Increased capacity in minimal space

Rabbit Hole Distillery has installed a high-density system to store 24,500 barrels of whiskey.

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

CHALLENGES

- **Expand the storage capacity** of 550-pound barrels in a small space.
- **House barrels at different temperatures** for a period of four to six years.
- **Ensure the safety** of the rickhouse's product.

SOLUTIONS

- **Bolted racking.**
- **Clad-rack rickhouse.**

ADVANTAGES

- **Storage capacity increased**: 24,500 barrels.
- **Warehouse prepared to adapt to temperature changes** according to the time of the year and to foster whiskey ageing.
- **Seismic racking** and fire **protection system** to ensure maximum safety.

Kaveh Zamanian founded Rabbit Hole Distillery in 2012 after his family moved to Kentucky, leaving behind a successful career as a clinical psychologist and psychoanalyst to start his own spirits company. He put everything on the line to start a liquor brand that would eventually put Rabbit Hole at the forefront of the American spirits category, producing 27,000 barrels a year.

» **Founded in: 2012**

» **Annual production: 27,000 barrels**

» **Distillery location: Louisville, Kentucky**

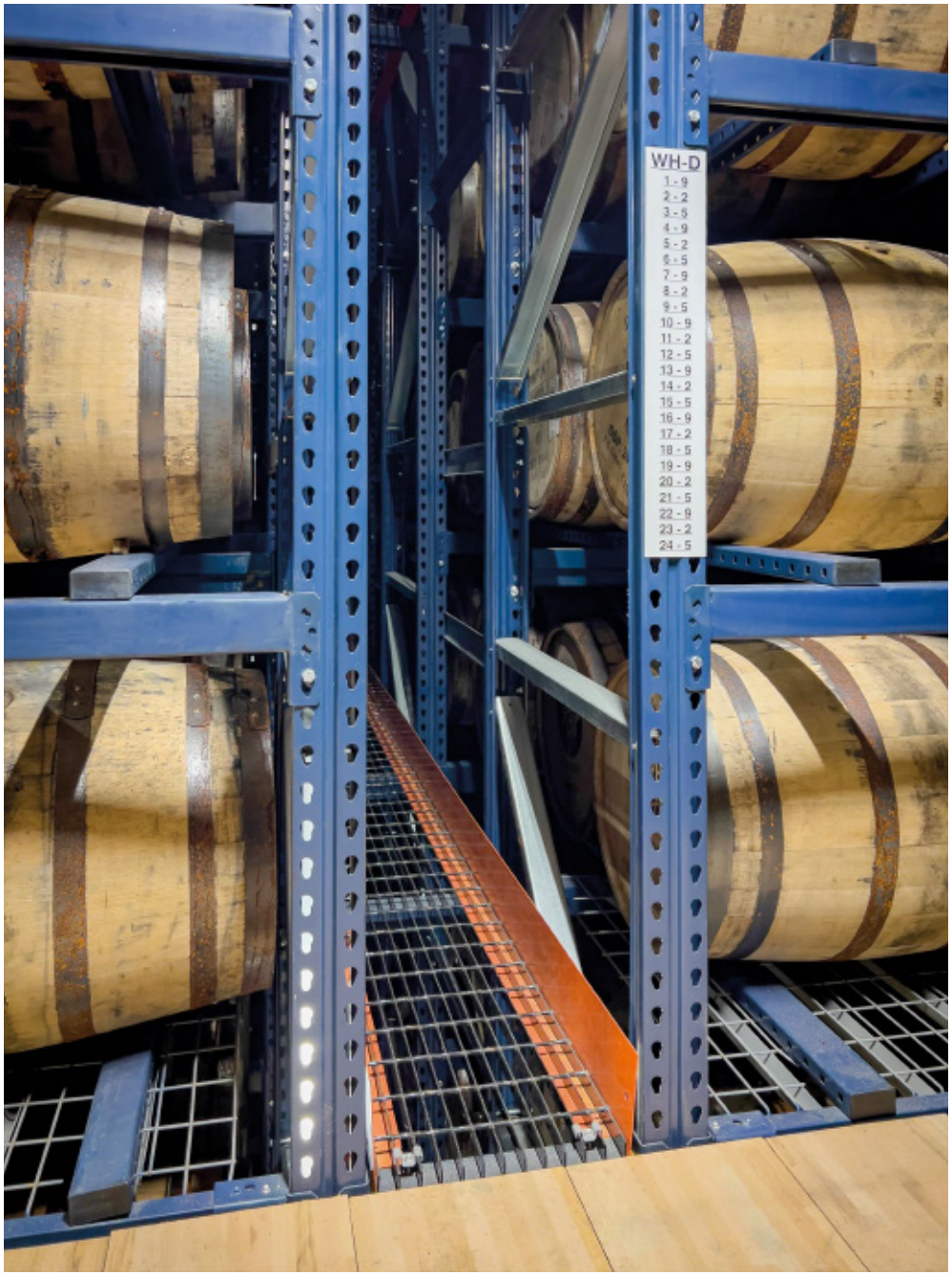
Innovation and creativity have always been at the heart of Rabbit Hole Distillery, a producer of fine spirits located in Louisville, Kentucky. The company prides itself on honoring the past by restoring creativity to the craft of producing spirits such as bourbons, rye whiskeys, barrel-aged gins, and more.

Rabbit Hole was looking for an innovative way to store thousands of whiskey barrels during the aging stage, where the beverage is left to rest for four to six years before being bottled. The company's main need was to maximize storage capacity and guarantee safe goods handling. At the same time, it had to continually preserve the quality of the product and the safety of the operators. Another of Rabbit Hole's priorities was to guarantee that the warehouse was prepared to adapt to the drastic temperature changes in winter and summer and to overcome any possible ground movement. Temperature changes are extremely important in the aging process because they cause the whiskey to expand and contract inside the barrels, resulting in a unique flavor, color, and aroma.

With all these requirements, the distiller turned to Interlake Mecalux and partner A&S Solutions to develop a solution at its Campbellsburg, Kentucky, location that would do just that. After analyzing Rabbit Hole's current needs, Interlake Mecalux and A&S proposed building a clad-rack rickhouse, which is a storage space for whiskey barrels during the aging process.

This warehousing structure is unique in that it is the racking structure that supports the building façade and roof. This would be one of the safest ways to house the facility's 24,500 barrels, according to Alex Smith, A&S Vice President: "The great thing about partnering with Interlake Mecalux on this rack-supported building for the distilled spirits industry is that Mecalux has an all-bolted system."

Rabbit Hole's new clad-rack rickhouse stands out for its maximization of space thanks to a high-density storage system



High-density storage system

Rabbit Hole's new clad-rack rickhouse stands out for its maximization of space thanks to a high-density storage system. In 10,800 ft², the company can now store 24,500 charred oak barrels. To store the goods compactly, the racks were designed with a depth to accommodate up to 24 barrels, each weighing 550 lb.

Safety was a major priority when designing and installing the warehouse. Capable of withstanding 6,730 tons, the facility is equipped with numerous devices to ensure the safety of the products, and the structure.

"A focus on this system is safety. It has safety grating, so if somebody were to roll a barrel and slip, we're ensuring that we're protecting the employees who are working in the system itself," Smith says. "And then we've got corrugated decking underneath the floors. This acts as a fire barrier. It's also a structural component for employees walking on each level who are rolling barrels. So, if there was a fire, we're allowing employees that little extra time to get outside the warehouse safely," says Smith.

In addition to improved fire protection, the storage system's racking is seismic rated to protect against tremors in the event of an earthquake. Reinforced profiles, numerous safety accessories, and a non-rigid structure allow for the rack to perform better against any seismic movements.

Another unique feature of this 500-ton rack-supported structure is its easy-to-assemble bolted rack design that allows for simple and economical repairs. If a bolted rack component is damaged, only that element needs to be replaced. This is done both quickly and easily, Smith says. "Typically, in the material handling industry, your uprights and frames are all welded. We're ensuring that we can replace a component to the system itself quickly and affordably. The focus was easy preventable maintenance, and if something were to rust inside this warehouse storing 24,500 bourbon barrels, we can just simply unbolt a bolt, pop the strut out, and put a new one in in five minutes," Smith adds. Bolted frames can also be assembled on-site during an installation, thereby saving transportation costs.

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>
> **Alex Smith**
> Vice President, A&S

Different temps: key to the aging process

The rickhouse design also took into account temperature changes in Kentucky, which can range from 10 to 120 °F depending on the time of year. In the summer heat, the liquid expands, penetrating the pores inside the wooden barrels. When the temperature drops, the liquid contracts, extracting the aromatic components and flavors from the oak. Thus, with each season of the year, the whiskey in storage ages, gaining more flavor, aroma, and body.

The location of the barrels in the warehouse also affects the aging process of the final product. Barrels stored at the top are exposed to a higher temperature, which causes the whiskey in the barrels to age faster. By contrast, barrels placed on the lower levels remain cooler, slowing down the aging process. To regulate and compensate for the difference in temperature between storage levels, the facility has been designed to maximize airflow, both cold in winter and hot in summer.

Fluctuations in temperature and humidity — which favor the aging of whiskey — can cause the components that make up the structure to deteriorate. To increase safety, cataphoresis, an immersion painting method based on a cathodic electrodeposition process, has been employed. Cataphoresis also provides a more uniform finish as well as high resistance to corrosion.

Warehouse designed for whiskey aging

Oftentimes, clad-rack warehouses are the most economical storage solution when a new facility is necessary. These structures can be built with a variety of racking systems such as selective, drive-in, and push-back racks. Moreover, with the current demand for industrial land at a premium, rack-supported buildings can be the best choice, especially when an accelerated construction schedule is required.

For Rabbit Hole Distillery, the decision to construct a clad-rack warehouse with bolted racking was a simple one, as it offered a unique solution for storing close to 24,500 barrels for long periods of time safely and economically. And much like Rabbit Hole places a value on creativity when crafting high-quality spirits, the modular bolted system of its rack-supported building enabled Interlake Mecalux and A&S Solutions to offer a more creative, custom, fast, and efficient solution.