FOR IMMEDIATE RELEASE

New Study Released on Abrasion Resistance of Portland-Limestone Cement (PLC) Systems for Industrial Floors

Findings emphasize the need for more collaborative research on field-based studies of behavior and performance of PLC concrete, and support for performance-based specifications and guidance.

ALEXANDRIA, VA, April 23, 2026 – The ACI Foundation, American Cement Association (ACA), and Concrete Advancement Foundation (CAF) today jointly release a research report conducted by Temple University researchers that evaluates the abrasion resistance and carbonation behavior of portland-limestone cement (PLC, Type IL) systems for industrial floor applications, such as fulfillment and distribution centers, as well as data centers.

As fulfillment and distribution centers expand, owners and designers seek concrete floor systems that deliver both long-term durability and lower embodied carbon. The study, led by Temple Principal Investigator Mehdi Khanzadeh Moradllo, Ph.D., P.E., and his research team, addresses a critical evidence gap by systematically comparing the abrasion resistance of PLC and PLC+SCM (supplementary cementitious materials) systems with conventional ordinary portland cement (OPC) systems using the BS 8204-2 standard abrasion test in both laboratory and field settings.

The study found that PLC and PLC+SCM systems demonstrated abrasion resistance comparable to that of OPC systems in many of the tested mixtures when properly proportioned and finished.

The report equips specifiers, contractors, owners, and pavement engineers with empirical data to evaluate PLC and PLC+SCM as a lower-carbon alternative to OPC for industrial floors. The results also caution to employ standard industry practices for optimizing concrete mix designs, account for regional variability in PLC when developing mixes, and use proper finishing and curing methods when placing the concrete. The lab-to-field abrasion comparison is a foundational result that is a first step toward the development of performance-based recommendations in industry standards and guides. Adoption of PLC, where appropriate, may reduce embodied carbon in large-area industrial slabs without compromising durability.

“Providing robust, field-validated data on PLC performance lets the industry adopt lower-carbon cement technology with confidence,” said Dr. Moradllo.

“This research shows that industry organizations continue to collaborate, exchange ideas, and focus on developing practical solutions for the entire concrete industry,” said Ann Masek, Executive Director, ACI Foundation.

“Owners and contractors need actionable guidance when specifying and placing industrial slab systems,” said Julia Garbini, President of the Concrete Advancement Foundation. “This study’s lab-to-field comparison is an important step toward performance-based specifications and encouraging best practices for successful projects.”

“Cement innovation, including blended cements, is an important part of the solution to lower concrete’s carbon footprint,” said Paul Tennis, Ph.D., ACA Senior Director, Research & Product Standards. “These findings demonstrate that an optimized PLC system is a practical, durable option for industrial applications.”

The full report, including test methods, mixture details, data, and recommendations, is available for download here or at https://zenodo.org/records/19389662. It is also available by contacting the ACI Foundation, American Cement Association, or Concrete Advancement Foundation.

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About the ACI Foundation

The ACI Foundation is a 501(c)(3) nonprofit organization that supports a wide range of research and educational initiatives that contribute to keeping the concrete industry at the forefront of technological advances in material composition, design, and construction. We engage with industry partners, invest in students and research, share knowledge, and provide programs to encourage innovation and new technology. The American Concrete Institute established the ACI Foundation in 1989 to promote progress, innovation, and collaboration in the industry. Learn more at acifoundation.org.

About the American Cement Association

Founded in 1916, the American Cement Association is the premier policy, research, education, and market intelligence organization serving America’s cement manufacturers. ACA supports sustainability, innovation, and safety while fostering continuous improvement in cement manufacturing, distribution, infrastructure, and economic growth. For more information, visit www.cement.org.

About the Concrete Advancement Foundation

For 35 years the Concrete Advancement Foundation (CAF) has played a central role in aligning industry expertise, funding and innovation to address pressing challenges and opportunities facing the concrete industry. The Foundation’s mission is to advance decarbonization of the cement and concrete industries, as well as resilient communities and sustainable infrastructure. CAF is a 501(c)3 non-profit organization. Visit www.concreteadvancement.org for more information.

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