



## Free Water Removal from Liquid Hydrocarbon Streams

### APPLICATION

Removal of free water in liquid hydrocarbon streams is one of the most difficult applications to achieve. Kinetic separation is a method to accomplish this removal, provided some conditions are met. The water and hydrocarbon must have a sufficient difference in specific gravity for the separation to occur. In addition, low differential pressure and low flow rate are desirable to allow sufficient separation time and to prevent the water from being forced through filtration materials.

The Sheffield Separator Model SS1200LF-PTFE (P/N SS1200L-1015-1110) uses kinetic energy and differences in specific gravities of the flowing media to separate water (heavier material) from hydrocarbon (lighter material). The hydrocarbon component will negotiate a complete change of direction while free water will continue in a downward direction due to the difference in specific gravities. The first chamber aids separation with a Teflon<sup>®</sup> lined (hydrophobic) filter which repels water.

Flow in the first chamber is adjusted to a higher rate to appreciate the maximum kinetic effect, while the second chamber flow is reduced to allow for maximum separation time. After kinetic separation in the second chamber, any remaining water which manages to reverse direction will encounter a pure Teflon<sup>®</sup> (PTFE) filter. Pure PTFE naturally repels water and functions to coalesce water on the filter surface. Differential pressure from inlet to outlet should not exceed 2 PSI, which prevents water from migrating through the Teflon<sup>®</sup> media.

When the percent of water in the sample is very high due to upsets or the difference in specific gravities is low, an optional third stage consisting of a small, inexpensive membrane separator may be utilized.

Use of the kinetic separator has eliminated free water and particulates from hydrocarbon streams, rendering analyzers more effective and achieving greater reliability. Maintenance, including replacement parts and associated manpower, is greatly reduced.

Gas and liquid separation may be accomplished utilizing the kinetic principle. Applications have included nuclear density, oxygen analysis, and removal of hydrocarbon globules from a liquid stream. Any application involving differences in specific gravities may be accomplished with a kinetic separator. Dual chambers provide efficiency and assure maximum separation of components.

**MTI Analytical Technology** is available to assist with environmental, laboratory, and process monitoring applications. Design, engineering, fabrication, installation, and commissioning may be accomplished, thus assuring integrity and performance of component units.

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