

# Gravimetric Precision Metering

A new gravimetric metering system has now been developed that opens the door to a technology which was previously carried out by more cost-intensive methods. The main features of the new system are its rapid metering via metering valves, combined with outstanding accuracy. Alternatively, for particularly fine metering, the process can be run via cellular wheel sluices.

The new metering system, which bears the name Graviko GK, was shown at Fakuma by Werner Koch Maschinentechnik GmbH, Ispringen/Germany. A balance weighs all the individual components with an accuracy of between 0.05 and 0.1 g. A horizontal agitator mixes the components. Depending on the throughput rate of the processing machines, the system can cope with between two and eight different materials. Four standard models cover the range between 5 and 1500 kg/h. Quick-lock closures, as well as sliding and swivelling devices make for fast setting up and conversion without the need for tools.

All the basic settings such as formulation and batch size can be entered via the microprocessor control unit. Other pre-settings are not needed. The Graviko's management system can handle up to 124 formulations. An RS-422 interface comes as standard, as does an automatic calibration set-up with digital weighing cells and interface.

## Combination of Innovations

The scales in the new Graviko GK measure the actual weight of the individual

components. This value is transmitted to the MCG control unit and compared with the calculated target weight. The weighing for each filling is carried out several times, one after the other, with normal fluctuations being balanced out by taking the mean value. Once the actual weight conforms to the target weight, the material is emptied into the mixer. Through the optional, highly accurate chamber volume metering process in combination with the regulating and correcting process of the gravimetric metering method, a control loop is created that guarantees absolute precision metering down to an accuracy of 0.1 g – irrespective of the particular component.

The V2A steel weighing tank in the Graviko GK is particularly light so that it is not its weight but that of the substance being weighed that dominates. This means that the tiniest of quantities of every single component down to 0.1 g including the weighing container can be measured, evaluated and documented by the scales.

## Data Acquisition and Evaluation

The MCG control unit is used in the gravimetric metering system for measuring, instrumentation, control, communication, operating, reporting and documentation. It is noted for its innovative

technology and ease of operation. The following data can, among other things, be entered into the MCG control unit: the exact formulation, the formulation management, the batch size and the post-running time of the mixer. The data output gives details of the composition of the material, as is required by the regulations of DIN ISO 9000ff. Through the integrated serial interface it is possible, for registering the operating data, to print out a protocol or transmit the data to another computer. The system fits perfectly into Koch's modular system, in other words, all the intermediate hoppers, metering stations, and conveying units can be interchanged for the respective throughputs of any metering device.

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Fig 1. Graviko GK metering system

Fig 2. Gravimetric metering system, Graviko model, in use on silos for one-day operation

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