Petrochemical

Static mixer, heat exchanger for petrochemicals, oil & gas

PRIMIX is a supplier and developer of static mixers and heat exchangers for refineries, petrochemical plants and the gas processing industry. With over 30 years of experience, we provide solutions for high viscosity mixing, dispersion, desalination, gas/liquid mixing and turbulent mixing of media.

Inline static mixers and heat exchangers

PRIMIX static mixers are suitable for upstream applications in exploration drilling, both onshore and offshore, and also recovery, storage and distribution of oil and gas.

Applications

PRIMIX static mixers are used for:

- Crude oil / water sampling
- Crude oil mixing and desalting
- Gas sweetening
- LNG desuperheating
- Mud Mixers
- Well Bore Cement Mixers
- Oil Sands Mixers
- Desalination
- CO_2 reduction in natural gas

The downstream production includes cracking / converting oil into fuels, asphalt and several other petrochemical products. Here the PRIMIX static mixers and heat exchangers can be used for:

- Several refining processes
- Cooling asphalt
- Petrol blending
- Wash water mixers
- Blending of diesel, gasoline, lubricants and natural gas at tank farms
- Alkylation
- Coal Slurry applications
- USLD mixing

Advantages of the PRIMIX static mixer - tubular mixer

- ✓ Suitable for mixing at very high pressures
- ✓ Lower energy consumption
- ✓ No moving parts
- ✓ Maintenance free
- ✓ ATEX
- ✓ No direct drive required
- ✓ Simple installation
- ✓ Little space required
- ✓ Totally closed piping system
- ✓ Can be manufactured with optional injectors
- ✓ Optional sheath for heat exchange
- ✓ Worldwide support

Mixers for explosion hazardous processes

The family of PRIMIX static mixers can be manufactured optionally with an ATEX certification. The “Ex II 2DG” classification means in practice that our mixers can be used anywhere except in mine shafts. We take into account all possible hazardous situations and take measures to prevent them; a HAZOP is drawn up and you will receive a comprehensive guide that will keep you fully informed about the do's and don'ts of this product. Finally, you will receive the certificate.

Prevents frequent corrosion problems at refineries and gas production companies

During the lifetime of a refinery, the quality of the crude oils that are ingested gradually deteriorate. The reason is that easy to win sources dry up and then a switch over to harder to gain sources is needed which usually increases the undesirable impurities in these oils. The corrosion resistance of expensive equipment in a refinery is then no longer sufficient and the equipment rapidly becomes unserviceable. In-line interference from all types of corrosion inhibitors is by far the most cost efficient method to put a halt to this process. Static mixers are particularly well suited for that.

Polymer & Fibres

Static mixer, heat exchanger for polymers, plastics & fibers

PRIMIX is a manufacturer of static mixers and heat exchangers for the production and processing of polymers and fibers. With over 30 years of experience, we provide solutions through static mixers and heat exchangers for:

- Homogenisation of molten material
- Making emulsions
- Removing vaporous components
- Cooling of molten fiber / polymer
- Mixing additive – Admixing
- Plastic / Polymer by means of injection moulding
- Blending titanium into liquid polymer
- Mixing several different sorts of polymer
- Polymerization in a plug flow reactor

Static mixers and heat exchangers for polymers and fibers

The PRIMIX static mixers and heat exchangers can be used in production systems for the processing of the following types of polymers:

- Polystyrene PS
- ABS (Acrylonitrile Butadiene-Styrene)
- Polyethylene - PE
- PTA (Purified Terephthalic Acid)
- Polypropylene - PP
- Polyesters
- Nylon
- Biodegradable plastics
- Synthetic Rubber
- Latex
- PET - Polyethylene terephthalate
- EPS and PLA

Optimal homogenisation of the melt

A perfectly homogenised melt is one of the most important requirements for obtaining a high-quality polymer or fiber product. Irregularities, such as streamlines, colour streaks, non-uniform wall thickness, and flow variations lead to increased product failure and thus to higher production costs. This is often due to the homogenising of a bad melt.

Heat exchangers for polymer chemistry

Within this field of application where high viscosity, pressures and temperatures play a role, a number of aspects are of interest which can adversely affect heat transfer within a heat exchanger. These are:

- Thick tube walls, for the necessary strength as a result of the high process pressures
- Low thermal conductivity of the polymer
- Laminar flow as a result of the high viscosity
- Small acceptable logarithmic temperature differences due to the strongly temperature dependent viscosity.

PRIMIX technology for static mixer heat exchanger

During the development of the static mixer heat exchanger PRIMIX paid a great deal of attention to the technology to be applied for the connection of the mixing element and the process tube. The solder connection between element and tube is not an amorphous layer, but because of the soldering method it takes on the austenitic structure of the parent material, which creates one entity. The resistance to heat transfer of the compound is equal to the material of the tube and element, while the mechanical strength comes to approximately 70% of the parent material. This connection technology results in the element surface also behaving as a heat-exchanging surface. This allows the heat exchanger to be of a more compact construction with an unchanged output. The Nusselt number of a heat exchanger with non-soldered elements is approximately three-times higher. Soldered elements are up to 10 times better.

Small residence time spreading in the PRIMIX heat exchanger for polymers

In addition to good heat transfer a low residence time spread is also very important. This is because the polymer continues responding during cooling. Polymer that stays in the heat exchanger for too long can have a negative impact on the quality of the end product. As a solution PRIMIX has adopted the application of a unique manifold, which provides a perfect distribution of the polymer across the process tubes, with complete elimination of dead zones.

The walls on the product side are finished to a roughness of 0.5 microns. Cooling is achieved by letting thermal oils flow through the process tubes in counter-current. Baffles ensure that there is good contact between the cooling oil and the process tubes. The above described design has resulted in a heat exchanger, that - thanks to its relatively small size - can be economically deployed for high viscous process media and shows an almost ideal plug -flow.

In the meantime the PRIMIX design for polymer chemistry is standard

The design is now used as standard in the polymer chemistry. The design and construction take place under all of the required design codes, including testing and inspection. Known codes are ASME VIII, AD2000, EN 13445, etc.)