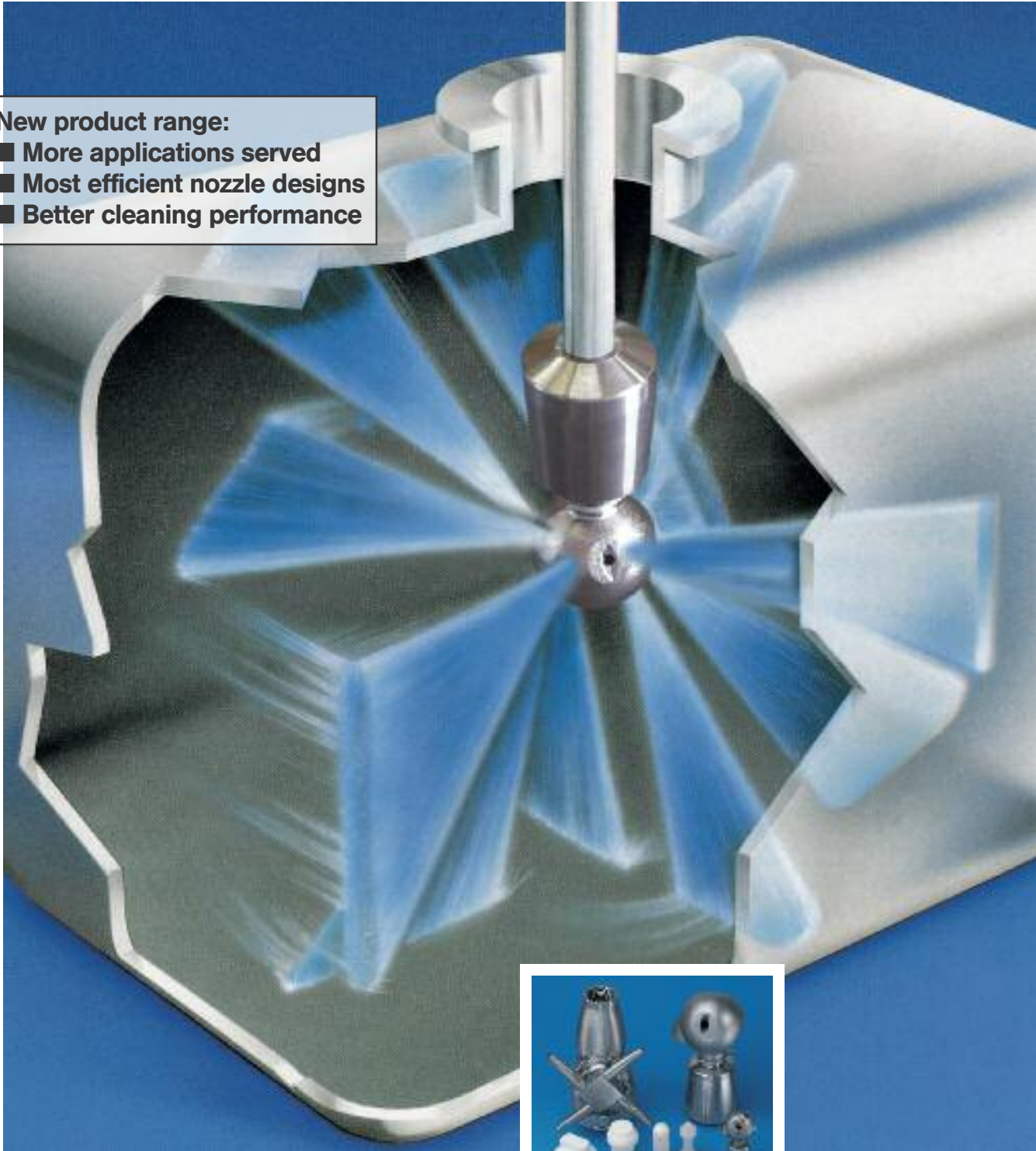




**NEW: ATEX-approved  
and FDA-conform nozzles**

## Tank Cleaning Nozzles

- New product range:
- More applications served
  - Most efficient nozzle designs
  - Better cleaning performance



# Lechler tank cleaning nozzles - economical, reliable and time-tested

Lechler, with more than 130 years of experience, is a world leader in nozzle technology. Lechler has pioneered numerous groundbreaking developments in this field, and numerous products characterized by extraordinary efficiency and reliability have emerged from our engineering work.

## Optimizing the cleaning process

Thousands of companies are satisfied users of Lechler tank cleaning nozzles for the largely automatic cleaning of diverse tanks, vessels, machines and enclosed spaces.

Your advantages:

- You can forget all the risks, limitations and expenses of cleaning tanks by hand.
- Modern nozzle technology requires less cleaning liquid and reduces equipment down-time.
- The cleaning process is trouble-free, reproducible and verifiable.

## New products for practically any application

Lechler's new tank cleaning program features innovative drives and state-of-the-art

nozzles in a broad range of sizes and materials. Among this unique array, you'll surely find the products you need for any application, be it an elementary arrangement or a sophisticated CIP system.

## High cleaning capability at low-pressure

Thanks to the cutting-edge technology we employ, tank cleaning nozzles by Lechler exhibit superior cleaning capabilities, even at low pressures. That saves expensive energy, and the fact that they are driven and lubricated by the cleaning liquid makes them both low maintenance and particularly reliable.

## Your competent specialist – anywhere in the world

Lechler has subsidiaries in the USA, England, India, China, France, Belgium, Sweden, Finland and Spain and is represented by qualified agents in more than 40 additional countries.

Take advantage of our know-how to solve your cleaning problems – anywhere in the world.



## Scope of application

- Chemical industry
- Food & beverage industry
- Tank-building and process technology
- Machine-tool engineering
- Cosmetic industry
- Pharmaceutical industry
- Bioengineering
- Agricultural engineering



Headquarters, Germany



Lechler Ltd., England



Lechler Inc., USA

# How to choose a good tank cleaning nozzle

The following step-by-step rundown will help you define your cleaning task and get the most out of our corresponding products.

## Begin by analyzing your cleaning task:

- How large is the tank in terms of size and interior surface area?
  - Where is the dirt located; how bad is it; and what is its nature?
  - Which method of cleaning is required: strong blasts of cleaner or repetitive rinsing?
  - What kind of cleaning chemicals are you using?
  - Are there any internal obstacles (e.g., mixing vanes)?
- More information on page 4.



## In defining your tank cleaning nozzle installation, be sure to observe the following three parameters:

### 1) Rinsing effect – a function of flow rate

Ascertain the requisite liquid flow rate by trial and error as a function of the applied pressure.

- All points of relevance should be turbulently circumswept/rinsed by an adequately thick film 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 whatever you're putting in the tank.

→ More information on page 6.

### 2) Force of impact – helps strip off crusty dirt

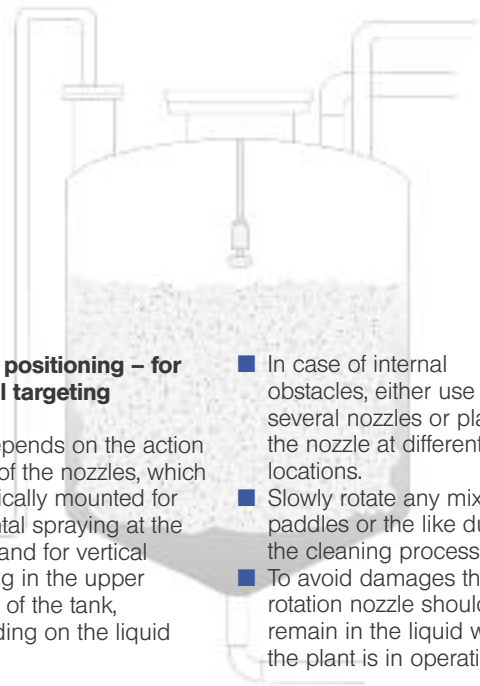
The force of impact depends on:

- ...adherence to the optimal operating pressure range for the type of nozzle in use;
- ...the right action 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

The higher the pressure, the smaller the droplet size. Consequently, more flow is better than more pressure.

### 3) Proper positioning – for optimal targeting

- This depends on the action radius of the nozzles, which are typically mounted for horizontal spraying at the center and for vertical spraying in the upper quarter of the tank, depending on the liquid level.
- In case of internal obstacles, either use several nozzles or place the nozzle at different locations.
- Slowly rotate any mixing paddles or the like during the cleaning process.
- To avoid damages the rotation nozzle should not remain in the liquid while the plant is in operation.



**Check with your local Lechler nozzle-application advisor about the requirements for your particular application.**

# Guidelines for application and operation

## General design families

### Shared characteristics:

#### ■ Low-pressure application.

Your benefit: lower energy consumption coupled with less wear and tear.

#### ■ Rotational cleaners: driven and lubricated by the cleaning liquid.

Your benefit: no need for elaborate drive mechanisms.

### Free-spinning heads

The cleaning liquid turns the spray head by means of specially positioned nozzles. Rapid-repetition impact loosens the dirt and washes it off of the tank surfaces. The effect is best at low pressures in small to medium-size tanks. → See pages 9 to 15 for nozzle design families

### Internal regulated drive

The liquid flow powers the head by way of an internal turbine. This keeps the speed of the head within its optimal range across a wider span of pressures, and the nozzle develops more powerful spray propagation and a wider range.

→ See page 16 for ACCUClean nozzles

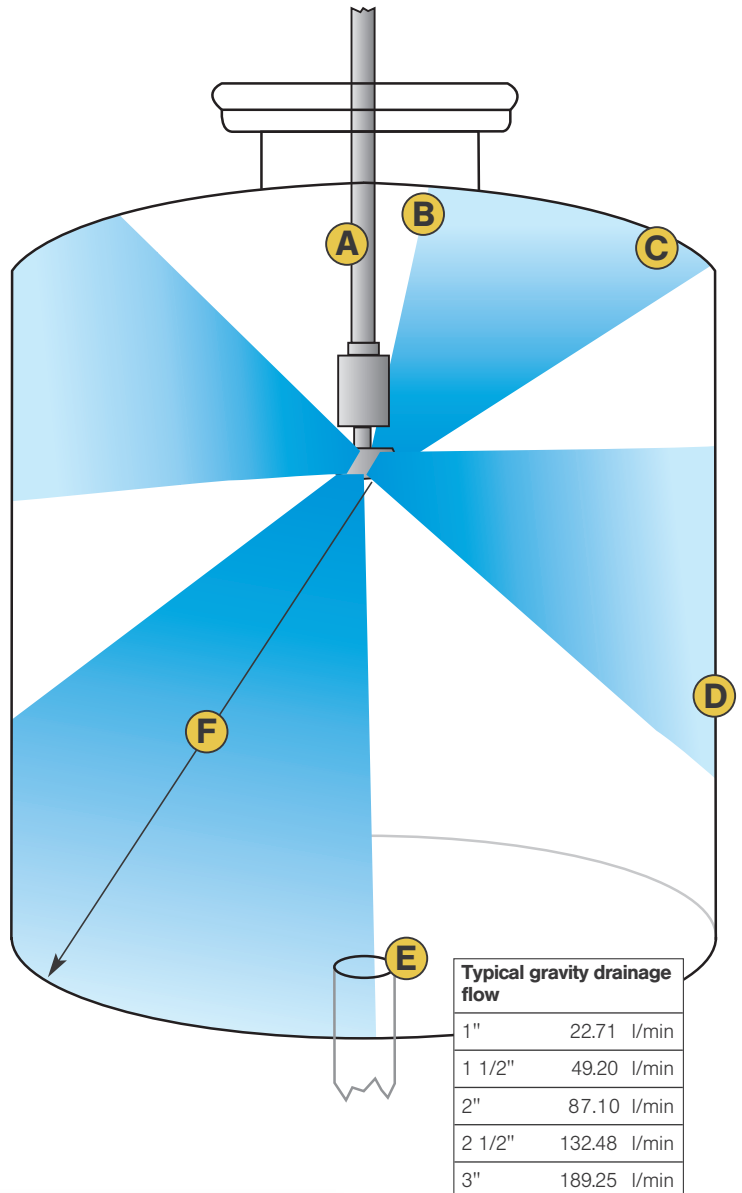
## Programmed rotation machines

Here, the cleaning fluid drives via the turbine an internal gear reducer that keeps the sprayer turning in two planes. In the course of a spraying cycle, the jets sweep the entire inside surface of the tank according to a preprogrammed, model-specific pattern. This takes a certain amount of time, but these models generate the highest jet pressures (= force of impact) and are therefore ideal for very large tanks and the toughest of cleaning tasks. → See page 17 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. They are used primarily for washing down relatively small tanks and vessels.

→ See pages 18 and 19 for spray balls



### Typical applications

- Ⓐ - Position the tank cleaning nozzle(s) at the center of the tank, roughly one-quarter of the distance from top to bottom.
- Ⓑ - Nozzles invariably leave an unsprayed shadow area directly overhead, the size of which varies according to the type of nozzle and the piping.
- Ⓒ - The distance between the top of the tank and the nozzle should amount to approximately one-quarter of the nozzle's action radius. Size your unit to ensure sufficient flow to the top part of the tank wall.
- Ⓓ - The film of liquid grows thicker toward the bottom of the tank, where the washing effect is the most pronounced.
- Ⓔ - Standing water reduces impact and allows solids to accumulate. Make sure that the drain can handle whatever you put into the tank.
- Ⓕ - The longest spray distance is from the nozzle to the bottom corner, so the nozzle should be sized for this »effective washing distance«.

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

# Mounting configurations

## Requirements for critical CIP applications

### Mounting configurations

All Lechler tank cleaning nozzles are designed to be mounted on a pipe. 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 pipe that has a cross hole drilled. A pin is then inserted to hold the head in place.

#### Tri-Clamp

Food and beverage manufacturers use tri-clamp connectors to join pipe. Some tank cleaning nozzles are available with a compatible flange to mate with those. Each product section describes the mounting options in detail.

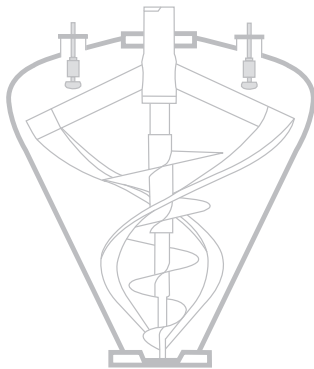
See separate product descriptions from page 9 on for detailed connection data.

### 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.

→ CIP-nozzles see pages 9, 10, 12, 15, 18, 19

We are welcome to help you with your choice.



### Typical washing sequences

A thorough tank cleaning sequence depends on the interaction between the soil, the cleaning solution and spray impact. This type of process is used in many applications:

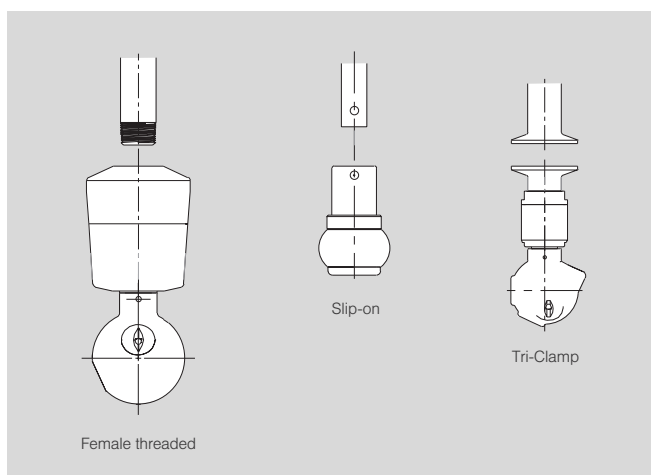
- Pre-Rinse: Begin with low grade or »used« water to rinse the interior, washing out the heaviest soil.
- Alkali Wash: Use a mild solution such as 1 % sodium hydroxide or TSP. This removes most types of deposits
- Second rinse: Follow with cleaner water to rinse out the alkali. This water can be used 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 which will not be recirculated, as the final step

This approach is not suitable for every application but it is adaptable. The degree of soiling and cleaning chemical selection 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 the others.

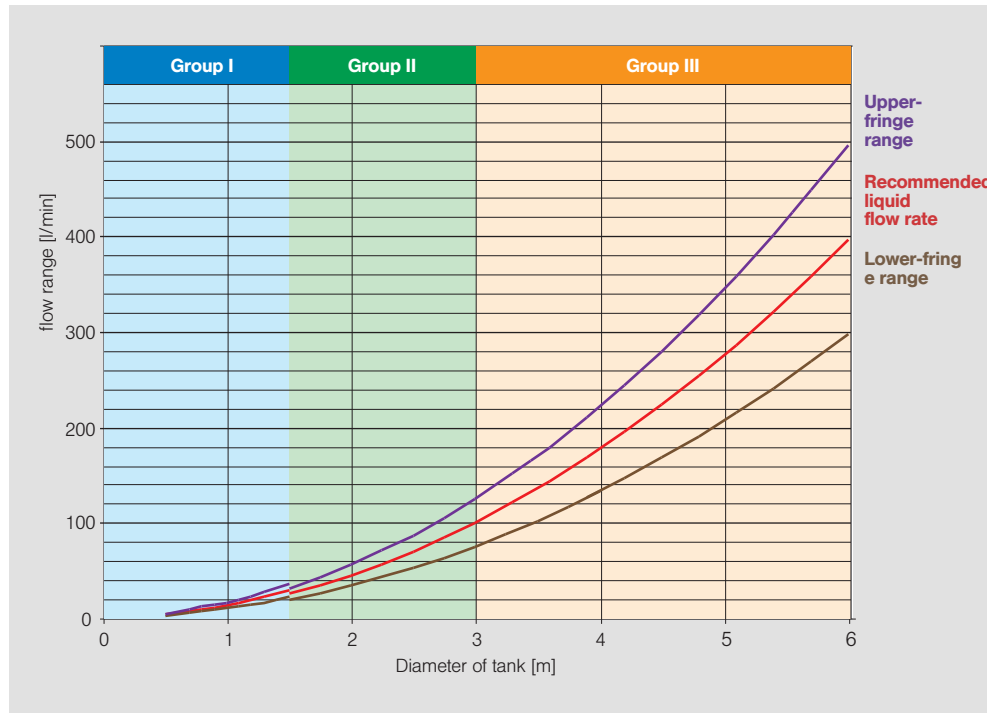
### Documentation

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



# Orientation aid for flow-rate determination



## Example:

A spherical tank with a diameter of 4 m is in need of a thorough cleaning. The recommended flow rate is approximately 130 – 220 l/min. Group-III products are the most suitable, e.g., series 515.

## Flow rate

The flow rate to be provided by the cleaning nozzle depends on many different factors and has to be determined separately for each individual application. The above diagram is therefore offered as a non-binding recommendation. The center curve shows the approximate flow rate required for building up a strong (entraining) flow of liquid (3 – 5 mm) down the wall of a spherical tank, depending on the diameter of the tank. The upper and lower curves represent a 25 % upward and downward deviation from the recommended flow rate. Rotating jet cleaners like those forming the 5TM family, however, should be planned according to a different set of rules, see on page 17.

The following groups of products are appropriate for the three diameter vs. flow-rate ranges of corresponding color in the above diagram:

Group	Suitable products	Page
Group I	Spray balls – low capacity	18, 19
	Miniature nozzles	9, 10, 11, 12
Group II	Spray balls – medium capacity	18, 19
	Family 569 or 583, low capacity	13, 14, 15
	ACCUClean series 515, low capacity	16
	series 569 or 583, high capacity	13, 14, 15
Group III	Spray balls – high capacity,	18, 19
	ACCUClean series 515, high capacity	16
	ACCUClean series 519, low capacity	16
	5TM, low capacity	17
	ACCUClean series 519, high capacity	16
	5TM, high capacity	17

# A brief guide on ATEX

## 1. Arrange the equipment into groups

The new identification first requires the declaration of an equipment group. The pieces of equipment are divided into Groups I and II, according to the area in which they are used.

**Group I:**  
Potentially explosive areas underground (mining industry)

**Group II:**  
Other potentially explosive areas

## 2. Determine the potentially explosive atmosphere

You must then determine the potentially explosive atmosphere in which the equipment is used. As before, there is a division into two areas.

G: Gas atmospheres  
D: Dust atmospheres

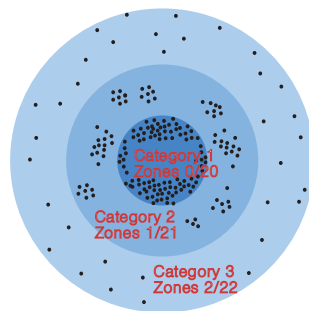
## 3. Divide by zone

In order to know which safety requirements apply to equipment, protective systems and components, you must divide the potentially explosive areas in your company into zones. The respective zone determines the category of safety requirement according to which the equipment and components must be tested. According to the new regulation, zones 0 – 2 apply to potentially explosive atmospheres of gas, vapour or mist and zones 20 – 22 apply to dust atmospheres, whereby:

**Zone 0/20:** for continuous, prolonged, frequent occurrence of the potentially explosive atmosphere

**Zone 1/21:** for occasional occurrence during normal operation

**Zone 2/22:** for rare or short-term occurrences



## 4. Have the right equipment tested

In the next step, you, as the manufacturer or user, determine which of your equipment must be given a CE mark according to the new directive in view of their use in Zones 0 – 1 (Gas) or 20 – 21 (Dust).

Equipment requiring testing

Electrical equipment  
Non-electrical equipment  
Non-electrical components

## 5. Check the ignition protection type and temperature

The new identification also requires the declaration of the ignition protection type and temperature class. The following protection types and temperature classes apply:

Protection type:

- Flameproof enclosure (d)
- Increased safety (e)
- Oil immersion (o)
- Pressurized apparatus (p)
- Powder filling (q)
- Encapsulation (m)
- Not igniting (n)
- Intrinsic safety (i)

Temperature class	Ignition temperature
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

**ATEX-approved Rotation Nozzle see on page 11 (Series 566) and 14 (Series 569)**

## 6. Obtain an overview of the identification

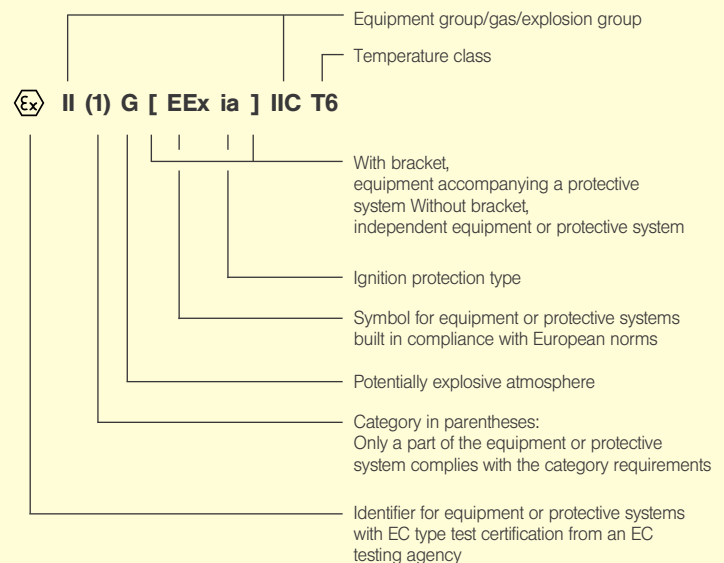


### Explosion protection

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

Now it is important to obtain the right identification for your equipment or to acquire equipment with the correct identification. In addition to the usual data on the rating plate, such as the serial number and manufacturer, the new identification also calls for the following information:

### Identification



# Nozzle selection guide



## FDA approval.

FDA is a US-American federal administration dealing inter alia with the approval of technical equipment used in the food industry. Therefore the FDA has developed a list of non harmful material which can be used in such plants.



## »3-A® Sanitary Symbol Council Administrative Council for Spray Cleaning Devices (78-00)«

The 3-A® authority is a US-American organization setting up criteria for the clean ability of devices used in dairy and food industry. Parts and plants are being analyzed if

germs and impurities can not adhere to surface or be removed easily. When this criterion is fulfilled the devices receive a 3-A®-certification.

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

Series	Page	Type of rotation	Cleaning mechanism/ action	Max. tanksize for washing [dia., m]	Max. tanksize for rinsing [dia., m]	Operating pressure [bar]	Flow rate range [l/min/ 2 bar]	Coverage options
Miniature rotating nozzles 500.186, 500.191, 566 500.234	9-12	Free spinning	Flat-fan, solid-stream nozzles	1	2	0 1 2 3 4 5 6 7 	8 - 21	
Spray balls: CIP (3-A®) 527, Compact 540, Standard 591	18-19	No rotation, static spray	Solid-stream nozzles, max. impact	3	5	0 1 2 3 4 5 6 7 	10 - 460	
Whirling Nozzle 569	13-14	Free spinning, ball bearing	Flat-fan nozzle, washdown action	3	5	0 1 2 3 4 5 6 7 	51 - 145	
Teflon Whirling Nozzle 573/583	15	Free spinning, friction bearing	Solid-stream nozzles, wash-down actions	3	5	0 1 2 3 4 5 6 7 	58 - 225	
ACCUClean 515 Stainless steel	16	Slow, gear drive	Flat-fan nozzle, medium impact	4	6	0 1 2 3 4 5 6 7 	97 - 193	
ACCUClean 519 Stainless steel	16	Slow, gear drive	Flat-fan nozzle, medium impact	6	9	0 1 2 3 4 5 6 7 	242 - 419	
5TM rotating jet cleaner	17	Gear-driven	Solid-stream nozzles, max. impact	15	24	0 1 2 3 4 5 6 7 	120 - 247	

### Notes:

#### Operating pressure

This is the recommended range for maximum cleaning efficiency. The individual product tabulations may extend beyond these levels.

#### Flow rate range

This term covers the smallest through the largest unit in a family across the recommended pressure range.

#### Maximum tank size for washing

This is the size of the largest spherical tank in which the largest unit of a family, while operating at the maximum recommended pressure, can deposit a **thick film of liquid** with a high force of impact.

#### Maximum tank size for rinsing

This is the size of the largest spherical tank that can be covered with a somewhat **thinner film of water** by the largest unit of the family operating at the maximum recommended pressure.

# Rotation Nozzle »Precision Whirly« Series 500.234

**FDA-conform**  
See page 8.

## Series 500.234

- Unique extremely small nozzle design
- For bottles and narrow spacing
- All stainless steel AISI 316L, colsterised
- Slide bearing
- Very compact design
- Self rotating
- Driven and lubricated by the cleaning fluid
- All used materials are FDA-conform

### Applications:

Cleaning of

- Kegs
- Barrels
- Cans
- Autoclaves
- Machines

### Max. spray diameter:

1 m

### Operating pressure:

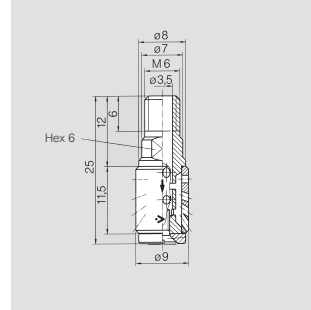
1 – 2 bar

### Max. temperature:

200 °C

### Installation:

Operation in every direction is possible



Spray angle	Ordering number	E Ø [mm]	Con-nection	Flow rate [l/min]			Length [mm]	Maximum width [mm]
				Δ p [bar]	( Δ p <sub>max</sub> = 5 bar)	40 psi [US gal./min]		
300°	<b>500.234.G9.00</b>	1.8	M6	5.7	8.0	9.8	25	9

E = Narrowest free cross-section

**Please note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.

# Rotation Nozzle »MicroWhirly« Series 566 Stainless steel version

**FDA-conform**  
See page 8.

## Series 566

- Only 20 mm diameter to insert in small openings
- Excellent cleaning power
- Stainless steel AISI 316 L
- Durable PEEK Slide Bearing
- Slip-on pin mounting for 3/4" diameter tubing
- All used material (including slide bearing) are FDA-conform
- Very compact design
- Self rotating
- Driven and lubricated by the cleaning fluid

### Applications:

Cleaning of

- Kegs
- Barrels
- Cans
- Autoclaves
- Machines

### Max. spray diameter:

1 – 1.5 m

### Operating pressure:

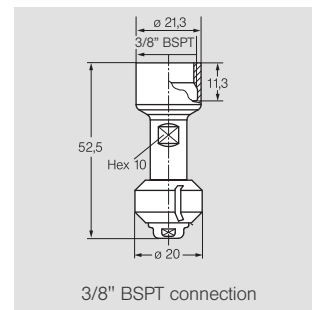
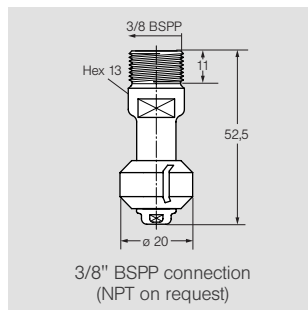
1 – 2 bar




### Max temperature:

140 °C

### Installation:

Operation in every direction is possible

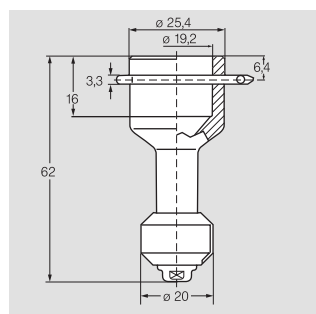


Spray-angle 	Ordering number				E Ø [mm]	Flow rate $\dot{V}$ [l/min]			
	Type	3/8" BSPP*	3/8" BSPT	Slip-on		$\Delta p$ [bar] ( $\Delta p_{max} = 6 \text{ bar}$ )			40 psi [US gal./ min]
180° 	566.873.1Y	AE	AF	TF	2.4	12	15	18	4.7
	566.933.1Y	AE	AF	TF	2.4	15	21	26	6.5
180° 	566.874.1Y	AE	AF	TF	2.4	12	15	18	4.7
	566.934.1Y	AE	AF	TF	2.4	15	21	26	6.5
360° 	566.879.1Y	AE	AF	TF	2.4	12	15	18	4.7
	566.939.1Y	AE	AF	TF	2.4	15	21	26	6.5

E = Narrowest free cross-section · \* NPT on request

**Please note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.

**Example**    **Type**                    + **Connection** = **Ordering no.**  
**for ordering:** 566.873.1Y.XX    + AE                    = 566.873.1Y.AE



Slip-on connection  
(incl. R-Clip, made of stainless steel AISI 316 L,  
Ord. no. 095.022.1Y.50.94.E)

# Rotation Nozzle »MicroWhirly« Series 566 – ATEX version Stainless steel version

**NEW: With ATEX approval**  
See page 7.



- Only 20 mm diameter to insert in small openings
- Excellent cleaning power
- Stainless steel AISI 316 L
- Durable PEEK Slide Bearing, electrically conductive
- Slip-on pin mounting for 3/4" diameter tubing
- Operating instructions (Ord. no. 095.009.00.14.85.0) are included in delivery

### Applications:

Cleaning of

- Kegs
- Barrels
- Cans
- Autoclaves
- Machines

### Max. tank diameter:

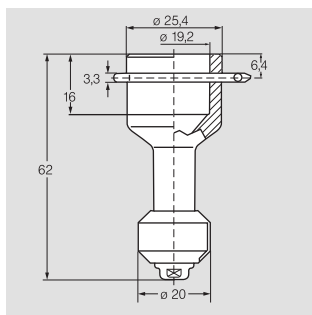
1 - 1,5 m

### Operating pressure:

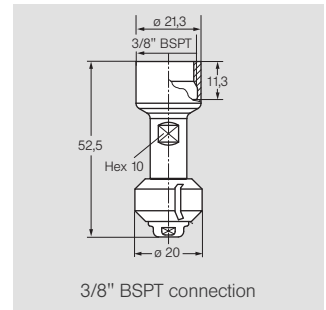
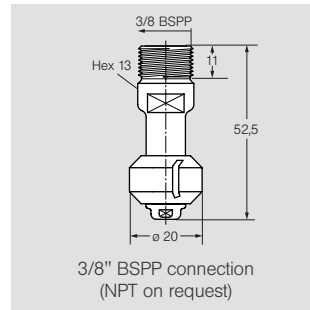
1 - 2 bar

### Installation:

Operation in every direction is possible



Slip-on connection  
(incl. R-Clip, made of stainless steel AISI 316 L,  
Ord. no. 095.022.1Y.50.94.E)



Spray-angle	Ordering number	Connection			E Ø [mm]	Flow rate $\dot{V}$ [l/min]			
		Type	3/8" BSPP*	3/8" BSPT		3/4" Slip-on	$\Delta p$ [bar]	$\Delta p_{max} = 6$ bar	40 psi
180°	566.873.1Y.XX.EX	AE	AF	TF	2.4	12	15	18	4.7
	566.933.1Y.XX.EX	AE	AF	TF	2.4	15	21	26	6.5
180°	566.874.1Y.XX.EX	AE	AF	TF	2.4	12	15	18	4.7
	566.934.1Y.XX.EX	AE	AF	TF	2.4	15	21	26	6.5
360°	566.879.1Y.XX.EX	AE	AF	TF	2.4	12	15	18	4.7
	566.939.1Y.XX.EX	AE	AF	TF	2.4	15	21	26	6.5

E = Narrowest free cross-section · \*NPT on request

**Please note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.

**Example**    **Type**                    **+ Connection = Ordering no.**  
**for ordering:** 566.873.1Y.XX.EX    + AE                    = 566.873.1Y.AE.EX

### ATEX approval

The Type **MicroWhirly** – Series 566 conforms to the requirements of the Directive 94/9/EG (ATEX) covering equipment and safety systems for correct use in locations where there is an explosion hazard, and can be used for cleaning rooms. This also applies to rooms in which reaction media with a tendency to explode are present in solid, dust or gaseous form. Due to its design, the specified safety measures and the strict observance of these operating instructions, the rotating nozzle represents no potential ignition source.

#### Unit group, category, zones:

⊕ II 1 GD c T4 T 120 °C +5 °C ≤ Ta ≤ +90 °C    for zone 0, 1, 2    (gas atmosphere)  
for zone 20, 21, 22    (dust atmosphere)

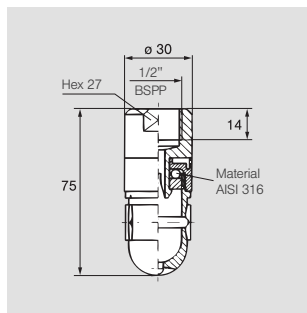
The cleaning units in the scope of validity of these operating instructions are certified for the following temperature classes in accordance with the ATEX requirements.

T-Class (flammable gas)	Highest temperature value of the Temperature Class	Temperatures	
		Maximum surface temperature of the cleaning unit (80 % of the maxi- mum temperature value of the T-Class)	Maximum temperature of cleaning agent and container during cleaning
T4	135 °C	108 °C	90 °C

# Rotation Nozzles »MiniWhirly«/»MicroWhirly« Series 500.186/500.191 Plastic versions

## Series 500.186

- Robust design, especially reliable in operation
- 300° spray angle
- Material: POM
- Stainless steel ball bearing (AISI 316)
- Very compact design
- Self rotating
- Driven and lubricated by the cleaning fluid



**Max. spray diameter:**

1 – 1.5 m

**Operating pressure:**

1 – 2 bar

**Max. temperature:**

50 °C

**Installation:**

Vertically facing downward

### Applications:

Cleaning of

- Kegs
- Barrels
- Cans
- Autoclaves
- Machines

Spray angle	Ordering number	E Ø [mm]	Con-nection	Flow rate [l/min]				Length [mm]	Maximum width [mm]
				Δ p [bar]	( Δ p <sub>max</sub> = 5 bar)	40 psi [US gal./min]			
300°	500.186.56.AH	1.9	1/2"	13	18	22	5.5	75	30

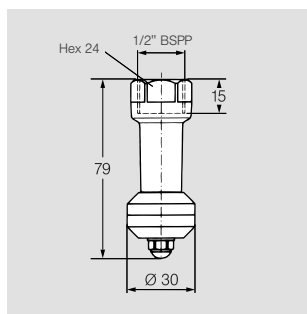
E = Narrowest free cross-section

In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.

**FDA-conform**  
See page 8.

## Series 500.191

- Inexpensive rotating head
- Good corrosion resistance
- 360° and partial coverage
- Material: PVDF
- Slide bearing
- Very compact design
- Self rotating
- Driven and lubricated by the cleaning fluid
- All used materials are FDA-conform



**Max. spray diameter:**

1 – 1.5 m

**Operating pressure:**

1 – 2 bar

**Max. temperature:**

90 °C

**Installation:**

Operation in every direction is possible

Spray angle	Ordering number	E Ø [mm]	Con-nection	Flow rate [l/min]				Length [mm]	Maximum width [mm]
				Δ p [bar]	( Δ p <sub>max</sub> = 5 bar)	40 psi [US gal./min]			
180°	500.191.5E.02	2.2	1/2"	9	13	16	4	79	30
180°	500.191.5E.01	2.2	1/2"	9	13	16	4	79	30
360°	500.191.5E.00	2.2	1/2"	14	20	24	6.2	79	30

E = Narrowest free cross-section

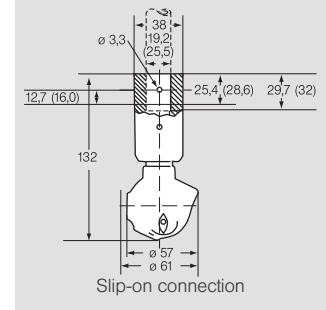
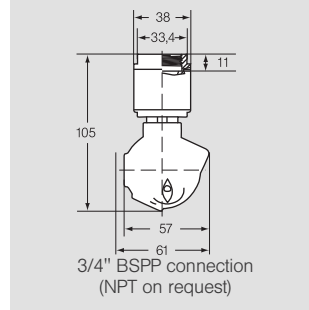
**Please note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.



# Whirling Nozzle »Whirly« ATEX Version Series 569

**NEW:**  
With ATEX approval  
See page 7.

**NEW:** FDA-conform  
See page 8.



## Series 569

- Flat jet nozzles with improved vertical coverage
- Better balance for smoother operation
- Fits through smaller openings
- Slip-on or thread connection (adapter) or tri-clamp
- Operating instructions (Ord. no. 095.009.00.14.86.0) are included in delivery

## Applications:

For small and medium sized tanks e.g. in Chemical, Beverage, Food industries

## Connections:

- For general industrial use: 3/4" ISO female
- For sanitary CIP use: Slip-on 3/4" tubing includes R-Clip made of stainless steel AISI 316L (Ord. no. 095.022.1Y.50.60.E)

## Max. tank diameter:

Rinsing: 5 m  
Cleaning: 3 m

## Installation:

Operation in every direction is possible; when installed horizontally rotation starts at 2 bar

## Operating pressure:

1 – 2.5 bar

## Material:

Stainless steel AISI 316L

## Bearing:

Double bearings made of stainless steel AISI 316L with PEEK-cage (FDA-conform) and Rulon bushing

Spray-angle	Ordering number	Connection		E Ø [mm]	Flow rate V̇ [l/min]			
		Type	3/4" BSPP*		3/4" Slip-on	Δ p [bar]	(Δ p <sub>max</sub> = 6 bar)	40 psi [US gal./ min]
270°	569.055.1Y.XX.EX	AL	TF	3.6	34	48	59	15
	569.135.1Y.XX.EX	AL	TF	4.8	50	71	87	22
	569.195.1Y.XX.EX	AL	TF	5.6	68	97	118	30
270°	569.056.1Y.XX.EX	AL	TF	3.6	34	48	59	15
	569.106.1Y.XX.EX	AL	TF	4.8	41	58	71	18
	569.196.1Y.XX.EX	AL	TF	5.6	68	97	118	30
360°	569.059.1Y.XX.EX	AL	TF	3.2	34	48	59	15
	569.139.1Y.XX.EX	AL	TF	3.6	50	71	87	22
	569.199.1Y.XX.EX	AL	TF	4.8	68	97	118	30
	569.279.1Y.XX.EX	AL	TF	7.1	103	145	178	45

E = Narrowest free cross-section · \*NPT on request

**Please note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.1 mm/170 mesh is recommended.

**Example**    **Type**                    + **Connection**    = **Ordering no.**  
for ordering: 569.055.1Y.XX.EX + AL                    = 569.055.1Y.AL.EX

## ATEX approval

The Type »Whirly« – Series 569 conforms to the requirements of the Directive 94/9/EG (ATEX) covering equipment and safety systems for correct use in locations where there is an explosion hazard, and can be used for cleaning rooms. This also applies to rooms in which reaction media with a tendency to explode are present in solid, dust or gaseous form. Due to its design, the specified safety measures and the strict observance of these operating instructions, the rotating nozzle represents no potential ignition source.

## Unit group, category, zones:

⊙ II 1 GD c T4 T 120 °C +5 °C ≤ Ta ≤ +90 °C                    for zone 0, 1, 2                    (gas atmosphere)  
for zone 20, 21, 22                    (dust atmosphere)

The cleaning units in the scope of validity of these operating instructions are certified for the following temperature classes in accordance with the ATEX requirements.

T-Class (flammable gas)	Highest temperature value of the Temperature Class	Temperatures Maximum surface temperature of the cleaning unit (80 % of the maximum temperature value of the T-Class)	Maximum temperature of cleaning agent and container during cleaning
T4	135 °C	108 °C	90 °C



# ACCUClean – The most efficient way to clean your tank Series 515/519

## Series 515/519

The consequent redesign of the successful ACCUClean concept combines now even more efficient cleaning technology in an economical package:

- Controlled rotation for maximum spray impact
- Optimized drive mechanism
- Special nozzle geometry for sharp sprays
- Excellent vertical coverage
- Smooth, self-draining and self-flushing design
- Long-life bearing
- Wide flow and pressure range

### Applications:

- For use in all applications, where a high cleaning performance is required

### Max. tank diameter:

Rinsing: 6 – 9 m  
Cleaning: 4 – 6 m  
depends on nozzle size

### Operating pressure:

2 – 5 bar

### Temperature range [°C]:

5 – 140 °C

### Installation:

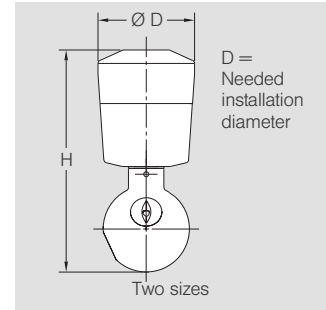
Vertically facing upward and downward

### Materials:

Body: Stainless steel 316L  
Gear parts: PEEK

### Bearing:

Ball bearing made of stainless steel AISI 316L



Spray angle	Ordering number	E Ø [mm]	Con-nection BSPP*	Flow rate [l/min] ( $\Delta p_{max} = 6 \text{ bar}$ )					40 psi [US gal./min]	Length H [mm]	D [mm]
				1	2	3	5	6			
180°	<b>515.213.7T.AL</b>	1.0	3/4"	68	97	118	153	168	30	170	85
180°	<b>515.214.7T.AL</b>	1.0	3/4"	68	97	118	153	168	30	170	85
270°	<b>515.215.7T.AL</b>	1.0	3/4"	68	97	118	153	168	30	170	85
	<b>515.285.7T.AL</b>	1.0	3/4"	103	145	178	229	251	45	170	85
270°	<b>515.216.7T.AL</b>	1.0	3/4"	68	97	118	153	168	30	170	85
	<b>515.286.7T.AL</b>	1.0	3/4"	103	145	178	229	251	45	170	85
360°	<b>515.219.7T.AL</b>	1.0	3/4"	68	97	118	153	168	30	170	85
	<b>515.289.7T.AL</b>	1.0	3/4"	103	145	178	229	251	45	170	85
	<b>515.339.7T.AL</b>	1.0	1"	137	193	237	306	334	60	170	85
180°	<b>519.373.7T.AS</b>	1.5	1 1/2"	171	242	296	382	419	75	267	140
180°	<b>519.374.7T.AS</b>	1.5	1 1/2"	171	242	296	382	419	75	267	140
270°	<b>519.375.7T.AS</b>	1.5	1 1/2"	171	242	296	382	419	75	267	140
270°	<b>519.376.7T.AS</b>	1.5	1 1/2"	171	242	296	382	419	75	267	140
360°	<b>519.379.7T.AS</b>	1.5	1 1/2"	171	242	296	382	419	75	267	140
	<b>519.429.7T.AS</b>	1.5	1 1/2"	228	322	395	509	558	100	267	140
	<b>519.469.7T.AS</b>	1.5	1 1/2"	296	419	513	662	726	130	267	140

E = Narrowest free cross section · \* NPT on request

**Please Note:** We do not recommend the operation with compressed air. Higher pressure generally means higher wear and smaller droplets. This might have adverse effects on the cleaning result. For further ordering data please turn to your Lechler contact person. In order to protect the bearing a line-strainer with a mesh size of 0.3 mm/50 mesh is recommended.

# High impact Tank Cleaning Machine – Series 5TM

**Improved Version**

## Series 5TM

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

- Very high cleaning performance already at low pressures
- Driven and lubricated by the cleaning fluid
- Systematically cleans the entire tank interior (360°)
- Robust, low-maintenance stainless steel construction

The standard machine configuration uses two or four nozzles to blast the tank walls and rinse all surfaces. In operation, the unit has to run for the cycle time between 7 and 41 min depending on type and pressure. This ensures full cleaning. For extremely difficult applications the cleaning time might have to be extended.

### Max. tank diameter for:

Rinsing: 24 m  
Cleaning: 15 m

### Recommended operating pressure:

2 – 5 bar

### Temperature range:

2 – 95 °C

### Installation:

Vertically facing downward

### Weight:

approx. 7.5 kg

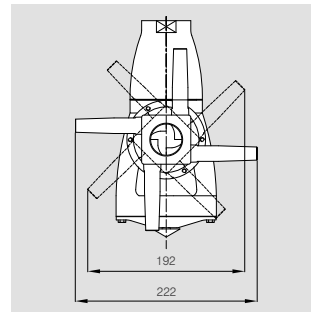
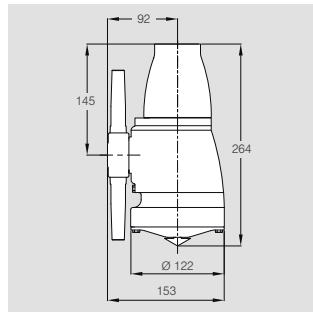
### Materials:

Stainless steel AISI 316L  
Gear components made of PTFE and carbon fibre

### Connection:

Female thread 1 1/2" ISO 228

If you are not sure what you need for your application, ask for assistance. We can discuss your specific needs and configure the best system.



### Applications:

Large tanks and installations, e.g. in the Chemical, Beverage, Food industry

Spray angle	Ordering number	E Ø mm	Number, Ø nozzles	Flow rate [l/min] Δ p [bar] (Δ p <sub>max</sub> = 7 bar)			
				2	3	5	40 psi [US gal./ min]
360°	5TM.208.1Y.AS	8	2x8.0	120	147	190	37.3
	5TM.210.1Y.AS	10	2x10.0	152	186	240	47.1
	5TM.406.1Y.AS	6	4x6.0	146	178	230	45.1
	5TM.407.1Y.AS	7	4x7.0	168	205	265	52.0
	5TM.408.1Y.AS	8	4x8.0	190	232	300	58.8
	5TM.410.1Y.AS	10	4x10.0	247	302	390	76.5

The cycle time takes between 7 and 41 min depending on type and pressure.

For flow rates > 300 l/min please use special gear train.

We recommend the use of a line strainer (approx. 0.2 mm/80 mesh).

For further ordering data please turn to your Lechler contact person.



Please ask for our application sheet.

# Static Spray Balls – for sanitary CIP applications Series 527

**FDA-conform**  
See page 8.

**A<sup>3</sup>**  
Sanitary version certified  
according to »3-A«.  
See page 8.

## Series 527

For critical sanitary applications Lechler provides these special spray ball design:

- Very fine surface finish inside and outside (Ra 0.8 µm)
- All mount using slip-on fittings and pins.

There are no threaded inlets available.

- All used materials are FDA-conform

### Applications:

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

### Max. Tank diameter:

4 – 8 m

### Operating pressure:

1 – 3 bar

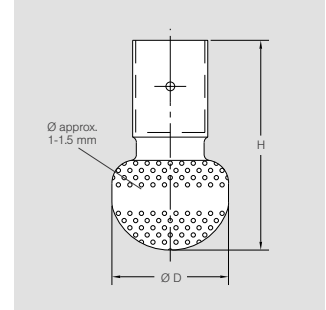
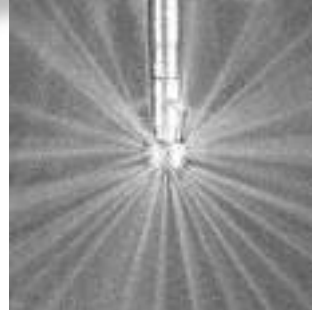
### Max. Temperature:

200 °C

### Material:

Stainless steel AISI 316L

**Please ask for our application sheet.**



Spray angle	Ordering number	E Ø mm	For pipe Ø	Flow rate [l/min]				40 psi [US gal./ min]	Length H [mm]	Max. width D [mm]
				△ p [bar]	( △ p <sub>max</sub> = 5 bar)	1	2			
360° 	<b>527.209.1Y.00.75</b>	0.8	3/4"	42	60	73	95	19	68	32
	<b>527.289.1Y.01.50</b>	1.14	1 1/2"	85	170	208	269	50	116	65
	<b>527.449.1Y.02.00</b>	1.7	2"	297	420	514	664	127	152	102

E = Narrowest free cross-section

Higher pressure generally means smaller droplets. This might have adverse effects on the cleaning result.

**Spray balls are useful for certain types of applications, although they are not as effective for most cleaning tasks as a comparable rotating nozzle. They do have specific advantages:**

- No moving parts
- Self draining
- Easy mounting for inspection
- Traditionally used in sanitary environments

Since rotating nozzles depend on their turning action for full cleaning, if the unit stops for some reason, parts of the tank may not be cleaned. There is no such concern with a static head. However, they can develop cleaning voids if debris collects in the head and blocks individual orifices. Spray balls require higher flow rates than rotating nozzles, usually at least 2 to 3 times the amount of liquid.

# Static Spray Balls – for standard industrial use Series 540/591

## Series 540

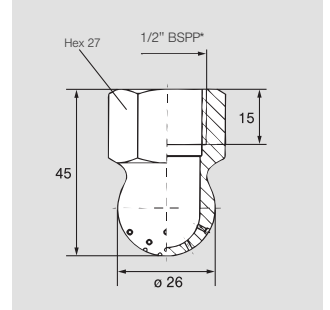
- Very compact static spray ball
- Sharp solids jets, excellent for rinsing small drums
- Also to use with saturated steam
- Nozzles 120° on request


**Max. tank diameter:**  
1 – 3 m

**Operating pressure:**  
1 – 3 bar

**Max. temperature:**  
200 °C

**Material:**  
Stainless steel AISI 303



Spray angle	Ordering number	E Ø [mm]	Flow rate [l/min]			
			Δ p [bar]			
			0.5	2	5	40 psi [US gal./min]
240° 	540.909.16	0.8	9.0	18.0	28.5	5.6
	540.989.16	1.0	14.0	28.0	44.3	8.7
	541.109.16	1.5	28.5	57.0	90.1	17.7
	541.189.16	2.0	45.0	90.0	142.3	27.9
	541.239.16	2.3	59.0	118.0	186.6	36.6

E = Narrowest free cross-section · B = bore diameter · \*NPT on request

## Series 591

- Popular sprayball design
- For higher flow rates
- Corrosion resistant material
- Available in different sizes

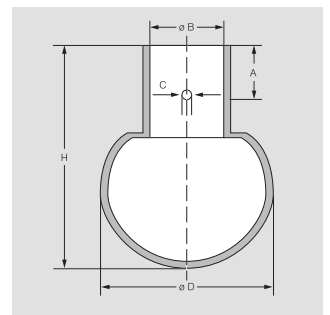
**Max. tank diameter:**  
1 – 5 m

**Operating pressure:**  
1 – 3 bar

**Max. temperature:**  
200 °C

**Materials:**  
Stainless steel AISI 316Ti  
Pin:  
Stainless steel AISI 316L

Other materials  
- 316L (FDA-conform)  
- PTFE



Spray angle	Ordering number	E Ø [mm]	Effective cleaning Ø [m]	Flow rate [l/min]				40 psi [US gal./min]	Dimensions approx. [mm]					
				Δ p [bar] ( Δ p <sub>max</sub> = 5 bar)					Ø D	Lenght H	Con-nection B	Slip-on *	C	A
				0.5	1	2	3							
360° 	591.M11.17.00	0.8	0.5	7	10	14	17	4	20	32,5	8,2	DN8	-	-
	591.X11.17.00	1.2	0.5-1.0	25	35	49	61	15	24	37,5	12,2	DN10	2,2	9,0
	591.Y11.17.00	1.2	1-1.5	49	70	99	121	31	30	42	18,2	DN15	2,2	9,0
	591.A21.17.00	2.0	2-2.5	91	128	181	222	56	40	53	22,2	DN20	2,5	9,0
	591.B31.17.00	2.1	2.0-3.0	130	183	259	318	80	64	90	28,2	DN25	2,8	18,0
	591.B51.17.00	3.0	3.0-4.0	206	292	412	505	128	64	90	28,2	DN25	2,8	18,0
180° 	591.A23.17.00	2.0	2.0-2.5	74	105	148	182	46	40	53	22,2	DN20	2,5	9,0
	591.B53.17.00	3.0	3.0-4.0	146	207	292	358	91	64	90	28,2	DN25	2,8	18,0
180° 	591.B32.17.00	2.1	2.5-3.0	103	145	205	251	64	64	90	28,2	DN25	2,8	18,0
	591.D42.17.00	2.2	4.0-4.5	230	325	460	563	142	90	122	52,3	DN50	3,3	25,0

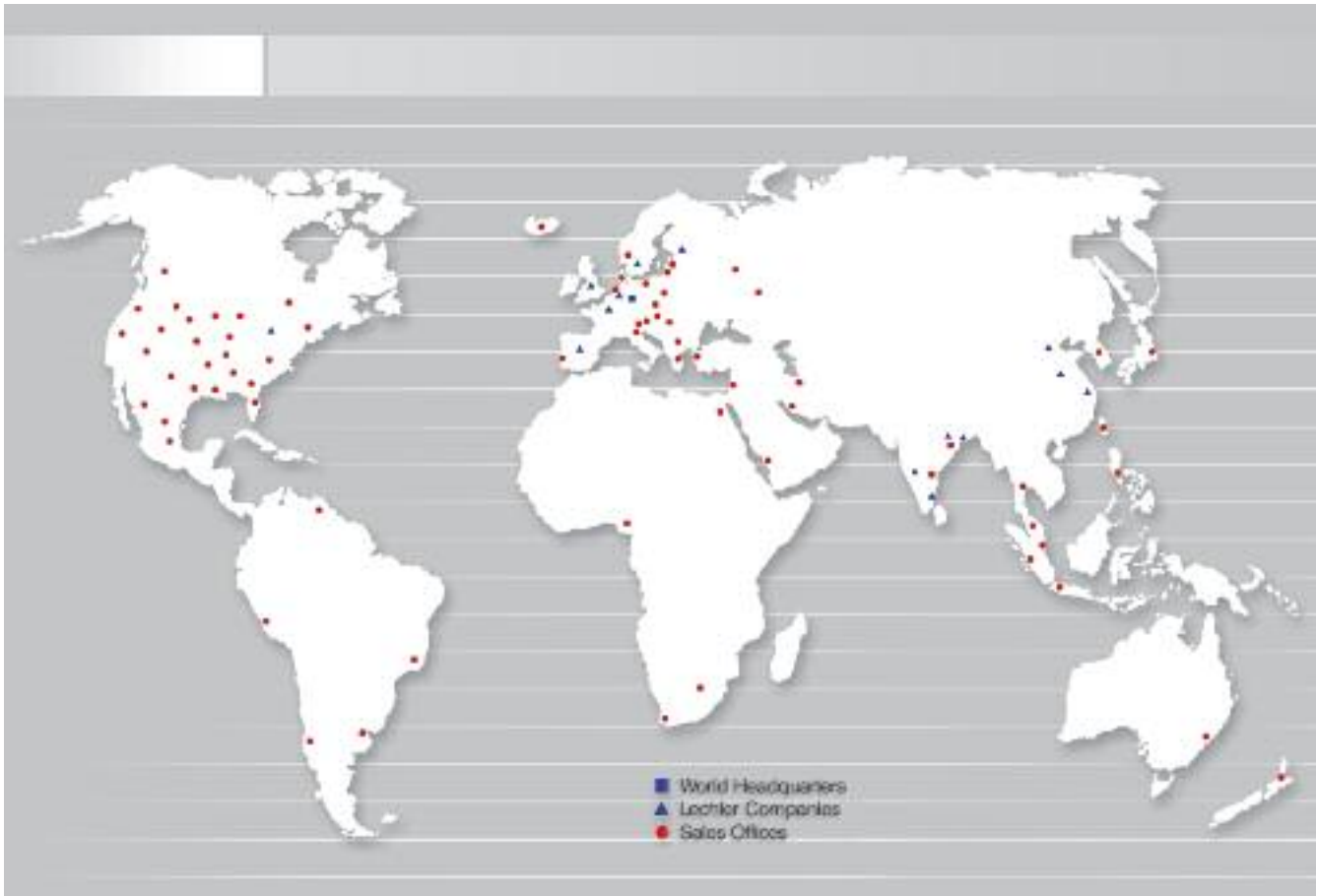
E = Narrowest free cross-section · B = Bore diameter · \* Female thread on request  
Higher pressure generally means smaller droplets. This might have adverse effects on the cleaning result.

Contact us now



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## Yes, I want to get detailed information on Lechler tank cleaning nozzles!

Please send me the special information:

- Catalogue »Precision Spray Nozzles and Accessories«
- Brochure »Spray Nozzles for the Food Industry«
- Brochure »Spray Nozzles for the Beverage Industry«
- Brochure »MEMOSPRAY® – the intelligent Nozzle System for Surface Treatment«

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