

Архангельск (8182)63-90-72  
Астана (7172)727-132  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81  
Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Казахстан (772)734-952-31

Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Таджикистан (992)427-82-92-69

Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

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# Порошковые миксеры

## Alfa Laval Vortex Mixmate®

### Safe chemical mixing barrel

#### Introduction

Small batch mixing of corrosive chemical solutions is a necessary process for many industrial applications. The hazardous nature of these chemicals imposes safety risks to workers who need to handle and mix them. Mixing barrels are often used to mix these hazardous solutions while keeping them securely contained, minimizing worker exposure to them. The Alfa Laval Vortex Mixmate is an advanced style of mixing barrel designed with durability and optimum safety in mind.

#### Applications

The Alfa Laval Vortex Mixmate is a high quality harsh chemical mixing barrel that is built to withstand tough industrial applications. It is designed for safe, rapid, homogeneous mixing and dispensing of small batches of hazardous liquids. Its most common use is in oil and gas drilling fluid applications for the purpose of mixing dry caustic soda powder into small batches of solution and feeding it into the drilling fluid to regulate the drilling fluid pH level. Caustic soda solution mixing is a highly exothermic heat generating reaction that results in hot, corrosive liquid that can easily burn skin and eyes. The Mixmate allows easy, proper mixing and dispensing of caustic solution with no risk of physical exposure to personnel.

#### Benefits

- Simple robust design
- High quality construction
- Low maintenance
- Safe, effective mixing of harsh chemicals
- Easy dispensing of mixed solutions
- Easily integrated with the Alfa Laval Vortex Shear-Mixer

#### Standard Design

The Alfa Laval Vortex Mixmate consists of a 379 L (100 gallon) stainless steel drum with work table and a protection baffle designed to eliminate the risk of liquid splash-back during mixing. It features a stainless steel, lockable, hinged safety cover with a viewing window. The unit has 38mm (1.5") water inlet and solution discharge outlets equipped with stainless steel ball valves, a 76 mm (3") overflow port, a stainless steel turbine impeller and shaft powered by a four horsepower air motor, and a stainless steel skid base.



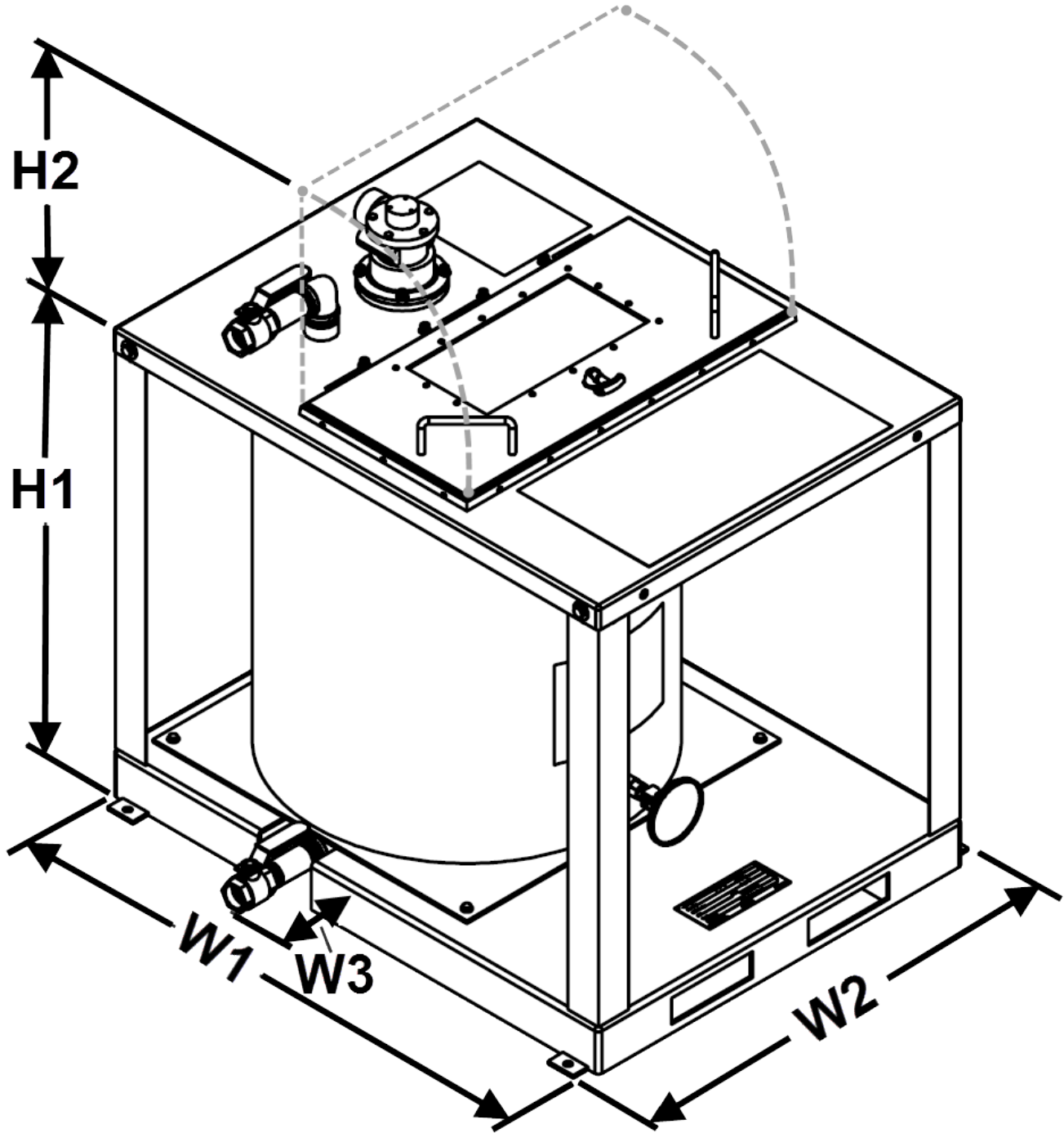
#### Working Principle

The Mixmate is first filled with fresh water. The 4 horsepower air motor is turned on to agitate the water. The cover is opened and caustic powder or pellets are gradually added into the Mixmate, where they are aggressively mixed into a concentrated solution by the stainless steel impeller. The thermal gauge indicates when the reaction temperature has leveled off and the solution is fully mixed. The solution can then be easily dispensed from the base of the unit and into the drilling mud by opening a ball valve. This allows the solution to either gravity feed into a vessel or pit, or be vacuumed out and mixed directly into a fluid stream by an Alfa Laval Vortex Shear-Mixer.

#### Technical Data

Maximum caustic powder load	90.7 kg (200 lbs)
Maximum liquid capacity	378.5 L (100 gallons)
Operating air pressure	6.9 Bar (100 PSI)
Weight	277 kg (610 lbs)

Dimensional Drawing



**Dimensions**

H1	1016 mm (40 in)
H2* <i>Safety door clearance</i>	439 mm (17.3 in)
W1	1219 mm (48 in)
W2	991 mm (39 in)
W3	144 mm (5.7 in)



## Alfa Laval Hybrid Powder Mixer M15

Powder mixer and pump in one mobile unit

### Application

The Alfa Laval Hybrid Powder Mixer is a patented hygienic mobile unit that both disperses powders into liquids quickly and efficiently and pumps the resulting solution at outlet pressures of up to ~5 barg, all using a single motor. This versatile, easy-to-use mixer produces homogeneous products at high dry matter concentrations and high productivity.

The mixer is an excellent choice for use in a wide range of dairy, beverage and food powder mixing applications, e.g. for incorporating thickeners and stabilizers like pectin and xanthan and emulsifiers in the concentrations required in most applications. It is also capable of producing recombined milk with more than 50% dry matter.

### Design

The Alfa Laval Hybrid Powder Mixer is comprised of a two stage pump with one rotor-stator stage and one pump stage. The unit is fitted with a single motor and a frequency converter. A funnel is used for introduction of powder through an injector system which can be isolated using a hygienic C-Ball valve. The construction is mounted on a stainless steel frame and the liquid inlet is equipped with a sight glass and a butterfly valve.

### TECHNICAL DATA

#### Versions:

ROW version . . . . . (380-480 VAC)

#### Materials:

Product wetted steel parts: . . . W. 1.4404 (316L) and Duplex steel

Other steel parts: . . . . . W. 1.4301 (304)

Product wetted seals: . . . . . EPDM, PTFE

Other O-rings: . . . . . EPDM

Finish: . . . . . Semi-Bright

Internal surface roughness: . . . Pipework acc. to DIN11850 Ra<0.8  
µm (Impellers: Blasted/machined)

Shaft seal: . . . . . Single mechanical SiC/SiC, flushed version

Flush tank: . . . . . Approx. 1 ltr. incl. sight glass

Note: Flush through possible via easy connection

#### Motor:

ROW version (Incl. SS motor shroud): Standard foot-flanged motor with a fixed ball bearing on drive side, according to IEC metric standard, 2 poles = 3000/3600 RPM at 50/60 Hz, enclosure IP55 (with drain hole with labyrinth plug), insulation class F.

#### Power:

Installed power: . . . . . 18.5 kW



#### Frequency drive

Type: . . . . . Danfoss VLT® AutomationDrive FC 300 series

Power rating: . . . . . 18.5 kW (Normal overload 110 %/60 s)

Input voltage:

ROW version: . . . . . 380-480 VAC

Mains option: . . . . . Local mains disconnect

Insulation class: . . . . . IP66

RFI filter:

ROW version: . . . . . Class A1/B

Display: . . . . . Graphical local control panel

#### Connections:

Liquid inlet connection:

ROW version: . . . . . DIN 11851 DN 50 male union

Liquid outlet connection:

ROW version: . . . . . DIN 11851 DN 40 male union

#### Control of powder addition:

Manually actuated special C-Ball valve for dry ingredient adding

#### Other:

Funnel strainer.

Blind cover at powder inlet for use during CIP

**OPERATIONAL DATA**

**Technical data:**

Temperature range: . . . . . -10°C to + 95°C  
 (Max. at CIP)  
 Temperature, Media, Maximum: . . . . . 70°C  
 Recommended inlet pressure: . . . . . 0.0 - 0.2 bar  
 Min. back pressure recommended: . . . 1 barg  
 Dry ingredient capacity: . . . . . Dependent on powder (e.g.  
 3000 kg/h capacity for  
 skimmed milk powder).  
 Noise level (at 1 m): . . . . . < 90 dB(A)

**Dimensions/weight:**

HxWxL [mm]: . . . . . 1130 X 826 X 1340  
 Weight: . . . . . Approx. 280 kg  
 Max. table load: . . . . . 300 kg

**Benefits**

The Alfa Laval Hybrid Powder Mixer provides a lower total cost of ownership of a powder-mixing system by combining powder mixer and pump function in one unit, thereby reducing installation costs. The system also allows the introduction of additional pressure-drop producing equipment downstream of the powder mixer, such as valves, heat exchangers, etc. without the necessity of installing an additional pump for boosting pressure. In addition, the simple design of the system keeps maintenance costs low. Furthermore, for a mixing application in a batch tank, the powder mixer can be configured in combination with an Alfa Laval Rotary Jet Mixer in such a way that the Hybrid Powder Mixer delivers the flow and pressure needed for the Rotary Jet Mixer.

**Operation of the Alfa Laval Hybrid Powder Mixer**

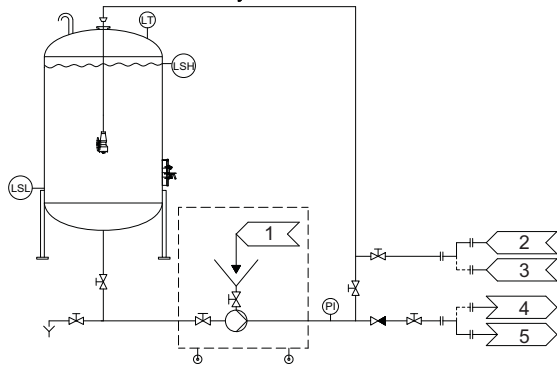
The two-stage in-line Hybrid Powder Mixer is installed in a recirculation loop connected to a batch tank. This user-friendly mobile unit has a built-in table to facilitate handling of heavy bags of powder. The table easily slides into position for convenient placement of the bags during mixing.

After adding liquid ingredients to the tank, the Alfa Laval Hybrid Powder Mixer is used to circulate the liquid over the tank. To provide high-efficiency mixing in tanks with volumes larger than 1 - 2 m³ it is recommended to install an Alfa Laval Rotary Jet Mixer in the tank by connecting it to the end of the circulation pipe.

After powder is introduced in the funnel, the C-Ball valve under the funnel is opened. The valve is the only component that the operator must control during introduction of the powder. The injector positioned under the valve creates an under pressure in the funnel outlet, drawing the powder into the rotor-stator stage of the pump and blending the powder and liquid into a homogeneous mixture. The impeller in the second stage of the pump transfers the powder-liquid mixture back to the tank while part of the powder-liquid mixture is sent through the injector creating the under pressure in the funnel outlet, which enables the suction of the powder into the liquid.

When mixing is complete, the Hybrid Powder Mixer may be used as a discharge pump or, when used with the Alfa Laval Rotary Jet Mixer, as a CIP forward pump – depending on the size of the tank and Rotary Jet Mixer - to clean the tank interior.

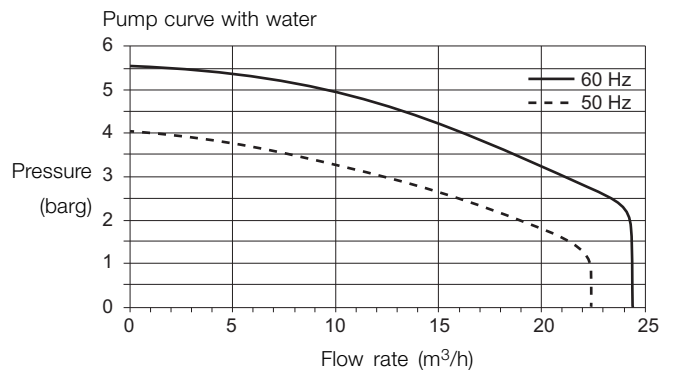
**Example of setup with the Alfa Laval Hybrid Powder Mixer and an Alfa Laval Rotary Jet Mixer**



NOTE: This diagram is for illustration and guidance only!

- 1. Powder/Crystals
- 2. Water/main media
- 3. CIP-F
- 4. CIP-R
- 5. Product

**Pump Curve for the Alfa Laval Hybrid Powder Mixer**







# Alfa Laval Hybrid Powder Mixer S15

Powder mixer and pump in one unit

## Application

The stationary Alfa Laval Hybrid Powder Mixer S15 is a patented hygienic unit that both disperses powders into liquids quickly and efficiently and pumps the resulting solution at outlet pressure of up to 5 bar, all using a single motor. This versatile, easy-to-use mixer produces homogeneous products at high dry matter concentrations and high productivity.

The mixer is an excellent choice for use in a wide range of dairy, beverage and food powder mixing applications, e.g. for incorporating thickeners and stabilizers like pectin and xanthan and emulsifiers in the concentrations required in most applications. It is also capable of producing recombined milk with more than 50% dry matter.

## Design

The Alfa Laval Hybrid Powder Mixer S15 is comprised of a two stage pump with one rotor-stator stage and one pump stage. The unit is fitted with a single motor and a funnel for introduction of powder through an injector system which can be isolated using a hygienic c-ball valve.



## TECHNICAL DATA

ROW version: . . . . . 380-420 D/660-690 Y @ 50 Hz

### Materials:

Product wetted steel parts: . . . W. 1.4404 (316L) and Duplex steel

Other steel parts: . . . . . W. 1.4301 (304)

Product wetted seals: . . . . . EPDM, PTFE

Other O-rings: . . . . . EPDM

Finish: . . . . . Semi-Bright

Internal surface roughness: . . . Pipework acc. to DIN11850

Ra<0.8 µm (Note: Impellers:  
Blasted/machined)

(Note: Impellers: . . . . . Blasted/machined)

Shaft seal: . . . . . Single mechanical SiC/SiC, flushed  
version

Flush tank: . . . . . Approx. 1 ltr. incl. sight glass

Note: Flush through possible via easy connection

### Power:

Installed power: . . . . . 15 kW

### Frequency drive

The HPM S15 should always be operated by use of a frequency converter.

### Connections:

Liquid inlet connection: . . . . . DIN 11851 DN 50 male union

Liquid outlet connection: . . . . . DIN 11851 DN 40 male union

## OPERATIONAL DATA

### Technical data:

Recommended operation frequency 60 Hz (specially for thickeners and stabilizers)

Temperature range: . . . . . -10°C to + 95°C  
(Max. at CIP)

Temperature, Media, Maximum: . . . . . 70°C

Recommended inlet pressure: . . . . . 0.0 - 0.2 bar

Min. back pressure recommended: . . . 1 barg

Dry ingredient capacity: . . . . . Dependent on powder  
properties (for example, 3000  
kg/h capacity for skimmed  
milk powder).

Noise level (at 1 m): . . . . . < 90 dB(A)

### Dimensions/weight:

HxWxL [mm]: . . . . . 1115 X 580 X 1300

Weight: . . . . . Approx. 230 kg

### Motor:

Incl. SS motor shroud: Standard foot-flanged motor with a fixed ball bearing on drive side, according to IEC metric standard, 2 poles = 3000/3600 RPM at 50/60 Hz, enclosure IP55 (with drain hole with labyrinth plug), insulation class F.

### Other:

Funnel strainer.

Blind cover at powder inlet for use during CIP

### Control of powder addition:

Manually actuated special C-Ball valve for dry ingredient adding

## Benefits

The Alfa Laval Hybrid Powder Mixer S15 provides a lower total cost of ownership of a powder-mixing system by combining powder mixer and pump function in one unit, thereby reducing installation costs. The system also allows the introduction of additional pressure-drop producing equipment downstream of the powder mixer, such as valves, heat exchangers, etc. without the necessity of installing an additional pump for boosting pressure. In addition, the simple design of the system keeps maintenance costs low. Furthermore, for a mixing application in a batch tank, the powder mixer can be configured in combination with an Alfa Laval Rotary Jet Mixer in such a way that the Hybrid Powder Mixer delivers the flow and pressure needed for the Rotary Jet Mixer.

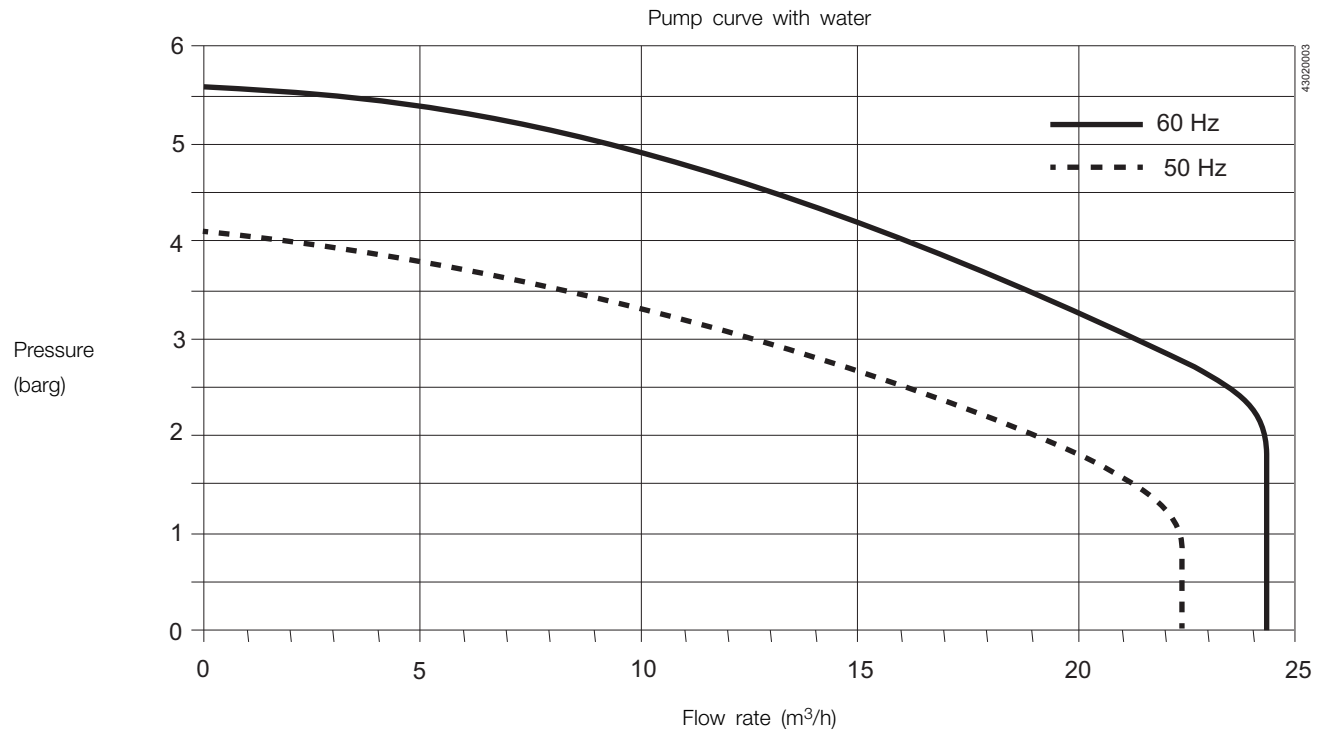
## Operation of the Alfa Laval Hybrid Powder Mixer S15

The two-stage inline Hybrid Powder Mixer is installed in a recirculation loop connected to a batch tank. After adding liquid ingredients to the tank, the Alfa Laval Hybrid Powder Mixer S15 is used to circulate the liquid over the tank. To provide high-efficiency mixing in tanks with volumes larger than 1 - 2 m<sup>3</sup> it is recommended to install an Alfa Laval Rotary Jet Mixer in the tank by connecting it to the end of the circulation pipe.

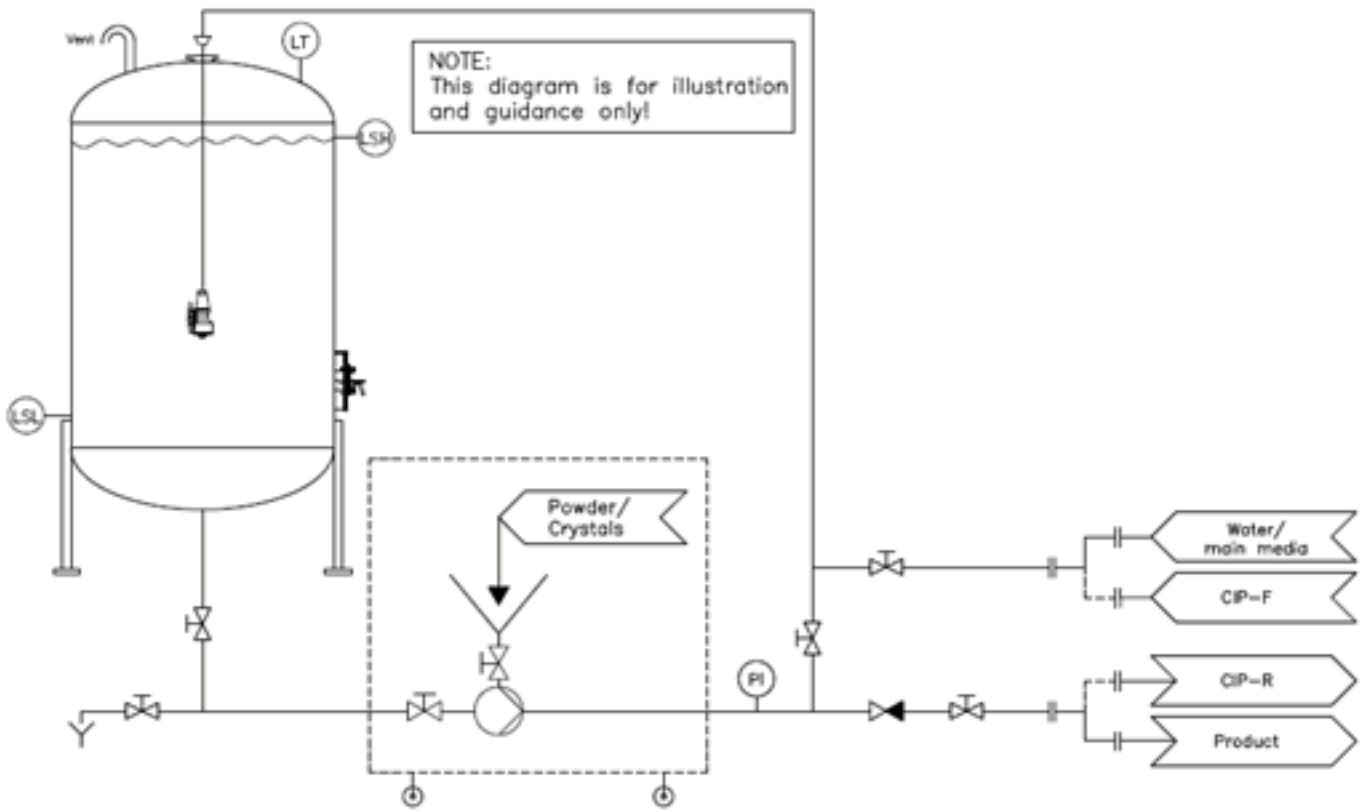
Before powder is added in to the funnel, we have to make sure that no air is in the circulation pipe and a minimum pressure of 1 bar is build up after the HPM. After powder is introduced in the funnel, the C-Ball valve under the funnel is opened. The valve is the only component that the operator must control during introduction of the powder. The injector positioned under the valve creates an under pressure in the funnel outlet, drawing the powder into the rotor-stator stage of the pump and blending the powder and liquid into a homogeneous mixture. The impeller in the second stage of the pump transfers the powder-liquid mixture back to the tank while part of the powder-liquid mixture is sent through the injector creating the under pressure in the funnel outlet, which enables the suction of the powder into the liquid.

When mixing is complete, the Hybrid Powder Mixer may be used as a discharge pump or, when used with the Alfa Laval Rotary Jet Mixer, as a CIP forward pump – depending on the size of the tank and Rotary Jet Mixer - to clean the tank interior.

## Pump Curve for the Alfa Laval Hybrid Powder Mixer S15



Example of setup with the Alfa Laval Hybrid Powder Mixer S15 and an Alfa Laval Rotary Jet Mixer





## Alfa Laval Vortex Shear-Mixer Basic

### Advanced Slurry Mixing Eductor

#### Introduction

Mixing of liquid and powder, or slurry mixing, is a necessary process for many applications. Effective slurry mixing significantly impacts operational safety, speed, and overall cost. However, the perceived simplicity of the process often leads to poor, unsafe slurry mixing practices and the use of outdated or improper equipment. Venturi eductors, or slurry eductors as they are commonly referred to, are relatively simple devices that are installed directly into motive liquid flow lines. They have been employed in numerous applications over the years as an extremely cost effective means of mixing slurries. They have no moving parts or motors, and passively convert motive flow pressure into vacuum, inducing powdered additives directly into the motive fluid. However, they are not free from issues such as plugging, sensitivity to recirculated solids, and inadequate powder dispersion which disqualifies them for use in applications where continuous powder flow, batch recirculation, and slurry homogeneity are critical. The Alfa Laval Vortex Shear-Mixer is an advanced style of venturi eductor that provides all of the functional simplicity of its predecessor, but overcomes multiple issues that inhibit the traditional venturi eductor.

#### Applications

The Alfa Laval Vortex Shear-Mixer is a high-performance venturi slurry eductor uniquely designed to operate in demanding slurry mixing jobs. Handling high flow rate requirements, high solids content, and difficult to mix additives are major criteria for meeting demanding slurry mixing conditions in applications such as oil and gas drilling fluid mixing, construction material production, chemical production, mining, liquid sugar mixing, brine mixing, cosmetics, paint pigment mixing, metal processing, and plastic production.

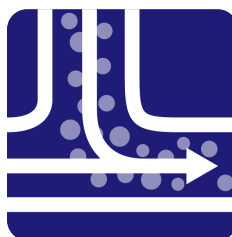
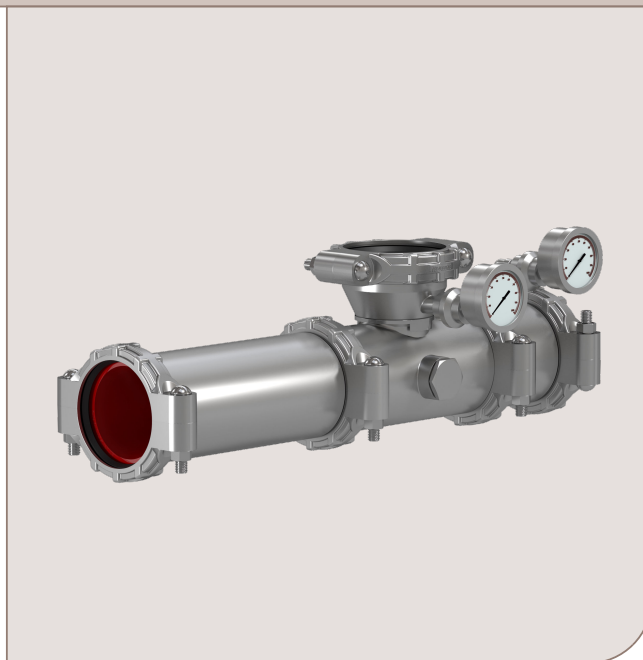
#### Benefits



#### Lobestar

##### Accelerated Mixing with dynamic shearing

Unique nozzle design creates high vacuum, dynamic shearing and reduces plugging



#### MaxiFlow

##### Maximized mixture and flow-through rates

Open mixing chamber significantly reduces clogging

- Robust design, no moving parts, easy to replace inserts
- Handles hard to mix additives such as clays or polymers
- Highly customizable to fit specific applications

#### Standard Design

Much like traditional slurry eductors, The Alfa Laval Vortex Shear-Mixer has no motorized or rotating components. It relies on low pressure vacuum and dynamic, hydraulic shear to easily mix additives into fluid. It outperforms traditional venturi eductors; providing higher additive loading rates and more complete additive mixing. However, unlike traditional venturi eductors, it is exceedingly resistant to plugging and downtime. The Alfa Laval Vortex Shear Mixer Basic is offered in four standard sizes: 2" (51mm,) 3" (76mm,) 4" (102mm,) and 6" (152mm.) The 4" and 6" Shear-Mixers are available in dual suction port options for added versatility and connection to secondary additive feed devices or accessories, such as bulk bag hoppers or bulk surge tanks. The Shear-Mixer

consists of a housing body with special Lobestar Mixing Nozzle® and venturi/diffuser tube inserts. 3", 4", and 6" models can be outfitted with the Radial Premixer "pre-wetting" and wash down accessory and all Shear-Mixers can be equipped with an optional hopper, V-Slide® bulk flow promoter, bulk bag station, or dustless surge tank accessory. The standard connection style for all basic 3", 4", and 6" Shear-Mixers is grooved end pipe couplings. Basic 2" Shear-Mixers have male pipe threaded connections. There are multiple basic Shear-Mixer models which can accommodate many different applications, but if a standard model does not suit the application, a custom engineered Shear-Mixer can be designed to meet specific application demands.

insert. The fluid's velocity spikes as it passes through the nozzle, and the resulting pressure drop creates a near perfect vacuum for maximum additive loading. The Lobestar Mixing Nozzle produces a unique jet stream that has a dual impact. First, it dynamically shears fluid, rapidly hydrating and uniformly dispersing additives. Secondly, it promotes a highly-energized fluid boundary layer, which when combined with the effect of the Shear-Mixer's specialized venturi/diffuser tube, minimizes the impact of pressure loss in the downstream piping and increases the distance and elevation which the mixed slurry can be delivered through the discharge piping. Generally, the Shear-Mixer can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

### Working Principle

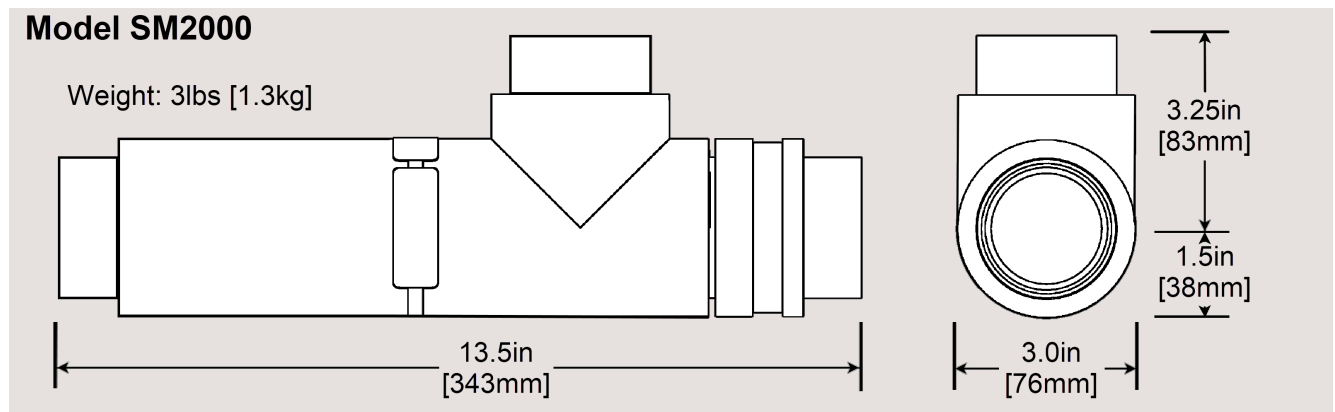
Fluid is pumped at a high rate into the inlet of the Shear-Mixer where pressure builds behind the Lobestar Mixing Nozzle

### Technical Data

Physical Attributes					
Model	Inlet & Discharge Connections	Suction Connection	Body Material	Insert Material	Gaskets
SM2000	2" (51mm) MNPT	2" (51mm) MNPT	Molded Polyurethane	Molded Polyurethane	None
SM3100	3" (76mm) grooved pipe	3" (76mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM4000					
SM4100	4" (102mm) grooved pipe	4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM4200					
SM4203					
SM6000	6" (152mm) grooved pipe	6" (152mm) grooved pipe	304 stainless steel	Molded Polyurethane	Buna
SM6100					
SM6200					

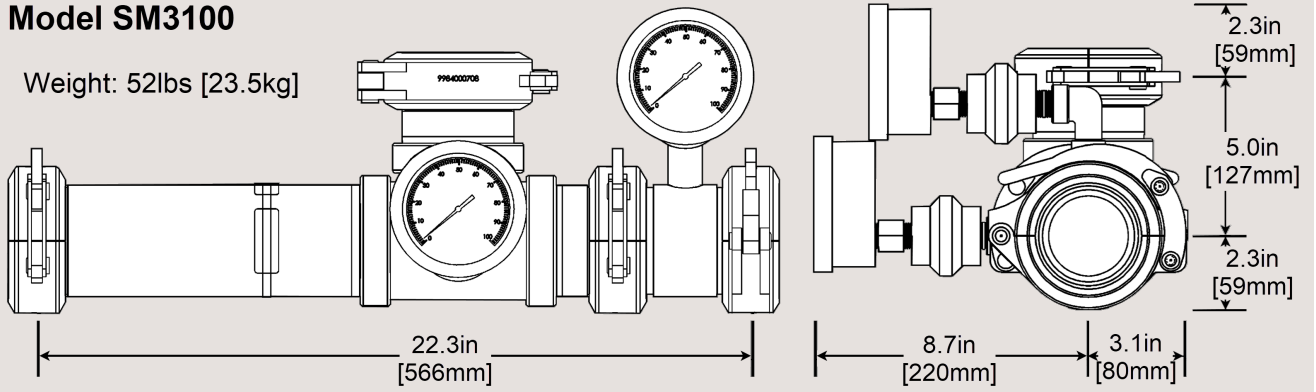
Performance Attributes			
Model	Optimum Motive Flow Range	Optimum Differential Head	Design Temp.
SM2000	65–85gpm (14.7–19.3m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM3100	118–150gpm (28–38m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4000			
SM4100	260–350gpm (59–79.5m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4200			
SM4203			
SM6000	475–625gpm (108–142m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6100			
SM6200			

### Dimensional Drawings



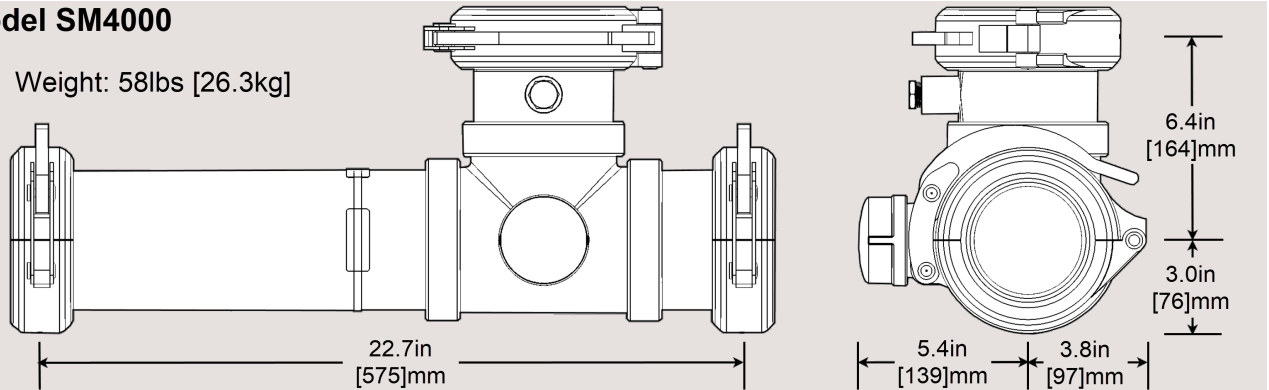
### Model SM3100

Weight: 52lbs [23.5kg]



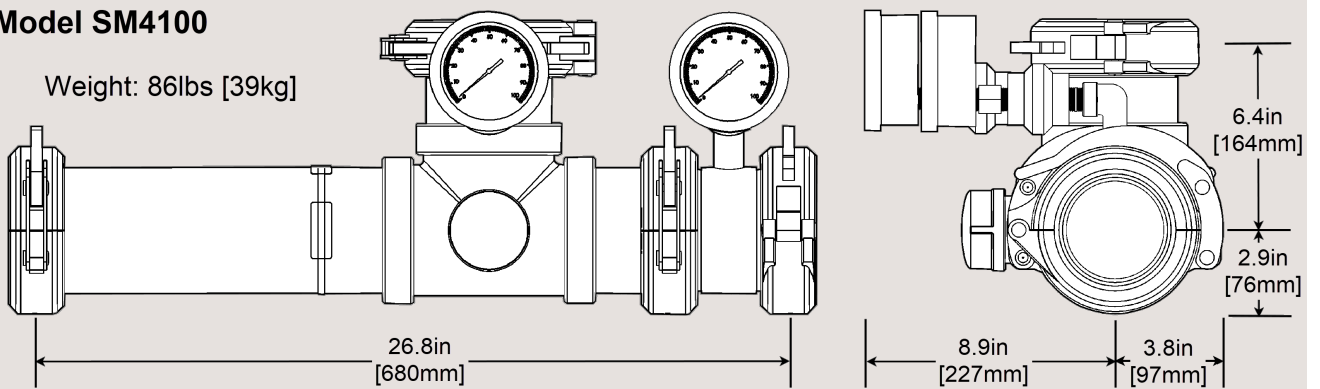
### Model SM4000

Weight: 58lbs [26.3kg]



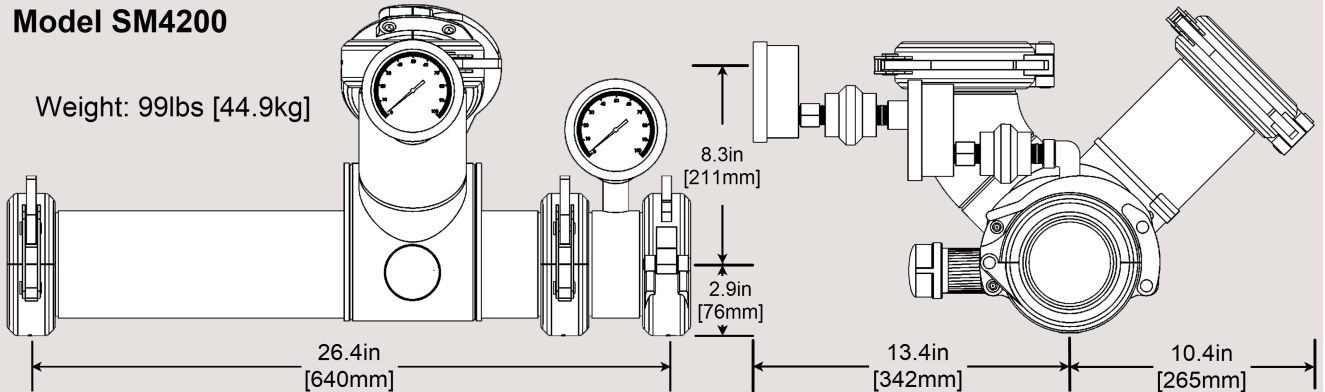
### Model SM4100

Weight: 86lbs [39kg]



### Model SM4200

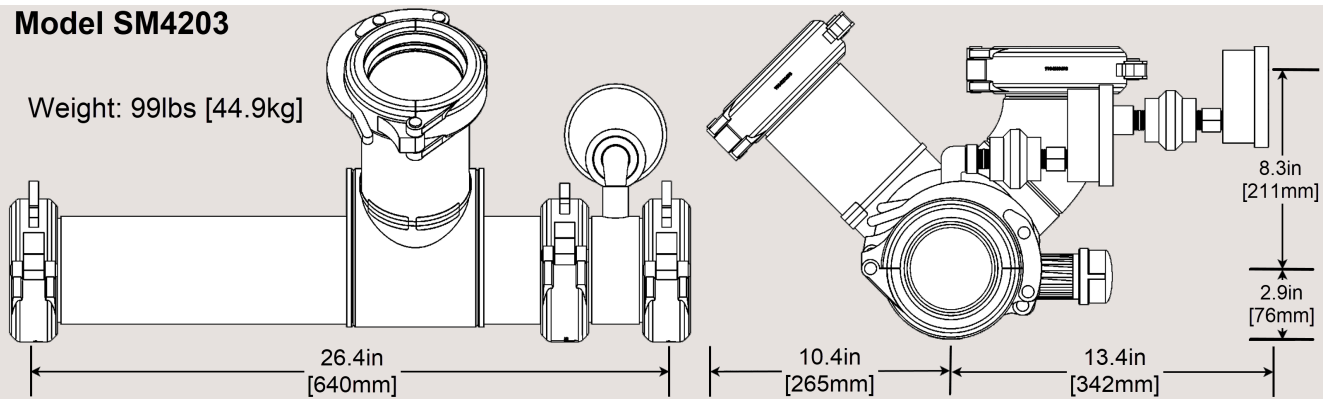
Weight: 99lbs [44.9kg]





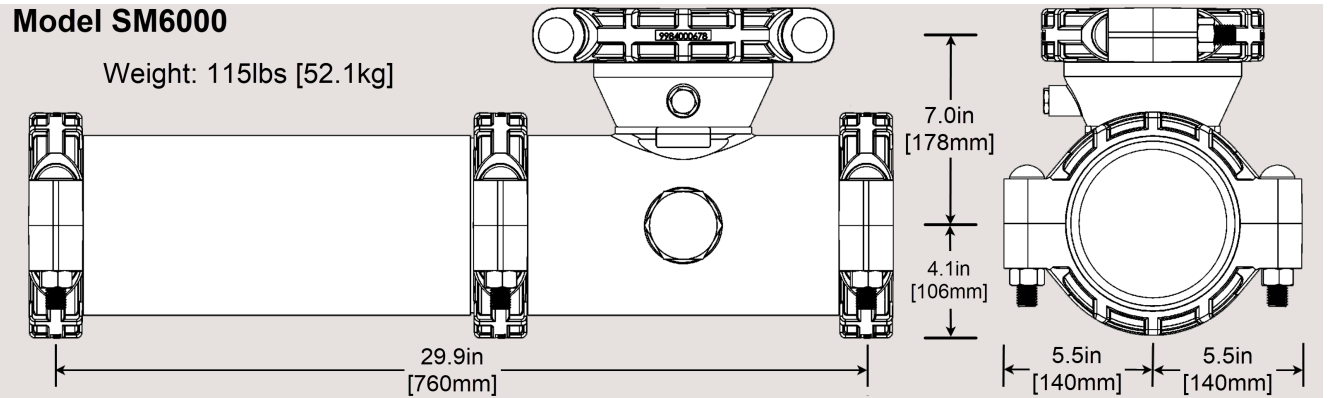
### Model SM4203

Weight: 99lbs [44.9kg]



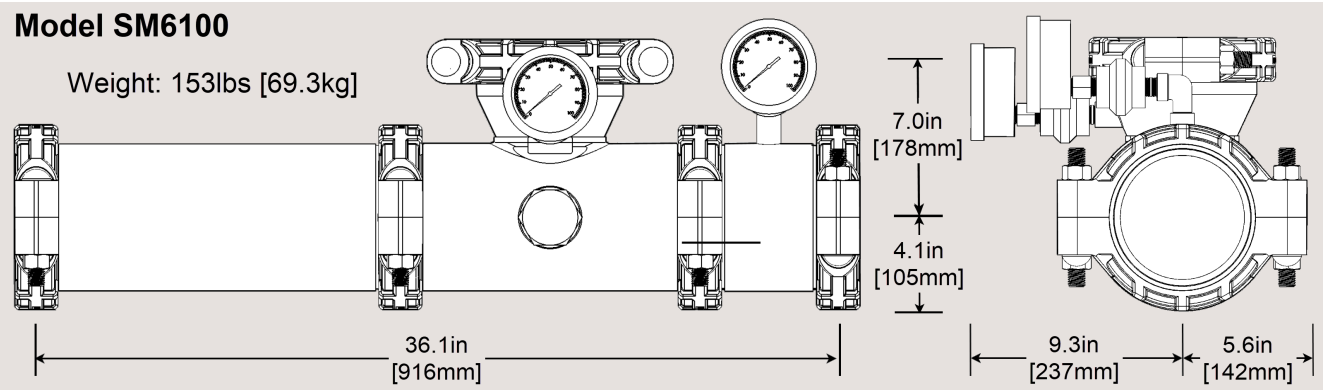
### Model SM6000

Weight: 115lbs [52.1kg]



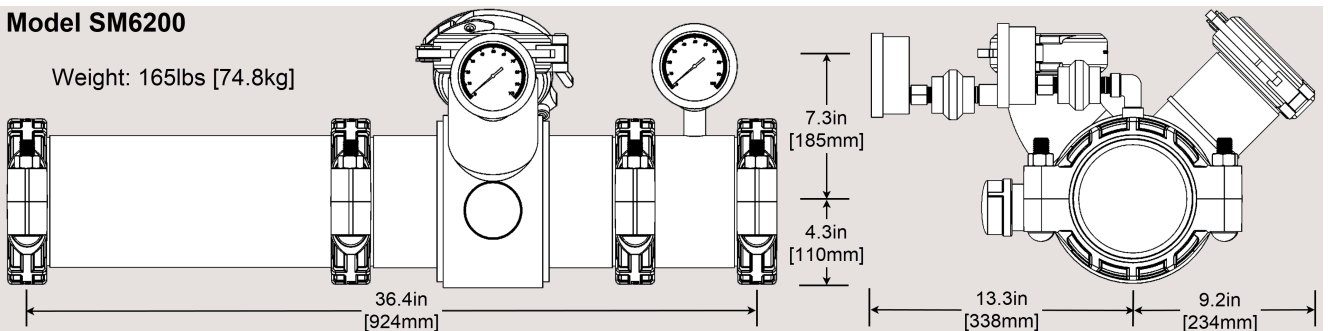
### Model SM6100

Weight: 153lbs [69.3kg]



### Model SM6200

Weight: 165lbs [74.8kg]





# Alfa Laval Vortex Shear-Mixer BBS

## Advanced slurry mixing system for bulk material

### Introduction

Mixing of liquid and powder, or slurry mixing, is a necessary process for many applications. Effective slurry mixing significantly impacts operational safety, speed, and overall cost. However, the perceived simplicity of the process often leads to poor, unsafe slurry mixing practices and the use of outdated or improper equipment. Venturi eductors, or slurry eductors as they are commonly referred to, are relatively simple devices that are installed directly into motive liquid flow lines. They have been employed in numerous applications over the years as an extremely cost effective means of mixing slurries. They have no moving parts or motors, and passively convert motive flow pressure into vacuum, inducing powdered additives directly into the motive fluid. However, they are not free from issues such as plugging, sensitivity to recirculation of solid containing slurries, and inadequate powder dispersion which disqualifies them for use in applications where continuous powder flow, batch recirculation, and slurry homogeneity are critical. The Alfa Laval Vortex Shear-Mixer is an advanced style of venturi eductor that provides all of the functional simplicity of its predecessor, but overcomes multiple issues that inhibit the traditional venturi eductor.

### Applications

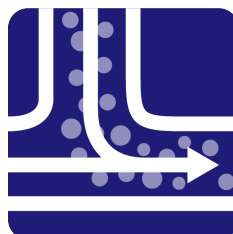
The Alfa Laval Vortex Shear-Mixer is a high-performance venturi slurry eductor uniquely designed to operate in demanding slurry mixing jobs. Handling high flow rate requirements, high solids content, and difficult to mix additives are major criteria for meeting demanding slurry mixing conditions in applications such as oil and gas drilling fluid mixing, construction material production, chemical production, mining, liquid sugar mixing, brine mixing, cosmetics, paint pigment mixing, metal processing, and plastic production.

### Benefits



#### Lobestar

**Accelerated Mixing with dynamic shearing**  
Unique nozzle design creates high vacuum, dynamic shearing and reduces plugging



#### MaxiFlow

**Maximized mixture and flow-through rates**

Open mixing chamber significantly reduces clogging



#### LiquidLock

**Minimized air entrainment**

Vortex action creates a liquid buffer, inhibiting air entrainment



#### MaxiMix

**Swirling mixing effect reduces clumps**

Vortex action washes down and pre-mixes product

- Robust design, no moving parts, easy to replace inserts
- Handles hard to mix additives such as clays or polymers
- Highly customizable to fit specific site applications

### Standard Design

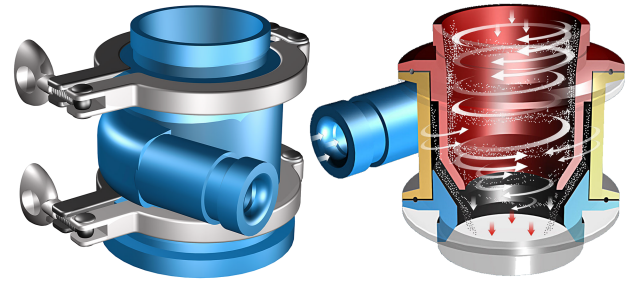
Much like traditional slurry eductors, The Alfa Laval Vortex Shear-Mixer has no motorized or rotating components. It relies on low pressure vacuum and dynamic, hydraulic shear to easily mix additives into fluid. It outperforms traditional venturi eductors; providing higher additive loading rates and more complete additive mixing. However, unlike traditional venturi eductors, it is exceedingly resistant to plugging and downtime. The Alfa Laval Vortex Shear-Mixer BBS is a 6" (152mm) Shear-Mixer connected to a 45 cubic ft stainless steel bulk bag hopper via the Vortex V-Slide® bulk flow promoter. Models SM6222 and SM6223 each include a dual suction port Shear-Mixer with Radial Premixer "pre-wetting"/ wash down accessory, and these models are recommended for applications where both bulk material mixing and small sack material mixing by hand may be required. Model SM6121 is a single suction Shear-Mixer that has no Radial Premixer and is recommended for applications where mixing will be conducted strictly from bulk bags. The Shear-Mixer consists of a stainless steel body, Lobestar Mixing Nozzle® insert, and venturi/diffuser tube insert mounted on a stainless steel base plate. Its primary suction port is connected directly to the bulk bag hopper via a butterfly valve and the V-Slide bulk flow promoter. The secondary suction ports on models SM6222 and SM6223 are connected to a frame mounted, stainless steel hopper table with butterfly valve and Radial Premixer accessory. The standard connection style of the Shear-Mixer BBS is 6" grooved end pipe couplings. The standard range of Alfa Laval Vortex Shear-Mixer BBS can accommodate many different applications, but if necessary, a custom engineered system can be designed to meet specific demands.

### Working Principle

Fluid is pumped at a high rate into the inlet of the Shear-Mixer where pressure builds behind the Lobestar Mixing Nozzle insert. The fluid's velocity spikes as it passes through the nozzle, and the resulting pressure drop creates a near perfect vacuum for maximum additive loading. The Lobestar Mixing Nozzle produces a unique jet stream that has a dual impact. First, it dynamically shears fluid, rapidly hydrating and uniformly dispersing additives. Secondly, it promotes a highly-energized fluid boundary layer, which when combined with the effect of the Shear-Mixer's specialized venturi/diffuser tube, minimizes the impact of pressure loss in the downstream piping and increases the distance and elevation which the mixed slurry can be delivered through the discharge piping. Generally, the Shear-Mixer can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

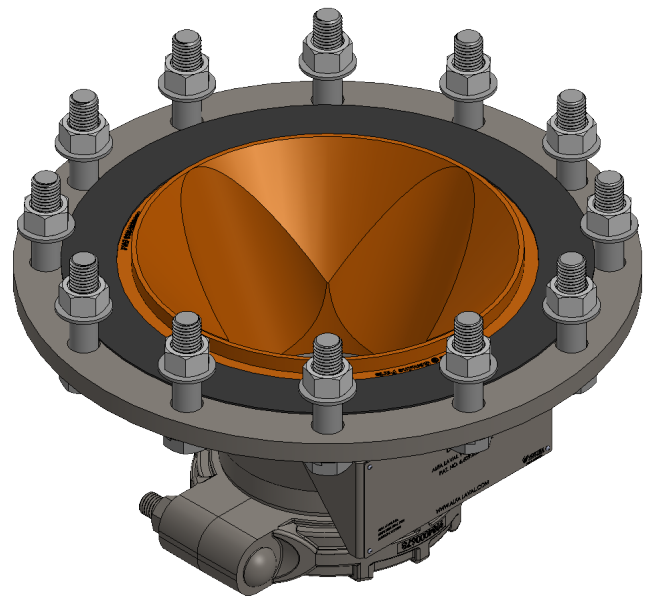
The Radial Premixer accessory "pre-wets" chemical additive particles, preventing them from forming clumps, fish eyes, or microgels in the mixed slurry. The Radial Premixer wash down effect also helps to inhibit foaming in slurries by partially flooding the Shear-Mixer suction with motive fluid and preventing entrainment of free air into the slurry. During mixing

start up or shut down, motive fluid can be recirculated through the Radial Premixer to clear the Shear-Mixer mixing chamber of any accumulated or settled additives.

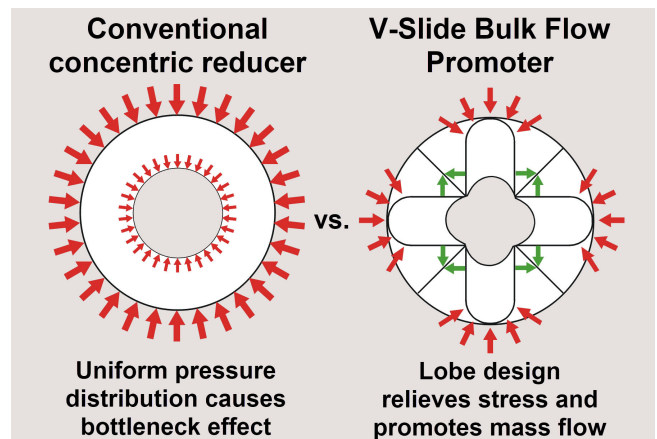


### Radial Premixer "pre-wetter" and washdown accessory

The Vortex V-Slide bulk flow promoter promotes continuous, uniform mass flow of powders and granular materials. Bridging, plugging and "rat-holing" occur when bulk material uniformly compacts in the divergent section of concentric reducers, surge tanks, silos and bulk hoppers. The Vortex V-Slide's elliptical lobe design eliminates the circumferential stress point found in typical cone shaped hoppers, allowing bulk material to flow freely without outside assistance.



### Alfa Laval Vortex V-Slide® bulk flow promoter



## Technical Data

### Physical Attributes

Model	Inlet & Discharge Connections	Suction Connection(s)	Body Material	Premixer Body Material	Insert Material	Gaskets
SM6121	6" (152mm) grooved pipe	45ft <sup>3</sup> bulk bag hopper	304 stainless steel	None	Molded Polyurethane	Buna
SM6222 SM6223	6" (152mm) grooved pipe	45ft <sup>3</sup> bulk bag hopper & 24" Conical hopper table	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna

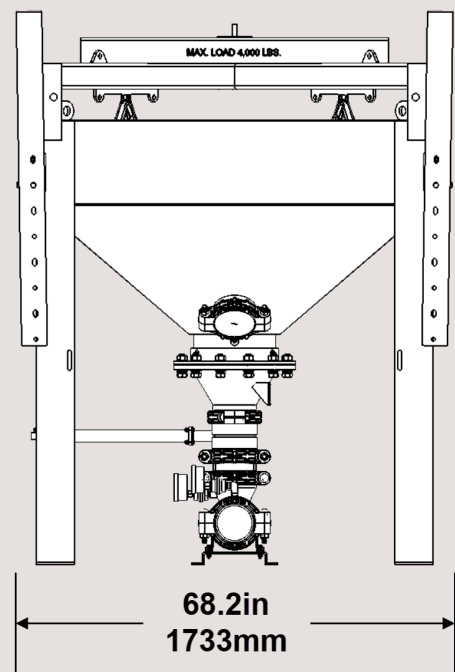
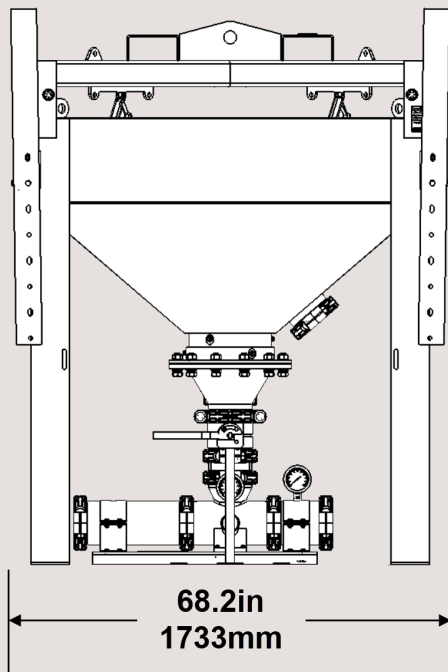
### Performance Attributes

Model	Optimum Motive Flow Range	Optimum Differential Head	Design Temp.
SM6121			
SM6222	475–625gpm (108–142m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6223			

## Dimensional Drawings

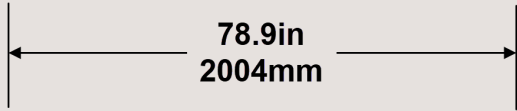
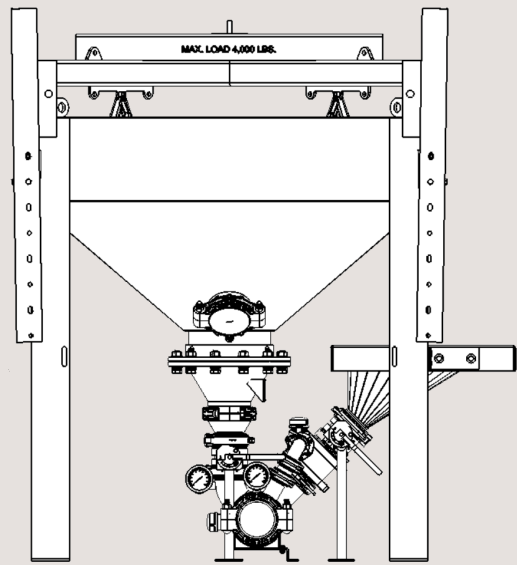
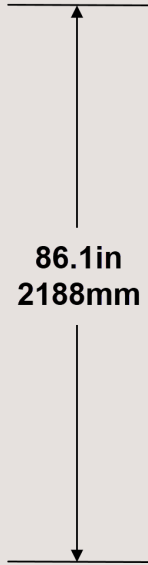
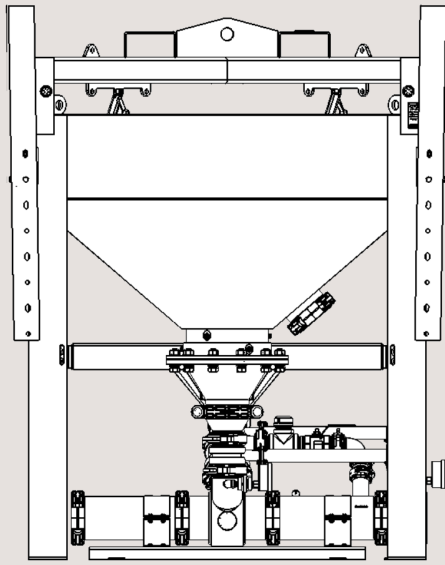
### Model SM6121

**Weight: 1915lbs [868.6kg]**



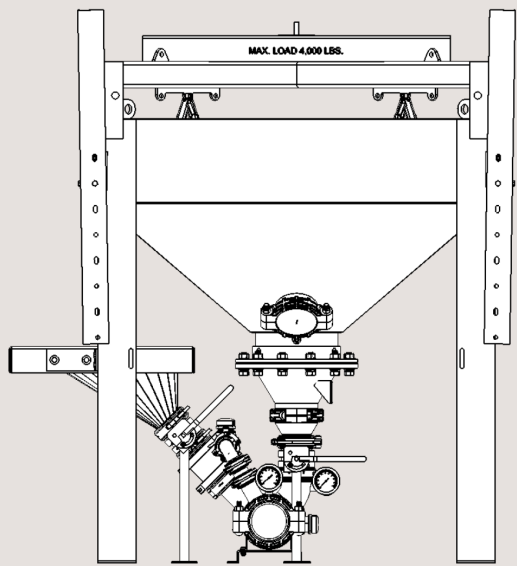
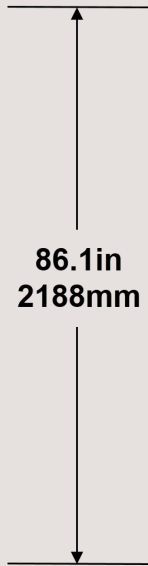
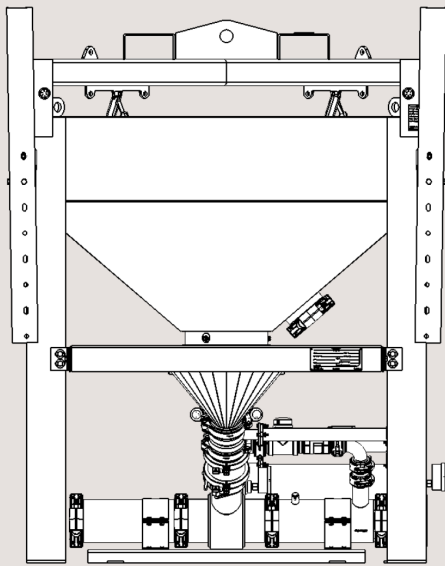
# Model SM6222

Weight: 2093lbs [949.3kg]



# Model SM6223

Weight: 2093lbs [949.3kg]





## Alfa Laval Vortex Shear-Mixer Tier 2

### Advanced Slurry Mixing Educator

#### Introduction

Mixing of liquid and powder, or slurry mixing, is a necessary process for many applications. Effective slurry mixing significantly impacts operational safety, speed, and overall cost. However, the perceived simplicity of the process often leads to poor, unsafe slurry mixing practices and the use of outdated or improper equipment. Venturi educators, or slurry educators as they are commonly referred to, are relatively simple devices that are installed directly into motive liquid flow lines. They have been employed in numerous applications over the years as an extremely cost effective means of mixing slurries. They have no moving parts or motors, and passively convert motive flow pressure into vacuum, inducing powdered additives directly into the motive fluid. However, they are not free from issues such as plugging, sensitivity to recirculation of solid containing slurries, and inadequate powder dispersion which disqualifies them for use in applications where continuous powder flow, batch recirculation, and slurry homogeneity are critical. The Alfa Laval Vortex Shear-Mixer is an advanced style of venturi educator that provides all of the functional simplicity of its predecessor, but overcomes multiple issues that inhibit the traditional venturi educator.

#### Applications

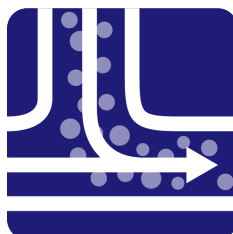
The Alfa Laval Vortex Shear-Mixer is a high-performance venturi slurry educator uniquely designed to operate in demanding slurry mixing jobs. Handling high flow rate requirements, high solids content, and difficult to mix additives are major criteria for meeting demanding slurry mixing conditions in applications such as oil and gas drilling fluid mixing, construction material production, chemical production, mining, liquid sugar mixing, brine mixing, cosmetics, paint pigment mixing, metal processing, and plastic production.

#### Benefits



##### Lobestar

**Accelerated Mixing with dynamic shearing**  
Unique nozzle design creates high vacuum, dynamic shearing and reduces plugging



##### MaxiFlow

**Maximized mixture and flow-through rates**

Open mixing chamber significantly reduces clogging



##### LiquidLock

**Minimized air entrainment**

Vortex action creates a liquid buffer, inhibiting air entrainment



##### MaxiMix

**Swirling mixing effect reduces clumps**

Vortex action washes down and pre-mixes product



- Robust design, no moving parts, easy to replace inserts
- Handles hard to mix additives such as clays or polymers
- Highly customizable to fit specific site applications

### Standard Design

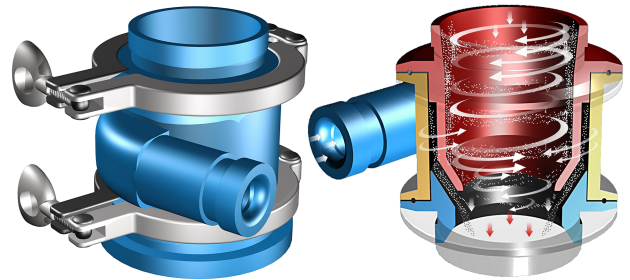
Much like traditional slurry eductors, The Alfa Laval Vortex Shear-Mixer has no motorized or rotating components. It relies on low pressure vacuum and dynamic, hydraulic shear to easily mix additives into fluid. It outperforms traditional venturi eductors; providing higher additive loading rates and more complete additive mixing. However, unlike traditional venturi eductors, it is exceedingly resistant to plugging and downtime. Alfa Laval Vortex Shear-Mixers Tier 2 are offered in three standard sizes: 3" (76mm,) 4" (102mm,) and 6" (152mm.) The 4" and 6" sizes are available in dual suction port options for added versatility and connection to secondary additive feed devices or accessories, such as bulk bag hoppers or bulk surge tanks. Each Shear-Mixer Tier 2 consists of a stainless steel body, Lobestar Mixing Nozzle® insert, venturi/diffuser tube insert, and a Radial Premixer "pre-wetting"/wash down accessory assembled and mounted on a stainless steel base plate. Tier 2 Shear-Mixers can be equipped with an optional hopper, V-Slide® bulk flow promoter, bulk bag station, or dustless surge tank accessory. The standard Shear-Mixer Tier 2 connection style is grooved end pipe with couplings. There are multiple Shear-Mixer Tier 2 models which can accommodate many different applications, but if a standard model does not suit the application, a custom engineered Shear-Mixer can be designed to meet specific application demands.

### Working Principle

Fluid is pumped at a high rate into the inlet of the Shear-Mixer where pressure builds behind the Lobestar Mixing Nozzle insert. The fluid's velocity spikes as it passes through the

nozzle, and the resulting pressure drop creates a near perfect vacuum for maximum additive loading. The Lobestar Mixing Nozzle produces a unique jet stream that has a dual impact. First, it dynamically shears fluid, rapidly hydrating and uniformly dispersing additives. Secondly, it promotes a highly-energized fluid boundary layer, which when combined with the effect of the Shear-Mixer's specialized venturi/diffuser tube, minimizes the impact of pressure loss in the downstream piping and increases the distance and elevation which the mixed slurry can be delivered through the discharge piping. Generally, the Shear-Mixer can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

The Radial Premixer accessory "pre-wets" chemical additive particles, preventing them from forming clumps, fish eyes, or microgels in the mixed slurry. The Radial Premixer wash down effect also helps to inhibit foaming in slurries by partially flooding the Shear-Mixer suction with motive fluid and preventing entrainment of free air into the slurry. During mixing start up or shut down, motive fluid can be recirculated through the Radial Premixer to clear the Shear-Mixer mixing chamber of any accumulated or settled additives.



*Radial Premixer "pre-wetter" and washdown accessory*

### Technical Data

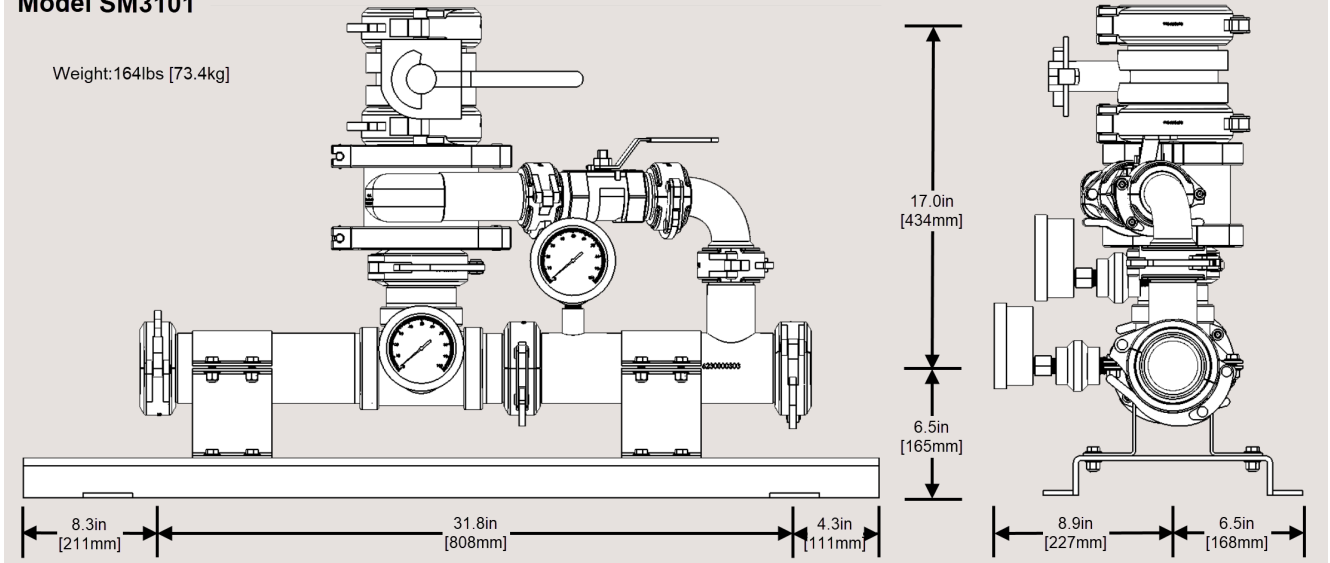
Physical Attributes						
Model	Inlet & Discharge Connections	Suction Connection	Body Material	Premixer Body Material	Insert Material	Gaskets
SM3101	3" (76mm) grooved pipe	3" (76mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM4103 SM4204	4" (102mm) grooved pipe	4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM6101 SM6102	6" (152mm) grooved pipe	6" (152mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM6203	6" (152mm) grooved pipe	4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna

Performance Attributes			
Model	Optimum Motive Flow Range	Optimum Differential Head	Design Temp.
SM3101	118–150gpm (28–38m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4103 SM4204	260–350gpm (59–79.5m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6101 SM6203	475–625gpm (108–142m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6102	590–780gpm (134–177m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)

Dimensional Drawings

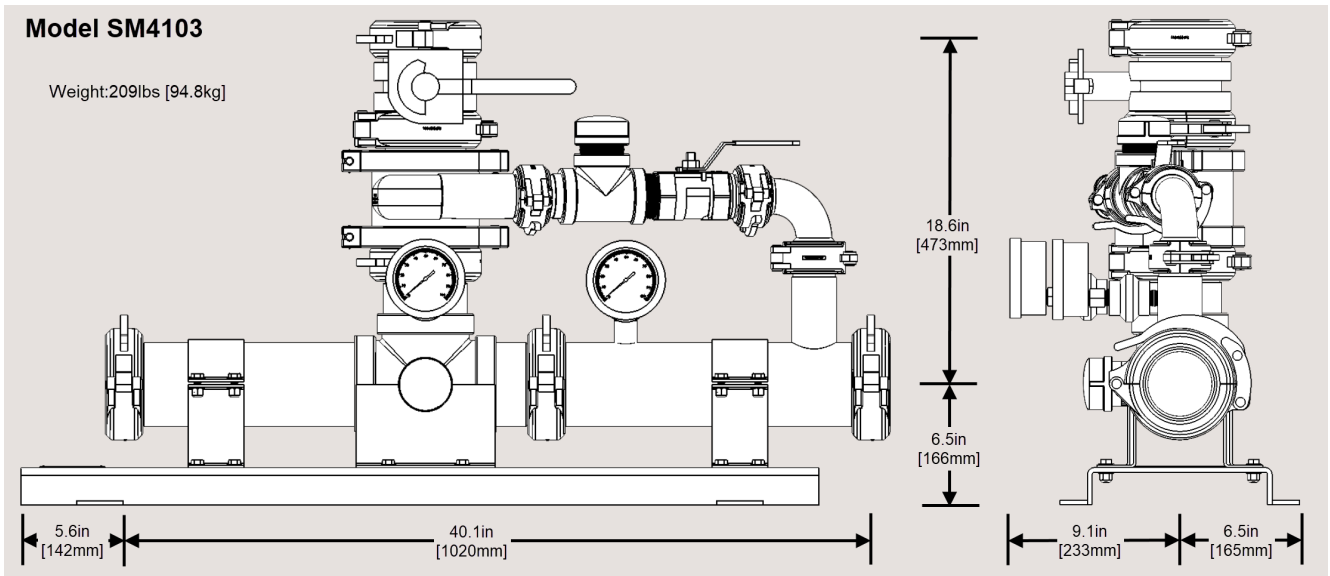
**Model SM3101**

Weight: 164lbs [73.4kg]



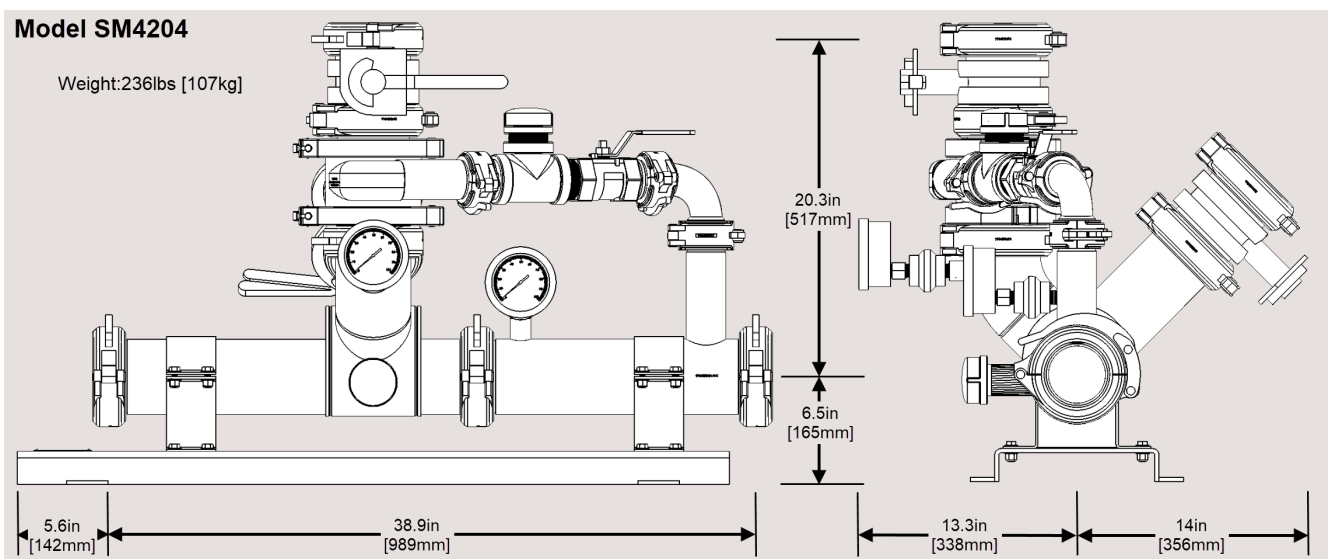
**Model SM4103**

Weight: 209lbs [94.8kg]



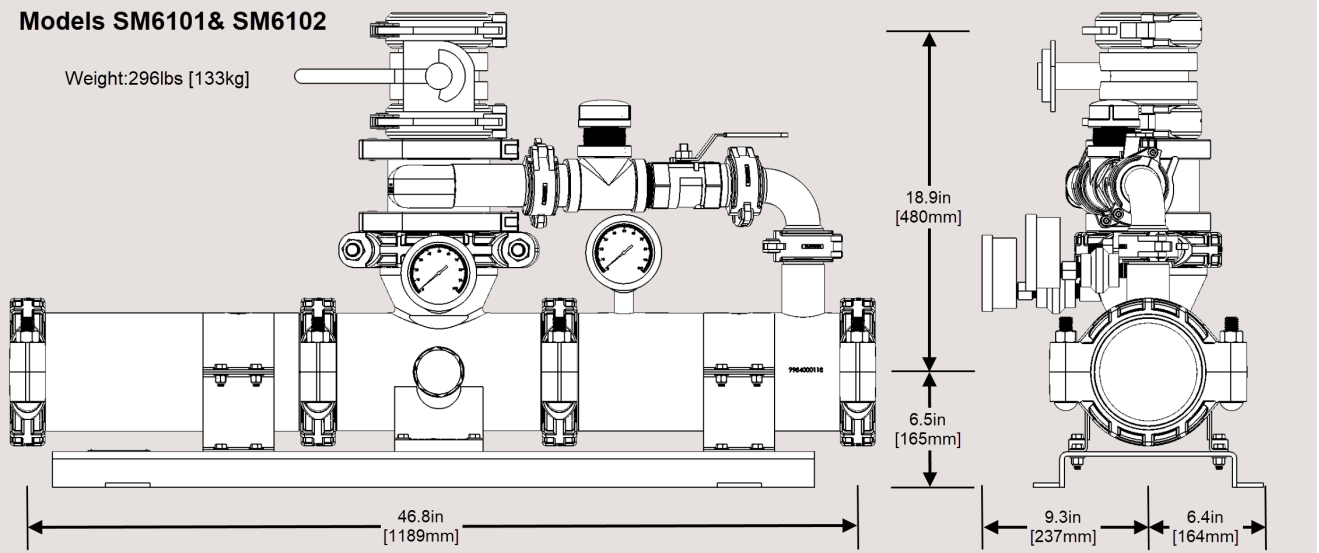
**Model SM4204**

Weight: 236lbs [107kg]



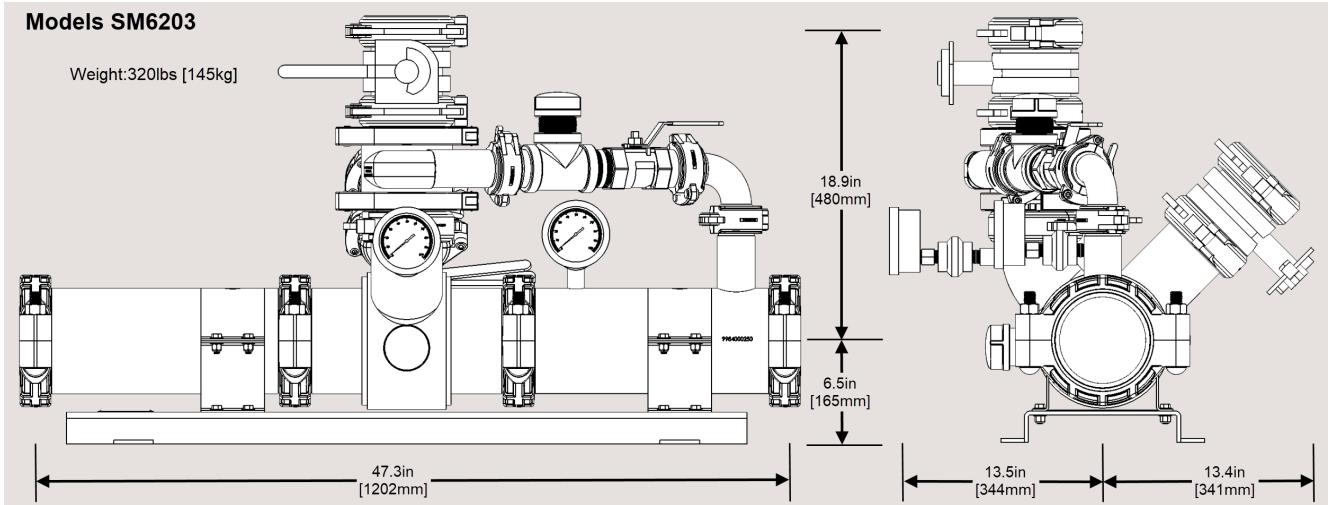
**Models SM6101& SM6102**

Weight:296lbs [133kg]



**Models SM6203**

Weight:320lbs [145kg]





# Alfa Laval Vortex Shear-Mixer Tier 3

## Advanced Slurry Mixing Educator

### Introduction

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### Applications

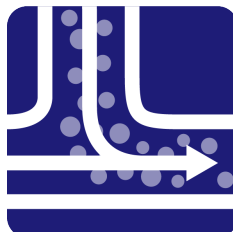
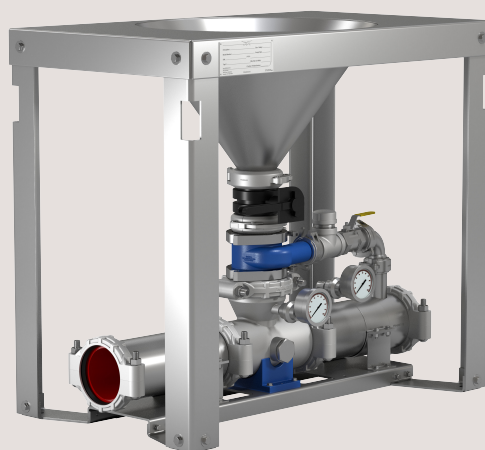
The Alfa Laval Vortex Shear-Mixer is a high-performance venturi slurry educator uniquely designed to operate in demanding slurry mixing jobs. Handling high flow rate requirements, high solids content, and difficult to mix additives are major criteria for meeting demanding slurry mixing conditions in applications such as oil and gas drilling fluid mixing, construction material production, chemical production, mining, liquid sugar mixing, brine mixing, cosmetics, paint pigment mixing, metal processing, and plastic production.

### Benefits



#### Lobestar

**Accelerated Mixing with dynamic shearing**  
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#### MaxiFlow

**Maximized mixture and flow-through rates**

Open mixing chamber significantly reduces clogging



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**Minimized air entrainment**

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- Robust design, no moving parts, easy to replace inserts
- Handles hard to mix additives such as clays or polymers
- Highly customizable to fit specific site applications

### Standard Design

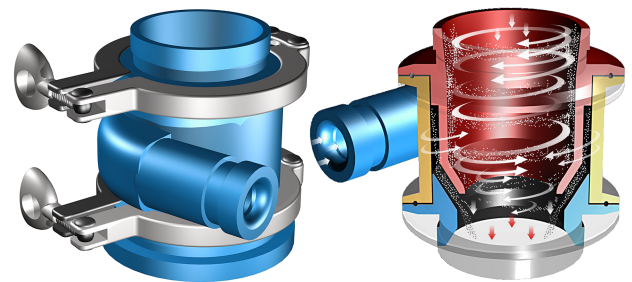
Much like traditional slurry eductors, The Alfa Laval Vortex Shear-Mixer has no motorized or rotating components. It relies on low pressure vacuum and dynamic, hydraulic shear to easily mix additives into fluid. It outperforms traditional venturi eductors; providing higher additive loading rates and more complete additive mixing. However, unlike traditional venturi eductors, it is exceedingly resistant to plugging and downtime. Alfa Laval Vortex Shear Mixers Tier 3 are offered in four standard sizes: 2" (51mm,) 3" (76mm,) 4" (102mm,) and 6" (152mm.) The 3", 4", and 6" sizes are available in dual suction port options for added versatility and connection to secondary additive feed devices or accessories, such as bulk bag hoppers or bulk surge tanks. Each 3", 4", and 6" Shear-Mixer Tier 3, except for model SM6103, consists of a stainless steel body, Lobestar Mixing Nozzle® insert, venturi/diffuser tube insert, Radial Premixer "pre-wetting"/wash down accessory, and a stainless steel work table hopper. SM6103 does not include a Radial Premixer. 2" Shear-Mixers Tier 3 consist of molded polyurethane bodies with Lobestar Mixing Nozzle® inserts assembled with a ball valve and a stainless steel conical hopper on a stainless steel base plate. 3", 4", and 6" Dual suction Shear-Mixers Tier 3 can be equipped with an optional, V-Slide® bulk flow promoter, bulk bag station, or dustless surge tank accessory. The standard connection style for all Shear-Mixer Tier 3 sizes except the 2" is grooved end pipe couplings. The 2" size has male pipe threaded connections. There are multiple Shear-Mixer Tier 3 models which can accommodate many different applications, but if a standard model does not suit the application, a custom engineered Shear-Mixer can be designed to meet specific application demands.

### Working Principle

Fluid is pumped at a high rate into the inlet of the Shear-Mixer where pressure builds behind the Lobestar Mixing Nozzle

insert. The fluid's velocity spikes as it passes through the nozzle, and the resulting pressure drop creates a near perfect vacuum for maximum additive loading. The Lobestar Mixing Nozzle produces a unique jet stream that has a dual impact. First, it dynamically shears fluid, rapidly hydrating and uniformly dispersing additives. Secondly, it promotes a highly-energized fluid boundary layer, which when combined with the effect of the Shear-Mixer's specialized venturi/diffuser tube, minimizes the impact of pressure loss in the downstream piping and increases the distance and elevation which the mixed slurry can be delivered through the discharge piping. Generally, the Shear-Mixer can be utilized in any application where the motive fluid can be handled by a centrifugal pump.

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*Radial Premixer "pre-wetter" and washdown accessory*

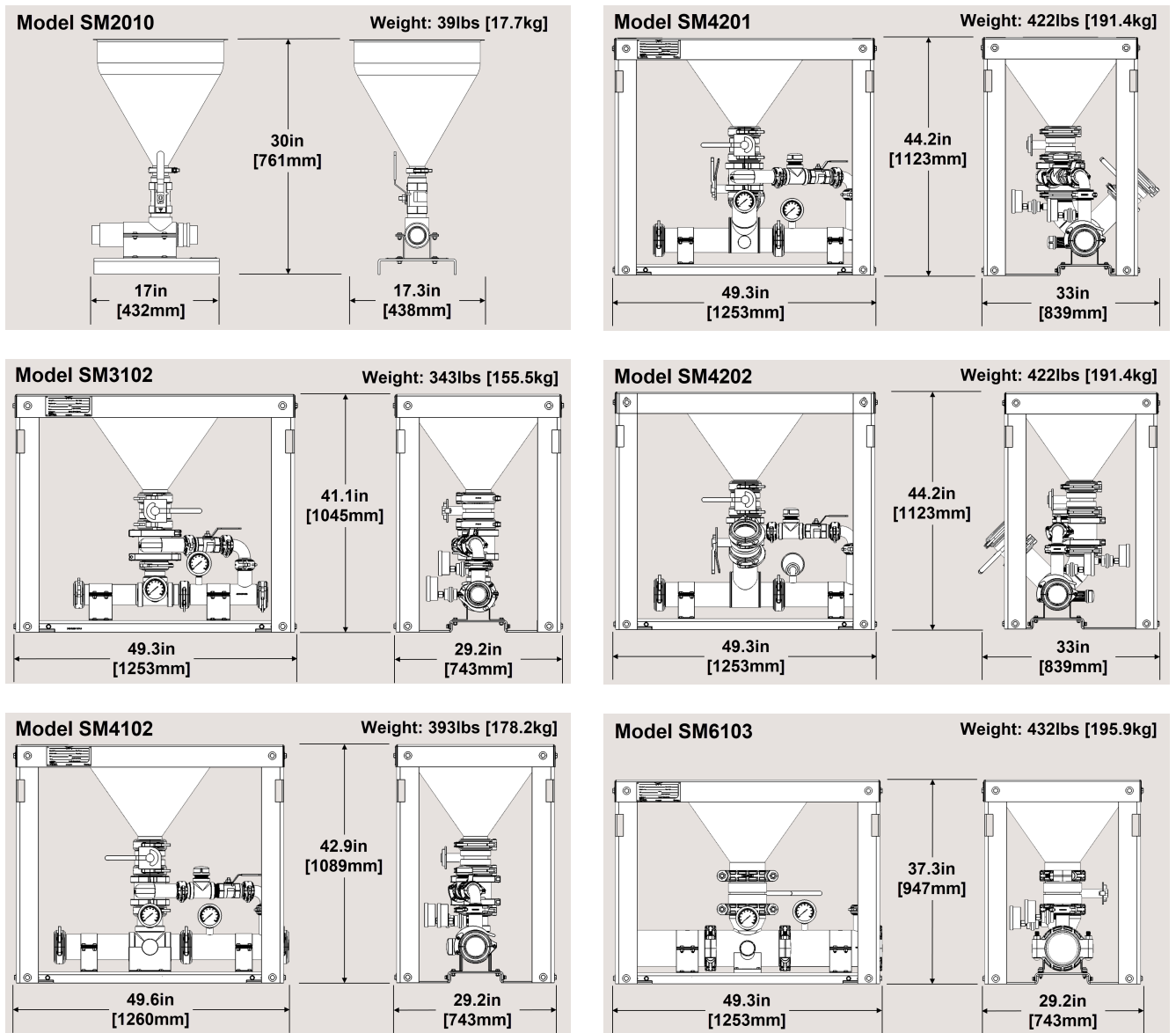
### Technical Data

Physical Attributes						
Model	Inlet & Discharge Connections	Suction Connection(s)	Body Material	Premixer Body Material	Insert Material	Gaskets
SM2010	2" (51mm) MNPT	16" Conical hopper	Molded Polyurethane	None	Molded Polyurethane	None
SM3102	3" (76mm) grooved pipe	24" Conical hopper table	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM4102	4" (102mm) grooved pipe	24" Conical hopper table	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM4201 SM4202	4" (102mm) grooved pipe	24" Conical hopper table & 4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM6103	6" (152mm) grooved pipe	24" Conical hopper table	304 stainless steel	None	Molded Polyurethane	Buna
SM6104 SM6105 SM6106	6" (152mm) grooved pipe	24" Conical hopper table	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna
SM6201 SM6202	6" (152mm) grooved pipe	24" Conical hopper table & 4" (102mm) grooved pipe	304 stainless steel	Molded Polyurethane	Molded Polyurethane	Buna

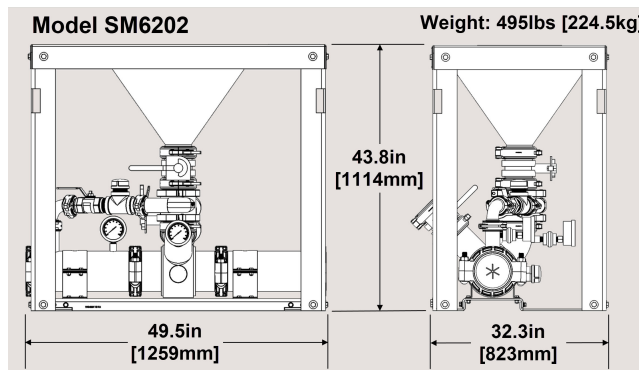
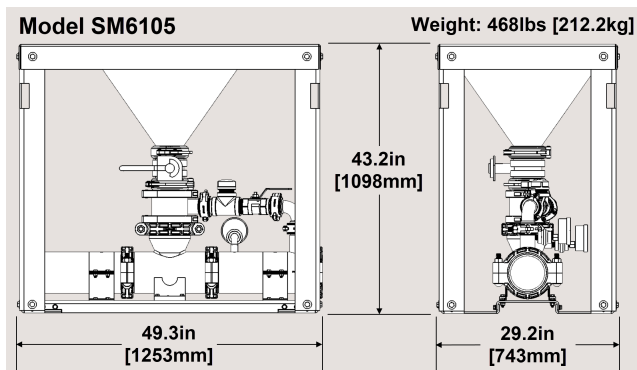
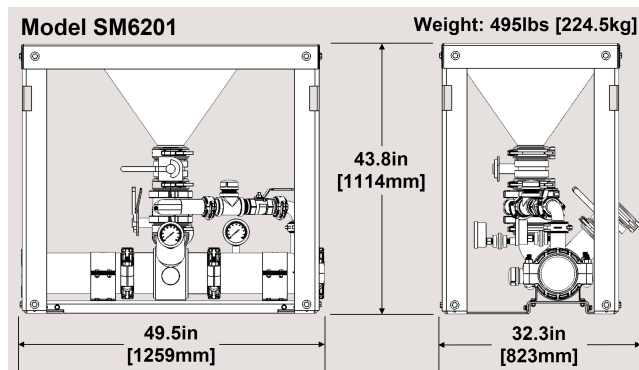
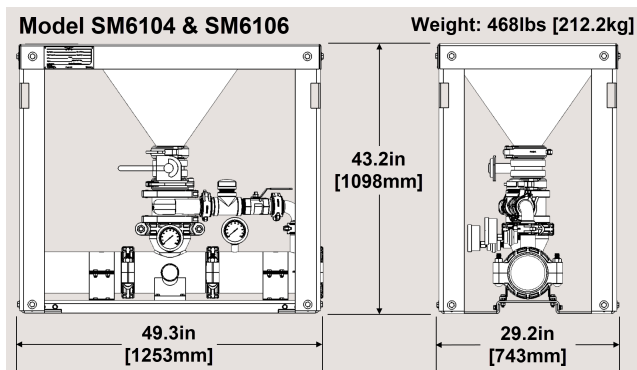
**Performance Attributes**

Model	Optimum Motive Flow Range	Optimum Differential Head	Design Temp.
SM2010	65–85gpm 914.7–19.3m <sup>3</sup> /hr	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM3102	118–150gpm (28–38m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4102			
SM4201	260–350gpm (59–79.5m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM4202			
SM6103			
SM6104			
SM6105	475–625gpm (108–142m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)
SM6201			
SM6202			
SM6106	590–780gpm (134–177m <sup>3</sup> /hr)	115–185ft of head (35–56m of head)	–20°F to 135°F (–28.8°C to 57°C)

**Dimensional Drawings**







Архангельск (8182)63-90-72  
 Астана (7172)727-132  
 Астрахань (8512)99-46-04  
 Барнаул (3852)73-04-60  
 Белгород (4722)40-23-64  
 Брянск (4832)59-03-52  
 Владивосток (423)249-28-31  
 Волгоград (844)278-03-48  
 Вологда (8172)26-41-59  
 Воронеж (473)204-51-73  
 Екатеринбург (343)384-55-89  
 Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
 Иркутск (395)279-98-46  
 Казань (843)206-01-48  
 Калининград (4012)72-03-81  
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