Industry 4.0 warehouse to distribute 2,000 pallets daily to 74 countries

Konya Şeker, Turkey's largest sugar manufacturer, connects its production plant in an earthquake-prone region with a 125-foot-tall automated warehouse.

Country: **Turkey** | Sector: **food & beverage**

CHALLENGES

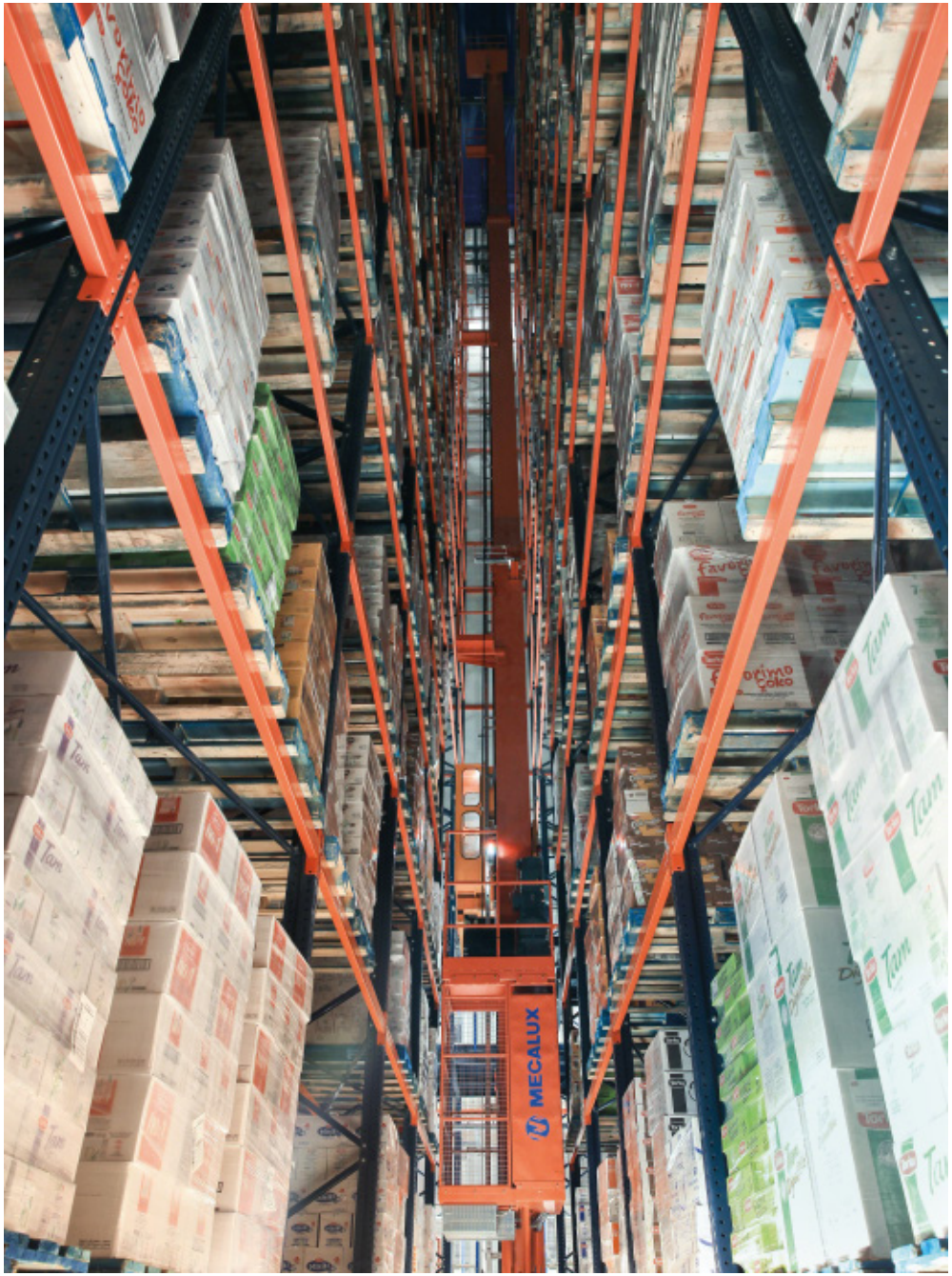
- **Streamline** the production, storage and shipment of chocolates and biscuits.
- **Track** all Konya Şeker goods to ensure the smooth operation of its business.
- Safeguard storage operations in an **earthquake-prone** region.

SOLUTIONS

- **Automated rack-supported building for pallets**.
- **Easy WMS warehouse management system**.
- **Pallet conveyor system**.

BENEFITS

- Efficient distribution of **2,000 pallets a day** to **74 countries**.
- Traceability of **48,000 pallets** containing finished goods, raw materials and packaging items.
- Automated rack-supported building (**125' tall)** on the **Anatolian tectonic plate**, capable of withstanding earthquake ground motions.



Konya Şeker is a Turkish business specializing in the production and sale of sugar and other derivatives. The company also makes a wide variety of sweets prepared with its sugar, including chocolates, cookies, and halvas (Middle Eastern sweets made with sesame paste). Since 2008, Konya Şeker has been a part of the Anadolu Birlik Holding (ABH) group, which brings together industries in diverse sectors such as food, agriculture, energy, and chemicals.

- **Founded: 1954**
- **Facilities: 45**
- **Farmers: 900,000**
- **No. of employees: 10,000+**

Over the past few decades, Konya Şeker has completely overhauled its logistics and production operations with the latest technologies in the market, firmly embracing robotic process automation. By upgrading its supply chain, the company increased its production volumes, becoming Turkey's largest sugar manufacturer. Moreover, this modernization prepared the organization to carry out an ambitious expansion project. Currently, Konya Şeker's 45 production facilities produce approximately 22% of the sugar consumed in Turkey. The business is also a leader in the frozen potato market.

In the town of Çumra, on the outskirts of the city of Konya, the company boasts the largest sugar factory in Turkey. This facility spans 642.5 acres and is equipped with 27 production lines. "In recent years, we've doubled our annual sugar production, reaching over 480,000 tons. All machinery and equipment were sourced from top-tier European suppliers specializing in state-of-the-art technology. Moreover, this is the only sugar factory in the world that can obtain its raw materials within a 13-mile radius," says Kerim Başaran, AS/RS Warehouse Manager at Konya Şeker.

The Çumra plant is home to the manufacturing center for the organization's brand of chocolates and cookies. "Our Torku chocolate production facility stands out as one of the most modern centers in terms of technology. It serves the domestic market and enables us to export our products to 74 countries, including Switzerland, the motherland of chocolate," says Başaran.

A few years ago, Konya Şeker expanded and diversified Torku's product portfolio, introducing chocolates, dairy, meat, pastries, oil, and vinegar, among other items. Consequently, the company had to prioritize its logistics operations to cope with the increase in production. Initially, it managed its raw materials and finished products in a traditional warehouse. However, the need to reduce goods-in/goods-out lead times led the business to invest in intralogistics technology.

In line with its modernization strategy, Konya Şeker set up an automated rack-supported building. Managed by Mecalux's Easy WMS software, the facility distributes 2,000 pallets a day. The warehouse, capable of storing 48,000 pallets containing cookies and chocolates, is integrated with the production center. This connection facilitates the autonomous exchange of raw materials and finished goods ready for distribution.

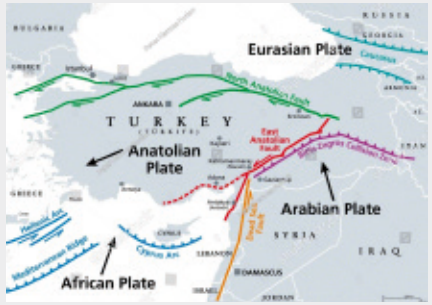
In addition to boosting throughput, technology has helped to maximize the quality of the sweets by ensuring strict adherence to safety and hygiene protocols. "Our top priority at the facility is consumer health. Therefore,

AN AUTOMATED WAREHOUSE IN A SEISMIC REGION

Most of Turkey sits on the Anatolian tectonic plate, wedged between the Eurasian, Arabian, and African plates. The friction between these plates makes this country one of the most seismically active regions on the planet.

Konya Şeker's warehouse is a rack-supported building, meaning the racking supports its own weight as well as that of the roof, vertical enclosures, and goods. Mecalux designed it taking into consideration several factors affecting the structure, including wind force. In this specific case, it also accounted for seismic activity in the area and the local regulations currently in effect.

Building a 125-foot-tall warehouse on a site with such a high degree of earthquake activity as Konya posed a challenge for Mecalux's structural engineering department. It demanded tremendous precision during the assembly process. The racks were reinforced, and sturdier central frames were employed to absorb the dynamic forces caused by potential seismic movements.



we focus our efforts on producing natural, additive-free chocolate while preserving its properties. To do this, it's essential to ensure compliance with the relevant legislation," says Başaran.

Maximum storage productivity

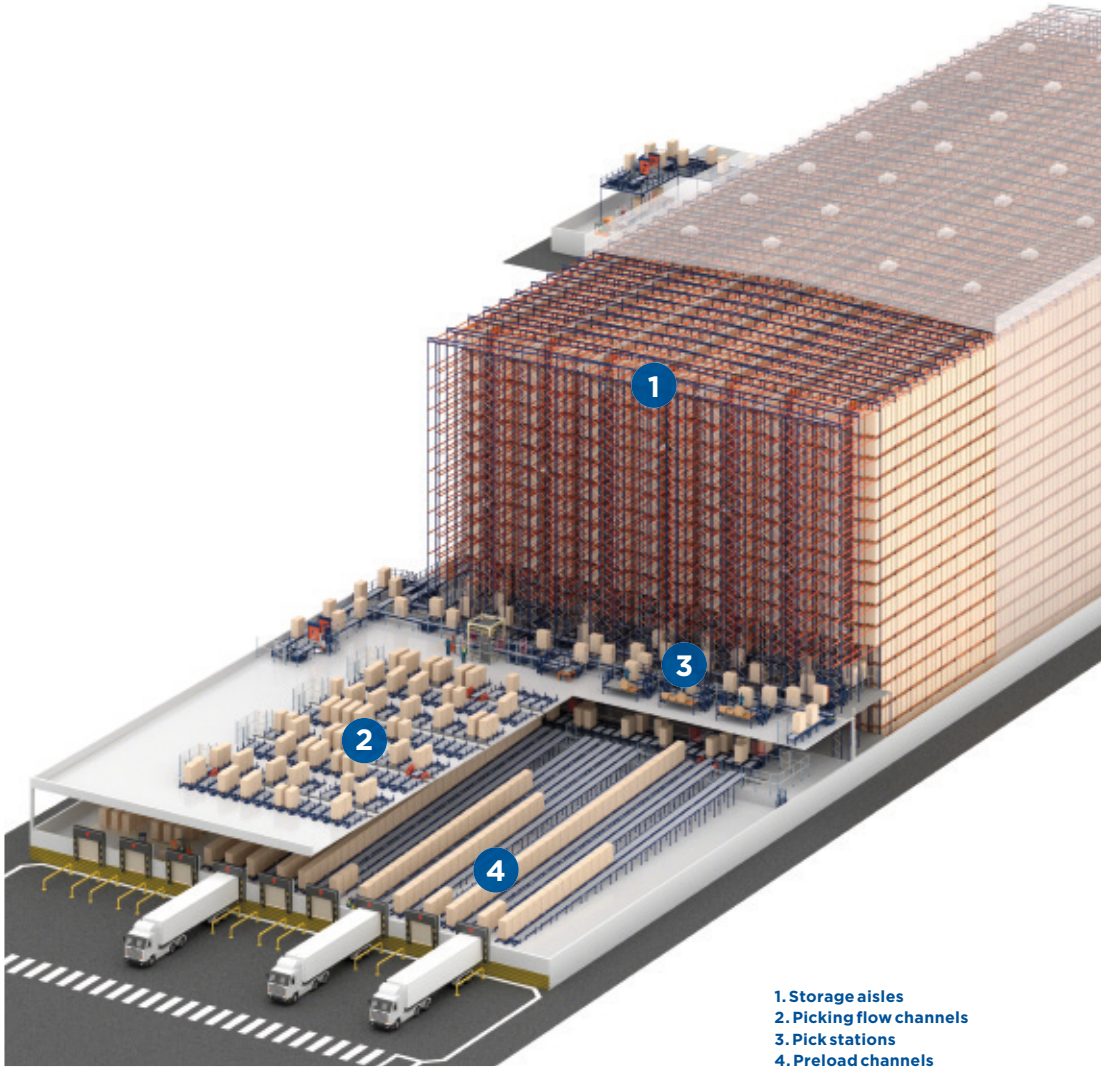
"Automation has reduced our goods storage and retrieval times," says Başaran. Konya Şeker's automated rack-supported building consists of seven aisles, each 453′ long, with double-deep racking. To deposit and retrieve materials, the Mecalux stacker cranes for pallets installed in each aisle are equipped with telescopic forks. This allows them to access the second storage position on all levels. These machines, which follow the commands of Easy WMS, operate at a travel speed of 722′/min and a lifting speed of 210′/min.

Two of Konya Şeker's warehouse aisles are allocated to raw materials and packaging items, while the remaining five aisles house finished goods. Three of these run at a controlled temperature of 59 °F to preserve the consistency, flavor, and aroma of the chocolates. The other two aisles operate at ambient temperature.

SKUs are assigned to locations based on their dimensions and the ABC analysis, managed by Easy WMS. High-turnover products are placed on the ends of the aisles, closest to the incoming and outgoing conveyors. Meanwhile, low-turnover items are slotted further away, at the opposite end of the aisles. This strategy optimizes stacker crane movements.

Automatic connection with production

One of the greatest advantages of automating Konya Şeker's warehouse is its integration with the manufacturing center. This plant is divided into two distinct areas: one dedicated to chocolates and another to cookies.



1. Storage aisles
2. Picking flow channels
3. Pick stations
4. Preload channels

To maintain a continuous flow of movements, a 20-foot-high raised tunnel connects the outputs from the chocolate and cookie production lines directly to the warehouse. Inside the tunnel, an automatic conveyor line runs along the side of the logistics complex, extending the front of the rack-supported building. Thanks to the conveyor's accumulation capacity, the pallets can remain on stand-by temporarily, awaiting entry in an orderly manner and without needing to be placed on the floor.

Subsequently, lifts located at the beginning and end of the tunnel transport the goods between different levels.

Floor devoted to automated picking

Konya Şeker is charged with supplying its products to supermarkets and stores across Turkey every day. With this objective in mind, a two-story building is located at one end of the warehouse. Order picking is performed on the upper floor, while the lower floor is dedicated to shipping.

The picking floor has four blocks of flow channels for high-consumption goods. An automatic transfer car supplies each channel, which can store up to three pallets of a single SKU. Thus, reserve merchandise is always available. On the lower part of the channels, operators access the pallets directly. They retrieve the boxes that make up each order, traveling through the aisles assisted by order pickers. Operators locate SKUs as instructed by Mecalux's warehouse management system via their RF scanners.

In front of the storage aisles, the conveyors transport the necessary SKUs to three pick stations for low-demand items. Operators can prepare up to 12 orders simultaneously.

Once the orders are closed, the pallets head to the stretch wrapper. They are then stored until Easy WMS assigns them a route and dispatches them to the shipping area.

The lower floor of the building adjacent to the warehouse handles outbound operations. A transfer car classifies and sequences the goods into 26 preload flow channels. Pallets are grouped in each channel — taking into account whether they belong to the same order or route — and later loaded onto trucks.

The Mecalux software plays a pivotal role in all Konya Şeker logistics processes: "With Easy WMS, we maintain tighter control over the 48,000 pallets in our automated warehouse. It helps make all our operations faster as well as error-free," says Başaran.

To enhance goods management, the software interfaces with Konya Şeker's ERP system. The ERP notifies Easy WMS in advance of the items that will arrive at the automated rack-supported building from production. This enables the WMS to assign the products locations more quickly.

High-performance logistics processes for a leading company

"Torku has earned consumer recognition with its 100% natural, safe, and high-quality products. We make them by overseeing the entire process from seed to table, guaranteeing their purity and supporting the work of Anatolian farmers," says Başaran.

> *"With Easy WMS, we maintain tighter control over the 48,000 pallets in our automated warehouse. It helps make all our operations faster as well as error-free."*

Kerim Başaran
AS/RS Warehouse Manager, Konya Şeker

The 125-foot-tall automated warehouse has marked a turning point in Konya Şeker's supply chain, specifically for Torku chocolates and cookies. Logistics automation and digitalization are fundamental tools for the company to achieve its targets. Thanks to these technologies, the business tracks its products comprehensively. Furthermore, it has improved the efficiency of its operational processes with a clear goal: to ensure the distribution of 2,000 pallets daily to 74 countries.