

Varied requirements governing pumps for the food industry

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Varied and challenging: the food industry, in particular, places precise demands on pumps, as they need to comply with exacting hygiene requirements and the media can often be very challenging. Comparing MX, Twin NG and Vario Twin NG pump ranges from Pumpenfabrik Wangen shows that progressing cavity pumps and twin screw pumps are ideally suited for different applications and for pumping a wide variety of media.

Decision-making criteria when it comes to choosing the right pump

Key decision-making criteria for or against the use of certain pumps include the required pressure, need for gentle pumping, and non-contact operation. Further criteria include temperature requirements for certain media, the processing of the smallest residual quantities, and any required certification. Users can use the Twin NG series of twin screw pumps for non-contact pumping, as the spindles are separated from each other and from the housing by a gap. There is therefore no abrasion of elastomers. The Vario Twin NG is recommended if the medium is too thick, i. e. high-

viscosity, so that it can no longer be drawn in by suction. This pump complements the Twin NG and is an additional module with a hopper and screw conveyor that enables the medium to be pre-delivered in a way that is gentle on the product. The multi-stage pump sets of the MX series of progressing cavity pumps with pressures of up to 80 bar are appropriate if, on the other hand, the focus is on pressure rather than on non-contact pump operation. Their maximum capacity is 100 m³/h. These pumps are capable of pumping even the most viscous, thick media with ease if a hopper feed pump or a self-priming pump with a worm pre-conveyor is selected. A plug screw feeder is attached to the joint, which converts the rotary motion of the drive shaft to the eccentric motion of the rotor. It transports the medium into the stator-rotor-system, where the actual pumping process begins.

Service-friendly design

Twin screw pumps stand out on account of their service-friendly design. The pump housing is separated from the rest of the pump by loosening just four screws, with no need to discon-

nect it from the pipework. This is especially beneficial with heated pipework and pump housings, as it is not necessary to drain and then bleed the heating circuits once again. Once the pump has been separated from the housing, there is free access to the spindles and seals, which can then be easily and quickly serviced and replaced. In general, Twin NG pumps are capable of flow speeds of over 1.5 m/s in the pipework. They are therefore also suitable as CIP pumps, as a sufficiently high flow speed is a criterion for CIP cleaning (Cleaning in Place).

The ease of servicing of progressing cavity pumps series comes from their modular design. Great importance was attached to a straightforward design and ease of disassembly in the design of this pump. The MX 20 series of pumps can be dismantled by manually removable clamp fastenings, obviating the need to loosen a multitude of individual connections. A torsion rod with no hidden cavities can be used in place of a cardan joint. The use of pre-tensioned mechanical seals provides for a low dead space design and the medium pumped in the pump is automatically displaced by the medium following on. The dwell times of the fluids in the pumps are correspondingly short. The dead space-free design and the possibility of cleaning the pump using an additional CIP pump ensures optimum cleanliness. When appropriate temperature-resistant elastomers are used, the pump can also be sterilised by SIP (Sterilisation in Place) using saturated steam at temperatures of up to 135 °C.

Varied applications for the most diverse media

Both the twin screw pump series Twin NG and the progressing cavity pumps of the MX series are specifically used in the confectionery industry. Exam-

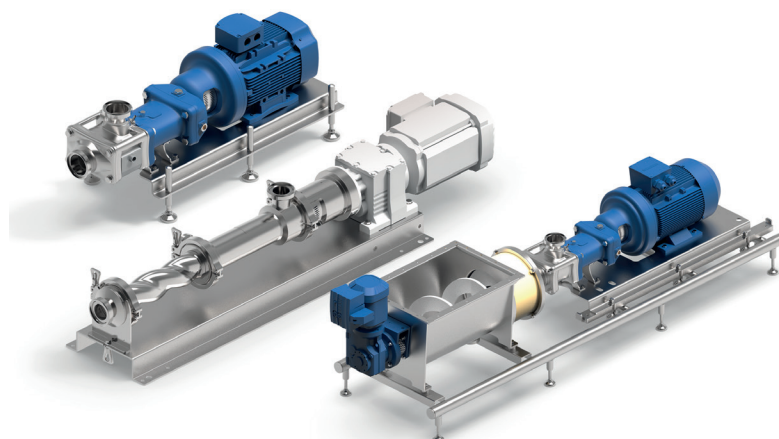


Fig. 1: Hygienic pumping with the Twin NG VarioTwin NG series of twin screw pumps and MX series of progressing cavity pumps

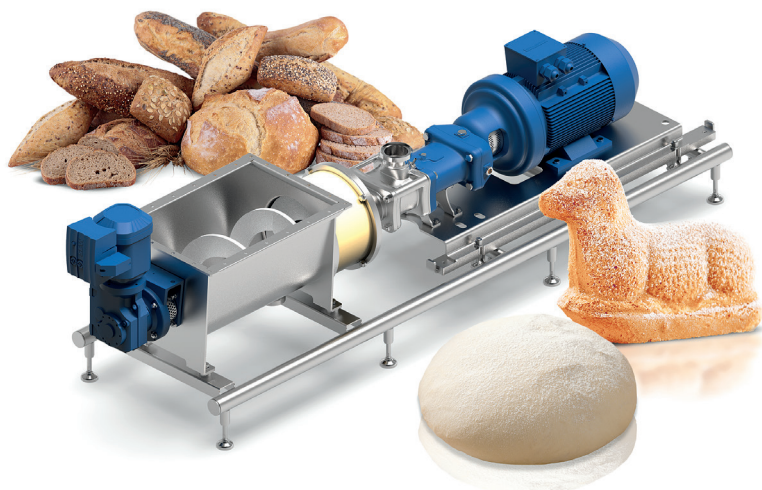


Fig. 2: Twin screw pump Vario Twin NG: Designed to reliably pump low to highly viscous, volatile or gaseous products where maximum hygiene and efficiency is required

ples of applications include the production of chocolate masses, creams and fillings for waffles, dairy products of all kinds, honey and gelatin, as well as soups and minced meat. Vario Twin NG pumps are primarily used in the food industry and pump media that cannot be drawn in by suction, including dough, ricotta cheese, apple strudel fillings, mashed potato, sweetcorn and minced meat. They are also used to make dough specifically in the baking industry. This involves the mixing of flour and water to produce a homogeneous, smooth dough without lumps of flour and ensure consistent hydration of the flour.

"Beyond Meat", that is meat-free products, represent a future growth market. Pumps can also be used in this sector. The Managing Director of the pumps manufacturer, explains: "As the world's population grows, the demand for food is increasing, but cannot be met by meat alone in view of its carbon footprint. Meat substitutes are therefore becoming increasingly important. Our pumps are capable of reliably pumping these high-viscosity vegetable masses in the food industry."

The twin screw pump Vario Twin NG is an example of a technical solution to a user problem encountered with suction. In the food industry, many media cannot be drawn in by suction as they are not free-flowing, but rather set like mashed potato. Twin screw pumps are nonetheless capable of pumping these media. The

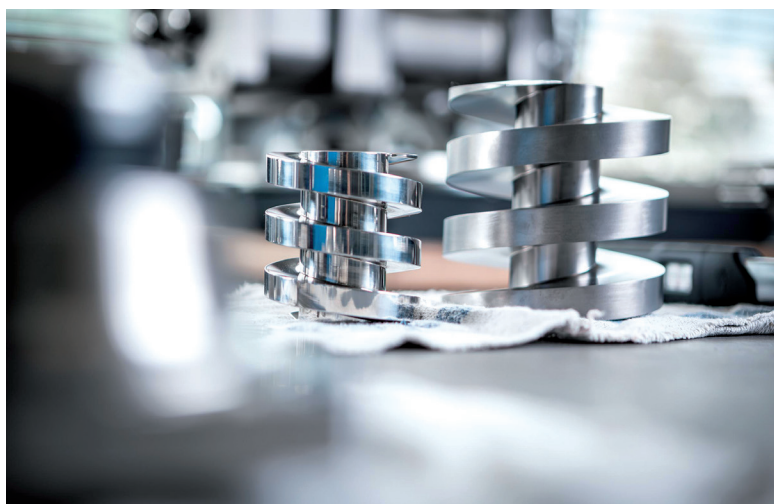


Fig. 3: Developed and produced in Wangen in the Region of Allgäu, Germany

challenge here is to transport the medium to the pump. As soon as the medium is in the pump, the pump then increases the pressure, which then allows the medium to "flow".

This problem is solved with a worm pre-conveyor and a hopper on progressing cavity pumps. On these pumps, the worm pre-conveyor is attached to the pump joint and rotates at the same speed as the rotor. Overpumping or underpumping by the progressing cavity pump is avoided by the adjustment of the screw pitch. By contrast, with Vario Twin NG twin screw pumps, the pump speed and the speed of the screw conveyor are independent of each other due to them having separate drives. This means that media of different viscosities can be gently fed to the pump at the respective speed required.

Certified according to EHEDG standards

The Twin NG series of twin screw pumps are certified to EHEDG EL Class I (sizes 70 to 180) and to 3-A Sanitary Standards (sizes 70 to 130). They are also designed to be low dead space and self-draining. The wetted components are manufactured in the corresponding qualities of stainless steel (V4A, 1.4404) and the surface roughness is below 0.8 µm. The Twin NG pumps can also be used as CIP pumps and sterilised using saturated steam at temperatures of up to 135 °C. The MX series of progressing cavity pumps is currently under-

going a recertification process in line with the current EHEDG standards. Certification in accordance with the currently applicable 3-A standards is planned.

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