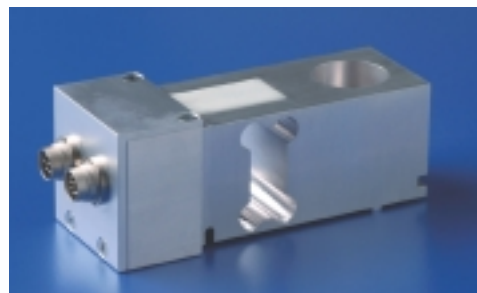




*HBM's FIT® load cells are used to control gravimetric filling machines for soybean oil and can fill as many as 38,000 bottles an hour*

*The FIT® load cells are available in variants such as the PW 18i which meets IP 67 protection class and is not enclosed in a stainless steel housing*



## The target weight

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### FIT® - Precise sensor technology for high-volume throughput

To achieve the desired degree of accuracy when weighing and batching small amounts of bulk liquids and solids there are two aspects that must be considered - the application and the sensor technology. Liquid food-stuffs, for example, are automatically bottled at a high-volume throughput with strict hygiene maintained. In these cases, gravimetric bottling machinery is used to determine the height of fill from the weight. There is no contact with the product and it is a perfectly hygienic method. However, the load cells used for weighing in these conditions have to be able to register the weight with great precision under very dynamic conditions, in the shortest possible time.

#### Krones FIT® solution no. 1

HBM's FIT (Fast Intelligent Transducers), which was specifically developed for dynamic weighing processes, was adopted by Krones AG, a leading bottling plant for the beverage industry, to control gravimetric filling machines for soybean oil and baby milk.

The baby milk plant uses 16 FIT® load cells fitted in a single carousel and produces 10,000 bottles per hour, or around three every second. The empty bottles move on to a rotating carousel, are filled in one second, checked, weighed and then moved off the carousel.

The weight is monitored at a rate of 100 measurements a second and filling stops when the target weight is reached. Despite the high fill speed and the dynamic boundary conditions, the system achieves the required standard deviation for 100g of filled weight. This plant operates for eight hours every day and is then thoroughly sterilised with a 60°C hot soap solution. The cleansing routine demands waterproof and corrosion resistant load cells.



*FIT® - the digital load cell for highly dynamic weighing processes*



*Fitted with HBM weighing technology:  
IFA batching systems*

Gravimetric systems are suitable for high-precision systems or where other measurement techniques are unsuitable such as with materials that tend to foam, are very aggressive or demand an extremely high level of hygiene.

## Krones FIT® solution no. 2

A similar, but much larger, gravimetric bottling system is used for the soybean oil plant. Here the carousel is equipped with 72 FIT® load cells and can fill as many as 38,000 bottles per hour. The standard-supply, controlling software program was used to analyze the filling procedure and optimize the mechanical system.

## IFA FIT® solution

Similarly, IFA Industrielle Wiegetechnik GmbH of Germany uses HBM's load cells as batch weighers for its solid and liquid component batching systems. The load cells usually comprise a batch station with two feed screws for proportioning the solids and four gravimetric sub-weighers for the liquid components. The mixture flows from the batch weighers into pre-containers for pouch or container discharge.

The suitable solution from HBM...

A different load cell may be more suited for other processes. For example, to ensure accuracy for the precise batching of 50 liters of material, even in potentially explosive environments, HBM's stainless steel PW 15 single point load cell can be fitted into sub-weighers. The PW 15 has one mounting point with no other force introduction parts and guide rods for easy installation.

...including data processing

Finally, accurate proportioning is critical. HBM digital electronics process measured data, including proportioning control and automatic optimization.



*HBM's AED 9301  
amplifier:  
data processing and  
measurement control*

Devices suitable for these applications are HBM's AED series of digital transducers:

— AED 9201plus with RS 485 interface or the

— AED 9301plus with a Profibus DP V1 interface.

The AED 9301plus is intended for applications using a bus system where the role of the PLC and the tasks of its connected slaves have to be decided.