



APPLICATION NOTE

Power Generation

Level measurement of plastic waste in a waste treatment plant

- Continuous monitoring of a waste silo to control a shredder
- Precise and reliable radar level monitoring of an inhomogeneous, low reflective medium with high moisture formation
- Efficient waste shredding by adapting to the actual waste volume

1. Background

An Austrian utility company runs a waste-to-energy plant in Upper Austria. The plant is designed for a total annual throughput of around 320,000 tons of waste on two lines. Through a process of thermal recycling, the site produces electricity and heat on a scale that meets the needs of 60,000 households per year. Further modernisation of the plant included optimising the loading station for plastic waste.

2. Measurement requirements

The waste supplied varies in quality and is pre-sorted accordingly. The company collects the plastic waste in an approx. 3m / 9.8 ft high container. This waste is processed in a shredder in the waste silo before being transported to the furnace. In order to ensure that the shredder operates optimally and efficiently, the fill level of the waste must be constantly maintained within a specified range by the rotors.

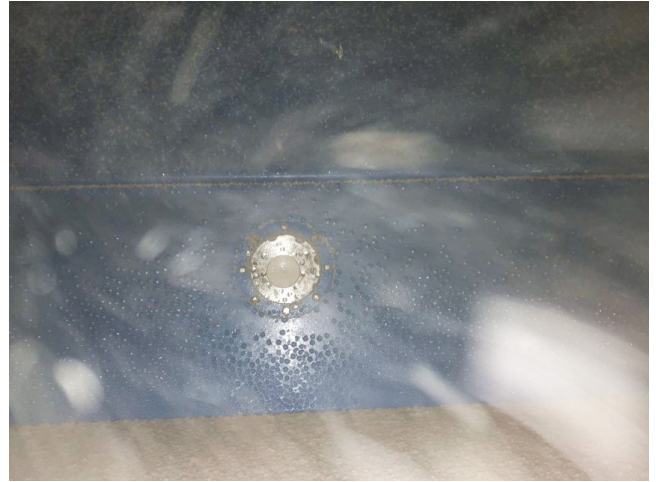
Thus, the utility company was looking for an effective instrument that could continuously measure the fill level of the receiver and optimally shred the waste. Plastic waste is, however, difficult to measure. It is very inhomogeneous, some of it is dusty, but also damp. Overall, the waste is scattered loosely and unevenly in the tank and is constantly in motion. Moreover, it has a low dielectricity and is therefore not very reflective, which poses a problem for conventional radar level transmitters.

3. KROHNE solution

The customer installed the OPTIWAVE 6500 C. The 80 GHz (FMCW) radar level transmitter was fitted on top of the waste silo using a flange connection. Thanks to its PEEK lens antenna (DN70) the level radar is ideal for use in the damp and dusty environment of the waste container. Due to the flush-mounted installation there is no intrusion of the antenna into the container. This ensures there are no troublesome deposits or build-ups.



Waste container with the measuring point of the OPTIWAVE 6500 (red arrow)



PEEK lens antenna of OPTIWAVE 6500 with heavy moisture cumulation in waste container

4. Customer benefits

The OPTIWAVE 6500 C ensures continuous operation of the plant. The reliable and accurate measurement prevents both overfilling and undersupply of the bunker. The waste can always be shredded efficiently and in a consistent quality. Unscheduled process interruptions are a thing of the past. The radar level transmitter ensures that the rotors of the shredder always have enough waste and are always used to capacity. If the volume of the waste in the container is ever too low, operation is temporarily suspended. This saves energy costs and prevents unnecessary wear and tear of the shredder.

Challenging process conditions such as low reflectivity, dust and high moisture levels pose no problem to the KROHNE device. The measuring dynamic of the 80 GHz radar is extremely high. This means that the measuring device can still measure accurately and consistently even in such challenging conditions. The level transmitter is maintenance-free. It does not even require an additional purge port or a separate antenna purging system.

The highly responsive FMCW radar level measurement has proven itself in practice under difficult and rapidly changing process conditions.

5. Product used

OPTIWAVE 6500 C

- 80 GHz FMCW radar level transmitter for plastic and other waste
- Continuous, non-contact level measurement in containers and collecting tanks
- Extremely high dynamics for accurate measurement of products with low reflectivity in dusty and damp environment
- For large or small and narrow containers and collection tanks



Contact

Would you like further information about these or other applications?
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