

METTLER TOLEDO APPLICATION NOTE

Conductivity For Pump Control In Separators

BACKGROUND

Separators are processing units that are used to separate water (aqueous phase) and an immiscible (non-mixing) liquid (non-aqueous phase). Separators are used in a variety of industries:

- chemical processing (separation of aqueous and non-aqueous solutions).
- secondary oil production (water recovery).
- environmental (recovery of grossly contaminated water).

Separators are charged with the mixture which is allowed to separate into two phases, the aqueous (water or water solution) and the non-aqueous (oil, fuel, organic solvent, or solution). Depending upon the density of the non-aqueous component relative to water, the mixture will either float to the top of the water (the usual case) or precipitate to the bottom. The separated components are simply pumped or allowed to drain from the separator.

THE PROCESS

The use of conductivity is based on the simple principle that most aqueous solutions are good conductors of electricity, while, with few exceptions, non-aqueous solutions do not appreciably conduct electricity. A conductivity measurement can be used to signal the presence of the aqueous or non-aqueous phase by a simple on/off signal. As water accumulates in a separator, a conductivity sensor mounted above the inlet to the pump can sense the presence of the aqueous phase and, using a high alarm contact in the conductivity analyzer, pump the dirty water out for disposal.

INSTRUMENTATION

Since the non-aqueous solutions, especially oils, can coat the metal electrode surfaces of contacting conductivity sensors, only toroidal sensors should be used. For this application the METTLER TOLEDO InPro[®] 7200 series of Toroidal Conductivity Sensors is recommended. Figure 1 illustrates the role of the conductivity measurement in the separator.

The compatible toroidal analyzer is the Model Condl 7100 Analyzer.

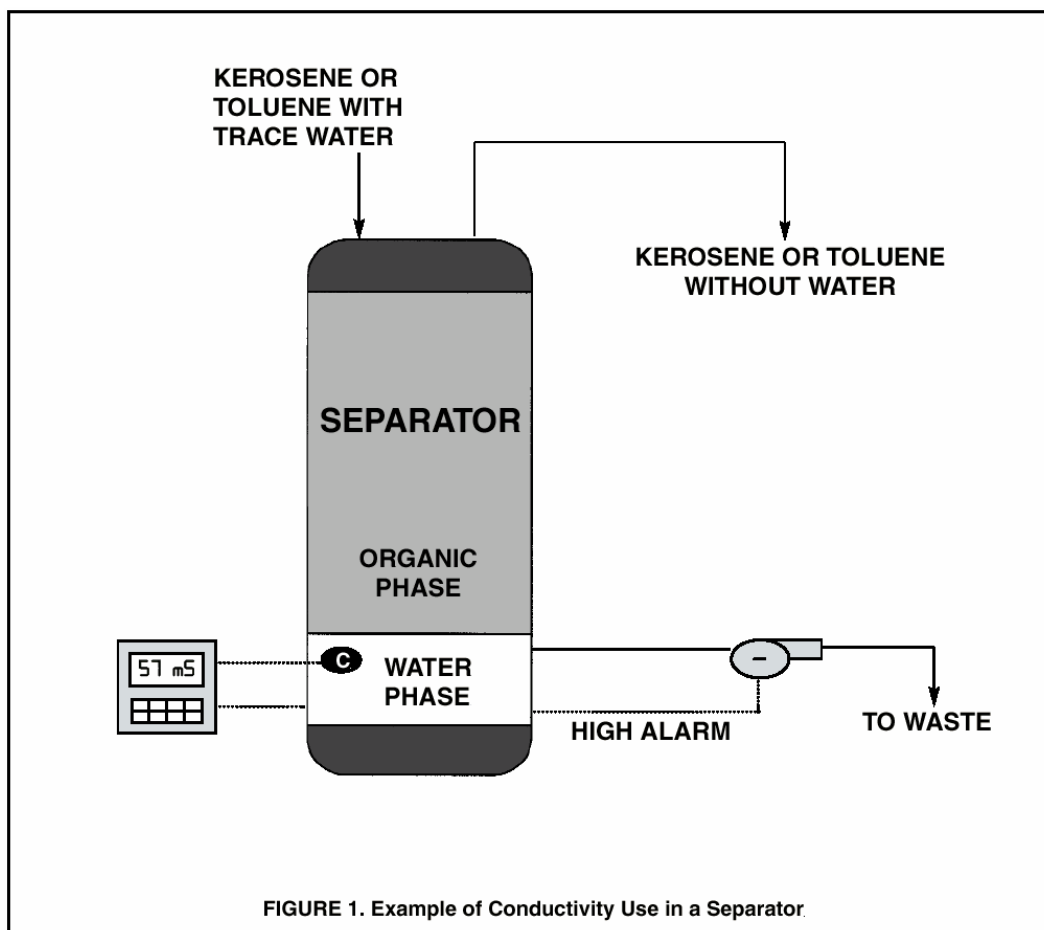
PRODUCTS

Model Condi 7100 Toroidal Conductivity Analyzer

- Measures conductivity, resistivity and % concentration
- Detachable front panel and plug-in terminals for ease of installation
- All functions accessible through the keypad for increased ease of use
- Continuous sensor and transmitter diagnostics to monitor performance
- FM certification for Class I, Div 1 & 2 Environments
- 3 year warranty

InPro® 7200 Toroidal Conductivity Sensors

- Recommended for high accuracy measurement in high conductivity processes
- Choice of materials of construction for increased chemical compatibility
- High temperature range option suitable for CIP and Boiler Blowdown applications
- FM approved for electrical safety



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