

HelloParks Industrial Floor, Hungary

Macro Synthetic Fibre Reinforced Jointless Floor

BarChip Inc.
The Synthetic Fibre Experts

24m x 24m Jointless Flooring Solution with BarChip MQ58 Macro Synthetic Fibre Reinforcement

Owner: HelloParks

Contractor: ASA Construction Ltd.

Designer: JKP Static Ltd.

In mid-2023, construction began on the groundbreaking PT2 Big Box Warehouse, a 42,000 m² Jointless Floor reinforced solely with BarChip macro synthetic fibre concrete reinforcement. PT2 is part of HelloParks 87 hectare Páty mega-park, located west of Budapest, Hungary, with a total development potential of 384,000 m².

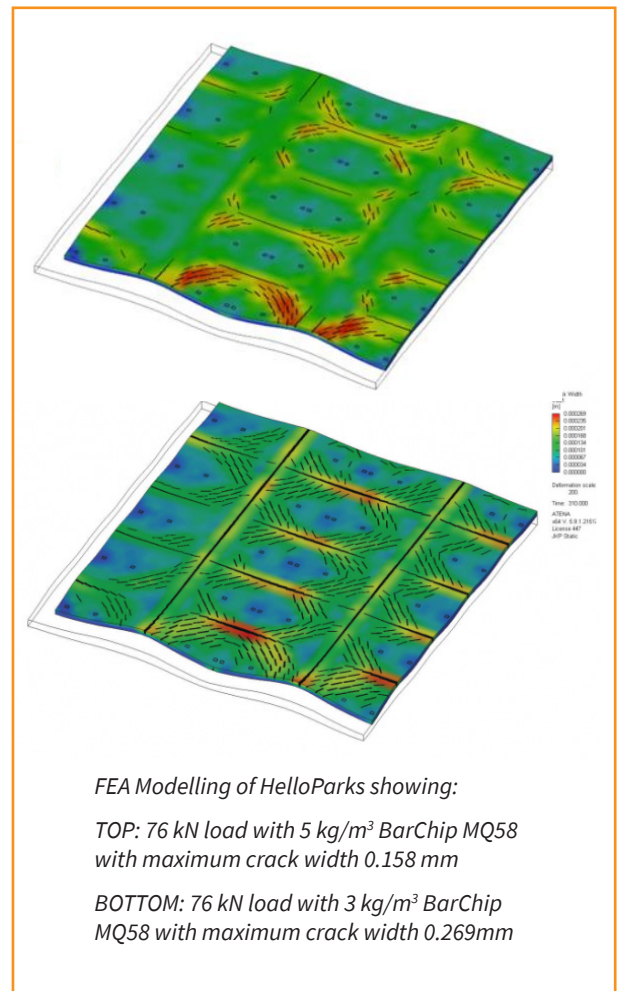
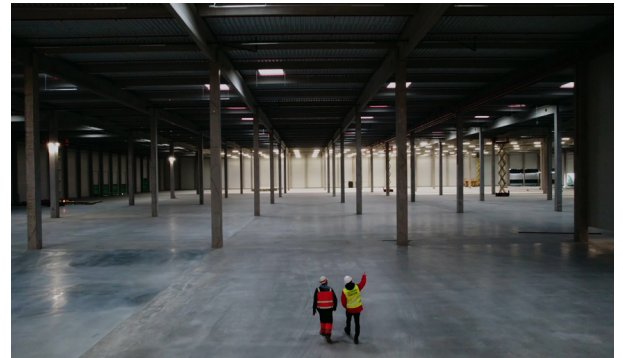
PT2 used a typical C30/37 industrial flooring concrete mix using either 320 kg/m³ CEM II/B or CEM III/A cement and a 0.49 w/c ratio. The slab was 19 cm thick with a rack load characteristic value of 76 kN, joint spacing of 24m x 24m and a crack width limitation of 0.3mm.

HelloParks are an up-and-coming industrial real estate developer in Hungary at the forefront of sustainable industrial facilities. They were the first industrial building developer in Hungary to achieve Excellent and Outstanding certifications in the BREEAM sustainability New Construction category. HelloParks were initially attracted to macro synthetic fibre for the potential carbon savings compared to traditional steel reinforcement. HelloParks Head of Sustainability Anna Bencze explains:

“For the PT2 warehouse, the embodied carbon footprint of the concrete floor, considering A1-3, A4, B1-5, C1-4 life cycle stages according to EN 15978 became around 3% lower with BarChip fibre compared to the previous technique (steel fibre) with the same floor size and technical data”

This represents a significant carbon savings simply by changing the reinforcement. The floor was designed by leading engineering design firm JKP Static. The basis for the design was a complete static calculation using TR34 together with advanced Finite Element Analysis (FEA) to check the effect of the dilatation length and included the modelling of shrinkage and friction effects. The modelling was influenced by JKP research which shows that residual strength and friction work together to eliminate crack localization in macro synthetic fibre reinforced slabs. JKP’s Dr. Juhasz explains:

“Our research showed that as residual strength increases, the maximum crack width decreases. However, increasing friction also decreases the maximum crack width. From this we can see that residual strength and friction work together to eliminate crack localization, even with strain softening materials like macro synthetic fibre.”



HelloParks Industrial Floor, Hungary

Macro Synthetic Fibre Reinforced Jointless Floor

Controlling the effects of shrinkage is also critical to the success of Jointless Floors. Research shows that BarChip MQ58 has the same effect as micro-PP fibre in reducing early age shrinkage cracking. JKP's Peter Schaul explains:

“Shrinkage ring tests showed that with 2 kg/m³ of BarChip MQ58, shrinkage cracks almost completely disappear”.

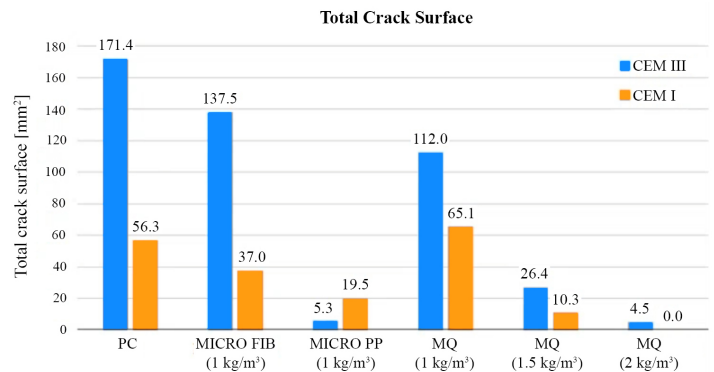
The unique design of BarChip MQ58 makes this possible, and it's the only fibre on the market that delivers both early age shrinkage crack control and post crack residual strength in hardened concrete, as well as a fibre free surface finish; a 3-for-1 that makes it an ideal choice for Jointless Flooring.

Achieving a high quality finish is vital for concrete floors. Good finishes enhance durability by increasing resistance to weathering and abrasion, a critical factor for high traffic areas. Smooth surfaces also make cleaning and maintenance easier, improve air quality and are visually appealing, practical benefits that make a big difference. Recognising BarChip MQ58's reputation for exceptional finishing qualities, ASA chose to trial BarChip fibre. ASA conducted trials with 3, 3.5 and 4 kg/m³ of BarChip MQ58, with all trial slabs delivering flawless results. ASA's Tibor Mihucz tell us more:

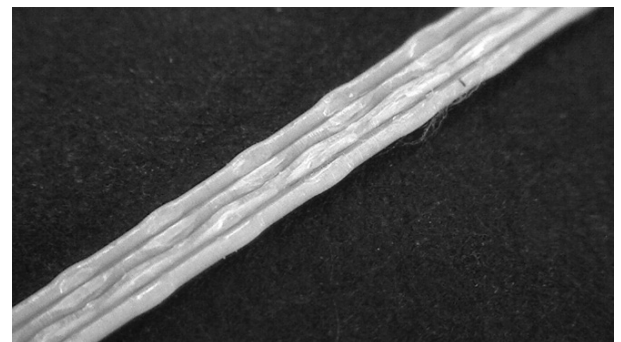
“BarChip MQ58 is the only synthetic fibre that joins fibre strands along its length. They separate in the mix, have no memory and don't show up on the surface. It's the easiest fibre to finish we have used”.

BarChip was added to the concrete at the Batching Plant and delivered to site ready-reinforced. Site conditions allowed the fibre reinforced concrete to be placed directly from the truck without the need for a boom pump. The concrete floor was finished with normal processes and equipment, which included laser screeding, helicopter finishing and hand tools.

The construction of the 42,000 m² PT2 Big Box was completed in May 2024. Impressed with the results, HelloParks has since specified BarChip MQ58 in over 150,000 m² of industrial flooring. To date, no one has seen a fibre on the surface.



Shrinkage testing of micro fibre and BarChip MQ58 macro fibre.



BarChip MQ58 strands separate in the concrete mix.



PT2 Big Box Jointless Floor

Download Research Papers



Parametric numerical study on jointless macro synthetic fiber reinforced concrete industrial floors (2023)



Controlling early age shrinkage cracks with steel or synthetic macro fibre reinforcement in jointless floors (2015)

JKP | STATIC

CONSOLIS
ASA



BarChip MQ58

HelloParks Industrial Floor, Hungary

Macro Synthetic Fibre Reinforced Jointless Floor



BarChip Inc.

info@barchip.com

Australia: +61 1300 131 158

N. America: +1 704 843 8401

EMEA: +353 (0) 1 469 3197

Asia: +65 6835 7716

S. America: +56 2 2703 1563

Brazil: +55 19 2121 5417



The Synthetic Fibre Experts

Distributors are located in other regions. For contact details visit www.barchip.com.

Disclaimer: This information has been provided as a guide to performance only, for specific and supervised conditions. The user is advised to undertake their own evaluation and use the services of professionals to determine the product suitability for any particular project or application prior to commercial use. ISO 9001:2015. HP_2024. © BarChip Inc. 2024

www.barchip.com