



# CASE STUDY

## Logistics

### PROJECT OVERVIEW

**Project:** JYSK Distribution Center

**Customer:** JYSK

**General Contractor:** DS Flexhal AS

**Product:** PrimX high-bay floor

**Usage:** Automated robotic logistics warehouse

**Address:** Lars Larsens Vej 10, 7171 Uldum, Denmark

**Casted:** March, 2017

**Area:** 13 572 m<sup>2</sup> (146 087 ft<sup>2</sup>)

**Slab thickness:** 350 mm (13 in)

**CO<sub>2</sub> savings:** 203 580 kg (448 817 lb)

**Automated system:** SSI SCHAEFER



### CUSTOMER

JYSK is a Danish retail chain that sells household goods such as mattresses, furniture, and interior décor. The company is owned by its founder, Lars Larsen, who opened his first JYSK store in Denmark in 1979.

In total, JYSK Group currently has 2,507 stores and 21,000 employees across 48 countries with annual revenues of 3.12 billion euro. Its head office is in Brabrand, Denmark.

### CHALLENGE

Because of JYSK's rapid growth, the company needed a new warehouse at its distribution center in Uldum, Denmark. JYSK decided to build a fully automated, very high – 42 m (138 ft.) high-bay warehouse, with robotic systems supplied by Schaefer of Germany. Such extreme heights mean extremely high loads: bayload 315 kN, wheel load 220 kN. In addition, the robotic systems require absolute flatness and structural stability. At the same time, the whole building, including the floor, was built on piles, which added to the complexity and demands on the floor. Finally, because of the company's exceptional growth, the schedule was very tight.



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Low maintenance



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40% Less CO<sub>2</sub> emissions



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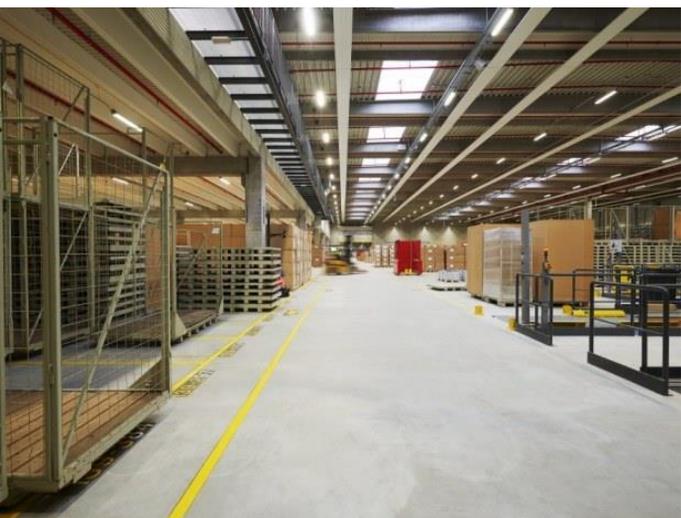
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## SOLUTION

Our solution - A High-Performance Steel Fiber Reinforced Concrete (HPSFRC), PrīmX floor was chosen because it has:

- › very high load-bearing capacity,
- › no joints within the daily casting area,
- › absolute flatness - that stays flat,
- › high rigidity - even under the extreme loads of this high-performance warehouse, it has negligible deflections.



Due to heavy steel fiber reinforcement using 1,700 N/mm<sup>2</sup> high-strength steel fibers at a dosage rate of 50 kg/m<sup>3</sup> (85 lbs/yd<sup>3</sup>) and our proprietary anti-shrinkage additives, our composite concrete are much stronger. Therefore, we were able to provide thinner slabs while exceeding the defined loadbearing demands. Our solution was 350 mm slab (13 in) with 540 mm (21 in) perimeter beams.

As PrīmX does not use steel bar reinforcement, we were able to save weeks of construction time. It took only 10 working days, casting 570 m<sup>3</sup> (741 yd<sup>3</sup>) per day, using parallel work streams with two lines of fiber and admixture integration and a high-speed concrete pump.

During the process, we used our online quality system, PrimeQuality, to constantly check and monitor 21 key parameters to ensure a perfectly transparent process.



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