

# **MICROWAVE MOISTURE METER OF SOLID MATERIALS AND ULTRASONIC-GAS METERS**

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Grain moisture is the key parameter, the reliable control of which affects the cost of drying, the reduction of losses during the storage of agricultural products, the increase of yield percentage in flour milling production, etc.

The widespread use of moisture metering have rapid moisture meters that are based on microwave techniques. There are several advantages of microwave moisture meters and, above all, high precision control (absolute error of measurement of moisture not worth than  $\pm 0,3 \dots 0,5\%$ ).

In the report the matters that improve the accuracy of the discrete and automatic moisture control by microwave moisture meter are shown. It summarizes the theoretical fundamentals of microwave absorption and cavity, and the results of a new generation of moisture meters series "Mikroradar", used in industrial and agricultural production for both continuous and discrete control and process automation.

The development and implementation of an automated system of grain moisturing before grinding at the LTD "Lidahleboprodukt" are considered in details in the report. The state acceptance testing was conducted by "Belarusian MIS" in 2010.

In the second part of the report the results of the development and implementation at the Baranovichi broiler poultry enterprise "Friendship" of ultrasonic gas flow meters of sizes G16 and G25, as well as automated systems of gas calculation based on them are presented.

Among the varieties of acoustic methods of flow measurement we have chosen a time-pulse method with single-channel flow transducer, which allows to determine the difference in time of acoustic oscillations within the flow and against it  $dt$ , with time measuring with a relative error of  $0.5 \dots 1\%$ .

The average value of flow velocity  $\bar{V}$  at the length of dimensional section  $L$  and the speed of acoustic wave in a gas  $C$  is calculated by formula:  $\bar{V} = \frac{C^2}{2L} dt$ .

The serial production of ultrasonic gas meter of sizes G16 and G25 as well as their modifications with the correctors for pressure and temperature are implemented at the enterprises in Belarus.