

Clean processing or storage tanks are essential in many industrial applications. This requirement has prompted the development of a variety of spray techniques and products that clean tanks efficiently, with a minimum amount of effluent produced. Several factors dictate what type of spray equipment is appropriate for a given application. These include the size and shape of the tank, the nature of the material to be removed, and the presence of other equipment, such as agitators, within the tank. As a result, we have developed and offer nozzle systems that are designed for the specific requirements of a given tank washing application.

There are several basic factors associated with the design of an effective tank washing system. These include:

- **Proper filtering.** Tank washing nozzles generally have small internal passages and outlet orifices. Therefore, it is advisable to install a filter in the inlet line to avoid clogging due to particulate in the feed line.
- **Optimization of operating parameters.** There is a seemingly endless array of conditions that can exist within a tank. This dictates that each application be thoroughly evaluated with respect to washing parameters. Such elements as selecting an appropriate detergent, operating at the proper temperature, choosing the most effective spray pressure, and determining an adequate washing cycle time are all important in setting up an effective tank washing process.
- **Nozzle selection.** The choice of a specific nozzle for a washing application depends on a number of factors, the principal one being the nature of the material to be removed from the walls. The type and condition of the residue, such as whether it is dry or wet, its viscosity if wet, and its solubility in the cleaning liquid, are all important in selecting an appropriate nozzle. The degree of cleanliness required is another issue. These factors determine the degree of washing intensity required. Some processes may need only a quick rinse. Others may call for a long-lasting, high-impact treatment.
- **Rotary nozzles.** In most cases, it is essential that the entire interior wall be cleaned uniformly. This is best accomplished using rotary nozzles, in which the nozzle rotates about an axis (or axes) throwing the liquid out to the walls in a uniform manner. In those instances where the residue is difficult to remove, it is advisable to use a nozzle that provides high impact. This necessitates choosing a nozzle that limits the rotational speed so that the individual jets do not break up into drops prior to contacting the wall.

Deep cleaning also is enhanced if the wall is impacted at different spots on successive rotations of the nozzle. This can be accomplished using a dual axis rotary nozzle, which is designed such that jet paths are slightly displaced between successive cycles. This ensures complete coverage of the wall.

TANK WASHING

NOZZLE TYPES

Stationary Washer Nozzles

These are the simplest of the tank washing nozzles. They are useful in those applications involving tanks of limited size and residues consisting of liquids or non-sticking powders.

The nozzles are fabricated with a series of orifices covering the surface of a spherically shaped shell.



Single Axis Rotary Nozzles/ Speed Controlled

This type of rotary washing nozzle contains a gear set within the nozzle housing that is driven by the reaction force of the liquid jets. The frictional force generated by the gear set slows down the rotational speed. The gear set is coupled to the rotating shaft of the spraying portion of the nozzle.

This arrangement limits the rotational speed to a few rpm so that the liquid jets do not break up into drops and remain a solid stream. This results in a high impact washing action and a longer throw, which is effective for cleaning larger tanks.



Single Axis Rotary Nozzles

This class of nozzles features a rotary motion produced by the reaction forces from the liquid jets. The rotational speed is quite high, which assures uniform coverage of the interior walls. However, the high speed results in the jets being broken into drops at long distances from the source. This limits their use to smaller size tanks.



Dual-Axis Rotary Nozzles/ Speed Controlled

A dual-axis rotary nozzle features the added capability of rotation about a horizontal axis as well as the standard vertical axis rotation. By properly synchronizing the two motions, the impact zone on the walls is slightly displaced between successive rotations. This assures that every point on the wall will be impacted, resulting in superior cleaning action.

Nozzles of this are speed controlled as described above for the single-axis type. In addition, designs utilizing either electric or air-driven motors are available.

