

Steam Cleaning Technology for Industrial Part Cleaning

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With its EcoCSteam system, Dürr Ecoclean has developed a new eco-friendly cleaning technology that reliably removes both particulate and film-type contamination from parts and surfaces of diverse materials without any use of chemicals. The performance of this innovative steam cleaning method is based on the use of saturated steam plus an airflow accelerated to a high velocity. Apart from its ecological advantages, the EcoCSteam process can be easily automated and excels in economic and quality aspects.

In industrial part and surface cleaning, as in all other fields of manufacturing, the optimization of cost efficiency, sustainability and quality has gained increasing significance. Dürr Ecoclean GmbH's innovative EcoCSteam technology fully supports this trend. The new steam cleaning process ensures a rapid and reliable removal of particulate and film-type contaminants – e.g., oils, grease, emulsions, mould lubricants, chips, particles, dust and fingerprints – from any material without the use of detergents. Another advantage of this eco-friendly technology is that it lends itself easily to automation and can hence be integrated into manufacturing lines without any problem.

In the past, cleaning large and heavy parts such as wind turbine transmissions, railway engine blocks and vehicle bogies, or boat and ship engines used to require

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extremely large and expensive cleaning equipment. For such applications EcoCSteam opens up all-new perspectives in terms of cleaning quality and cost efficiency. Moreover, the process provides optimum results when it comes to cleaning mechanical items such as, e.g., cylinder heads, housings and stampings. It is likewise suitable for cleaning tanks, composite parts and sectional material as well as metal and plastic parts intended to be subsequently painted or coated. Compared to conventional solutions, EcoCSteam provides higher cleaning quality in less cycle time. This has been demonstrated in diverse applications both in and outside of the automotive industry.

A key factor contributing to the effectiveness of the EcoCSteam process is the new steam generation method developed by Dürr Ecoclean in cooperation with experts in this field. It is based on the principle of "flow-through" water heating whereby pressurized water is passed through a piping system comprising heater coils. Depending on the cleaning task, the water is thus heated to a temperature between 135 and 280°C. Its conversion to steam takes place before the water is pumped from the piping to the cleaning nozzle.

Unlike conventional boiler systems, the flow-through steam generating method ensures that steam is made available in constant amounts and quality, thus bringing unvarying steam properties to the cleaning task. The water and steam flow rates as well as heating power can be accurately adapted to the cleaning application via the EcoCSteam system's programmable logic controller (PLC) which also monitors and controls these parameters permanently.

The system's outstanding cleaning performance is owing to the interaction of saturated steam with a high-velocity airflow. As the steam jet exits the nozzle, it is enshrouded all around by heated air accelerated to a very high velocity and thus focused directly onto the surface to be cleaned. Any intermixing between the two media is prevented by the high flow velocity of the air and the properties of the steam.

For an optimum cleaning result the moisture content of the steam can be accurately adapted to the cleaning task or specific contamination type. Thus, for removing oil, wet steam is applied to modify the oil viscosity so that the oil will be atomized into ultra-fine droplets. These are then blown off the part surface, along with particulate contaminants, by the airflow. Drying is provided by the high-velocity airflow as well.

The EcoCSteam cleaning process is commonly performed in one or two steps. This translates into shorter cleaning cycles compared to conventional methods, and productivity is enhanced as a result. But this space-saving steam cleaning technology also excels in cost efficiency. On the one hand, it involves much lower investment. On the other, it provides operating cost savings since no chemical cleaning agents are needed and no bath treatment and filtration equipment is required. Its exceptional ease of maintenance and high availability are further benefits speaking in favour of the EcoCSteam process.

For more information, visit www.durr-ecoclean.com [1].

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