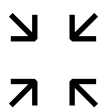


## Guided Wave Radar and Bulk Silos

Grain Inventory, guided wave radar replaces through air radar for low dielectric materials



01 LWT mounted on top of silos



### Introduction

In the food industry, proper management of inventory is crucial to ensure efficient and timely production processes, minimize waste, and maintain product quality. One essential aspect of inventory management is monitoring the level of bulk solids in silos, which store a range of ingredients and raw materials used in food processing. Monitoring of inventory levels can help identify potential safety hazards such as silo overfilling, static electricity buildup, and mitigating material expiration.



### Challenge

Through air radar instrumentation is a widely used technology for measuring the level of bulk solids in various industries. However, the measurement of low dielectric constant solids in tall silos can be a challenging task for this style of transmitter. The reason for this is the loss of signal strength from dust affecting readings while filling, uneven surfaces causing false echoes, low dielectric constant, and measurement length. When these factors are present it's recommended as a best practice to transition to guided wave technology.

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02 LWT310 display waveform

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03 Example of proper mounting through concrete

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04 Field installation of radar



## Rationalization

The tensile load that will be put on the cable and weight must be factored in addition to the moisture content of the material being measured. The wider and taller a silo is, the more tensile load resistance is required. Additionally, the moisture content plays a major role in determining how low the dielectric constant will be. Lastly installation criteria must be examined to ensure that there aren't obstructions that would absorb radio frequencies such as concrete. A steel pipe used as a go between is recommended as a best practice.

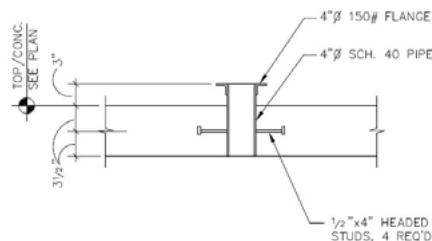


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## The ABB Solution

ABBs guided wave radar technology is able to solve all the challenges mentioned above. To overcome potential issues with false readings, ABB also implemented the median filtering algorithm. This is accomplished by taking a series of measurements, aligning them in ascending numerical order, and outputting the middle number. The LWT310 and LWT320 series boasts a maximum pull force of 1,000 lbs / 1,400 lbs. This offers flexibility in most bulk solids applications. The technology also can read solids with dielectric constants as low as 1.4. However, careful consideration is still needed when selecting any guided wave radar in bulk silos.



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# Notes

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