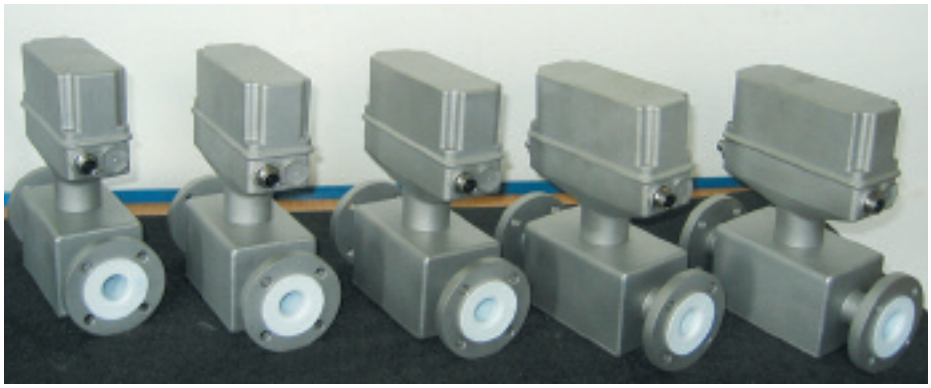

IZM-C, the fully integrated volumetric meter

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The flow of milk

Fresh from cow to table?

Almost 90 per cent water, yet so valuable and full of goodness! Milk, a basic foodstuff containing many important nutrients, plays a major role in our lives where health and nutrition are concerned. Thanks to a variety of processing techniques and a large number of different recipes, this natural material provides us with a wide diversity of food products to choose from. Milk is a "living" substance and so needs to be handled carefully, in order to ensure that the consumer is not exposed, as the flip-side to all these benefits, to any possible health risks.

The fundamental requirement of any industrialised milk processing chain is that the milk should follow a clear, traceable and protected route from the cow to the finished product. The direct way, "fresh from cow to table", is not one to be recommended.

Milk deposited at the roadside in churns and allowed to stand there in the sun no longer accords with modern requirements in respect of transportation standards.

It is better for the milk to be collected in a hygienic tank at the farm after milking, and to be kept there, well cooled and stirred, until it can be collected in a properly organised manner and transported to the dairy.

The way the milk is handled even at this early stage is among the factors influencing the quality of the ultimate dairy products and the length of time they can be kept for. With regard to the "flow of milk", attention should be paid to the following factors, which all have an impact on quality:

- The breeding methods employed must produce healthy and resistant breeds of cow;
- Feed must be fresh and correctly dosed;
- The cows' health, including the necessary standards of hygiene in the cowsheds, must be continuously monitored;
- Cleanliness must be maintained during milking and the cleaning instructions applicable to all the equipment required in and around the milking parlour strictly complied with;
- Controlled cooling and regular stirring must be provided for, ensuring that the raw milk keeps well at the farm until it is collected;
- Milk tankers must have bodies suitable for the transportation of foodstuffs, with properly documented cleaning of the individual tank compartments and of all the attachments and pipework;
- The temperature of the milk collected must be continuously monitored and cross-sectional samples taken regularly as traceable indications of quality;
- Tours and transportation times must be optimised to ensure that the temperature of the milk does not exceed the critical limit value as long as it remains on board the tanker;
- Laboratory tests must be carried out before the milk is discharged into the storage tank at the dairy, in order to check once again that it does not contain any residues of forbidden medication and is completely suitable for further processing;
- The milk reception unit into which the milk is discharged must be equipped with enclosed vessels designed in accordance with the applicable hygiene standard;
- The milk temperature must be recorded again as a quality parameter for purposes of product traceability, and a cross-sectional sample, representative of the entire tank content, taken completely automatically for a variety of laboratory tests;
- Before being released for the various and in some cases extremely complicated processing steps, the raw milk is initially kept in the storage tanks; a detailed and coordinated labelling and documentation system must then ensure traceability throughout the production process, so that the consumer may be sure of being able to rely on a healthy product of impeccable quality.

Precise and reliable recording of quantities creates confidence

It goes without saying that in the design of reception equipment, the hygiene directives are consistently applied at all stages. In determining quantities, the focus is on precision, since only if officially approved metering devices are used can the milk

The Zevodat C1 in-truck computer

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"FastSpeed" metering unit mounted on the tractor of an articulated vehicle

payment be reliably calculated. Electro-magnetic flow meters achieve a maximum deviation of 0.25 per cent at different throughput rates, as the responsible state authorities confirm. Even at farms where reception conditions are difficult, the deviation is less than a quarter of a litre when the smallest permissible quantity, 50 l, is transferred.

In the middle of the 1980s, the mechanical "Diessel meters", as rotary piston meters were affectionately known, began to be gradually replaced by the then revolutionary metering technology exploiting the electromagnetic Faraday effect.

Having no moving parts, these devices are free of wear, and therefore offer users enormous advantages.

The latest development among devices using this technology, the IZM-C, is small in size, is made entirely of stainless steel, and uses less than a quarter of the amount of electricity required by earlier comparable models. Such advances can only be achieved by determined and continuous efforts in the field of product development.

The registered brand name Zevodat stands for a control and data capture unit, produced by GEA Diessel, which has been doing reliable service in tanker fleets for many years now.

From data registration to complete milk reception control

Although there are demonstrable advantages to determining the quantity of milk at the tanker, where it can be done very accurately and without there being any opportunity for the figures to be manipulated, there are still some countries where this technology has not yet been adopted. Instead, the level in the farm tank is measured manually with a dip-stick and the quantity then calculated, taking the temperature into account. GEA Diessel's ZEVODAT C1 version represents an economical starter version that simply records data, in order to have the relevant figures available for the later settlement of the milk payment. If this version of the device is coupled to a suitable sampling system, a representative sample quantity will automatically be diverted into a bottle identified by some method such as a bar code when the milk is transferred to the tanker. The farmer receives an official document containing a printout of all the data for his records. One advantage of this technology is that if the vehicle is later retrofitted with automatic quantity recording equipment, all the devices can continue to be used with only slight modifications.

There is a great number of possible ways of upgrading the equipment.

A broad range of devices are on offer, from officially approved volumetric metering apparatus for "normal" reception speeds of up to, say, 400 l/min with a positive pump, all the way to complex milk reception equipment with a combination of several pumps achieving throughputs approaching 2,000 l/min.

Practical experience shows that it is worthwhile retrofitting even older vehicles with newly developed data capture systems such as the Zevodat-flash, in order to be able to take advantage of the most up-to-date functionality throughout the fleet. Automatic supplier identification by GPS or quick and straightforward data transfer by GPRS or EDGE will enable even an older tanker to be integrated into a system of on-board logistical communications that offers great advantages.

Summary

Among the tasks that a modern transport management system has to be able to perform are the quality assurance of milk and its traceability when it is transported from the supplier to the dairy. The more rapidly milk data can be made available, the more efficiently the fleet logistics system's special route optimisation programmes can perform.

GEA Diessel can offer not only its broad range of products – from individual components such as volumetric meters, samplers or control and data capture units all the way to complete measuring units performing officially approved quantity determination for accounting purposes – but also an enormous wealth of experience in solving specific challenges.

With the Zevodat-flash device, GEA Diessel is successfully continuing to meet the latest market requirements for data systems. The overall concept whereby it is possible for milk tankers to be retrofitted or upgraded in an almost continuously variable manner allows customers to make reliable calculations of their medium to long-term capital expenditure requirements.

Retrofitting older tankers with the latest Zevodat-flash in-truck computer makes sense