

# Static mixer

**Static mixer** is a device that utilizes stationary geometric elements placed inside a pipe to create the desired mixing effect without the use of any moving parts. This means that the energy needed for mixing is solely provided by the pressure of the fluid flowing around these elements.

## As Your **Reliable Partner**

PANTAN has provided numerous process packages and equipment to different customers, tailored to meet their individual demands.

Our team designs and manufactures Static Mixers for different applications and different sizes as per the client's requirements. Also, Computational Fluid Dynamic (CFD) and pilot tests are employed to ensure performance of mixing at our "Innovation and Research Center".

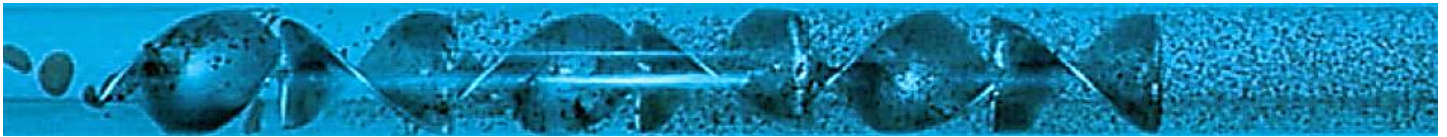
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## Concept of static mixers

Static mixers, also known as motionless mixers, are employed to achieve homogeneity. This homogeneity isn't just limited to concentration but also including velocity, temperature and residence time. Accordingly, static mixers are utilized in blending, dispersion, reaction and heat transfer applications.

## Dispersion

Dispersive multiphase mixing is distinguished from simple blending in that the additive phase breaks up into discrete drops or bubbles which are surrounded by the other phase. The measure of the quality of the mixture in dispersion relies on the mean droplet size and droplet size distribution.



## Blending

Blending is the term we use for mixing miscible fluids and the level of blending quality can be determined using the Coefficient of Variation (CoV). A lower CoV indicates a higher quality of blending, and is therefore preferred.



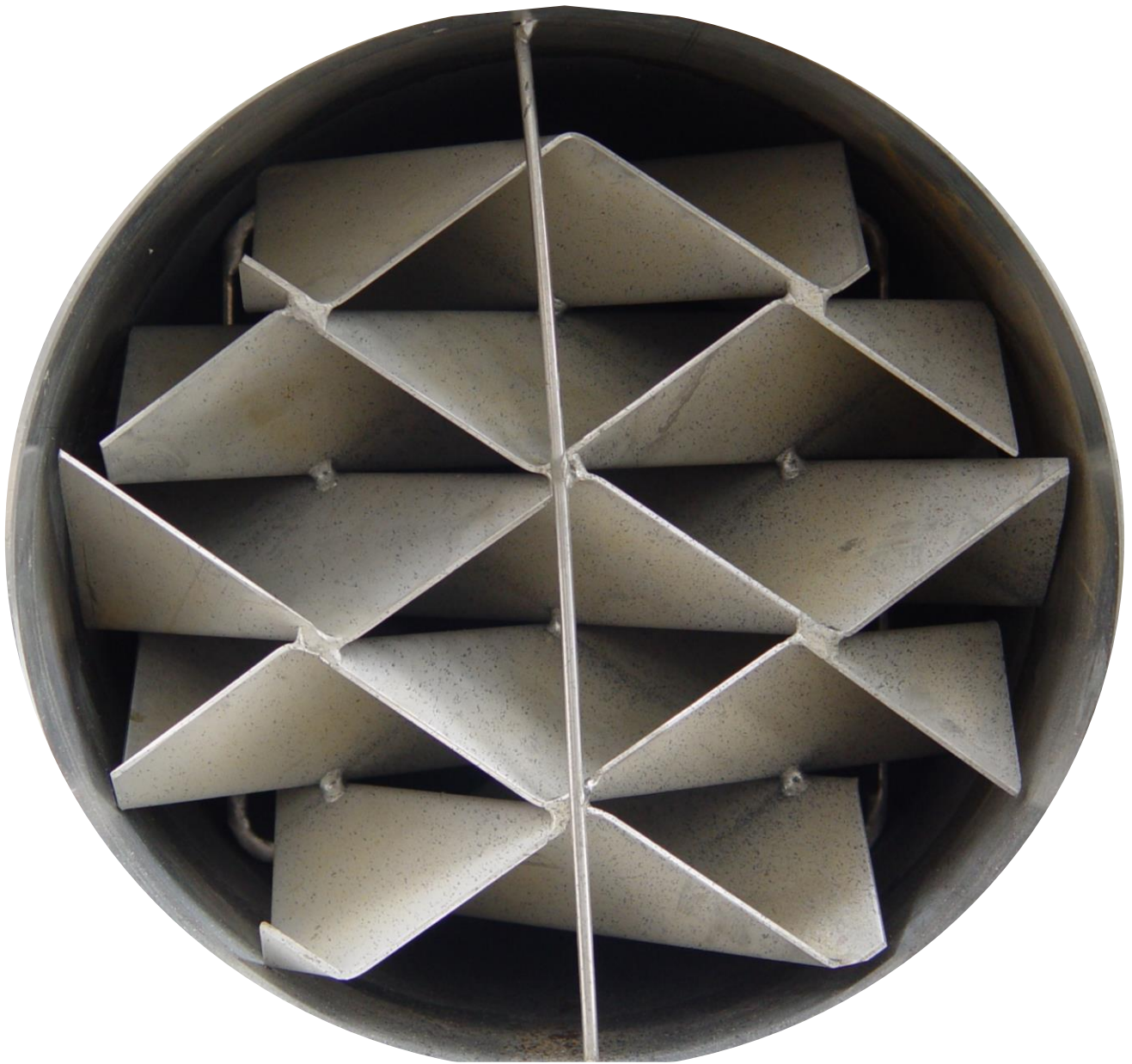
## Heat transfer

Heat transfer is hindered by the thermal boundary layer that forms on the pipe wall in an empty pipe. Fortunately, A static mixer can remedy this by creating a transversal flow that removes this boundary layer and ensures a consistent temperature across the pipe's cross-section.

## Reaction

Static mixers act as plug flow reactors because they achieve radial mixing that evens out temperature, velocity distribution, and concentrations.





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# Industrial applications of static mixers

- Blend one grade of oil (or gasoline) into another oil
- Mercaptan removal from hydrocarbon streams with caustic
- Adjusting the viscosity of heavy oil with gas oil
- Mixing pigments into resins or polymer melts
- Thermal homogenization of polymers in melt lines
- Mixing TiO<sub>2</sub> pastes into polymer melts for delustering
- Pulp Bleaching with ClO<sub>2</sub>
- In-line neutralization or pH adjustment of product streams
- Aeration, iron removal, or deacidification of drinking water with ozone, oxygen, chlorine, or fluorine
- Mixing of flavors and colors into creams, chocolate, yogurt, etc.
- Carbonization with CO<sub>2</sub> in beverage industry
- Heating and cooling at various process stages in adhesives production

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