

## ALLWEILER Pumps: Long Service Life with Organic Waste Processing

When regular commercial pumps are used to process organic waste, they typically wear out after only a short period of time. Liquids pumped under these conditions attack pumps from two different angles: first with highly abrasive additives; second with liquids that have highly fluctuating pH values that exhibit a high level of chemical aggressiveness. These conditions are very tough on seals and elastomer stators. As a result, these parts must be changed often, increasing downtime. ALLWEILER progressing cavity pumps operating in an Austrian plant have proven that having the right pumps and the right materials can make a big difference.

BioEnergie GmbH, located in Austria's wine growing region, has pointed the way. This company

worked together with plant builders Komptech Anlagenbau GmbH and ALLWEILER AG to optimize the materials used in these pumps. The results are significant: longer service lives, even for pumps located at the beginning of the process where they are attacked the most.

The plant receives all conceivable types of organic waste. Household waste, leftover food, restaurant waste, and plant material are a few examples of material that finds its way to the plant. Total volume is approximately 15,000 metric tons every year, 5000 metric tons of which are sent to a dump or used as fertilizer.

Regular waste is received in its packaging and processed without



The plant processes virtually any type of packaging and additive.



Martin Hajszan is in charge of the plant: "These pumps are unusually durable. We replace worn parts ourselves. The elastomer stators have been in service for more than one year without visible signs of wear."

being separated. Examples of this include glass, metal lids and seals, wooden pallets, plastic packaging, and even metal drums. The first step in the process reduces the material to a grain size of no larger than 60 mm. Once reduced in size, a conveyor belt carries the material to a separation container. Process water is added, causing heavy extraneous materials to sink to the bottom where they can be removed.

The remaining liquid contains 10% to 15% dry substance and a minimum pH of 4. A sieve retains solids with a diameter of greater than 12 mm before the first progressing cavity pump carries the mass to the grit separator. This is a AEB1E-series pump capable of moving up



ALLWEILER progressing cavity pump of the AEB1E2700 series, with readjustable stator; medium: biomass; capacity: 100 m<sup>3</sup>/hour; pressure: 2 bar.

to 60 m<sup>3</sup> per hour. Due to the highly variable chemical properties of the liquid and the presence of sand and

other mechanical abrasive solids, this pump must be able to handle a high level of stress. Organic waste



ALLWEILER progressing cavity pump of the AEB1E750 series; liquid: biomass at 75 °C; capacity: 18 m<sup>3</sup>/hour; pressure: 2-4 bar.

in particular has a highly variable composition, but it almost always contains sand, gravel, and glass.

The same or similar ALLWEILER progressing cavity pumps are used in the subsequent process steps. In total, 11 progressing cavity pumps are operating in the plant. They move the biomass from disinfection to the biogas reactor and the separator in addition to pumping process water into the plant.

Important characteristics for achieving a long pump service life are slow speeds and high quality materials. BioEnergie GmbH has chosen to run the pumps at about 200 rpm. In order to achieve the required pump capacity of up to 100 m<sup>3</sup>/hour at such low speeds, the plant utilizes large pumps equipped with frequency-converter control.

After starting operation, the plant collaborated with the vendor to experiment with potential materials. With its readjustable polyurethane stators and specially coated rotors, the first pump (subject to the greatest loads) stayed in service for more than one year, recording more than 1000 operating hours. This is possible because ALLWEILER AG is one of a small number of pump manufacturers that produces its own stators and offers its customers a choice of more than 15 different materials. ■