Movement of waxes

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Operation:
3 Tanks with each 5.600 l volume for wax raw materials for production

Operation of each: 1 OLOID Type 400 (with round gearbox)

Period
since August 2018 / April 2019

Success:
Better homogenisation and quality of the waxes

Application definition and problem description:
During production, a wax base (viscosity: approx. 10 mPas) is stored in 3 heated storage tanks. The mixing of the storage tanks should be secured at all filling heights. The problem was: in winter, the external installation of the tanks caused thermal bridges, which caused a crystallization of certain components in the cold and thus lead to product loss.

Technical solution:
The OLOID type 400 was installed laterally with a specially developed round gearbox in the lower part of the 3 tanks. The electrical connection capacity of OLOID agitators is only 0.25 kW. Alternatively, a bucket agitator with 1.5 kW each could have been installed per tank. It is controlled by a frequency converter (FC), which enables level-dependent, yet even more energy-saving operation (effective: approx. 0.10 kW).

Result, from the customer's point of view:
Through the operation the wax has a better quality and through continuous homogenisation, the wax mass remains at a constant temperature. This counteracts the precipitation of the higher melting components in the matrix. At the same time, the natural colour stays better and longer lasting. The temperature control of the inner heating coils could be minimised.

Outlook:
If maintenance is required, the round gearbox (DN 400) can be easily removed when the tank is empty and the opening can be sealed with a blind flange supplied.

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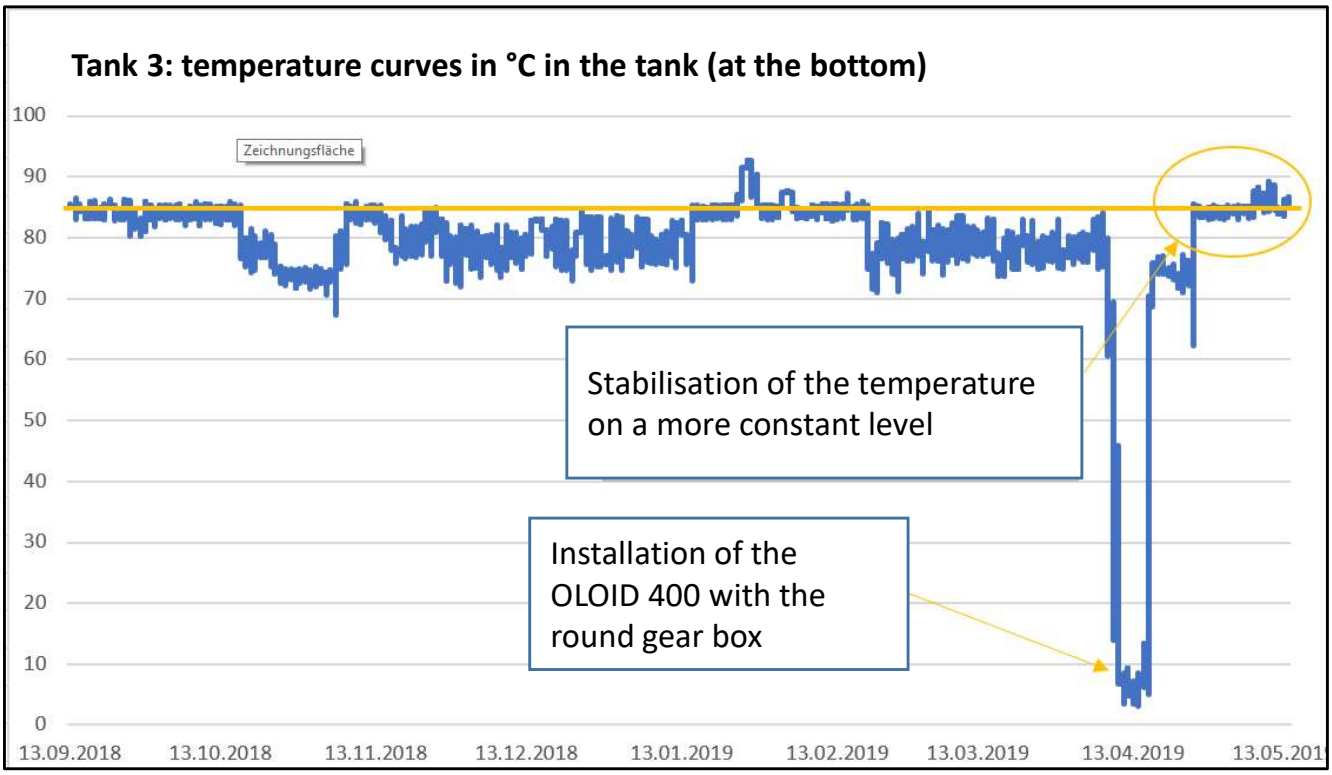
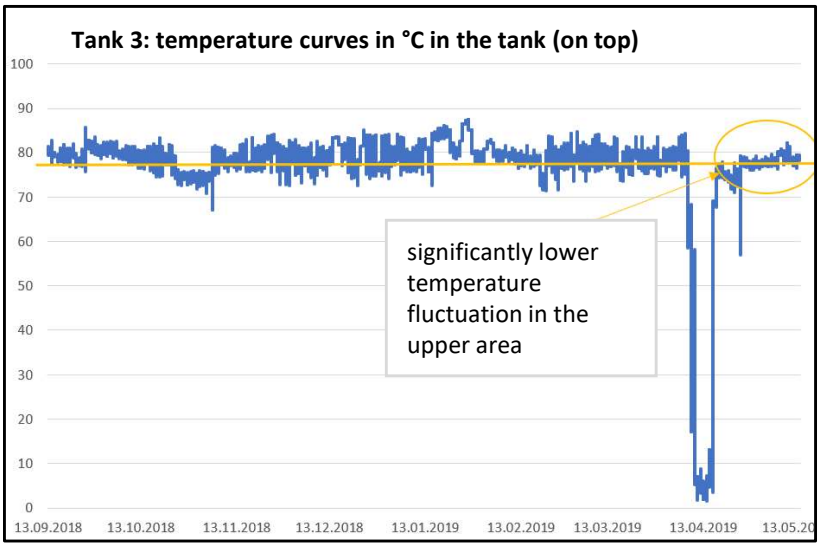
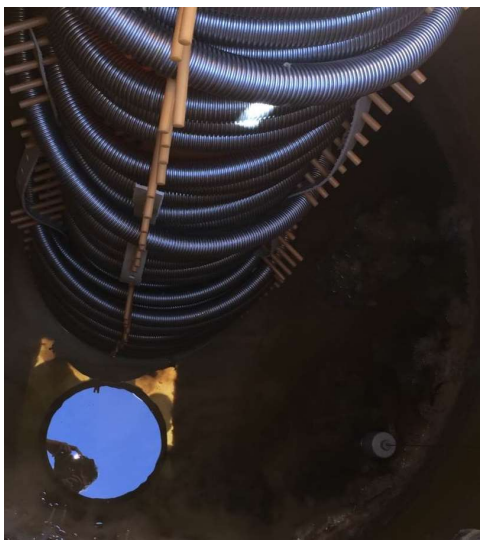
Experience report and data evaluation at the lower temperature measuring point in tank 3:
After only a short time, it becomes apparent that the temperature in tank 3, for example, is at a much higher level after installation of the OLOID Type 400 and also has lower fluctuations! This is especially evident at the lower temperature measuring point!



Upper measuring point in tank 3:
At the upper measuring point it is clearly visible that the temperature is exposed to significantly lower fluctuations!





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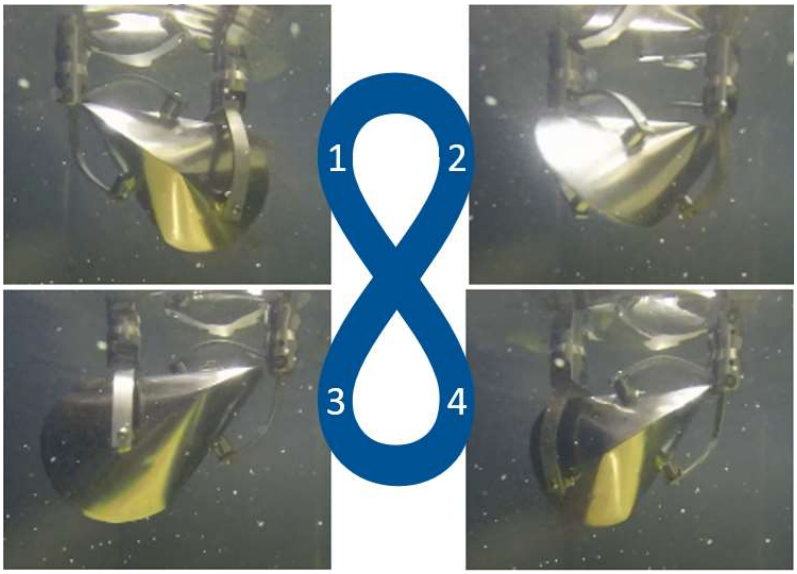
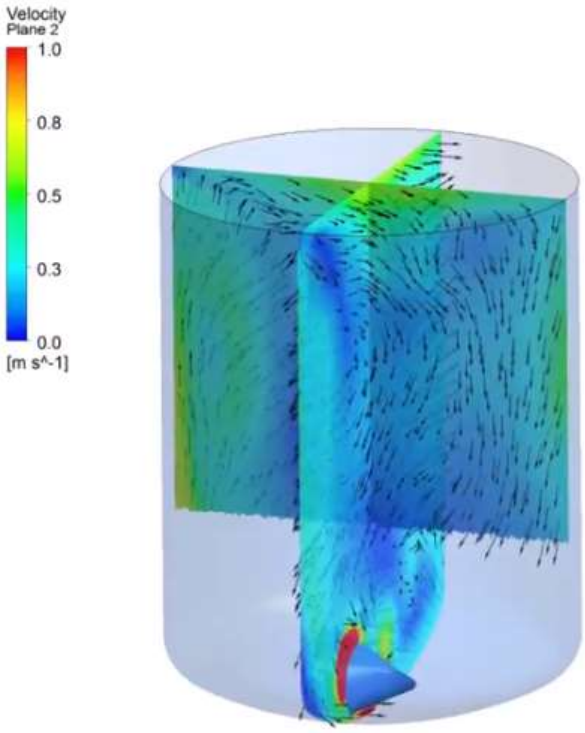
How it works:
All OLOID devices produce an impulse-like flow. The movement always follows the same eighth looped movement, which is illustrated in Figures 1 to 4. In the first picture, the OLOID is sending out the impulse with its right half and the left half is preparing for the impulse. In the second image, the upward movement of the OLOID body produces a slight upward flow on the right side. In Fig. 3 and 4, the right-hand side sequence described above is repeated on the left-hand side.





As a result of the pulsed flow at about 30 ° angle of the OLOID in one direction, a heart-like flow in the tank is formed, which captures and mixes the entire volume of the medium. As a result, the separation process of the constituents of the wax raw materials is prevented. These flow conditions are shown schematically in a CFD simulation in the left picture and could be observed in reality in the tank. Mixing is carried out by constantly changing velocities and directions of flow, so that both horizontally and vertically mixing is achieved at all levels. The main flow direction generates a flow in a circular motion in the tank.

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