

Car Washes Remain Big Business for Water Treatment Professionals

Car washes find reverse osmosis provides the spot-free results consumers demand.



When car washes were first introduced, they used three things: soap to clean the car, water to rinse it off and towels to dry it. However, this simplistic approach cannot be used in car washes today. Because of customer demands and changing technology, car washes now offer additional features to enhance their service.

One feature that constantly is in high demand is a spotless car wash. Customers will pay extra to have a spot-free car, whether it is sold as an option at a full-service wash or turned on at the final rinse of a self-serve wash. Either way, the driver expects to pull away without a single spot on the car.

Unfortunately, this is easier said than done. Even though washing with soap and water removes debris off of a car, using normal water for the final rinse leaves residue that forms spots because of the naturally occurring minerals in the water. To avoid these deposits, it is important to have a spot-free rinse as the final step in a car wash. The only problem is figuring out how to consistently achieve this result.

Weighing the Options

When it comes to a spot-free car wash, the name of the game is reducing dissolved materials in water. Two main technologies can accomplish this goal—reverse osmosis (RO) and de-ionization (DI). These means to the spot-free end are quite different.

Before the advent of RO, DI exchange was the technology of choice. While the quality is as good or even better with DI, the technology has a significant capacity limitation. The DI tank can remove materials to a certain extent but after that point it no longer provides the quality that a car wash needs. This leaves car wash owners with two choices: regenerate on site, which is a meticulous process involving hazardous chemicals, or set up a tank exchange where a fresh tank is delivered when needed. Although the initial capital investment may be small with the exchange option, over the course of a year, the cost of replacement tanks quickly adds up.

Regenerating on site poses a different problem because of the risk involved with the chemicals. Since DI uses hazardous

chemicals, this leads to a dangerous environment that is not suitable for the typical car wash owner. Most car wash operations do not deal with hazardous chemicals, so they have neither the background nor desire to handle them. Without the right mechanical skills and knowledge to properly use these chemicals, DI can be unsafe.

Due to the principles of operation, RO technology does not use chemicals, which eliminates a potentially harmful situation. In addition, the technology has become more accepted during the past 15 years as people have become more familiar with RO. In a maturing industry where people are sometimes wary of new technology, the gradual adoption and proven history of RO technology has created a comfort level for the technology.

Getting Started

A lot has changed since RO was first brought to the car wash industry. When first introduced, machines were not only complicated but expensive as well. Today, car wash owners are looking for inexpensive

solutions to remove spots. As a result, a typical RO machine in a car wash is relatively basic, making it as cost effective and easy to operate as possible.

When adding RO technology to a car wash, the required equipment is relatively simple. The owner needs only to install an RO machine and membranes to be on the spot-free path. For the most part, an RO machine could last 10 to 15 years since the only item needing attention and occasional replacement is the membrane element that removes material from the water and, when maintained correctly, the membrane elements last two to three years.

Once the equipment is in place, the RO system uses the car wash's standard water source (generally city water) as well as two common pretreatments—water softening and activated carbon. Although most car washes already have softening installed since it produces a better reaction with soap, activated carbon is required to remove chlorine and protect the membrane. While generating the spot-free water is one thing, correctly applying it to the vehicle to make it spot-free is another story. More specifically, the car wash needs to do an effective job of replacing the standard rinse water on the vehicle with spot-free water. By combining the right amount of water volume and pressure to get enough water on the vehicle, the standard rinse water is washed away and is replaced by the spot-free water, resulting in a spotless car.

Examining the Benefits

The main advantage to using RO is a spot-free car wash and, as a result, a more satisfied customer. The cost of the technology also is a benefit. Since many customers will pay extra to have a spotless car, the system typically pays for itself in about a year, providing a fast return on the initial investment. In addition, the technology is safe and easy to use and maintain. Once an RO system is installed, aside from some

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minimal routine maintenance, it is for the most part trouble free. Another benefit for full-service car washes is that the car does not have to be wiped off, which eliminates the need for towels and additional personnel to dry cars at the end of the line.



While there are many advantages, the use of an RO system has a key disadvantage—water usage. The end result of RO is that the car wash always is generating a concentrate stream. Even though it is possible to reuse this water, those who choose not to will see that they do use more water to create a spot-free rinse.

Factors To Consider

All of these benefits do not come without concerns. As pure water is generated with RO technology, a concentrate stream also is generated to insure that the membrane does not fail. On one side there is the spot-free water and on the other is the concentrate stream, which is two to four times the volume of its counterpart. Given this additional flow of concentrate water, the end user must consider the option of reusing this resource. If this water is not reused, car washes can go through an excessive amount of water. Fortunately, in the car wash environment, that water generally is captured and reused to wash vehicles.

Temperature also is a factor to take into

consideration. Membrane systems will produce less water with lower temperatures. In order to keep a consistent water flow, RO systems are all rated at 25° C or 77° F. While maintaining this temperature throughout the year is possible in certain regions, it is not an option for cooler climates. Fortunately, this problem easily is fixed by installing a larger machine to accommodate the climate. This will allow the system to generate sufficient water regardless of the temperature, keeping cars spot-free year round.

One particular environment where RO is not applicable is where the water source is of exceptionally high quality. In some mountain locations, for example, the source water contains virtually no mineral deposits to begin with, and RO is largely unnecessary. It is important to keep in mind that the temperature and the quality of the water are different in every city. That is why each car wash needs to adjust to these conditions so that the parameters are met.

There also are some applications where RO is not the best solution for creating spot-free

water. For example, if a car wash has zero discharge environment, wash and rinse water is constantly reused. Because of this, it does not have the ability to capture the concentrate stream. Another place where RO is not a good fit is if a car wash wants to use reclaimed water to feed the RO. Both of these applications can cause problems since car wash wastewater is being used in the RO system. If the membrane system is not properly designed and configured by experts, it can lead to membrane failure. While car wash owners want to reuse this wastewater in the RO machine, the end result shows that it may be a good fit. There are many factors that need to be considered before a car wash application can begin to produce spot-free results. Fortunately, applying RO technology can help to set a car wash in the right direction.

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