STATIC MIXER

SMK Model

Low pressure drop

▶ Product Introduction

OMORIS-SMK model element is a rectangular plate that is twisted 180 degrees to helical shape ,creating a right element and a left element ,depending on the direction of the twist ,the basic length of each element is 1.5 times than the diameter .

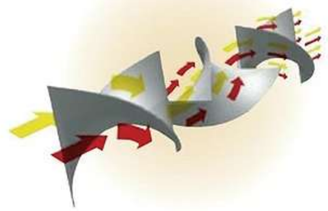
Turbulent Blending SMK Static Mixer

The SMK Static Mixer produces rapid mixing by inducing circular patterns that reverse direction at each element intersection.

Laminar Blending SMK Static Mixer

The alternating helical elements of the SMK Static Mixer continually divide stretch and reorient theflow stream to produce complete mixing with minimum pressure drop.

▶ Operating Principle



Division process

Each time a liquid passes through an element,it is split in half.Number of separations N=2n.

N:number of elements.

Conversion process

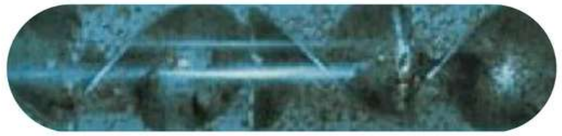
The liquid glides along the inner spiralwalls of the element,moving from the center part of the cylinder to the walls,and from the walls to the center part,being sorted in the process.

Inversion process

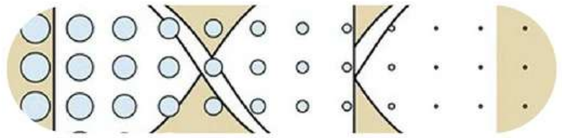
The liquids direction of rotatio changes in each element,receiving rapid inversion of inertial force,which agitates the liquid.

▶ Structure

Liquid-liquid Mixing



Liquid-liquid Dispersion



Alkali& acid neutralization

Low viscosity substances with mutual solubility are mostly mixed through the inversionprocess.You can see that it is sufficiently mixed with relatively few elements.

Oil dispersion into water

Even with two low viscosity substances,without mutualsolubility like water and oil,they are mostly dispersed during the conversion process.You can see how the particles get smaller each time the fluid passed through the element.

The highest dispersion degree : ≤ 10 um ,Liquid-liquid, liquid-solid phase

Nonuniformity coefficient α√X≤ 5%

$$\triangle P=\Phi D\frac{\rho c}{2}w^2\frac{L}{D} \qquad ReD=D\rho c\frac{W}{\mu}$$

▶ Flowing Type And Reynolds Numbers

Laminar flow sectlon	Scope	$ReD < 23$
	Relation formula	$\Phi D = 430/ReD$
Transient fow section	Scope	$23 < ReD < 300$
	Relation formula	$\Phi D = 87.2ReD^{-0.491}$
Turbulence section	Scope	$300 < ReD < 1100$
	Relation formula	$\Phi D = 17.0ReD^{-0.205}$
Total turbulence section	Scope	$ReD < 1100$
	Relation formula	$\Phi D = 2.53$