

**Compact and robust:****TORNADO<sup>®</sup> rotary lobe pump reliably diverts up to 200 m<sup>3</sup> an hour of waste water with varying consistency during work on sewers**

Waldkraiburg, 27.08.2014

**Almost 10 percent of public sewers in Germany are between 76 and 100 years old; the majority have been in service for 26 to 50 years according to the 'German Association for Water, Waste Water and Waste Management' (DWA). Therefore, regular repairs and maintenance measures are becoming ever more important. However, the problem with this is that waste water still needs to be discharged while work on the sewer is in progress; but standard pumps are often not capable of handling the inhomogeneous and partly abrasive matter. For this reason, a TORNADO<sup>®</sup> rotary lobe pump from NETZSCH Pumpen & Systeme GmbH has recently been put into operation in Bad Fallingbostel, Lower Saxony. The self-priming pump technology can also handle fluctuations in dry matter content without clogging up. Thanks to its compact design, it takes up little room at the construction site and is easy to transport.**

Around 17 percent of the German sewer system needs to be restored immediately or mid-term according to DWA information. One aspect complicating the necessary construction measures in many cases is safe drainage. This includes measures which, on the one hand, are designed to protect the section under restoration; on the other hand, they also need to protect the environment and third party property from damage caused by the sewers backing up or leaking waste water. Depending on the structural situation, various methods are worth considering, such as controlled backup or partial continued flow within provisional pipes. During the sewer repairs in Bad Fallingbostel, however, stretches as long as 3,000 metres had to be bridged; therefore, an above ground diversion to the nearest sewer junction was the only viable option.

**Conveyance even for high solids concentration**

Centrifugal pumps have previously been used to lift the waste water, as the pumping capacity can amount to 200 m<sup>3</sup> and more an hour. However, these are only suitable for finer suspensions; media with coarser settling particles, on the other hand, may affect

the pumping capacity. "With the waste water to be moved in this case, the dry matter content varies enormously, which has repeatedly caused the centrifugal pump to clog up," explains Helmut Hentrich, a sales representative at NETZSCH. Therefore, the decision was taken to use a positive displacement pump with rotary lobes for the sewer work in the Lower Saxon district town.

The central part of the TORNADO® pump used are two three-lobe, helical rotors, which engage whilst rotating, thereby generating a vacuum on the suction side. The medium is drawn in automatically as a result and pumped through the rotor chambers to the discharge side. The dry matter content hardly affects the volume flow in the process. The free ball passage in this design is very large, which means that even larger solids in the waste water present no difficulty. Furthermore, the NETZSCH rotary lobe pump is designed for easy handling and maintenance, which also allow many parts to be accessed away from the workshop right on site. For example, to clean or replace seals and lobes only the inspection port has to be removed; dismantling the housing or pipelines is unnecessary compared to other pump systems.

### **Robust design with protected gearbox**

When designing the TORNADO® special attention was paid to robustness to ensure that potentially abrasive or aggressive media, like the waste water in this case, would be unable to damage the technology. In this respect, the lobes are coated with resistant nitrile rubber, which enables the pump seal to do its job reliably for long periods even under great stress and strain. Furthermore, the gearbox and pump chambers in the rotary lobe pumps are soundly separated from one another. This Gearbox Security System (GSS) ensures that even in case the shaft seal fails, matter will not be able to get into the complex gearbox. In turn, this ensures disruption-free operation and prevents serious defects, as Erwin Weber, Head of the Rotary Lobe Pump Division at NETZSCH explains: "If medium, such as sludge or a similar substance, was to get into a traditional timing gear, that would mean a complete write-off."

This robustness and security is even more important, as media with both non-solid and solid content of particle sizes up to 70 mm and viscosity of 1 to 1,000,000 mPas may be conveyed by the TORNADO® pumps. Depending on the application requirements and size of the system, up to 1,000 m<sup>3</sup> can be pumped an hour. In this way, both sticky

and dry substances, thixotropic, dilatant, shear-sensitive or abrasive media can be conveyed. Combustion engines, or electric or hydraulic motors can be used as drives.

**Up to 200 m<sup>3</sup> of waste water pumped an hour by means of -0.5 bar suction level**

In Bad Fallingbostel, the TORNADO<sup>®</sup> rotary lobe pump is continuously in operation during work on the sewers. A 22 KW motor drives the pistons, which reach speeds of between 180 and 400 revolutions a minute. 75 to 200 m<sup>3</sup> an hour is diverted at 3 bar, depending on the amount of waste water involved. Even the suction level of up to -0.5 bar, which may cause pumping failures in other pumping processes, is handled by the reliable seal and suction effect without loss of performance. Thanks to its compact design, the system hardly takes up any space at all at the construction site and can be simply dismantled and taken to the next site of operation. "The sewage workers were extremely satisfied with this solution," according to Hentrich, the Project Manager. "Plans have now been made to acquire a second TORNADO<sup>®</sup> with twice the performance."

[5,901 characters, incl. spaces]

*For 60 years, NETZSCH Pumps & Systems has served markets worldwide with its NEMO<sup>®</sup> progressing cavity pumps, TORNADO<sup>®</sup> rotary lobe pumps, grinding machines, barrel emptying units, dosing technology and accessories, providing customized, sophisticated solutions for applications in every type of industry. With a workforce of more than 1,900, Pumps & Systems is the largest business unit in the NETZSCH Group with the an annual turnover of more than 240 Mio Euro (Business year 2013) alongside Analysing & Testing and Grinding & Dispersing.*

**Contact:**

NETZSCH Pumpen & Systeme GmbH  
Geretsrieder Straße 1  
84478 Waldkraiburg  
Germany  
Tel.: +49 8638 63-2356  
Fax: +49 8638 63-92356  
[Info.nps@netzsch.com](mailto:Info.nps@netzsch.com)  
[www.netzsch.com](http://www.netzsch.com)

**Photos:**



Safe drainage is a fundamental measure for repairs or maintenance work on the sewers. This ensures that the construction section as well as the surrounding properties will be protected from uncontrolled waste water leakage.  
Source: Hartmut, pixelio.de



During the work on sewers in Bad Fallingbostel, the waste water had to be partly conveyed above ground more than 3,000 metres to the nearest junction. Due to the fluctuating dry matter content, a TORNADO® rotary lobe pump from NETZSCH was used.  
Source: NETZSCH Pumpen & Systeme GmbH

Thanks to its compact design, the TORNADO® pump is easy to transport and takes up hardly any room at the construction site.



Furthermore, the system has a robust structure, which enables it to pump even abrasive media without suffering any damage.  
Source: NETZSCH Pumpen & Systeme GmbH



The positive displacement pump is suitable for sticky and dry substances, thixotropic, dilatant, shear-sensitive and abrasive media with viscosities of 1 to 1,000,000 mPas. Depending on the size of the system, up to 1,000 m<sup>3</sup> can be pumped an hour.  
Source: NETZSCH Pumpen & Systeme GmbH

© NETZSCH Pumpen & Systeme GmbH. Printing free of charge. Sample copies requested.