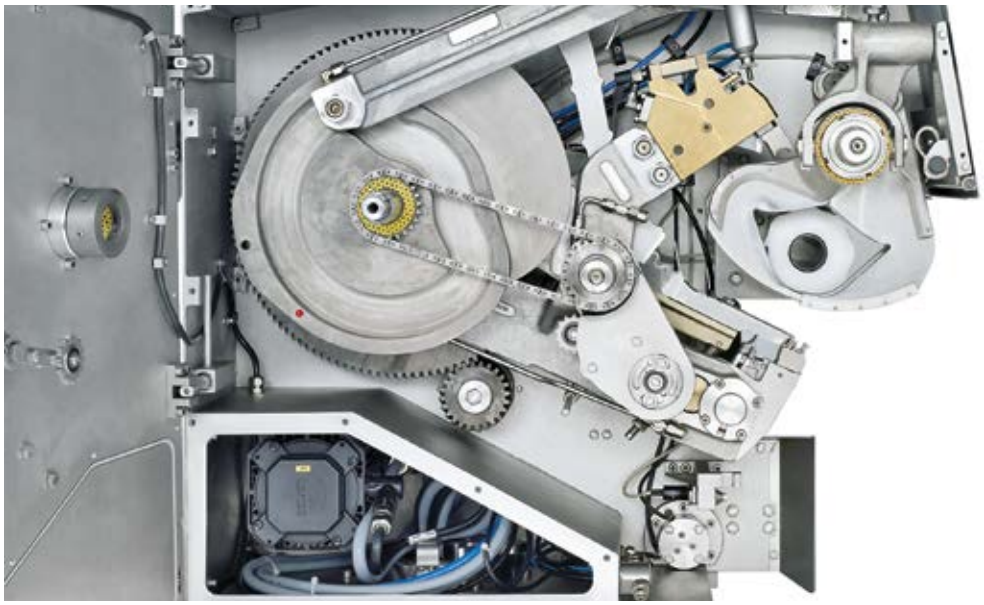
Technical Report

When it really matters – Indirect force measurement with innovative strain sensors DST55R by Baumer.

Sausage is not the same as sausage. In Germany, for example, there are said to be about 1500 different varieties. When they are packaged, they all have one thing in common: two closed ends. With the modern TT automatic double clippers by TIPPER TIE, all familiar plastic, fibrous and collagen casings can be closed hygienically and economically. The new strain sensors DST55R with protection class IP 69K provide a significant contribution.

We cannot imagine the world of clip packaging solutions without TIPPER TIE. Since it was founded in 1952, the company has introduced numerous innovations in the field of clippers and clip technology. Over the years, not only the product line of TT automatic double clippers has been constantly further developed, taking into account increasing market requirements, demanding customer needs and with the use of advanced technologies. Today, TIPPER TIE offers application expertise, equipment and after-sales support worldwide for customers of all sizes – from the independent sausage manufacturer through the small butcher's shop to global Fortune 500 processing companies.

The new, robust strain sensor DST55R by Baumer for the cost-effective force measurement of high forces in applications requiring hermetic sealing



The electronic clip closure force monitor "NewCon" with the DST55R strain sensor increases production reliability.

The TT1815 and TT1512 automatic double clippers are produced at the company's Glinde location in Germany. Due to their hygienic design, they are characterized as easy to use and low total operating costs and once again underline the important position of the company in its sector.

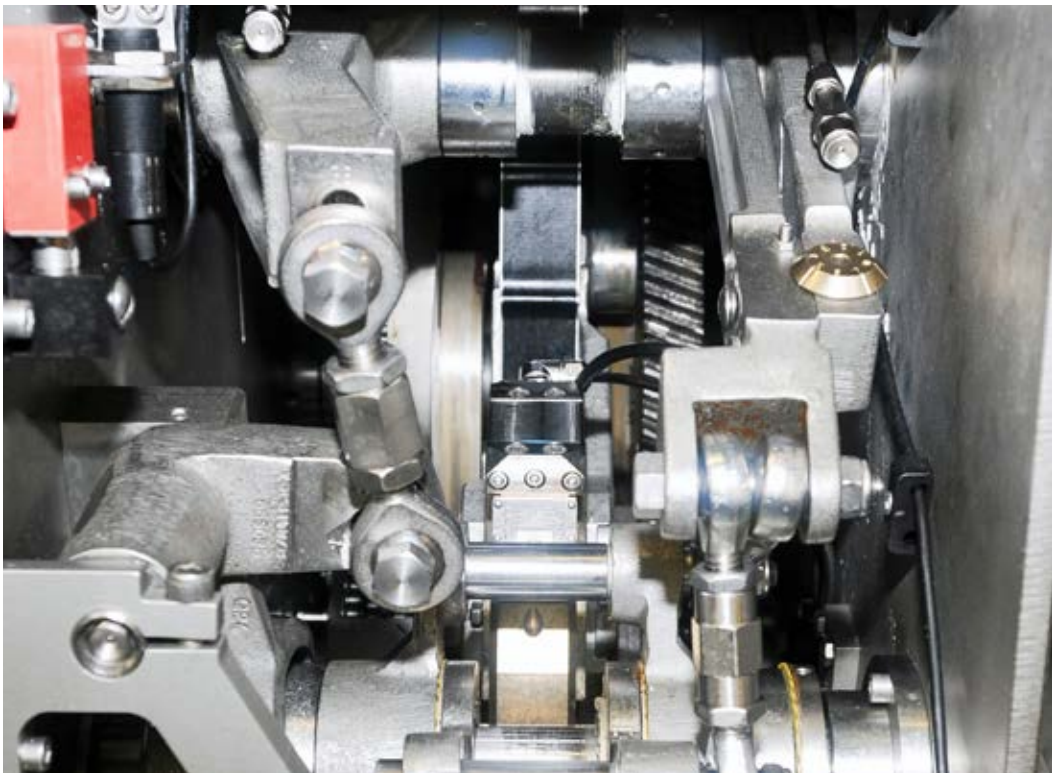
Fine-tuned clipping process

The closure area is the operative heart of the automatic clippers. It consists of two gatherers, matrices and a two-ended punch. Whether individual, string or ring sausages, the beginning and end of a sausage are always clipped simultaneously in the manufacturing process. The two gatherers grasp the sausage, pull the casing apart in a controlled process and make room for the clips. These are supplied by the matrices in an upward movement and closed precisely by the downward-moving punches while complying strictly with predefined parameters. An electronic clip closure force monitor prevents machine damage in the case of incorrect operation. A strain sensor DST55R mounted on the punch monitors all processes reliably and safely. If the set threshold value of the closing force is reached, it triggers the safety system with a digital CANopen® signal to the controller and stops the machine.

Challenges of closing force and impermeability

The automatic double clippers of the latest generation work with cycles of up to 180 portions per minute. In the process, different forces act on the sausage portions. Depending on the casing material and clip size, these must be set accurately, measured reliably and must be reproducible. On the one hand, the closure force of the punch must be sufficient to close the sausage ends reliably. On the other hand, it must not be too great. Otherwise it would damage the sensitive casing, leading to loss of quality and in the worst case it could cause the sausage to burst in one of the next process steps of smoking, cooking or boiling.
In the production process, the automatic clippers are cleaned regularly with high-pressure cleaners, often after batch changes or changes in the recipe. This is why all components, such as valves, drive units and sensors must be hermetically sealed against water and dirt.

The modern TT double clippers with their hygienic design seal the sausage portions efficiently and accurately without meat residue in the ends of sausages. They are also used for the packaging of semi-finished confectionery products, cheese, soups and non-food products.



The DST55R strain sensors do not have to be adapted to the machine design in a time-consuming process, but can easily be bolted onto the ideal place – here on the plunger.

The new DST55R measures the forces cost-effectively by means of strain. It handles all challenges effortlessly. Compared to other strain sensors on the market, it has the highest IP protection class, reacts quickly and can accurately detect even the slightest elongation or compression. It is stable in the long term. Once it has been set up, it guarantees permanent precise force measurements. It is not affected by hard shock and vibration. Its robust housing made of nickel-plated steel is resistant to aggressive cleaning agents, high water pressure and high temperatures. The materials used and the design of the sensor meet the strict requirements of the food industry in general and specific in-house test specifications of TIPPER TIE with respect to increased sealing requirements for the sensor on account of the chemical influence of cleaning agents on the surface tension of the water.

Solution-oriented cooperation

"With the strain sensor DST55R, we have the right solution for our high-performance automatic double clippers", says Gunnar Jäckel, Global Group Manager for Electronics at TIPPER TIE. "We are very satisfied. In its development, Baumer responded to our needs in great detail. In terms of size, for example, it supersedes its predecessor perfectly. Machine failures due to water in the sensor are a thing of the past. This is very important for us, considering the worldwide distribution of our machines. We also attach great importance to product availability over the entire service life of the machine. The unique mechanical construction of the sensor is designed to influence the machine structure as little as possible. This allows excellent measurement results, as well as reliable and reproducible process control. The sensors are available with different measuring ranges from 100 µm/m to 1000 µm/m and the output signals voltage output +/- 10 DVC and with a CANopen interface. The new strain sensor by Baumer has been successfully put into series production. Sensors will continue to play an important part in further considerations by TIPPER TIE in connection with Industry 4.0 and condition-based maintenance.

Further informations:
www.baumer.com
www.tippertie.com

AUTHOR
Gunnar Jäckle
Global Group Manager for Electronics bei TIPPER TIE

AUTHOR
Thomas Hertig
Product Manager for Force and Strain Sensors at Baumer

Baumer
Passion for Sensors

Baumer Group
Phone +41 (0)52 728 1122
sales@baumer.com
www.baumer.com