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CO₂ uptake by interlocking paver blocks using CARBOFIX[®] cement, a CO₂-absorbing/cured cementitious material, reported to the United Nations

CO₂ uptake by concrete using CARBOFIX[®] cement developed by Taiheiyo Cement Corporation (Headquarters: Bunkyo-ku, Tokyo; President: Yoshifumi Taura) was included in the Japanese report to the United Nations about greenhouse gas (GHG) emissions and absorptions (CO₂ uptake).

The Japanese government assesses and publishes domestic GHG emissions and absorptions every year in accordance with the United Nations Framework Convention on Climate Change, the Paris Agreement, and the Decisions of the Conference of the Parties. Last year, absorptions (CO₂ uptake) by three types (four subtypes) of environmentally friendly concrete were assessed for the first time in the world, and this year, concrete using CARBOFIX cement, which is our cementitious material that absorbs CO₂ and hardens during the reaction with CO₂, has been added to them.

The domestic absorptions in 2023 reported to the United Nations were 121 tons, which included 0.2 tons of CO₂ uptake by the interlocking paver blocks using CARBOFIX cement (construction area of 25 m², paved with 1344 blocks).

Taiheiyo Cement has been working on the Development of Carbon Circulation Technology for the Cement Industry which is a project originally funded by the New Energy and Industrial Technology Development Organization (NEDO) of Japan for the FY 2020-2021 period. One of the important initiatives of the project is to develop manufacturing processes for low-carbon carbonation-cured concrete products.

The CARBOFIX cement-based interlocking blocks included in the latest assessment were those manufactured at Saitama Plant of Taiheiyo Precast Concrete Industry Co., Ltd. (Headquarters: Shinjuku-ku, Tokyo; President: Akira Igarashi) by forced carbonation curing (a technology in which concrete absorbs CO₂ and hardens during the reaction with CO₂), using CO₂ captured from the exhaust gas from our Kumagaya Plant. The blocks were installed at a parking lot of our Kumagaya Plant and have been in service in good condition.

Compared to conventional portland cement, CARBOFIX cement can accept more recycled resources as raw materials, which will contribute not only to reducing CO₂ emissions but also to building a circular economy. In addition, since existing facilities for portland cement can be used for manufacturing CARBOFIX cement, it is possible to flexibly respond to future increases in demand for concrete that absorbs CO₂.

Our group will work to expand the use of CARBOFIX cement with the aim of achieving carbon neutrality throughout the entire supply chain by 2050, thereby contributing to the realization of a decarbonized society.

*1: CARBOFIX is a registered trademark of Taiheiyo Cement Corporation.

Related release:

CARBOFIX[®] CO₂-absorbing/cured Cementitious Material Successfully Developed (September 20, 2022)
<https://www.taiheiyo-cement.co.jp/news/news/pdf/220920.pdf>

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