®. PE's chemical compatibility is resistant to crack propagation and the fused system eliminates the need for cement and thread. Chem Prolok® is also highly resistant to sunlight allowing for above ground installations. Stocking sizes 1x3 through 12x16.

### Supply Range

#### Standard Materials:

PE Polyethylene (both inner & outer)

#### Pipe and Fittings

- 1x3 through 12x16
- Ratings: Pipe: SDR 11 / PN 10 / 150 PSI (inner or outer) and SDR 33 / PN 3.5 / 45 PSI (outer)

#### Welding Methods

Staggered and Simultaneous Butt Fusion



## Material Properties

**Asahi/America's Chem Proline® 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 at 150 psi at 72°F
- Wide temperature range (between -22°F - 140°F)
- Exceptional weldability
- High resistance to chemical attack
- High impact resistance and ductility

## Chem Proline® vs other Plastic & Metal Piping Systems

Chem Proline® by Asahi/America is manufactured under special license by AGRU of Austria. Chem Proline® is made from the latest polyethylene resins available, which provide the highest resistance to chemical attack.

### Chem Proline® 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

### Chem Proline® vs FRP Pipe

- Better impact resistance
- Much shorter joint cure times

### Chem Proline® vs Metal Pipe

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

### Chem Proline® vs PVC/C-PVC

- No glued or threaded joints
- Much lower brittleness temperature - more ductile
- Greatly reduced install time, short cure times needed

### Chem Proline® vs Plastic Lined Steel Pipe

- No flange/mechanical joints
- No metal corrosion issues

## Chemical Resistance

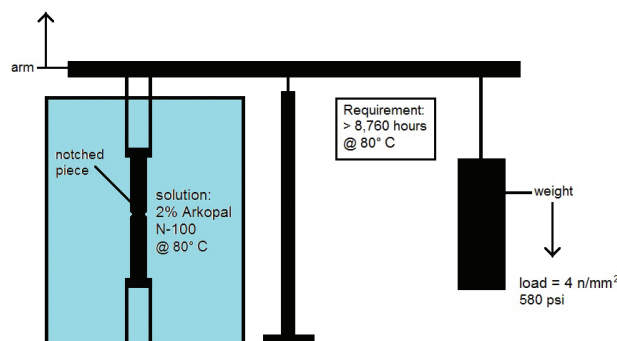
To enable the use of Chem Proline® in new application areas, research by raw material suppliers has focused in the past few years on a material property that is generally known as "resistance to slow crack growth" or "stress crack resistance". By means of process optimization in raw material production and special copolymerization methods, the raw material suppliers have developed Chem Proline® featuring outstanding stress crack resistance.

The main technical advantage of Chem Proline® 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 >8760 hours for Chem Proline® in comparison to 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
Chem Proline®	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)
Chem Proline®	14,648 Hours (2 samples)



Full Notch Creep Test



### Sample Specifications

#### Quick Specification for ChemProline® :



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 C-PVC 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 150 psi at 72° F for chemical service. System shall be joined by socket fusion, butt fusion and/or electrofusion.

#### Quick Specification for Chem Prolok® Double Wall :



Chem Prolok® D/C 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 150 psi at 72° F. Secondary pipe shall be SDR 11 rated to  $\leq 150$  psi or 33 rated to 45 psi at 72° F. System shall be joined by socket fusion, butt fusion and/or electrofusion.

Please consult Asahi/America for expanded product sample specifications for both systems.

### Application - Water and Wastewater Industries

Chem Proline® offers the water and wastewater industries significant advantages over traditional piping systems used for chemical feed applications such as PVC and C-PVC. The installed cost is approximately the same for Chem Proline® as PVC Schedule 80. The cost of ownership is where Chem Proline® provides a far better return on the investment. During the first 5 years of a typical PVC or C-PVC chemical feed piping system, the maintenance costs can be high.

Typical issues include: leaking solvent cement joints, pipe breakage, leaks in threaded joints, etc. (as shown in the image on the right).

Since Chem Proline® utilizes leak proof fusion joining technology, leaking cement or threaded joints are eliminated. Chem Proline® is in a class by itself when it comes to long-term, trouble-free performance. Therefore, the cost of ownership is much lower for Chem Proline®, and the life expectancy is much longer.



Failed solvent cement joint  
25% caustic soda service.



Scan the code to visit our web site to learn more about  
Chem Proline® and Chem Prolok®



## Chem Proline® - Water Treatment Chemicals - Quick Reference Guide

Symbols: + = Resistant, x = Not Resistant. \* All references are based on ambient temperature liquid

Chemical Name	Chemical Symbol	Common Uses	Typical Concentrations / Conditions	Chem Proline Pipe Reference	Alternative Pipe Reference	Chem Proline Valve	Special Considerations
Aluminum Sulfate (Alum)	$Al_2(SO_4)_3$	Coagulant Flocculant	< 50%	+		PVC/EPDM	
Aluminum Chlorohydrate	$Al_2Cl(OH)$	Coagulant Flocculant	100%	+		PVC/EPDM	
Aluminum Hydroxide	$Al(OH)_3$	Coagulant Flocculant	50%	+		PVC/EPDM	
Ammonia	$NH_3$	Biocide	Gas Anhydrous	+		PVC/EPDM	
Ammonium Chloride	$NH_4Cl$	Water Treatment - Polymers	20%	+		PVC/EPDM	Vented Ball Valves
Ammonium Hydroxide	$NH_4OH$	Disinfection	40%	+		PVC/EPDM	(Aqueous Ammonia)
Ammonium Sulphate	$(NH_4)_2SO_4$	Biocide Chloramination	40%	+		PVC/EPDM	
Monosodium Phosphate	$NaH_2PO_4$	RO Membranes Antiscalant	Solution	+		PVC/EPDM	
Aqueous Ammonia	$NH_4OH$	Biocide Chloramination	19%	+		PVC/EPDM	
Ascorbic Acid	$C_6H_8O_6$	Dechlorination	Solution	+		PVC/EPDM	Based on Citric Acid. Ascorbic info N/A
Sodium Hypochlorite (Bleach)	$NaOCl$	Biocide	up to 25%	+		PVC/FKM	Vented Ball Valves
Calcium Carbonate	$CaCO_3$	Neutralizing Agent	Solution	+		PVC/EPDM	
Calcium Chloride	$CaCl_2$	Clarifying Agent / Drainage Aid / pH Control	Solution	+		PVC/EPDM	Vented Ball Valves
Calcium Fluoride	$CaF_2$	Fluoridation	Solution	+		PVC/EPDM	No info for $CaF_2$ . Based on $CaCl_2$
Calcium Hydroxide Solution (Lime)	$Ca(OH)_2$	Neutralizing Agent	Solution	+		PVC/EPDM	
Calcium Hypochlorite	$Ca(ClO)_2$	Biocide	Solution	+		PVC/FKM	Vented Ball Valves
Calcium Oxide (Quicklime)	$CaO_2$	Softening	Solution	+		EPDM	
Calcium Thiosulfate	$CaS_2O_3$	Dechlorination	30%	+		No info. Available	
Carbon Dioxide	$CO_2$	Corrosion Control	Gas	+		PVC/EPDM	
Sodium Hydroxide (Caustic)	$NaOH$	PH Adj./Corrosion Control	50%	+		PVC/EPDM	
Chlorine Dioxide	$ClO_2$	Biocide	0.1 - 0.5%	X	HALAR E-CTFE	PVC/PTFE Dia. valves	
Chlorine Gas - Dry	$Cl_2$	Biocide	Gas	X	HALAR E-CTFE	PVC/FKM	

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# Chem Proline® - Water Treatment Chemicals - Quick Reference Guide

**Symbols: + = Resistant, x = Not Resistant. \* All references are based on ambient temperature liquid**

Chemical Name	Chemical Symbol	Common Uses	Typical Concentrations / Conditions	Chem Proline Pipe Reference	Alternative Pipe Reference	Chem Proline Valve	Special Considerations
Chlorine Gas - In Water Hypochlorous Acid	HClO	Biocide	< 3,500 ppm	+		PVC/EPDM	
Citric Acid	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	Resin/Membrane Cleaner	Solution	+		PVC/EPDM	
Copper Sulphate	CuSO <sub>4</sub>	Algaecide/Taste - Odor Control	22%	+		PVC/EPDM	
Nitrates & Nitrites		Corrosion Inhibitor	Solution	+		PVC/EPDM	
Ferric Chloride	FeCl <sub>3</sub>	Flocculant	40%	+		PVC/EPDM	Vented Ball Valves
Ferrous Chloride	FeCl <sub>2</sub>	Flocculant	40%	+		PVC/EPDM	Vented Ball Valves
Ferric Sulfate	FE <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	Coagulant	50%	+		PVC/EPDM	
Formic Acid	HCO <sub>2</sub> H	Biocide Enhancer	Aqueous 85%	+		PVC/EPDM	
Hydrochloric Acid	HCl	PH Adjustment	37%	+		PVC/FKM	Vented Ball Valves
Hydrofluosilicic Acid	H <sub>2</sub> SiF <sub>6</sub>	Fluoridation	50%	+		PVC/EPDM	
Hydrogen Peroxide	H <sub>2</sub> O <sub>2</sub>	Oxidant	100%	+		PVDF/PTFE Dia. Valve	
Lithium Bromide	LiBr	Absorption - Refrigerant	Solution	+		PVC/EPDM	
Methanol (Methyl Alcohol)	CH <sub>3</sub> OH	Nitrate to Nitrogen Conversion	Pure	+		PVC/EPDM	
Oxygen	O <sub>2</sub>	Disinfection	Gas	+		PVC/EPDM	
Ozonated Water	H <sub>2</sub> O + O <sub>3</sub>	Biocide	Dilute Solution	+		PVC/EPDM	≥ 0.5 ppm
Ozone	O <sub>3</sub>	Biocide	Gas	X	HALAR	PVC/EPDM	
Peracetic Acid	CH <sub>3</sub> CO <sub>3</sub> H	Biocide	12%	+		PVC/EPDM	
Phosphoric Acid	H <sub>3</sub> PO <sub>4</sub>	Corrosion Control	Solution	+		PVC/EPDM	
Polyaluminum Chloride	Al(OH)Cl <sub>3</sub>	Coagulant	Solution 20%	+		PVC/EPDM	
Polymers		Dispersant	Solution	+		PVC/EPDM	
Potassium Hydroxide	KOH	Clarification Coagulant-Flocculant/Corrosion Control	50%	+		PVC/EPDM	
Potassium Permanganate	KMnO <sub>4</sub>	Biocide / Taste - Odor Control	1 - 4%	X	PVDF	PVC/EPDM	

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## Chem Proline® - Water Treatment Chemicals - Quick Reference Guide


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Chemical Name	Chemical Symbol	Common Uses	Typical Concentrations / Conditions	Chem Proline Pipe Reference	Alternative Pipe Reference	Chem Proline Valve	Special Considerations
Sodium Carbonate (Soda Ash)	Na <sub>2</sub> CO <sub>3</sub>	Softening	Solution	+		PVC/EPDM	
Sodium Aluminate	NaAl(OH <sub>4</sub> )	Coagulant	Solution	+		PVC/EPDM	
Sodium Bisulfite	NaHSO <sub>3</sub>	Excess Chlorine Removal	40%	+		PVC/EPDM	
Sodium Chloride	NaCl	Softening	Solution	+		PVC/EPDM	
Sodium Chlorite	NaClO <sub>2</sub>	ClO <sub>2</sub> Generation	25%	+		PVDF/PTFE Dia. Valve	
Sodium Fluoride	NaF	Fluoridation	Solution	+		PVC/EPDM	
Sodium Fluorosilicate	Na <sub>2</sub> SiF <sub>6</sub>	Fluoridation	Solution	+		PVC/EPDM	
Sodium Nitrite	NaNO <sub>2</sub>	Odor Control	10%	+		PVC/EPDM	
Sodium Permanganate	NaMnO <sub>4</sub>	Oxidant	20%	X	PVDF	PVC/EPDM	
Sodium Polyphosphates	Na <sub>3</sub> PO <sub>4</sub>	Corrosion Control	Solution	+		PVC/EPDM	
Sodium Silicate	Na <sub>2</sub> SiO <sub>3</sub>	Coagulant/Flocculant	Solution	+		PVC/EPDM	
Sodium Sulfite	Na <sub>2</sub> SO <sub>3</sub>	Oxygen Scavenger/Dechlorination	Solution	+		PVC/EPDM	
Sodium Thiosulfate	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Dechlorination	Solution	+		No info. Available	
Sulfur Dioxide	SO <sub>2</sub>	Dechlorination	Gas	+		PVC/EPDM	
Sulfuric Acid	H <sub>2</sub> SO <sub>4</sub>	Raw Water Treatment & PH Adjustment	Up to 96%	+		PVC/FKM	
			96% - 98%	X	PVDF	PVDF/PTFE	
			Above 98%	X	HALAR	HALAR E-CTFE	
Zinc Sulfate	ZnSO <sub>4</sub>	Corrosion Inhibitor	37%	+		PVC/EPDM	

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# **Another Corrosion Problem Solved.<sup>TM</sup>**



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