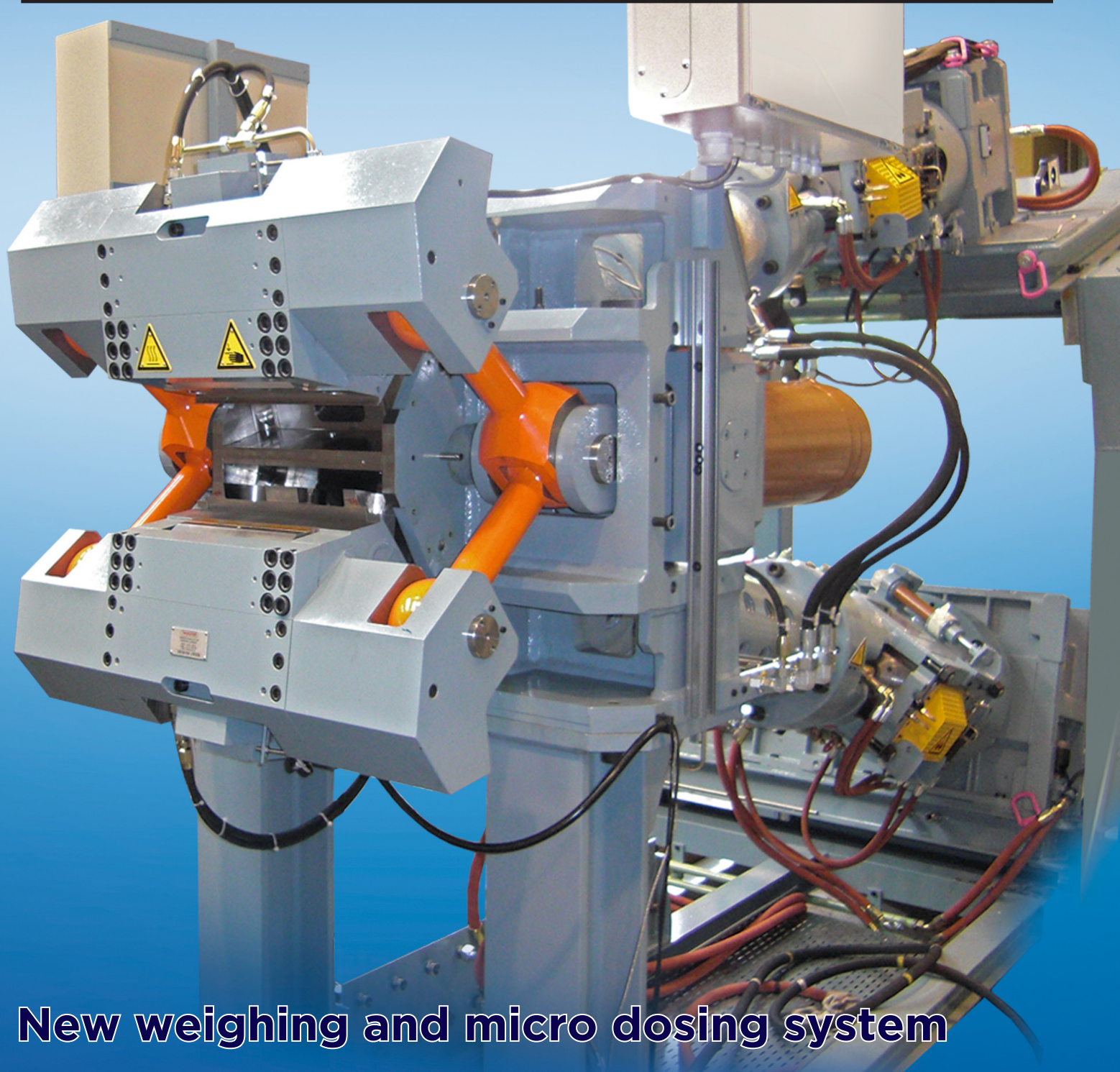


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## New weighing and micro dosing system

by Peter K. Gessert and Marcelo S. Hildebrandt, Gomaplast Machinery, Inc.

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# A new weighing and micro dosing system

by Peter K. Gessert and Marcelo S. Hildebrandt, Gomaplast Machinery

A new weighing and micro dosing system designed to control and monitor every step of the weighing process has been introduced by Gomaplast Machinery, Inc. It features complete traceability, more accurate weighing results, substantial reduction in cross-contamination, and cleaner and safer working conditions.

With this semi-automatic micro dosing system, the user is able to prepare up to ten equal recipes simultaneously. When using a large amount of ingredients, this system will lead to a smoother execution, fewer problems with contamination, more accountability, better product quality and higher profitability.

How does the system work? Before starting the weighing process, the operator has to scan his/her badge. The system then assigns a name to the task, and the screen will show the recipe to be weighed with the respective tolerances. If the weight is not within tolerance, the system will send an alert signal to the operator to correct the weight. If the operator gets distracted and dumps more ingredient into the bag, the system will be locked.

In most weighing rooms, cross-contamination is a real problem, especially during the feeding process. This system has a mechanical lock on the storage bins when they are not being accessed, eliminating cross-contamination issues. When the opera-

tor is feeding the bins, he/she has to scan the bag containing the ingredient and then scan the corresponding bin to be fed. If the information on the bag does not match the information contained in the bin, a red light will be activated, letting the operator know that an error has occurred. It should be mentioned that the feeding process does not interfere with the weighing process.

This system is ergonomically designed for easy access to the storage bins and to reduce accidents and repetitive strain injuries (RSI). It allows for the entire process to be strictly controlled, monitored, and for all relevant information to be stored in the company's database, which can be accessed and delivered at any time. It can also manage stock levels in the storage tanks and bins, bags, super sacks, etc. All the above results in substantial productivity gains.

The main features of the weighing station include the following:

- Computer with state-of-the-art software to monitor and supervise all the steps of the weighing process and to store all the data and relevant production information.
- Control station with PLC and color touch screen for easy and fast visual verification.
- Ten 28-gallon PE bins for storing ingredients; designed for easy bin expansion.
- Storage bins have a FIFO (first in-first out) design.
- Carousel has ten 2.6 gallon weighing buckets; buckets are expandable to 5.4 gallons.
- Bar code printer and bar code reader.
- Electronic weighing scale (0-20 kg).
- RFID cards are used to assign IDs to operators, storage bins, weighing buckets, etc.
- Elevator for assisting during the feeding/loading of the bins.

## Weighing sequence

The daily production orders are generated in the computer. The operator starts by scanning his/her badge. Once the operator is recognized by the system, he/she will see on the screen the tasks to be performed. The system will display the recipe with the ingredients to be weighed and the bin where the weighing process

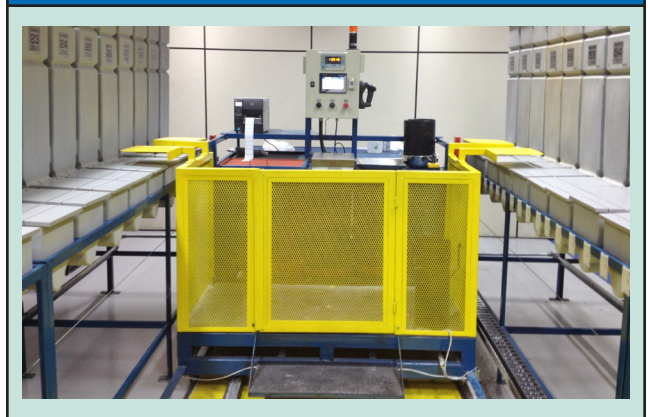
**Figure 1 - 40-bin micro dosing system**



**Figure 2 - micro dosing**



**Figure 3 - micro dosing close-up**



**Figure 4 - large volume system with enclosure**



**Figure 5 - large volume system without enclosure**



will start. The operator will push the weighing station to the designated bin; the operator will hear a beep indicating the correct bin location; the correct weight will be displayed on the screen, in addition to the tolerance. Also displayed on the screen will be the number of repetitions per recipe to be completed during that production shift. The operator accesses the bin, weighs the product, checks if the value is within tolerances, and then dumps it into the weighing bucket. The resulting values are automatically stored and displayed on the screen. The screen shows the next ingredient to be weighed until the last ingredient is weighed. When the recipe has been completed, the system will generate a sequence tag with specific data for the final product, plus a bar code with the proper identification. The operator can then open the carousel door, remove the bags from the buckets, put labels on the bags and send them to the next step of the production process.

The system controls inventory levels. If any of the bin's storage levels is low, the supervisor can assign another employee to feed the bin without interrupting the weighing process. All ingredient information, such as product code, stock level, etc., can be integrated to the company's enterprise resource planning (ERP) system, allowing full system integration. The system allows supervision in real time, process status and alarm monitoring. Access can be carried out from any environment with access to the internet.

Benefits of the weighing and micro dosing system include the following:

- Increases accuracy through systematic monitoring of the weighing process.

**Figure 6 - oil weighing station**



- Sets high standards with a positive effect on final product quality and a reduction of defective products.
- Productivity gains via the use of a carousel that enables the weighing of ten identical batches simultaneously.
- Greater agility, simplicity, cleanliness and work ergonomics.
- Each storage bin contains a unique ingredient with full traceability, avoiding exchanges and cross-contamination during the weighing process.
- Daily production orders are automatically shown on the screen.
- Inventory monitoring that allows the fast identification and reloading of the bins without interrupting production.
- The system can weigh 120 batches/shift, based on recipes with 10-12 ingredients.
- Operator safety during weighing and feeding of the bins.
- Visual and audible alarms.

#### **Large weighing systems with liquids**

Gomplast Machinery also offers large volume feeding and weighing systems involving solids and liquids, such as carbon blacks, process oils, etc. These systems can be semi-automatic or fully automatic.

#### **Conclusion**

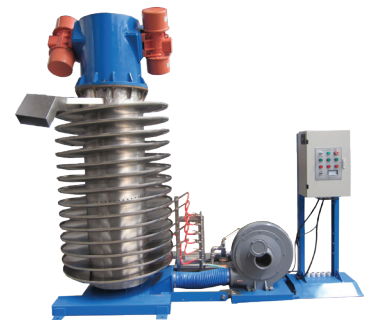
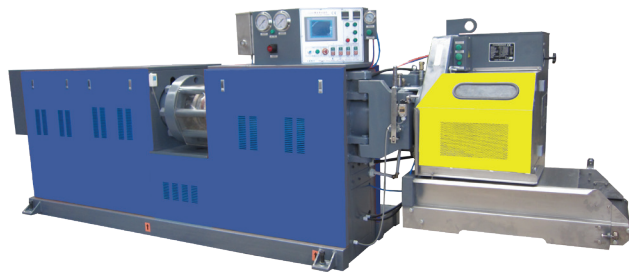
The weighing system offered by Gomplast Machinery represents an interesting alternative to improve weighing accuracy, product quality and inventory management, and reduce cross-contamination and work-related injuries.

A complete weighing and micro dosing system is available for demonstration in GMI's showroom.

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