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# Keeping track of the milk

## Focus on milk collection tankers

Milk is a raw material that is experiencing a global boom. For decades, milk and dairy products had a negative image: in the countries of the European Union the terms “milk lake”, “butter mountain” etc. were synonymous with the problems of overproduction afflicting this basic foodstuff. The guardians of Europe’s agriculture, seeking to stem the tide of excess, responded with a mass of regulations such as the “milk quota” or the “slaughter premium”. From 2001 the producer price in Germany has fallen by five eurocents per litre to below euro 0.28 at times. Since the beginning of 2007, however, the milk price has appeared to be exploding on all fronts.

This enhancement of the value of milk as a raw material is in itself a sufficient motivation for dairy farmers and indeed all those involved in the production chain to do everything possible to ensure that 100 per cent of what comes out of the udder gets into the final product, and to close as many as possible of the “leaks” that cause losses along the way.

In the metering and facility equipment business, the rule of thumb is that the more valuable the raw material, the more important and the more worthwhile it is to make use of

high-quality technology. If we look at the milk processing chain, volumetric metering technology offers just the right tool for the optimisation of processes.

The key to success is the degree of accuracy that is demanded; and accuracy is precisely the feature that GEA Diessel has focused on ever since it first started to develop metering equipment. Diessel’s mechanical rotary piston meters with their hygienic design had a breakthrough in the food processing industry as early as in the 1950s. The device that became known as the “Diessel meter” was, and remains even today, the epitome of accuracy and reliability in the



Tanker measuring unit with the new ZEVODAT-flash data capture system

metering device is the heart of any measuring unit, the other accompanying parameters must also be correct if proper and accurate measurement is to be guaranteed. Air in the product is poison for any high-precision measuring device. This fact is reflected in the catalogue of requirements for every measuring point that is subject to official monitoring, e. g. for the purposes of verifiable accounting.



Milk reception from the farm storage vessel

recording of quantities of milk, beer or other liquid foodstuffs. But thanks to the many advantages of modern non-contact sensors, for example the electromagnetic flow meter, these have nowadays largely supplanted mechanical meters.

GEA Diessel has been successfully developing and producing flow meters that make use of this principle for more than 20 years. The IZM family, with its great diversity of different models, has been in use all over the world for many years.

Flow meters of this type cost very little to buy nowadays, so that they are now routinely used at many points in the production process.

It is bad enough to lose quantities of product somewhere along the processing chain; but it is much worse not knowing where these expensive losses occur. Experienced metrology engineers know, of course, that while the

## Mobile measuring equipment

When milk starts off on its journey, such requirements come into play at the latest when it is collected from the farm by the milk tanker. Here, air plays a thoroughly decisive role, for the hose is always empty before reception starts, as indeed it must be. During priming from the churn or farm storage vessel, a mixture of air and milk is sucked up that does not allow quantities to be determined with any certainty. An intermediate vessel, known as the air eliminator, is needed to solve this problem, and, if properly dimensioned, is the key to the correct recording of quantities, the accuracy of which generally has to be confirmed by an official body such as the weights and measures office. In order to optimise the high intake rates of 60,000 l/h or even 90,000 l/h which are playing a more and more important role in the industry today, sophisticated sensors with pressure measurement and “bubble sensing” are used, together with a combined control unit for the air eliminator and the pump. And it goes without saying that once all the raw milk has been sucked up out of the churn or farm

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## IZM flow meter, made completely of stainless steel

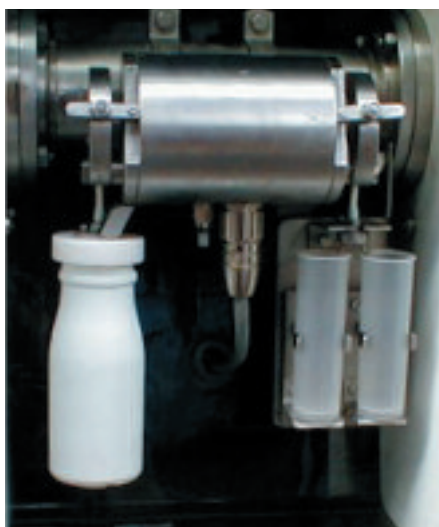


storage vessel, no milk must remain in the hose, since exact recording of quantities only works if the situation before and after reception is the same, allowing a proper delimitation of quantities. One important parameter in the accuracy of a milk collection tanker system is the smallest intake quantity. The smaller the quantities are that need to be precisely measured, the more elaborate as a rule the equipment is. Milk that is brought to collection points in churns, for example, continues to present a major challenge to metering technology and equipment.

There have been substantial developments with regard to these fundamental requirements for quantity recording systems on milks over the last 25 years, thanks to the new possibilities afforded by electronics and modern communications in fields ranging from automatic milk payment accounting to complex tanker fleet management.

In developed countries, metering equipment control and data capture systems form part of the basic equipment of tankers. The immediate availability of data at the central depot and urgent reporting back to drivers are attractive

#### Stationary reception unit (modular)



Double sampler with trip and individual sample

possibilities in modern logistics. Flexible control systems such as GEA Diessel's "ZEVODAT" devices fulfil this requirement profile of modern dairy and haulage businesses. With its latest development, the ZEVODAT-flash generation of equipment, GEA Diessel is now presenting a powerful new electronic system onto the market, even the basic version of which offers wide-ranging functionality. The possibility of integrating quantity measurement into control and data capture cuts the costs of the individual metering unit.

Modern communications technology such as data transmission using the EDGE process (which is about five times faster than GPRS) and supplier identification by GPS are included even in the basic version of ZEVODAT-flash.

In addition to recording milk quantities, on-board sampling on tankers has become a more and more attractive proposition in recent years, as it allows not only the quantity but also the quality of the milk to be recorded when it is received at the farm. GEA Diessel has been offering equipment for individual and overall trip sampling for years already.


In the ZEVODAT-flash, the regular and representative filling of the sample bottle is achieved automatically by making use of the measured and anticipated milk quantities from a supplier. Route optimisation programmes which can communicate actively with the vehicles achieve a higher utilisation of capacity for each tanker during its trip, thus reducing travelling distances and times.

#### Stationary measuring equipment

At many dairies, quantities are not only recorded on the tanker but also

counterchecked using stationary equipment. Such measurement procedures can also be carried out in accordance with weights and measures requirements, and here too, it is customary to have an automatic sampler installed. Since such metering systems generally have larger quantities to measure than the reception quantities when milk is taken on board the tanker from churns or farm storage vessels, and in addition the situation on site is more favourable, stationary measuring equipment can as a rule be simpler in design. Similar to the tankers, the stationary reception equipment, trip data can be linked during unloading with the metered quantity of milk and with the identification of the associated cross-sectional sample, and can be transmitted to the dairy's data processing system. In this way, the quantity and quality of the material is double-checked.

#### Summary

The more valuable a raw material, the more worthwhile it is to ensure that quality and quantity are precisely monitored and tracked. In the case of milk, in order to do justice to the dairies' needs (including with regard to the official weights and measures requirements), GEA Diessel technology offers a variety of approaches with regard to quantity recording, the control of measuring equipment, data communication and sampling. The new electronic ZEVODAT-flash platform offers forward-looking technology with an attractive cost-benefit ratio: a further module contributing to the fulfilment of complex and specific customer requirements. 

## NEWS

### Freschissimo Pack&Tech Retail 2008

With Freschissimo Pack&Tech Retail, Ipack-Ima Spa and BolognaFiere Group organise a new exhibition dedicated to foodservice, in-store processing and packaging and retail logistics platforms.

The show will open from 10th to 12th September 2008 in Bologna. Freschissimo Pack&Tech Retail is dedicated to decision-makers involved in foodservice purchase and management. The show will be staged every two years, but the 2010 edition might be held in conjunction with So Fresh, offering the domestic and international distribution market an all-comprehensive event dedicated to foodservice management.

More information at [freschissimo2008.it](http://freschissimo2008.it). 