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Taiheiyo Cement Developed an AI Technology for Predicting Concrete Slump

Taiheiyo Cement Corporation (Head office: Minato-ku, Tokyo; President: Masafumi Fushihara; "Taiheiyo Cement") has been researching artificial intelligence (AI) based quality prediction during the manufacturing and unloading of concrete[*1], as well as after its hardening. Taiheiyo Cement announced today that it has developed technology to instantly predict slump from images of mixing inside the mixers during the concrete manufacturing process.

Slump, an index that indicates the consistency of fresh concrete before it sets, is one of the most important quality measurement criteria. In addition to appropriate material management and measuring control, operators in concrete manufacturing plants maintain the stability of slump by visually confirming that concrete is being mixed with its correct composition via the monitor that shows the mixing of concrete inside mixers.

Taiheiyo Cement has developed fundamental technology that contributes to automated and advanced concrete manufacturing to instantly predict the slump of mixed concrete with high accuracy using AI.

This technology applies image recognition techniques using AI deep learning, which allows operators to predict the slump instantly from an image of concrete mixing in a mixer as seen in Photo 1, with an extremely high accuracy rate of over 99% (within a measured value ± 2.5 cm[*2]).

Taiheiyo Cement will apply this AI-based prediction technology to its concrete manufacturing plants, with an aim to further stabilize the quality of concrete, save labor to solve the worker shortage in the manufacturing process and advance automation. In addition, Taiheiyo Cement strives to enhance this technology by using not only images but also a variety of data on materials, manufacturing and other related items, and also to establish quality prediction technologies during on-site unloading and after the hardening of concrete. Through these activities, Taiheiyo Cement continues to promote technology development to supply more stable, higher-quality concrete than ever.

*1 Concrete is manufactured by mixing ingredients, including cement, water, aggregates and admixtures.
*2 Tolerance specified by Japanese Industrial Standards (JIS) (JIS A 5308 Ready-mixed concrete)

Photo 1 Example of concrete mixing during the manufacturing process