

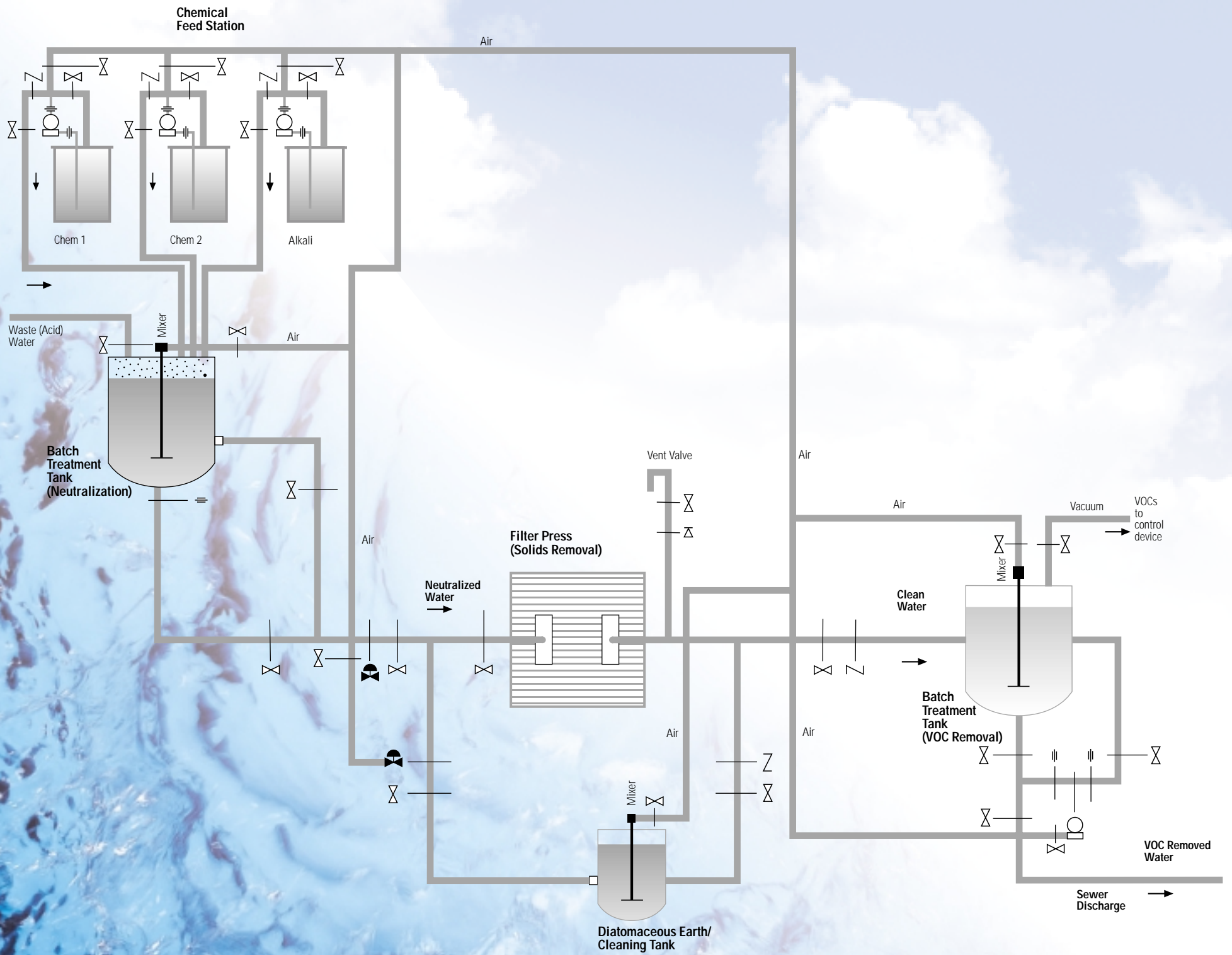


that flow for  
**ideas**  
wastewater  
treatment

# Chemtrol®

Chemtrol® Thermoplastic Flow Solutions

Chemtrol® is a brand of **NIBCO**



**Legend**

- ⊗ Ball Valve
- Z Check Valve
- ⊞ Air Diaphragm Pump
- ≡ Flange
- ⊕ Pneumatic Ball Valve

# Chemtrol®: another great idea for wastewater treatment systems

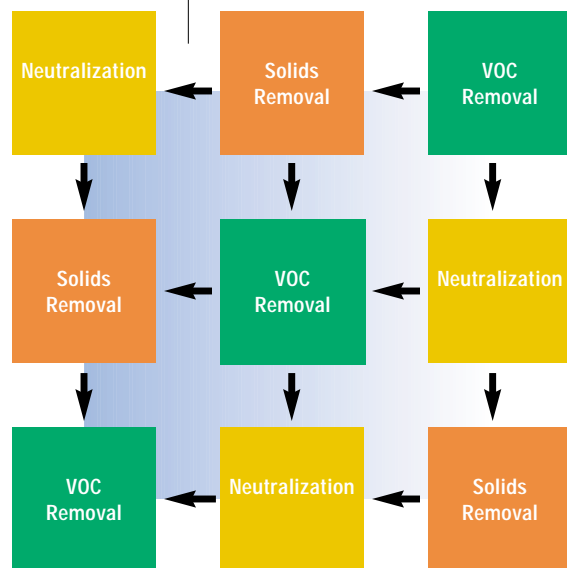
## Industrial wastewater: a product of the process.

Through manufacturing processes, raw materials are transformed into countless products for commercial, industrial, and consumer use—products that enhance, and often sustain, our lives.

But these same processes also generate a product for which there is no demand: wastewater.

Industrial wastewater, laden with chemicals, toxins, and pollutants, must be treated properly before it is discharged to the environment or to a municipal wastewater treatment facility.

*This diagram illustrates the 3-step process in wastewater treatment. The order in which these processes are carried out will vary from design and application. Fundamentally, all wastewater water treatment designs will follow these basic steps in one form or another.*



## Meeting the right criteria for an effective treatment system.

Although industrial wastewater treatment methods vary, every system must be designed to:

- handle the worst combination of flow and pollutant loads that may be encountered.
- meet stringent regulatory requirements and industrial standards.
- deliver excellent performance without exceeding budgeted costs.

To satisfy these criteria, each component in the system must do its job effectively and efficiently.

## Asking the right questions.

Asking the right questions and getting the right answers are key factors in the design of any wastewater system.

The most critical components of any wastewater system are its valves, pipe, and fittings—the flow control products needed to carry the medium through the entire treatment process.

To optimize the capability of a system, the following areas should be evaluated before deciding on flow control products:

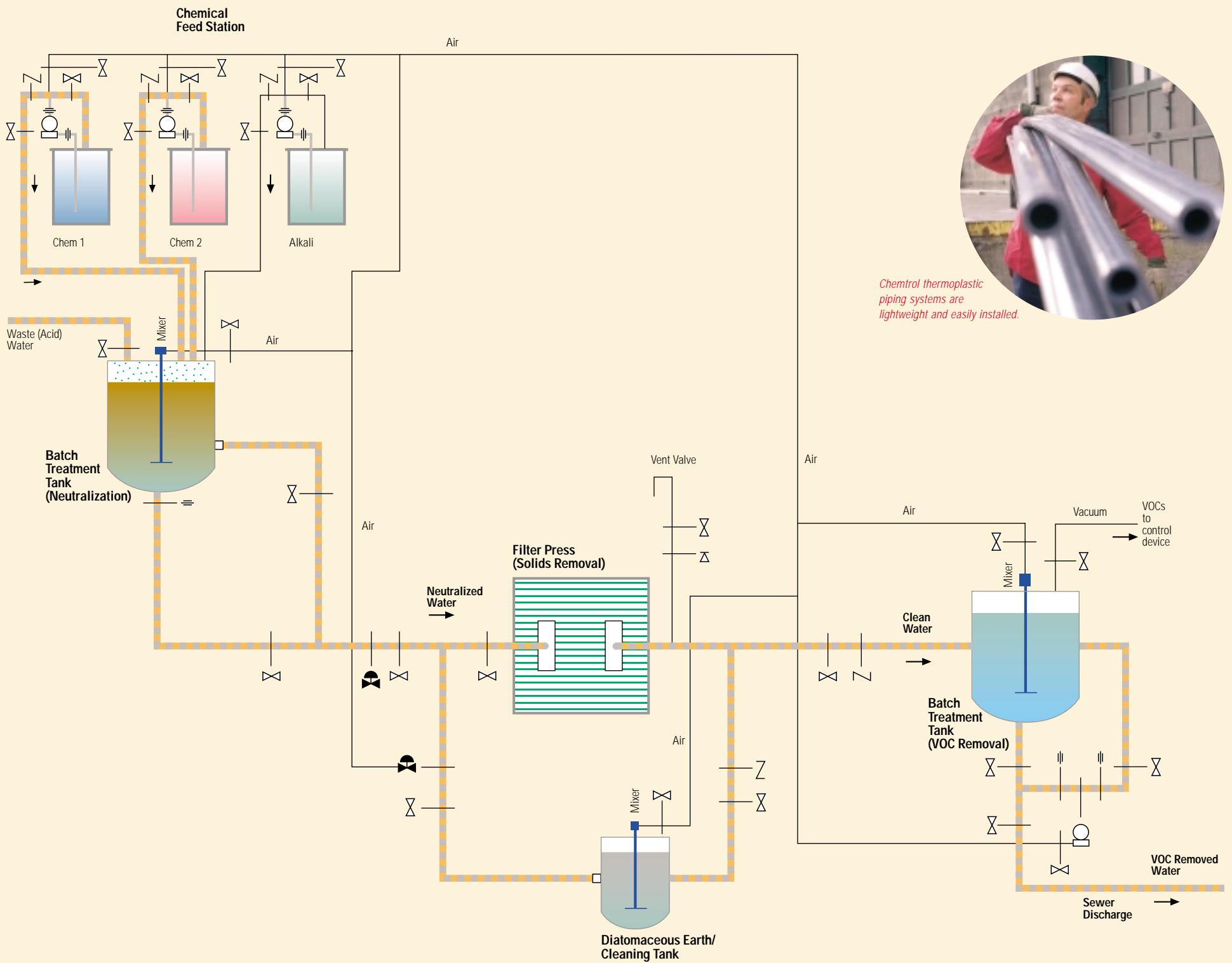
- Range of pH levels needed in the system
- Types of chemicals, acids, and abrasives used
- Range of pressures and temperatures
- Forecast of the potential need to improve and upgrade the system and the ease of product modification in this process
- Capability of products to control media flow
- Potential for rust, corrosion, and pluggage
- Comparison of product costs, including installation and maintenance

## Finding the right solutions.

Now, consider the benefits of using Chemtrol® thermoplastic flow-control products.

The schematics on the following pages illustrate the possibilities of Chemtrol thermoplastics as applied to three primary processes for industrial wastewater treatment:

- *Neutralization.* Through this process, acids and alkali are balanced to achieve the optimal pH levels for treating wastewater.
- *Solid waste removal.* This process may consist of several stages—including the introduction of organics to consume a portion of the solid waste. Alum, polymers, and other flocculants may be added to the wastewater causing the smaller particles to agglomerate. The solids will sink to the bottom of the tank for removal. Pressure filtration is another method for removing solids from the water. This method is achieved by pumping the sewage between filter plates; the solids are retained and subsequently removed.
- *VOC removal.* Volatile organic compounds (VOCs) may be removed by “flashing off” the media through steam stripping. This process is performed by applying heat to raise the water temperature to the necessary level for VOC vaporization. The residual vapors from the VOC removal are cooled, condensed into a liquid, and then either incinerated or fed back into the system to be re-treated.



*Chemtrol thermoplastic piping systems are lightweight and easily installed.*

- Legend**
- Ball Valve
  - Check Valve
  - Air Diaphragm Pump
  - Flange
  - Pneumatic Ball Valve

**Piping Materials**

PVC/CPVC

*The choice of materials for any system depends on the chemicals, solutions, pressures, temperatures, and other variables involved in the process. Please refer to Chemtrol's technical manuals and chemical resistance guide for assistance in selecting the products most appropriate for your application.*

# Chemtrol PVC and CPVC (Corzan®)

## Strong, versatile, and maintenance-free

Chemtrol Schedule 80 PVC thermoplastic flow control products can handle the most aggressive media. Characterized by high physical properties, PVC is ideal for processes such as neutralization. Chemtrol PVC resists corrosion and chemical attack by acids, alkalis, salt solutions, and a wide range of other chemicals. With a design stress of 2,000 psi, it has the highest long-term hydrostatic strength at 73° F of any major thermoplastic piping material.

For piping that is run through a high-heat environment, Chemtrol CPVC (Corzan®), with a maximum service temperature of 210° F, provides physical properties and chemical resistance similar to PVC while meeting the need for a higher tolerance to heat.

Chemtrol PVC and CPVC are joined by solvent cementing, threading, or flanging. Like all Chemtrol thermoplastic flow control products, they are lightweight, easy to install, and maintenance-free.

Refer to Chemtrol Technical Manuals for pressure ratings at various temperatures.

## Polyvinyl Chloride (PVC)



## Chlorinated Polyvinyl Chloride (Corzan® CPVC)



### Typical Applications

Chemical processing, industrial plating, chilled water distribution, chemical drainage, and irrigation systems

Systems for hot corrosive liquids, hot and cold water distribution, chemical processing, industrial plating, deionized water lines, chemical drainage, wastewater treatment systems, and similar applications above the temperature range of PVC

### Joining Methods

Solvent cementing, threading, or flanging

Solvent cementing, threading, or flanging

### Max. Service Temperature

140° F/60° C

210° F/99° C

### Fittings

Schedule 80

Socket—1/2" through 12"  
Threaded—1/4" through 4"

Socket—1/4" through 12"  
Threaded—1/4" through 4"

Large diameter

Schedules 40 and 80  
10" and 12" couplings, tees, 90° and 45° elbows, reducer bushings, and Van Stone flanges

10" and 12" couplings, tees, 90° and 45° elbows, reducer bushings

### Valves

Tru-Bloc/True Union ball valves\*

1/2" through 6" socket, threaded, and flanged connections

1/2" through 6" socket, threaded, and flanged connections

Tru-Bloc/True Union ball check valves

1/2" through 4" with socket, threaded, or flanged ends

1/2" through 4" with socket, threaded, or flanged ends

Butterfly valves\*

2"—10" EPDM and FPM (Viton®) liner

EPDM and FPM (Viton®) liner 3" only

Diaphragm valves

1/2" through 4" with spigot, socket, or flanged ends

1/2" through 4" with spigot, socket, or flanged ends. Also available in natural polypropylene (Chem-Pure®) and natural PVDF.

Multiport valves\*

True Union 3-way/3-position; 1/2" through 2" with socket or threaded ends

True Union 3-way/3-position multiport ball valves, 1/2" through 2" with socket and threaded ends.

Diverter valve

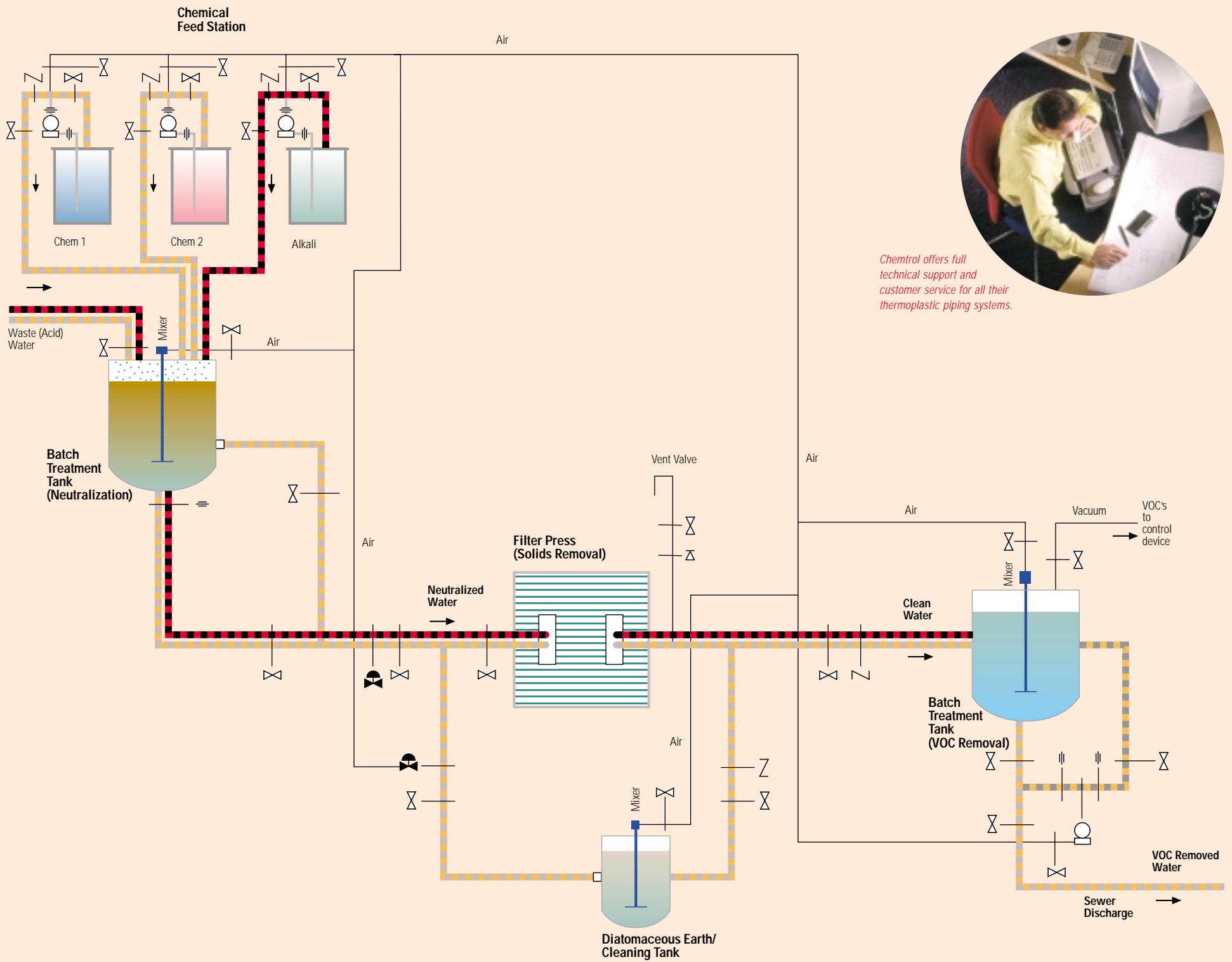
3-way/2-position; 1/2" through 2" with socket and threaded ends

3-way/2-position ball valves, 1/2" through 2" with socket and threaded ends

Specialty valves

Angle and Y pattern: 1/4" through 1" threaded  
Needle and Chemcock: 1/4" threaded

\*For pneumatic or electric actuation.



*Chemtrol offers full technical support and customer service for all their thermoplastic piping systems.*

**Legend**

- Ball Valve
- Check Valve
- Air Diaphragm Pump
- Flange
- Pneumatic Ball Valve

**Piping Material**

- PP/PVDF
- PVC/CPVC

*The choice of materials for any system depends on the chemicals, solutions, pressures, temperatures, and other variables involved in the process. Please refer to Chemtrol's technical manuals and chemical resistance guide for assistance in selecting the products most appropriate for your application.*

# Chemtrol Polypropylene (PP) and Polyvinylidene Fluoride (KYNAR® PVDF)

## High chemical resistance; high service temperatures.

If PVC or CPVC are not compatible with a process such as solids removal, consider the properties and benefits delivered by Chemtrol Polypropylene (PP) and Polyvinylidene Fluoride (PVDF) KYNAR®.

Chemtrol Polypropylene, with a maximum service temperature of 180° F, is resistant to sulfur-bearing compounds and is an excellent material for applications involving mixtures of acids, bases, and solvents. PVDF KYNAR®, a tough, chemical and abrasion-resistant fluorocarbon material, resists distortion and retains most of its strength to 280° F. Both materials are joined by thermo-seal fusion, threading, or flanging to provide a strong, leakproof system.

The Schedule 80 pipe fittings and valves have smooth interior walls that allow media to flow easily, with minimal friction loss, while maintaining relatively uniform temperatures. Unimpeded flow eliminates the downtime typically required for flushing out pipes or routing out debris. The absence of clogging and corrosion contributes to energy savings as well, since less work is demanded of the pump that moves the media through the system.

Refer to Chemtrol Technical Manuals for pressure ratings at various temperatures.

## Polypropylene (PP)



## Polyvinylidene Fluoride (PVDF KYNAR®)



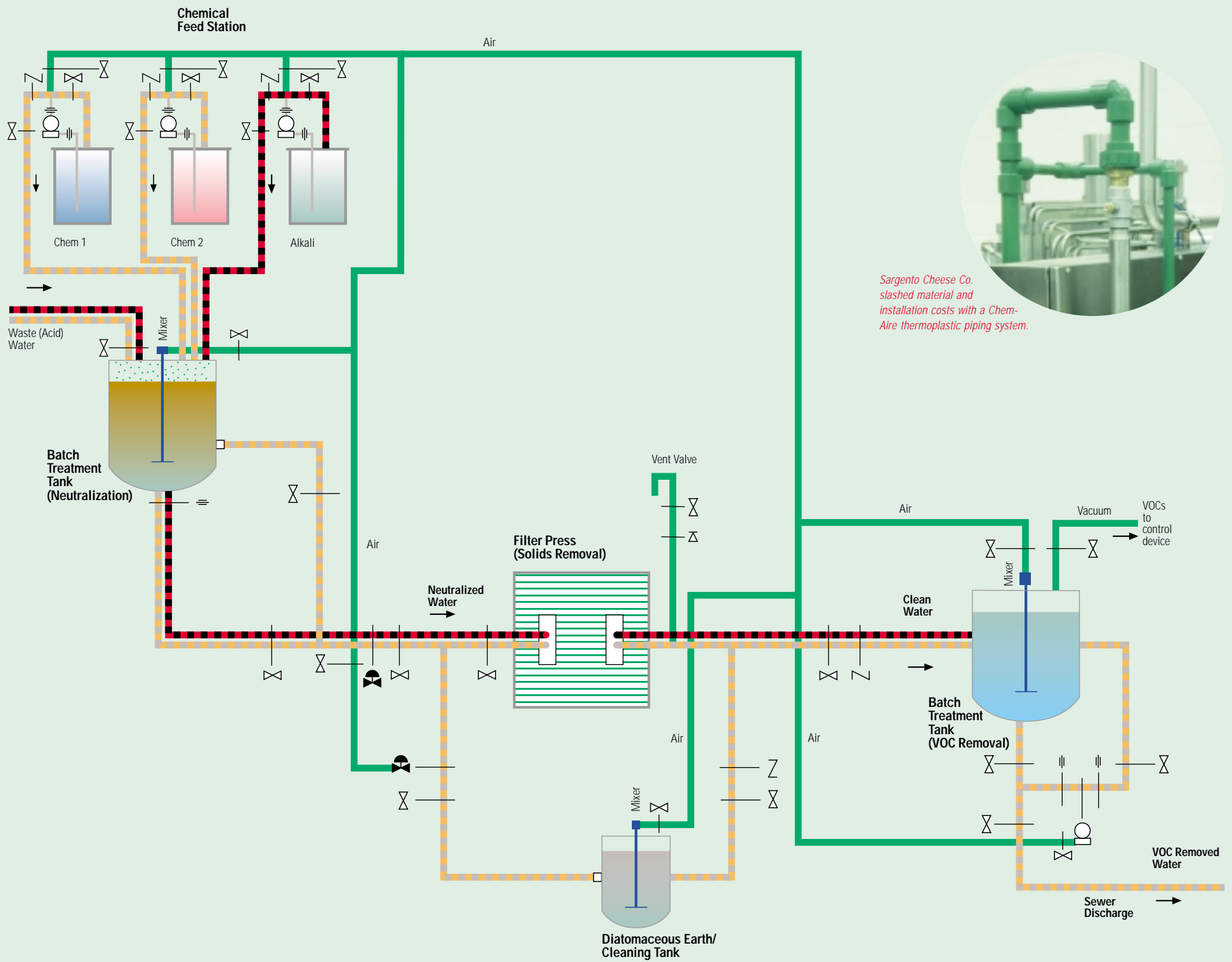
Typical Applications	Black Polypropylene: Clean chemical processes, hot corrosive liquids, industrial plating, waste treatment systems	Natural Polypropylene: Deionized water systems, clean chemical processes, pharmaceutical operations, food processing	Red KYNAR® PVDF, which protects fluid medium from UV exposure, is an excellent material for general industrial applications, especially outdoor installations.	Natural KYNAR® (Unpigmented) PVDF is ideal for industries such as electronics, pharmaceuticals, and processed foods or beverages.
Joining Methods	Thermo-seal fusion, threading, or flanging	Socket heat fusion or flanging	Socket heat fusion, threading, or flanging	Socket heat fusion, threading, or flanging
Max. Service Temperature	180° F/82° C	180° F/82° C	280° F/138° C	280° F/138° C
Fittings	IPS socket type— 1/2" through 6" Threaded— 1/2" through 4"	IPS socket type— 1/2" through 4" Industrial, Threaded— 1/2" through 2"	IPS socket type— 1/2" through 6" Threaded— 1/2" through 2"	IPS socket type— 1/2" through 6" Threaded— 1/2" through 2"
Valves	Tru-Bloc/True Union ball valves*  Tru-Bloc/True Union ball check valves  Diaphragm valves	1/2" through 4" with socket, threaded, or flanged ends; FKM (Viton) O-rings only  1/2" through 4" with socket, threaded, or flanged ends	1/2" through 4" with socket, threaded, or flanged ends  1/2" through 4" with socket, threaded, or flanged ends	1/2" through 4" with socket, threaded, or flanged ends; FKM (Viton) O-rings only  1/2" through 4" with socket, threaded, or flanged ends  1/2" through 4" with metric spigot, IPS socket, or ANSI flanged ends
Special joining equipment	NIBCO socket fusion equipment for joining PP and KYNAR® (PVDF) fittings 1/2" through 6"			

## Pipe

Schedule 40 and 80 wall thicknesses






Schedule 40 and 80 wall thicknesses

\*For pneumatic or electric actuation.






Sargento Cheese Co. slashed material and installation costs with a Chem-Aire thermoplastic piping system.

**Legend**

-  Check Valve
-  Ball Valve
-  Air Diaphragm Pump
-  Flange
-  Pneumatic Ball Valve

**Piping Materials**

-  Chem-Aire
-  PP/PVDF
-  PVC/CPVC

The choice of materials for any system depends on the chemicals, solutions, pressures, temperatures, and other variables involved in the process. Please refer to Chemtrol's technical manuals and chemical resistance guide for assistance in selecting the products most appropriate for your application.

# Chem-Aire®

## The efficient, economical compressed-air system that takes the pressure.

Manufactured from a specially engineered polymer, Chem-Aire is a highly ductile, impact-resistant material that can handle pressures of up to 185 psi at 100° F.

The unique properties of a Chem-Aire compressed-air system make it an excellent choice for any process requiring reliable, efficient, and consistent transport of compressed air. In the VOC removal process, a Chem-Aire system can run the mixers for agitation of the media in the treatment tank. Chem-Aire resists corrosives, even in hostile environments. The interior and exterior pipe surfaces remain smooth, clean, and debris-free.

Chem-Aire is a non-threaded, maintenance-free, leak-free thermoplastic system that is lightweight and easy to install. The piping can be joined by Chemtrol's unique TruConnect™ push-to-connect fittings or by solvent cementing.

With a design life exceeding 50 years, a Chem-Aire compressed system can last indefinitely.

*Refer to Chemtrol Technical Manuals for pressure ratings at various temperatures.*

## Chem-Aire® Compressed Air Systems



### Typical Applications

Chem-Aire® is a homogeneous, shatter-resistant thermoplastic piping system specifically designed for compressed air. Manufactured from a specially engineered formulation of acrylonitrile butadiene styrene (ABS), it offers outstanding strength, ductility, and impact resistance.

### Joining Methods

Solvent cementing, flanging, and TruConnect™ "push-to-connect" fittings

### Max. Service Temperature

140° F/60° C (1/2" through 2");  
120° F/50° C (3" through 4")  
185 psi@100° F

### Fittings Schedule 80

TruConnect™ "push-to-connect" fittings–  
1/2" through 2"

Socket– 1/2" through 4"

### Valves Tru-Bloc/True Union ball valves\*

Tru-Bloc®/True Union ball valves\*  
1/2" through 4" with socket ends  
1/2" through 2" TruConnect™  
"push-to-connect" ends





### Specialty valves

Tru-Bloc®/True Union Safety Vent ball valves

### Pipe

IPS outside diameters with heavy-duty wall thickness: SDR 9.0 (1/2" - 2") and SDR 10.0 (3" - 4")

\*For pneumatic or electric actuation.

<p>Polyvinyl Chloride (PVC) Schedule 80 Fittings and Pipe</p> 	<p>Chlorinated Polyvinyl Chloride (CPVC) Schedule 80 Industrial Fittings and Pipe</p> 	<p>Polypropylene (PP) Schedule 80 Industrial Fittings and Pipe</p> 	<p>Polyvinylidene Fluoride (KYNAR® PVDF) Schedule 80 Fittings and Pipe</p> 
<p><b>Scope</b> This specification covers the manufacturing requirements for PVC Schedule 80 piping components intended for use in industrial pressure rated fluid handling systems of 140° F or less where resistance to corrosion is of prime importance.</p> <p><b>Materials</b> Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Cell Classification 12454-B polyvinyl chloride as outlined in ASTM D-1784. PVC shall be gray in color. Pipe and fitting materials shall be specially formulated with sufficient UV screeners to provide for long-term outdoor exposure with no deleterious effects. Materials from which pipe and fittings are manufactured shall have been tested and listed for conveying potable water by the National Sanitation Foundation (NSF).</p> <p><b>Dimensions/Design (IPS Size)</b> Fitting components that utilize socket type solvent welded connections shall have socket diameters, lengths, and wall thicknesses as required by ASTM D-2467. Components utilizing taper pipe thread connections shall have thread lengths, diameters, and configurations in conformance with ASTM D-2464. Fittings shall be industrial, heavy duty, hub style. Flanges shall be one-piece solid design or two-part Van Stone type which utilize the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges. Unions shall be the O-ring seal type having interchangeable components with true union valves for maximum system versatility. Unions intended for joining dissimilar materials shall be the transition type, which utilize components of the two dissimilar materials, joined with an O-ring to absorb the thermal expansion coefficient differential. Pipe shall be as prescribed by ASTM D-1785 for pressure rated piping systems.</p> <p><b>Pressure Ratings</b> Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM D-1785. Threaded fittings shall be pressure rated at 50% of the rating for socket fittings. Valves, unions, and flanges shall be pressure rated at 150 psi for water service at 73° F, non-shock and have a minimum burst requirement of 3.2 times the rated pressure. Pipe shall be pressure rated as prescribed by ASTM D-1785.</p> <p><b>Markings</b> Fittings and pipe shall be clearly marked with the manufacturer's name or trademark, materials, ASTM number or alternate symbol indicating compliance with applicable standards, NSF seal of approval indicating compliance with NSF Standard 14 for the conveyance of potable water, and further indicating compliance with the applicable ASTM Standard and the country of manufacture.</p> <p><b>Installation/Maintenance</b> At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions.</p>	<p><b>Scope</b> This specification covers the manufacturing requirements for CPVC Schedule 80 piping components intended for use in industrial pressure rated fluid handling systems of 210° F or less where resistance to corrosion at elevated temperatures is of prime importance.</p> <p><b>Materials</b> Rigid CPVC (chlorinated polyvinyl chloride) used in the manufacture of Schedule 80 piping components shall be Cell Classification 23447-B as identified in ASTM D-1784. CPVC materials shall be light gray in color. Pipe and fitting materials shall be specially formulated with sufficient UV screeners to provide for long-term outdoor exposure with no deleterious effects. CPVC material used to manufacture pipe and fittings shall have been tested and listed for conveyance of potable water.</p> <p><b>Dimension/Design (IPS Size)</b> Fitting components that utilize socket type solvent welded connections shall have socket diameters, lengths, and wall thicknesses as required by ASTM F-439. Components utilizing taper pipe thread connections shall have thread lengths, diameters, and configurations in conformance with ASTM F-437. Pipe shall have diameters and wall thicknesses in conformance with the requirements of ASTM F-441. Fittings shall be industrial, heavy duty, hub style. Flanges shall be one-piece solid design or two-part Van Stone type, which utilize the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges. Unions shall be the O-ring seal type having interchangeable components with true union valves for maximum system versatility. Unions intended for joining dissimilar materials shall be the transition type, which utilize components of the two dissimilar materials, joined with an elastomeric seal to absorb the thermal expansion coefficient differential.</p> <p><b>Pressure Ratings</b> Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM F-441. Threaded fittings shall be pressure rated at 50% of the rating for socket fittings. Valves, unions, and flanges shall be pressure rated at 150 psi for water service at 73° F, non-shock and have a minimum burst requirement of 3.2 times the rated pressure.</p> <p><b>Markings</b> Fittings and pipe shall be clearly marked with the manufacturer's name or trademark, materials, ASTM number or alternate symbol indicating compliance with applicable standards, NSF seal of approval indicating compliance with NSF Standard 14 for the conveyance of potable water, and further indicating compliance with the applicable ASTM Standard and the country of manufacture.</p> <p><b>Installation/Maintenance</b> At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions.</p>	<p><b>Scope</b> This specification covers the manufacturing requirements for black and Chem-Pure® Schedule 80 piping components intended for use in industrial pressure rated fluid handling systems of 180° F or less where resistance to corrosion is of prime importance.</p> <p><b>Materials</b> Rigid PP (polypropylene) used in the manufacture of Schedule 80 piping components shall be (select one): • Black pigmented PP pipe material shall be Cell Class PP0110-A2-1510 as per ASTM D4101. Fittings material shall be Cell Class PP0110-M30-A10120 (glass bead material) and Cell Class PP0110-B67154 (unfilled material) as per ASTM D4101. These materials shall be pigmented jet black. • Chem-Pure Natural PP pipe material shall be Cell Class PP0110-A2-1510 as per ASTM D4101. Fitting material shall be Cell Class PPO210-B45145 as per ASTM D4101. These materials shall be unpigmented, of the highest purity, and meet the following requirements: – FDA-21 CFR 177.1520(c) (1.1) – USP-CLASS VI – USDA-requirements for packaging materials in contact with meat and poultry products.</p> <p><b>Dimensions/Design (IPS Size)</b> Fitting components that utilize socket type heat fusion welded connections shall have socket lengths and wall thicknesses as required for Schedule 80 fittings in ASTM D-2467. Socket diameters shall be in accordance with the manufacturer's recommendations for an interference fit with the pipe as prescribed in ASTM D-2657. Components utilizing taper pipe threads shall have lengths, diameters, and configuration in accordance with ASTM D-2464 for Schedule 80 fittings. Pipe shall have diameters and wall thicknesses in conformance with ASTM D-1785 for Schedule 80 pipe. Fittings shall be industrial, heavy duty, hub style. Flanges shall be one-piece solid design utilizing the tapered face, serrated, full face gasket technique for joining, with bolt pattern compatible with ANSI B16.5 Class 150 metal flanges. Flanges shall be reinforced with 30% glass bead for dimensional stability, (black only). Unions shall be the O-ring seal type having interchangeable components with true union valves for maximum system versatility. Unions intended for joining dissimilar materials shall be the transition type, which utilize components of the two dissimilar materials, joined with an elastomeric seal to absorb the thermal expansion coefficient differential.</p> <p><b>Pressure Ratings</b> Pipe and fittings joined by the socket fusion technique shall be pressure rated according to the following at 73° F water service. 1/2" – 410 psi 1" – 310 psi 2" – 200 psi 4" – 160 psi 3/4" – 330 psi 1 1/2" – 230 psi 3" – 190 psi 6" – 140 psi Note: Threaded connections shall be rated at 20 psi maximum for all sizes at 73° F water service. Socket type valves, unions, and flanges shall be rated at 150 psi for water service at 73° F, non-shock and have a minimum burst requirement of 3.2 times the rated pressure.</p> <p><b>Markings</b> Fittings and pipe shall be clearly marked with the manufacturer's name or trademark, the size, material, and country of manufacture.</p> <p><b>Installation/Maintenance</b> At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions. Specialized joining equipment shall be as recommended by the manufacturer.</p>	<p><b>Scope</b> This specification covers the manufacturing requirements for red and natural PVDF Schedule 80 piping components intended for use in industrial, pressure rated, fluid handling systems of 280° F or less where resistance to corrosion is of prime importance.</p> <p><b>Materials</b> Rigid PVDF (polyvinylidene fluoride) used in the manufacture of Schedule 80 piping components shall conform to requirements in ASTM D-3222 for Type I homopolymers. Pipe and fitting components shall be manufactured from (select one): • PVDF compound which shall be colored strawberry red with a minimum 1.7% pigment content for opaqueness to UV radiation. • PVDF compound which shall be natural (unpigmented) 700 series Kynar of the highest purity and maximum transparency to UV radiation.</p> <p><b>Dimensions/Design</b> Fitting components that utilize socket type heat fusion welded connections shall have socket lengths and wall thicknesses conforming to ASTM D-2467 and socket diameters shall be in accordance with the manufacturer's printed recommendations to provide an interference fit with the pipe. Components utilizing taper pipe threads shall have thread lengths, diameters, and configurations in conformance with ASTM D-2464. Pipe shall be manufactured to the same tolerances for outside diameter and wall thicknesses as outlined in ASTM D-1785 for Schedule 80 pipe. Fittings shall be industrial, heavy duty, hub style. Unions shall be the O-ring seal type having interchangeable components with true union valves for maximum system versatility. Unions intended for joining dissimilar materials shall be the transition type, which utilize components of the two dissimilar materials, joined with an elastomeric seal to absorb the thermal expansion coefficient differential.</p> <p><b>Pressure Ratings</b> Socket fittings and pipe shall be pressure rated according to the following at 73° F water service. 1/2" – 580 psi 1" – 430 psi 2" – 270 psi 4" – 220 psi 3/4" – 470 psi 1 1/2" – 320 psi 3" – 260 psi 6" – 190 psi Note: Threaded pipe and fittings shall be rated at 50% of the values given for socket. Valves, unions, and flanges (either socket or threaded) shall be pressure rated at 150 psi service at 73° F, non-shock and have a minimum burst requirement of 3.2 times the rated pressure.</p> <p><b>Markings</b> All pipe, fittings, and valves shall be clearly marked with the manufacturer's name or trademark, size, and country of manufacture.</p> <p><b>Installation</b> At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions. Specialized joining equipment shall be as recommended by the pipe, valves, and fittings manufacturer.</p>

## Chem-Aire® Compressed Air Systems



## 150 P.S.I. Tru-Bloc, True Union Ball Valves 1/2" through 6" Sizes



## 150 P.S.I. Ball Check and Foot Valves PVC, CPVC, PP, PVDF 1/2" through 4" Sizes



### Materials

Specifically designed for compressed air, Chem-Aire is manufactured from a specially engineered formulation of acrylonitrile butadiene styrene (ABS) modified extensively to produce a homogeneous shatter-resistant piping system with outstanding strength, ductility, and impact resistance. The ABS material ASTM used in manufacturing Chem-Aire is D3965, cell classification 54322.

Material design stress is a minimum of 1250 psi @ 73° F incorporating a 2-to-1 safety factor, allowing a service life exceeding 50 years under continuous pressure conditions.

### Dimensions/Design

- Pipe is designed to Iron Pipe Size (IPS) outside diameters with heavy-duty wall thickness conforming to a Standard Dimension Ratio (SDR) or 9.0 (1/2"-2") and 10.0 (3"-4").
- Chem-Aire systems meet all requirements of California OSHA Standard "Plastic Piping Systems for Compressed Air" Title 8, Chapter 4.

### Pressure/Temperature Ratings

- Pipe and fittings are to be pressure-rated for continuous use at 185 psi @ 100° F.
- Valves, unions, and flanges are pressure-rated for continuous use at 150 psi @ 100° F.
- Maximum service temperature for all 1/2"-2" Chem-Aire products is 140° F and for 3"-4" Chem-Aire products is 120° F.

### Markings

- Pipe is bright green, clearly marked with manufacturer's identification, standard dimension ratio (SDR), nominal size, Chem-Aire name, pressure ratings, made in U.S.A., "For Compressed Air," and ASTM D3965 cell classification 54322.
- Fittings, valves, and unions are bright green, clearly marked with manufacturer's identification, Chem-Aire name, nominal size, and made in U.S.A.

Note: See Technical Bulletin No. 10005 for most current industry standards to which Chemtrol products conform.

Some compressor lubricating oils and some oil additives can cause deterioration. Please refer to a current Chemtrol Technical Bulletin or call Chemtrol for information on specific lubricants.

### Scope

This specification covers the manufacturing requirements for dual blocking (Tru-Bloc) and downstream only blocking (true union) quarter turn ball valves of PVC, CPVC, PP, PVDF materials intended for use in industrial, commercial, and residential pressure piping systems where cost-effective, long-term resistance to corrosion is of prime importance and the service temperature does not exceed: PVC - 140° F; CPVC - 210° F; PP - 180° F; PVDF - 280° F.

Major component parts shall be constructed of (select one):

1/2" – 4" PVC (polyvinyl chloride), Cell Class 12454-B per ASTM D-1784, industrial gray in color, and the valve style shall be full port Tru-Bloc, TU (6" size is standard port) or Tru-Bloc, SU (1/2" – 2" only)

1/2" – 6" CPVC (chlorinated polyvinyl chloride), Cell Class 23447-B per ASTM D-1784, industrial light gray in color, and the valve style shall be full port Tru-Bloc, TU (6" size is standard port) or Tru-Bloc, SU (1/2" – 2" only).

1/2" – 4" PP (polypropylene) Cell Class PP0110-M30-A10120 (glass filled material) and Cell Class PP0110-B67157 (unfilled material) as per ASTM D4101. These materials shall be pigmented jet black. Valve style shall be full port True Union.

1/2" – 4" Chem-Pure (natural polypropylene) Cell Class PP0210-B45145 as per ASTM D4101. Materials shall be unpigmented and of the highest purity. Valve style shall be full port True Union.

1/2" – 4" PVDF (polyvinylidene fluoride) Type I compound per ASTM D-3222. The material shall be pigmented red for maximum UV opacity, and the valve style shall be full port Tru-Bloc, TU or True Union.

1/2" – 4" PVDF (polyvinylidene fluoride) Type I compound per ASTM D-3222. The material shall be natural (unpigmented) 700 Series Kynar of the highest purity and maximum transparency to UV radiation, and the valve style shall be full port Tru-Bloc, TU or True Union.

### Dimensions/Valve Design

PVC and CPVC socket connections shall conform to the requirements of ASTM D-2467 and F-439 for Schedule 80 pressure fittings. PP and PVDF socket connections shall be fusion type as described in ASTM D-2657 Procedure 1.

All threaded connectors shall conform to the requirements of ASTM D-2464 and F-437 as well as ANSI B1.20.1 for tapered pipe threads.

### Performance

Valves shall be rated for 150 psi service at 73° F water, non-shock, and have a minimum burst rating of 3.2 times the rated working pressure for maximum safety.

### Markings

Valves shall be clearly marked with the manufacturer's name or trademark, size, material of construction, and country of manufacture. PVC and CPVC valves shall additionally bear the National Sanitation Foundation NSF-pw SE seal inferring third-party certification that product and materials are regularly tested for ASTM physical compliance and NSF chemical requirements for safe conveyance of potable water.

### Installation

At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions.

### Scope

This specification covers the manufacturing requirements for PVC, CPVC, polypropylene, and PVDF ball check and PVC, CPVC foot valves intended for use in industrial, commercial, and residential pressure piping systems where cost-effective resistance to corrosion is of prime importance. Maximum service temperatures are: PVC - 140° F; CPVC - 210° F; PP - 180° F; PVDF - 280° F.

Major component parts shall be constructed of (select one):

1/2" – 4" PVC (polyvinyl chloride), Cell Class 12454-B per ASTM D-1784, industrial gray in color.

1/2" – 4" CPVC (chlorinated polyvinyl chloride), Cell Class 23447-B per ASTM D-1784, industrial light gray in color.

1 1/2" – 2" PP (polypropylene) Cell Class PP0110-M30-A10120 (glass filled material) and Cell Class PP0110-B67157 (unfilled material) as per ASTM D4101. These materials shall be pigmented jet black.

1/2" – 2" Chem-Pure (natural polypropylene) Cell Class PP0210-B45145 as per ASTM D4101. Materials shall be unpigmented and of the highest purity.

1/2" – 2" PVDF (polyvinylidene fluoride) Type I compound per ASTM D-3222. The material shall be pigmented red for maximum UV opacity.

1/2" - 2" PVDF (polyvinylidene fluoride) Type I compound per ASTM D-3222. The material shall be natural (unpigmented) 700 Series Kynar of the highest purity and maximum transparency to UV radiation.

### Dimensions/Valve Design

PVC and CPVC socket connections shall conform to the requirements of ASTM D-2467 and F-439 for Schedule 80 pressure fittings. PP and PVDF socket connections shall be fusion type as described in ASTM D-2657 Procedure 1.

All threaded connectors shall conform to the requirements of ASTM D-2464 and F-437 as well as ANSI B1.20.1 for tapered pipe threads.

The valve design shall be full port (6" size is standard port) with full flow around the rib-guided ball. Foot valve models shall have a minimum cumulative area ratio of screen holes (inlet) to valve port of 3:1.

The valve seat shall be an elastomer which will permit low seating head, and a flow directional arrow shall be molded on the valve body for permanent visibility.

### Performance

Valves shall be rated for 150 psi service at 73° F water, non-shock, and have a minimum burst rating of 3.2 times the rated working pressure for maximum safety.

### Markings

Valves shall be clearly marked with the manufacturer's name or trademark, size, material of construction, and country of manufacture. PVC and CPVC valves shall additionally bear the National Sanitation Foundation NSF-pw SE seal inferring third-party certification that product and materials are regularly tested for ASTM physical compliance and NSF chemical requirements for safe conveyance of potable water.

### Installation

At the specifying engineer's option, the manufacturer shall provide, at no additional cost, on-site training for installation/maintenance personnel. Otherwise, installation shall be as specified by the manufacturer's printed instructions.

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