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### HUBER Drum Screen LIQUID – an innovative product with more and more success in Germany

In 2017, HUBER was successful with its innovative HUBER CarbonWin® system for carbon removal, winning projects in two federal states of Germany. We are now working busily on implementing the two projects in Saxony-Anhalt and Baden-Württemberg.

#### Project Staßfurt – first HUBER CarbonWin® system installation in Germany

Staßfurt is a town in the Salzlandkreis district in Saxony-Anhalt, Germany. On 31<sup>st</sup> January 1851, the town became the cradle of the worldwide potash mining industry. It was the seat of the Royal Prussian Salt Mine, the first potash mine in the world. When the first potash mine shafts were driven, Staßfurt experienced an enormous economic upswing due to the mining industry itself but also due to the chemical industry settling there.

The sewage treatment plant Staßfurt is designed for 40,00 PE. As more and more industries have settled there, the inlet COD load has steadily increased and is now equivalent to approx. 46,000 PE. The nitrogen concentration, however, would suggest a plant size of 27,000 PE. Given these basic conditions, an economically attractive solution had to be found to eliminate the very large amounts of carbon generated on site. The overall concept would have to include the change of the process management from aerobic to anaerobic sludge stabilisation and digestion.



*Fig. 1: The installation of a HUBER CarbonWin® system with fine screening technology saves the costs for a biological treatment stage.*

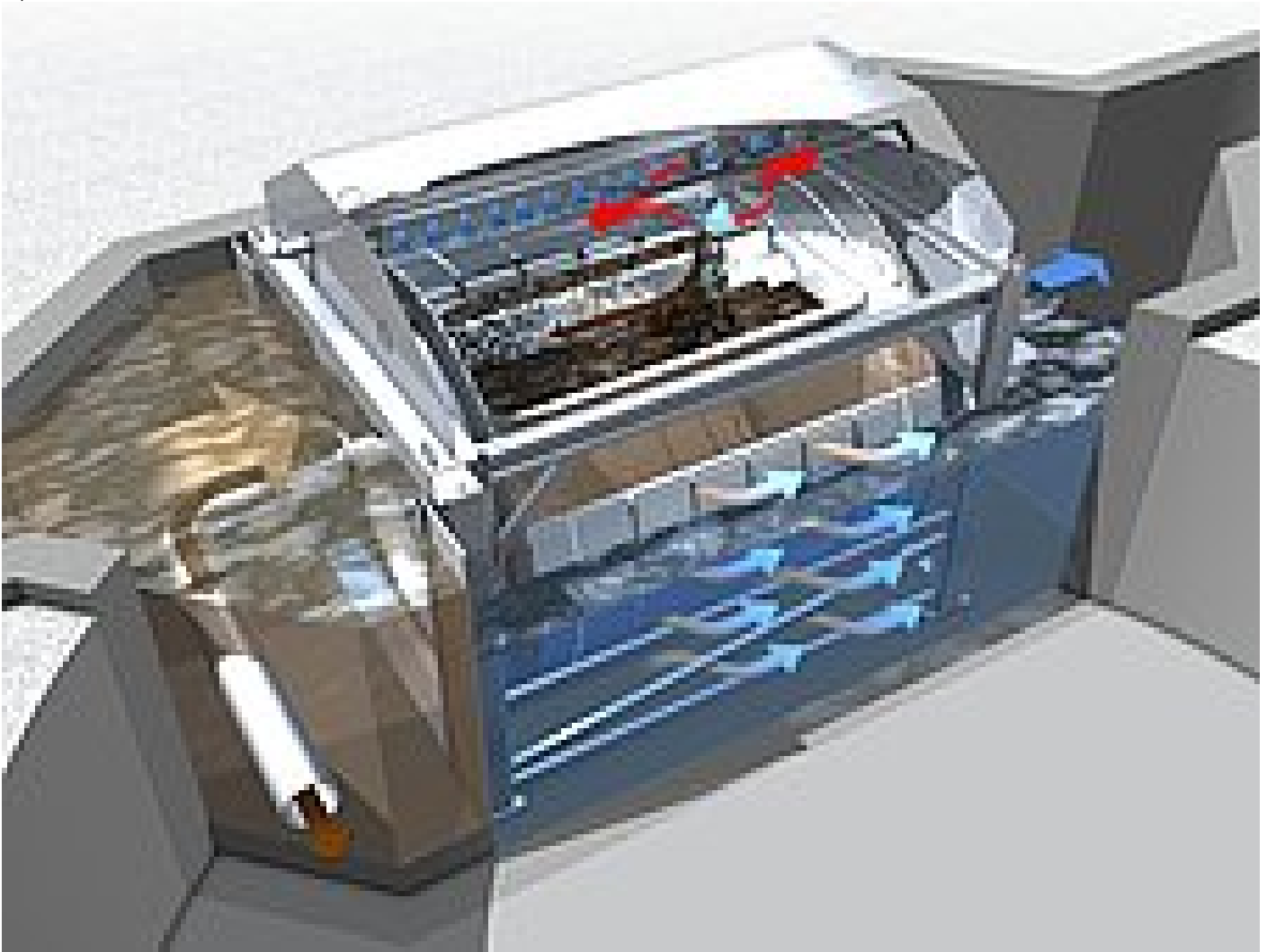


Fig. 2: HUBER Drum Screen LIQUID for maximum reduction rates for filterable solids and COD

To achieve this, it is necessary to build a primary clarification stage. With its reduced space requirements and economic efficiency, the HUBER Drum Screen LIQUID represents the better alternative to a conventional primary clarifier.

The HUBER Drum Screen LIQUID is applied for fine screening the wastewater and designed for a partial flow treatment of 100 l/s. As the total flow to the sewage treatment plant is 256 l/s under stormwater conditions, 156 l/s are discharged in this case. Due to the very high COD removal rate of the HUBER Drum Screen LIQUID, the biological sewage treatment stage on site (see fig. 1) can soon be shut down. This will save considerable amounts of aeration energy. Moreover, the primary sludge generated from fine screening with the HUBER screen will be converted into energy-rich biogas in the digester and this biogas converted into electrical energy in a block heat and power plant.

### The principle of the treatment process on STP Staßfurt

The HUBER Drum Screen LIQUID is installed downstream of the grit trap instead of a primary settling tank and integrated into the existing system. The maximum flow to the screen is controlled by a flow meter and control valve. Special focus has been placed on the fact that the HUBER screen is a gravity flow system. HUBER Drum Screen LIQUID screens are installed horizontally in the channel. The water flows through the screen from inside to outside. The maximum filter surface can be utilised due to the horizontal position of the screen drum and at the same time a very high maximum possible upstream level. As the water level upstream of the machine increases, a filter carpet is developing on the filter mesh. Due to the filter carpet leading to a deep bed filtration effect, all particles are retained that are much smaller than the nominal aperture size of the mesh. When the water level upstream of the drum screen reaches the maximum permissible water level, the screen basket is cleaned. The fine screenings (primary sludge) are removed from the screen surface and accumulate in the internal trough from where they are conveyed by gravity to the downstream continuous thickener. The statically thickened sludge from the continuous thickener is pumped into the digester or optionally further thickened in a HUBER Disc Thickener S-Disc unit. Also the surplus sludge generated is thickened in the HUBER Disc Thickener S-Disc prior to being pumped into the digester.

### Project Spaichingen

Situated on the river Prim at the foot of the Dreifaltigkeitsberg hills, Spaichingen is the third largest market town in the district of Tuttlingen. The river Prim is a tributary of the upper reaches of the river Neckar in Baden-Württemberg and flows along the steep escarpment of the Albtrauf hills. The mountains Dreifaltigkeitsberg and Heuberg belong to the Danube Hills Nature Park.

Designed for a capacity of 17,000 PE, the sewage treatment works Spaichingen clarifies the municipal and industrial wastewater of the

municipalities Spaichingen and Balgheim. The sewage treatment plant is already operated as an anaerobic sludge stabilisation process with digestion. The maximum stormwater flow that can be handled by the plant is 175 l/s. After completion of this stage of extension it will have a capacity for 225 l/s. The sewage treatment plant is equipped with an Imhoff tank that is used as a primary clarifier. The Imhoff tank has reached its design capacity limit, this means that it fulfills its task under dry weather conditions and will do so in the future, but will be overloaded under stormwater conditions. Due to the planned plant extension by another 50 l/s a solution had to be found to improve the situation. Various options were discussed.

The first approach under discussion was to integrate a two-line primary clarifier and shut down the Imhoff tank. There would have been enough space on site for this solution but they actually did not want to give up the Imhoff tank that still worked well with dry weather conditions and were therefore looking for an alternative.

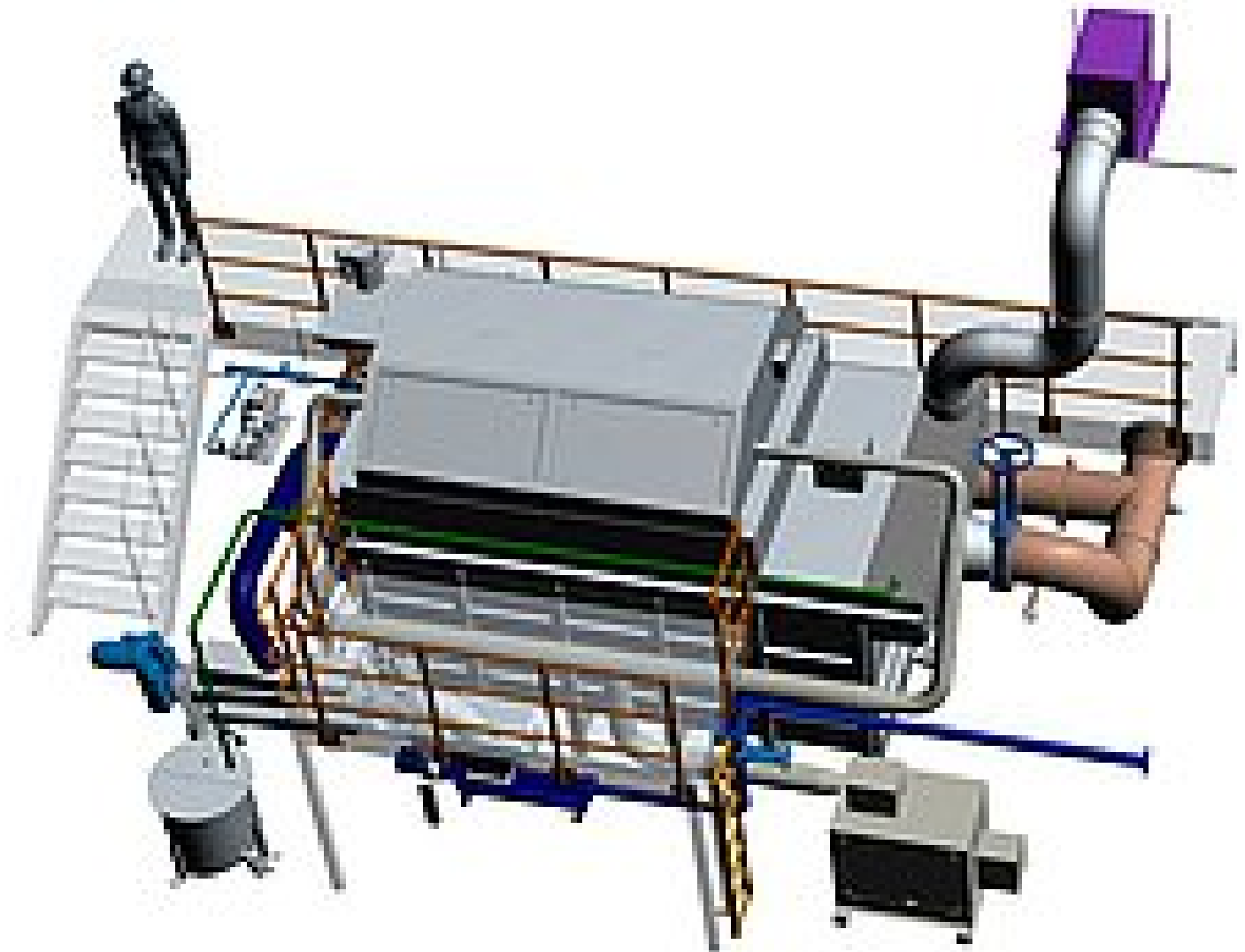


Fig. 3: HUBER Drum Screen LIQUID as replacement for a conventional primary clarification tank

Mechanical carbon removal with a HUBER Drum Screen LIQUID as fine screening system was then found to be the all in all more economical solution. With the use of the Drum Screen LIQUID (with a throughput of 100 l/s in normal operation) it is possible to reduce the load on the Imhoff tank during peak hours and establish a controlled plant operation. Despite the capacity extension, the Imhoff tank can still be operated at its optimal operating point and, depending on its capacity utilisation, the HUBER Drum Screen can additionally be switched on as required to meet the requested separation results. A specific feature of this project is that the HUBER Drum Screen LIQUID will be installed into an old aeration tank that is not needed anymore. There will additionally be a building in the tank to ensure optimal working conditions. The throughput is regulated by a flow meter with control valve installed downstream of the grit trap via gravity lines to the HUBER Drum Screen LIQUID.

### The principle of the treatment process on STP Spaichingen

The wastewater flows through the HUBER Drum Screen LIQUID in tank from inside to outside (see fig. 3). The wastewater is fed via a gravity line downstream of the grit trap. As the water level upstream of the machine increases, a filter carpet is developing on the filter mesh. The fine screenings (primary sludge) are removed from the screen surface and accumulate in the internal trough from where they are conveyed to a downstream HUBER Wash Press WAP® liquid. With this dewatering system, a freely adjustable, defined DR content of the primary sludge can be achieved. An eccentric screw pump with buffer tank delivers the mechanically thickened primary sludge to the existing digester. The generated surplus sludge is thickened together with the primary sludge of the Imhoff tank or optionally further treated in a static thickener prior to being passed on to the digester.

The projects Staßfurt and Spaichingen are in the construction phase and will go into service in summer 2018. Both sewage treatment plants are taking another step forward together with HUBER towards becoming a sewage treatment plant of the future.

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**HUBER CS spol. s r.o.**

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