

# Industrial ultrasonic cleaning

We are a Total Care service provider in the field of industrial cleaning, waste management and transport. Total Care stands for qualified staff, cost-efficiency and safe implementation, one point of contact and sustainable client relationship.



## How does it work?

Industrial ultrasonic cleaning takes place in a large tub, also called the ultrasonic unit. High-frequency sound waves are used.

These sound waves are generated by several generators that transmit the sound waves to the transducers hanging in the immersion pool. Because the sound waves are high-frequency, small air bubbles form and implode. This phenomenon is called cavitation, in which many (cleaning) forces are released. Because this phenomenon takes place on the surface of the materials to be cleaned, all dirt - such as, for example, residues of a petroleum fraction - will come off. In combination with the correct mix of chemicals, this loosened dirt will either be discharged to the surface of the liquid or dissolved in the liquid itself. Finally, raising the temperature of the liquid will ensure that the cleaning rate and absorbing capacity are increased.

## Opportunities

REYM has a cleaning line of which the ultrasonic unit is a part. Sometimes the application of a simple cleaning method is sufficient for the cleaning of an object and sometimes a combination of methods is needed to obtain an optimal cleaning result.

With the ultrasonic unit a wide variety of objects can be cleaned. Primarily, the REYM ultrasonic unit has been developed and built for the cleaning of small and medium-sized tubular or hairpin heat exchangers. The inside size of the ultrasonic unit is 9 x 1.9 meters. A large, heavily contaminated bundle of a heat exchanger with a weight of 20 tons fits in easily.

By using a stainless-steel cage that can be hoisted and lifted independently, other objects can also be cleaned.

For example: safety devices, hand valves, pump components, plate exchangers, flame arrestors, expansion dampers, scaffolding parts, demister packages, filter cartridges, Pall and Raschig rings.

In the covered cleaning line, heat exchangers are placed in the ultrasonic unit by means of two 25-tonne overhead cranes. Thanks to the innovative lift system, the heat exchanger can be discharged in a controlled way. Independent height adjustment of the lift system allows internal ventilation of the heat exchanger and optimises contact with the cleaning fluid. In this way, the correct functioning of the chemistry and the progress of the cleaning is guaranteed, as well as the possibility of an interim visual inspection.

#### **Important advantages**

In a number of ways, industrial ultrasonic cleaning offers advantages over other cleaning methods.

#### **Cleaning of restricted areas**

The transmission of high-frequency sound waves largely passes through the material of the object.

#### **Less risk of mechanical damage**

Due to a thorough preparation, the industrial ultrasonic cleaning will be a correct match between the contamination on the object, the materials of the object and the mix of chemicals to be applied. This reduces the risk of damage to the materials or the surface of the material.

#### **Cleaning speed**

To achieve the same cleaning result for more complexly constructed objects, applying a different cleaning method than industrial ultrasonic cleaning would take more time. Industrial ultrasonic cleaning is therefore form independent.

#### **Lower emissions**

We are aware that emissions can occur during the cleaning of objects. In industrial ultrasonic cleaning, the actual cleaning takes place immersed in the fluid. The mix of chemicals is composed in such a way that undesired emission of certain chemical substances is often chemically controlled and collected and included in the cleaning fluid. In this way, the environment is protected, and a safe working environment is maintained.

#### **Reduced water consumption**

Sometimes the water consumption in relation to the object to be cleaned is low, but sometimes it is also high because there is no other option. In both cases, this cleaning fluid will have to undergo various processing steps if it is to be suitable for reuse again or qualitatively suitable for discharge into

surface water. Industrial ultrasonic cleaning has proven experimentally to reduce water consumption by more than 50% compared to more conventional cleaning methods. After all, less water consumption leads to less waste water. Less waste water requires less processing. And less processing leads to lower costs. That sum is quickly added up.

#### **Safe cleaning method**

Ultrasonic cleaning at REYM is an almost fully automated cleaning system. Safety and ergonomically responsible working for our operators are the most important principles.

For example, the available overhead cranes are used to lift the objects into and out of the tub and an automatic separation takes place in the tub of the released solid contaminants.

#### **Cleaning Degree**

How clean and tidy an object must be cleaned is decided between the client and the contractor. Technical cleanliness, production cleanliness or inspection cleanliness are often a qualification for the degree of cleaning to be achieved for an object after cleaning. Industrial ultrasonic cleaning can be used as a cleaning method for all these qualifications. "Field trails of ultrasonically cleaned heat exchangers have even shown that in a number of cases the service life in the process was significantly longer due to the higher degree of cleanliness achieved with industrial ultrasonic cleaning.

The deep - pore-cleaning effect of industrial ultrasonic cleaning, the chosen mix of chemicals and the cleaning temperature in combination with the cleaning of restricted areas, are the reasons for this. This is again a confirmation of the added value of industrial ultrasonic cleaning.

#### **Industrial ultrasonic cleaning is a combination of:**

- Transmission of high-frequency sound waves
- Choosing the right mix of chemicals
- Use an increased fluid temperature

If you would like more information, please contact one of the REYM branches in your region.

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