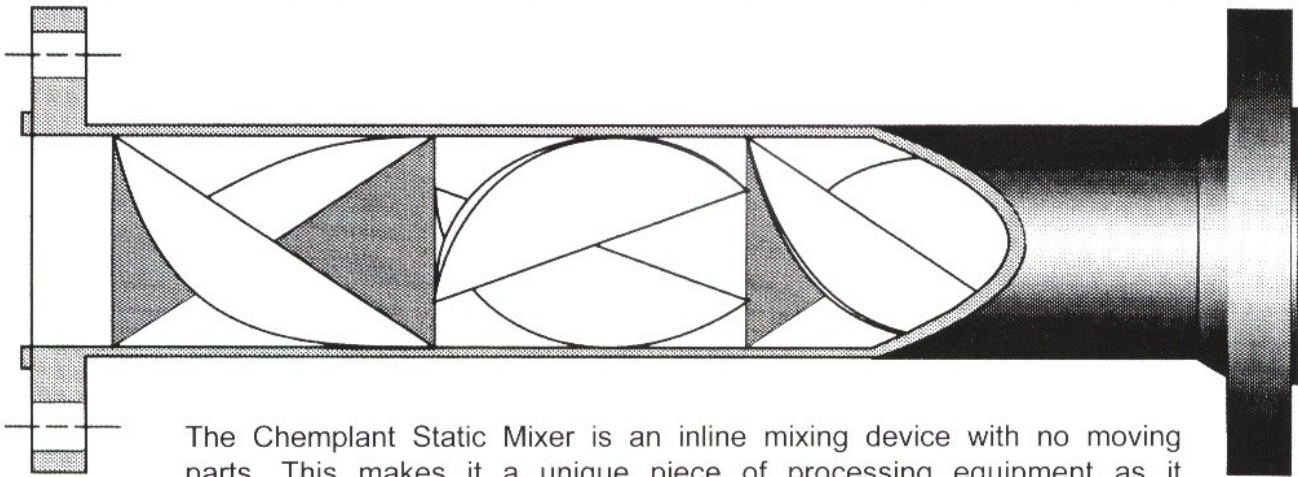


# CHEMPLANT STATIC MIXER

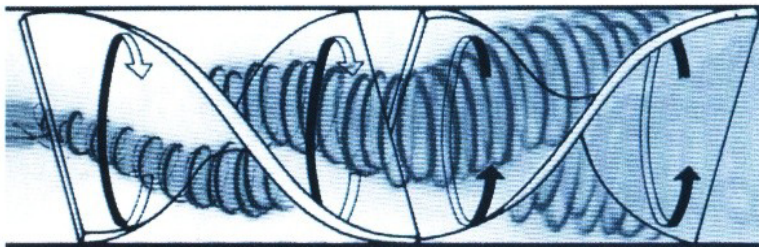


The Chemplant Static Mixer is an inline mixing device with no moving parts. This makes it a unique piece of processing equipment as it requires no external power source and is completely maintenance free. A Chemplant mixer produces a homogeneous blend of dispersion in laminar, transitional or turbulent flow within a very short length of pipe.

## METHOD OF OPERATION

Chemplant Static Mixers have elements which rotate the fluid around its hydraulic centre. This directs flow radially to the walls and back to the element regardless of the velocity or Reynold's Number. The elements are combined with alternating right and left hands to maximize mixing efficiency by utilizing the actions of momentum reversal and flow division.

In turbulent flow the mixing occurs mainly as a result of momentum reversal. This means that the fluid is forced to change its direction of rotation by the twist of the following element. Thus the mixing takes place in the inter element sections or between each two elements



In laminar flow mixing occurs as a result of flow splitting and rotation. This builds up increasing number of layers of material each time fluid passes between two elements.

## MIXING AND BLENDING

Chemplant Static Mixers can process any combination of miscible fluids in all flow regimes. A static mixer in turbulent flow removes any risk of stratification which regularly occurs if mixing is left to natural turbulence only and provides a mix equivalent to 80-100 pipe diameters.

## DISPERSIONS

The uniform shear characteristics of the Chemplant Static Mixer results in accurate drop size predictions when processing immiscible fluids. This allows the engineer to predict mass transfer very accurately. Dispersion of both gases and liquids are all achievable with the mixer.

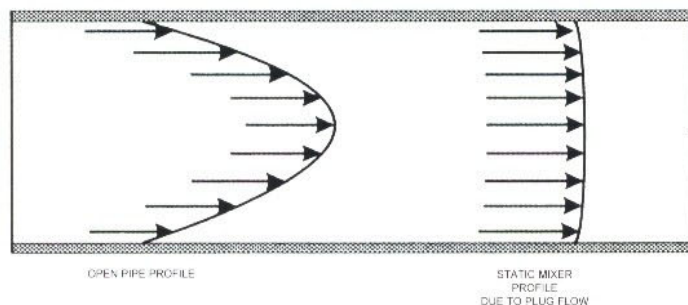
## HEAT TRANSFER

The Chemplant Static Mixer causes the fluid to rotate around its hydraulic centre. This means that a problem involving heat transfer to a viscous material can be solved by a much reduced internal heat transfer coefficient. This helps reduce the size of the exchanger and also prevents plastic flow occurring through the exchanger, which would drastically reduce the efficiency. The 'self wiping' action also helps reduce deposition on the tube wall which would affect the exchangers performance over time.



## CHEMICAL REACTION

Causing the fluid to rotate as it does when passing through a Chemplant Static Mixer has the effect of reducing the velocity in the centre of the mixer and increasing that at the wall. The velocity profile across the mixer therefore looks as follows:



This means that the mixer approximates to a plug flow device. In a chemical reactor plug flow is very desirable as it would mean that each particle would be within the reactor for a known time. The Chemplant Static Mixer results in less by-product formation.

## STANDARD PRODUCTS

Chemplant Static Mixers are available in a wide variety of sizes from 5-1500 mm or greater. Materials of construction include Mild Steel, Stainless Steels, Hastelloys, Monel, PVC, CPVC, FRP, PTFE, Ceramic and many others. End connections can be plain, screwed or flanged to your specification. Hygienic 'SAN' series mixers are supplied with ferrules to accept tri-clamp style connections or can be furnished with bevel seat fittings.

## CUSTOM DESIGN

Chemplant is willing to undertake custom designs including such options as injection ports, jackets, special materials, coded manufacture etc.



## PARTIAL LIST OF APPLICATIONS

### Hydrocarbon and Chemical Process Industries

- \*Blending additives to process streams
- \*Gas and liquid scrubbing
- \*Direct steam heating
- \*Laminar flow heat exchange
- \*Oil/Water sampling
- \*Dispersion

### Water and Wastewater Treatment

- \*pH samples and control
- \*Flash mixing of flocculation and coagulation aids
- \*Disinfection
- \*In-line aeration
- \*Polymer addition

### Food and Pharmaceutical Production

- \*Inline gas sparging
- \*Mixing fragile, shear sensitive materials
- \*Flavouring and colouration addition
- \*Syrup dilution
- \*Marbleizing, creating "layer effect"

### Pulp and Paper Production

- \*Stock bleaching and blending
- \*Consistency control
- \*Chemical preparation
- \*Pulp and board production
- \*Direct steam heating
- \*pH control

