# VEGAPULS 69 radar sensor measures the level reliably in small dosing vessels

The dog is one of man's favourite companions. Many dog owners spare no effort in care and want only the very best for their pet. Accordingly, a wide range of dog food is available, from puppy food to senior mixes, as well as products for stomach-sensitive and allergic animals. The product range and the variety of recipes has been growing for years.

The South African company RCL Foods knows exactly what dogs like to eat. This leading African food producer not only produces various types of pet food, but has also developed and designed its own production equipment for just that purpose. Yet adding essential oils and fats to the food products has proven to be a very difficult and complex process.

The basic steps of the pet food process include sourcing raw materials, commingling via a dosing system that involves adding essential vitamins and nutrients, grinding to a specific specification and size, and then mixing. In the next step, the pre-processed product is fed pneumatically via a conveyor line to the extrusion unit. Steam, water and other ingredients are added there to produce many different shapes, sizes and mixes of animal feed.
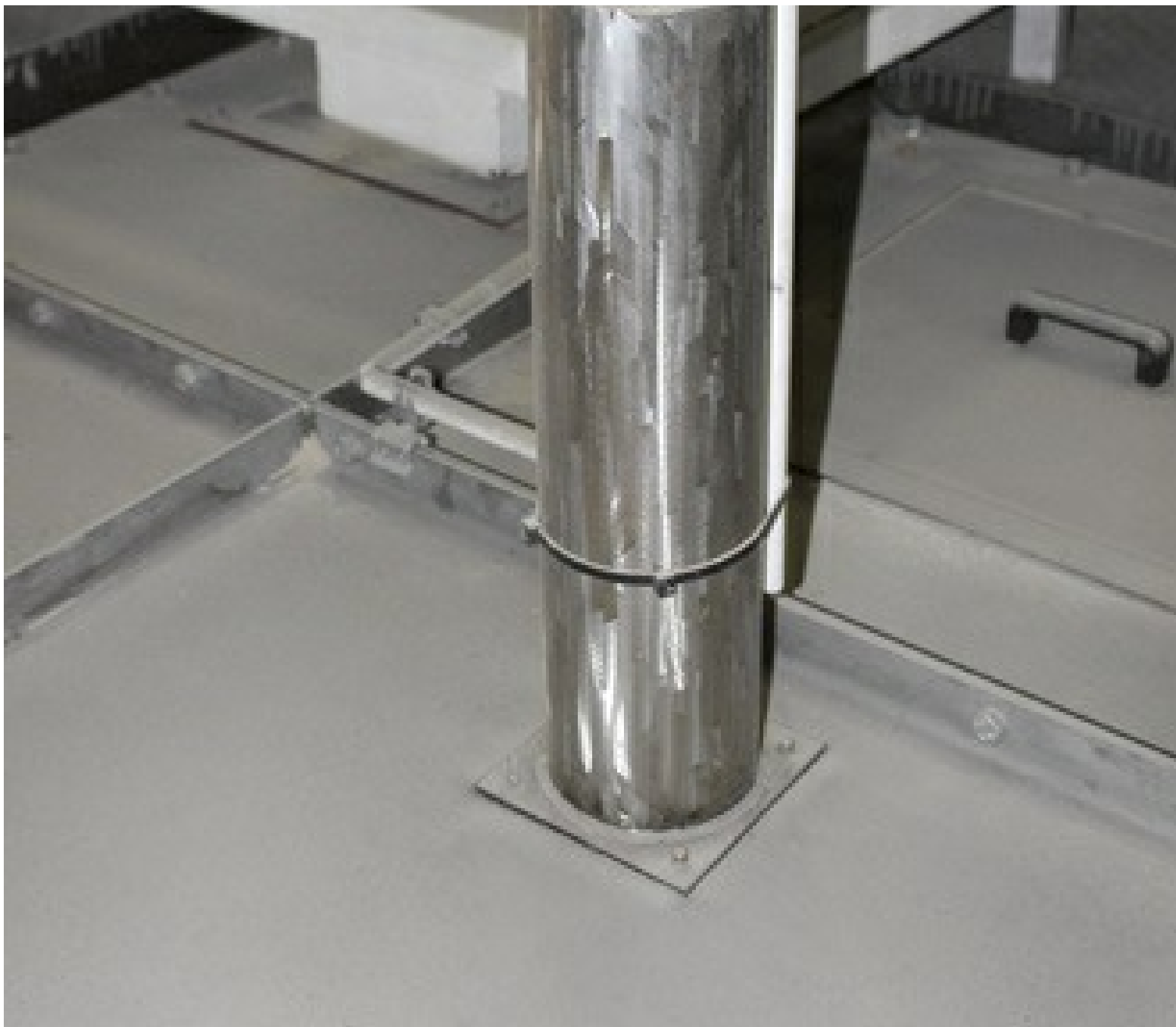
Despite the significantly shorter wavelength of VEGAPULS 69, the sensor is very insensitive to deposits.

After extrusion, the product has to be dried according to moisture specifications. When the product leaves the dryer, it gets coated with essential fats and oils. At this point in the process, however, there have always been difficulties until now. Although this brand new, state-of-the-art facility was designed and built by the company's own engineering team, one measuring point did not provide readings reliable enough to ensure a smooth, continuous process.

The problem: When the product leaves the batch dryer, the food product is supplied with fats and oils. For this purpose a container for holding the dried pellets was installed. This in turn feeds a belt weigher, which is used to obtain an accurate flow rate for the addition of fats and oils. It is absolutely necessary for the filling level in this storage container to be reliably measured in order to achieve an unvarying flow. Only in this way can the belt weigher operate smoothly and stably. The reason for this is that the four PID loops that control the addition of fats and oils cannot cope well with strongly fluctuating process variables.
At first glance, the measuring point does not appear to be especially problematic. The ambient temperature is moderate and the food pellets are actually easy to handle. From time to time light vibration occurs in the system, but that normally does not affect the measurement. The real difficulty only becomes apparent when you take a closer look. The size, composition and density of the individual pellets vary constantly. What is more, the level itself changes very quickly because the product flows so quickly. That's why reliable level measurement in the storage container was extremely difficult.
RCL has been working with Vega for more than a decade and appreciates the excellent service provided by the local subsidiary of the Black Forest company.

Reliable level measurement also in small vessels

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Since the product flows quickly, the filling level also changes constantly. Reliable level detection in the storage tank is therefore no easy task.

VEGA proposed a trial run with radar level sensor VEGAPULS 69. The higher 80-GHz frequency considerably extended the spectrum of applications for radar level measurement technology. An essential aspect of this success is the fact that the measuring instrument only requires an opening angle of 3° (previously 10°), which allows the measuring beam to glide right past internal fixtures or buildup on the vessel wall. In practice, the significantly tighter focusing of the transmitted signal offers a whole range of advantages, the most important being that the actual measuring signal can be better separated from interference signals, allowing even the smallest reflection signals to be detected.

Nevertheless: RCL Foods was particularly concerned about the low height of the container (only 2 meters) and the effective measuring range, which at 1.5 meters was even smaller. This is a problem that many users are familiar with, especially in applications with small apparatuses and vessels, for example in technical centres or pilot plants. The blocking distance (dead band) of the sensor, the size and design of the antenna or the measurement uncertainty at the bottom of the vessel normally pose some difficulties when it comes to obtaining a reliable measuring signal.

Although VEGAPULS 69 has a measuring range of up to 120 metres, it also copes well with small distances, such as those in the storage container of the South African company.

Good focusing enables measurement with sockets

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The level in the pellet container is reliably measured and can be kept constant.

During installation it was necessary to use the existing mounting sockets, wherever possible without any modifications. This was not optimal, but due to the very good focusing of the sensor there were hardly any interfering reflections. After installation, the instrument was quickly set up via Bluetooth and smartphone. The measurement engineering team was positively surprised by the high quality of the measuring signals. Now, the level in the pellet container is reliably measured and can be kept constant. The continuous process of coating the food pellets now runs smoothly. Dust deposits from the dog food are also no problem for VEGAPULS 69. According to the company, the sensor hasn't been touched since it was installed two years ago, neither for cleaning nor for maintenance. The level signal is reliable and accurate, ensuring production of a balanced dog food mix.

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