

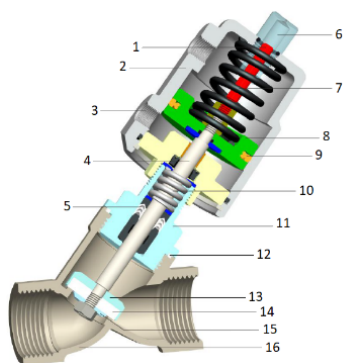
2. Study of the dosing process of liquid food products in flow dispensers

Taras Butyk, Oleksandr Gavva (postgraduate student), Liudmyla Kryvoplias-Volodina
National University of Food Technologies, Kyiv, Ukraine

Introduction. The purpose of this work is to improve equipment for dosing liquid food products. Research into the dosing process of liquid food products in flow dispensers is aimed at developing new dosing methods and technologies that will be more efficient, accurate and reliable.

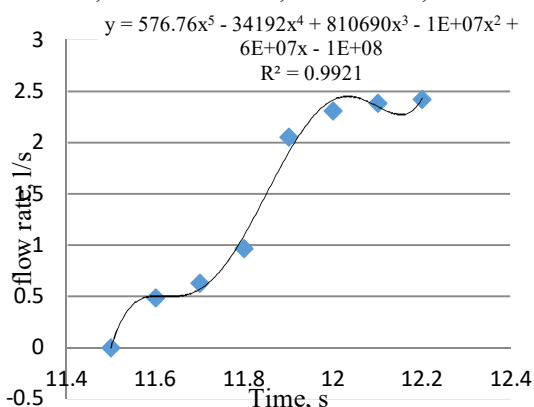
Materials and methods. The object of research is the processes of formation and dosage of a liquid food product. The subject of the research is the design of the dosing device. Research methods are based on physical experiment, mathematical modeling and processing of research results.

Results and discussion. A functional mechatronic module with a saddle valve (Fig. 1)



can be used in industrial machines and devices for dosing and packaging of liquid food products. Modern flow dispensers are characterized by high productivity. They can dispense liquids at a rate of up to several thousand liters per hour. This allows to significantly increase production efficiency. Further development of flow dispensers can be expected in the future. They will become even more accurate, productive and automated. This will allow them to be used in an increasingly wide range of applications. The use of modern materials and technologies allows to increase the accuracy of dosing up to $\pm 1\%$.

Fig. 1. Seat valve controlled by pneumatic drive: 1 – indicator; 2 – housing of the controlled drive; 3 – air connection port; 4 – working rod; 5 – sealing; 6 – cap; 7 – working spring; 8 – piston; 9 – piston seal; 10 – spring; 11 – cover; 12 – housing seal; 13 – working saddle; 14 – saddle seal; 15 – washer, 16 – housing



The development of new types of drives allows increasing the productivity of dispensers. (Fig. 2). The introduction of automation allows increasing the accuracy and productivity of dispensers, as well as simplifying maintenance.

Fig. 2. The graph of flow rate changes at the outlet of the seat valve in the range from 0 to 100% flow rate

Conclusions. A Dispensing valve with an electropneumatic positioner provides the best output flow schedule between 0 and 100% flow. This graph has high smoothness and accuracy, which is

achieved due to the linear control law and high accuracy of the positioner.

References. Kryvoplias-Volodina L.O., Gavva O.O. (2023) Criterion quantification of adaptronic functional modules of machines for packaging products in consumer packaging. Print Trends in Lean production and packaging of food products: materials of the 12th International Specialised Scientific and Practical Conference, Kyiv – NUFT. - P. 74 -76. URL: <http://surl.li/rmfde>