

## Find the right nozzle quickly and efficiently

Cleaning efficiency classes developed by Lechler can help with choosing the ideal nozzle.

**The task of cleaning tanks and equipment in the chemical industry poses particular challenges for the technology used. Automated cleaning processes require up-to-date nozzle systems that are customized specifically for the task at hand. Lechler helps its customers to select the right nozzle for their needs by defining the cleaning efficiency class. The nozzle guide offers a wide product range, from the static spray ball to the new rotating *XactClean HP* with specially developed flat fan nozzles. Users benefit from optimal and economical solutions, which cut costs, reduce downtimes and increase process reliability.**

Production and processing applications in the chemical industry cover a wide range of different processes. In most cases, the systems, tanks and other parts of production equipment require cleaning from time to time. These types of circumstances demand automated, efficient and environmentally-friendly cleaning processes. These must be proven and replicated so that no harmful impact is seen on either product quality or productivity. But which nozzle and which cleaning concept can guarantee a reliable but yet efficient result?

The optimum nozzle for all applications does not exist. Over the course of 135 years, Lechler has developed a deep understanding of spray and atomization processes in the chemical industry under greatly varying conditions with different pressures, temperatures and atmospheres. The

result is a wide range of standard nozzles for different applications, as well as individual solutions for specific tasks.

By looking at the wide product range at first, it is not easy to find the right nozzle. As a general rule, mechanical and chemical factors, as well as time and temperature, determine the cleaning process. As a leader in nozzle technology, Lechler's primary focus is on the mechanical factor. A nozzle with the correct pressure, flow rate and spray pattern will help reduce the cycle time and the desired cleaning result will be achieved faster. Innovative nozzle technology requires less chemicals and demands specific temperature ratings to ensure cleanliness as well as a germ free environment. It saves on resources and is environment-friendly. The costs for cleaning agents is also reduced as well as for the treatment of water.

So that plant manufacturers and operators can quickly get an idea of how they can optimally and efficiently solve their cleaning task in the planning phase, Lechler has defined five **cleaning efficiency classes** based on years of experience and knowledge for a wide range of different processes in the chemical industry (see Figure 1). The classification of the different products by cleaning efficiency classes is unique to the market. Therefore, Lechler has the capability of offering its customers a quick method for finding the most suitable nozzle technology for their application.

The cleaning efficiency classes are based on the degree of soil that must be cleaned:

- light and easy-to-remove soil ("rinsing"), e.g. rinsing off non-adhering powder contamination
- light or minimal-adhering to medium soil
- stubborn, strong-adhering, tacky and/or viscous soil

The appropriate nozzle series is then matched by Lechler with the applicable cleaning efficiency class. However, the variances between the individual cleaning efficiency classes, degrees of soiling and the respective nozzle types are by no means fixed. After a brief introduction to the degree of soiling, category of cleaning efficiency class and nozzle type, the next criteria to consider is the tank size and flow rate.

For **cleaning efficiency class 1**, static spray balls are designed for rinsing, a task that is frequently required in the chemical industry. Spray balls can achieve good cleaning results, if the water cascading down the tank wall resolves the desired cleaning task. Rotating nozzles are a better solution if expensive cleaning agents are being used or if more intensive cleaning is necessary.

The Lechler *Spinner* series, for example, are rotating nozzles and found in **cleaning efficiency class 2**. These remove light to medium soil and are also suitable for similar rinsing tasks of cleaning efficiency class 1 (using less water consumption). The free-rotating nozzles in this series are made from different high-grade materials, such as Hastelloy<sup>®</sup>, which is resistant to a large number of aggressive chemicals.

For light to medium-heavy soils, the rotating nozzles of the *Whirly* series are the right choice in **cleaning efficiency class 3** because of their special flat fan nozzle geometry. These nozzles rotate freely and are suitable for both small and large tanks. Like most Lechler tank cleaning nozzles, they can also be used for CIP cleaning (Clean in Place). The *Whirly* nozzle series is made of high-grade materials and is also available as an ATEX version.

Controlled-rotation cleaning nozzles include the high-performance *XactClean* and *AccuClean* series, which are assigned to **cleaning efficiency class 4**. These remove medium to stubborn dirt and can be combined with rotation monitoring sensors, which guarantee a reliable cleaning process. The *XactClean HP*, which is a new product development by Lechler, delivers optimum and efficient results. The controlled rotation of the spray head and the specially developed flat fan nozzles guarantee uniform cleaning as well as high impact in comparison with free-spinning nozzles, even at higher operating pressures. The impact is an important characteristic value for cleaning tasks: It describes the force with which the jet strikes a unit area. The nozzle is driven by a gear-controlled drive unit. This states that maximum process reliability is guaranteed, even if the cleaning medium is dirty. The *XactClean HP* is made of high-grade and food-compliant materials, such as stainless steel and PEEK. The advantages for the user include high nozzle impact and cleaning coverage of the entire tank with just one spray head revolution,

which significantly reduces the process time. With this product, Lechler has closed the gap between free-spinning cleaners and high-impact tank cleaning machines. The new *XactClean HP* significantly reduces process costs.

If the dirt is particularly stubborn, high-impact tank cleaning machines from the Lechler *IntenseClean* series in **cleaning efficiency class 5** are used. These nozzles are also suitable for large containers because of the separate gear unit and two solid jets, which rotate around two axes. In contrast to other rotating cleaners, the concentrated solid jets of the high-impact tank cleaning machines strike the full area of the surface to be cleaned with a very high impact force. The *Intense Clean* series represents the most powerful form of cleaning.

In the early planning and consulting phases along with orientation discussions, the focus is primarily on obtaining an initial impression of the cleaning task based on the cleaning efficiency classes and on developing an understanding of the complexity and importance of both optimum and efficient cleaning processes. The individual parameters are defined in more detail in subsequent detailed planning. The end result, is an agreed upon cleaning concept that meets all the standard requirements in the chemical industry in terms of safety and reliability. Lechler technicians and engineers provide support as dependable partners, both during development and while having an understanding of working solutions for the entire operating life of the plant.

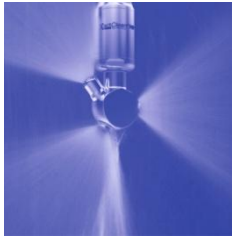
#### Picture material:

##### Picture 1:



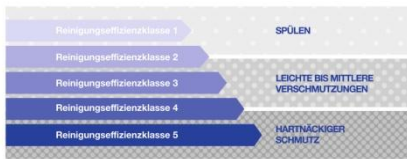
Rotating cleaner XactClean HP

##### Picture 2:



Spray pattern of rotating cleaner XactClean HP, spraying

**Picture 3:**



Cleaning efficiency classes