

# HIGH-PERFORMANCE PUMPS FROM COLFAX FLUID HANDLING

## PUMPING DEWATERED SLUDGE ACROSS 70 M (230 FT)

The Hurma municipal sewage treatment plant near Antalya, Turkey is notable for several reasons. Its approach to sludge clarification, drying, and reprocessing, as well as the associated generation of heat and power, is unique in Turkey. Secondly, only a small number of plants use a progressing cavity pump to move sludge to a dryer across such a long distance (70 m/230 feet).

### High-pressure progressing cavity pump

For this situation, the plant relies on a pump from Colfax Fluid Handling. The pump was manufactured by the Colfax Fluid Handling brand Allweiler in Germany. It pumps sludge that has been dewatered to 18-20 % dry substance at a pressure of 16 bar (232 psi) and a flow rate of up to 20 m<sup>3</sup>/h (88 gpm). A stator with uniform wall thickness enables achievement of the high pressures. The elastomer is adapted to the chemical and physical properties of the liquid. As a result, it can stay in service of continuous operation for more than 18 months. Plant managers intend to switch to the new ALLDUR<sup>®</sup> stators the next time they are replaced. This could increase service life by another five times while simultaneously boosting overall efficiency and energy efficiency. These are welcome developments because energy consumption will have a higher priority in the future.

### Allweiler<sup>®</sup> pumps in every process

In addition to this pump, another 40 "Tecflow" pumps from Allweiler<sup>®</sup> are used in Hurma. They enhance every process from pumping of raw sewage to pumping residual sludge. They have worked flawlessly since their commissioning three years ago, which was not the case with the Italian pumps used in the past. There were bad experiences with their drives and seals.

### Numerous benefits

Additional benefits of Allweiler<sup>®</sup> pumps are apparent upon closer examination. They are easy to maintain. In particular, replacing the seals is accomplished quickly. Spare parts are available quickly. This, and the use of many common parts out of the modular system that Allweiler<sup>®</sup> has, eliminates the need to keep large stocks of parts, reducing the capital commitment. Maintenance and service expenses are very low, due largely to the choice of materials, particularly of the stator elastomer. One of the major benefits of using Allweiler<sup>®</sup> is the effective support on the plant and therefore their rapid response times." In this case support is provided by Argus Makine in Istanbul. They have been a partner of the German manufacturer since 1991 and have years of experience with a wide variety of pumps and numerous applications.

### Self-sufficient system

The plant went into service in 2001 solely to provide preliminary clarification. In 2001, a biological clarification stage was added; the biology was expanded in 2005; and in 2011 the plant was expanded at every level. It is currently designed for up to 1,400,000 resident equivalent units and a capacity of 210,000 m<sup>3</sup> per day (38,529 gpm). Antalya processes all wastewater according to the German standard ATW131. Daily production of 6500 m<sup>3</sup> (8502 cubic yards) of digestion gas covers all of the plant's energy requirements. This gas, produced during sludge treatment, contains approximately 65% methane and 35% CO<sub>2</sub>. On average, 150 metric tons of digested sludge are produced every day. The final product is composed of 90% dry matter. Nearly 140 kg (309 lb) of this material are produced every hour.



This plant's technology is unique in Turkey. Here it is shown on a video screen in a modern training room.



**Application:** Pump sludge for drying  
**Pump series:** Allweiler® AE 1+1N 5000-RG high-pressure progressing cavity pumps  
**Pumping distance:** 70 m (230 feet)



Sludge entering the pumping screws of the high-pressure pump.



**Application:** Pump sludge  
**Pump series:** Tecflow 2701 (at the front)  
**Pressure:** 3 bar (43.5 psi)  
**Flow:** 60 m<sup>3</sup>/h (264 gpm)  
At the back: a high-pressure pump for pumping sludge.



**Application:** Pump sludge  
**Pump series:** Tecflow 2701  
**Pressure:** 1 bar (14.5 psi)  
**Flow:** 80 m<sup>3</sup>/h (352 gpm)



**Application:** Pump sludge  
**Pump series:** Tecflow 1001  
**Pressure:** 4 bar (58 psi)  
**Flow:** 30 m<sup>3</sup>/h (132 gpm)



**Application:** Pump sludge  
**Pump series:** Tecflow 2701  
**Pressure:** 1 bar (14.5 psi)  
**Flow:** 80 m<sup>3</sup>/h (352 gpm)



**Application:** Pump sludge  
**Pump series:** AEB 1L 551  
**Pressure:** 1 bar (14.5 psi)  
**Flow:** 15 m<sup>3</sup>/h (66.1 gpm)



**Application:** Pump sludge  
**Pump series:** AE 1E 5000  
**Pressure:** 2.7 bar (39.2 psi)  
**Flow:** 161 m<sup>3</sup>/h (709 gpm)



On the left: (three pumps):

**Application:** Pump sludge  
**Pump series:** AE 1E 5000  
**Pressure:** 2.7 bar (39.2 psi)  
**Flow:** 161 m<sup>3</sup>/h (709 gpm)

On the right: (two pumps):

**Application:** Pump milk of lime  
**Pump series:** AE 1E 550  
**Pressure:** 2 bar (29 psi)  
**Flow:** 15 m<sup>3</sup>/h (66.1 gpm)



The length of the pipe between the high-pressure progressing cavity pump (far left) and the dryer (far right) is approximately 70 m (230 feet) and overcomes a height difference of about 4.5 m (14.8 feet) when crossing a street.

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Power Generation Products & Services

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