REVOLUTIONARY MATERIALS
RESULT IN LONG-LASTING STATORS

CHALLENGE

Stators made from a material that significantly extends service life compared to conventional materials, even when pumping highly abrasive liquids.

SOLUTION

Use stators made from „Alldur®“.

RESULTS

The elastomer's new chemical composition and special production methods increase service life of the stator (and therefore of the entire pump) by up to 500 percent.

The pump moves 5 to 10 m³/h of abrasive thick sludge with 6% dry substance at a pressure of 8 to 12 bar.

REVOLUTIONARY MATERIALS RESULT IN LONG LASTING STATORS

CIRCOR offers stators made of “Alldur®“in progressing cavity pumps manufactured by Allweiler® in Bottrop, Germany. These pumps have been used for decades in a variety of applications, including many sewage plants in Germany and other countries.

Feed pumps of the AE series for the filter beds

They are characterized by their ability to easily pump liquids with a large proportion of dry substance and abrasive components. A variety of available designs and materials enable adaptation of the pumps to specific liquids and pumping conditions. Now, with stators made of “Alldur®“, they are even more economical.

This new material reflects decades of experience and is designed specifically for pumping abrasive wastewater in sewage plants.

The composition of “Alldur®“ is adapted to provide maximum resistance to mechanical influences. The elastomer's new chemical composition and production methods increase service life of the stator (and therefore of the entire pump) by up to five times.

The large Cologne-Stammheim sewage plant uses Allweiler® pumps of the type “AE4H750“ for pumping thick sludge, among other uses. The new stator material has been undergoing long-term durability tests since December of 2012. Two identical pumps – one with a standard stator and

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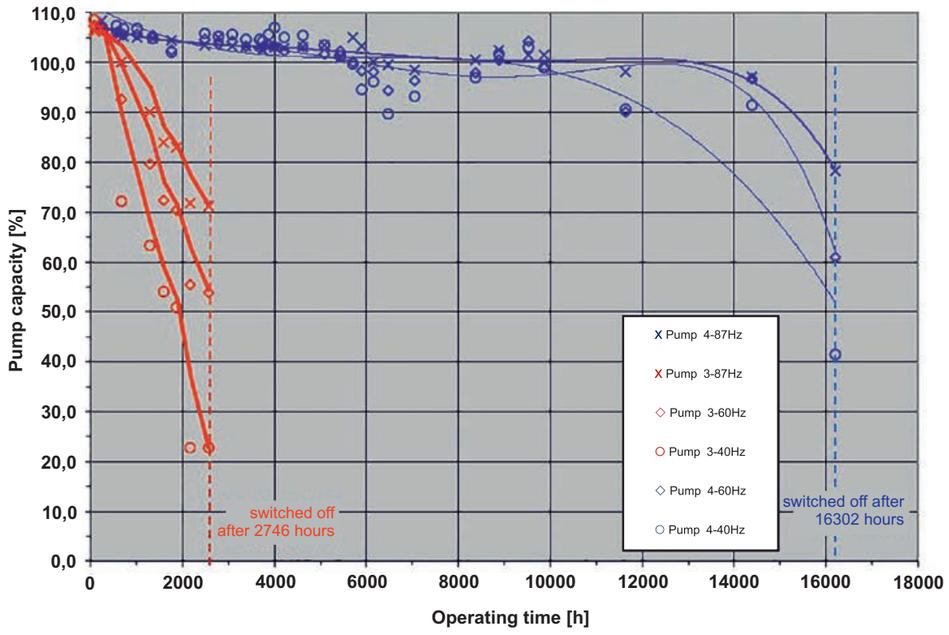
Discharge pumps of the AE series pump 5-10 m³/h of abrasive thick sludge at pressures of 8-12 bar.

another with "Alldur®" – were tested while pumping thick sludge from a thickening machine.

Capacity was measured at regular intervals at a variety of pressures and speeds over several thousand hours. The test results confirm the new material's ideal characteristics for use in stators. The pump with a conventional stator exhibited initial signs of wear after four months and a continual linear loss of capacity.

After an additional three months, pump capacity in the lower speed range was no longer sufficient and it was necessary to replace the stator. Berndt Fritsche, Director of Maintenance: "We were able to extend pump operation by another three months only by increasing its speed. In contrast, the capacity of the pump with the "Alldur®" stator remained constant for more than two years."

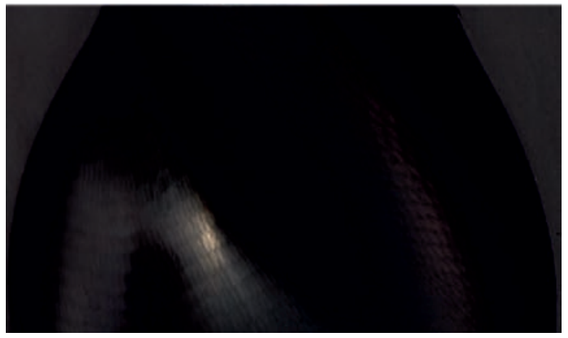
Comparative pumps of the AE4H750 series



With the ALLDUR® stator (blue line), capacities over about 10'000 operating hours had dropped only marginally (5 to 10 %) with a flat reduction of the capacity values. Pumps with usual stators (red lines) showed a heavy decline. The test pumps conveyed abrasive thick sludge with approximately 6 % dry substance; capacity ranged from 5 to 10 m³/h with a discharge pressure of 8 to 12 bar.

POWER AND INDUSTRY 2013 SUCCESSTORY

Allweiler® progressing cavity pumps of the AEB series dose the flucculant aids.



„Shark skin" surface structure of the new „Alldur®"stators

Excess sludge is thickened by filter belts manufactured by Huber of Germany.

By March of 2013, its capacity had dropped marginally by approximately 5 to 10% with a flat reduction of the capacity values.

The durability of the "Alldur®" stator has already compensated for its additional cost. There is also less downtime for maintenance and repairs. Elevated energy costs normally associated with higher speeds are also avoided. Thomas Klein, Director of Operations at the sewage plant: "Our experiences with the new stator material have been wholly positive. One by one, we plan to equip all of our pumps with the Alldur® stators."

The test pumps conveyed abrasive thick sludge with approximately 6% dry substance; capacity ranged from 5 to 10 m³/h with a discharge pressure of 8 to 12 bar. The composition of "Alldur®" is adapted to provide maximum resistance to mechanical influences. The elastomer's new chemical composition and production methods increase service life by up to five times.

"Wear is incredibly low, even when the pump moves highly contaminated wastewater with a high proportion of solids for long periods of time," according to Alfred Paul, technical director at Allweiler®. The new stator is also highly elastic and exhibits high tensile strength. It has high tear-growth resistance and can be used across a wide temperature range. "Alldur®" stators are now available in all of the company's progressing cavity pumps.

CIRCOR Allweiler® brand is one of the few companies that manufactures every part of its progressing cavity pumps at its own plants in Germany. Stators are particularly important and must be carefully matched to the pumped liquid. "Allweiler® selects from twenty combinations of elastomers so the customer gets the most economical solution possible." Allweiler®'s plant in Bottrop, Germany manufactures approximately 8,500 progressing cavity pumps for sewage treatment plants every year.

The large Cologne-Stammheim plant is designed to serve 1.57 million residents. More than 83% of all private and commercial wastewater from the Cologne metropolitan area is processed there. Due to positive experiences over several decades, the plant procurers the majority of its pump technology from CIRCOR brand Allweiler®.

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