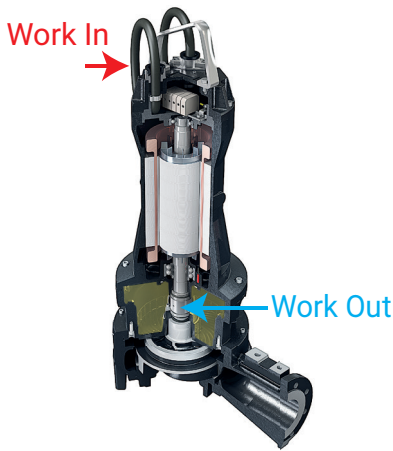


Balancing Efficiency and Reliability in Wastewater Pump Selection

$$\text{Motor Efficiency} \times \text{Hydraulic Efficiency} = \text{Total Efficiency}$$



$$\frac{\text{Motor Work Out}}{\text{Motor Work In}} \times \frac{\text{Pump Work Out}}{\text{Pump Work In}}$$

Total pump efficiency is the product of motor and hydraulic efficiency—but true performance depends on durability in real-world conditions.

In wastewater and industrial dewatering applications, selecting the proper pump design and impeller configuration is critical to achieving long-term reliability. Different applications present different challenges, including fibrous wipes, abrasive grit, sludge, and corrosive materials. Matching the pump and impeller design to the operating environment helps reduce clogging, minimize wear, and improve overall system performance.

One of the most important first steps in pump selection is understanding the application itself. Municipal wastewater, sludge handling, mining, and construction dewatering all involve different solids and operating conditions. Reviewing previous pump failures can also provide valuable insight into whether clogging, abrasion, or corrosion is the primary issue affecting reliability. Considering the entire pumping system — including upstream conditions and downstream equipment — can also help improve long-term performance and reduce unexpected failures.

While hydraulic efficiency remains an important consideration, reliability often has a greater impact on overall lifecycle cost. A highly efficient pump that frequently clogs or requires maintenance can quickly erase potential energy savings. In demanding wastewater applications, downtime may lead to repair costs, rental equipment, operational disruptions, or even environmental penalties.

For applications involving wipes, rags, and fibrous materials, cutter, grinder, and chopper-style impellers



REPAIR / REPLACEMENT OF PUMP

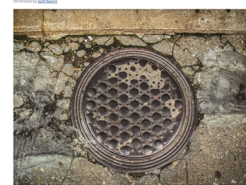
15HP motor rewind
= ~ \$2,000



RENTALS

~ \$1,000/Day

Nearly 36,000 gallons of raw sewage spills in Jacksonville



PENALTIES

Fines can start at \$500/incident with fines reaching up to 5 figures

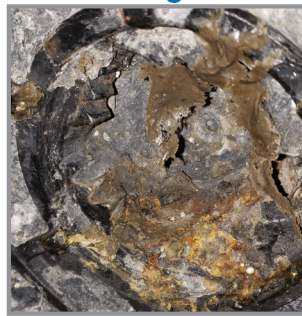
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Prioritize reliability as much as efficiency by choosing the right pump design for the application to reduce clogging and lifecycle costs.

Abrasive Erosion



Clogs

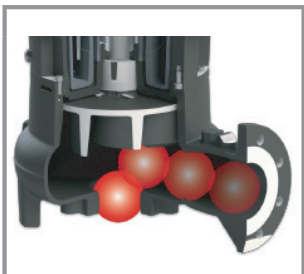


provide a reliable solution by reducing solids before they pass through the pump. Although these designs may reduce hydraulic efficiency due to added drag, they significantly improve resistance to clogging and help protect downstream piping systems.

Vortex impellers are often preferred for applications containing large solids or abrasive materials. Because the impeller is recessed away from the pump inlet, solids can pass through with less direct contact against wear components. While vortex designs typically operate at lower efficiency, they can greatly improve reliability and wear life in difficult operating environments.

Material selection also plays a major role in pump longevity. High chrome iron alloys offer excellent abrasion resistance in slurry and dewatering applications, while stainless steel may be better suited for corrosive environments. Balancing hydraulic efficiency, solids handling capability, material selection, and long-term reliability is essential for achieving dependable pump performance in demanding wastewater applications.

Large Solids Passage



Downstream Protection



From abrasive wear to clogging and solids passage, application conditions dictate the right impeller solution.

CONTACT

TSURUMI (AMERICA), INC.

1625 Fullerton Ct
Glendale Heights, IL 60139

Yumiko T. Lindgren
Marketing Manager
yumikot@tsurumiamerica.com
(630) 547-2245

www.tsurumipump.com

 Follow Tsurumi America on Social Media



ABOUT TSURUMI

Founded in 1979, Tsurumi (America), Inc. is a division of Tsurumi Manufacturing Co., Ltd., a global pump industry innovator since 1924. Headquartered in Glendale Heights, Illinois, the company maintains additional operations in Quebec, Canada; El Paso, Texas; and Salt Lake City, supporting customers across North America. Globally, Tsurumi operates in more than 45 countries, delivering reliable pumping solutions for construction, civil engineering, mining, industrial and municipal wastewater, sewage treatment, flood control, and landscape applications. Tsurumi products are backed by independent, third-party verification and supported by a robust distribution network and one of the largest on-hand inventories in North America.