



THE
SPRAY NOZZLE
 PEOPLE

INDUSTRY FOCUS

BREWING



01273 400092

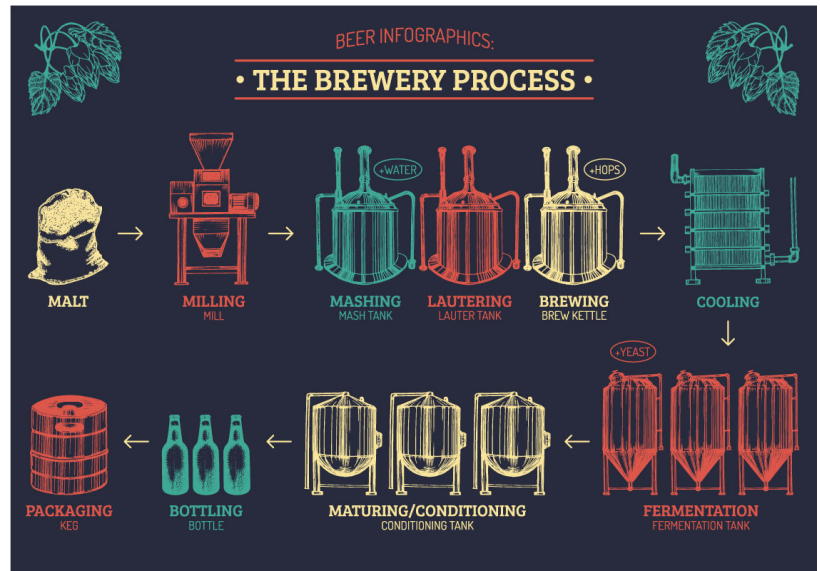
www.spray-nozzle.co.uk

Spray nozzles are used extensively in the brewing industry, working hard behind the scenes to keep brewhouse equipment clean to ensure batches aren't spoiled and the final product is of the highest quality. They can also play an important role in pasteurising and packaging processes.

APPLICATION Tank Wash

Maintaining exemplary hygiene and sanitation in the brewhouse is essential to prevent the growth of harmful micro-organisms and ensure the highest quality, best tasting product. The numerous different stages of brewing mean that there are a range of different vessels, from the mash tun to the brew kettle to fermentation tanks, that need meticulous cleaning and sanitising, either between batches or at regular intervals and each may present its own unique set of issues.

Fortunately, today's innovative spray nozzle solutions can help at each stage of the brewing process.



▶ MANUAL V CIP SYSTEMS

There are two tank cleaning systems commonly used in brewing today: **manual cleaning**, whereby workers use brushes and handheld spraying equipment to manually clean and sanitise the different vessels; and automated **cleaning in place (CIP)** systems which use spray nozzle systems to clean the insides of the tank.

The disadvantages of manual cleaning are obvious: thoroughness and consistency are difficult to achieve, particularly if access is difficult, and the cleaning equipment itself - brushes and scourers etc - has to be thoroughly cleaned and sanitised to prevent cross contamination. It is also time consuming and can use a lot of water and cleaning detergents which are costly. In addition, staff can be exposed to harsh cleaning fluids.

CIP systems use spray nozzles or heads, static or rotating, which are programmed to follow a set cycle and pattern that thoroughly cleans every inch of the tank and which recirculate water and detergent, making them much more economical. However, all CIP systems are not made equal and there are a number of considerations when finding the right one.



WHY CHOOSE SNP FOR YOUR BREWING INDUSTRY NOZZLE NEEDS?

- The ability to solve unique and complex process challenges
- ISO 9001:2015 Certified
- Consistent quality assurance
- World-class customer support, service and advice

► COMMON CONSIDERATIONS FOR OPTIMAL CIP

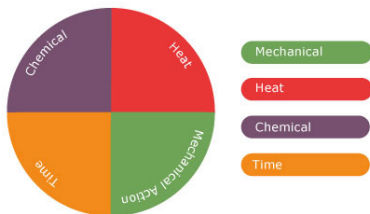
When selecting the most effective brewhouse CIP system for each stage of the brewing process, companies need to consider:

- **Type of residue**

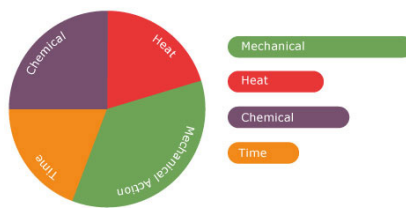
The different vessels will require different levels of cleaning and, from the cooling stage onwards, sanitisation due to the potential for micro-organism growth. The grains and husks which are the primary residues found in the mash and lauter tuns require a different approach to the tannins and protein scales found in the fermentation tanks.

- **Optimisation of the cleaning mix**

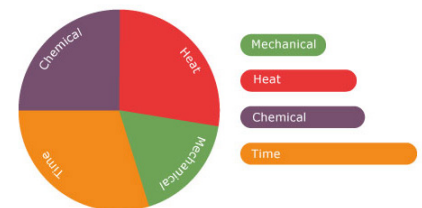
Effective tank cleaning consists of 4 elements: chemical action, time, mechanical action and heat. Each of these elements contributes a certain amount of "cleaning power" in any given tank cleaning operation. The relative cost of each element should be assessed based on the residue and nature of the tank and then consideration can be given to the optimal mix. Some brewers may be keen to reduce their water consumption but they need to consider what adjustments they can make to the time and chemical elements to achieve this. Similarly, reducing the cost of heating will mean either more time, chemicals or mechanical action will need to be increased. Sinner circles are a useful way of demonstrating this.



Equal action of elements



High mechanical action



Low mechanical action

- **Tank size and shape**

Brewing vessels come in all shapes and sizes and the individual features of each tank have to be taken into consideration; lauter tuns for example tend to have slotted or perforated false floors to allow the wort to run through so a cleaning system needs to be powerful enough to give an adequate clean but not too powerful that it pushes the grains around the tank and through the floor rather than flushing them towards the drainage channel.

- **Obstacles in tank**

The position of motorised rakes in lauter tuns and mixers or agitators used in other stages of the brewing process need to be taken into account. Areas that are out of the 'line of sight' of the tank cleaners may require more than one cleaner to ensure all areas of the tank are being treated.



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▶ DIFFERENT TYPES OF CIP SYSTEM

There are three main types of tank cleaning system: static, rotary spray and rotary jet. Choosing the best system for the job depends on careful consideration of the factors discussed above. However, as a general rule of thumb:

Static nozzles are cost effective and very robust as they have no moving parts. However, they have a limited coverage and produce little impact so are not good for tough residues. Also, they are easily clogged by particles in the mash, lauter and fermentation tanks which are best suited to our HydroClaw clog-resistant cleaning head.

PRODUCTS: SVSTW, HydroClaw

Rotary spray balls give greater coverage and moderate impact so they can clean larger vessels. They can also clean tougher residues and will lose less water to do so.

PRODUCTS: RSB, Mushroom

Rotary jet cleaners clean really tough residues and scales, making them ideal for brewing vessels. They also reduce water and chemical usage. They can be used in small and medium sized tanks as well as huge tanks (they can produce jets over 20 metres in length, meaning a centrally mounted unit could clean a 40m diameter tank).

PRODUCTS: Orbitor Eco, Orbitor Compact
Orbitor 2 (larger tanks) Orbitor 4 (larger tanks)



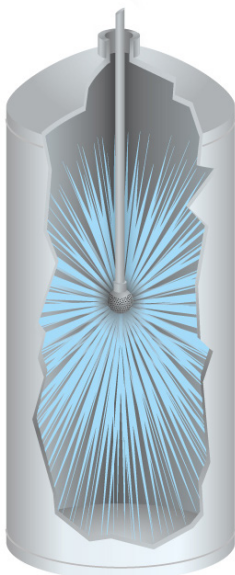
Wash diameter: 1-7m
Flow: 50-500 l/min
Pressure: 1-3 bar
Best for lighter residues
No moving parts



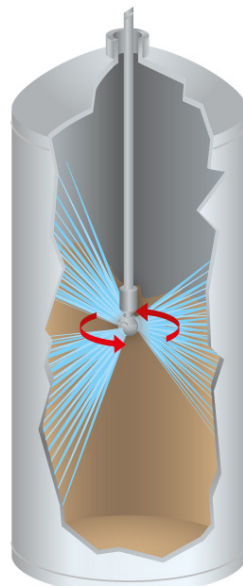
Wash diameter: 1-5m
Flow: 10-350 l/min
Pressure: 1-3 bar
Best for medium residues
Reduce water / chemical usage
Reduce clean cycle time



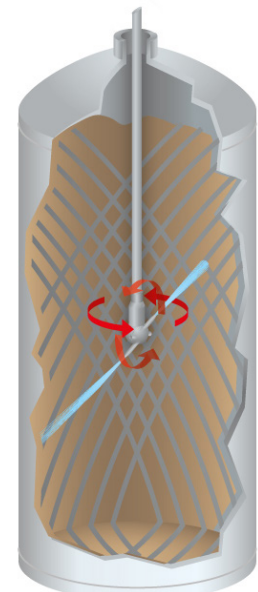
Wash diameter: 2-20m
Flow: 40-500 l/min
Pressure: 3-15 bar
Tough residues and heavy soiling
Reduce water / chemical usage
Reduce clean cycle time



Static Nozzles



Rotary Spray Ball



Rotary Jet

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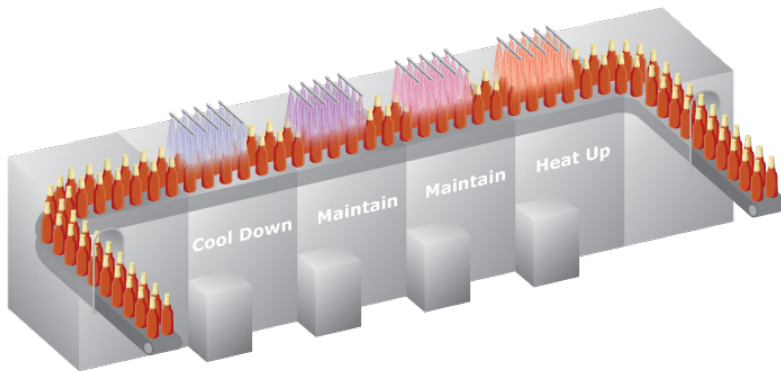


APPLICATION PASTEURISATION

Where beer is pasteurised after bottling, it will pass along a pasteurisation tunnel. Pasteurising spray tunnels use multiple nozzles to deliver water to raise, hold and then cool the temperature of the product.

Temperature control

The temperature of the product, particularly if in glass containers, needs to be changed gently to avoid thermal shock/cracking. Additionally, if the temperature is raised too much or held for too long, flavour may be impaired. This means that tunnels have multiple spray stages to precisely control temperature changes.



A full or hollow cone spray nozzle is desirable to reduce droplet size and so increase the surface area of the spray. This improves heat transfer.

Often space is tight so tangential whirl nozzles are also an option.

PRODUCTS:

Impingement misting, low flow rate: PJ
Air atomising, modular design: XA
Small orifice misting nozzle: Microwhirl



APPLICATION DRYING

Using compressed air

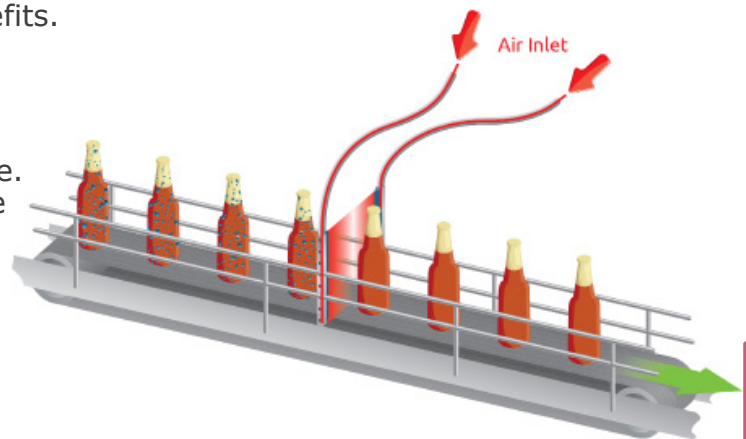
Compressed air products have a range of uses across a broad range of industries. They are used extensively in food processing and manufacturing, enhancing the impact and flow of air such that up to 90% less energy can be used when compared to simply spraying air from an open air line. In addition, compressed air products reduce noise to acceptable working levels and so have great potential health and safety benefits.

Drying

Air knives can be used to ensure bottles are dry before labelling and packaging. They are easy to fit, take up little space and are maintenance free. Air knives deliver a high impact air stream in a line along the length of the devices. The shape of the air knife is such that it aids in the entrainment of the surrounding air. The air entrained in this way greatly increases the force and impact of the flow meaning less compressed air can be used overall.

PRODUCTS:

Air Knife X-Stream Standard
Air Knife X-Stream Silent



For full details on all our compressed air enhancement products, visit our sister company ANP at www.airnozzle.co.uk or call us on 01273 400092.



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