VELODYNE

A company driven to deliver the very best polymer blending and chemical feed systems, fueled by constantly asking, “What if?”

WHAT HAPPENS WHEN YOU BUILD A COMPANY AROUND THE QUESTION, “WHAT IF?”

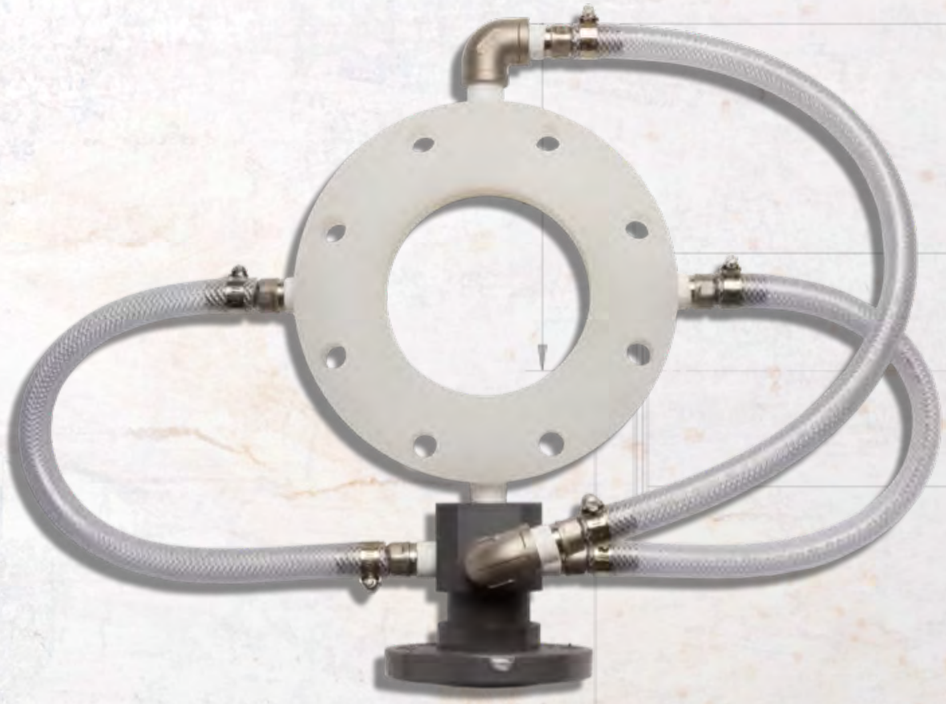


Figure A | INJECTION RING

The short answer is, you get a company like VeloDyne. Our products deliver superior results because of our almost obsessive nature for optimizing everything that goes into designing, building, installing and supporting our systems. We are driven by a deep understanding of maximizing polymer and how polymer and chemical feed systems relate to industrial process and to water and wastewater treatment as a whole. We also know what’s important to the people behind the systems, which heavily influences everything we do. When something isn’t right, we look to fix the problem. When everything’s working smoothly, we look for ways to make things work better. It’s just who we are, and it’s an approach to business that, to us, simply makes sense. It’s also the reason we are able to deliver products and services that we are proud to have associated with the VeloDyne name.

Note C4:
Larger manifold will improve polymer solution distribution and reduce buildup

YOU NEVER KNOW WHAT MIGHT SOLIDIFY YOUR COMPANY'S REPUTATION. FOR US IT WAS A $300 PART.

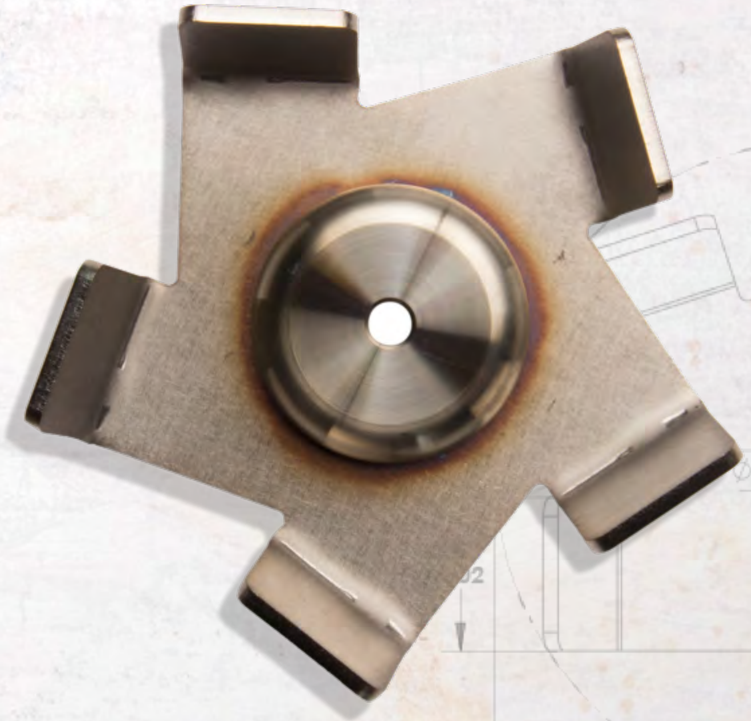


Figure A | IMPELLER BLADE

Our original design for the VeloBlend mixing chamber used a high-strength, machined plastic impeller. While this design performed well in testing, the rigors of running 24/7/365 resulted in having some impellers fail after years of constant operation. The first thing we did was upgrade our design to a more durable, stainless steel impeller. And, even though the equipment affected was past its warranty period, we also upgraded any customer's plastic impeller that failed with a new stainless steel one at no cost to them. In our minds, this was simply the right thing to do, and if faced with the same choice tomorrow, we would still handle things the same way.

IT TURNS OUT IT'S POSSIBLE TO PATENT "AND."

Figure A | POLYMER ACTIVATION CHAMBER

While the rest of the polymer equipment industry was engaged in a mechanical versus non-mechanical system debate, we thought, "Why not just combine the two?" So we did. The result is our unique, patented hybrid polymer activation technology that combines the reliability of non-mechanical mixing with variable speed hydro-mechanical mixing into a highly controllable, three-stage mixing environment. Additional features, such as an angled polymer inlet valve, a more adjustable water control valve and a variable speed impeller with angled blades allows for more precise control of mixing conditions and helps you optimize the performance of all available polymer.

LEARN MORE ABOUT VELOBLEND:

ACTIVATION CHAMBER | SKID CONFIGURATION | VELOBLEND MODELS

VELODYNE

THE FIRST STEP TO EFFECTIVELY WETTING DRY POLYMER HAS NOTHING TO DO WITH WETTING AT ALL.

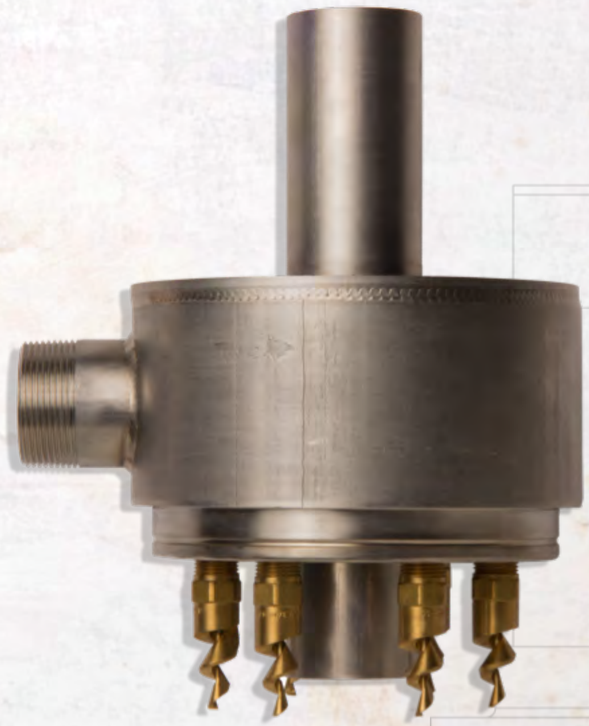


Figure A | PNEUMATIC WETTING CHAMBER

Dry polymer particles just by themselves have a tendency to clump together, which is why dispersing the polymer before it comes in contact with water is key for optimization. With this in mind, we developed a system that atomizes the dry polymer before introducing it into the wetting chamber. More effective particle wetting is just one aspect of the advanced engineering featured in our HydraMax systems. We also found ways to deliver greater control over the entire blending process. This allows you to more accurately regulate everything including solution concentration, mixing environment and aging conditions in order to create the perfect conditions required to optimize the specific dry polymer you choose. All this in a design that's completely scalable for high-rate applications.

LEARN MORE ABOUT HYDRAMAX:

WETTING CHAMBER | HYDRAMAX SYSTEMS

VELODYNE

THROW OUT ALL YOUR ASSUMPTIONS ABOUT CHEMICAL FEED SYSTEM DESIGN. THAT'S WHAT WE DID.

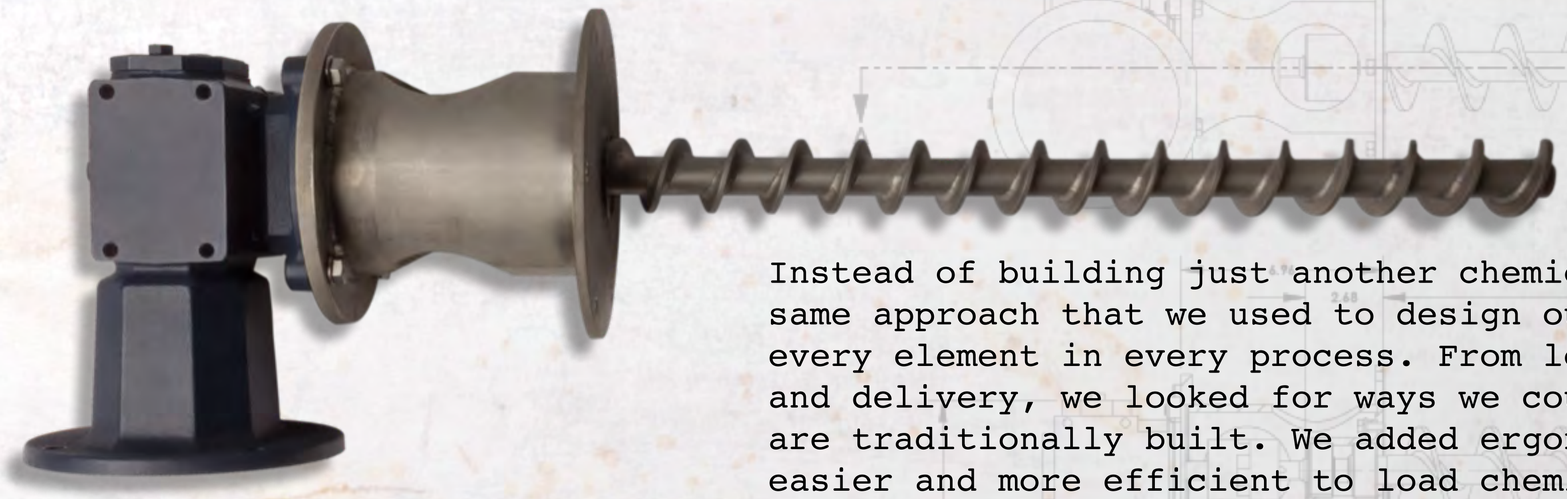


Figure A | FEEDER DRIVE

Instead of building just another chemical feed system, we applied the same approach that we used to design our polymer systems — we analyzed every element in every process. From loading and storage to wetting and delivery, we looked for ways we could improve on the way systems are traditionally built. We added ergonomic design that makes it easier and more efficient to load chemicals. We developed ways to keep material flowing so it can be metered more accurately and fed with greater consistency. We improved wetting techniques to help prevent buildup and plugging. We made equipment more rugged to improve longevity and reliability. We also strategically integrated all of the system components into the skid in a way that results in a more compact system, while also making sure all the parts are easily accessible.

LEARN MORE ABOUT CHEM FEED:

WETTING BOWL SKID

VELODYNE

THE MOST IMPORTANT PART IN OUR SYSTEMS ISN'T TECHNICALLY A PART.

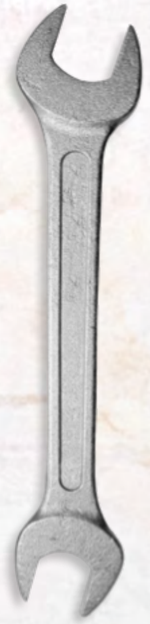


Figure A

5/16 x 3/8 OPEN END WRENCH

At VeloDyne, we aren't satisfied with simply designing and selling the best polymer mixing and chemical feed systems in the industry — we have always been driven to deliver more. Our dedication to providing the best solutions possible starts from the moment a potential customer first reaches out, and it continues long after the actual system goes online. We simply do what needs to be done, when and where it needs to be done, to deliver optimal results. It's just who we are.

PROCESS OPTIMIZATION

We will fine-tune your equipment around the specifications of your application to make sure your system is optimized.

TROUBLESHOOTING

Things happen, and when they do, our service department is standing ready to help resolve the issue over the phone, or jump on a plane if needed.

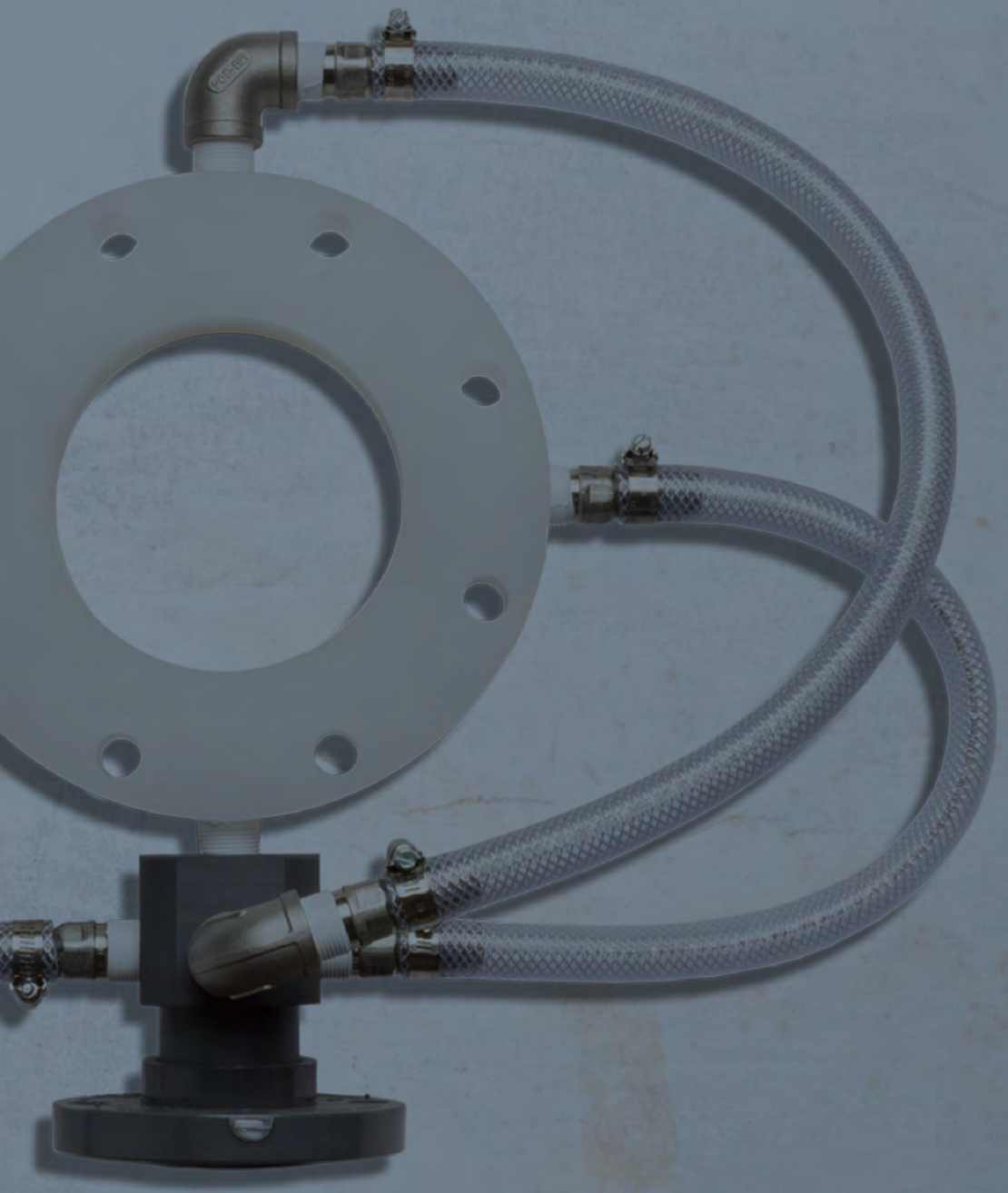
ON-SITE SERVICES

We can help handle everything to make sure you get the most out of your new VeloDyne equipment including commissioning, system start-up and training.

EQUIPMENT REFURBISHING

We can breathe new life into your aging systems to help you avoid the larger expense of replacing it.

VELODYNE



For detailed contact information,
please visit www.velodynesystems.com.

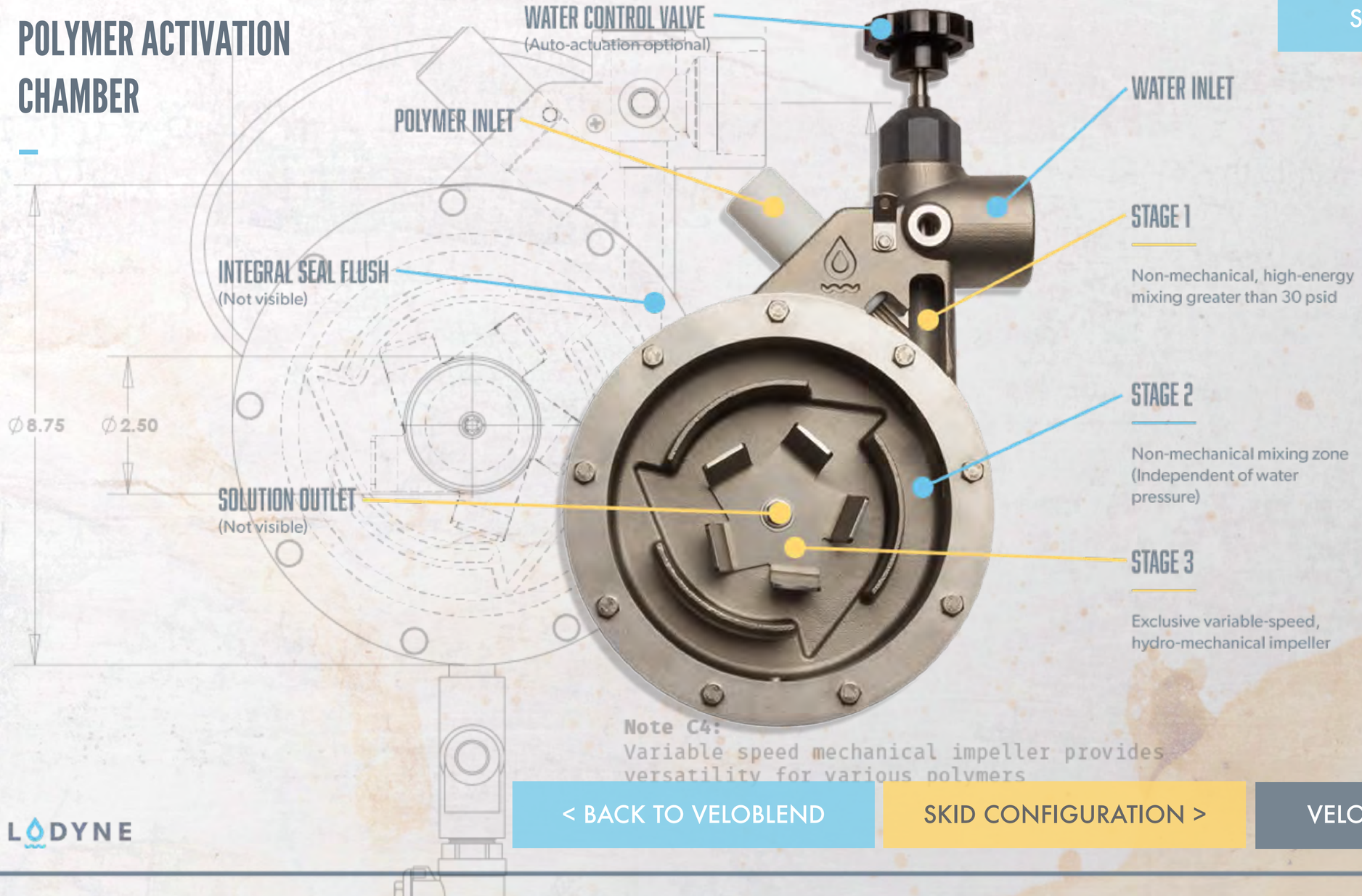
CONTACT A VELODYNE SALES REP:

303.530.3298
sales@velodynesystems.com

VELODYNE

POLYMER ACTIVATION CHAMBER

SEE IT IN ACTION >



WATER INLET

STAGE 1

Non-mechanical, high-energy mixing greater than 30 psid

STAGE 2

Non-mechanical mixing zone (Independent of water pressure)

STAGE 3

Exclusive variable-speed, hydro-mechanical impeller

Note C4:
Variable speed mechanical impeller provides versatility for various polymers

< BACK TO VELOBLEND

SKID CONFIGURATION >

VELOBLEND MODELS >

VELODYNE

SKID CONFIGURATIONS

DILUTION WATER SYSTEM

Manual or fully automatic water control.

NEMA 4X CONTROLS

Six standard control systems are available to meet your specific control requirements.

RUGGED STAINLESS STELL SKID

Available in 304 or 316 stainless steel, they feature an open design for easy maintenance and are engineered to provide ideal pump suction conditions.

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VIEW BACK >

SERIES 6000

Skid 2 configuration. Progressive cavity pump, 0.025 to 60 GPH neat polymer, 0.2 to 100 GPM solution. Control level Db through RpSB.

SERIES 2400

Skid 1 configuration. Progressive cavity pump, 0.025 to 24 GPH neat polymer, 0.2 to 40 GPM solution. Control level Db through E.

SERIES 12000

Skid 3 configuration. Progressive cavity pump, 2.5 to 120 GPH neat polymer, 15 to 200 GPM solution. Control level Db through RpSB.

SERIES 36000

Skid 4 configuration. Progressive cavity pump, 4.5 to 360 GPH neat polymer, 30 to 600 GPM solution. Control level Db and Rw.

Note C4:
Variable speed mechanical impeller provides versatility for various polymers

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< ACTIVATION CHAMBER

VELOBLEND MODELS >

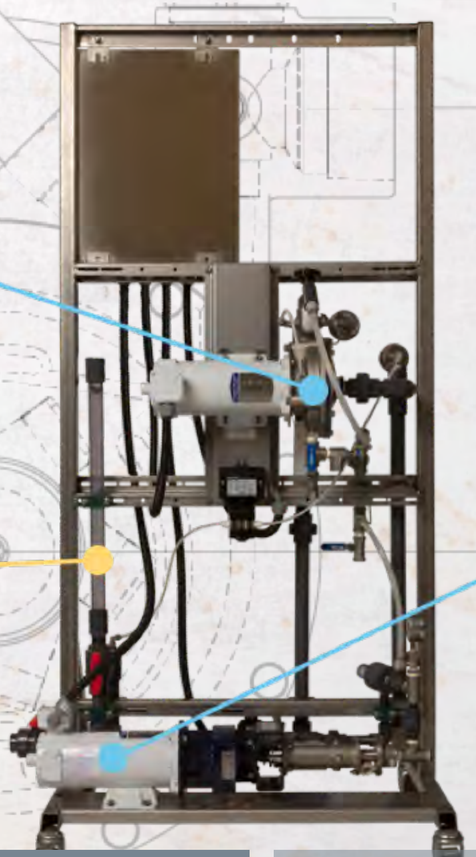
VELODYNE

SKID CONFIGURATIONS

ACTIVATION CHAMBER

VeloBlend advanced liquid polymer activation technology delivers unsurpassed performance and reliability.

CALIBRATION COLUMN



NEAT POLYMER PUMP

Progressive cavity pumps are standard, but other options for pump types are available.

< VIEW FRONT | VIEW BACK >

SERIES 6000

Skid 2 configuration. Progressive cavity pump, 0.025 to 60 GPH neat polymer, 0.2 to 100 GPM solution. Control level Db through RpSB.

Note C4:
Variable speed mechanical impeller provides versatility for various polymers

SERIES 2400

Skid 1 configuration. Progressive cavity pump, 0.025 to 24 GPH neat polymer, 0.2 to 40 GPM solution. Control level Db through E.

SERIES 12000

Skid 3 configuration. Progressive cavity pump, 2.5 to 120 GPH neat polymer, 15 to 200 GPM solution. Control level Db through RpSB.

SERIES 36000

Skid 4 configuration. Progressive cavity pump, 4.5 to 360 GPH neat polymer, 30 to 600 GPM solution. Control level Db and Rw.

SERIES 2400

- Progress Cavity Pump
- Hydro-Mechanical Mixing Chamber
- Rugged, Compact Frame
- Low to Mid Flow Range
- Open Accessibility to All Components
- Wide Array of Options

SERIES 6000

- Progressive Cavity Pump
- Hydro-Mechanical Mixing Chamber
- Rugged, Tall Frame
- Wide Array of Flow Ranges
- Automatic Control of Total Mix Energy
- Full Ratio Control Capability

SERIES 12000

- Progressive Cavity Pump
- Hydro-Mechanical Mixing Chamber
- Rugged, Wide Frame
- Automatic Control of Total Mix Energy
- Full Ratio Control Capability

SERIES 36000

- Progressive Cavity Pump
- Hydro-Mechanical Mixing Chamber
- Rugged, Custom Configured Frames
- Dilution Water Flow Rates to 600 GPM
- Ratio Control Capability

Note C4:
Variable speed mechanical impeller provides versatility for various polymers

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VELOBLEND DATA SHEET >

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VELODYNE | VELOBLEND MODELS

VELOBLEND BASE MODEL	POLYMER GPH	WATER GPH	SERIES 2400	SERIES 6000	SERIES 12000	SERIES 36000
VM-0.5P-120	0.025 — 0.5	12 — 120	•	•		
VM-2P-300	0.1 — 2	30 — 300	•	•		
VM-3P-600	0.3 — 3	60 — 600	•	•		
VM-10P-1200	0.5 — 10	120 — 1200	•	•		
VM-10P-1800	0.5 — 10	180 — 1800	•	•		
VM-15P-2400	0.75 — 15	240 — 2400	•	•		
VM-20P-3600	0.75 — 15	360 — 3600		•		
VM-30P-6000	1.5 — 30	600 — 6000		•		
VM-50P-9000	2.5 — 45	900 — 9000			•	
VM-60P-12000	3.0 — 60	1200 — 12000			•	
VM-120P-24000	12 — 120	2400 — 24000				•
VM-150P-30000	15 — 150	3000 — 30000				•
VM-150P-36000	18 — 180	3600 — 36000				•

CONTROL OPTIONS	SERIES 2400			SERIES 6000						SERIES 12000						SERIES 36000	
	CONTROL LEVELS			CONTROL LEVELS						CONTROL LEVELS						CONTROL LEVELS	
	Db	D	E	Db	D	E	Rw	Rp	RpSB	Db	D	E	Rw	Rp	RpSB	Db	Rw
Control Type: Discrete	•	•	•	•	•	•				•	•	•				•	
Control Type: PLC							•	•	•				•	•	•		•
Local & Remote Start/Stop Discrete Input		•	•		•	•		•	•		•	•		•	•		
Remote Start/Stop From Tank Level - Discrete Input	•			•			•			•			•			•	•
Remote Start/Stop From Tank Level - Analog Input							•						•				•
4-20Ma Pump Pacing Analog Input		•	•		•	•		•	•		•	•		•	•		
4-20Ma Solids Density Analog Input									•						•		
System Running Discrete Output		•	•		•	•	•	•	•		•	•	•	•	•		•
System In Remote Discrete Output		•	•		•	•	•	•	•		•	•	•	•	•		•
Pump Rate Analog Output			•			•	•	•	•			•	•	•	•		
Solution Rate Analog Output							•	•	•				•	•	•		•
Loss Of Polymer Flow Alarm Discrete Output	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Loss Of Water Flow Alarm Discrete Output	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Manual Water Ratio Control (Batch Only)	See PLC / HMI Options Below						•						•				•
Auto Water Ratio Control								•	•					•	•		
SmartBlend™ Mixing Energy Control									•						•		
Ethernet Communication							•	•	•				•	•	•		•

SKID OPTIONS	FOOTPRINT	SERIES 2400	SERIES 6000	SERIES 12000	SERIES 36000
1.	34"W X 24"D X 42"H	•			
2.	34"W X 30"D X 72"H		•		
3.	56"W X 40"D X 52"H			•	
4.	56"W X 40"D X 52"H				•

POWER OPTIONS	SPECS	SERIES 2400	SERIES 6000	SERIES 12000	SERIES 36000
A.	120V/1PH/60HZ	•	•		
B.	240V/1PH/60HZ		•		
C.	240V/3PH/60HZ		•	•	•
D.	480V/3PH/60HZ		•	•	•
E.	600V/3PH/50HZ		•	•	•

PLC OPTIONS	SERIES 2400	SERIES 6000	SERIES 12000	SERIES 36000
VeloDyne PLC/HMI Combination		•	•	•
Allen Bradley MicroLogix		•	•	•
Allen Bradley CompactLogix		•	•	•
Allen Bradley ControlLogix		•	•	•
Modicon M340		•	•	•
Modicon Momentum		•	•	•
Custom			•	

HMI OPTIONS		SERIES 2400	SERIES 6000	SERIES 12000	SERIES 36000
C-More 8"	Allen Bradley, Modicon, Custom		•	•	•
C-More 10"			•	•	•
PanelView 7"	Allen Bradley		•	•	•
PanelView 10"			•	•	•
PanelView 12"			•	•	•
Magelis 7"	Modicon		•	•	•
Magelis 10"			•	•	•

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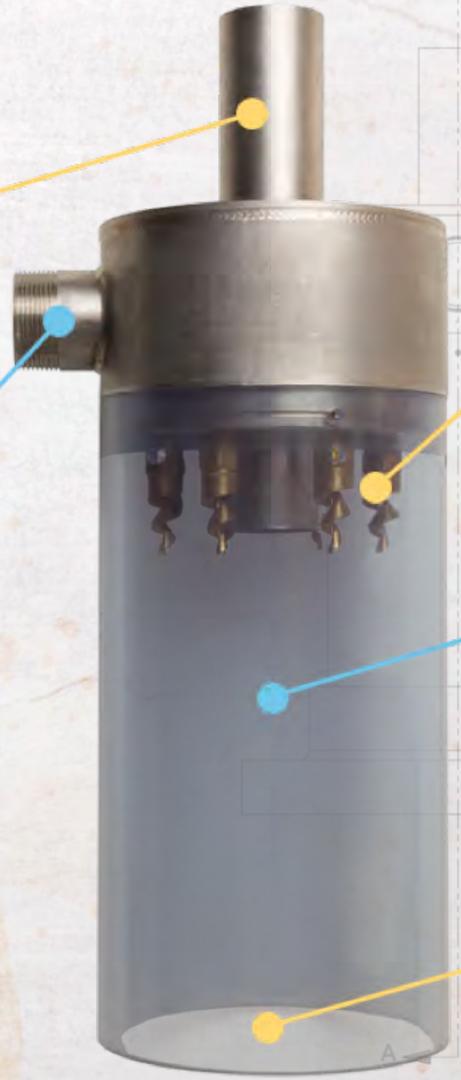
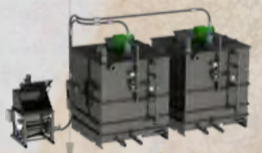
WETTING CHAMBER



SEE IT IN ACTION >

Typical over/under system installation

Typical side-by-side system installation



Typical alternating batch installation

Note D2:
Increased wetting area optimizes polymer particle wetting

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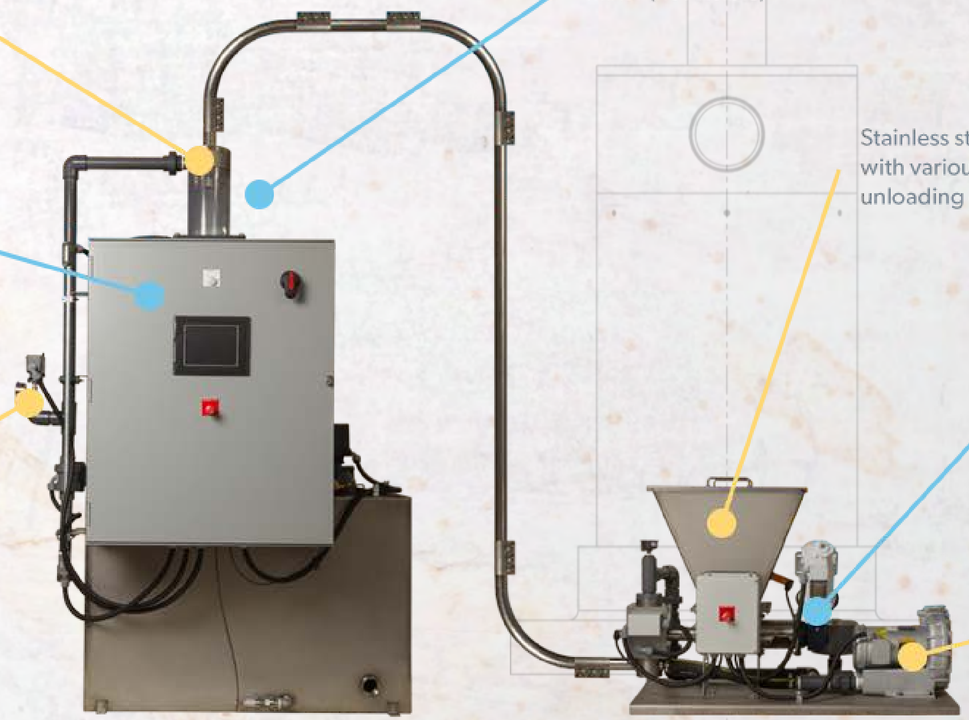
SYSTEM CONFIGRUATION >

VELODYNE

ENGINEERED TO MEET YOUR SPECIFIC NEEDS



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ADDITIONAL HOPPER COVER OPTIONS

Super sack adapter

50# bag unloader with dust collector

Universal hopper

Note D2:
Increased wetting area optimizes polymer particle wetting

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VELODYNE

ENGINEERED TO MEET YOUR SPECIFIC NEEDS

< VIEW FRONT

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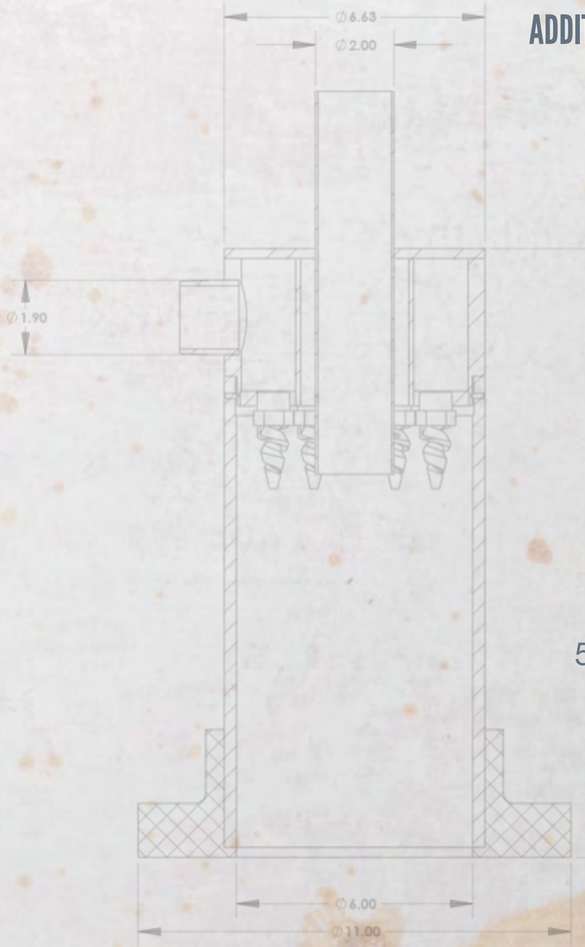

Note D2:
Increased wetting area optimizes polymer particle wetting

ADDITIONAL HOPPER COVER OPTIONS

Super sack adapter

50# bag unloader with dust collector

Universal hopper

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HYDRAMAX DATA SHEET >

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VELODYNE | HYDRAMAX MODELS

HYDRAMAX BASE MODEL		#/HR POLYMER AVAILABLE SOLUTION CONCENTRATION 0.25%	0.50%	GPM SOLUTON AVAILABLE	WATER RATE REQUIRED TRANSFER RATE		 SOU SERIES	 SS SERIES	 AS SERIES
S100	45 Minutes Aging	2.4	4.7	1.9	20 GPM @ 50 PSI	30 GPM	•		
	60 Minutes Aging	1.8	3.7	1.5					
S200	45 Minutes Aging	4.4	8.8	3.6	40 GPM @ 50 PSI	40 GPM	•		
	60 Minutes Aging	3.5	7.0	2.9					
S400	45 Minutes Aging	8.0	16	6.2	40 GPM @ 50 PSI	40 GPM	•		
	60 Minutes Aging	6.5	13	5.0					
S750	45 Minutes Aging	12	25	10	50 GPM @ 50 PSI	50 GPM		•	
	60 Minutes Aging	10	21	8.0					
A750	45 Minutes Aging	15	31	13	50 GPM @ 50 PSI	50 GPM			•
	60 Minutes Aging	12	25	10					
S1000	45 Minutes Aging	18	36	14	100 GPM @ 50 PSI	100 GPM		•	
	60 Minutes Aging	14	29	12					
S1500	45 Minutes Aging	22	45	18	100 GPM @ 50 PSI	100 GPM		•	
	60 Minutes Aging	19	38	15					
S2000	45 Minutes Aging	27	55	22	100 GPM @ 50 PSI	150 GPM		•	
	60 Minutes Aging	24	48	19					
A2000	45 Minutes Aging	32	65	26	100 GPM @ 50 PSI	150 GPM			•
	60 Minutes Aging	27	54	22					
S2500	45 Minutes Aging	31	62	25	100 GPM @ 50 PSI	150 GPM		•	
	60 Minutes Aging	27	54	21					
S3000	45 Minutes Aging	50	100	40	200 GPM @ 50 PSI	200 GPM		•	
	60 Minutes Aging	41	83	33					
A3000	45 Minutes Aging	62	125	50	200 GPM @ 50 PSI	200 GPM			•
	60 Minutes Aging	50	100	40					
HOPPER DESIGN									
50# Bag Unloader							•	•	•
50# Bag Unloader With Dust Collector							•	•	•
Bulk-Bag Adapter							•	•	•
Combination 50# Bag / Super Sack Unloader							•	•	•
Silo - Bulk Delivery								•	•
STORAGE CAPACITY CUBIC FEET									
2							•		
4							•	•	•
10								•	•
20								•	•
70								•	•
1500								•	•
PLC OPTIONS									
VeloDyne PLC/HMI Combination							•		
Allen Bradley MicroLogix							•	•	•
Allen Bradley CompactLogix							•	•	•
Allen Bradley ControlLogix							•	•	•
Modicon M340							•	•	•
Modicon Momentum							•	•	•
HMI OPTIONS									
C-More 8"	Allen Bradley / Modicon / Custom PLC						•	•	•
C-More 10"							•	•	•
PanelView 7"	Allen Bradley PLC						•	•	•
PanelView 10"							•	•	•
PanelView 12"							•	•	•
Magelis 7"	Modicon PLC						•	•	•
Magelis 10"							•	•	•
POWER OPTIONS									
240V/3PH/60HZ							•		
480V/3PH/60HZ							•	•	•
600V/3PH/50HZ							•	•	•

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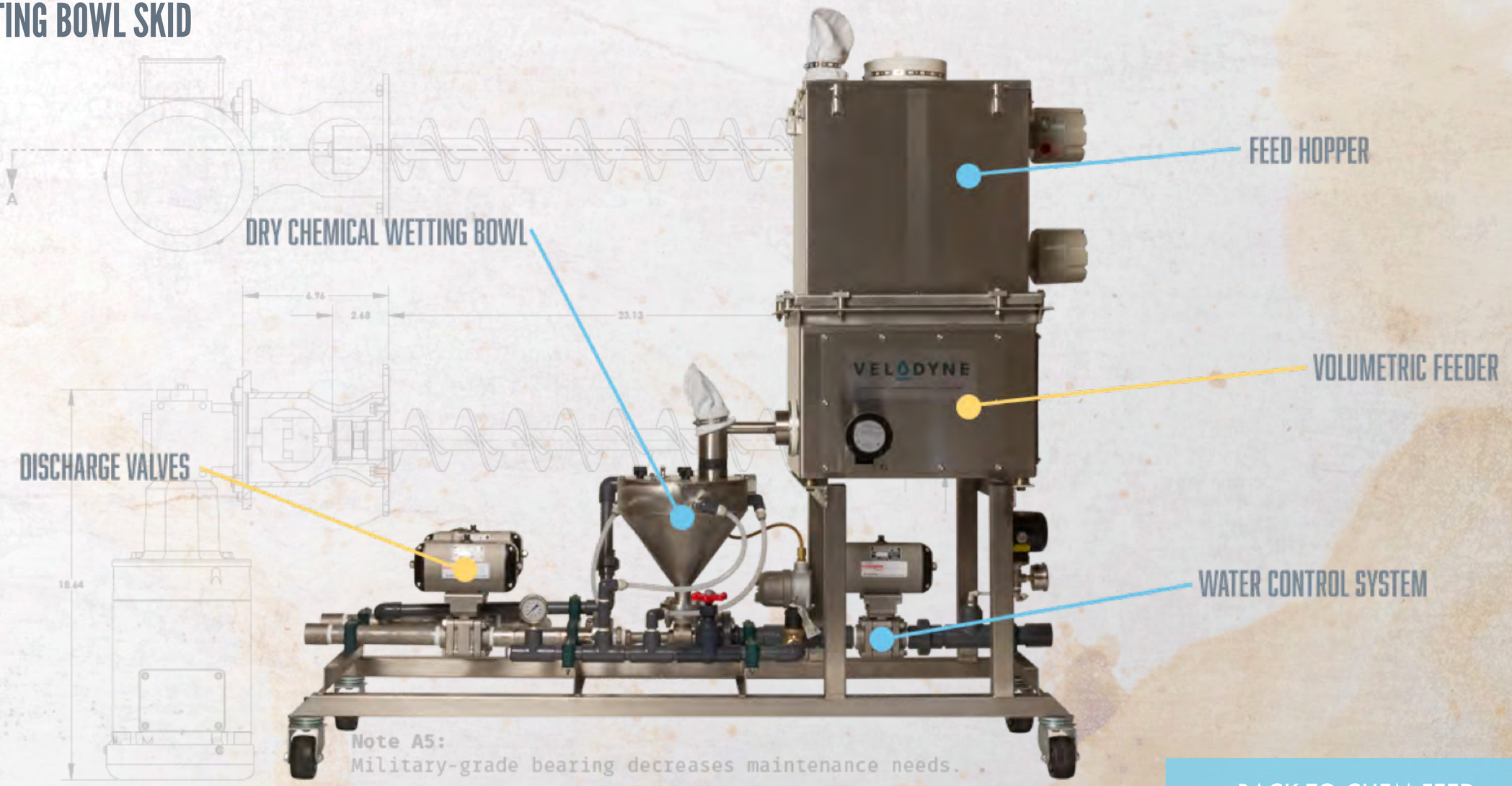
WETTING BOWL SKID



Note A5:
Military-grade bearing decreases maintenance needs. .

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To effectively optimize polymer performance, you have to understand polymer in all its phases. VeloDyne's innate knowledge of polymer itself is one of the reasons our systems are so effective in optimizing the performance of such a wide range of polymers.

NEAT POLYMER

"Neat polymer" refers to the polymer you get from your supplier. It's primarily comprised of unactivated, coiled-up polymer encased in oil, water and an inverting agent.

FULLY ACTIVATED, UNDAMAGED POLYMER

When neat polymer is exposed to the proper mixing conditions, the oil is effectively scrubbed and the polymer fully uncoils, which allows it to become fully optimized and deliver peak performance.

DAMAGED POLYMER

Once the polymer uncoils, it is susceptible to shear damage from the impeller during the mixing process. Damaged polymer is far less effective and will increase your polymer usage.

UNACTIVATED POLYMER MOLECULE

In its neat state, the polymer is coiled like a spring and is capable of withstanding ultra-high mixing energy without experiencing damage to its molecular structure.

PARTIALLY ACTIVATED POLYMER

When exposed to insufficient mixing energy, the polymer fails to fully activate. This limits the polymer's effectiveness and reduces its ability to perform efficiently, which ultimately increases the amount of polymer you need.

OPTIMIZING DRY POLYMER >

A number of factors go into effectively optimizing dry polymer. The thorough understanding of each of these factors is one reason VeloDyne systems are so effective in optimizing the performance of such a wide range of polymers.

1

EFFECTIVE POLYMER PARTICLE WETTING

Optimizing dry polymer performance starts with effectively wetting each individual polymer particle. The most efficient way to achieve this is by separating the particles just prior to wetting, so each individual particle is exposed to wetting. Methods such as simply metering dry polymer into a wetting bowl require longer wetting times, which can result in shear damage caused by the mixing impeller.

2

PROPER SOLUTION CONCENTRATIONS

Proper solution depends on the type of polymer you use. Cationic polymers are typically prepared at solution concentrations between 0.25% to 0.5%. Anionic polymers are typically prepared between 0.1% and 0.25% solution. The solution can then be further diluted after the solution metering pumps through a secondary dilution system.

3

PROPER MIXING

When polymer is first wetted, the molecule is not susceptible to damaging shear induced by a tank mixing impeller. However, during the hydration process the polymer elongates and becomes susceptible to shear, which can degrade the polymer's effectiveness. Too low of mixing energy, or insufficient mix times will prevent the polymer from fully uncoiling. Too much mixing energy or mixing for too long will damage the polymer. Inducing higher initial impeller speeds that are then decreased as the polymer becomes more activated delivers a better performing polymer solution.

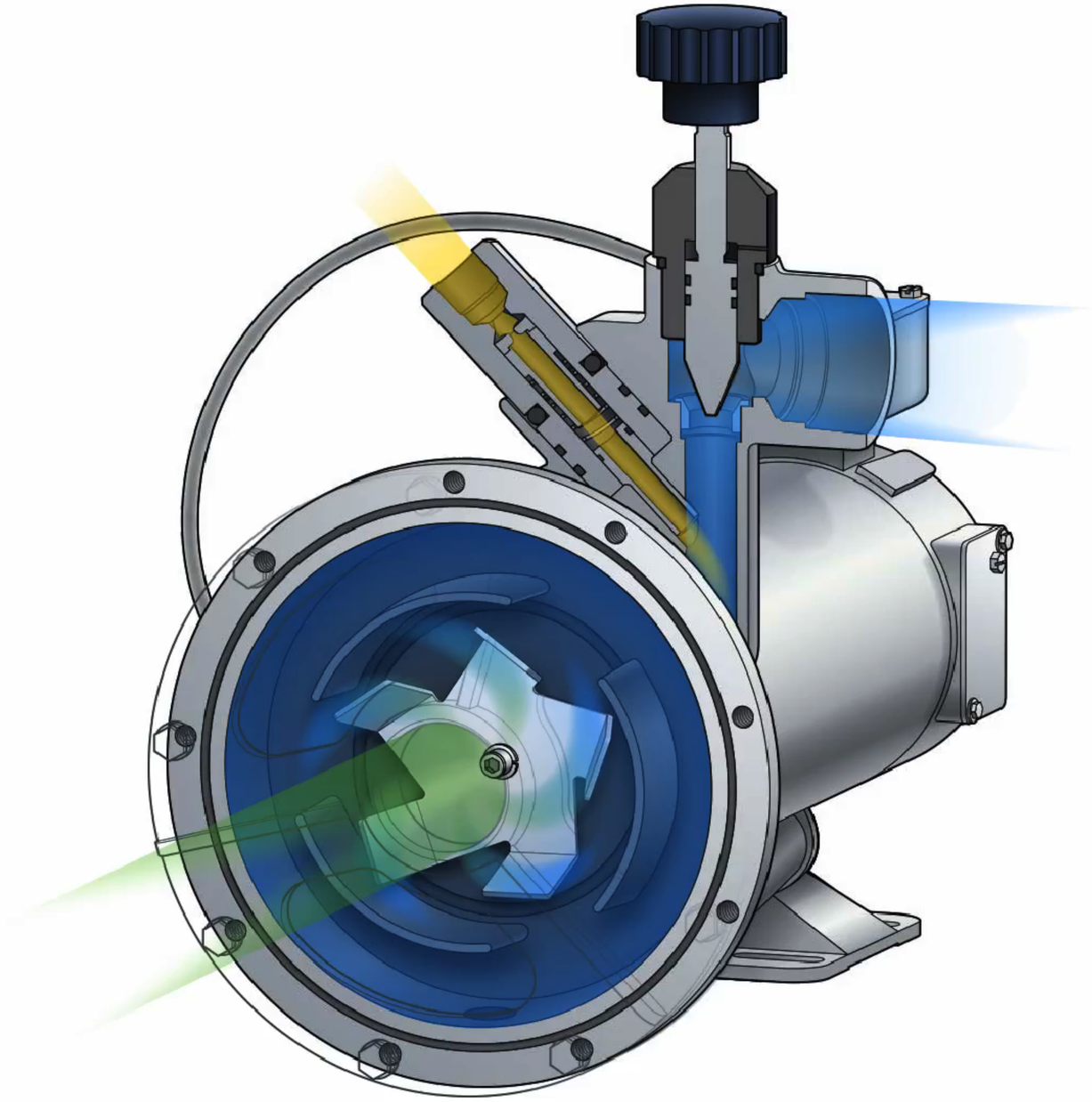
4

SUFFICIENT POLYMER AGING

The amount of aging time required to reach optimal performance depends on a number of factors including the type of polymer water temperature. It's not uncommon for systems to be designed with insufficient aging time. For optimum system flexibility, performance and with proper preparation as described above, it's recommended that cationic polymer systems provide 45 to 60 minutes of aging, and anionic polymer systems can deliver up to 120 minutes of aging.

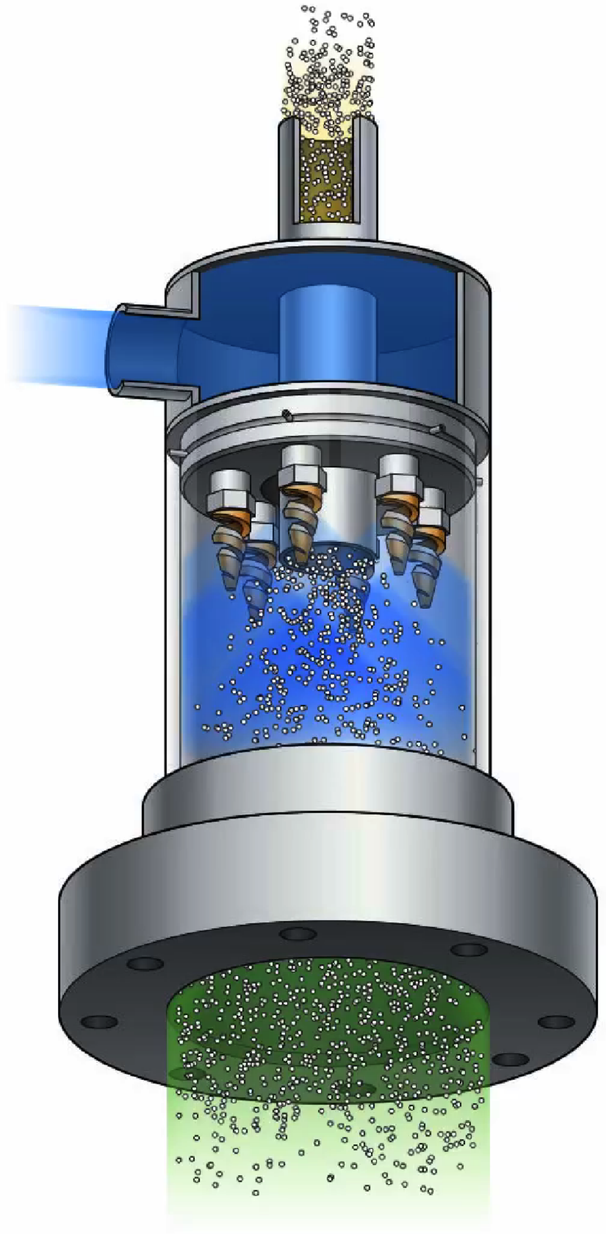
VELODYNE

OPTIMIZING WET POLYMER >



Having issues playing video? This video is best viewed using Adobe Reader and the latest version of Adobe Flash Player installed.

< BACK TO ACTIVATION CHAMBER



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< BACK TO WETTING CHAMBER