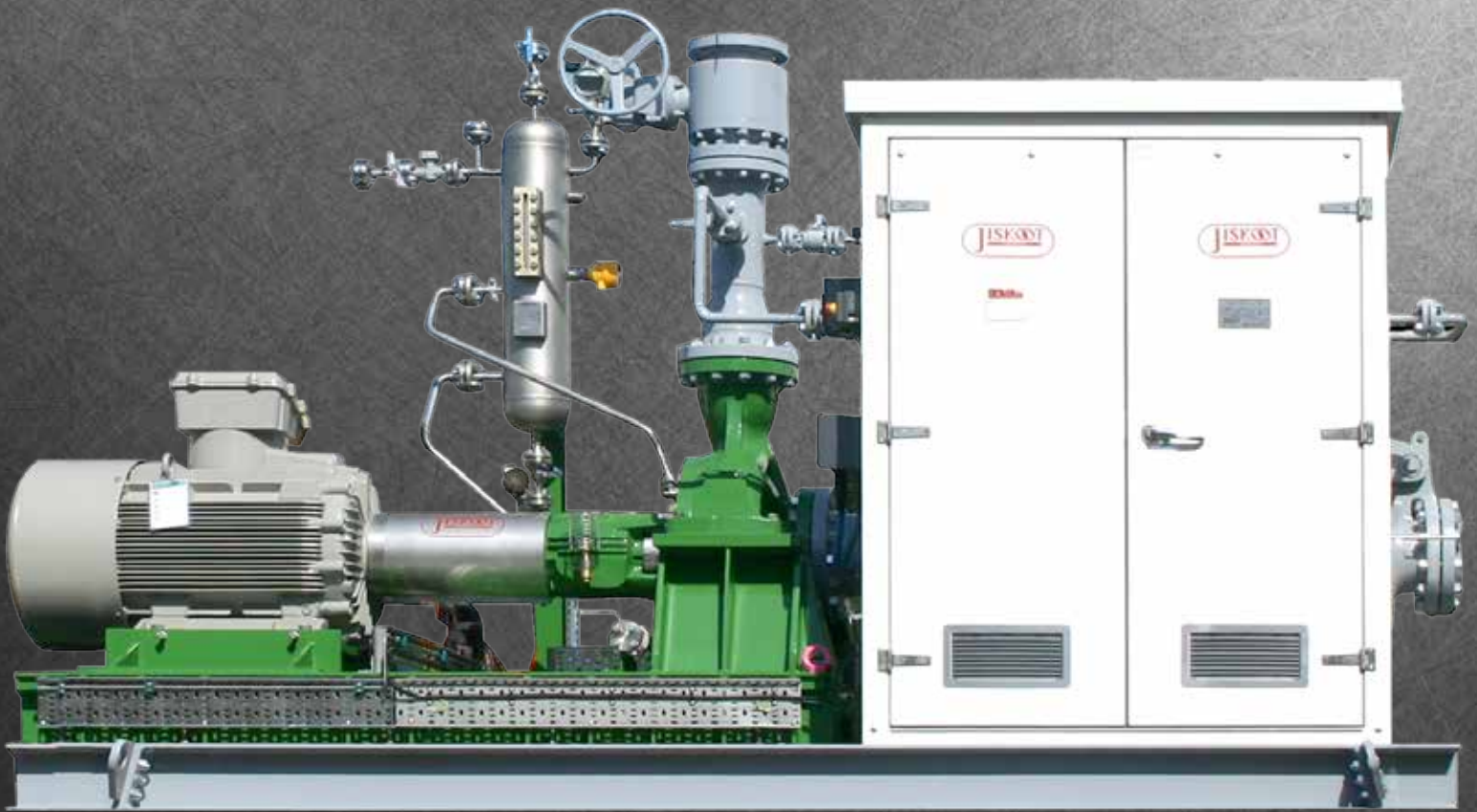


# JISKOOT JetMix System

TECHNOLOGY



# JISKOOT JetMix System

Cameron's JISKOOT™ JetMix® System provides the ideal solution for mixing pipeline contents across an extended range to a suitable quality for sampling, blending or analysis. It can be installed and maintained without pipeline shutdown and, unlike traditional mixers, causes minimal pressure loss.

Millions of dollars are lost every year by the petroleum industry through inaccurate measurement. Any online measurement or sampling device is only as representative as the fluids it receives. To guarantee accuracy, a device must be presented with fluid that is representative of the whole cross-section of the pipeline. Mixing may be required where non-homogeneous fluids are flowing or where fluids have been blended.

To achieve this, a suitable pipeline location must be found or created at which the fluid is thoroughly mixed. Relying on natural turbulence for mixing often is not possible as this depends on maintaining minimum flow rates. Rapid mixing may be essential, therefore a mixing system is required which provides adequate mixing regardless of flow conditions.

The primary elements of a JetMix System are a jet nozzle and a pump. A small portion of the process fluid is withdrawn and reinjected upstream in the form of high-velocity jets. The jets are positioned to produce maximum energy addition in the area of the greatest stratification.

The purpose of the jets is to finely disperse and evenly distribute the phases over the complete cross-section of the pipeline by twin helix rotation, ensuring that the pipeline is rapidly mixed with minimal loss of process pressure.

*The JetMix System was originally developed to mix water into crude oil but can be used for other applications such as mixing on blend headers prior to trim control, as well as injection and rapid dispersal of fluids into pipelines.*

## Operates at all Flow Rates

The degree of mixing in a fluid depends on the rate of energy dissipation. Where natural turbulence is inadequate, traditional in-line mixers divide and turn the fluid, increasing the rate of dissipation through pressure loss. Energy added to the flow for mixing in this way is generally proportional to the square of the flow rate – which means that if the mixer adds enough energy at the lowest flow rates where it is needed, it will waste energy and possibly over-mix at high flow rates. Conversely the energy added to the flow by a JetMix System is constant – the energy added per unit volume increases as the mainline flow rate drops. As a result the performance of the JetMix

Withdrawable version available for ease of maintenance

No pipeline pressure drop

Minimal installation time – installed by hot tapping

Low maintenance costs

Can be supplied for top or bottom mounting

No size limitation

System is not affected by changing flow rates. A JetMix System supplies a constant mixing energy, vital during low flow rates when the need for mixing is greatest. When natural turbulence is sufficient it can be turned off.

## Can be Removed for Pipeline Pigging

Many pipelines need pigging and all equipment contained within the pipe is a hindrance to this process. The JetMix System was designed from the outset in both fixed and withdrawable versions to allow removal for pipeline pigging. This design also provides for easy maintenance whilst the pipeline remains in operation, in stark contrast to a static mixer which is not removable and a power (turbine) mixer which requires the line to be drained for maintenance.

### Causes No Pressure Drop

Traditional mixers derive energy from the flow within the pipeline, thereby causing a drop in pressure. A JetMix System adds energy to the flow and therefore causes no measurable pressure drop.

### Minimal Installation Time

The JetMix System can be installed by hot tapping which will minimize any disruption to the process. This is an important consideration when calculating initial costs.

### Low Maintenance Costs

The nozzle has no moving parts and can be removed from the line for service without shut – down. The pump and skid are outside to the pipeline and can be serviced online.

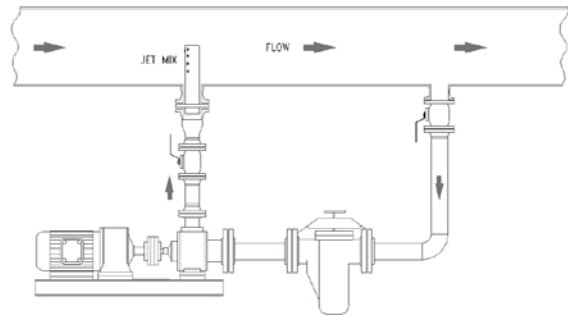
### No Size Limitation

The JetMix System is designed to operate in all pipelines and can be supplied to fit lines from 3" to 48".

### Reliability

Cameron has a large worldwide installed base of JetMix Systems.

## Jet Function



### Fluids mixed

- Crude oil/water, refined hydrocarbons and chemicals

### Maximum line pressure

- Designed to suit

### Line size range (typical)

- 3" to 48" (other sizes available on request)

### Line tapping size

- Typically 3" to 8" (this depends upon application, location and up/downstream piping configuration)

### Installation requirements

- Please contact Cameron

### Velocity range

- Designed to suit

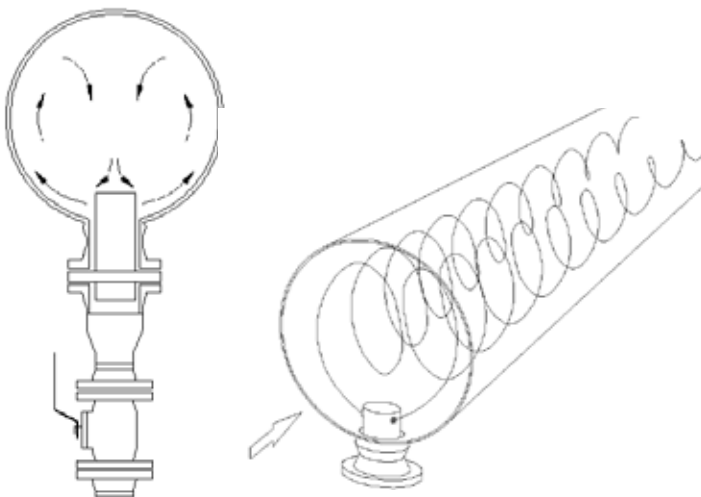
### Options

- Withdrawable JetMix nozzle (and quill in top three entry applications)
- Extractor tool for withdrawable nozzle (and quill)

In addition to the standard fixed bottom-entry JetMix assembly, a retractable JetMix System can be supplied for top or bottom mounting. The retractable JetMix nozzle is supplied with an extraction tool to both insert and retract it under full process conditions without de-pressurizing and draining the pipeline.

A JetMix System is normally installed in a horizontal section of the pipeline.

## Typical Schematic of a JetMix System



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**HSE Policy Statement**

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.