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Guinness World Record: HUBER supplies technology for the world's largest water treatment plant in Egypt

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Clean water for the Sinai Peninsula: The water treatment plant in Bahr El-Baqar (Egypt) has recently been awarded by Guinness World Records as the world's largest plant of its kind. Every year, more than two billion cubic metres of water are to be treated here on an area of about 650,000 square metres. The Berching-based company HUBER is supplying, among other equipment, 128 SOLSTICE® sludge turners for the large-scale project, from which about half a million people will benefit in the future.

- HUBER delivers 128 HUBER Sludge Turner SOLSTICE® units
- Capacity: over 2,000,000,000 m³ of water per year (over 64 m³ per second)
- Total area: 650,000 m²
- Chief Technology Officer Dr. Johann Grienberger: "Innovative technology to correct ecological imbalance in the future."

The Bahr El-Baqar drainage canal runs from the Egyptian capital Cairo along the Suez Canal through Lake Manzala into the Mediterranean Sea. Partially untreated municipal and industrial wastewater as well as polluted surface water from agriculture have so far led to an ecological imbalance.

Total order volume of 700 million US Dollars: joint venture brought HUBER on board

To solve this problem, the joint venture Orascom Construction and Arab Contractors was awarded the contract in 2018 to build a water treatment plant for more than 700 million US dollars. For this, the joint venture brought HUBER SE on board, among others: the Berching-based company is supplying its innovative technology for sewage sludge drying with solar energy for the world's largest sewage sludge drying project.

The water treatment plant has an annual water capacity of over two billion cubic metres, which corresponds to about 5.6 million cubic metres per day and over 64 cubic metres per second. The Bahr El-Baqar plant covers a total area of 650,000 square metres, and the area of the solar sewage sludge drying plant is 160,000 square metres.

"Pollution of the Bahr El-Baqar drain has so far led to a severe ecological imbalance in the region. With our innovative technology, we are helping to treat very large volumes of water. The fact that the local people will benefit from this major project makes us proud," says Dr Johann Grienberger, Chief Technology Officer of HUBER SE.

HUBER Sludge Turner SOLSTICE® units dry sewage sludge for reuse

The purification process produces very large quantities of sludge during water treatment. To reduce the amount of sludge to be disposed of, it is mechanically dewatered and dried by the fully automatic sludge turners using solar energy. The 128 HUBER Sludge Turner SOLSTICE® units dry the sludge produced during water treatment to a quarter in mass and volume and turn it into granules. The end product is used in agriculture, for example as soil fertiliser and cultivating agent.

"Drying sewage sludge with solar energy is a sustainable and environmentally friendly process: the dewatered sludge is distributed in a greenhouse structure and dried homogeneously by the radiation of the sun into a stable and odourless granulate," says Dr Grienberger. "The process ensures the best mixing and aeration of the entire sludge bed – with minimised odour and dust development, optimised evaporation performance and low power consumption."

490,000 tons of dewatered sewage sludge per year: fully automated drying process using solar energy

The central element of the HUBER process for sewage sludge drying with solar energy is the HUBER Sludge Turner SOLSTICE®: the machine takes care of spreading, granulating, aerating, turning and mixing of the sludge. Overall, the proportion of dry residue from 490,000 tons of dewatered sewage sludge annually will be increased from 24 to 75 percent. Thus, only about 160,000 tons of stable dry granulate need to be disposed of per year. In 16 greenhouses, a total of 128 HUBER sewage sludge turners will operate on eight lines



Aerial photo of the Bahr El-Baqar plant ;
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HUBER SRT system – solar sewage sludge drying with the HUBER Sludge Turner SOLSTICE®



HUBER Sludge Turner SOLSTICE®



A double shovel is ploughing through the sludge bed and turning the sludge as the machine is moving through the greenhouse

In addition to the 128 sludge turners, HUBER supplies the fully automatic sludge feed and discharge system by means of moving floor systems and 64 HUBER Screw Conveyor Ro8 T units. These have a total length of three kilometers, which corresponds to the length of about 30 soccer fields. In addition, the Berching-based company supplies the control system for the entire solar drying plant and the complete detailed process engineering.

From concept layout to complete package with detailed plant layout: the engineering process

In the engineering process, HUBER's project management team gradually turned the concept layout into a complete package with a detailed plant layout and technical documentation that met the customer's high requirements. "In order to master the challenges of a project of this dimension, a high degree of detailed project planning was necessary at a very early stage – across departmental and company boundaries," says Georg Heinzelmann, Head of Project Management at HUBER SE. "For everyone involved, there were numerous hours of technical coordination to be done internally and externally, as well as consistent coordination between sales, project management, technical departments, the customer and suppliers."

Tight time frame: successful project implementation within one year

Another challenge in the implementation of the project was the narrow time window. There were only twelve months between the technical approval and the delivery of the last machines to Bahr El-Baqar. Within this tight time frame, the project team not only ensured that the 128 HUBER Sludge Turner SOLSTICE® and 64 HUBER Screw Conveyor Ro8 T units were ready for dispatch. The entire purchasing scope was also coordinated, suppliers were kept on schedule and weekly deliveries were made over a period of nine months.

40,000 hours of production time, 39 partial deliveries and 270 containers: the deliveries in numbers

On 26 November 2020, the last machines were delivered within the given time from the production site at HUBER's headquarters in Berching. The following figures provide a good insight into the dimension of this project: a total of about 40,000 hours of production time were required, so that at peak times six sludge turners or four screw conveyors of approx. 50 metres each were delivered per week. A total of 39 partial deliveries including direct deliveries from suppliers were organised and 270 containers were shipped to the construction site on the northern Mediterranean coast of Egypt.

Despite the Corona pandemic: project on the home straight

The Corona pandemic has severely limited the possibility to get a regular and comprehensive overview of the construction site. Despite these adverse circumstances, those involved in the project have accomplished to manage this major project and enter the home stretch. The award of the official Guinness World Record a few months ago is both a cause for joy and additional motivation to bring the Bahr El-Baqar project to an equally successful conclusion.

The milestones of the project:

- September 2019: receipt of order
- February 2020: first delivery to Bahr El-Baqar
- December 2020: completion of main delivery
- March 2021: start of assembly of the HUBER machines and equipment
- August 2021: start of commissioning

Find an **informative animation at YouTube** with function and process of the 128 Sludge Turner SOLSTICE® units for the large-scale project in Bahr El-Baqar:

<https://youtu.be/VmVJJI27Dj8>

Learn more about the world's largest water treatment plant:

<https://www.guinnessworldrecords.com/world-records/86215-largest-water-treatment-plant>

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