



Annular Injection Mixer (AIM™)

ProSep's Innovative Injection / Mixing Solutions

LNG Conditioning / LPG Quenching / Natural Gas Processing

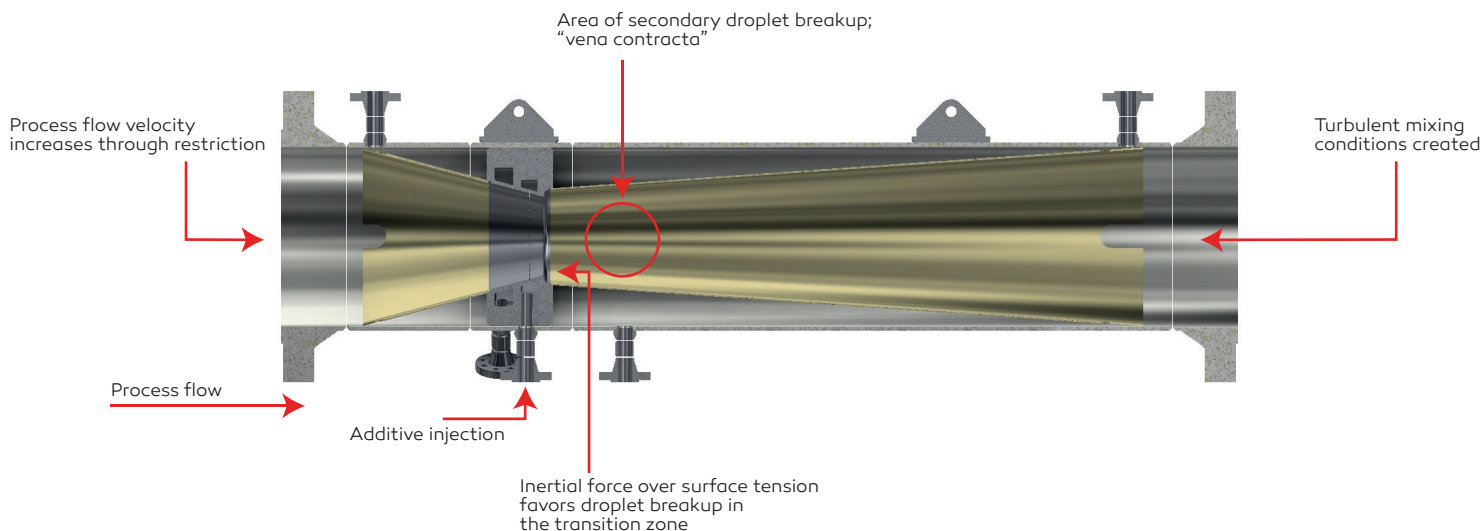
FEATURES

Utilizing client process parameters, each AIM mixer is designed to provide optimized initial liquid droplet formation followed by secondary breakup to achieve 100% homogenization before the outlet of the mixer and vaporization within several pipe diameters.

DESIGN

At the heart of the AIM's innovative design, the mixer utilizes two cones; an inlet reducing cone and an outlet expanding cone, to perform the work of the injection mixer. As the process stream travels through the AIM, the velocity increases until it passes through the transition point between the two cones.

By injecting the additive on the surface of the inlet cone, the increasing process fluid momentum spreads the additive on the cone and transports it to the transition edge. At the transition between the two cones, the cross-sectional area expands, and the additive film is dispersed into the process stream. Just downstream of the transition zone, the fluids experience the vena contracta – a zone of high velocity flow that causes secondary droplet breakup of the additive. This ensures maximum droplet surface area is achieved, enhancing chemical reactions, vaporization or process quenching. The downstream expanding cone adds turbulence amplifying mixing and recovers some of the pressure drop from the inlet constriction.



AIM LNG & Midstream Natural Gas Conditioning

Quenching & Vaporization

ProSep's Annual Injection Mixer (AIM) had demonstrated superior performance injecting additives for Natural Gas and LNG processing

CASE STUDY

Preconditioning Feed NG for LNG

ProSep's AIM injection mixer is being used to vaporize LPG for conditioning a natural gas stream prior to a Gulf Coast LNG facility. Two (2) injection mixers are installed on each of the three (3) pipelines all feeding the same facility. The client required a wide range of operating flowrates, pressures and injection volumes which were incorporated into the design of the unit and verified with CFD simulations prior to fabrication. The objective is to vaporize all the LPG within 10 meters to effectively condition the natural gas feed. CFD simulation indicated and flow loop testing verified 100% homogeneous mixture at the AIM flange exit under the most challenging operating conditions of the project. During commission, operational data shows effective injection, dispersion and vaporization as indicated by the online GC analyzer.

APPLICATIONS:

- Chemical injection
- NG Dehydration Debottlenecking
- BOG (Boil Off Gas) Reliquification
- Wash / Quench Water Injection
- Gas Treating
- NG Conditioning
 - BTEX Removal
 - BTU Adjustment
- Quenching
 - C3
 - C4
 - C5
- Compressor Suction Temperature Control



BENEFITS:

- High Turndown
 - 3:1 turndown for the process fluid (greater with multiple units)
 - 6:1 turndown for the additive phase
- Low Pressure Drop
 - <0.3 bar DP
- 100% Vaporization and Rapid Quenching
- Inline Solution
- Simple Retrofit Configuration
- Maintenance Free