



## APPLICATION NOTE

Chemical

### Measuring level of cement dust

- Reliable, continuous measurement in air-injected silos
- Overcome challenges of heavy dust formation and fine powders with low dielectric constants

#### 1. Background

Cement is made by heating limestone and small quantities of other materials to 1450 °C in a process called calcination. The resulting hard substance (clinker) is then ground into a powder (cement). A Chinese cement works uses ball mills to ground clinker into cement. This process generates a large amount of dust which is collected, stored and fed back into the production cycle.

#### 2. Measurement requirements

The storage silos containing this dust are 9 meters high and equipped with air injectors. They fluidify the dust and prevent it from forming up on the silo walls which simplifies the extraction. Cement dust has a very low dielectric constant which drops to 1.4 when mixed with air. This and the dust-laden atmosphere make continuous level measurement of this medium a challenging task. The customer had tested various technologies in the past (e.g. ultrasonic, TDR and radar devices from competition) and none of them were able to provide reliable and accurate results under these conditions.



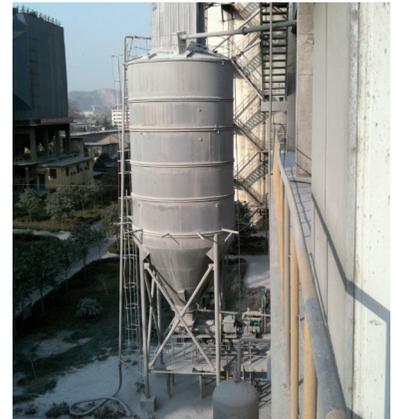
## 3. KROHNE solution

Developed especially for solids, KROHNE delivered the OPTIWAVE 6300 C with a DN 150 PP Drop antenna and a DN 150 flange connection. Fitted on a silo roof, this 2-wire FMCW non-contact Radar continuously measures the quantity of product left in each silo.

After several months of test, the customer equipped another 9 silos with OPTIWAVE 6300 and KROHNE became official supplier in level units for all his cement works.

## 4. Customer benefits

By combining the high signal dynamics and FMCW radar technology, the OPTIWAVE 6300 C guarantees reliable measurement even in very dusty atmosphere. Unlike traditional horn antennas, the shape and smooth surface of its innovative Drop antenna prevent from crust forming: purging systems become obsolete and maintenance is kept to a minimum. Thanks to the software, using a specific algorithm, accurate and continuous measurement of uneven surfaces is no longer a problem with the OPTIWAVE 6300 C. The DN 150 Drop antenna has a smaller beam angle than the DN 80 Drop antenna, making it perfect for measuring uneven surfaces in silos with internal objects. Due to its size, the DN 150 Drop antenna is also more efficient on products with low dielectric constants. The fact that a 2-wire device needs less wiring, has an immediate impact on installation and operating costs. All this combined with the competitive price make the OPTIWAVE 6300 C a cost-effective and attractive solution for the customer.



9 meter high silo containing cement dust



OPTIWAVE 6300 C fitted on silo roof

## 5. Product used

### OPTIWAVE 6300 C

- 2-wire 24...26 GHz non-contact FMCW radar, ideal for solid applications
- No more purging systems: the Drop antenna made of plain PP or PTFE minimizes product build-up and hence, maintenance
- PACTWARE software supplied in full and free of charge
- Wizard driven setup
- Reduced installation cost: FMCW technology is not affected by angle of repose, making expensive aiming kits obsolete



## Contact

Please visit our website for a current list of all KROHNE contacts and addresses.



[www.krohne.com](http://www.krohne.com)