

LM80 Laser Level Transmitter Sinter Preparation (Iron ore) Silos Application

Measurement made easy

Sinter production uses a combination of limestone, iron ore, coke, and heat to prepare the iron ore for steel manufacturing. This application is typical of many in the ore processing industry and is very similar to steel making and coal power plants. These applications present a combination of challenges to silo level measurement.



Some details of the application at a customer facility:

- The silos were all geometrically lined up with common height of 18 meters.
- Several conveyors and tripper cars load the silos independently at the same time.
- Several of the silos were constantly being filled / emptied at the same time
- There is a constant situation of “rat-holing” of the product in the silos. The rat holing at times only leaves a small percentage of the silo flowing, especially in the constantly filling silos.
- There is a wide variety of “Particle” sizes from fist-size rocks to powder.
- The materials with small particle size create dust.
- Extreme Peaking and Slumping of the material.
- Diverter Plates can greatly vary the location of the falling fill stream.
- Product colour and dielectric constant vary greatly.
- High Vibration when silo vibrators are turned on.

The customer had been trying a variety of Capacitance, Radar, and Ultrasonic transmitters for years without success. The latest sensors installed were capacitance level switches which had all failed in the application for a variety of reasons and required the staff to monitor the silos visually 24 hours a day.



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All devices (every silo) were out of service. Reasons for the failures were easy to see and understand:

- Moving location of the Rat-holes.
- Worn through Sensor cables
- Changing dielectrics due to material and moisture changes
- Uneven Coatings
- Peaking and slumping of the material

ABB LM80 laser level transmitters were tested and were successful in providing level readings on the silos. The signal from the LM80 was connected to the DCS, and used to adjust the speed of the conveyors, and turn on the vibrators on the silos when rat-holing was excessive.

Dust, Particle size, and Color were not an issue for any of the silos including the powdered limestone, with the exception of the recycled fines, which have the consistency of fly ash. In this environment the LM80 is not able to penetrate the dust beyond a distance of about 10 meters and can only be used for close up measurements. Adjustable mounts are used to have the capability to redirect the LM80 in case the feed conveyors are relocated. Heavy dust mode with some fine tuning of parameters is required for this application. Vibration from the silo vibrators caused no false indication of movement in the LM80 readings.

The LM80 is an ideal fit for this application. Such sites typically also have large Stacker/Reclaimer machinery in addition to the silos and are good targets for LM200 laser positioning applications.

At this specific location, production rate is 10,000 metric tons per day of sinter ore. The customer is the Philippine Sinter Corporation, a subsidiary of Kawasaki Steel Corporation of Japan. They have agreed to act as a reference site.

Should you have any question about Sinter and Iron Applications, please do not hesitate to contact PMU Quebec Team at laserscanner.support@ca.abb.com.

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