

As Switzerland's leader in renewable biomass energy, Axpo Tegra AG relies on Hexagon's automated volume measurement solution

Hexagon provides Axpo Tegra AG with the ideal BLK247 VolumeMonitor solution for automated volume measurements at their biomass power plant



Challenges to monitor, measure and manage bulk goods

Companies whose operations depend on handling bulk goods face numerous challenges. A critical one is the determination of their on-stock volume. Imprecise measurements can negatively impact the business' upstream and downstream processes. This could mean that they need to pay more attention to current stock, have higher than necessary carrying costs and that sub-optimal operating decisions are being made.

Laser scanning technologies operated by trained personnel have been shown to provide accurate volume information. But for high precision, current processes still require manual human resources, which can interrupt the operation of the plant and expose personnel to a hazardous environment. Importantly, these processes are costly in time and labour, creating a need for automated solutions.

Hexagon's Leica BLK247 VolumeMonitor, the world's fastest, smallest, and easiest-to-use laser scanner for volume monitoring, can solve this problem. With a fully automatic measurement process, it speeds up and simplifies measurement workflows and is an ideal solution for companies dealing with bulk goods like grain, wood chips, chemicals, cement, and other finished goods.

One such company needing a system for their bulk goods is Axpo Tegra AG, a leader in the renewable energy sector in Switzerland. The company is active in the biomass sector within the areas of fermentation, composition and wood energy. Its CO₂-neutral biomass power plant is a leader in producing renewable energy in Switzerland, requiring precise and timely volume information to ensure continuous operation.

Automatic survey-grade volumes delivered in near real-time

Historically, the problem with survey-grade measurements via laser scanning was the significantly manual process. Both in data acquisition and the data processing stages. Of course, the volumes were reliable, but the time consuming and costly process could not be justified for daily measurements. Often, they would only be performed for monthly reporting requirements. Because of the demand for this information by their production, Axpo Tegra AG sought out a different solution.

Daniel Kressig, Head of Biomass Power Plant:

"It was great to use the simple and intuitive interface of the BLK247 VolumeMonitor solution. We now have easy access to reliable volume information and value the visual monitoring the BLK247 provides in addition."

Some technologies already exist for continuous observation and automated volume measurements. For example, single-point laser or radar/echo systems, but these systems provide less accurate volumes. Especially, when the stockpile and site have irregular shapes.

By using Hexagon's Leica VolumeMonitor solution and installing the Leica BLK247 directly above the center of the stockpile, Axpo Tegra AG has now leveraged Hexagon's advanced 3D measurement and processing technologies to automatically achieve survey-grade volume precision. Most importantly, these on-demand measurements are delivered at a frequency far beyond that of other laser-scanning workflows.

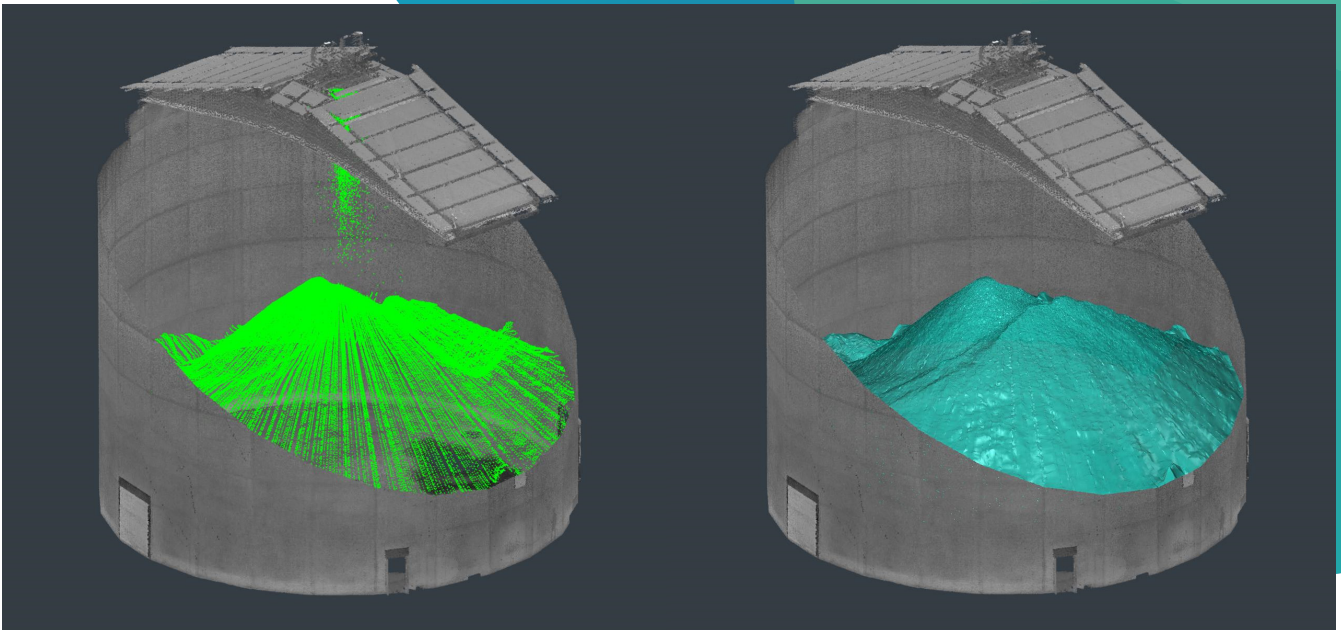


The BLK247 VolumeMonitor measures the volume of the silo

To achieve this, a dense point cloud is captured from the BLK247's fixed installation, continuous LiDAR sensor. The VolumeMonitor software then creates a precise 3D digital twin of the stockpile's surface – even while the silo is being filled. Finally, the volume is computed by comparing the stockpile's 3D surface against an existing 3D model of the empty site.

The fact that we use precise 3D models is important as other solutions lose accuracy by representing the site through geometric primitives to simplify computation. By using 3D digital twins of the site and stockpile, the Leica BLK247 VolumeMonitor can maintain its high accuracy. Another strength of this solution is, that it can be adapted to fit all different shaped storage areas at the same time.

Most importantly, though, the whole measurement and computation process is performed in a matter of seconds, fully automatically. The BLK247 VolumeMonitor solution then makes this volume data or 3D intelligence immediately accessible to all internal stakeholders. For Axpo Tegra AG, this means reliable volume information is available whenever their decision-makers require it. With the 3D digital twin of the stockpile, they can validate all measurements and have absolute confidence in the size of their silo's stockpile.



The Leica BLK247 VolumeMonitor solution creates a digital twin of the stockpile as shown here. Original point cloud on the left and final surface model on the right.

BLK247 sensor fusion delivers simultaneous visual monitoring

The Leica BLK247 is a sensor-fusion device, meaning that in addition to the LiDAR sensor, it also integrates 360-degree high-resolution RGB cameras as well as IR cameras. These enable the VolumeMonitor solution to do two things at once: volume monitoring and visual monitoring.

For each volume measurement, the BLK247 VolumeMonitor records high-resolution imagery. Simultaneously, live video can be streamed directly to a 3rd party video management system (VMS), for example, the site's control room. This gives operators sight from within their silo without having to install additional cameras. For VolumeMonitor, it enables a visual inspection of the quality of the material delivered and can help identify any foreign materials that may impact the downstream operations of the wood-fire power plant. Likewise, these live video feeds are available via a VMS to monitor for other hazards or unsafe conditions that may arise.

3D Intelligence delivered effortlessly and directly to internal stakeholders

Inventory managers are usually confronted with the challenge that volume records are often documented with a lengthy paper trail. Hexagon's Leica BLK247 VolumeMonitor solution changes this. It delivers high-frequency, high-accuracy volume measurements through an easy-to-use web interface. This interface can be accessed at the same time by multiple stakeholders.

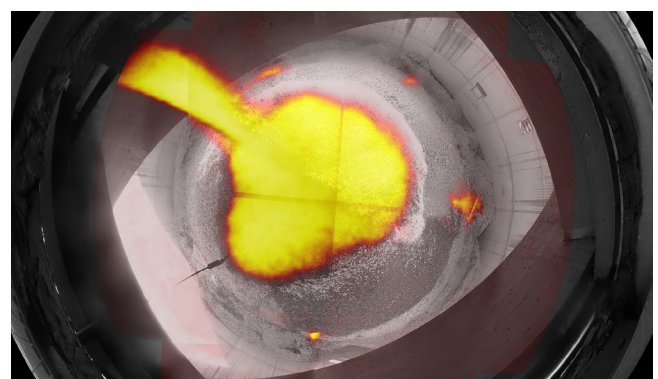
The automated process can be easily set in the software through a scheduling system. This enables measurements to be acquired at a rate of daily, hourly, or even every few minutes, without extra labour costs or effort.

By having precise and highly temporal data, these stakeholders can take a data driven approach to their decision making which can benefit both their upstream and downstream processes. Whether based on the current levels or historical data, it is easily accessible within the BLK247 VolumeMonitor's web interface.

For Axpo Tegra AG, just one example is that their purchasing manager now has absolute confidence in the quantity and distribution of stock within the silo. This allows them to optimize their procurement of wood chips, particularly in extraordinary situations when there are significant fluctuations in market prices.

Daniel Kressig, Head of Biomass Power Plant:

"With the BLK247 VolumeMonitor, we can better plan extraordinary operations around the automated, frequent and reliable measurements of our silo."



BLK247 VolumeMonitor thermal sensors capture the incoming bulk material

For more information about the BLK247 VolumeMonitor, visit [our website](#).



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Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

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