ProSeries® CHEM-FEED® Engineered Skid Systems

by Blue-White Ind.

Engineering and Technical Data

CHEM-FEED® CFS

- Single pump and dual pump systems
- Strong, lightweight polyester powder coated welded aluminum structure
- Efficient, small footprint design
- Flow indicator
- Drip containment tray
- Stainless Steel mounting pads
- Can be shipped via UPS

Dual pump model number CFS-2AA-AAAAAA
Shown with Flex-Pro pump sold separately

Single pump model number CFS-1AA-AAAAAA
Shown with Chem-Pro pump sold separately

*Complete the system by ordering any of the following **ProSeries**® metering pumps:*

- **Flex-Pro® A3 or A4 series Peristaltic Metering Pump with Integral Controller**
- **Chem-Pro® C2 or C3 series Diaphragm Metering Pump with Integral Controller**

Applications:

- Chemical metering
- Chlorination
- Fluoridation
- Potassium Permanganate
- Alum
- Sodium Bisulfite / Bisulfate
- Hydrochloric Acid
- Polymers
- Caustics
- Flocculants

Chem-Feed Skid System Features:

Chem-Feed Engineered Skid Systems were designed and engineered using solid modeling tools for superior piping installation and easy component maintenance. Custom engineered universal mounting blocks and pre-machined mounting slots provide for easy component servicing and replacement. Lightweight for wall of floor mounting. Each factory built and tested system includes the following standard components:

Pressure Relief Valve - Protects the system from over-pressurization, 5-100 psi setting range, 150 psi maximum system pressure.

Check Valve - Protects the user from back-flow during pump maintenance.

Flow Indicator - Provides a visual indication of chemical movement through the system.

The following optional components are available for specification (see the ordering matrix):

Inlet Y Strainer - Recommended for Diaphragm Pump systems.

Calibration Cylinder - Confirm pump output under system conditions. Specify cylinder volumes from 1.6 GPH to 32 GPH.

Pulsation Dampener - Protect the system components from pulsation. Recommended for diaphragm pump systems.

Pressure Gauge with Guard - Isolate and protect the system pressure gauge. Specify pressure ranges from 0-30 psi, 0-100psi, or 0-200 psi.

Flow Verification Sensor - Provides an electronic pulse to the pump to verify chemical movement through the system (minimum flow capability one ounce per minute).

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Specifications:

Skid
Chemically resistant polyester powder coated 6061 T6 aluminum. Welded joint construction.

Pump (sold separately)
Flex-Pro model A3 or A4 peristaltic pumps or Chem-Pro model C2 or C3 diaphragm pump. See page 6 for metering pump data.

Piping
PVC Schedule 80 (optional CPVC).

Tubing (T)
Reinforced braided PVC, 200 Psi max, meets NSF std. 51. The pump inlet and outlet flexible tubing connections are terminated to half unions and secured to the barbed fitting with stainless steel clamps. The calibration cylinder fill tube connections are secured to the barbed connectors with stainless steel clamps.

Tubing clamps
300 series SS band, 400 series SS screw

Unions (U)
PVC body, schedule 80, Viton seals (optional EPDM)

Ball valves (V)
Vented type ball, True unions, PVC body, PTFE shaft bearings and seats, Viton seals (optional EPDM)

Pressure Relief Valve (PRV)
PVC body, PTFE primary diaphragm seal. Non-wetted components: Viton secondary seal, zinc plated steel spring, stainless steel external hardware, HDPE pressure adjusting screw and locknut. Iinfinite adjustment from 5-100 psi. Maximum inlet pressure 150 psi, 1/8" F/NPT outlet safety vent.

Calibration Cylinder (CC)
PVC body, PVC end caps, 1/4" ID tubing outlet vent.
Available volumes: 1.6 GPH (100ml), 4 GPH (250ml), 8 GPH (500ml), 16 GPH (1000ml), 32 GPH (2000ml).

Pulsation Dampener (PD)
CPVC body,10 cubic inch volume, Viton bladder (optional EPDM bladder)

Gauge w/guard (G)
Gauge: liquid filled stainless steel with blowout plug, bottom mount, 1/4" NPT theads. Available pressure ranges: 0-30 psi, 0-100, psi, 0-200 psi.
Guard: PVC body, Viton diaphragm seal, temperature compensated oil filled.

Check Valve (CV)
PVC body, Viton diaphragm (optional EPDM). Cracking pressure: 1.0-1.5 psi. Maximum working pressure: inlet = 150 psi, back = 100 psi.

Flow Indicator (F)
Machined cast acrylic, PVC connections, ceramic ball, polypropylene ball stop, PVC half unions, viton seals (optional EPDM).

Y Strainer (S)
PVC body, Viton seals (optional EPDM).

Flow Verification Sensor (FVS)
PVDF body, PVC socket weld connections, viton seals (optional EPDM).
Available working flow ranges (ounces per minute):
1.0 to 10
3.5 to 35
7.0 to 70
10 to 100
17 to 170
24 to 240

Universal mounting blocks
PVC

Pump extended mounting brackets
316 Stainless Steel

Skid mounting foot / wall pads
316 Stainless Steel

Mounting hardware
18-8 Stainless Steel

Drip Tray
Polypropylene,16" x 21" x 3" - 4 gallons total containment

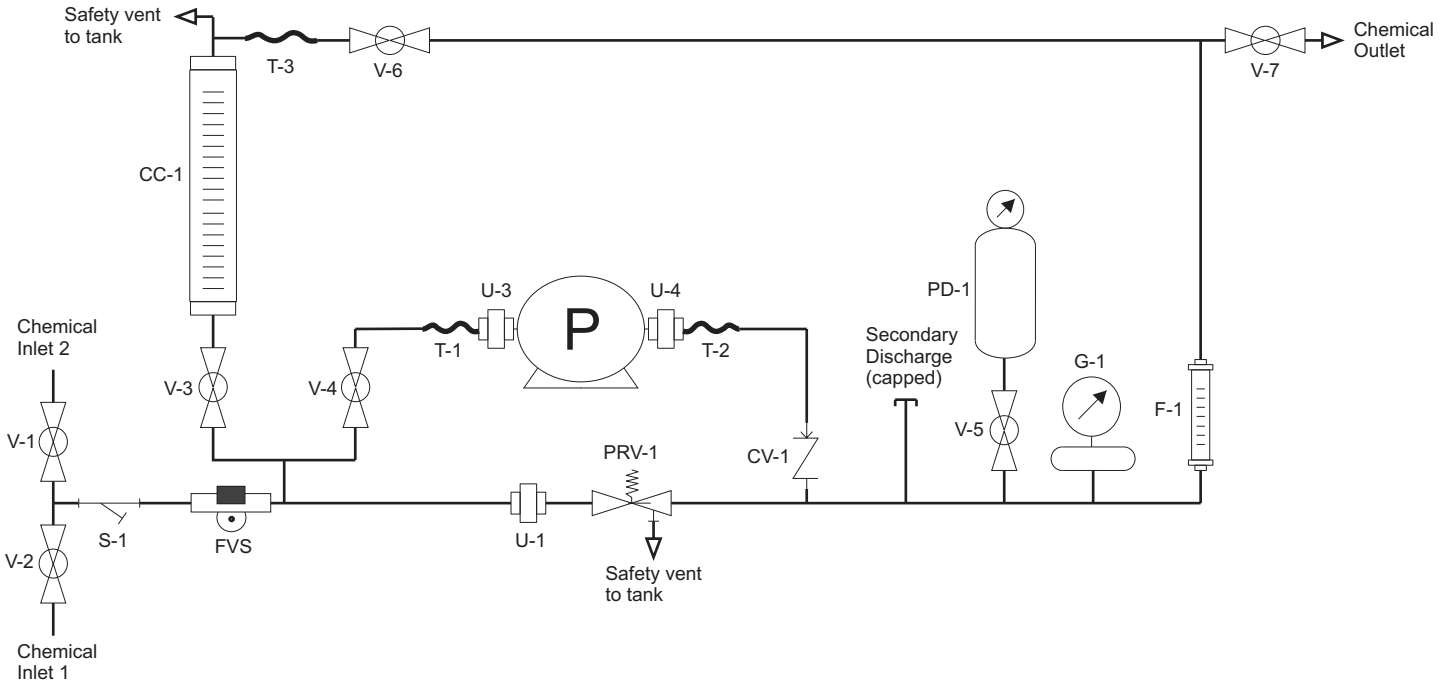
Maximum working pressure
150 psig (10.3 bar)

Operating Temperature
14°F to 115°F (-10°C to 46°C)

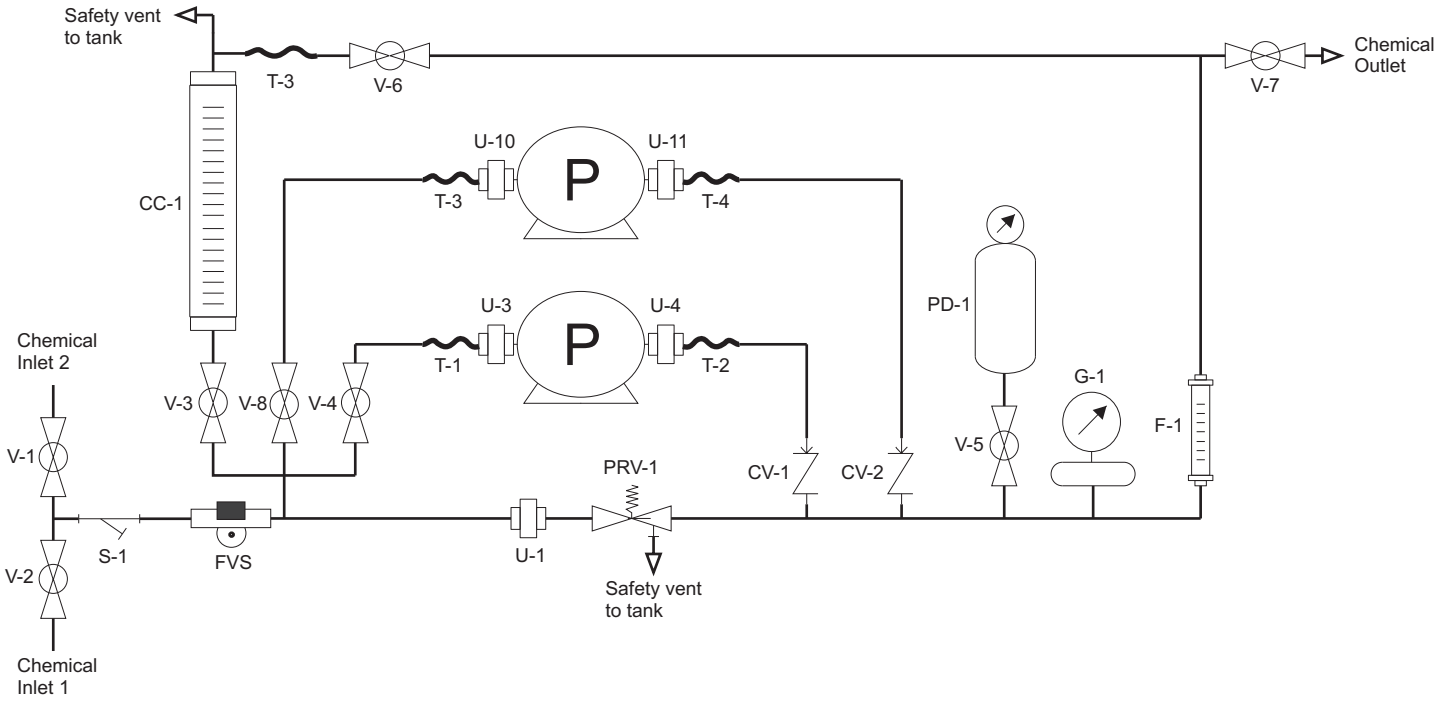
Approximate Shipping Weight (pump ships separately)
Single Pump System: 60 lb. (27.2 Kg)
Dual Pump System: 70 lb. (31.8 Kg)

Piping and Instrumentation Diagrams:

Single Pump Skids:

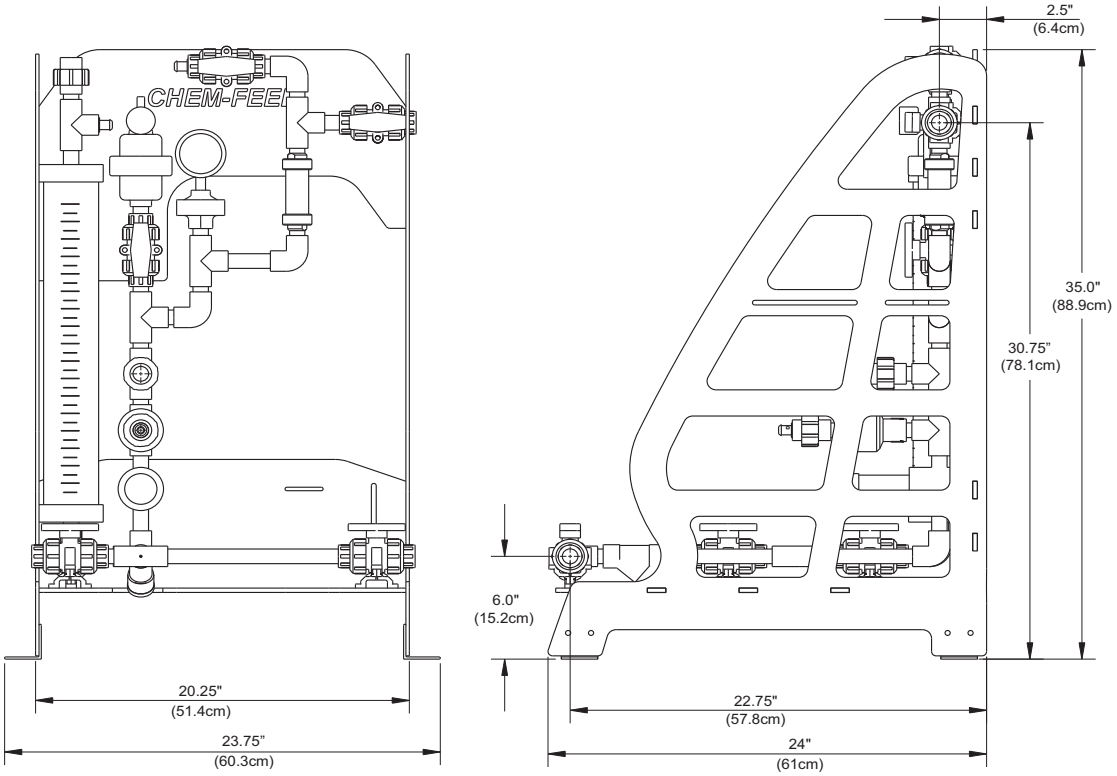


Dual Pump Skids:

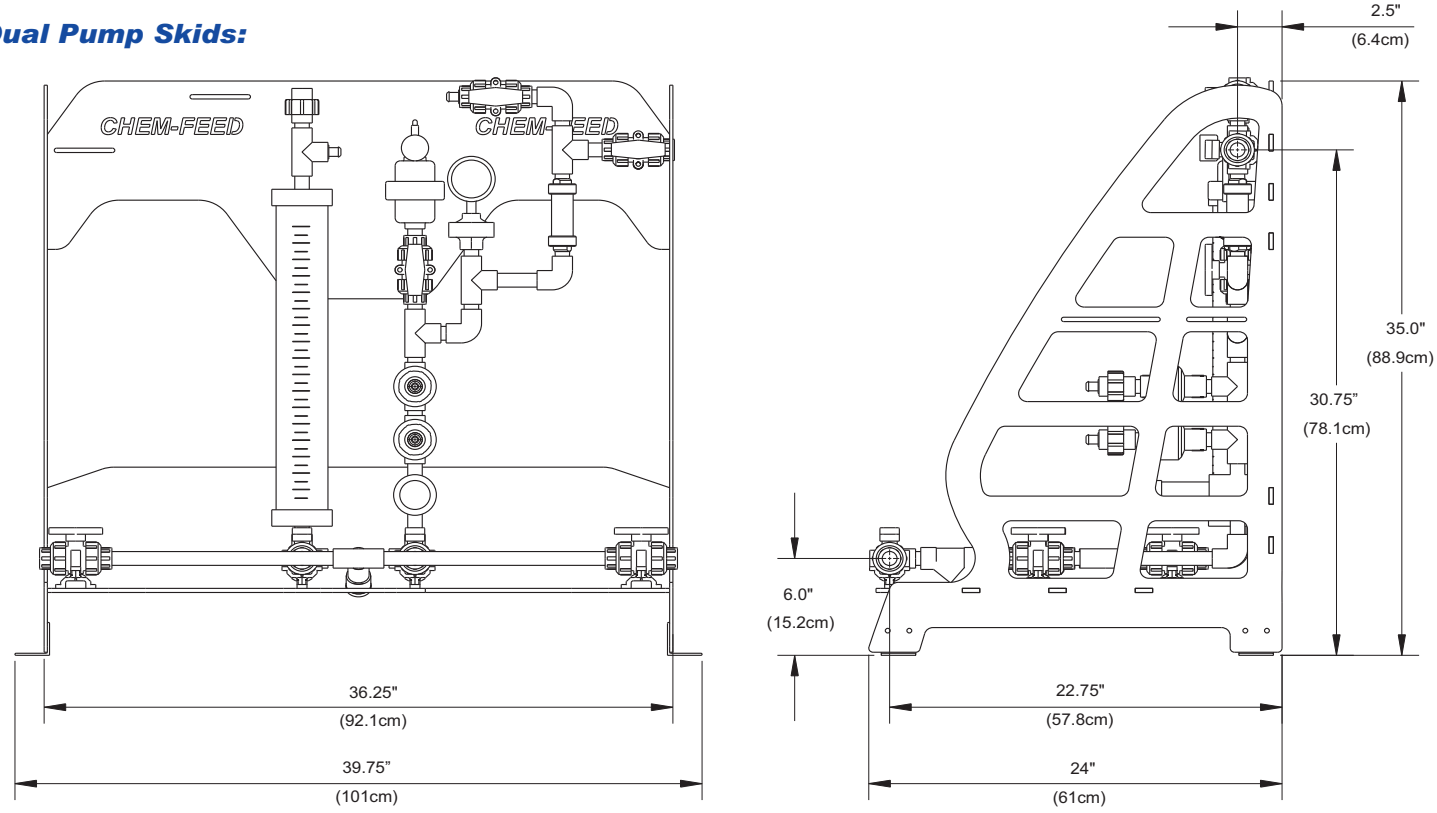


Dimensions:

Single Pump Skids:



Dual Pump Skids:



Suggested Model Variations (see model number matrix below for additional variations):

Suggested Models for Flex-Pro Peristaltic Pump Applications

Number of Pumps	Piping & Seals	Inlet Strainer	Calibration Cylinder	Pressure Relief Valve	Pulsation Dampener	Pressure Gauge w/Guard	Check Valve	Chem-Feed Skid Model Number
One	PVC/Viton	NO	NO	YES	NO	NO	YES	CFS-1AA-XXAXXA
One	PVC/EPDM	NO	NO	YES	NO	NO	YES	CFS-1BA-XXAXXB
Two	PVC/Viton	NO	NO	YES	NO	NO	YES	CFS-2AA-XXAXXA
Two	PVC/EPDM	NO	NO	YES	NO	NO	YES	CFS-2BA-XXAXXB

Suggested Models for Chem-Pro Diaphragm Pump Applications

Number of Pumps	Piping & Seals	Inlet Strainer	Calibration Cylinder	Pressure Relief Valve	Pulsation Dampener	Pressure Gauge w/Guard	Check Valve	Chem-Feed Skid Model Number
One	PVC/Viton	YES	32 GPH	YES	YES	200 PSI	YES	CFS-1AA-AAAAAA
One	PVC/Viton	YES	32 GPH	YES	NO	200 PSI	YES	CFS-1AA-AAAXAA
One	PVC/EPDM	YES	32 GPH	YES	YES	200 PSI	YES	CFS-1BA-BAABAB
One	PVC/EPDM	YES	32 GPH	YES	NO	200 PSI	YES	CFS-1BA-BAAXAB
Two	PVC/Viton	YES	32 GPH	YES	YES	200 PSI	YES	CFS-2AA-AAAAAA
Two	PVC/Viton	YES	32 GPH	YES	NO	200 PSI	YES	CFS-2AA-AAAXAA
Two	PVC/EPDM	YES	32 GPH	YES	YES	200 PSI	YES	CFS-2BA-BAABAB
Two	PVC/EPDM	YES	32 GPH	YES	NO	200 PSI	YES	CFS-2BA-BAAXAB

Model Number Matrix:

Chem-Feed Engineered Skid System Matrix

System type

CFS-1	Single pump system - single chemical / single outlet
CFS-2	Dual pump system - single chemical / single outlet

Piping / Valves / Unions / Seal Materials

A	PVC piping, PVC ball valves, PVC unions, Viton seals
B	PVC piping, PVC ball valves, PVC unions, EP seals

Structure Assembly Materials

A	Chemical resistant powder coated aluminum stand with 316SS mounting pads

Inlet Strainer and Flow Verification Sensors

A	PVC body Inlet Strainer with Viton seals (without flow verification sensor)
B	PVC body Inlet Strainer with EP seals (without flow verification sensor)
C	PVC body Inlet Strainer and 30-300 ml/min Flow Verification sensor with Viton seals
D	PVC body Inlet Strainer and 100-1000 ml/min Flow Verification sensor with Viton seals
E	PVC body Inlet Strainer and 200-2000 ml/min Flow Verification sensor with Viton seals
F	PVC body Inlet Strainer and 300-3000 ml/min Flow Verification sensor with Viton seals
G	PVC body Inlet Strainer and 500-5000 ml/min Flow Verification sensor with Viton seals
H	PVC body Inlet Strainer and 700-7000 ml/min Flow Verification sensor with Viton seals
J	PVC body Inlet Strainer and 30-300 ml/min Flow Verification sensor with Viton seals
K	PVC body Inlet Strainer and 100-1000 ml/min Flow Verification sensor with EP seals
L	PVC body Inlet Strainer and 200-2000 ml/min Flow Verification sensor with EP seals
M	PVC body Inlet Strainer and 300-3000 ml/min Flow Verification sensor with EP seals
N	PVC body Inlet Strainer and 500-5000 ml/min Flow Verification sensor with EP seals
P	PVC body Inlet Strainer and 700-7000 ml/min Flow Verification sensor with EP seals
X	None

Calibration Cylinder

A	32 GPH (2000 ml)
B	16 GPH (1000 ml)
C	8 GPH (500 ml)
D	4 GPH (250 ml)
E	1.6 GPH (100 ml)
X	None

Pressure Relief Valve

A	PVC body, PTFE diaphragm
B	PVDF body, PTFE diaphragm
C	PTFE body, PTFE diaphragm

Pulsation Dampener

A	10 cubic inch, CPVC body, PTFE diaphragm, Viton seals
B	10 cubic inch, CPVC body, PTFE diaphragm, EPDM seals
X	None

Pressure Guage w/Guard

A	200 PSI guage, PVC guard, PTFE diaphragm
B	100 PSI guage, PVC guard, PTFE diaphragm
C	30 PSI guage, PVC guard, PTFE diaphragm
X	None

Check Valve

A	PVC valve body, Viton diaphragm seal
B	PVC valve body, EPDM diaphragm seal

CFS-1	A	A	-	A	X	A	X	B	A	Sample Chem-Feed Engineered Skid System Part Number

ProSeries Pumps:

ProSeries Pump Features (see the specific technical data sheets for additional pump features)	Flex-Pro Peristaltic	Chem-Pro Diaphragm
Valveless peristaltic technology self primes against maximum back pressure. Cannot Vapor lock. Linear output.	•	
Diaphragm technology for system pressures to 175 PSI. PVDF/Ceramic/TFEp head resists most chemicals.		•
SCADA Input: Remote speed control via 4-20mA, 0-10VDC, high speed digital pulse, contact closure pulse	•	•
SCADA Input: One, contact closure (remote start / stop)	•	
Remote/Local control lockout settings	•	
SCADA Output: One, high switching current alarm relay	•	•
SCADA Output: Three, dry contact or maximum 30VDC/115VAC 1 amp contact closures	•	
SCADA Output: Programmable 4-20mA signal or high speed pulse, proportional to pump output	•	•
TFD (Tube Failure Detection) or DFD (Tube Failure Detection) System Alarm	•	•
FVS (Flow Verification System) Alarm *	•	•
NEMA 4X (IP66) wash-down rating	•	•
Variable speed motor	•	•
Variable speed brush-less DC motor	•	

Chem-Pro Diaphragm Pump Models:

See additional pump models and more information at www.blue-white.com

Feed Rate Operating Range			Maximum Pressure	Maximum Speed	Pumphead Materials	Chem-Pro Model Numbers	
GPH	LPH	ML/Min	PSI (bar)	Strokes per Minute		115V AC	230V AC
.07 - 7.1	.27 - 27.0	4.5 - 450	175 (12.0)	166	PVDF/Teflon/Ceramic/TFEp	C2V243XVA	C2V253XVA
.13 - 12.7	.48 - 48.0	8.0 - 800	175 (12.0)	166	PVDF/Teflon/Ceramic/TFEp	C2V241XVA	C2V251XVA
.20 - 20.3	.77 - 76.8	12.8 - 1280	175 (12.0)	166	PVDF/Teflon/Ceramic/TFEp	C2V242XVA	C2V252XVA
.42 - 42.0	1.59 - 159	26.5 - 2650	100 (6.8)	130	PVDF/Teflon/Ceramic/TFEp	C3V242XVA	C3V252XVA

Flex-Pro Peristaltic Pump Models:

See additional pump models and more information at www.blue-white.com

Feed Rate Operating Range			Pump Tube Material	Maximum Pressure	Maximum Speed	Flex-Pro Model Numbers	
GPH	LPH	ML/Min		PSI (bar)	RPM	115V AC	230V AC
.001 - 2.10	.003 - 7.80	.05 - 132	Norprene	125 (8.6)	125	A3V24-MND	A3V25-MND
.007 - 17.4	.026 - 66.0	.4 - 1097	Norprene	125 (8.6)	125	A3V24-MNH	A3V25-MNH
.013 - 33.3	.050 - 126	.8 - 2100	Norprene	125 (8.6)	125	A3V24-MNK	A3V25-MNK
.02 - 50.7	.08 - 192	1.3 - 3200	Norprene	80 (5.5)	125	A4V24-MNK	A4V24-MNK
.04 - 100.0	.15 - 378	2.5 - 6300	Norprene	50 (3.4)	125	A4V24-MNL	A4V25-MNL
.06 - 158.5	.24 - 600	4.0 - 10000	Norprene	30 (2.1)	125	A4V24-MNP	A4V25-MNP
.06 - 14.5	.022 - 55.1	.4 - 920	Norprene Chemical	50 (3.4)	125	A3V24-MTH	A3V25-MTH
.01 - 28.5	.043 - 108.0	.7 - 1800	Norprene Chemical	50 (3.4)	125	A3V24-MTK	A3V25-MTK
.02 - 42.8	.06 - 162	1.1 - 2700	Norprene Chemical	30 (201)	125	A4V24-MTK	A4V25-MTK
.002 - 4.60	.007 - 17.4	.1 - 290	Tygothane	65 (4.5)	125	A3V24-MGE	A3V25-MGE
.004 - 10.1	.015 - 38.4	.3 - 637	Tygothane	65 (4.5)	125	A3V24-MGG	A3V25-MGG
.011 - 28.5	.043 - 108	.7 - 1800	Tygothane	65 (4.5)	125	A3V24-MGK	A3V25-MGK
.022 - 55.5	.084 - 210	1.4 - 3500	Tygothane	65 (4.5)	125	A4V24-MGK	A4V25-MGK
.04 - 100.0	.15 - 378	2.5 - 6300	Tygothane	65 (4.5)	125	A4V24-MGKK	A4V25-MGKK

Tubing chemical resistance data

Norprene® Tubing Meets FDA criteria for food | Excellent chemical resistance

Alcohol general	Calcium hypochlorite 20%	Formic acid	Lactic acid	Propylene glycol
Aluminum sulfate	Ethylene glycol	Glucose	Magnesium chloride	Sodium hydroxide 50%
Ammonium chloride	Ferric chloride	Hydrochloric acid 33%	Magnesium sulfate	Sodium Bisulfite
Ammonium hydroxide	Ferric nitrate	Hydrocyanic acid	Phosphoric acid	Sodium Hypochlorite 12.5%
Benzyl alcohol	Ferric sulfate	Hydrogen peroxide	Plating solutions	Sodium sulfide
Bleach	Ferrous chloride - 43% in water	Hypochlorous acid	Potassium hydroxide	Sulfuric acid up to 50%
Brine solutions	Ferrous sulfate	Iodine	Potassium permanganate	Tannic acid

Norprene® Chemical Tubing - Ultra smooth plasticizer-free bore (inner liner) Meets FDA criteria for food | Superior chemical resistance

Ferrous Chloride (up to 40%)	Hydrofluoric Acid (up to 48%)	Potassium Hypochlorite (up to 70%)	Bases	Alcohols
Fluoboric Acid (up to 48%)	Nitric Acid (up to 71%)	Sodium Phosphate (up to 30%)	Salts	Isobutyl Alcohol
Fluosilicic Acid (up to 25%)	Phosphoric Acid (up to 85%)	Sulfuric Acid (up to 98%)	Ketones	

Tygothane® Tubing Meets FDA criteria for food | Resistant to oils, greases and fuels

Cyclohexane	Heptane	Mineral spirits	ASTM reference No.1,2,3	Oils:
Diesel Fuel	Hexane	Soap solutions	Castor	Linseed
Fatty acids	Kerosene	Turpentine	Coconut	Lubricating
Gasoline	Lard	Oils:	Fuel	Mineral

Norprene® is a registered trademark of Saint-Gobain.
Tygothane® is a registered trademark of Saint-Gobain.
Note: Data shown at 72 degrees F.