



USP®

Ultrasonic Scale Preventer

Ultrasonic Scale Preventer (USP)



Ultrasonic Scale Preventer
(Fe-Co transducer)



Ultrasonic Scale Preventer
(Explosion-Proof type)

Basics of Ultrasonic Scale Preventer

- **Vibration**

The Ultrasound is applied into the metal composing facility, the small vibration is generated and transferred to the whole facility through metal.

- **Acoustic Streaming**

When ultrasonic energy is transferred to fluid through metal, acoustic streaming acts into the fluid vertically against flow direction of fluid. Then particles motion in the fluid becomes significantly active, and convection and turbulent flow are generated in the flow. These can prevent fouling forming and scale deposit.

- **Increase of the Surface Area**

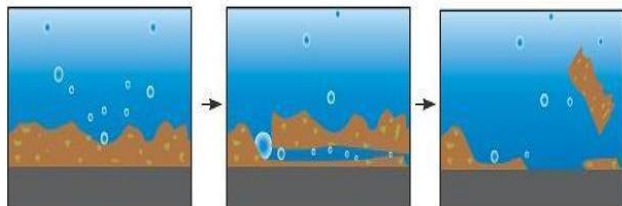
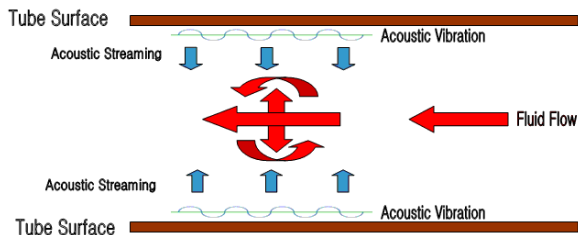
When a particle in liquid is shattered by ultrasonic waves, the surface area enlarges. The resultant enlarged surface area bonds to additional particles and shatters. The particles continue to shatter minutely.

- **Cavitation**

Ultrasonic vibrating make liquid emerge “empty effect”, bring out and broken lots of air bladder in a moment and repeatedly. When air bladder is absorbed and exploded, the high accelerated velocity (~30,000 times of G-force) & temperature are generated.

- **Prevention of Fouling and Scales**

When the combination energy of vibration, acoustic streaming and cavitation generated by USP acts on metal surface and in fluid, it can prevent scale deposit on metal surface and fouling forming in the fluid.



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Feature

Ultrasonic Generator



Ultrasonic Transducer



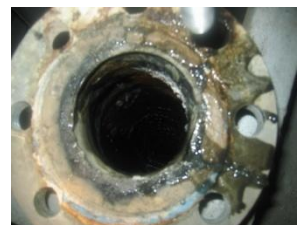
Applications

- Industrial solution for removing and preventing scales, sludge, and fouling occurring on boilers, heat exchangers, condensers, chillers and piping. (especially Refineries, Chemical Plants, Paper Plants, Sewage Treatments and etc)
- Particle quality improvement – Atomization & Equalization (Paint, Tire, Drink and etc)
- Other special applications – Fish and Birds Deterrent

Advantages & Benefits

- Optimum Energy & Cost Savings
- Reduction in maintenance Cost and Downtime
- Increase in Production & Efficiency
- Meet Environmental & Safety Standards

Result



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Specification

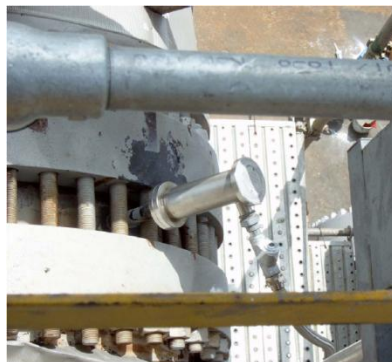
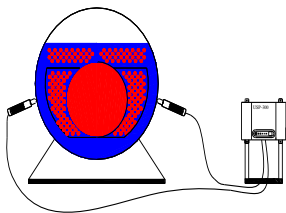
Model	USP-300	USP-500	USP-900	USP-1000	USP-H2
Input Frequency[Hz]	50/60 (controlled for application)				
Input Voltage[V]	220/230 (controlled for application)				
Power Consumption[W]	200	300	500	700	200
Transducer (Type)	2 EA Fe-Co	3 EA Fe-Co	4 EA Fe-Co	6 EA Fe-Co	2 EA Fe-Co
Generator (Weight)	1EA (28[kg])	1EA (31[kg])	1 EA (39[kg])	1 EA (39[kg])	Special specification
Transducer size[mm]	welding part : Dia. 35mm, cover size : Dia. 58mm designed for application				
Generator size[mm]	570 × 340 × 330		620×425×330		
Temperature for application	-25[°C] ~ +50[°C]				

Comparison btw Scale thickness & Loss rates of fuel

Thickness of scale [mm]	0.5	1	2	4	8	16	30
Loss rate of fuel [%]	2	4	6	10	20	40	80

Data from EU

Installation



S-Oil in Korea



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