



ESI Eurosilo

Futureproof Sugar Storage with the Eurosilo System
Operational Efficiency and Controlled Conditioning



Trends and Challenges in the Sugar Industry



Climate Change Impacts Sugar Beet Yields

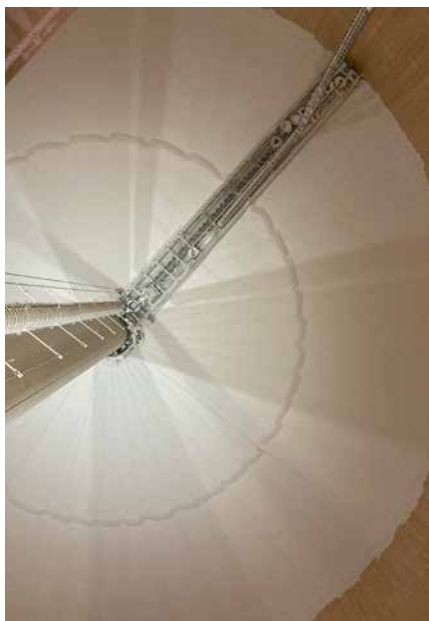
The sugar industry in Europe is facing significant impacts due to climate change. Persistent rainfall and wet soil provide poor conditions for farming and harvesting high-quality sugar beets. Additionally, plant diseases are exacerbating the challenges in sugar beet production in several regions. As a result, we are seeing a shift from traditionally dominant production areas in southern Germany and northern France to the northeastern parts of Europe. Production facilities in these regions require substantial expansion to handle the increased production volumes.

Updating Old Storage Facilities

As one of the oldest agricultural processing industries, many sugar storage facilities date back to the 1980s or even the 1960s. In the meantime, technology has advanced significantly, offering automation and improved efficiency, while several storage providers, such as Weibull, ABR, and Spaans, no longer exist. Additionally, regulations for the production environment have become stricter, particularly regarding CO₂ emissions and Health & Safety standards. This presents another challenge for sugar producers: maintaining older storage silos to meet modern requirements for another decade or more.



Storage Requirements and the Eurosilos System



Efficient Silo Cleanup

One of the most sought-after features in sugar storage is an effective and fully automated cleanup of the silo at the end of the sugar beet campaign. The Eurosilos system is specifically designed to meet this requirement. Its core component is a horizontal screw conveyor that elevates during filling, evenly spreading the sugar in layers, and then descends within the Eurosilos during reclamation. The screw conveyor reaches the remaining sugar at the bottom and pushes it towards the central outlet in the silo floor. This design provides the most efficient silo cleanup, eliminating the need for personnel to enter the silo.

Humidity control and optimal conditioning

The Eurosilos system for sugar storage is designed for humidity control and optimal conditioning of the sugar. A range of solutions can be integrated in the system to prevent undesired moisture buildup. From pre-heating, insulation and heating of the silo wall and floor, to a HVAC-installation to control the circulation of conditioned air in the silo or inside the stored sugar. Most importantly, the working principle of the Eurosilos ensures that, after a free fall through a telescopic chute, the incoming sugar is evenly spread in layers on top of each other, thus enabling it to rest and dry.



Food Safety Requirements

Maintaining sugar in optimal condition is the key function of the Eurosilos. Therefore, food-grade coatings are used for structures in direct contact with the sugar, while stainless steel is used for the auger and screw systems. A specialized design with food-approved lubrication and a lubrication collection system prevents any contamination of the sugar. In short, various options are available to configure the most suitable system, based on customer requirements and compliance with local regulations.

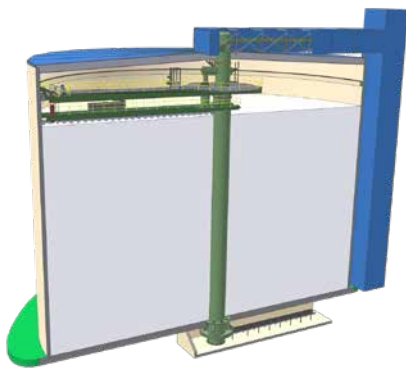
Explosion Prevention

The equipment and installations are designed to prevent any risk of dust explosions due to sugar handling. Therefore, all electrical and mechanical equipment is compliant with ATEX standards. Numerous systems have been designed according to ATEX and NFPA standards for our silo systems, including minimizing horizontal surfaces to reduce dust accumulation, carefully considering different ATEX zones within the silo, monitoring temperature, and more.





Working Principle of the Eurosilos



Storing Sugar Layer by Layer

Sugar infeed starts at the top of the silo. It is conveyed to the filling screw conveyor and then to the bellows chute. The sugar falls through the chute into a dust lock, which places the sugar in front of the main auger. This auger is suspended by cables attached to a rotating bridge, mounted on the centre column and ring bearing at the top of the silo.

As it rotates, the auger spreads the incoming sugar evenly over the already stored mass. This ensures uniform layers that extend to the silo wall. With each full rotation of the auger frame, the winch performs a hoisting step, continuing until the maximum level is reached.

For the outfeed of sugar a core flow is induced by the discharge outfeed mechanism position at centre of the silo bottom, this ensures the sugar at the bottom level to exit the Eurosilos first. During the discharge process the auger is lowered stepwise by the winch system until the lowest level is reached. When it has reached the lowest level, it moves the remaining sugar off the entire surface into the central discharge outfeed mechanism.

No Clumping and Segregation

The layered storage of the Eurosilos allows for the required cooling of freshly delivered sugar. By spreading the incoming sugar over the silo's surface after a free fall through the bellows chute, the sugar can rest, cool, and evaporate any moisture. This is aided by air ventilation and temperature control within the silo. Segregation, which leads to uneven output quality, is non-existent with the Eurosilos system due to the layer-by-layer infeed method. Based on our long-standing experience with hygroscopic materials, such as potato starch and fertilizer, it's safe to say that blockages due to clumping are a thing of the past.



Main Benefits

ESI Eurosilos have a long track record of designing systems for various bulk solids. Our systems can also meet the world's most stringent food and ATEX regulations. In the past, dozens of silos for sugar storage have been constructed based on the Eurosilos working principle.

Key benefits of our system include:

- Long-term sugar storage due to optimal conditioning
- Reduced labour costs due to fully automated operation
- Complete cleanup with a fully automated system
- Optimal homogenization with a layer-by-layer filling pattern
- High-capacity storage up to 100,000 tons
- Explosion-proof design according to ATEX/NFPA standards
- Space-saving with an optimal surface-to-storage ratio
- A secure storage solution with a lifespan of over 40 years



About ESI Eurosilos

Local Fit for a World-Class Solution

ESI offers space-saving and cost-effective facilities for the large-scale storage of bulk products. With over 190 units installed worldwide, our team has gained valuable experience in reliably handling complex bulk products in the agribulk industry, as well as in the process, power, and mining sectors. As an independent company, ESI does not own any production facilities. This allows us great flexibility in project execution and procurement, enabling local supply. Providing the best local fit through seamless collaboration and solid project management is one of our core competencies. It all starts with contacting our local agent in your region.

Wide Portfolio of Services and Solutions

The sugar-producing industry is clearly evolving. With our technology, we are ready to help you prepare for the coming decades. Whether it involves constructing new sugar storage silos with limited space at existing plant sites, updating or upgrading older silo systems from suppliers no longer in the market, or ensuring accurate maintenance and repairs, ESI is your global partner. As a leader in vertical storage, ESI also supports Weibull, ABR, and Spaans silos. Feel free to request references or more detailed information.



Contact your local ESI agent

ESI is represented by knowledgeable specialists through a global network of agents. So you can discuss any questions or issues first hand in your own region.

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