Tank cleaning nozzles

Beverage industry
Bioengineering
Chemical industry
Cosmetic industry
Food industry
Pharmaceutical industry
Tank building
and many others...
When planning your tank cleaning nozzle installation, be sure to observe the following four parameters:

1) Rinsing effect — a function of flow rate

Determine the required liquid flow rate by testing the applied pressure and the liquid’s ability to clean the dirt from the tank’s surface.

- As the nozzle head revolves, it should cover the entire area to be cleaned with an effective amount of cleaning liquid.
- In comparison with rotational cleaners, static spray balls require roughly twice as much liquid flow.
- Remember: Your drain must be able to handle the flow rate of what you’re putting in the tank.

More information on flow rate guidelines on page 25.

2) Force of impact — helps strip off crusty dirt

The force of impact depends upon:

- Adherence to the optimal operating pressure range for the type of nozzle in use.
- The right cleaning radius and volumetric flow for the size of tank in question.
- Concentration of the spray jets on the most badly soiled areas, e.g., 270° up or down.

As pressure increases, relative droplet size (mass) decreases. If pressure is elevated too high, an ineffectual mist is created. Increasing flow rate rather than pressure is a more efficient method of increasing impact. Lechler highly suggests contacting us if you have an application requiring operating pressures outside of the ranges for tank cleaning products listed herein.

3) Proper positioning — for optimal targeting

- In case of internal obstacles, either use several nozzles or place the nozzle at different locations.
- Slowly rotate any mixing blades or the like during the cleaning process.
- See “Typical Applications” box on page 21 for nozzle positioning assistance.

More information on page 21.

4) Application suitability — ensures safe operation

- When using any type of plastic spray nozzle, there is the possibility for static charge buildup that could create potential problems in some applications.
- For all tank applications involving combustible gas, flammable liquids, and/or other potentially explosive materials, please consult Lechler prior to purchasing tank cleaning nozzles.
- ATEX comprises two EU (European Union) directives describing what equipment and work is allowed in an explosive atmosphere. For companies in such areas who must also follow EU directives, Lechler makes tank cleaning nozzles which have ATEX approval. Contact Lechler for more information.
Guidelines for application and operation

Rotating tank cleaning nozzle advantages

- Low-pressure application for lower energy consumption.
- Increased cleaning effectiveness due to fluid flow movement compared to static spray.

Types of rotating tank cleaning nozzles:

- **Free-spinning heads**
  The cleaning liquid turns the spray head by means of specially positioned nozzles. The greater the inlet pressure, the faster the head rotation. Repetitive impact cleans the tank surfaces. The effect is best at low pressures in small to medium-size tanks.
  - See pages 26-30, 33-36, and 39 for free-spinning nozzle design families

- **Internal regulated drive**
  The liquid flow powers the head by way of an internal propeller. This keeps the speed of the head within its optimal range across a wider span of pressures, and the nozzle creates more powerful spray impact.
  - See page 37 for XactClean® HP nozzles

Programmed rotation machines

One variation of the internally-regulated drive is the programmed machine. Here, the cleaning fluid drives an internal gear reducer that keeps the sprayer turning in two planes. During a spray cycle, the jets sweep the entire tank interior following a programmed pattern. These models generate the highest impact and are therefore ideal for very large tanks and the toughest of cleaning tasks.
  - See page 40 for the 5TM design family

Static spray balls

Static spray balls do not rotate, so they require a comparatively large amount of liquid in order to generate turbulent flow, up to 2 to 3 times the amount compared to rotating nozzles. They are not as effective for most cleaning tasks as a comparable rotating nozzle. Their advantages include (1) having no moving parts, (2) being self draining, and (3) being traditionally used in sanitary environments. Whereas if a rotating nozzle stops turning, its cleaning effectiveness suffers, this is not a concern with a static ball. However, if a static ball has any of its orifices clogged, this can result in voids in coverage. Static balls are used primarily for washing down relatively small tanks and vessels.
  - See pages 31-32 for spray balls

Typical applications

A - Position the tank cleaning nozzle(s) at the center of the tank. For the best nozzle depth location in the tank, see point C below.
B - Nozzles invariably leave an unsprayed shadow area directly overhead, the size of which varies according to the type of nozzle and the piping.
C - The distance between the top of the tank and the nozzle should amount to 40%–70% of the nozzle’s cleaning radius. Size your unit to ensure sufficient flow to the top part of the tank wall. Nozzles work under a “line of sight” principle. You may need more than one nozzle to eliminate spray shadowing produced by internal components of a tank, such as mixers, agitators, dip tubes, etc. Generally, the nozzle should be located so that it is at least 1/2” to 1” above the maximum fill level of the tank so that the nozzle does not become submerged in the product of the tank. Also, the nozzle should be located in the upper third of the tank height to ensure cleaning of the top as well as to take maximum use of the cascading effect of the cleaning fluid against the walls of the tank.
D - The film of liquid grows thicker toward the bottom of the tank, where the washing effect is the most pronounced.
E - Standing water reduces impact and allows solids to accumulate. Make sure that the drain can handle whatever you put into the tank (see chart at right).
F - The critical spray distance is from the nozzle to the top corner, so the nozzle should be sized for this “effective washing distance”.

All pressure data is stated in terms of differential pressure directly at the nozzle, so be sure to take the line-pressure drop into account.

Typical gravity drainage flows

- 1” 6 gpm
- 1 1/2” 13 gpm
- 2” 23 gpm
- 2 1/2” 35 gpm
- 3” 50 gpm
- 4” 91 gpm
- 5” 142 gpm
- 6” 204 gpm
- 7” 278 gpm
- 8” 363 gpm
- 9” 459 gpm
- 10” 567 gpm
Mounting configurations

Requirements for critical CIP applications

Mounting configurations

All Lechler tank cleaning nozzles are designed to be mounted on a pipe or tube. However, there are several options for making the connection:

Threaded
Most designs use a female pipe thread for mounting on a male threaded pipe.

Slip-on
Nozzles for sanitary use do not use threads but slip around the end of a tube that has a cross hole drilled. A pin is then inserted to hold the head in place.

Tri-Clamp
Some manufacturers use tri-clamp connectors to join pipe. Lechler makes tank cleaning nozzles which have a compatible flange to mate with those. Each product section describes the mounting options in detail.

CIP nozzles for sanitary applications

Some installations leave the cleaning nozzle in the tank during production cycles such that it has contact with the product. If the product is critical, such as food or pharmaceutical materials, the nozzle has to be designed following specific protocols so that it will not contaminate the product.

See pages 32 and 35 for CIP nozzles

Typical washing sequences

A thorough tank cleaning sequence depends on the interaction between the soil, the cleaning solution and spray impact. The following sequence of steps are used in many applications:

- Pre-rinse — Begin with low grade or “used” water to rinse the interior, washing out the heaviest soil.
- Alkali wash — Use a mild solution such as 1% sodium hydroxide or trisodium phosphate. This removes most types of deposits.
- Second rinse — Follow with cleaner water to rinse out the alkali. This water can be used next time for the pre-rinse.
- Acid wash — A mild acid wash will neutralize any alkalinity and remove mineral deposits.
- Final rinse — Use your cleanest water as the final step.

This approach may not be suitable for every application but it is adaptable. The degree of soiling in the tank and the cleaning chemical selected to clean it will determine how many times you can use the same chemicals and rinse water. If the pre-rinse is effective, it can extend the life of chemicals in the other steps.

Documentation

Once the sequence is established, all steps of the process should be documented for consistency in future operations. This includes many operational details:

- Washing sequence with number of execution times for each step
- Cleaning chemical selection and concentration
- Washing temperatures and pressures
- Maximum time between the shut-down of the process and cleaning cycle
- Operation of any internal equipment, mixers, etc.
- Manual valve settings, equipment disassembly or other personnel-dependent operations
- Order information and operation parameters of the installed nozzle
**Service and support**

As mentioned below, each 5TM (M20) customer may choose to maintain their own unit by following the directions in the Operation Manual. But for even greater ease of maintenance, send your unit to Lechler and let our service staff do all of the maintenance work for you. We have years of experience in maintaining these units and guarantee to return your freshly-refurbished unit back to you within 48 hours of our receiving it. So let our experienced staff take the worry out of the maintenance of your 5TM (M20) machine.

**Rent vs. own**

The purchase of a Lechler 5TM (M20) High Impact Tank Cleaning Machine is a major decision. To help assist you in this decision-making, Lechler offers its customers the option of renting an 5TM (M20) first. And if you eventually decide to purchase that unit, all rental fees paid to that point will be applied to the purchase price. While rentals are generally for trials by our customers, we at Lechler feel confident that once you have used your 5TM (M20) machine, you won’t want to be without it again.

**The five factors of cleaning**

Tank cleaning, or any type of cleaning for that matter, is the result of four inter-related factors which can be manipulated for the greatest effectiveness:

- Temperature
- Chemical Reaction
- Mechanical Force
- Time
- Soil Composition

A tank cleaning nozzle (or machine) requires fluid (typically water) of a certain temperature, some type of chemical cleaning agent to interact with the cleaning medium, the mechanical action of the nozzle (typically its rotation) to project the fluid, and a period of time for the cleaning to occur. If any factor’s effectiveness is reduced, it must be compensated by one or more of the other factors in order to ensure proper cleaning. For instance, to reduce the cleaning time for a tank, a greater inlet pressure (mechanical force) may need to be applied for higher impact and faster soil removal. Hotter water (temperature) for assistance in loosening that soil may also be required and perhaps even a greater amount of soap (chemical reaction) is needed to further assist the soil removal. And in comparing the two most common tank cleaning methods, a spray ball requires much more time and chemical action to clean when compared to a typical Lechler rotating nozzle, which relies more on the mechanical force of the rotating head (therefore using less time) to get the job done.

**5TM (M20) Operation Manual**

If you purchase our 5TM (M20) High Impact Tank Cleaning Machine, you will receive an Operation Manual for the unit. This manual explains how to maintain your unit for a long, reliable service life. This can either involve simply sending the unit to Lechler for regular maintenance or following the instructions in the manual for self-maintenance of the unit. Let this manual be your guide to years and years of effective tank cleaning.

**Tank cleaning design assistance**

If you need to design a tank cleaning system for your application, let Lechler assist you. We have more than 25 years of experience in designing and manufacturing tank cleaning products for any size job. If you go to our web site, www.lechlerusa.com, you can access a questionnaire which you can complete and email to Lechler for assistance in selecting the right nozzle(s) and quantity for your application.
The FDA, the U.S. Food & Drug Administration, is a federal agency which oversees those two industries. Where so noted in the catalog, materials used in making Lechler products are complaint with the requirements of FDA regulation 21 CFR for use in food applications.

**Chart Heading Explanations**

**Tank diameter cleaning range**
This is the range of sizes of the largest spherical tank that can be covered with a somewhat thinner film of water by the given tank cleaning product operating at the maximum recommended pressure.

**Tank diameter rinsing range**
This is the range of sizes of the largest spherical tank in which the given tank cleaning product, while operating at the maximum recommended pressure, can deposit a thick film of liquid with a high force of impact.

### Flow rate range
This term includes the smallest through the largest flow rates in a family across the recommended pressure range.

### Safe use of products
Lechler, Inc. bears responsibility towards all of its spray products to (1) be free of manufacturing defects and (2) perform within normal tolerance values for the specific flow and coverage parameters that have been established. The customer using our products is responsible for the safe use and suitability of our tank cleaning products.

### Explosion protection
Due to the occurrence of static electricity, plastic heads are not suitable for spraying combustible cleansing media in potentially explosive atmospheres.

The following table will help you compare the various characteristics of Lechler’s diverse products. The basic technical data of each design family is provided here to enable quick selection of the most suitable type(s).

<table>
<thead>
<tr>
<th>Series</th>
<th>Page</th>
<th>Type of rotation</th>
<th>Cleaning mechanism/ action</th>
<th>Tank diameter cleaning range (Ø ft.)</th>
<th>Tank diameter rinsing range (Ø ft.)</th>
<th>Operating pressure (psi)</th>
<th>Flow rate range (gal./min.)</th>
<th>Coverage options</th>
</tr>
</thead>
<tbody>
<tr>
<td>PicoWhirly 500 MicroWhirly 500.191, 566</td>
<td>26-28</td>
<td>Free spinning</td>
<td>Flat fan, solid-stream nozzles</td>
<td>up to 5</td>
<td>up to 6</td>
<td>0 15 30 45 60 75 90 105</td>
<td>3-6</td>
<td><img src="image" alt="PicoWhirly 500 MicroWhirly 500.191, 566" /></td>
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<tr>
<td>PopUp Whirly 5P/5P3</td>
<td>29</td>
<td>Free spinning, friction bearing</td>
<td>Flat fan nozzles</td>
<td>3-5</td>
<td>5-7</td>
<td>0 15 30 45 60 75 90 105</td>
<td>2-12</td>
<td><img src="image" alt="PopUp Whirly 5P/5P3" /></td>
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<tr>
<td>Hygienic Whirlies 594/595</td>
<td>30</td>
<td>Free spinning, friction bearing</td>
<td>Flat fan nozzles</td>
<td>5-8</td>
<td>8-12</td>
<td>0 15 30 45 60 75 90 105</td>
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<td><img src="image" alt="Hygienic Whirlies 594/595" /></td>
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<tr>
<td>Spray ball 540/541, 527 (3A)</td>
<td>31-32</td>
<td>No rotation, static spray</td>
<td>Solid stream nozzle, max. impact</td>
<td>5-25</td>
<td>8-35</td>
<td>0 15 30 45 60 75 90 105</td>
<td>4-155</td>
<td><img src="image" alt="Spray ball 540/541, 527 (3A)" /></td>
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<tr>
<td>Spinner 5MC/5MI</td>
<td>33</td>
<td>Free spinning, ball bearing</td>
<td>Flat fan nozzle, wash-down actions</td>
<td>4-9</td>
<td>6-12</td>
<td>0 15 30 45 60 75 90 105</td>
<td>6-21</td>
<td><img src="image" alt="Spinner 5MC/5MI" /></td>
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<tr>
<td>Stainless Steel Whirly 569</td>
<td>34</td>
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<td>Flat fan nozzle, washdown action</td>
<td>4-10</td>
<td>10-15</td>
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<td><img src="image" alt="Stainless Steel Whirly 569" /></td>
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<td>Teflon Whirly 583/573 (3A) Hi-Temp Whirly 599</td>
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<td>Free spinning, friction bearing</td>
<td>Solid stream nozzle, washdown actions</td>
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<td>18-70</td>
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<td>Controlled rotation, Internal turbine</td>
<td>Flat fan nozzles, high impact</td>
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<td>15-30</td>
<td>0 15 30 45 60 75 90 105</td>
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<td>38</td>
<td>Gear-controlled</td>
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<td>42-46</td>
<td>26-39</td>
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<td><img src="image" alt="IntenseClean Hygienic 576/57B" /></td>
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<td><img src="image" alt="Gyro 577" /></td>
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<td>40-75</td>
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<td>40-110</td>
<td><img src="image" alt="Tank Cleaning Machine 5TM" /></td>
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</tbody>
</table>
Flow rate guidelines

These charts can help you choose a tank cleaning nozzle based on its size and configuration. Find the closest shape and size to yours and match the color to the key at the bottom. For purposes of flow sizing, we recommend evaluation based on flow per unit of interior surface area. For most washing applications using a rotating nozzle, a flow rate of 0.1 gpm per square foot of interior surface area is sufficient. This ensures coverage with a full sheet of liquid at the least adequately washed areas of the tank.

Light rinsing with full coverage requires at least 0.04 gpm per square foot. With less than that, there will be areas where the flow can tend to pull itself into channels.

Heavier washing will require greater flows. In severe cases, it can require as much as 0.2 gpm per square foot or more.

Static spray balls require at least 0.2 gpm per square foot (heavy wash column).

Tank cleaning machines, like the STM, should be sized using a different approach discussed on page 40. This includes the number of nozzles on the machine and the desired cycle time for a complete revolution.

**Flow rate guidelines**

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<thead>
<tr>
<th>Diameter (feet)</th>
<th>Height (feet)</th>
<th>Interior Surface (sq. feet)</th>
<th>Rinse (gpm)</th>
<th>Regular Wash (gpm)</th>
<th>Heavy Wash (gpm)</th>
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<th>Rinse (gpm)</th>
<th>Regular Wash (gpm)</th>
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</tbody>
</table>

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**Tall Cylinder** (height = 2 x diameter)
**PicoWhirly — for cleaning compact spaces**

**Series 500**

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**PicoWhirly series 500.234**

**Product features:**
- Unique extremely compact nozzle design
- All stainless steel Kolsterized
- Slide bearing
- Free spinning, self-lubricating, and self-flushing
- Operates in every position
- FDA Compliant (see page 24)

**Applications:**
- Kegs
- Cans
- Bottles
- Autoclaves
- Barrel washers
- Machines

**Max. tank diameter:**
3 ft.

**Operating pressure:**
15 – 40 psi, max. 70 psi

**Max. fluid temperature***:
200°F

**Weight:**
.025 lb.

**Material:**
Kolsterized 316L stainless steel

**Bearing:**
Sleeve bearing

**Filtration:**
Line strainer with 50 mesh size

---

<table>
<thead>
<tr>
<th>Spray Angle</th>
<th>Ordering no.</th>
<th>Connection</th>
<th>Flow Rate (Gallons Per Minute)</th>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>20 psi</td>
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<td>.04</td>
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</table>

**Example**


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* Contact Lechler for maximum ambient temperature.

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For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Miniature stainless steel rotating nozzles — compact design with powerful spray impact
Series 566

Stainless Steel Micro Whirly series 566

Product features:
- Very compact design
- Free spinning, self-lubricating, and self-flushing
- Operates in every position
- Suitable for use with steam
- FDA Compliant

Applications:
- Kegs
- Cans
- Bottles
- Autoclaves
- Barrel washers
- Machines

Max. tank diameter:
5 ft.

Operating pressure:
15 – 40 psi, max. 70 psi

Max. fluid temperature*: 266°F

Weight:
566 thread .1 lb.
566 slip-on .2 lb.

Material:
316L stainless steel
PEEK

Bearing:
Sleeve bearing

Filtration:
Line strainer with 50 mesh size

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Miniature plastic nozzles — compact design with powerful spray impact
Series 500

PVDF Micro Whirly series 500.191

Product features:
- Good corrosion resistance
- Very compact design
- Free spinning, self-lubricating, and self-flushing
- Operates in every position
- Fits 1/2” NPT connections
- FDA Compliant

Applications:
- Kegs
- Cans
- Bottles
- Autoclaves
- Barrel washers
- Machines

Max. tank diameter: 5 ft.
Operating pressure: 15 – 30 psi, max. 70 psi
Max. fluid temperature: 190°F
Weight: .06 lb.
Material: PVDF
Bearing: Sleeve bearing

Plastic Mini Whirly series 500.186

Product features:
- Good corrosion resistance
- Very compact design
- Free spinning, self-lubricating, and self-flushing
- Operates in every position
- Fits 1/2” NPT connections
- FDA Compliant

Applications:
- Kegs
- Cans
- Bottles
- Autoclaves
- Barrel washers
- Machines

Max. tank diameter: 5 ft.
Operating pressure: 15 – 30 psi, max. 70 psi
Max. fluid temperature: 120°F
Weight: .15 lb.
Material: PVDF or POM, 316 stainless steel
Bearing: Ball bearing
Filtration: Line strainer with 50 mesh size

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.

Please note: We do not recommend operation of these products with compressed air, steam, or gases. To protect the products’ inner workings, we suggest use of a line strainer with a 50 mesh size. For further information, please contact Lechler.
Rotating pop-up nozzles —
“PopUp Whirly”
Series 5P2 / 5P3

PopUp Whirly
series 5P2 / 5P3

With minimal liquid pressure, this nozzle pops up and rotates to clean. Can be installed in container wall or used when installation conditions are difficult due to presence of agitators, baffles, etc. Appropriate for CIP when nozzle cannot remain in container during production.

Product features:
- For installation in the tank wall
- Suitable for cleaning with foam
- Self rotating
- FDA Compliant
  (see page 24)

Applications:
- For cleaning and rinsing of small tanks, containers or duct work
- Where nozzle cannot remain in container during production
- Hard-to-reach areas in a vessel

Operating pressure:
30 psi, 5P2: opening pressure approx. 14.5 psi; closing pressure approx. 7 psi, 5P3: opening pressure approx. 13 psi, closing pressure approx. 7 psi

Max. fluid temperature:
284°F

Weight:
5P2 series approx. .66 lb.
5P3 series approx. 1.21 lb.

Bearing:
Sleeve bearing made of PEEK

Filtration:
Line strainer with 50 mesh size

Material:
316L stainless steel, spring made of 301 stainless steel, PEEK, O-ring made of EPDM

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.

<table>
<thead>
<tr>
<th>Spray angle</th>
<th>Ordering no.</th>
<th>Tank connection</th>
<th>Free Passage (in.)</th>
<th>Flow Rate (Gallons Per Minute)</th>
<th>Max. Tank diameter (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1¼” Male BSPP</td>
<td>1½” Male BSPP</td>
<td>Tri Clamp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15 psi</td>
<td>liters per minute</td>
</tr>
<tr>
<td>5P2. 873. 1Y. AP</td>
<td>- - -</td>
<td>.04</td>
<td>2.8</td>
<td>15.0</td>
<td>5</td>
</tr>
<tr>
<td>5P2. 873. 1Y. 00</td>
<td>- - -</td>
<td>.04</td>
<td>2.8</td>
<td>15.0</td>
<td>5</td>
</tr>
<tr>
<td>5P2. 923. 1Y. AP</td>
<td>- - -</td>
<td>.04</td>
<td>3.7</td>
<td>20.0</td>
<td>6</td>
</tr>
<tr>
<td>5P2. 923. 1Y. 00</td>
<td>- - -</td>
<td>.04</td>
<td>3.7</td>
<td>20.0</td>
<td>6</td>
</tr>
<tr>
<td>5P3. 043. 1Y. AR</td>
<td>- - -</td>
<td>.05</td>
<td>7.5</td>
<td>15.0</td>
<td>12</td>
</tr>
<tr>
<td>5P3. 043. 1Y. 00</td>
<td>- - -</td>
<td>.05</td>
<td>7.5</td>
<td>15.0</td>
<td>12</td>
</tr>
</tbody>
</table>
Hygienic Whirly — designed to clean with foam
Series 594 / 595

The hygienic Whirly is specifically designed for both (1) cleaning with foam from a mixture of liquid detergent and water and (2) sterilizing with steam. Optionally available as part of a fabricated lance containing two Hygienic Whirlies for even greater coverage.

**Product features:**
- Low water and detergent consumption
- Optimum cleaning efficiency due to slow rotation
- Sprays steam for sterilizing purposes
- Operates in any position
- FDA Compliant (see page 24)

**Applications:**
For cleaning of:
- Tanks with liquids and/or with foam from detergent/water mixtures
- Bottling machines, especially for cold aseptic filling

**Max. tank diameter:**
5 feet
Type 595.139.1Y up to 8 feet

**Operating pressure:**
10-45 psi

**Max. fluid temperature**:
212°F; short-term up to 280°F

**Weight:**
594 .4 lb.
595 .6 lb.

**Material:**
316L stainless steel
PEEK
EHEDG-version:
O-ring made of EPDM
R-Clip made of 316L stainless steel included with the tube slip-on. For reordering: 095.022.1Y.50.94.E

**For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.**

**Ordering no. Flow rate (Gallons Per Minute) Connection**

<table>
<thead>
<tr>
<th>Spray Angle</th>
<th>Ordering no. Type</th>
<th>Connection</th>
<th>Free Passage (in.)</th>
<th>Flow Rate (Gallons Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>360°</td>
<td>594. 829. 1Y AF</td>
<td>- 67</td>
<td>.067</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>594. 879. 1Y AF</td>
<td>- 67</td>
<td>.098</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>595. 009. 1Y AF</td>
<td>- 67</td>
<td>.157</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>595. 049. 1Y AF</td>
<td>- 67</td>
<td>.165</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>595. 139. 1Y - AL 67</td>
<td>.197</td>
<td>9.0</td>
<td>12.4</td>
</tr>
</tbody>
</table>

**Note:** For maximum ambient temperature, we suggest use of a line strainer with a 50 mesh size. For further information, please contact Lechler.

**Please note:** To protect the products’ inner workings, we suggest use of a line strainer with a 50 mesh size. The nozzles with a slip-on connection type fitting may have a higher flow rate than listed due to the self-flushing design around the customer’s tube which is inserted into the nozzle socket.
Static Spray Balls — for rinsing or producing steam
Series 540 / 541

Series 540 / 541

This nozzle is a very compact static spray ball. As it produces sharp solid jets, it is excellent for rinsing small drums.

Product features:
- For use with air or saturated steam
- Partial coverage (240°)

Applications:
- Small kegs
- Drums
- Barrel washers
- Totes
- Carboys

Max. tank diameter:
Rinsing: 10 ft.
Cleaning: 5 ft.

Operating pressure:
15 – 45 psi, max. 150 psi

Max. fluid temperature:
400°F

Weight: 20 lb.

Material: 303 stainless steel

Filtration: Line strainer with 50 mesh size

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.

<table>
<thead>
<tr>
<th>Spray Angle</th>
<th>Ordering no.</th>
<th>Connection</th>
<th>Flow Rate (Gallons Per Minute)</th>
<th>Length (in.)</th>
<th>Maximum Width (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fem. NPT</td>
<td>20 psi</td>
<td>2 bar</td>
<td>40 psi</td>
</tr>
<tr>
<td>240° down</td>
<td>540. 909. 16. BH</td>
<td>.031 1/2&quot;</td>
<td>4.0</td>
<td>18</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>540. 989. 16. BH</td>
<td>.039 1/2&quot;</td>
<td>6.1</td>
<td>28</td>
<td>8.7</td>
</tr>
<tr>
<td></td>
<td>541. 109. 16. BH</td>
<td>.059 1/2&quot;</td>
<td>13</td>
<td>57</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>541. 189. 16. BH</td>
<td>.079 1/2&quot;</td>
<td>20</td>
<td>90</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>541. 239. 16. BH</td>
<td>.090 1/2&quot;</td>
<td>26</td>
<td>118</td>
<td>37</td>
</tr>
</tbody>
</table>

Please note: To protect against clogging, we suggest use of a line strainer with an appropriate line strainer sized to trap particles larger than the free passage. For further information, please contact Lechler.
Series 527

For critical sanitary applications, Lechler provides these specially designed spray balls:

**Product features:**
- Meets the requirements of 3A standards
- Very fine surface finish inside and outside
- All mount using slip-on fittings and pins
- For use with air or saturated steam
- FDA Compliant

(see page 24)

**Applications:**
- For sanitary environments, e.g., dairies, pharmaceutical processing, food and beverage manufacturing, high purity chemicals

**Max. tank diameter:**
- 3/4" inlet: 17 ft.
- 1-1/2" inlet: 20 ft.
- 2" inlet: 27 ft.

**Operating pressure:**
- 15 – 45 psi, max. 75 psi

**Max. fluid temperature:**
- 400°F

**Weight:**
- 3/4" inlet: 0.11 lb.
- 1-1/2" inlet: 0.52 lb.
- 2" inlet: 1.43 lb.

**Material:**
- 316L stainless steel

**Filtration:**
- 3/4" — Line strainer with 50 mesh size
- 1-1/2" — Line strainer with 50 mesh size
- 2" — Line strainer with 30 mesh size

**Note:** There are no threaded inlets available.

---

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Static Spray Balls — RinseClean
Series 5B2/5B3

Series 5B2/5B3

The spray ball design has proven itself in many applications. It can be used in areas with high hygienic requirements and high temperatures. Our RinseClean spray ball is available with various slip-on connections, as well as in threaded or welded versions.

Product features:
- Very fine surface finish inside and outside
- For use with air or saturated steam
- FDA Compliant

Applications:
- For sanitary environments, e.g. pharmaceutical processing, food and beverage manufacturing, high purity chemicals

Max. tank diameter:
- 1/8" inlet 7 ft.
- 1/2" inlet 11 ft.
- 1" inlet 17 ft.
- 2" inlet 18 ft.

Operating pressure: 30 psi

Max. fluid temperature: 392°F

Weight:
- 3/4" inlet .11 lb.
- 1-1/2" inlet .52 lb.
- 2" inlet 1.43 lb.

Material: 316L stainless steel

Slip-on connection

With the slip-on connection, the spray ball is pushed onto the customer's connection pipe and secured with the supplied R-clip. Lechler offers the right connection sizes for the three most common pipe standards.

Slip-on information
- R-clip made of 316/316L SS is included.
- Ordering no.: See table on page 3
- Depending on diameter of adapter, the flow rate can increase due to leakage between connecting pipe and static spray ball.

Applications:
- For sanitary environments, e.g. pharmaceutical processing, food and beverage manufacturing, high purity chemicals

Max. tank diameter:
- 1/8" inlet 7 ft.
- 1/2" inlet 11 ft.
- 1" inlet 17 ft.
- 2" inlet 18 ft.

Operating pressure: 30 psi

Max. fluid temperature: 392°F

Weight:
- 3/4" inlet .11 lb.
- 1-1/2" inlet .52 lb.
- 2" inlet 1.43 lb.

Material: 316L stainless steel

Threaded connection

Threaded connection

www.LechlerUSA.com
Series 5MC / 5MI

When small tank openings restrict the size of the nozzle, the Spinner series offers high flow rates with a thin profile that will slip into tight spuds.

Product features:
- High flow slot orifices produce big sprays from a small head
- Head balanced for minimum vibration
- Operates in any position
- Free spinning, self-lubricating, and self-flushing
- FDA Compliant

Applications:
- Barrel washing
- For small and medium processing tanks
- CNC machining centers

Max. tank diameter:
- Micro rinsing: 6 ft.
- Micro cleaning: 4 ft.
- Mini rinsing: 12 ft.
- Mini cleaning: 9 ft.

Operating pressure:
- 15 – 30 psi, max. 60 psi

Max. fluid temperature*:
- 200°F

Weight:
- Micro: .15 lb.
- Mini: .68 lb.

Materials:
- 316L stainless steel
- 440C stainless steel
- R-Clip made of 316L stainless steel included. For reordering: 095.022.1Y.50.60 (5Mi)
- 095.013.1E.05.59 (5MC)

Bearing:
- Double ball bearing

Filtration:
- Line strainer with 170 mesh size

Example Type + Conn. = Ordering no. for ordering: 5MC. 004. 1Y. BF = 5MC. 004. 1Y. BF

Spray Angle | Ordering no. | Flow Rate (Gallons Per Minute)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Connection</td>
<td>5/8&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Female NPT</td>
<td>Female NPT</td>
<td>OD Slip-on</td>
<td>OD Slip-on</td>
<td>OD Slip-on</td>
</tr>
<tr>
<td>60° down</td>
<td>5MC. 042. 1Y BF - - TF05 -</td>
<td>.118</td>
<td>6.2</td>
<td>8.8</td>
<td>40</td>
<td>12.4</td>
<td>15.2</td>
</tr>
<tr>
<td>180° down</td>
<td>5MC. 004. 1Y BF - - TF05 -</td>
<td>.031</td>
<td>5.0</td>
<td>7.0</td>
<td>32</td>
<td>9.9</td>
<td>12.2</td>
</tr>
<tr>
<td>360°</td>
<td>5MC. 049. 1Y BF - - TF05 -</td>
<td>.035</td>
<td>6.1</td>
<td>8.6</td>
<td>39</td>
<td>12.1</td>
<td>14.8</td>
</tr>
<tr>
<td>60° down</td>
<td>5MI. 162. 1Y - BH - - TF07 -</td>
<td>.102</td>
<td>9.8</td>
<td>13.8</td>
<td>63</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>180° up</td>
<td>5MI. 113. 1Y - - BL - TF07 -</td>
<td>.039</td>
<td>10.4</td>
<td>14.7</td>
<td>67</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>180° down</td>
<td>5MI. 114. 1Y - - BL - TF07 -</td>
<td>.039</td>
<td>10.4</td>
<td>14.7</td>
<td>67</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>360°</td>
<td>5MI. 054. 1Y - - BL - TF07 -</td>
<td>.019</td>
<td>4.7</td>
<td>6.6</td>
<td>30</td>
<td>9.3</td>
<td>11.4</td>
</tr>
<tr>
<td>5MI. 074. 1Y - - BL - TF07 -</td>
<td>.023</td>
<td>7.6</td>
<td>10.8</td>
<td>49</td>
<td>15.2</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td>5MI. 014. 1Y - - BL - TF07 -</td>
<td>.035</td>
<td>10.7</td>
<td>15.1</td>
<td>69</td>
<td>21</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

Example Type + Conn. = Ordering no. for ordering: 5MC. 004. 1Y. BF = 5MC. 004. 1Y. BF

Spray Angle | Ordering no. | Flow Rate (Gallons Per Minute)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type</td>
<td>Connection</td>
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<td>3/4&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Female NPT</td>
<td>Female NPT</td>
<td>OD</td>
</tr>
<tr>
<td>360°</td>
<td>5MI. 089. 17. BL</td>
<td>.038</td>
<td>3/4&quot;</td>
<td>11</td>
<td>49</td>
</tr>
<tr>
<td>5MI. 139. 17. BL</td>
<td>.059</td>
<td>3/4&quot;</td>
<td>15</td>
<td>69</td>
<td>21</td>
</tr>
</tbody>
</table>

* Contact Lechler for maximum ambient temperature.
We do not recommend operation of these products with compressed air, steam, or gases. To protect the products’ inner workings, we suggest use of a line strainer with a 170 mesh size.

Please note: The nozzles with a slip-on connection type fitting may have a higher flow rate than listed due to the self-flushing design around the customer's tube which is inserted into the nozzle socket.

1-800-777-2926
Stainless Steel Whirly — the versatile standard solution
Series 569

The time-tested design of the Lechler Whirly nozzle now has been made even better:

**Product features:**
- Flat jet nozzles with improved vertical coverage
- Better balance for smoother operation
- Fits through smaller openings (569.106.1Y.BL fits through 1.8” opening)
- Slip-on or Tri-Clamp thread connection available
- Free spinning, self-lubricating, and self-flushing
- FDA Compliant (see page 24)

**Applications:**
- For cleaning small and medium-sized tanks, e.g., in chemical, beverage, food industries

Max. tank diameter:
- Rinsing: 15 ft.
- Cleaning: 10 ft.

Operating pressure:
- 15 – 40 psi, max. 80 psi

Max. fluid temperature*:
- 200°F

Weight:
- Threaded: 1.1 lb.
- Slip-on: 1.6 lb.
- Tri-Clamp: 1.3 lb.

Material:
- 316L stainless steel
- PEEK and Rulon 641
- R-Clip made of 316L stainless steel included with the tube slip-on. For reordering: 095.022.1Y.50.60.E

Bearing:
- Double ball bearing

Filtration:
- Line strainer with 170 mesh size

---

**Spray Angle**

<table>
<thead>
<tr>
<th>Angle</th>
<th>Ordering no.</th>
<th>Flow Rate (Gallons Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20 psi</td>
</tr>
<tr>
<td>270° up</td>
<td>569. 055. 1Y BL TF07 TF10 TF15 10</td>
<td>.141</td>
</tr>
<tr>
<td>270° down</td>
<td>569. 056. 1Y BL TF07 TF10 TF15 10</td>
<td>.141</td>
</tr>
<tr>
<td>360°</td>
<td>569. 059. 1Y BL TF07 TF10 TF15 10</td>
<td>.126</td>
</tr>
</tbody>
</table>

Stainless Steel Whirlies in 180° versions available upon request.

**Please note:** We do not recommend operation of these products with compressed air, steam, or gases. To protect the products’ inner workings, we suggest use of a line strainer with a 170 mesh size. For further information, please contact Lechler.

The nozzles with a slip-on connection type fitting may have a higher flow rate than listed due to the self-flushing design around the customer’s tube which is inserted into the nozzle socket.

Example: For ordering: 569. 055. 1Y. + BL = 569. 055. 1Y. BL

---

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Series 583 / 573

Product features:
- Corrosion resistance
- Lightweight
- Balanced rotating action
- Operates in every position
- 3/4” size fits through a 2” opening
- Slip-on version design meets 3A standards
- Smooth surface finish
- Free spinning, self-lubricating, and self-flushing
- FDA Compliant

(see page 24)

Applications:
- For rinsing of small and medium-sized vessels, e.g. in the dairy, chemical, pharmaceutical or food industries

Max. tank diameter:
- Rinsing: 18 ft.
- Cleaning: 10 ft.

Operating pressure:
- 20 – 40 psi, max. 90 psi

Max. fluid temperature**:
- 200°F

Weight:
- 3/4” .32 lb.
- 1” .68 lb.

Material:
- PTFE
- R-Clip made of 316L stainless steel included with the tube slip-on. For reordering: 095.022.1Y.50.88.E (3/4”) 095.022.1Y.50.60.E (1”)

Bearing: Sleeve bearing

Filtration:
- Line strainer with 50 mesh size

Please note: We do not recommend operation of these products with compressed air, steam, or gases. To protect the products’ inner workings, we suggest use of a line strainer with a 50 mesh size. For further information, please contact Lechler. The nozzles with a slip-on connection type fitting may have a higher flow rate than listed due to the self-flushing design around the customer’s tube which is inserted into the nozzle socket.

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.

Example Type + Conn. = Ordering no. for ordering: 583. 266. 55. + BL = 583. 266. 55. BL

** Contact Lechler for maximum ambient temperature.
PTFE Hi Temp Whirly — solution for high temperature cleaning
Series 599

While PTFE can withstand high temperatures, its dimensional stability limits its range as a tank cleaning device. Lechler’s design incorporates Hastelloy® rings to control the expansion of the material so it can continue to operate reliably in hotter environments than normally possible. The nozzle’s temperature range is actually extended, since it can perform equally well under normal conditions.

Product features:
- Balanced rotating action
- Operates in every position
- Free spinning, self-lubricating, and self-flushing
- Withstands repeated high temperature cycles
- Suitable for low pressure steam; slip-on sanitary model has been tested with steam up to 30 psig @ 274°F.
- FDA Compliant (see page 24)

Applications:
- For small and medium-sized vessels and reactors in higher temperature processing environments
- Corrosive environments

Max. tank diameter:
Rinsing: 18 ft.
Cleaning: 10 ft.

Operating pressure:
15 – 40 psi, max. 90 psi

Max. fluid temperature:
274°F

Weight:
3/4” .36 lb.

Materials:
PTFE
Rings: Hastelloy® C-276
R-clip made of Hastelloy®
C-276 included with the tube slip on. For reordering: 095.022.24.50.94.1

Bearing: Sleeve bearing

Filtration:
Line strainer with 50 mesh size

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Series 515

The design of the ACCUClean combines more efficient cleaning technology in an economical package.

Product features:
- Controlled rotation for maximum spray impact
- Optimized drive mechanism
- Special nozzle geometry for sharp sprays
- Excellent vertical coverage
- Self-lubricating and self-flushing
- Long-life bearing

Applications:
- Difficult soils or baked-on substances
- For medium tanks, such as chemical or pharmaceutical processing

Max. tank diameter:
Inlet Size Activity Tank Diam.
3/4" Rinsing 15 ft.
3/4" Cleaning 10 ft.
1" Rinsing 18 ft.
1" Cleaning 12 ft.

Operating pressure:
20 – 75 psi

Max. fluid temperature*:
200°F

Weight:
3/4" 3.1 lb.
1" 3.1 lb.

Material:
316L stainless steel
PEEK

Bearing:
Ball bearing

Filtration:
Line strainer with 50 mesh size

Rotation monitoring sensor:
This series is qualified for rotation monitoring with the Lechler sensor. Please see page 42 for more information.

Contact Lechler for other spray angles available.

Please note: We do not recommend operation of these products with compressed air, steam, or gases. To protect the products' inner workings, we suggest use of a line strainer with a 50 mesh size. For further information, please contact Lechler.

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
Series 5S2 / 5S3

Specially developed flat fan nozzles provide high impact and uniform cleaning for the XactClean® HP. The controlled rotation ensures that the XactClean® HP works extremely efficient. Thanks to the robust drive unit the XactClean® HP is very reliable and ensures increased operation liability. It is available in various spray angles and flow rates and is also compatible with the Lechler rotating monitoring sensor.

Product features:
- Controlled rotation
- Powerful flat jet nozzles
- Very efficient tank cleaning nozzle
- FDA Compliant

Materials:
- 316L SS, 316 SS, 632 SS, PEEK, PEEK ESD (ATEX version only) PTFE, Zirconium oxide, EPDM

Max. temperature: 203°F/ 95°C
Max. tank dimension: 11.5-26 ft.
Recommended operating pressure: 75 psi
Installation:
- Operation in every direction is possible

Filtration:
- Line strainer with a mesh size of 0.3 mm/50 mesh

Bearing:
- Double ball bearing

Rotation monitoring sensor:
- Sensor compatible, Info: see page 42

Nozzle dimensions [in]

<table>
<thead>
<tr>
<th>Connection</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF</td>
<td>5.83</td>
</tr>
<tr>
<td>BH</td>
<td>5.87</td>
</tr>
<tr>
<td>BL</td>
<td>5.47</td>
</tr>
<tr>
<td>TF05</td>
<td>5.91</td>
</tr>
<tr>
<td>TF07</td>
<td>6.46</td>
</tr>
</tbody>
</table>

Spray angle

<table>
<thead>
<tr>
<th>Type</th>
<th>3/8&quot; Female NPT</th>
<th>1/2&quot; Female NPT</th>
<th>1&quot; OD Slip-on</th>
<th>Free Passage (in.)</th>
<th>Flow Rate (Gallons Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 bar 30 psi</td>
<td>40 psi 75 psi 145 psi</td>
</tr>
<tr>
<td>270°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5S2. 955. 1Y BF BH - - TF05 -</td>
<td>.08</td>
<td>25</td>
<td>6.6</td>
<td>7.8</td>
<td>10.6</td>
</tr>
<tr>
<td>5S3. 055. 1Y - BH - - TF05 -</td>
<td>.08</td>
<td>41</td>
<td>10.8</td>
<td>12.8</td>
<td>17.2</td>
</tr>
<tr>
<td>5S3. 115. 1Y - BH BL - - TF07 -</td>
<td>.08</td>
<td>60</td>
<td>15.9</td>
<td>18.4</td>
<td>24.8</td>
</tr>
<tr>
<td>5S3. 185. 1Y - - BL - - TF07 -</td>
<td>.08</td>
<td>89</td>
<td>23.5</td>
<td>27.7</td>
<td>37.3</td>
</tr>
<tr>
<td>5S3. 235. 1Y - - BL - - TF07 -</td>
<td>.08</td>
<td>111</td>
<td>29.3</td>
<td>34.3</td>
<td>46.2</td>
</tr>
<tr>
<td>5S3. 265. 1Y - - BL BN - - TF07 -</td>
<td>.08</td>
<td>135</td>
<td>35.7</td>
<td>41.8</td>
<td>56.3</td>
</tr>
<tr>
<td>360°</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5S2. 959. 1Y BF BH - - TF05 -</td>
<td>.07</td>
<td>25</td>
<td>6.6</td>
<td>7.8</td>
<td>10.6</td>
</tr>
<tr>
<td>5S3. 059. 1Y - BH - - TF05 -</td>
<td>.08</td>
<td>41</td>
<td>10.8</td>
<td>12.8</td>
<td>17.2</td>
</tr>
<tr>
<td>5S3. 119. 1Y - BH BL - - TF07 -</td>
<td>.08</td>
<td>60</td>
<td>15.9</td>
<td>18.4</td>
<td>24.8</td>
</tr>
<tr>
<td>5S3. 189. 1Y - - BL - - TF07 -</td>
<td>.08</td>
<td>89</td>
<td>23.5</td>
<td>27.7</td>
<td>37.3</td>
</tr>
<tr>
<td>5S3. 239. 1Y - - BL - - TF07 -</td>
<td>.08</td>
<td>111</td>
<td>29.3</td>
<td>34.3</td>
<td>46.2</td>
</tr>
<tr>
<td>5S3. 269. 1Y - - BL BN - - TF07 -</td>
<td>.08</td>
<td>135</td>
<td>35.7</td>
<td>41.8</td>
<td>56.3</td>
</tr>
</tbody>
</table>

Example Type + Conn. = Ordering no.
for ordering: 5S2. 956. 1Y + BF = 5S2. 956. 1Y. BF

Please note: We do not recommend operation of these products with compressed air. In order to protect the bearing, a line strainer with a mesh size of 50 mesh should be used. Operation without a line strainer may result in damage to the nozzle. For further information, please contact Lechler.

The nozzles with a slip-on connection type fitting may have a higher flow rate than listed due to the self-flushing design around the customer's tube which is inserted into the nozzle socket.

For various configurations to mount your tank cleaning nozzle, see the Lances and Nozzle Headers section beginning on page 141.
High impact tank cleaning machine
“IntenseClean Hygienic”
Series 5TA / 5TB

Product features:
- Gear-controlled
- Particularly powerful solid jets
- Two different sizes for a variety of container sizes
- Operating pressures up to 362 psi possible
- FDA Compliant (see page 24)

Applications:
For cleaning of:
- Systems
- Machines
- Tankers
- Large tanks

Max. tank diameter:
See table

Operating pressure:
29 - 145 psi

Temperature:
203°F, 266°F (Environment)

Weight:
5TA approx. 2 lb.
5TB approx. 8.8 lb.

Materials:
Stainless steel AISI 316L,
AISI 632, PTFE, PEEK,
Zirconium oxide, EPDM,
32 RA surface finish is included with every material

Bearing:
Ball bearing

Required prefiltration:
Line filter with 0.2 mm/80 mesh

Installation:
Operation in every direction is possible

Rotation monitoring sensor:
This series is qualified for rotation monitoring with the Lechler sensor. Please see page 42 for more information.

The new Lechler rotating jet cleaner enables containers and systems to be cleaned very efficiently. Thanks to the powerful solid jets, it also performs even the most difficult cleaning tasks.

Its high-quality and hygienic design makes it especially well suited for use in the chemicals and pharmaceuticals industry.

### 5TA

<table>
<thead>
<tr>
<th>Spray Angle</th>
<th>Ordering no.</th>
<th>Number, Ø of nozzles (mm)</th>
<th>Flow Rate (Gallons Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>360°</td>
<td>5TA. 403. 1Y. BL</td>
<td>.059 4 x 3.0 mm</td>
<td>25.0 6.8 7.9 10.8 14.9 26 217</td>
</tr>
<tr>
<td></td>
<td>5TA. 404. 1Y. BL</td>
<td>.059 4 x 4.0 mm</td>
<td>42.0 11.2 13.0 17.7 24.7 36 217</td>
</tr>
<tr>
<td></td>
<td>5TA. 405. 1Y. BL</td>
<td>.059 4 x 5.0 mm</td>
<td>50.0 13.4 15.5 21.2 29.5 39 217</td>
</tr>
</tbody>
</table>

### 5TB

<table>
<thead>
<tr>
<th>Spray Angle</th>
<th>Ordering no.</th>
<th>Number, Ø of nozzles (mm)</th>
<th>Flow Rate (Gallons Per Minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>360°</td>
<td>5TB. 406. 1Y. BS</td>
<td>.236 4 x 6.0 mm</td>
<td>1070 28.7 33.1 45.4 63.1 42 362</td>
</tr>
<tr>
<td></td>
<td>5TB. 407. 1Y. BS</td>
<td>.236 4 x 7.0 mm</td>
<td>135.0 35.5 41.0 56.2 78.2 46 362</td>
</tr>
<tr>
<td></td>
<td>5TB. 408. 1Y. BS</td>
<td>.236 4 x 8.0 mm</td>
<td>165.0 40.3 46.7 63.9 88.8 46 362</td>
</tr>
</tbody>
</table>

ATEX version on request
Series 577

With our largest capacity free spinning designs, the Gyro family is the high flow work horse of our tank cleaning nozzle line.

Product features:
- Highest flow rates of all our tank cleaning nozzles
- High cleaning performance at low pressures
- PTFE bearings easily replaced to extend the service life
- Free spinning, self-lubricating, and self-flushing
- FDA Compliant (see page 24)

Applications:
- Medium to large tanks
- Ethanol fermenters
- Paper machine headboxes
- Chemical storage
- Breweries

Max. tank diameter:
Inlet Size | Tank Diameter
-----------|-------------
1”         | 11’         
2”         | 18’         

Operating pressure: 20 – 50 psi, max. 65 psi

Max. fluid temperature*: 200°F

Weight:
1”         | 1.65 lb.
2”         | 4 lb.

Material: 316 stainless steel PTFE

Bearing: Sleeve bearing

Filtration: Line strainer with 20 mesh size

The PTFE bearings and other wear parts can be replaced easily to extend the life of the unit. A rebuild kit contains: Bearing sleeves, bolt, nut, spacer, and complete instructions.

Contents of Gyro rebuild kit

Spray Angle

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>Flow Rate (Gallons Per Minute)</th>
<th>Length (in.)</th>
<th>Width (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20 psi</td>
<td>2 bar</td>
<td>40 psi</td>
</tr>
<tr>
<td>180° down</td>
<td>577. 284. 1Y BN -</td>
<td>35</td>
<td>161</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>577. 364. 1Y BN -</td>
<td>56</td>
<td>258</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>577. 494. 1Y - BW</td>
<td>120</td>
<td>538</td>
<td>170</td>
</tr>
<tr>
<td>270° up</td>
<td>577. 285. 1Y BN -</td>
<td>35</td>
<td>161</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>577. 405. 1Y - BW</td>
<td>70</td>
<td>322</td>
<td>100</td>
</tr>
<tr>
<td>360°</td>
<td>577. 289. 1Y BN -</td>
<td>35</td>
<td>161</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>577. 369. 1Y BN -</td>
<td>57</td>
<td>258</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>577. 409. 1Y - BW</td>
<td>70</td>
<td>322</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>577. 439. 1Y - BW</td>
<td>85</td>
<td>387</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>577. 499. 1Y - BW</td>
<td>120</td>
<td>548</td>
<td>170</td>
</tr>
</tbody>
</table>

Please note: We do not recommend operation of these products with compressed air, steam, or gases. For further information, please contact Lechler.

Example Type + Conn. = Ordering no.
for ordering: 577. 284. 1Y + BN = 577. 284. 1Y. BN

* Contact Lechler for maximum ambient temperature.
High impact tank cleaning machine — for the largest tanks and the toughest cleaning jobs
Series 5TM

Series 5TM
For the largest tanks and most difficult applications, this gear-driven tank washing machine is our most powerful.

Product features:
- Very high cleaning performance at low pressures
- Requires no lubricants
- Systematically sweeps the entire tank interior (360°)
- Regular maintenance by replacement of wetted parts ensures long product life
- Can be mounted in any orientation

Applications:
- Large tanks
- Tough cleaning tasks, e.g., wine and beer fermenters, tank trucks, rail cars, chemical processing

Max. tank diameter:
Cleaning: 50 ft.

Operating pressure:
30–100 psi, max. 150 psi

Max. fluid temperature*: 5TM: 140°F/60°C

Weight: Approx. 16.5 lb.

Material:
316L stainless steel
PTFE and carbon fiber

Bearing:
Ball and slide bearings

Filtration:
Line strainer with 80 mesh size

Opening requirement:
(Round hole diameter)
2 nozzle 5.9 inches
4 nozzle 7.8 inches

Rotation monitoring sensor:
This series is qualified for rotation monitoring with the Lechler sensor. Please see page 42 for more information.

<table>
<thead>
<tr>
<th>Type</th>
<th>Connection</th>
<th>No. of Nozzles x Diameter</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>5TM. 208. 1Y</td>
<td>BR BS 015</td>
<td>.314 2x8mm</td>
<td>Flow Rate 40 gpm</td>
</tr>
<tr>
<td>5TM. 209. 1Y</td>
<td>BR BS 015</td>
<td>.354 2x9mm</td>
<td>Flow Rate 45 gpm</td>
</tr>
<tr>
<td>5TM. 210. 1Y</td>
<td>BR BS 015</td>
<td>.394 2x10mm</td>
<td>Flow Rate 50 gpm</td>
</tr>
<tr>
<td>5TM. 211. 1Y</td>
<td>BR BS 015</td>
<td>.433 2x11mm</td>
<td>Flow Rate 57 gpm</td>
</tr>
<tr>
<td>5TM. 407. 1Y</td>
<td>BR BS 015</td>
<td>.276 4x7mm</td>
<td>Flow Rate 53 gpm</td>
</tr>
<tr>
<td>5TM. 408. 1Y</td>
<td>BR BS 015</td>
<td>.315 4x8mm</td>
<td>Flow Rate 62 gpm</td>
</tr>
<tr>
<td>5TM. 410. 1Y</td>
<td>BR BS 015</td>
<td>.394 4x10mm</td>
<td>Flow Rate 80 gpm</td>
</tr>
</tbody>
</table>

Bold type under operating pressure column indicates flows in excess of 80 gpm, which exceeds the normal maximum flow through the machine. Operating beyond this point can cause excessive speed and premature wear to the internal gear train. If you require this high a flow rate, contact us to discuss modifications to your unit. The operating Cycle Time is typically the minimum required for a full cleaning of a tank 30' in diameter or smaller. Larger tanks or difficult cleaning situations may require longer cycle times.

Please note: We do not recommend operation of these products with compressed air, steam, or gases. To protect the products’ inner workings, we suggest use of a line strainer with a 80 mesh size. For further information, please contact Lechler.

The previous M20/M29 series has been replaced with the 5TM series. 5TM components are compatible with all existing M20/M29 tank cleaning machines.

Example: Type + Conn. = Ordering no.
for ordering: 5TM. 208. 17 + BR = 5TM. 208. 17. BR

* Contact Lechler for maximum ambient temperature.
Special tank cleaning configurations and accessories

Rotation Monitoring Sensor

The new Rotation Monitoring Sensor is a reliable way to confirm that your rotating tank cleaning nozzle is actually moving inside the tank. This is especially important for enclosed tanks where the operator has no access to view the interior of the tank.

The sensor is mounted from outside the tank with a weld-in sleeve that allows the probe tip to fit directly inside the tank so that cascading liquid can come in direct contact with the probe tip. Special software monitors the flow of cascading liquid intervals to determine if the nozzle is rotating. It will show a green light when proper rotation is detected and a red light when it is not.

Product features:
- Reliable detection for rotating spray devices
- Free software, easy to configure for installation
- PC is no longer required after configuration
- Can be integrated into a PLC via M12 connector
- FDA Compliant

Applications:
- Tank and vessel cleaning

Material:
- Socket: 316L stainless steel
- Body: 303 stainless steel
- Probe tip: PEEK

Electrical:
- 18 up to 32 VDC
- Power: <20 mA
- Output signal: PNP, 50 mA short circuit protected

Operating temperature:
- 0° up to +212°F

Ambient temperature:
- 14°F up to 140°F

Ordering Numbers:
- 050.040.00.00.00.0 Rotation Monitoring Sensor with Weld-In Sleeve
- 050.040.00.00.01.0 Cable Set for first-time operation

Lances

A common way to insert a tank cleaning nozzle into a tank for cleaning is by way of a lance. As with any inlet connection for a tank cleaning product, nozzles may be connected to a lance in these ways:
- Threaded
- Tri-Clamp
- Slip-on (secured with an R-clip)
- Welded
- Flanged

There are two types of lances that can be used for tank cleaning:
- Standard (or fixed length)
- Retractable

Either can simply be bolted to the tank wall while the lance end is inserted into the tank.

The standard lance (see Figures 1-3) has a fixed length so care must be taken to ensure the lance is of the proper length for the size of the tank. On the retractable lance (see Figure 4), the shaft actually retracts, returning the nozzle back into the flange portion of the assembly so it only comes out when cleaning is performed.

Whatever your tank cleaning lance needs, even for something special like Figure 3, Lechler can fabricate one specifically for your application, be it for food, pharmaceutical, chemical processing or any other industry.