
Steel Plant Achieves Pump Reliability By Selecting KZE 370 For Scale Pit

Anyone who has ever participated in the process of selecting a pump for a specific application knows the importance of understanding the system as a whole. Over time, that system can be subject to changes which can dramatically affect pump performance. When pump performance is unreliable, it is important to work with experienced pump people who are capable to review the system, find the root cause of the problem, and provide a solution quickly.



One such solutions provider, based in Ohio, had a long-standing relationship with a local steel plant, which is a major producer of steel pipe in the U.S. Having originally started serving the steel plant in 1989, National Pump and Process had continued to provide pumps, parts, repair, and field service for this Midwestern steel plant, which underwent major reconstruction in 2012 as a result of a corporate merger.

The steel plant has several scale pits in operation. One of the smaller in-plant scale pits holds 25,000 gallons of water and has the highest concentration of scale. The scale is pumped away via a flume. “The pumps in this scale pit need to be extremely reliable and handle large scale loads without clogging. Failure would result in flooding of the manufacturing floor,” explains Scotty Graybill, VP of Operations for National Pump and Process.

The original 90 HP submersible scale pumps in this pit were designed to operate on variable frequency drives (VFD) to provide constant pit level control with one pump operating and the second used as a back-up. The primary pump failed four times in its first year in operation. The cause of the pump failure was the same every time – cavitation and abrasion. Having a long-standing relationship with National Pump and Process, the steel plant called Scotty Graybill for a solution to their pump problem.

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“The root cause of the problem was the original pumps were oversized. During reconstruction, changes had been made to the piping, and as a result, the system head was decreased,” Graybill explains, “The pumps were running out on the curve and failing as a result of cavitation.”

To prove his diagnosis, Graybill pulled a 30HP BJM submersible pump, Model KZN 220, out of National Pump’s inventory and brought it to the steel plant. The portable BJM submersible slurry pump with agitator handled the majority of the flow with the backup only coming on in peak flow periods.

“It was paramount for us to select the right pump for this application. So after we determined the correct flow and head for the system, we chose a pump that would be best suited for the steel plant’s system. The new pump had to meet critical criteria, which included durable metallurgy, the use of an agitator, and immediate availability.” Keeping the steel plant’s needs in mind, Graybill recommended the 55 HP BJM KZE 370 Series Submersible Slurry Pump, which is a high-capacity, hard-metal submersible slurry pump with an agitator.

Graybill reviewed the following key features of the KZE 370 with steel plant personnel:

- **Durable Hard Metal Material:**
 - 28% high-chrome iron wear parts: volute, impeller, wear plate
 - 403 Stainless Steel shaft and impeller key
 - 304 Stainless Steel hardware and fasteners
 - Cast iron motor housing
 - High-chrome iron agitator

- **Agitator** – the KZE 370 can pump wastewater with high concentrations of slurry - up to 70% - because it comes with a high-chrome agitator which helps keep solids suspended in the liquid; allowing the scale and wastewater to be pumped without clogging.

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- **Impeller** – the KZE 370 utilizes a semi-open, hard metal, slurry-type impeller which is capable of passing 1" solids, making it ideal for handling the high concentrations of scale.

There were additional features of the KZE 370 Submersible Slurry Pump that translated into improved pump reliability for the steel plant. These features included:



- **Sealing System** – the KZE 370 is engineered with double mechanical seals with silicon carbide faces and Buna N elastomers. The seal chamber is protected from the scale-saturated wastewater by labyrinth rings and a lip seal. The sealing system also includes BJM Pumps' proprietary Seal Minder® leak detection probe.
 - **Bearing System** – the KZE 370 is made with permanently lubricated upper and lower bearings with high temperature grease, which is engineered to extend pump life. The upper radial bearing is a roller bearing design, and the lower radial and axial thrust bearing have the double row angular contact design.
- **Motor Protection** – With Class H insulation and 4 pole motor speed, the KZE 370 can withstand temperatures up to 104° Fahrenheit. The Cable Entry Sealing System uses a compression fitting with a Buna N grommet as well as individually isolated and potted leads to prevent moisture intrusion and wicking. The Sensor Cable contains the Seal Minder® moisture sensing probe and motor thermal sensors.

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Within 24 hours after reviewing Scotty Graybill's recommendation and seeing the BJM KZN pump work well in the scale pit, the decision-makers at the steel plant submitted a purchase order for a 55 HP BJM KZE 370 Submersible Slurry pump. National Pump and Process custom-manufactured an adaptor that would enable them to install the BJM pump onto the existing rail system and discharge elbow.

"We are approaching two years since installing the first KZE 370 pump, and we have not had a single mechanical failure. This is a great run time, and it shows how this pump is extremely robust and a tremendous value," declares Graybill.

The steel plant installed the second KZE 370 soon after the first one was installed in 2013, and then purchased a third pump to keep as an online spare. The plant is saving about \$80,000 in maintenance dollars and seeing additional cost savings as a result of reduced energy usage from lower horsepower pumps.

"While being responsive is critical to properly supporting our customers," states Graybill, "being able to recommend a reliable pump is equally as important." By working with knowledgeable pump people and choosing an engineered, high quality pump, the steel plant was able to save maintenance dollars, reduce energy costs, and achieve pump reliability.

About BJM Pumps

BJM Pumps®, headquartered in Old Saybrook, Connecticut, has been providing fluid handling solutions for industrial and municipal services since 1983. Over its thirty year history, BJM Pumps has grown quickly by supplying world class pumps and accessories, priced competitively, through its global network of stocking distributors.

About National Pump and Process

Since 1978, National Pump and Process has been providing new pumps, parts, repair, and field services for the steel, utility, chemical, municipal, and other industrial markets. National Pump and Process repairs all types of rotating equipment with an array of reconditioning services and offers complete unit remanufacturing.