# Desalting Crude Oil
Analysis of Salt in Crude Oil

Crude oil contains salt, dissolved or suspended. The salt can lead to fouling and corrosion of heat exchangers and distillation overhead systems. Further salts are detrimental for catalysts in the downstream conversion processes. Excess of water has to be removed therefore desalting takes place before distillation. After preheating to 115 – 150 °C, the oily feedstock is mixed with water in order to dissolve and wash out the salts. The water must then be separated from the oil feedstock in a separating vessel by adding demulsifier chemicals to assist in breaking up the emulsion and in addition, by applying a high-potential electric field (via electrostatic grids) across the settling vessel to coalesce the polar salt water droplets. The wash water (brine) containing dissolved hydrocarbons, free oil, dissolved salts and suspended solids are further treated in an effluent treatment plant. Efforts are made in the industry to minimize water content of the desalted crude to less than 0.3 %.

Monitoring of the chloride in the crude and after desalting is needed to check the desalting process efficiency and to overcome corrosion problems in downstream processes. The analytical measuring method is according to ASTM D3230 by conductivity detection. Since the sample take off point is typically in a hazardous environment the ADI 2045 Ex Proof Process Analyzer is designed and equipped to meet directives 94/9EC (ATEX95). No <<Hot work permits>> are needed for maintenance and the analyser can be remotely controlled.

Simplified flow diagram of a crude desalter
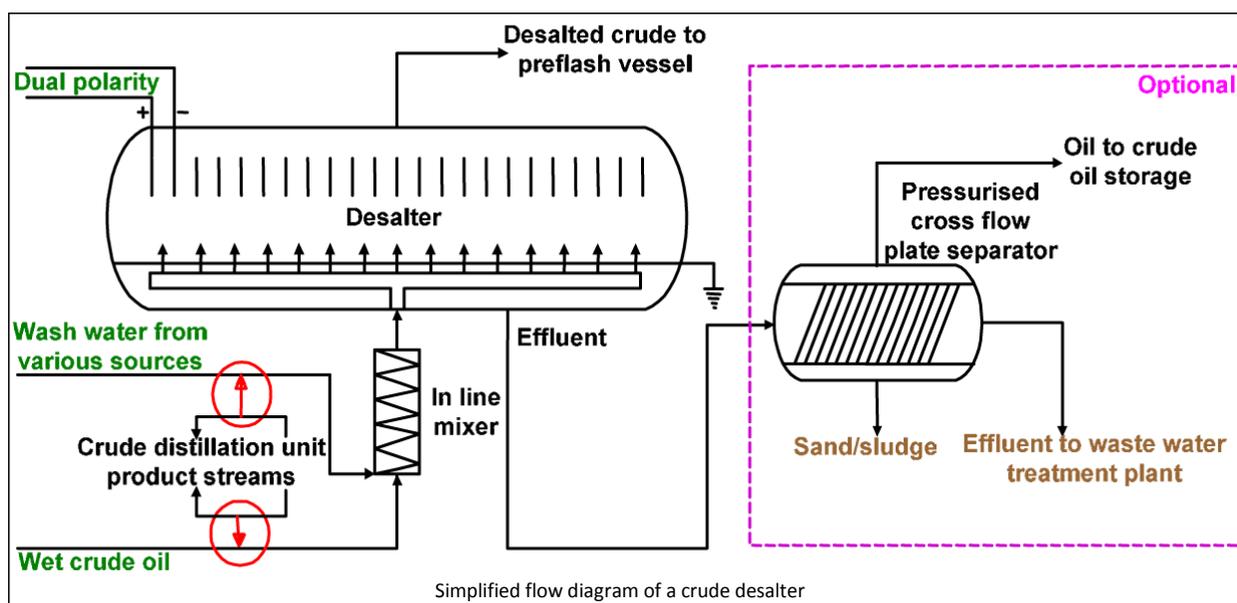
Application: On-Line monitoring of the salt content in crude oil by conductivity measurement.

Typical Range: ASTM: 0 to 500 mg/kg or 0 to 150 lb/1000 bbl as chloride concentration/volume of crude oil.

Remarks: Other measurement techniques can apply for low economy grade crudes like the Standard Test Method for Salt in Crude Oils (Potentiometric Method) ASTM D6470. Karl Fischer technique can be applied for moisture/water content as an additional parameter in the desalter.

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