

NETZSCH NEMO® Progressing Cavity pump replaces a competitor's lobe pump to solve high pressure CIP Problem for major pet food manufacturer

One of the nation's leading pet food company manufactures their line of wet dog food products in their facility in Arkansas (USA). It is at this plant location where process concerns had grown. The manufacturing process at the factory starts initially with frozen pieces of ground meat. The larger pieces are broken up and transferred to a cooking station via a screw conveyor. At the cooking station the meat is prepared to the required specifications and the gravy sauce is added. The meat emulsion with gravy then goes into a dynamic mixer, and from there to the filling and packaging station.

The company had been employing a competitor's sanitary rotary lobe pumps to transfer the meat emulsion with gravy from the cooking station to the mixer and from the mixer to the filling and packaging station. These lobe pumps were not able to handle the high pressure that was necessary for the pet food company's clean-in-place (CIP) process. Along with that, the cleaning and sanitation procedure was difficult. This led to longer downtime, higher maintenance costs and loss in production.

This is not entirely surprising, because rotary lobe pumps are inherently limited in their ability to handle pressure. In ideal circumstances the maximum may be 230 psi (16 bar), but for most practical purposes in many applications pressure may



be problematic beyond 145 psi (10 bar). Lobe pumps are also very sensitive to the range of viscosity and thickness of slurries and emulsions.

On the other hand, progressing cavity pumps (PCP) can handle greater pressures, a wide range of viscosities as well as the thicknesses of slurries and emulsions, and the pump performance is not affected by the variations and changes that may occur during this kind of process. Progressing cavity pumps also offer a positive sealing effect between the rotor and stator creating distinct cavi-

ties which permits the handling of higher pressure per stage.

NETZSCH, the world market leader for progressing cavity pumps and an expert in positive displacement pump technology (also rotary lobe and multiple screw pumps) with over 60 years of experience in this field, was consulted to find a solution.

After studying the application and analyzing all factors, NETZSCH offered NEMO® progressing cavity pumps as the best solution for transferring the meat and gravy emulsion from the cooking station

to the mixer, and from the mixer to the filling and packaging station. In addition to solving the pressure problem the progressing cavity pump also improved the consistency of the emulsion due to its gentle shear characteristics.

NETZSCH proposed a NEMO® NM076 pump in all 316 stainless steel polished construction with tri-clamp CIP and discharge connections. The pump utilizes a stainless steel wash down motor for ease of cleaning. It was mounted on a stainless steel baseplate with wheels and a handlebar for ease of movement. The open hopper and feed screw provides a smooth entry for the emulsion in the suction housing of the pump and into the conveying elements.

The stator material selected was a medium high acrylonitrile elastomer compounded to comply with the FDA Standard 177.2600 Code of Regulations Title 21. This material offers a good balance of thermal properties as well as rheological properties to handle high pressures and enhance the service life of the stators.

NEMO® pumps are carefully designed to ensure precise interference between the rotor and stator for delivering the maximum pressure per stage. NETZSCH manufactures all components to a high degree of accuracy and tight tolerances to provide consistent performance for extended service life and minimum maintenance.

The 2 stage NEMO® progressing cavity pump installed at the customer's facility in Arkansas has been operating successfully for more than 18 months as of the date of this report. It is easily capable of handling the higher pressures during the



Polished inlet hopper with feed screw.

CIP process. As an added benefit, during normal operation it has the advantage of even handling any pressure surges that may occur. The temperature of the emulsion ranges between 37 and 86 degrees F (3 and 30 degrees C) while during the CIP process, the temperature ranges from 140 to 175 degrees F (60 to 80 degrees C).

The customer has been very pleased with the performance of the pumps, and for simplifying the CIP process. All of this provides the customer with a lower total cost of ownership. The customer has expressed their satisfaction and appreciation to NETZSCH, and their team of experts, for solving a major problem.

Pump Data for 4-inch* pump

Pump type:	NEMO® PCP Model NM076
Capacity:	44 to 230 (CIP) gpm / 12 to 63 m³/h
Pressure:	20 to 150 psi / 1.4 to 10 bar
Medium:	meat emulsion with gravy
Product Temp:	37 to 86 °F / 3 to 30 °C
CIP Temp:	140 to 170 (CIP) °F / 60 to 80 (CIP) °C
Viscosity:	15,000 cps
Speed:	140 rpm

Contact NETZSCH

NETZSCH customers rely on our rigorous standards in design, engineering and manufacturing to deliver products with absolute functional reliability and exceptional quality. NETZSCH service, like NETZSCH quality, is geared to surpass our customers' expectations. For more information on this customer application and NETZSCH products and services:

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