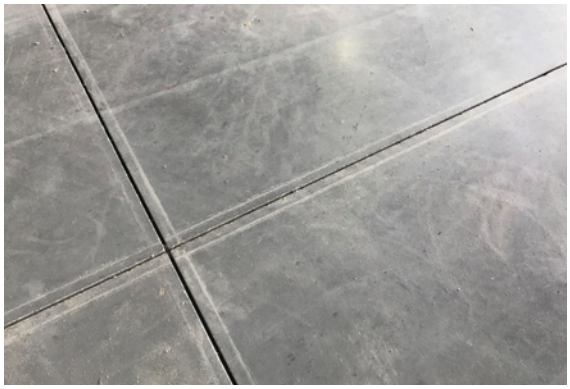
TECHNICAL BULLETIN FC-13

FAQs ON FLOOR JOINT SPACING WITH FIBER

EUCLID CHEMICAL

Q: Can floor joint spacing be increased or even eliminated by using macro-synthetic fibers?

A: Fiber reinforcement provides concrete with early age resistance to cracking and can be used to replace conventional steel reinforcement for temperature / shrinkage crack control and limited structural applications. With the increased tensile capacity of the concrete matrix when using fibers, it is reasonable to assume that fibers can contribute to reducing the overall shrinkage stresses in concrete that can lead to the idea of increasing the spacing of joints in fiber reinforced concrete floors.



Currently, there are successful examples and significant research in the industry that support the increase of control joint spacing in floor design when using fibers, specifically macro-synthetic and steel fibers. Most of this work is also in combination with improvements in concrete mix designs using advanced chemical admixtures and proper placement and curing practices. Some fiber manufacturers have also experimented both successfully and unsuccessfully with joint-free floors. Euclid Chemical currently recommends using normal ACI and PCA joint spacing practices in the absence of other relevant information that would be used to manufacture a low-shrinkage concrete.

To extend the spacing of joints beyond traditional construction practices, there are many factors that must be taken into consideration. The use of a low water to cement ratio, lower cement content, and shrinkage reducing and/or compensating admixtures with adequate curing should provide a very durable concrete floor with reduced risk for curling and shrinkage cracks. Other factors such as proper subgrade preparation, placement, saw-cut depth, curing time, and exposure conditions must also be considered. It is highly recommended to conduct testing and verification prior to the construction of a floor project to ensure engineering and specification requirements are met. This is typically done by initially conducting shrinkage testing on the proposed concrete mix design to establish general shrinkage characteristics which then lead to the discussion of potential joint spacing measurements.

Euclid Chemical can provide additional guidance on this topic and has provided a specification and construction document titled, 752HP™ Floor System. This fiber-reinforced, low shrinkage concrete floor system is designed to extend joint spacing, reduce curling and improve lifetime serviceability. This system is intended for interior industrial and commercial floors built in accordance with ACI 302 and 360 and includes specification direction to properly construct a floor with joints extended beyond what is typically provided by ACI recommendations.

For additional questions, comments or further explanations, please feel free to contact The Euclid Chemical Company at your convenience.