

# Sludge Blender Static Mixer



**mixing equipment with no moving parts for the in-line blending of viscous & fibrous sludge's & slurries prior to dewatering**



Mixing Pattern of High Performance Type GXR Static Mixer  
(Not Medium Performance Type VF Static Mixer described in this brochure)

## Introduction:

The StaMixCo Sludge Blender (Figure #1) with Type VF static mixing elements eliminates all fears of plugging or fouling when mixing chemical additives (liquids or gases) into sludge streams that contain solids and fibrous materials. If you can pump it, the Sludge Blender Static Mixer can mix it without plugging.

## Operating Principle:

The Sludge Blender (Figure #1) consists of individual Type VF static mixing elements mounted in series inside a pipe. Adjacent mixing elements are oriented 90°. Standard Sludge Blenders contain 3, 4, 6 or 8 mixing elements depending on the desired mix quality. When reactive gas is injected, additional mixing elements-residence time may be required to assure that mass transfer and reaction process requirements are achieved.

Each Type VF mixing element has three tapered finger-like blades protruding from the inside pipe wall into the flowing fluid at a 45° slope in the direction of process flow (as in a ski-jump). These 45° slope finger-like mixing blades resist fouling even with long fibers. The mixing blades force the injected fluid and sludge to continuously divide and recombine in a geometric sequence as material flows along the entire length of the mixing unit. The mixing performance is far greater and more predictable than that which can be achieved by sludge pumps, baffled tanks, mixing valves, ring injectors, tanks with mixing paddles, etc.

## Features:

- Non-fouling design
- Short length, hence small space requirements
- Fits in-line and can retrofit into existing piping
- No moving parts, hence no maintenance or spare parts
- Removable mixing elements
- Constant mixing performance over a wide flow rate range
- Low pressure drop/energy consumption

## Applications

The VF static mixer can be used to accomplish the following tasks efficiently:

### Waste Water Treatment Applications:

- Flash Mixing: Reactive chemical admixing
- PH Control: Acid or Base admixing, reaction and neutralization
- Flocculation: Admixing of Flocculants & Coagulants
- Nutrients: Addition of Nutrients
- Disinfection: Injection of Chlorine, Fluorine, Ozone
- Oxygen Boosting: Inject Air to decrease COD
- Sludge Conditioning: Admixing of Filter Aids, polymers, nutrients, additives, chemicals, etc.

### Process Industry Applications:

- Blend, bleach and condition pulp stock
- Treat sewage and waste sludge
- Admix solid food pieces to food in process lines
- Mix treatment chemicals into mining and heavy oil slurries
- Solids Mixing: Mix solids by gravity flow
- Blend additives into pneumatically conveyed powders/pellets



**Figure #1:** The StaMixCo Sludge Blender contains Type VF Static Mixing elements that can be removed from the housing for inspection and cleaning (right side photo). The mixing elements may be mounted in a pipe with threaded end connections (left side photo) or a pipe with flanged end connections (center of photo). For existing installations with flange connections, the Type VF static mixer is available as a Model BS sleeved unit with a plate flange (center photo) that slips into existing piping and is supported by the plate flange which sandwiches between the raised face of adjacent flanges in the piping system.

**Materials of Construction:**

Standard StaMixCo Sludge Blender sizes are shown in Table #1 (page 4). Typical materials of construction are 304 S/S and 316 S/S. Other sizes and materials are available upon request.

**Sizing & Pressure Drop:**

Please contact StaMixCo for a technical evaluation of your application. The key information we require is a description of what is to be mixed and the process goals; preferred pipe size; desired material of construction; design pressure and temperature; and the individual process stream flow rates and properties such as viscosity and density.

**Design Options:**

Depending on the flow regime of the process fluid, the VF static mixing element blade structure is available in three basic designs. Since most sludge blending applications are in the Laminar flow regime, a Model L static mixer is typically required.

- **Model L:** Flow Regime is always Laminar  
Description: Long length middle finger (see Figure #2)
- **Model M:** Flow Regime varies between Transition-Turbulent  
Description: Medium length middle finger (see Figure #3)
- **Model S:** Flow Regime is always Turbulent  
Description: Short length middle finger (see Figure #4)

**Construction Options:**

The VF static mixing element assembly is available in two basic construction options depending on customer preference:

- **Type TG:** Individual Tongue & Groove joint mixing elements (Figure #5) for installation into pipe housings.
- **Model BS:** Bayonet Sleeve Plate Flange mixing element assembly for retrofit into existing customer housing with flanged or threaded end connections. Plate flange is sandwiched between flanges (see Figure #1) or threaded pipe ends (with smaller plate flange).

**Number of Mixing Elements Required:**

The number of mixing elements required is a function of the desired degree of mixing, the volumetric and viscosity ratio of the materials to be mixed, and the method of injecting the additive into the main process stream (pipe tee vs. center point). For most standard applications, the following rules apply:

- 3 Mixing Elements: Crude Pre-Mix Quality Homogeneity
- 4 Mixing Elements: Pre-Mix Quality Homogeneity
- 6 Mixing Elements: Good Quality Homogeneity
- 8 Mixing Elements: Very Good Quality Homogeneity

Figure #2, #3 & #4: Design Options: Center Mixing Blade Length Options of VF Static Mixer

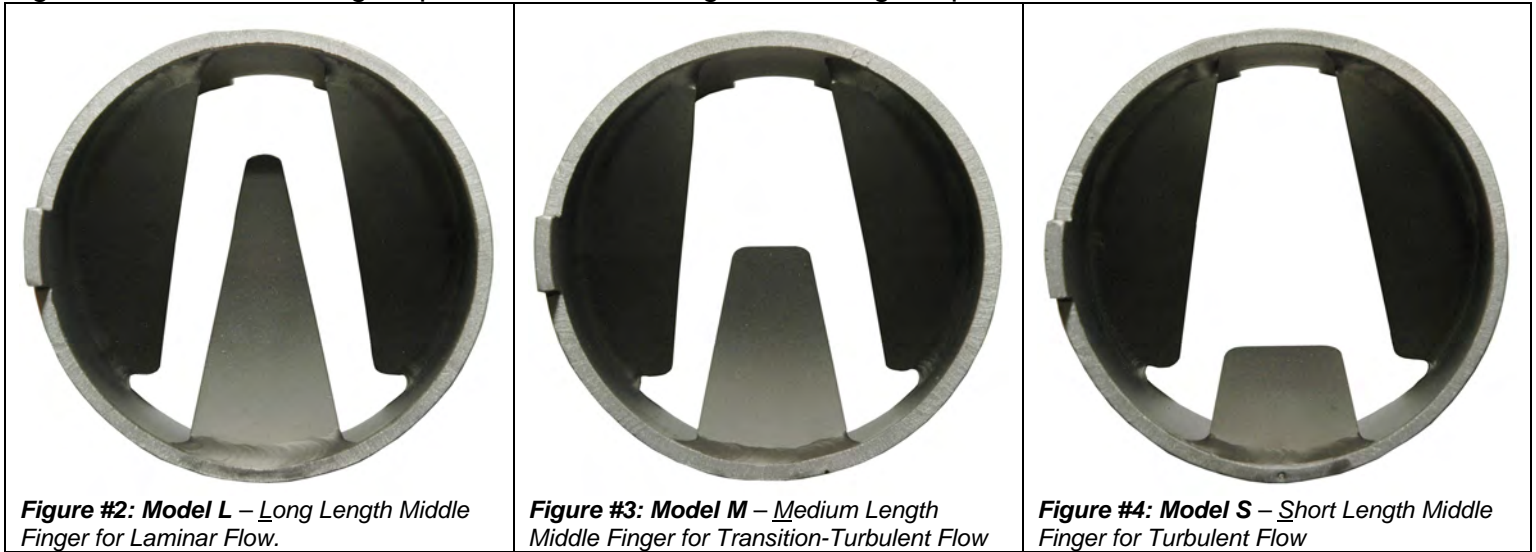


Figure #5 & #6: Construction Options for Mixing Element Assembly



## Dimensions:

Figure #7: Type TG (Tongue & Groove) Mixing Element Assembly

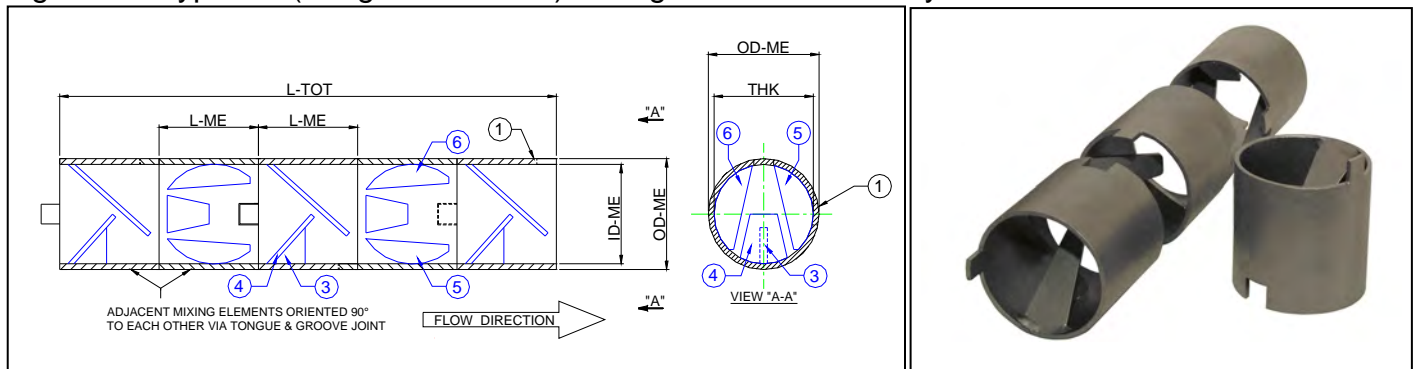


Figure #8: Type BS (Bayonet Sleeve with Plate Flange) Mixing Element Assembly

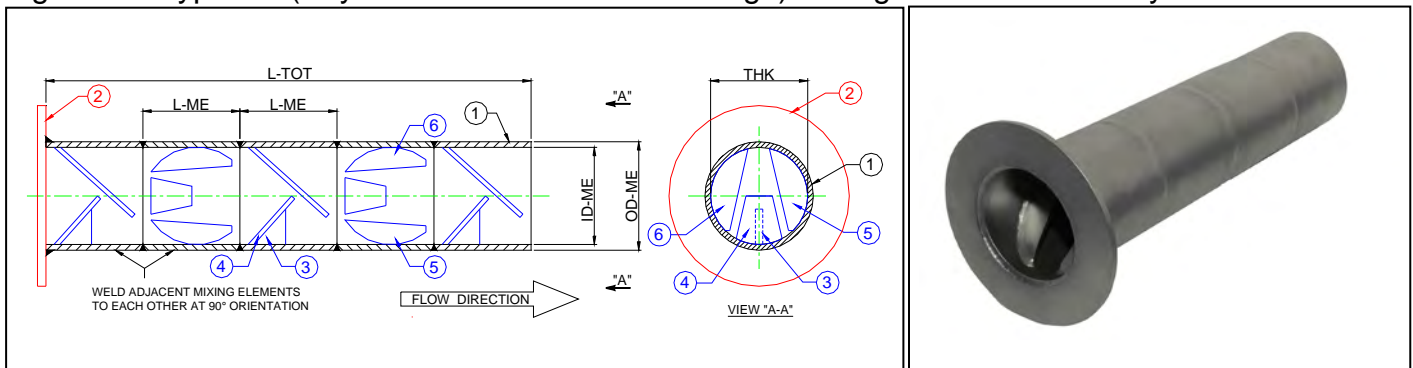


Table #1: Dimensions of Mixing Element Assembly Type TG & Type BS

Sludge Blender Model #	Nominal Pipe Size		OD-ME Outside Diameter Mixing Element (in)	ID-ME Inside Diameter Mixing Element (in)	L-ME Length of One (1) Mixing Element (in)	L-TOT Length of Mixing Element Assembly			
	Pipe Sch. 40S	Pipe Inside Diameter (in)				Three (3) Mixing Element Assembly	Four (4) Mixing Element Assembly	Six (6) Mixing Element Assembly	Eight (8) Mixing Element Assembly
SSB-2.0	2"	2.067	2.0"	1.76"	2.0"	6.0"	8.0"	12.0"	16.0"
SSB-3.0	3"	3.068"	3.0"	2.76"	3.0"	9.0"	12.0"	18.0"	24.0"
SSB-4.0	4"	4.026"	4.0"	3.76"	4.0"	12.0"	16.0"	24.0"	32.0"
SSB-6.0	6"	6.065"	6.0"	5.73"	6.0"	18.0"	24.0"	36.0"	48.0"
SSB-8.0	8"	7.981"	7.9"	7.70"	8.0"	24.0"	32.0"	48.0"	64.0"
SSB-10.0	10"	10.020"	9.94"	9.57"	10.0"	30.0"	40.0"	60.0"	80.0"
SSB-12.0	12"	12.00"	11.90"	11.50"	12.0"	36.0"	48.0"	96.0"	96.0"

## Part Number Designation:

Specifying a Part Number for a StaMixCo Sludge Blender consists of defining four components:

- 1) Specify Model Number: For example, SSB-4.0 (see Table #1, Column 1, Row 3)
- 2) Specify Number of Mixing Elements Desired: 3, 4, 6 and 8 mixing elements are standard (see Table #1, right side 4 columns)
- 3) Design Option Mixing Elements: L, M, S (see Figure #2, #3 and #4)
- 4) Construction Option for Mixing Element Assembly: TG or BS (see Figure #6 and #7)

Example Part Number: SSB-4.0-6-L-BS means  $\boxed{\text{SSB-4.0}}$  -  $\boxed{6}$  -  $\boxed{L}$  -  $\boxed{\text{BS}}$   
 Refer to above 1) – 4) description

**stamixco**  
www.stamixco-usa.com

A young company with over 60 years of employee accumulated experience in mixing technology.

### North & South America

StaMixCo LLC  
235 – 84<sup>th</sup> Street  
Brooklyn, NY 11209, USA  
Tel: (718) 748-4600  
Fax: (718) 833-8827  
E-mail: info@stamixco-usa.com  
Web site: www.stamixco-usa.com

### Europe, Asia-Pacific, Africa

StaMixCo AG  
Kronastrasse 10  
CH-8404 Winterthur, Switzerland  
Tel: + 41 52 338 17 11  
Fax: + 41 52 338 17 33  
E-mail: info@stamixco.com  
Web site: www.stamixco.com

### Distributed by:

Note: We believe the information contained in this brochure is correct. However, the information is not to be construed as implying any warranty or guarantee of performance. We reserve the right to modify the design and construction of our products based on new findings and developments. © 2012 StaMixCo LLC