



FOOD PROCESSING

Mapping & Visualization of Challenging Material

The Challenge

This food processor needed highly accurate volume measurements in order to know when to prepare to refill the bin, as the bin is almost always emptied completely before filling again to prevent damage to the material. The customer was seeking both accuracy and stability at batch empty rates of approximately one-half ton per minute, and was primarily interested in headroom or distance to product from the top of the silo. The material is very dusty and prone to sidewall buildup and bridging with the material surface being characterized by highly uneven topography during the emptying process. The 3DLevelScanner was being evaluated against radar systems from several different vendors.

The Solution

The MV model of the 3DLevelScanner was mounted on a 100 foot tall, 27 foot diameter, carbon steel silo containing granular rice. The device was mounted on an existing flange using the BinMaster adapter plate and mounted

one-sixth in from the silo diameter. The silo is a center fill, center discharge configuration and the internal bin environment is very dusty. However, the low frequency acoustics-based technology was able to penetrate the dust. Unlike the single-point measurement radar devices, the 3DLevelScanner MV model samples multiple measurements within a 70 degree beam angle inside the bin. Allowing material to settle in the bin and then visually mapping the contents helped the customer more closely manage inventory and schedule refilling at an optimal time and provided a more accurate estimate of bin volume. Based upon the success of the first silo, 27 additional units were installed at the location.

The Benefits

Sampling measurements from multiple points when the material surface of the bin is uneven provides a more precise headroom measurement and bin volume than a single point measurement device. The advanced mapping and visualization software – available on the 3DLevelScanner MV model – is helpful

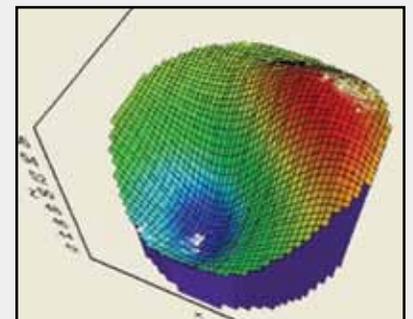
when used in material prone to sidewall buildup and bridging, where there are points in the bin that are lower or higher than the majority of the bin contents. Calculating volume after an empty or fill cycle, when there is a “cone down” or “cone up” can also be more accurate when multiple point measurement is used. Had a single measurement been taken, bin volume estimates could be significantly higher or lower than the actual volume.



Scanner mounted on existing flange, using an adapter plate.



Significant bridging is evident in the silo.



Bridging is detected and mapped by 3D software.



APPLICATION HIGHLIGHTS

Material	Rice
Bin Type	Carbon steel silo with cone bottom
Bin Size	100' tall x 27' diameter
Classification	Class 2, Div 1 outside silo
Model	MV