TECH PERSPECTIVE

Tech Perspective looks at technology-related issues and provides information and advice that cleaning professionals can apply to equipment selection and to their daily work in the field. Industry members are welcome to offer ideas for this column. Please direct them to editor Kim Peterson, editor@cleaner.com.

CLEAN MORE IN LESS TIME

High-efficiency jetter nozzles conserve water and clean better // By Dennis Farhat

N SEWER, STORM AND SANITARY line cleaning, hose nozzles are an essential tool that directs pressurized water to clear out obstructions such as silt, sludge, grease, mineral buildup and tree roots, as part of required maintenance or to prepare pipes for relining. In this way, the nozzle is like a gun and water like bullets that must be precisely directed with force to the target.

While there are many nozzle options available in a variety of configurations, the standard nozzles that typically are supplied with the purchase of a sewer truck are only rated as 50-60% efficient. Although these nozzles can handle some blockages, many sewer crews are opting for the highest performance nozzles to make short work of even the most challenging jobs.

Utilizing such high-performance nozzles has benefits that go far beyond conserving water to protect the environment. Reducing water use also minimizes trips to refill the sewer truck water tank and keeps crews effectively cleaning to expedite work completion. By decreasing unnecessary travel, the approach also reduces the cost of vehicle fuel and maintenance, which further boosts profitability.

OPTIMIZING EFFICIENCY

As is known throughout the industry, nozzles are rated for water efficiency. Low-efficiency nozzles are about 30% efficient. Mid-level nozzles are about 50-60% efficient.

High-efficiency nozzles can be 75% all the way up to 98% efficient. Although they cost less, low-efficiency nozzles tend to utilize only 30% of the available energy, wasting 70% due to excessive turbulence or otherwise lack necessary precision to clear obstructions. Mid-level nozzles are more efficient but are still not adequate to tackle tougher jobs or perform with anywhere near the efficiency offered by more sophisticated units.

In contrast, the most effective nozzles have tight water patterns that efficiently clean the pipe wall and create a powerful water stream to move debris long distances and propel the nozzle. Crucially, these



>>> High-efficiency nozzles, like the OMG twin penetrating nozzle (top) and the Aqua Power 700 nozzle (left) from KEG Technologies, reduce water use, decrease trips to refill the water tank, and clean more effectively because of their tight water patterns.



nozzles provide efficient fluid mechanics to prevent the wasteful use of water (gpm) and operating pressure (psi).

However, even within the high-efficiency category there are significant differences in levels of efficiency. Opting for the lower end, high-efficiency nozzle with 75% efficiency could still lead to additional trips to refill. Additionally, such units may not remove restrictive sewer buildup or blockages in a timely manner.

Consequently, to proactively improve operations sewer truck and accessory dealers and contractors are turning to the most efficient nozzles. This is enabling sewer maintenance work crews to clean better and faster while conserving water and achieving dramatically more between each water tank refill. This approach also substantially reduces labor and machine hours to clean lines, along with equipment wear and tear, and can save approximately 9-17% in vehicle fuel costs, including travel to refill water tanks and run equipment. demonstration of the power of the KEG Technologies OMG

"Today, operators want to conserve water use to be more productive with their trucks and work crews. Water is an important natural resource, and usually drinking water is used," says Matthew Woods, vice president of sales and marketing at Haaker Equipment, a dealer of sewer cleaners, pipe inspection equipment and parking

lot sweepers for the contractor, municipal and industrial sectors in California, Nevada and Arizona.

SAVING WATER

In the case of Haaker Equipment, Woods says that high-efficiency nozzles are frequently recommended, although the dealer also carries other nozzle types as well.

According to Woods, refilling the sewer truck tank with water can take 30 minutes to an hour, depending on the hydrant location.

"Typically, the highest operating cost over the life of the vehicle isn't the truck or the nozzle: it's the operator's labor, and that is saved tremendously by using an ultra-efficient nozzle. If an operator can avoid two water tank fill cycles a day by using the most efficient nozzles, they can save an hour a day, 20 hours a month, and 140 hours annually, which is a great boost to productivity."

Woods says the difference between using a mid-level nozzle and a top high-efficiency nozzle can be cleaning about 30% to 50% more sewer line with the same amount of water. Also, efficient water use also reduces vehicle fuel as well as wear and tear by requiring fewer trips to the hydrant.

In addition, while municipal water is usually free locally, the ability to conserve water can minimize potential water use charges for contractors who use water from a county line.

What sets the most efficient nozzles apart from others in the category is fluid mechanics engineering on a par with the aerodynamics of race cars or jet fighters.

In the case of top-notch nozzles that provide up to 98% efficiency, the high-performance fluid mechanics design leaves little room for power losses and excessive turbulence. After exiting the jetter hose, water travels into the body of the nozzle before moving through smooth, curved channels. This design enables the

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> water to maintain its power and speed before entering the nozzle's replaceable titanium ceramic inserts. Next, the water is funneled from a short conical shape to a larger, longer cylindrical shape, allowing a tight water pattern to emerge.

> The internal workings of the nozzle, including the way the water gets turned, redirects the energy of the high-pressure water entering the nozzle as efficiently as possible. This results in what is needed for the task: more thrust and power using less water.

> "There is tremendous force and pressure created in an extremely efficient nozzle. It is often what is needed to get the most out of the Vactor sewer trucks we represent, which are considered the 'Ferrari' of the industry. To extend the analogy, you cannot go 200 mph in a Ferrari with the cheapest tires available," Woods says.

> While Woods does not insist that such a high-efficiency nozzle is necessary for every job, he does recommend it as an essential tool for the sewer crew's toolbox.

FIND THE RIGHT FIT

Troy Whitton is a parts and service sales specialist at Vimar Equipment, a British Columbia, Canada-based dealer of sewer and street vehicles and equipment for the contractor and municipal markets. Whitton, who has been a dealer for 20 years and is the startup demonstration trainer for the equipment that Vimar sells, also recommends utilizing highly efficient nozzles.





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"With the most efficient design, operators get the greatest efficiency out of their water, which provides the most power to clean the pipe and pull the hose. Because it is so efficient, operators typically achieve more than they ever could before with a lot less water," he says.

According to Whitton, as a dealer it is important to educate contractors and municipal mangers to help them understand how they can achieve the greatest value with their equipment. As a dealer, he wants Vimar Equipment's customers to understand the importance of using the highest quality nozzle on the hose to get the cleaning job done safely, quickly and efficiently.

Additionally, he suggests that choosing the best tool for the job can resolve the most difficult cleaning challenges, when a less powerful or precise nozzle may not be sufficient to do the job in a timely way.

"Selling the best nozzle for the job goes hand-in-hand with selling vac trucks because the nozzles do the work. The nozzles are essentially the 'tip of the spear' so you need the right nozzle for the job," Whitton says. While he acknowledges that lesser nozzles may cost less at first, he says that such units ultimately end up costing considerably more in less efficient work performance on the job.

"Compared to a mid-level nozzle, a high-efficiency nozzle will cost a little more initially, but can pay off rather quickly because you can get the job done in much less time."

While dealers, contractors and municipal supervisors have long accepted the status quo in sewer, storm and sanitary line cleaning, better approaches now exist in the form of ultra-efficient water conserving nozzles that can enable work crews to perform significantly more in less time. Ultimately, this helps to costeffectively boost both service ratings and profitability. **c**

ABOUT THE AUTHOR

Dennis Farhat is general manager of KEG Technologies, a manufacturer of sewer and storm lines products including high-performing nozzles, chain cutters, floor cleaners and camera nozzle systems. The Spartanburg, South Carolina-based company is a member of the National Association of Sewer Service Cos.