

Easier, faster and less costly level measurement for the plastics industry



— Storage silos for plastic pellets

— 02 Narrow beam emitted by the LLT100

Overview

The demand for plastic is growing as it is increasingly being used as a substitute for metals or other materials in the automotive, construction, electrical and electronic industries. Plastic producers and plastic converters will typically store plastic pellets in tall and narrow silos, which creates a challenge for any radar and ultrasonic beam spread technology. With their narrow beams, ABB laser level transmitters have been used successfully in this market with thousands of installations over the last ten years.

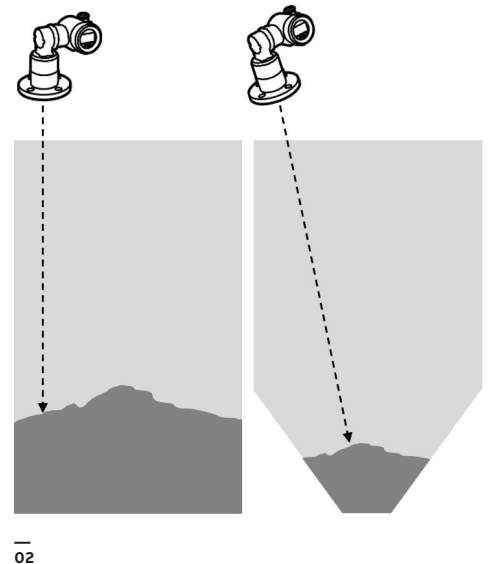
Applications

Typically, plastic manufacturers are large petrochemical and chemical companies that produce and supply raw plastic material, mostly in the form of pellets, to the rest of the supply chain. These companies value automation solutions and live inventory reporting, and they have used level measurement for storage or blending silos. Plastic product manufacturers also use level measurements in storage silos or day bins for inventory management.

Narrow and tall storage silos present a challenge for any beam spread technology. Laser level has been used with enormous success in this application due to its narrow beam and ability to measure right down to the bottom of the silo as illustrated in figure 02.

Plastic production and processing is one of the largest manufacturing industries. Laser transmitters have been successfully applied in this industry's manufacturing, converting and recycling processes.

Measurement made easy



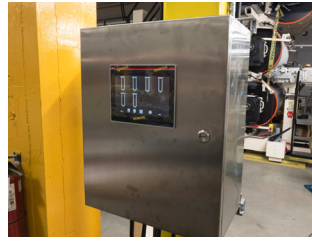
— 02

Laser beams are narrow (<math><0.3^\circ</math> divergence) and create a small spot on the surface, typically less than 30 cm even at long ranges. A typical installation is illustrated on the next page. The LLT100 is mounted on a spool piece using a swivel flange to aim precisely at the bottom of the silo. For increased protection, a dust tube is also used. For plastic applications, it is important to use a metal mounting plate or flange and ensure it is properly grounded to the silo to help dissipate static buildup.



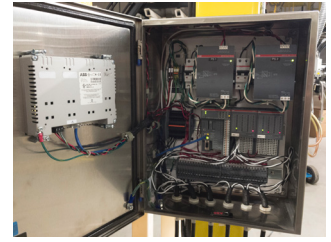
01

01 Typical installation



02

02 Turnkey solution



03 Day bins

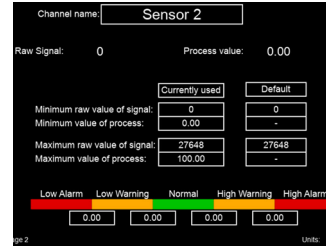
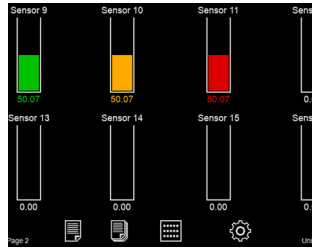
Another important advantage of using lasers in these applications is that silos of day bins are usually identical as shown below. Contrary to other technologies, laser levels only need to be configured for the first silo. This configuration then can be used for all remaining silos, making installation and commissioning easier, faster and less costly.



03

Complete turnkey solution

In addition to our LLT100 laser level solution, ABB also offers a complete turnkey solution with PLC control panel, displays, I/Os, customized user interface and more. This type of solution, as shown in figure 02, is often provided to silo manufacturers as part of a full-solution package during plant construction or expansion.



Benefits

LLT100 laser level transmitters offer many benefits for these applications:

- Non-contact technology to improve reliability.
- Plastic pellets will not stick to the device and break moving parts leading to repetitive maintenance as is the case for contact technologies.
- Strong laser beam reflection from plastics in contrast to radar waves.
- Works with low dielectric constant materials.
- Typical environment is not dusty, so no issue for laser beam.
- Narrow beam and small divergence aim directly at the bottom of a conical vessel.
- Can be installed very close to the wall and is unaffected by internal structures or vessel shape.

Conclusion

Plastics manufacturing and processing is one of the most interesting markets for LLT100 laser level transmitters with numerous opportunities worldwide. Narrow and tall storage silos used in this industry are very challenging for radar and ultrasonic spread technology but are perfect environments for lasers due to their narrow beams and ability to measure completely to the silo bottom. With thousands of installations over the last decade, ABB laser level transmitters have enjoyed excellent success in this application.

ABB Inc.
Measurement & Analytics
3400, rue Pierre-Ardouin, Quebec, Quebec
G1P 0B2 Canada

Tel: +1 418.877.2944
1.800.858.3847 (North America)
Email: lasers@ca.abb.com

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