

Implementing ultrasonic devices for fluid treatment in refinery plants

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Abstract Ultrasounds is a prevention technique against crusts on heat transfer surface that may as well decrease and remove the existing crusts. Fluid is continuously stirred due to the cavitation balls and their implosion. The paper describes tests performed on oil fluids such as crude, vacuum distillate and vacuum residue that flow through the heat exchanger equipment within refineries. Exposing the test tubes in an ultrasonic field at a power of 200 W, at 70°C in 15 minute-cycles activity /1-minute break resulted in a crust removal efficiency of 50 - 70%. The microscopic research revealed a 10μ layer on the metallic surface over which there are aggregates in an uneven distribution, more noticeable in oil than in vacuum distillate. Aggregate thickness is 60-70 μ with a trend towards increasing. They are amorphous and don't display any optical activity.

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