POLYMER OVERVIEW AND PROMINENT EQUIPMENT OFFERING

Session 1

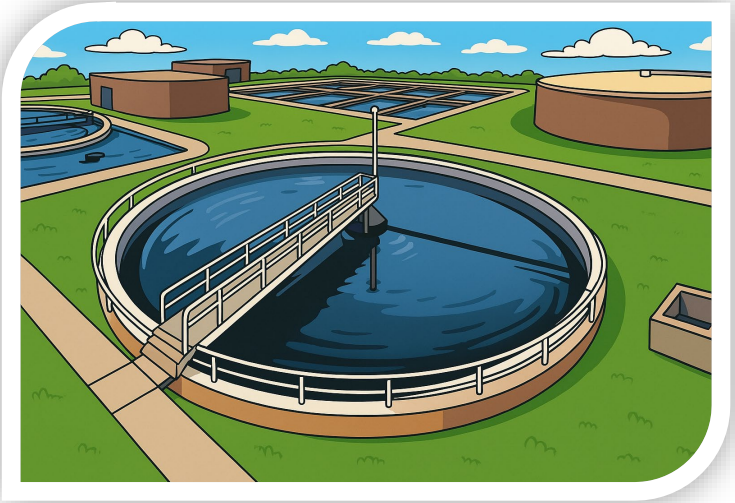
Doug Britton

Training Manager

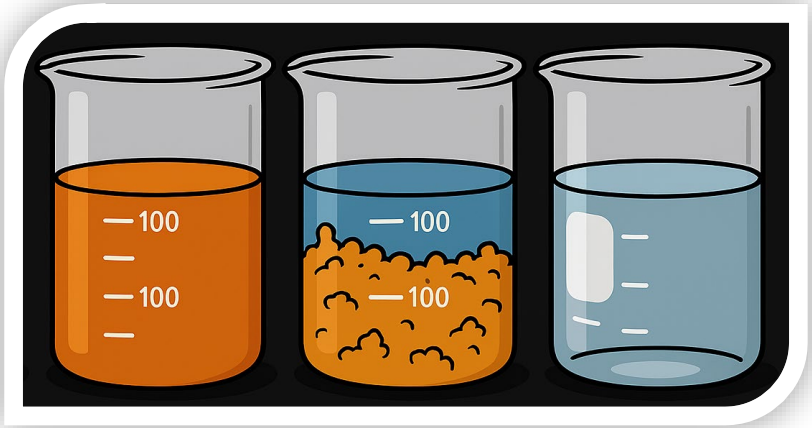
POLYMER INTRODUCTION

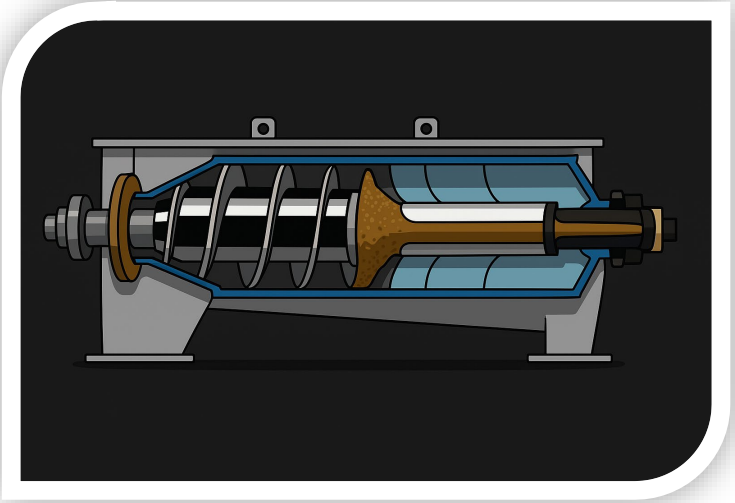
- WHY POLYMER
- WHAT IS POLYMER
- TYPES OF POLYMER

WHY POLYMER?

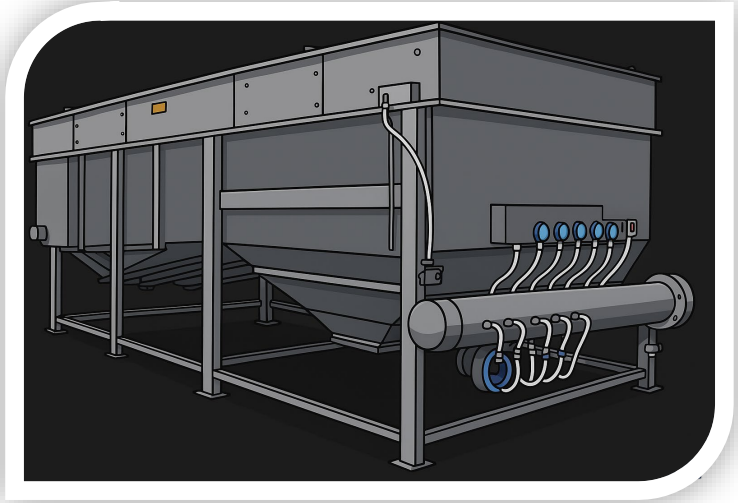


Helps particles settle faster





Improves liquid/solid separation



SETTLING RATES

Diameter of Particle, mm	Order of Size	Total Surface Area	Time Required to Settle
10.0	Gravel	0.487 sq in	0.3 sec
1.0	Coarse Sand	4.87 sq in	3.0 sec
0.1	Fine Sand	48.7 sq in	38 sec
0.01	Silt	3.38 sq ft	33 min
0.001	Bacteria	33.8 sq ft	55 hr
0.0001	Colloidal particles	3.8 sq yd	230 days
0.00001	Colloidal particles	0.7 acre	6.3 yrs
0.000001	Color particles	7.0 acre	63 yrs

ProMinent®

ALTERNATIVES

Common Name	Formula	pH at 1%	Availability
Alum	$Al_2(SO4)_3 * 14H_2O$	3.4	Lump – 175 Al_2O_3 Liquid – 8.5% Al_2O_3
Lime	$Ca(OH)_2$	12	Lump – as CaO Powder – 93-95% Slurry – 15-20%
Ferric chloride	$FeCl_3 * 6H_2O$	3 - 4	Lump – 20% Fe Liquid – 20% Fe
Ferric sulfate	$Fe_2SO_4 * 3H_2O$	3 -4	Granular – 18.5% Fe
Copperas	$FeSO_4 * 7H_2O$	3 – 4	Granular – 20% Fe
Sodium aluminate	$Na_2Al_2O_4$	11 – 12	Flake – 46% Al_2O_3 Liquid – 25% Al_2O_3

ProMinent®

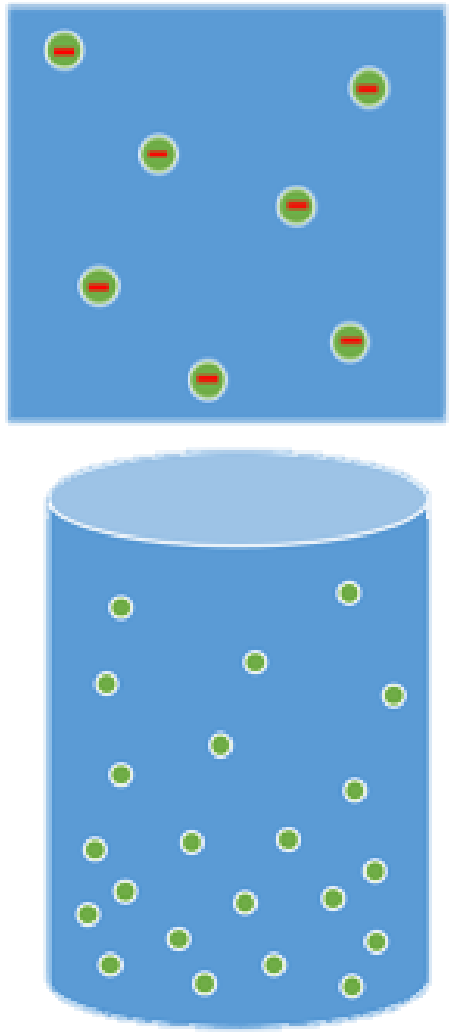
DEVELOPMENT/MARKET DRIVERS

- Increasing landfill costs
- Increasing regulatory concerns
- Advanced dewatering methods
- Cost vs. Performance
- Product development advances
- Opportunity to replace commodity chemicals

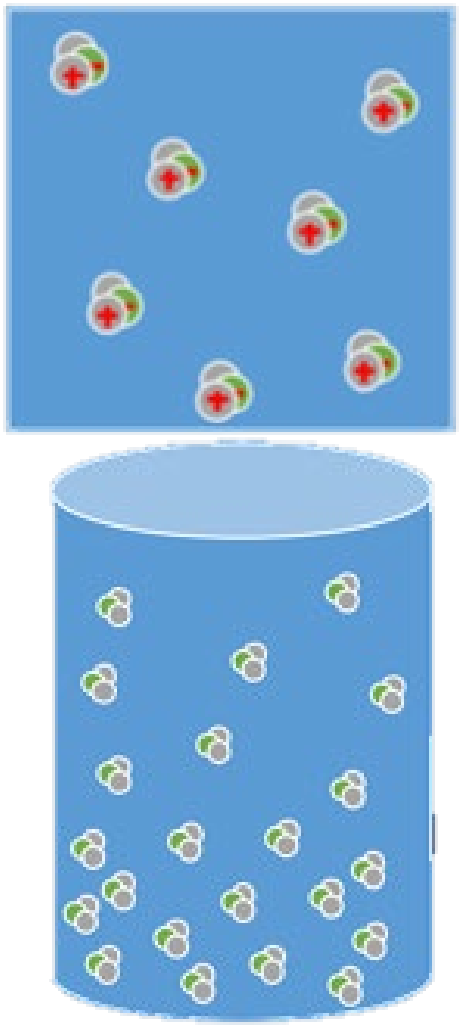
ProMinent®

CHEMISTRY – COAGULANT VS. FLOCCULANT

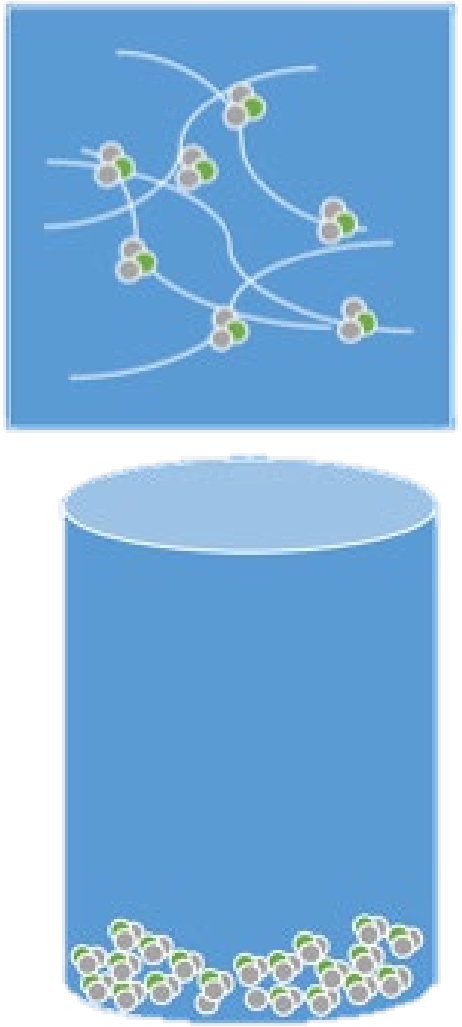
Before



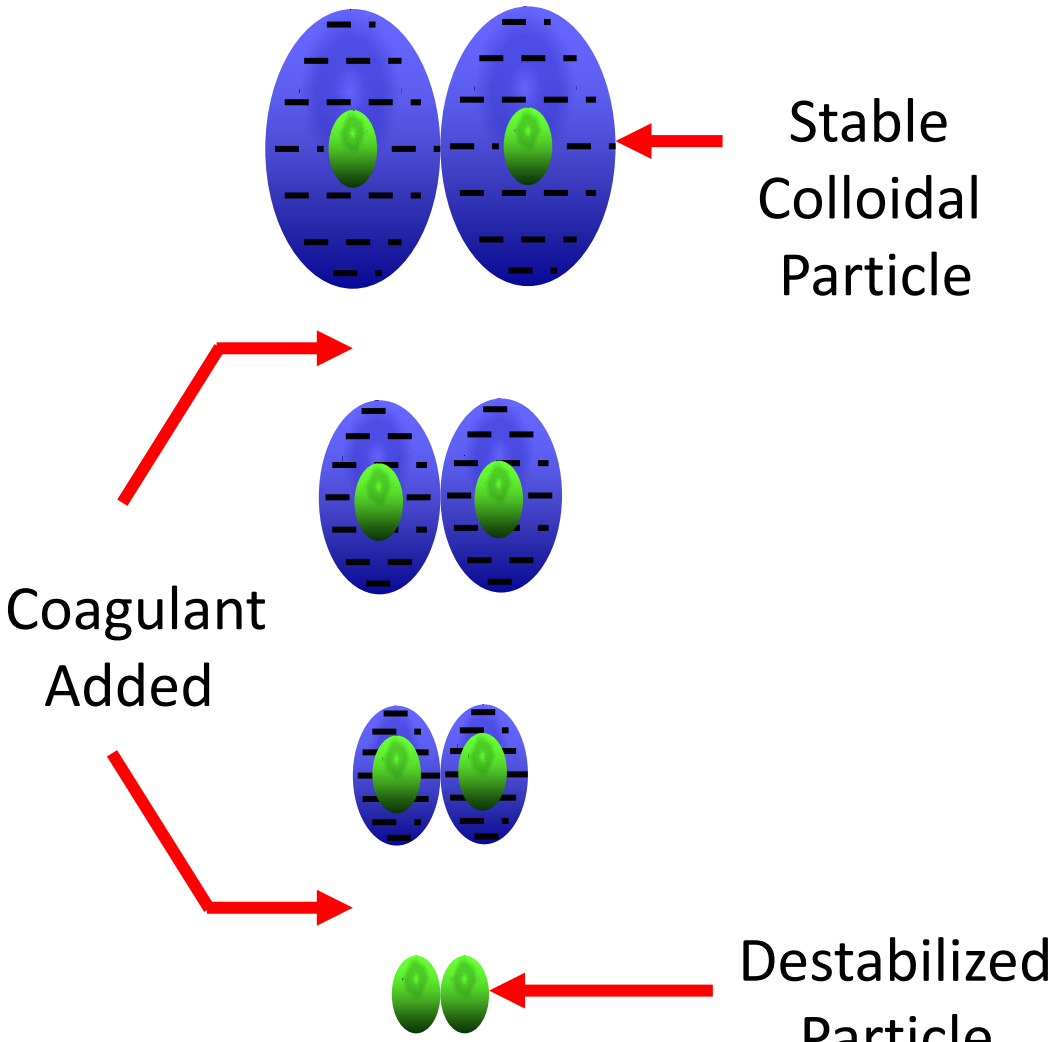
Coagulant

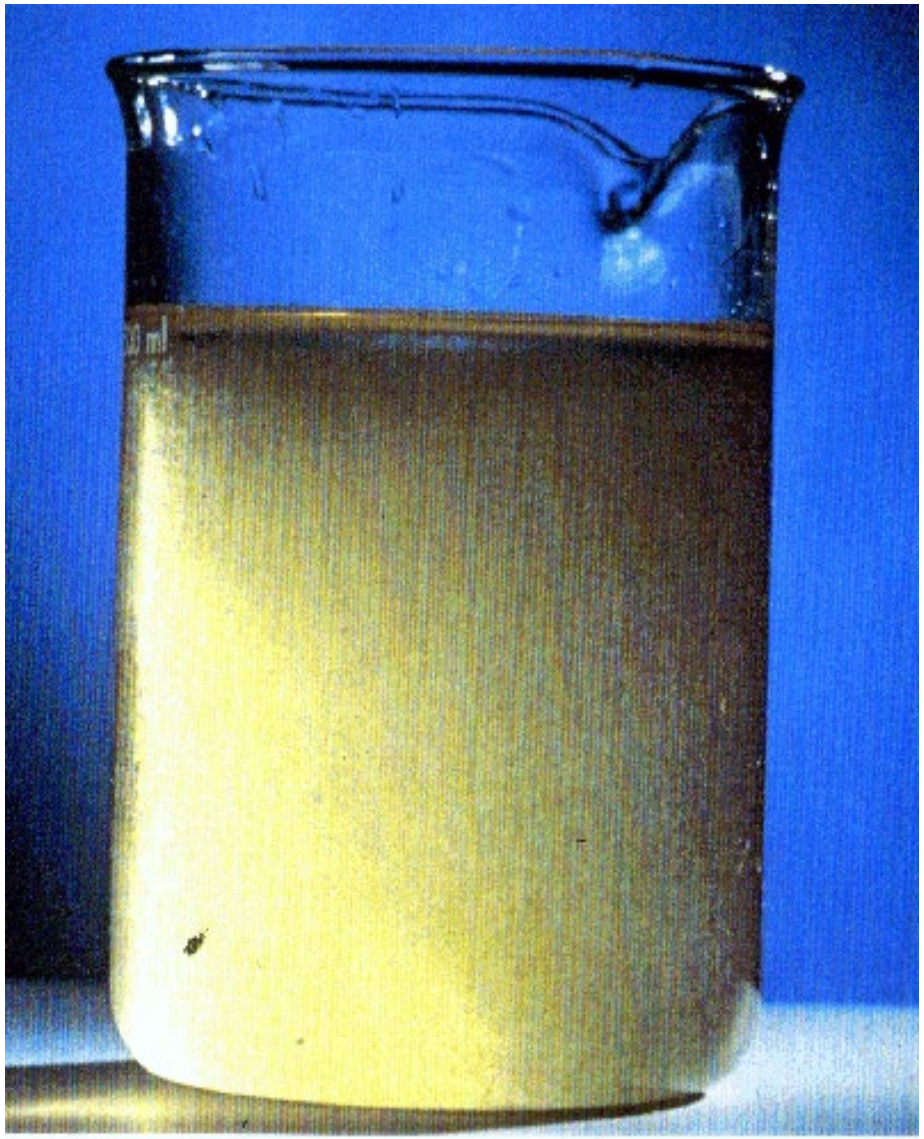


Flocculant

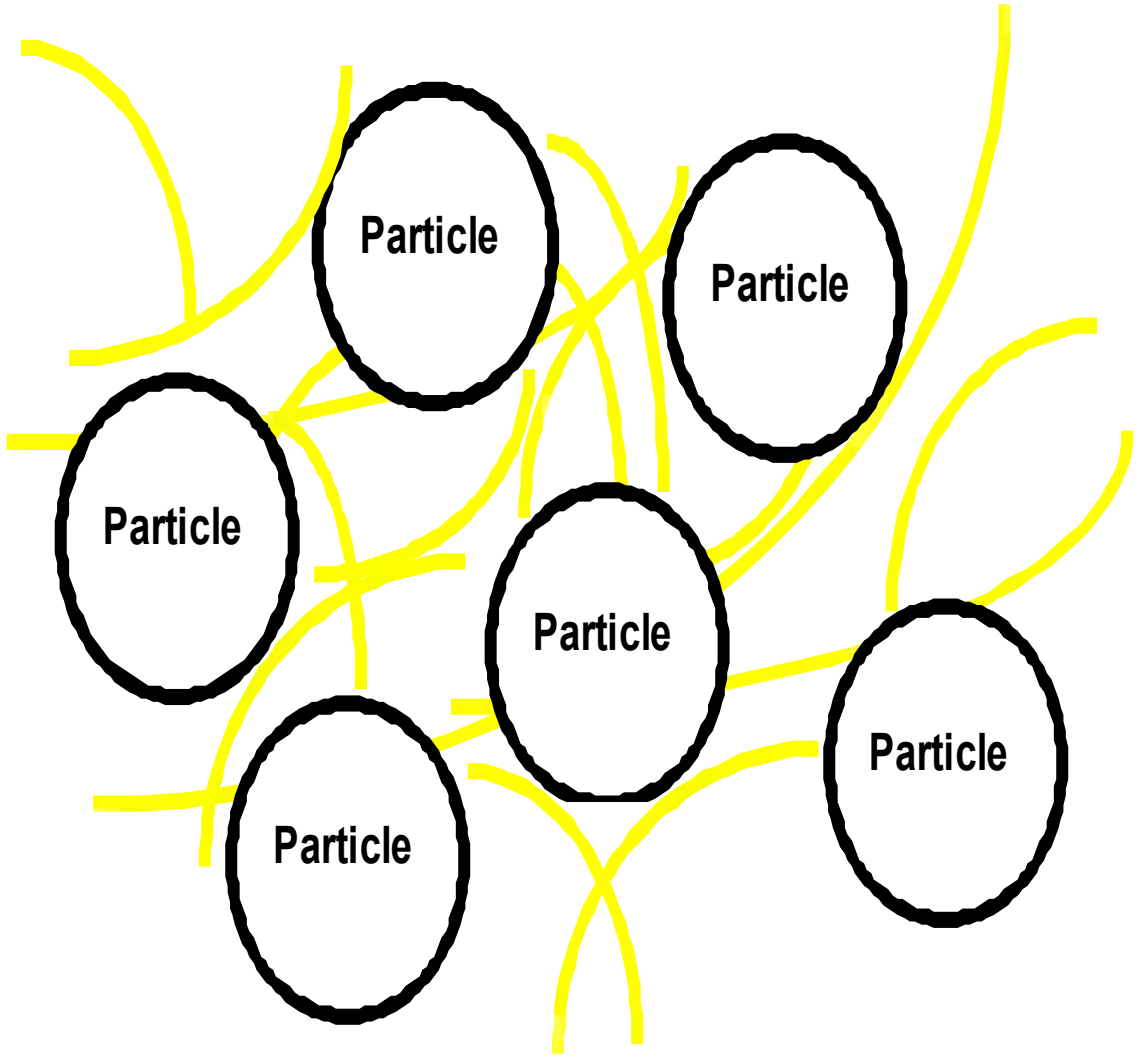


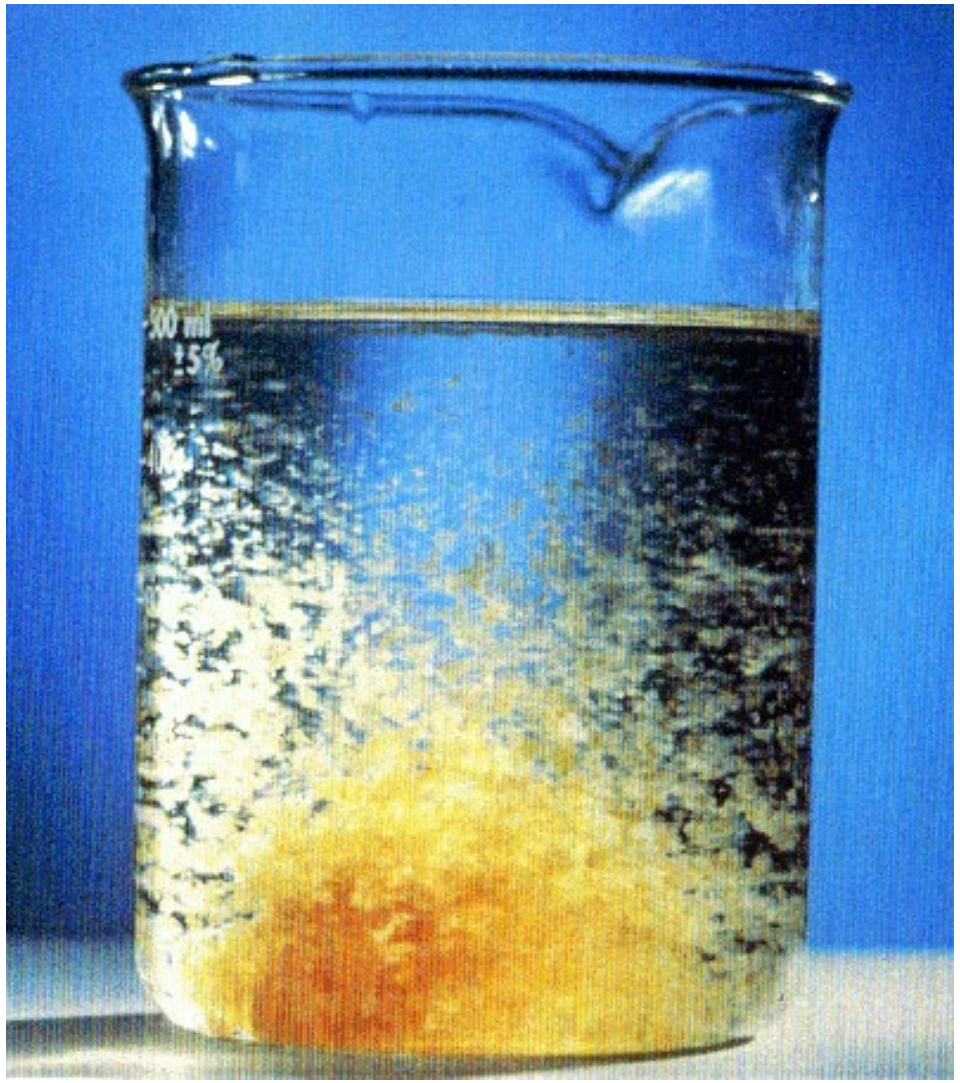
COAGULATION – CHARGE NEUTRALIZATION





FLOCCULATION - BRIDGING





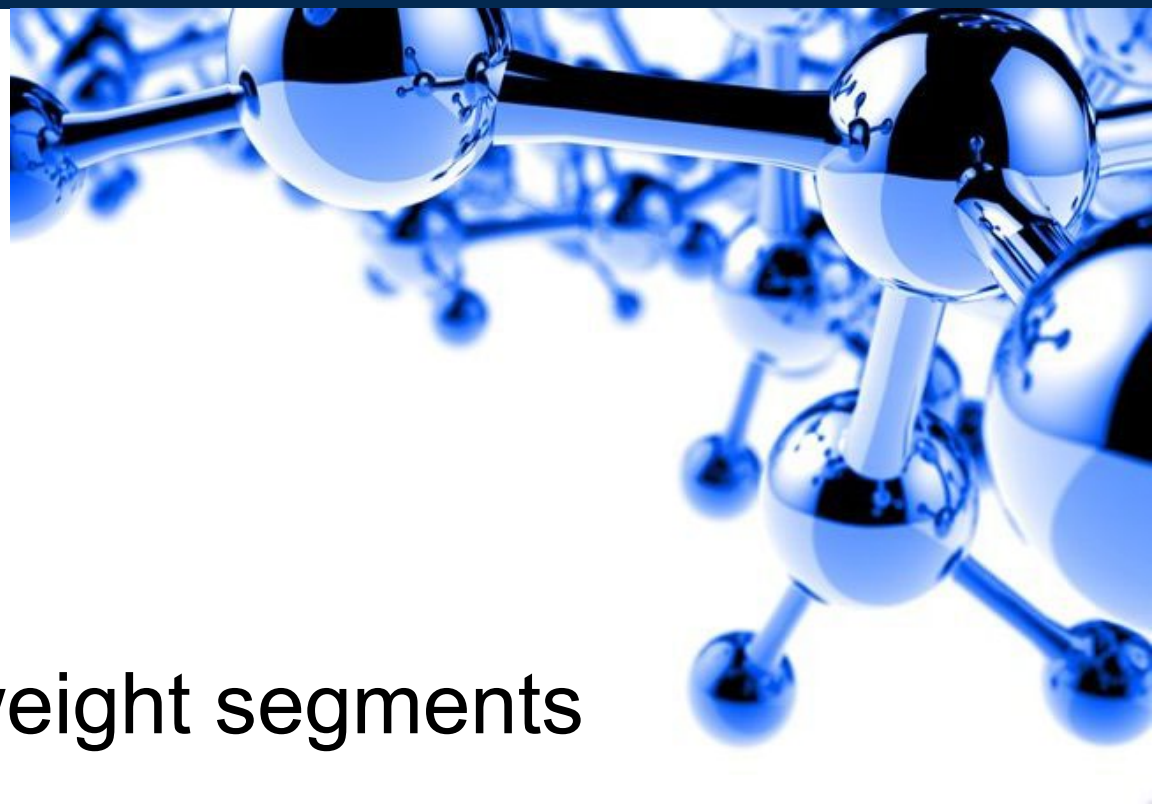
FORMS

Solution Polymers

- Clear homogeneous solution
- 10-50% active
- Low viscosity easy to handle
- Does not require “activation”
- Dispersion in waste stream is key
- Cationic, Anionic
- Supplied in pails, drums, totes, bulk

ProMinent®

FORMS



Mannich Solutions

- Flocculant
- Clear to amber solution
- 4-6% active
- Viscous 25,000 centipoise
- Crosslinked low molecular weight segments
- Fumes are “unpleasant”
- Cationic only
- Supplied in bulk – tanker trucks

ProMinent®

FORMS

Dry Polymers

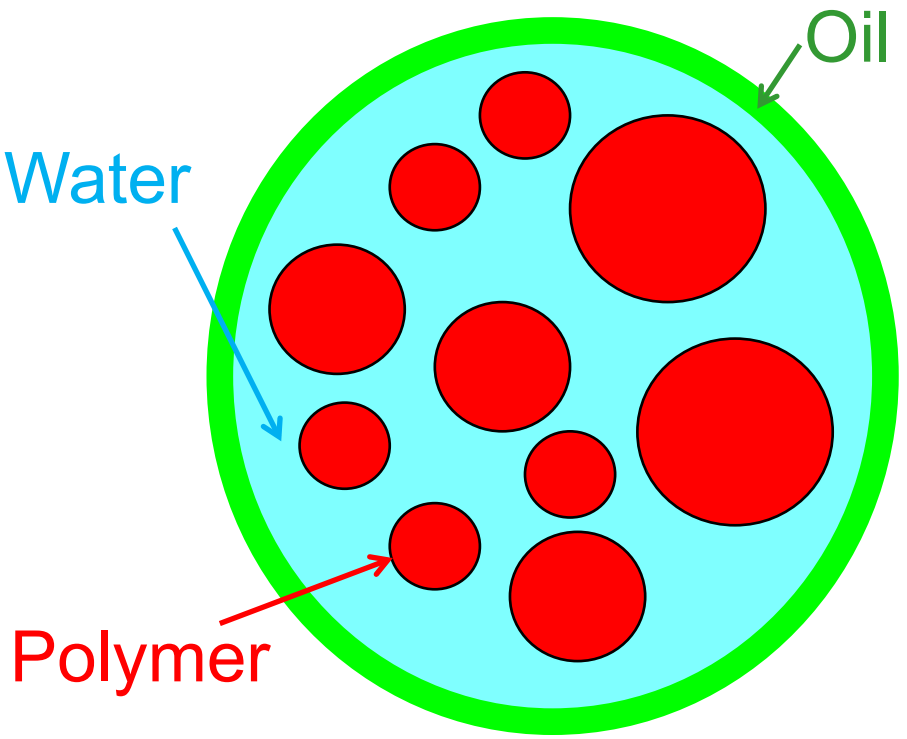
- 90% - 95% active
- Powder, pellets, granules, beads
- Package – bags, bulk bags
- Must be wetted
- Dusting is a safety concern
- Shelf life in years
- Cationic, anionic, non-ionic

ProMinent®

FORMS

Emulsion/Dispersions

- White liquid
- 25%-40% active
- Medium to high molecular weight
  - 5-10 million
- Settles/separates in “neat” form
- Needs “Activation”
- Susceptible to freeze
- Anionic, cationic, non-ionic
- Supplied in pails, drums, totes, bulk

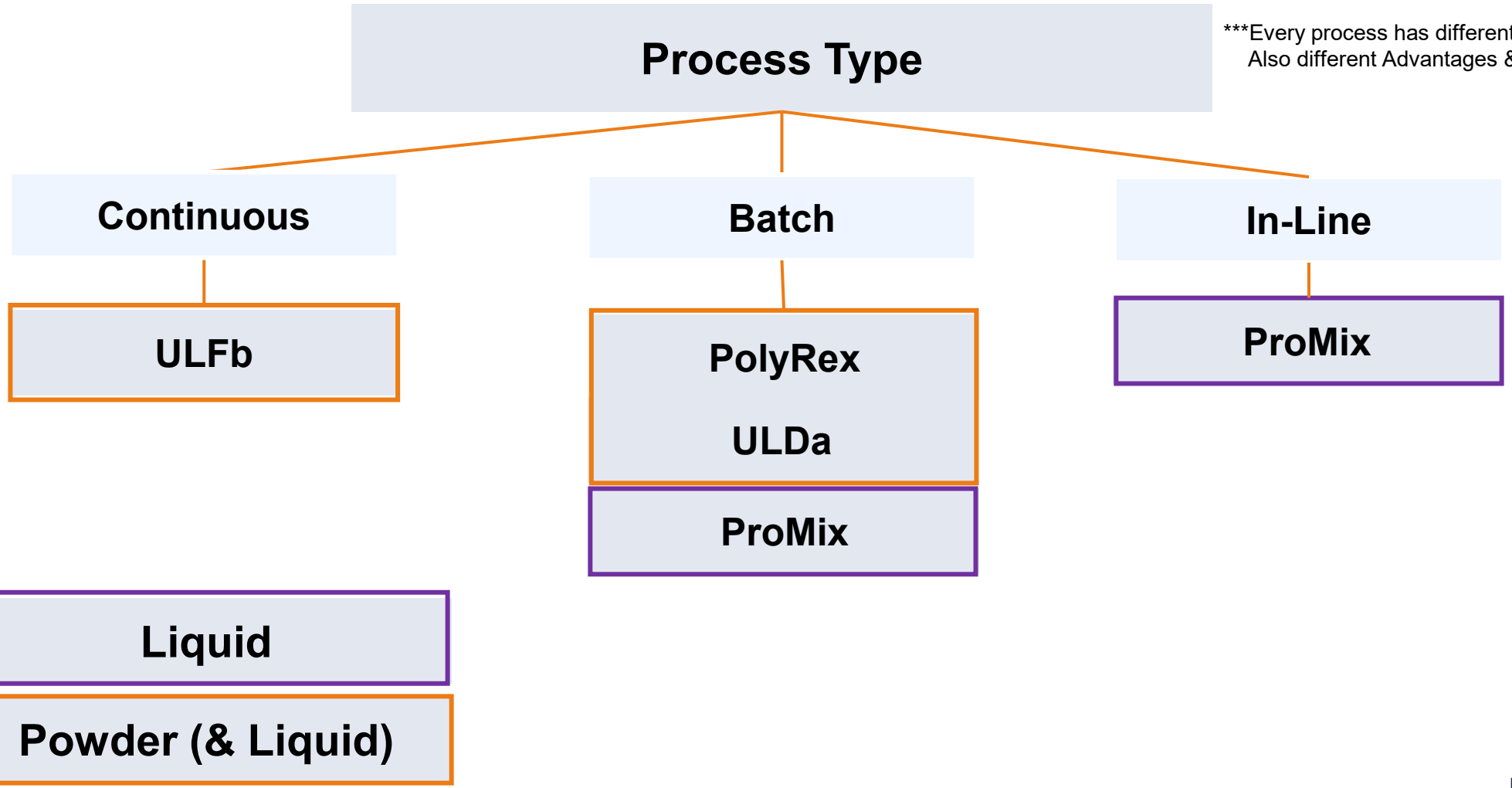


ProMinent®

QUESTIONS??

PROMINENT EQUIPMENT OFERING

PROMINENT EQUIPMENT OFFERING

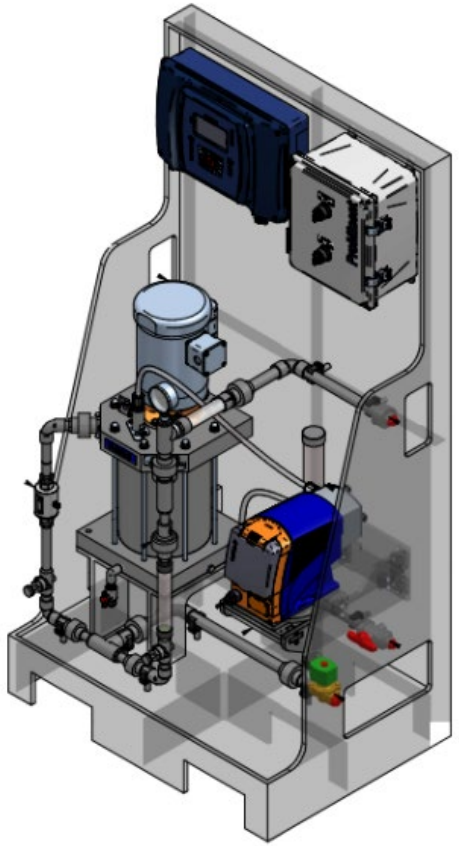


ProMinent®

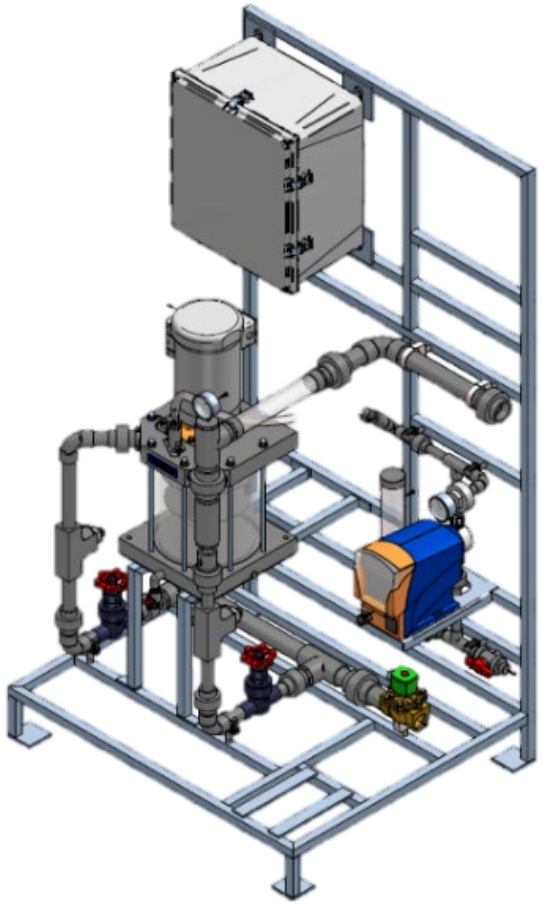
PROMIX OFFERING

ProMix H

ProMix S



ProMix M



ProMix L

ProMinent®

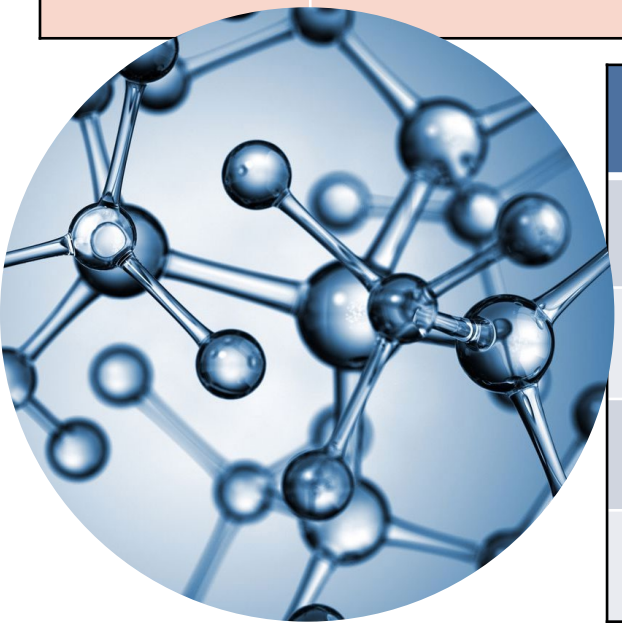
IN-LINE SYSTEM – PROMIX H

- A polymer blending system designed for municipal and industrial wastewater treatment.
- Utilizes a hydraulic mixing method with an eductor, creating a Venturi effect for optimal polymer activation without moving parts.
- Available with a DULCOFLEX DFXa or gamma /XL pump.
- The system supports manual, analog, contact, and auxiliary modes, with 4-20 mA and alarm outputs.
  - Bluetooth® capabilities when configured with gamma/ XL pump.
- Built for low molecular weight polymers, it handles flow rates from 60–600 GPH (227-2,271 LPH) at up to 100 PSIG (7 BAR).
- Provides consistent, high-performance polymer solutions while reducing operational complexity.

ProMinent®

ABOUT LOW MOLECULAR WEIGHT (LMW) POLYMERS

	Size Range	Characteristics	Best Suited for…
Low Molecular Weight Polymer	1 to 3 Million Daltons	• Less viscous • Shorter polymer chains • Small floc size • Faster reaction kinetics • Less shear sensitive	• Applications requiring rapid dispersion, charge neutralization and low viscosity handling • Dissolved Air Floatation (DAF) • Membrane filtration systems • Clarification processes • Clarification of low turbidity water • Industrial effluents with fine particles



Advantages	Limitations
Rapid reaction and dispersion in water	Less effective in sludge thickening compared to high molecular weight polymers
Effective in treating fine suspensions and colloidal matter	Requires higher dosages in some applications compared to medium/high molecular weight alternatives
Lower viscosity allows for easier pumping and dosing	Not suitable for large floc formation needed in sedimentation-heavy applications
Ideal for applications requiring fast floc formation and charge neutralization	

IN-LINE SYSTEM – PROMIX H

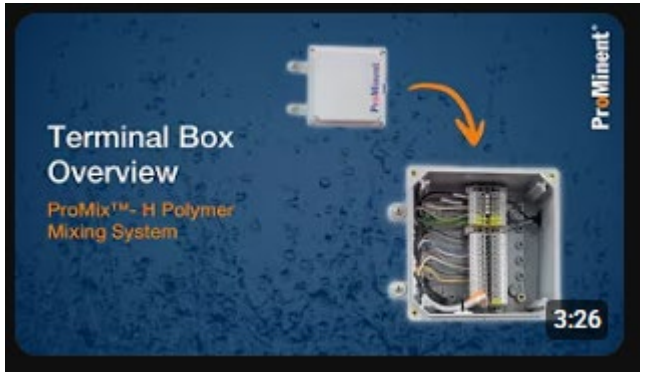
Positioning:

For small industrial and municipal wastewater treatment plants who currently use manual or outdated methods to mix polymer solutions, the ProMix H provides a low cost, low maintenance and simple operation solution with a proven durable ProMinent pump that is easy to integrate into existing systems with an almost immediate realization on cost savings.

Feature	Benefit	Why (the Customer Cares)
Hydraulic mixing with Eductor	Ensures optimal and efficient polymer activation	Lower polymer usage costs
Static Mixer	Ensures even polymer distribution	Improves treatment efficiency
Minimal components and no moving parts	Less chance for downtime	Low maintenance costs/time and low total cost of ownership
Compact and lightweight	Easy to install in tight places	Flexible placement in existing setups
ProMinent DFXa or gamma/ XL pump	Durable pump for precise and consistent dosing	Cost savings due to reduced downtime and chemical waste

TECHNICAL VIDEOS

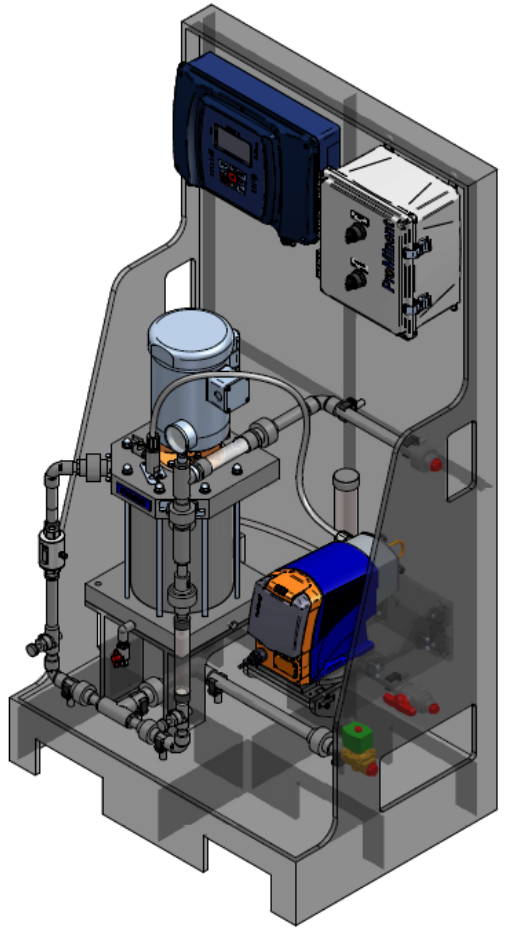
PROMINENT NA



ProMinent®

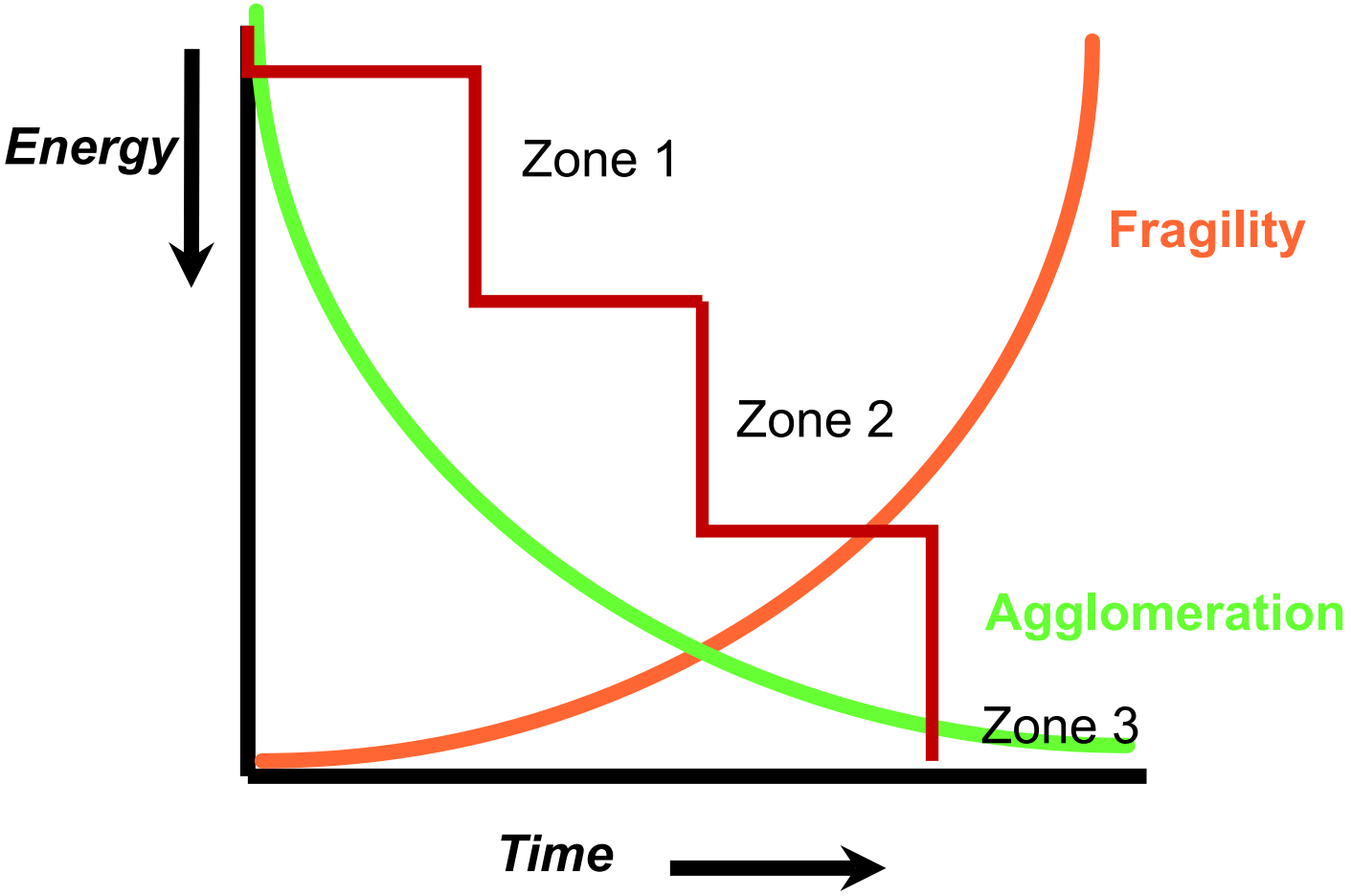
IN-LINE SYSTEM – PROMIX S

Polymer Types	Emulsion or Mannich
Discharge Flow Rates	0.2 – 600 GPH (0.75 – 2,271 LPH)
Polymer Loading Rate	0.02 – 3.60 GPH (0.75 – 13.6 LPH)
Ambient Temperatures	32°F to 120°F (0°C to 49°C)
Maximum Operating Pressure	100 PSIG (6.9 BAR) gamma/ XL, 65 PSIG (4.5 BAR) DFXa
Neat Polymer Pump Options	gamma/ XL and DFXa
Viscosity Range	3,000 cPs for Neat Polymer
Discharge Polymer Solution	0 – 1% for Emulsion Polymer
Discharge Polymer Solution	0 – 10% for Mannich Polymer
Operating Temperatures	+50°F to 100°F (10°C to 38°C)
Overall Skid Dimensions	24”L x 34”W x 66”H (610mm x 864mm x 1,676mm)
Overall Skid Weight	Approximately 170 lbs. (77 kg)
Water Inlet Connection	3/4” Brass NPT Solenoid Valve
Polymer Inlet Connection	1/2” PVC/ Viton NPT Ball Valve
Discharge Connection Size	3/4” PVC/ Viton NPT Union
Drain Connection	1/4” FNPT
Power Supply	120 VAC, 1 Phase, 60Hz
Control Type	AEGIS X
Communication	Wifi, ethernet, Modbus RTU. 4-20 mA, discrete contacts
Datalogging	All I/O in csv file format
Certifications	UL components



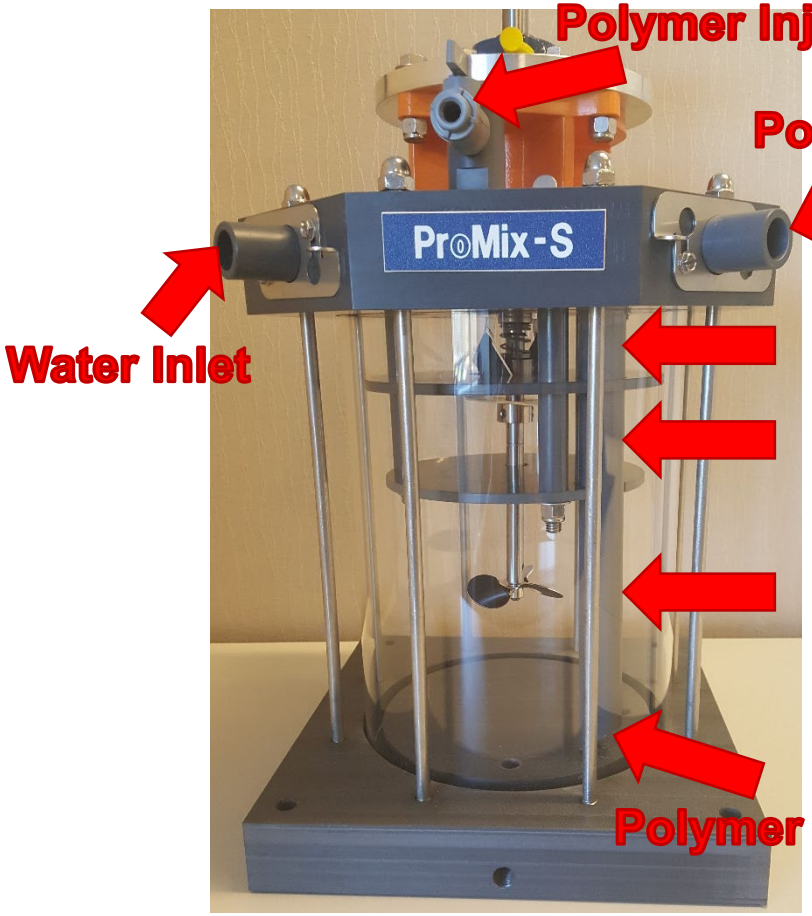
ProMinent®

PROMIX MIXING TECHNOLOGY



Mixing performance:

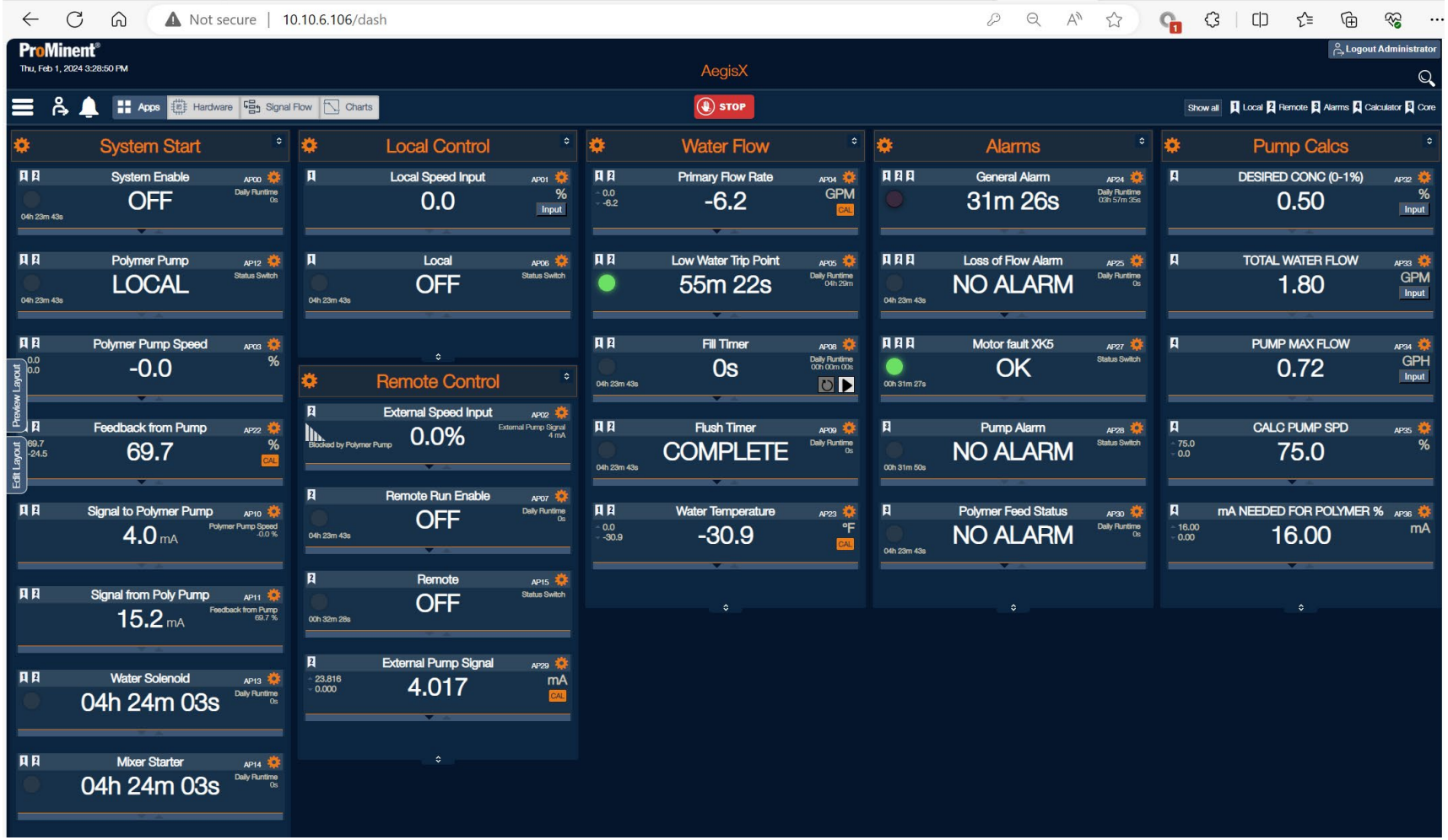
3 Zones

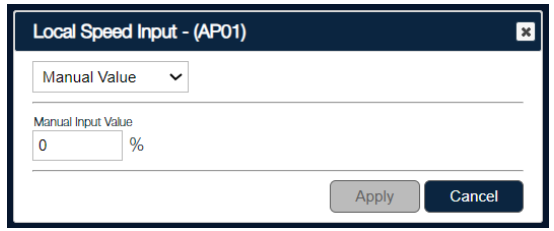


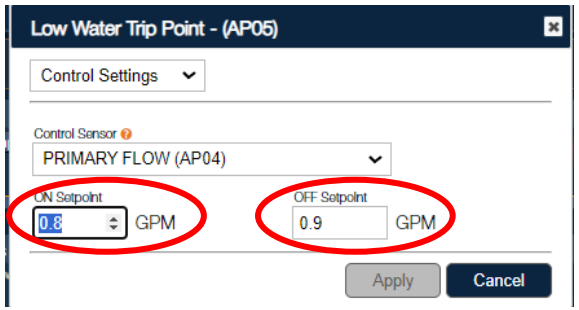
PROMIX MIXING TECHNOLOGY

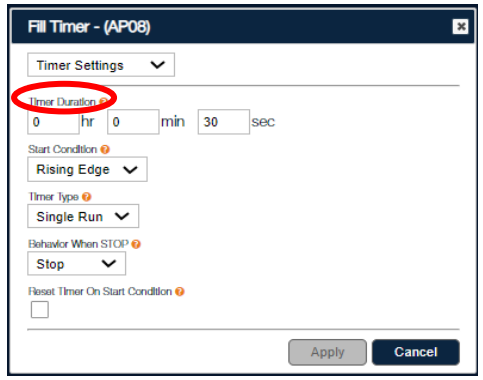
ProMinent®

PROMIX S - CONTROL









ProMinent®

IN LINE & BATCH SYSTEM - PROMIX M

Volume of Mixing Chamber: 3.2 Gallons

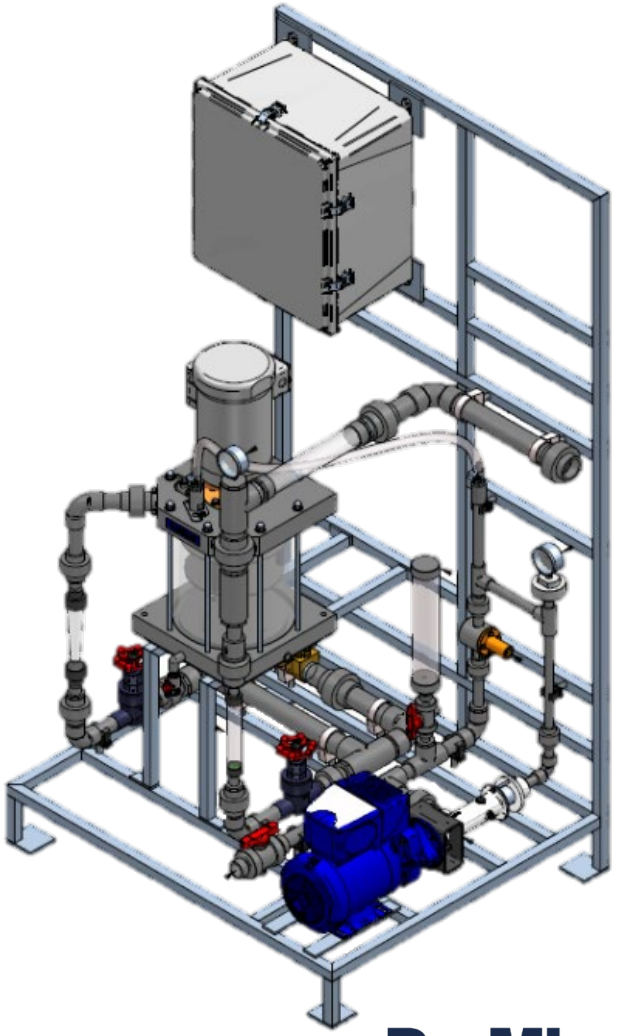
Discharge flow rates up to 3,000 GPH

Capacities to 24 GPH Polymer

Pressures up to 100 PSI

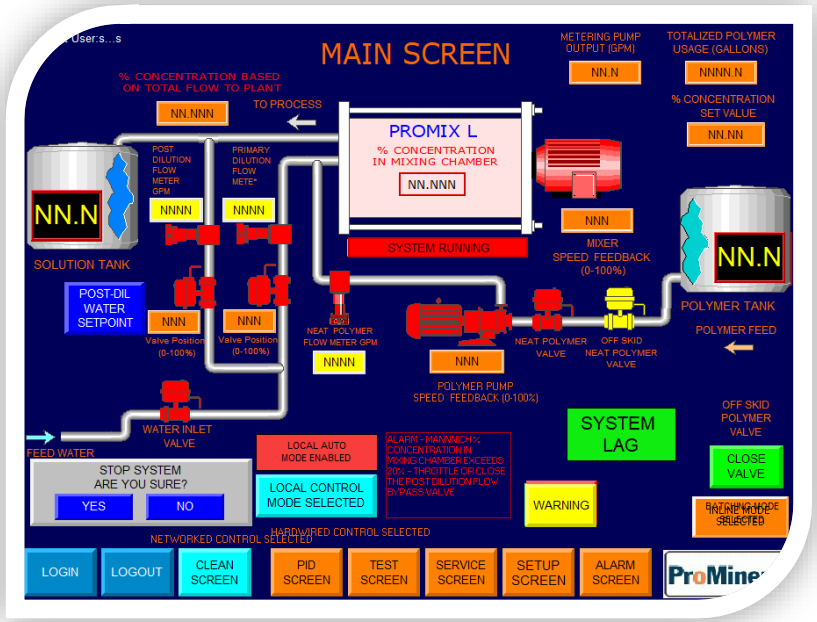
Polymer Pump Design

- Diaphragm
- Progressive Cavity



ProMinent®

PROMIX L



Discharge flow rates up to 12,000 GPH

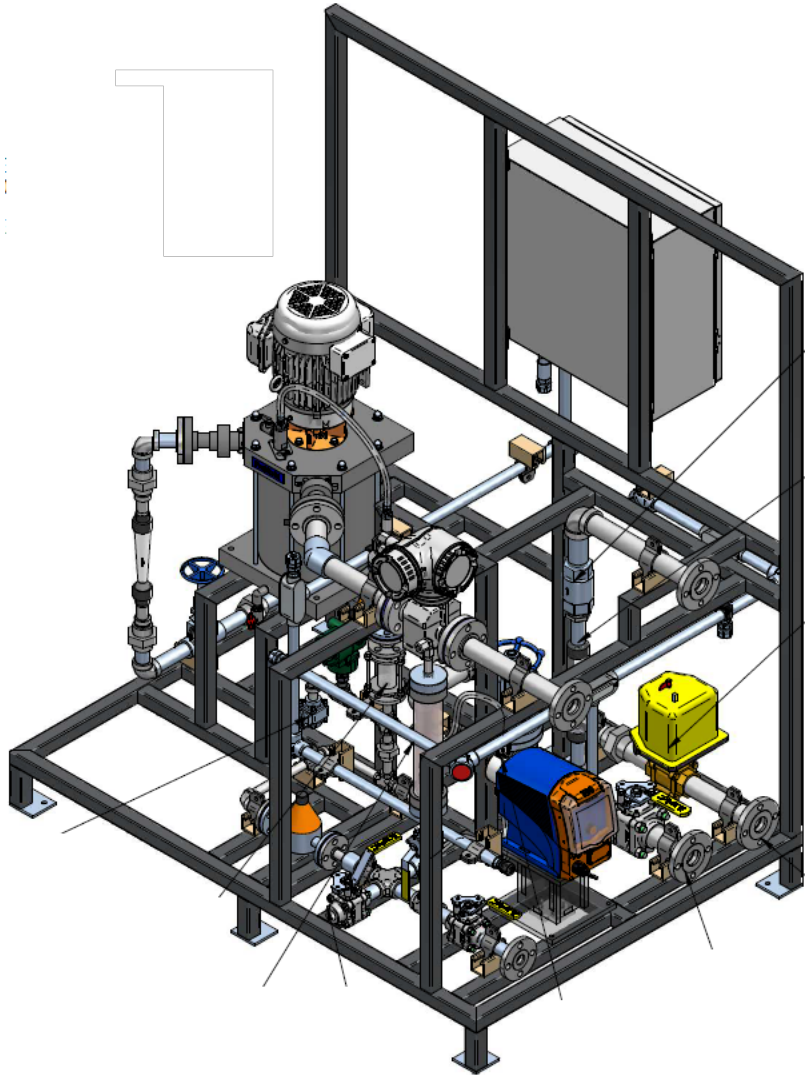
Capacities to 300 GPH Polymer

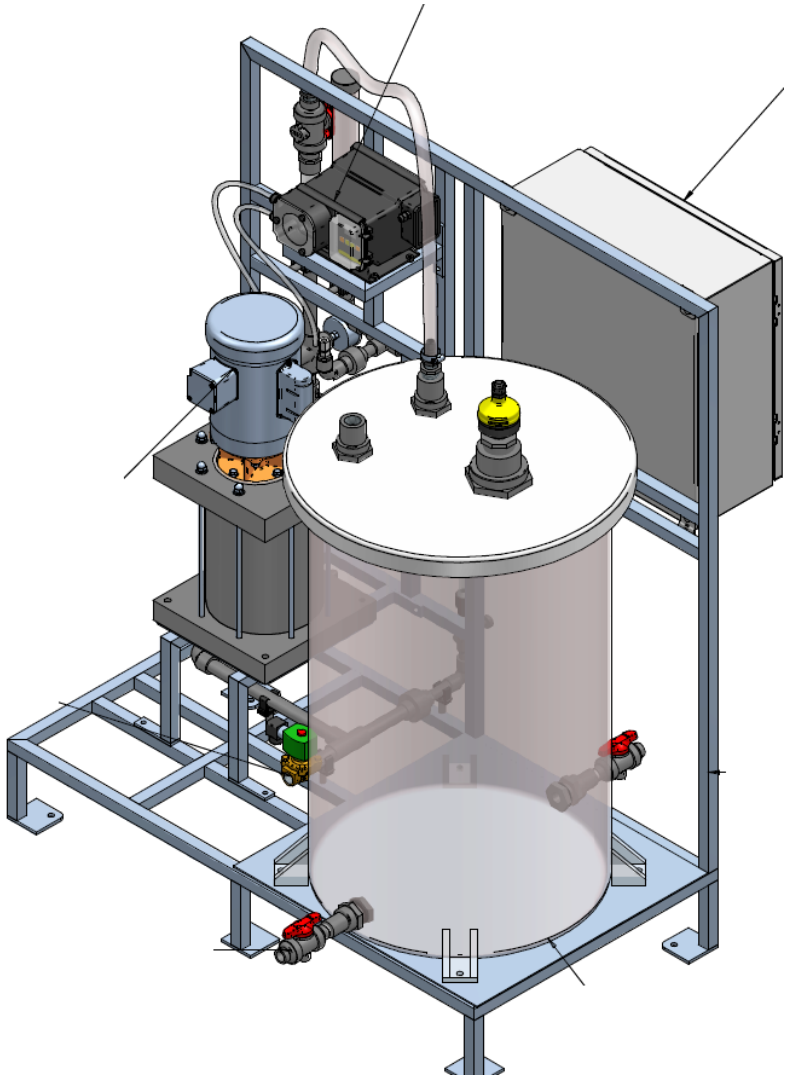
Pressures up to 100 PSI

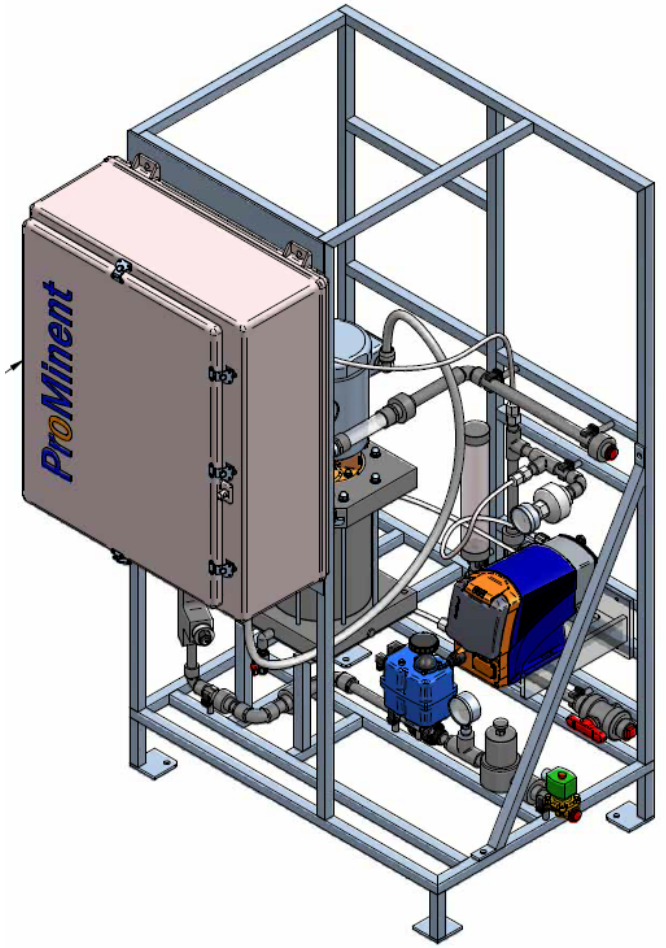
Polymer Pump Design

- Gear Pump
- Progressive Cavity

EXAMPLES OF CUSTOMIZED PROMIX SOLUTIONS

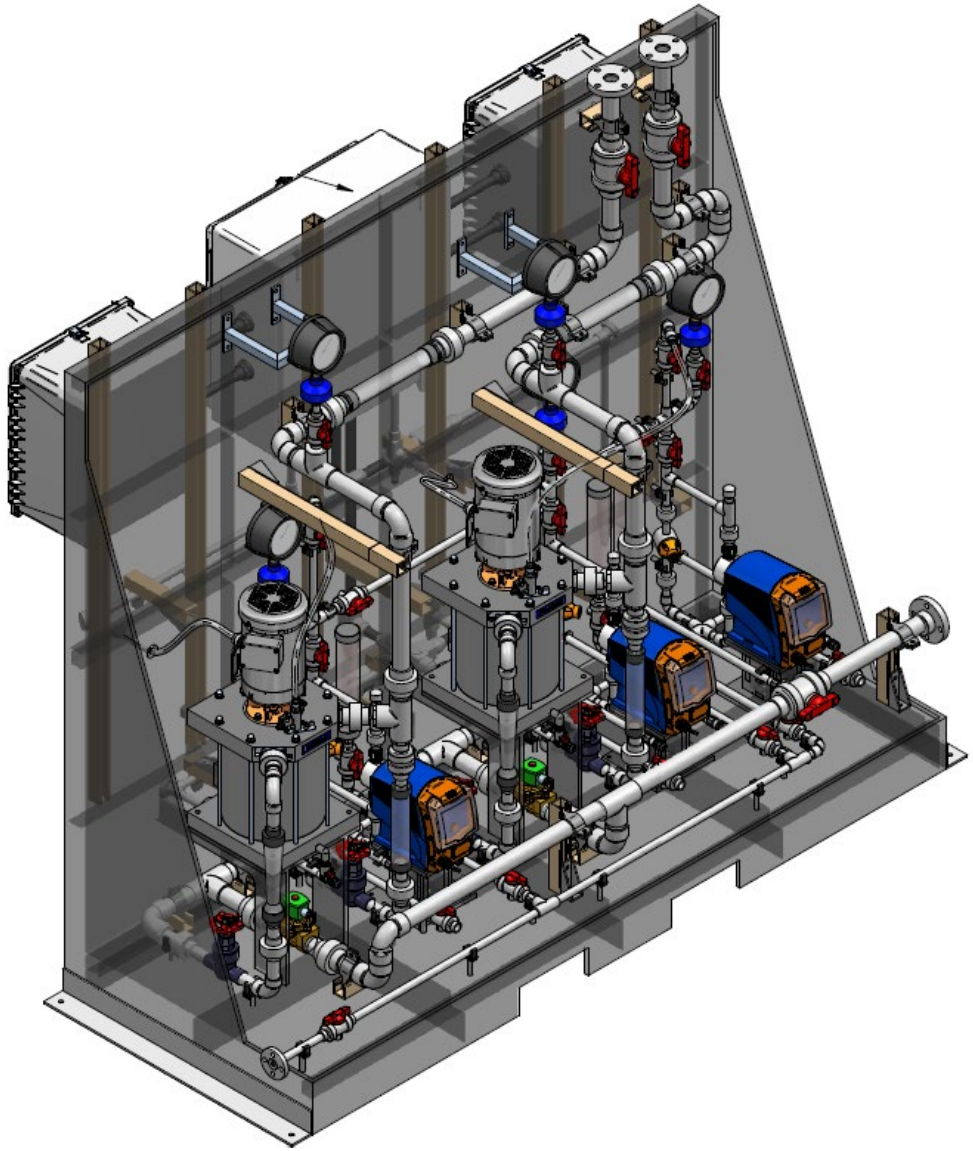






ProMinent®

EXAMPLES OF CUSTOMIZED PROMIX SOLUTIONS

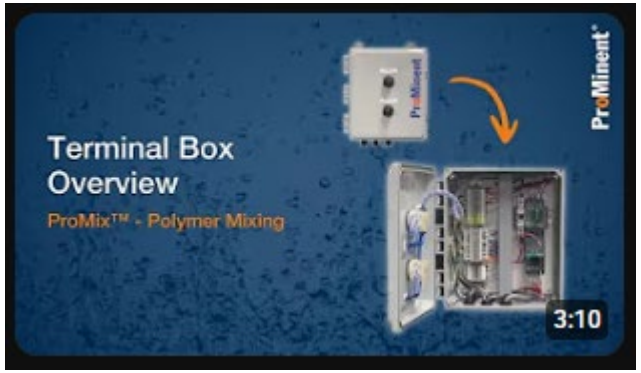


ProMinent®

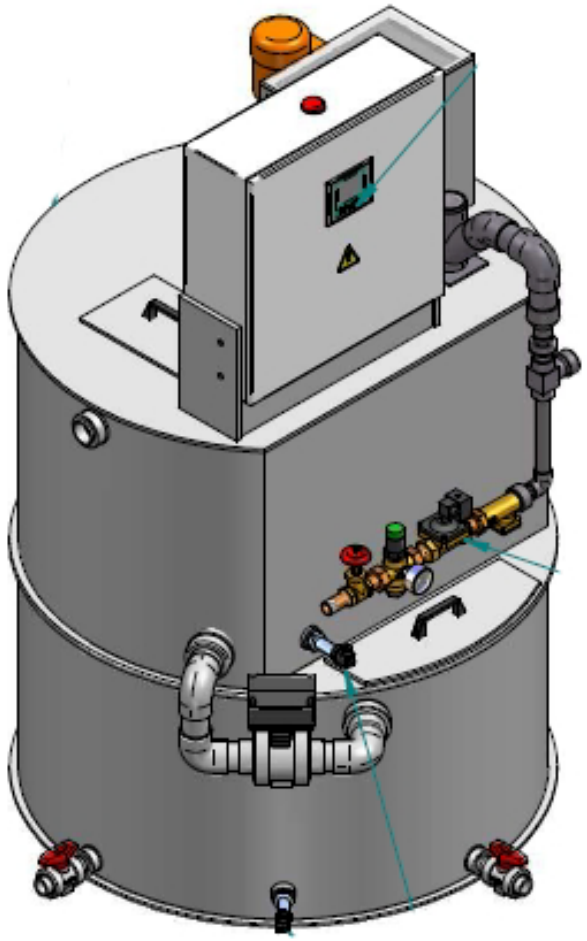
EXAMPLES OF CUSTOMIZED PROMIX SOLUTIONS

ProMinent®

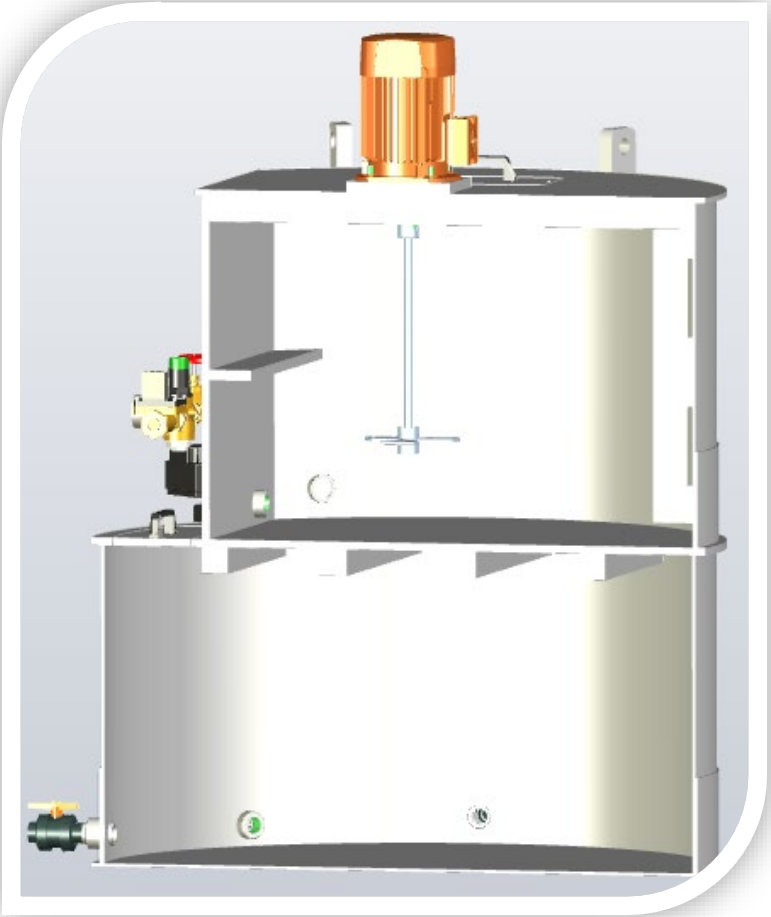
TECHNICAL VIDEOS PROMINENT NA



BATCH SYSTEM - ULTROMAT ULDA



- Types of polymer:
  - Liquid polymers (0.05 – 1.0 %)
  - Powdered polymers (0.05 – 0.5%)
- Capacity range:
  - 132 – 530 gal/h
- Plastic material: PP
- Self-standing tank design
- Smaller footprint



ProMinent®

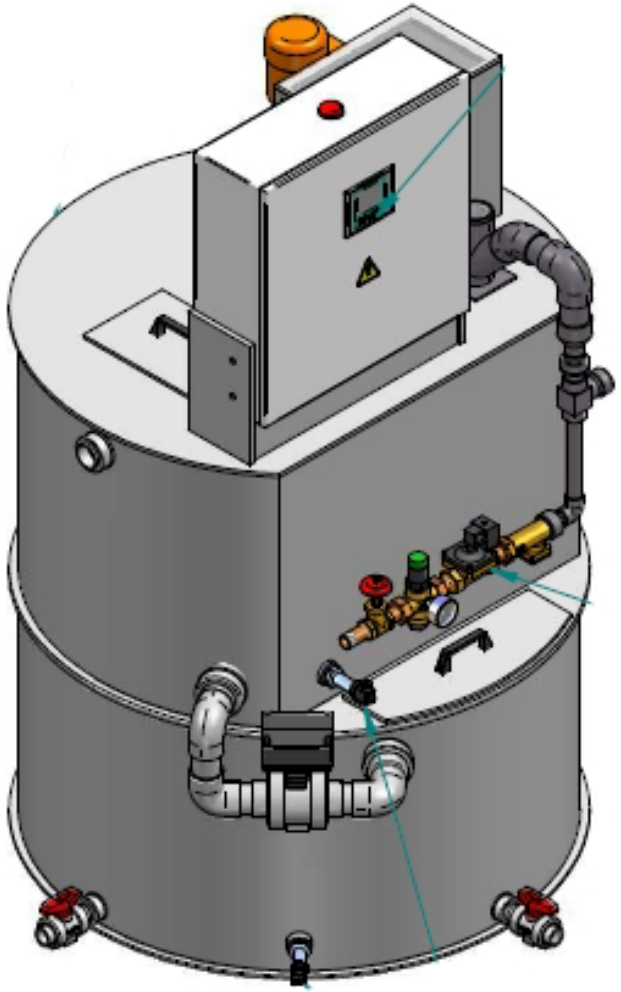
BATCH SYSTEM - ULTROMAT ULDA

Benefits

- Batch Benefits: Double decker
- Smaller footpring in comparison to other systems with maturing tanks
- Fully matured polymer solution
- Adjustable maturing time

Opportunities

- Small space installations
- Double Decker: Batch market prefereces
- Less expensive alternative to PolyRex



ProMinent®

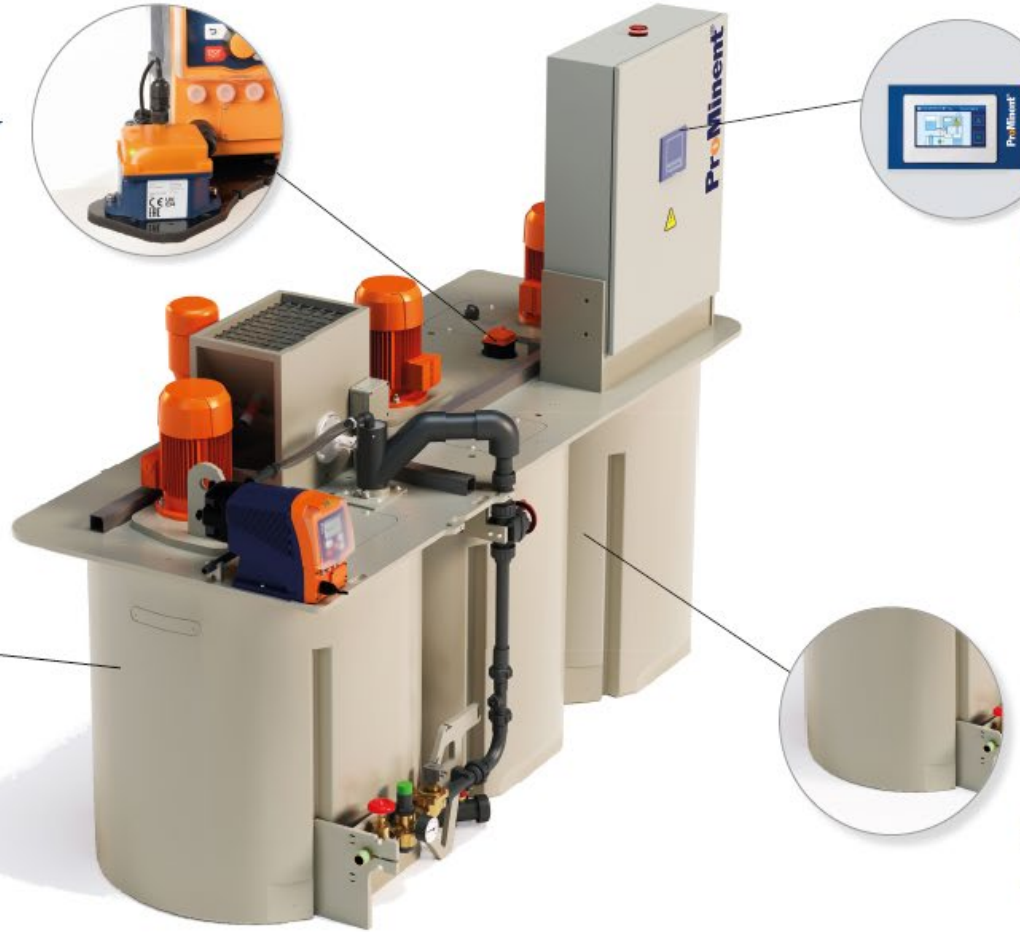
CONTINUOUS SYSTEM – ULTROMAT ULFB

Polymer Preparation System DULCODOS ULFb

Optimized polymer preparation with new tank design.

Special app to display the preparation volume and functional levels

Measurement by Dulcolevel radar sensor



Operation panel

Intuitive operation and process visualisation via HMI, data communication

For powder and liquid polymers

Cationic and anionic types
Maturation time 45 or 60 min

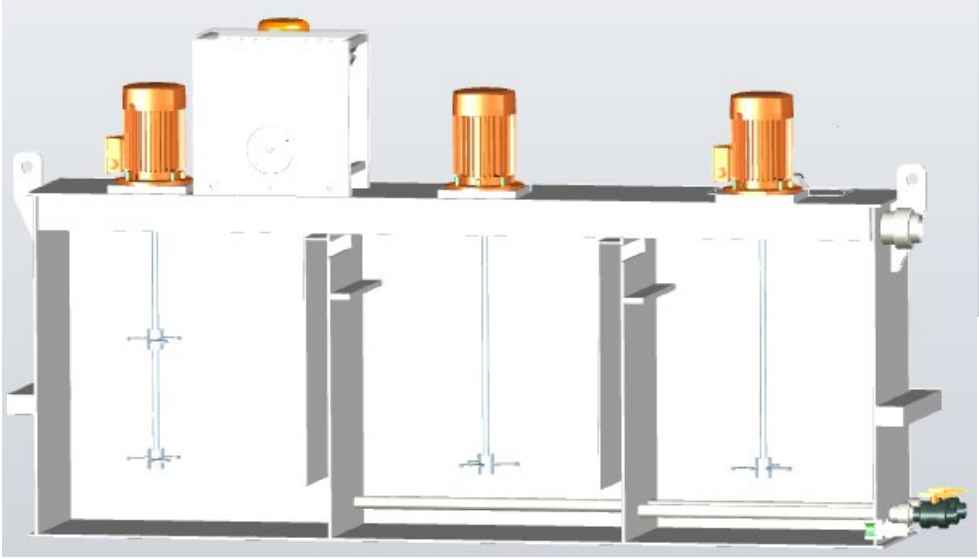
Innovative round tank design

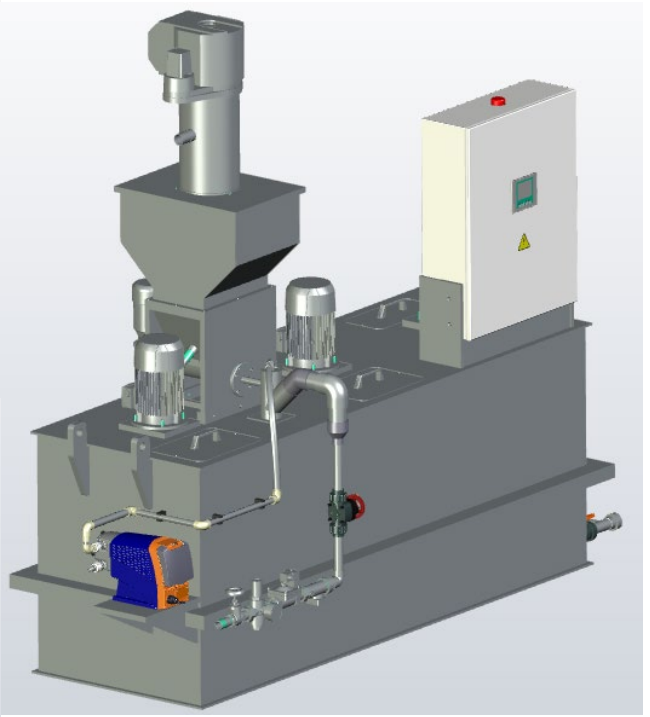
for 3-chamber systems 500 to 2000 l/h and emptying of 97% of the tank volume

Rectangular tank design for 4000-10000 l/h

ProMinent®

CONTINUOUS SYSTEM – ULTROMAT ULFA

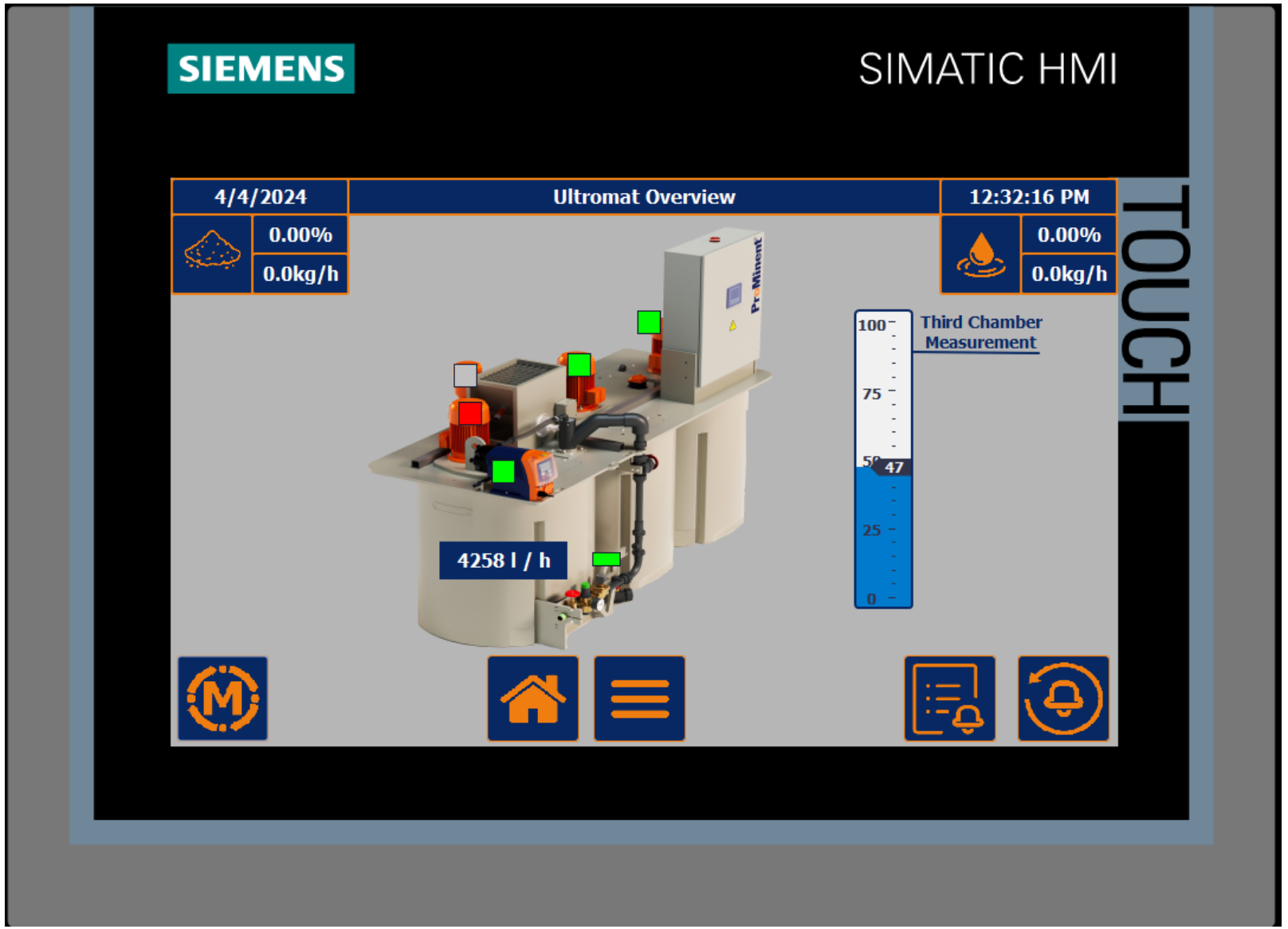




- Capacity range:
  - 1,000 – 2,640 gal/h
- For powder and liquid polymers
- 2 or 3 chamber system
- Two types of wetting solutions
- Vacuum or screw powder conveyor
- Optimized design for proper mixing

ProMinent®

NEW PLC DESIGN FOR 2025



ProMinent®

BATCH SYSTEM - POLYREX

	Tank contents	Discharge volume	Polymer dosing capacity
	gal | m^3	gph | l/h	lb/h | kg/h
PolyRex 0.6	2 x 79 | 2 x 0.3	63.4 | 240	2.6 | 1.2
PolyRex 1.0	2 x 159 | 2 x 0.6	121.5 | 460	5.1 | 2.3
PolyRex 2.0	2 x 264 | 2 x 1.0	248.3 | 940	10.4 | 4.7
PolyRex 3.0	2 x 396 | 2 x 1.5	338.2 | 1,280	14.1 | 6.4
PolyRex 4.0	2 x 528 | 2 x 2.0	502 | 1,900	20.9 | 9.5
PolyRex 5.4	2 x 713 | 2 x 2.7	634.1 | 2,400	26.4 | 12.0
PolyRex 6.6	2 x 872 | 2 x 3.3	845.4 | 3,200	35.3 | 16.0
PolyRex 8.4	2 x 1,110 | 2 x 4.2	1,009.2 | 3,820	42.3 | 19.2
PolyRex Maxi 11	2 x 1,453 | 2 x 5.5	1,347.4 | 5,100	56.2 | 25.5
PolyRex Maxi 16	2 x 2,114 | 2 x 8.0	1,743.7 | 6,600	72.7 | 33.0
PolyRex Maxi 23	2 x 3,038 | 2 x 11.5	2,166.4 | 8,200	90.4 | 41.0

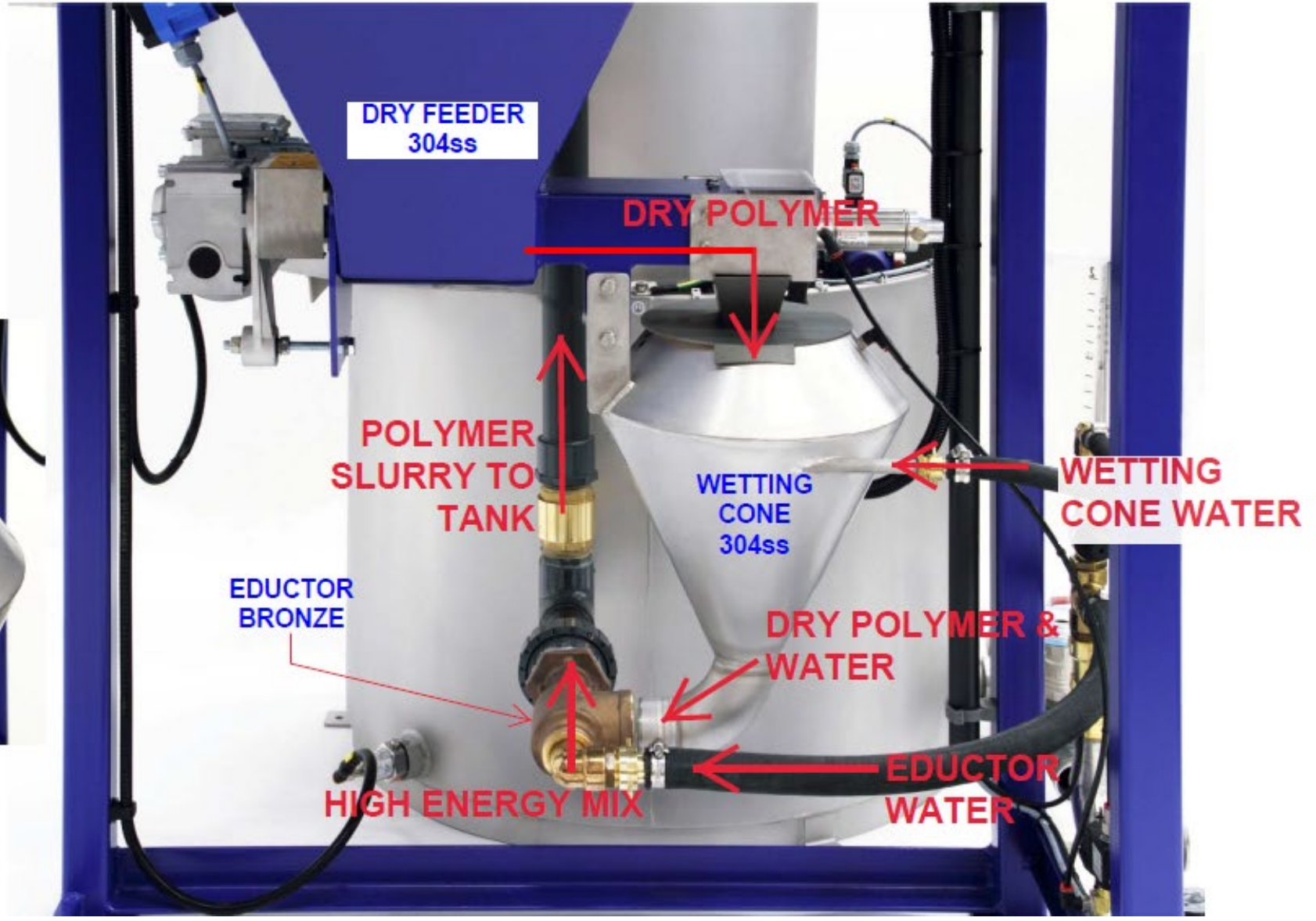
MULTISCREW POWDER FEEDER

- Multiscrew feeder ensures high powder dosage accuacy
- Multiscrew feeder has a self-cleaning feaure

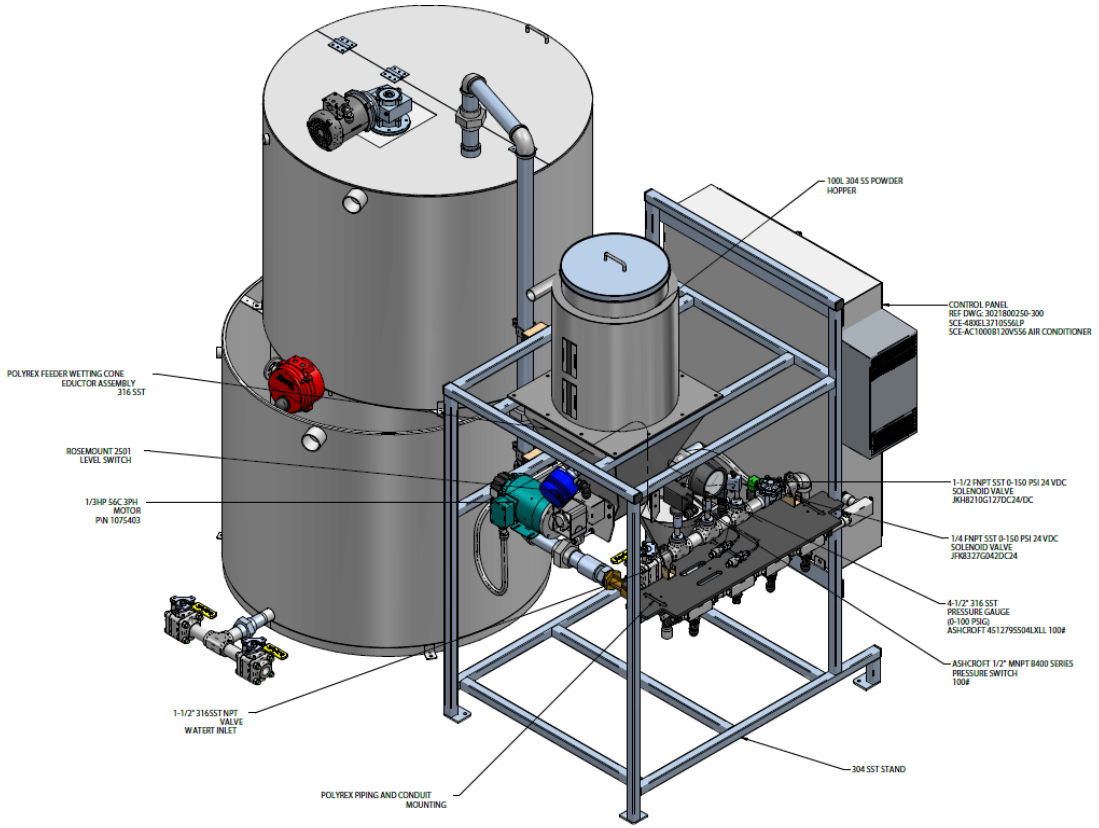
ProMinent®

POLYREX – WETTING CONE SYSTEM

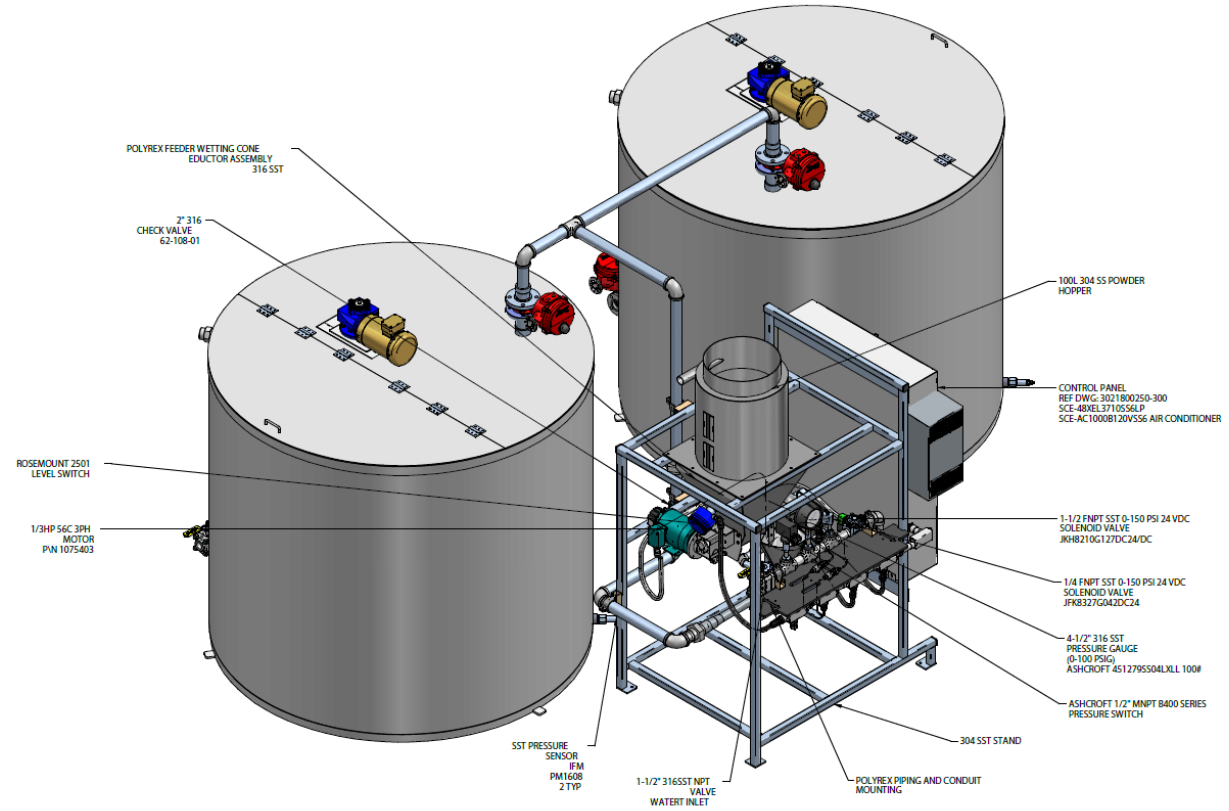
Wetting cone inlet.



STACKED TANK SYSTEM

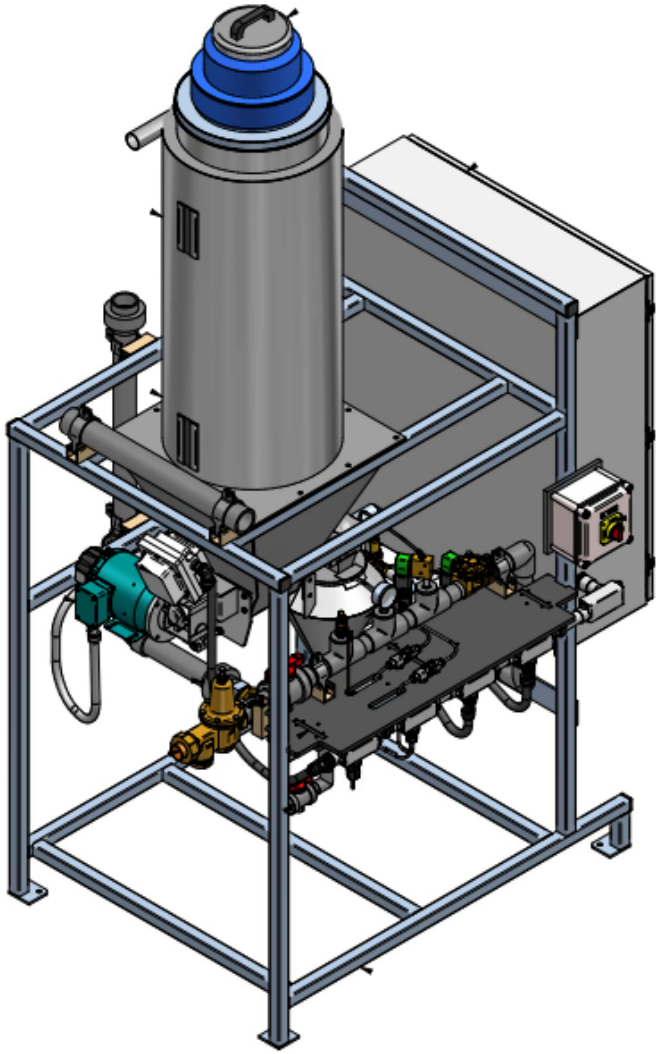


ALTERNATING TANK SYSTEM

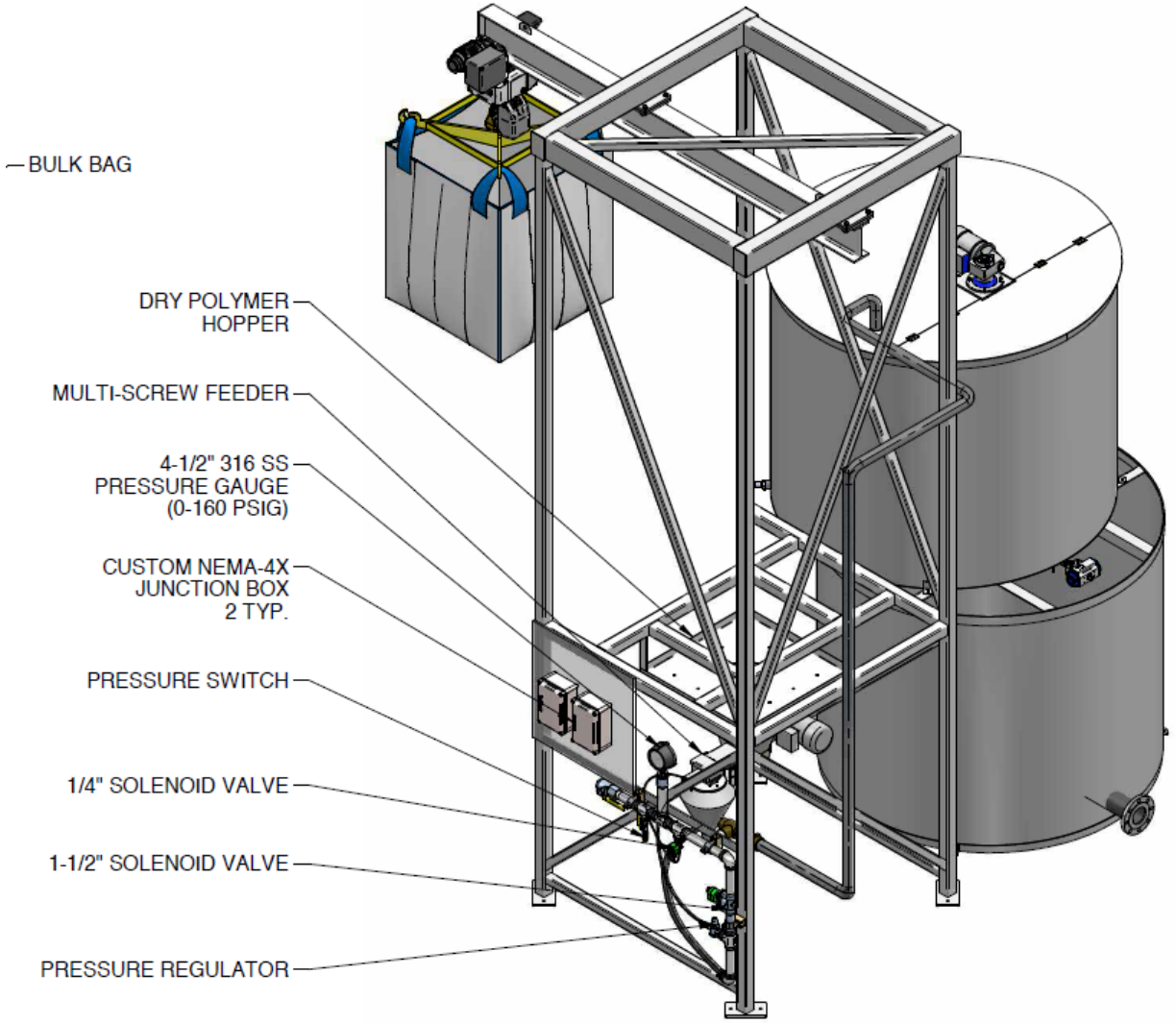


ProMinent®

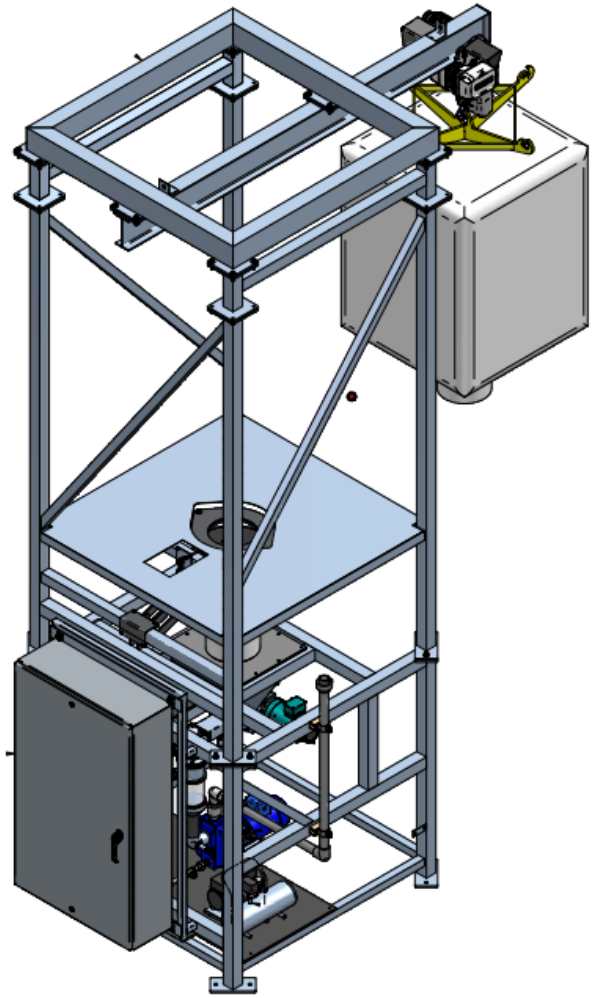
VACUUM LOADER

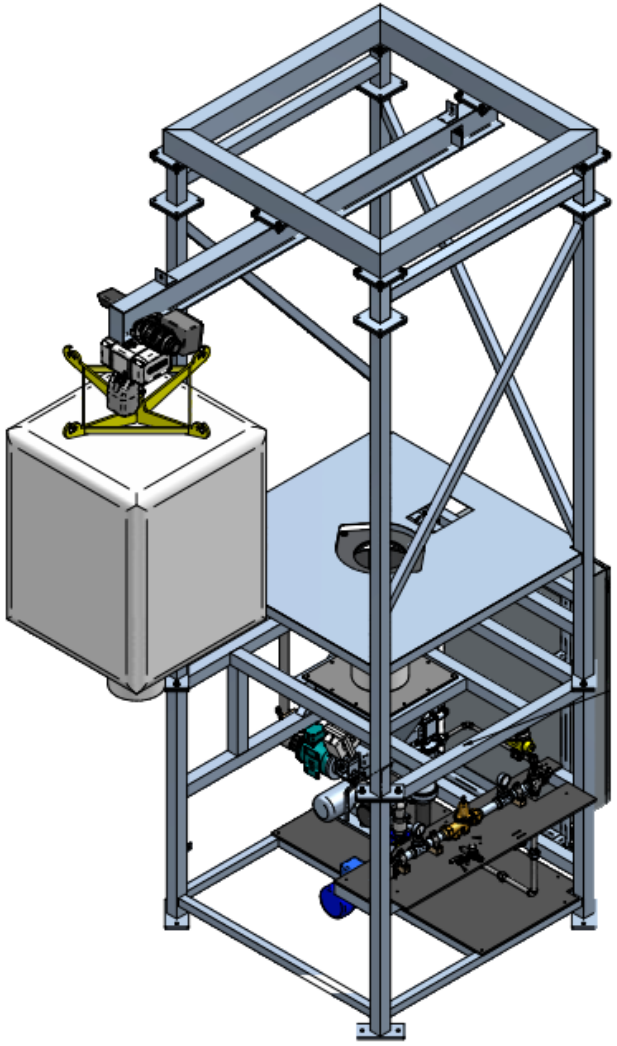


BULK BAG FRAME

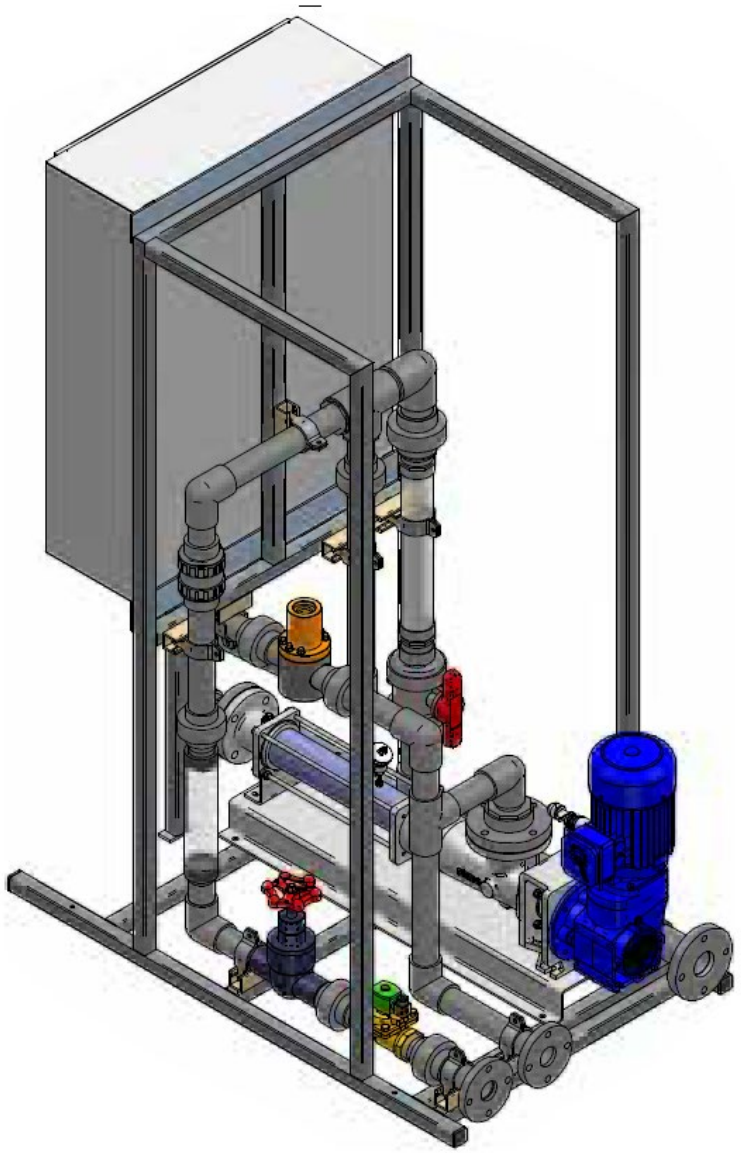


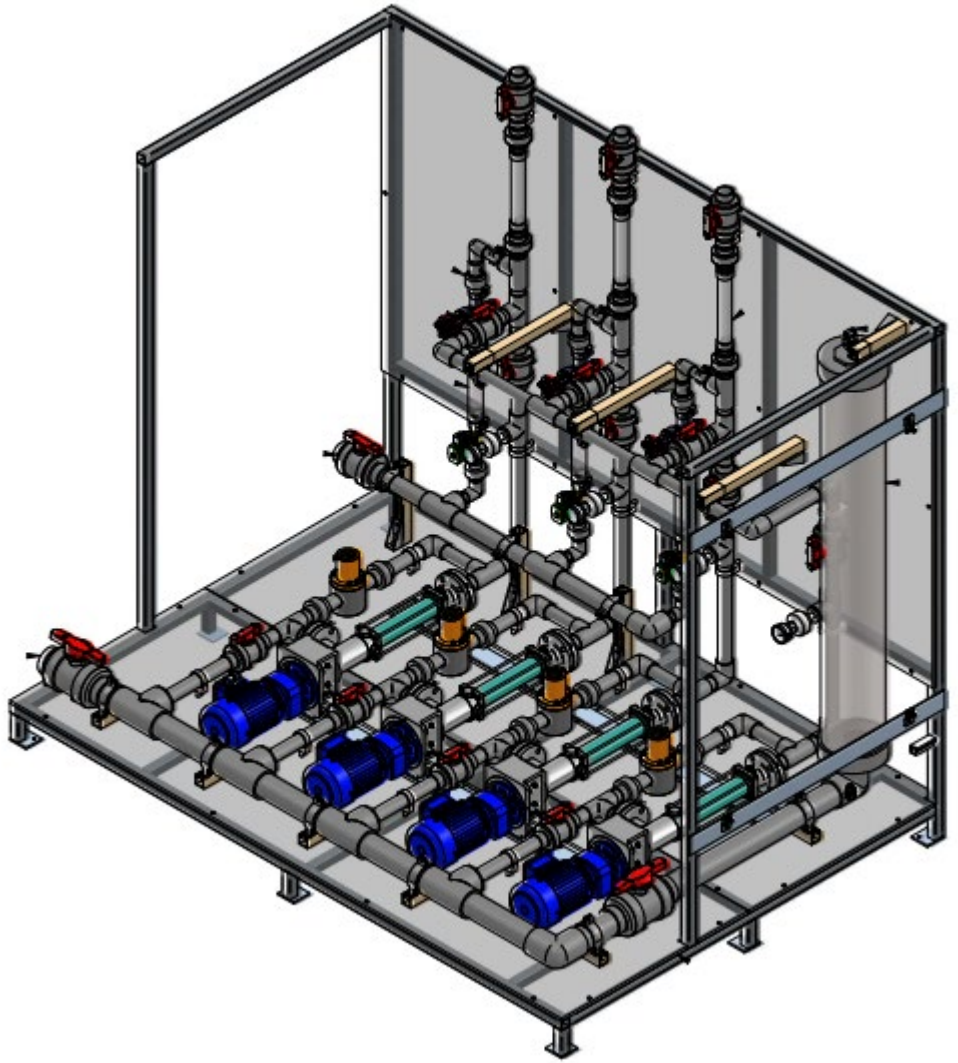
BULK BAG FRAME W/HYGIENIC VALVE OPTION





SOLUTION FEED SYSTEMS





Trainings

Overview of Polymers and ProMinent System Offerings

Date:
May 15, 2025

Location:
Online Webinar

Register

Applications and Use Cases of Polymers

Date:
TBD

Location:
Online Webinar

Coming Soon

How to Select and Quote the Right Polymer System

Date:
TBD

Location:
Online Webinar

Coming Soon

QUESTIONS?

Doug Britton

Training Manager

Britton.doug@prominent.com