News Release

World's First Demonstration Test of Glass Production Using Ammonia as Fuel in Actual Production Furnace

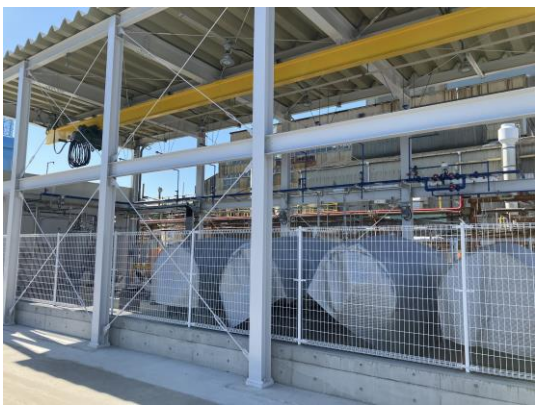
- Contributing to reducing greenhouse gas emissions in the glass manufacturing process -

Tokyo, June 27, 2023 - AGC (Headquarters: Tokyo; President: Yoshinori Hirai), a world-leading manufacturer of glass, chemicals, and high-tech materials, has announced that it has recently succeeded in the world's first demonstration test of glass production using ammonia as fuel in an actual production furnace under the project entitled “Technology Development for the Utilization and Production of Ammonia as Fuel” (“the project”) which is being undertaken as a commissioned project by New Energy and Industrial Technology Development Organization (NEDO).

The project is a joint technology development effort with Taiyo Nippon Sanso Corporation, the National Institute of Advanced Industrial Science and Technology, and National University Corporation Tohoku University. For this project, an actual test of ammonia combustion technology was conducted using an ammonia-oxygen burner with low NOx combustion technology developed by Taiyo Nippon Sanso at the glass melting furnace that produces architectural glass at the AGC Yokohama Technical Center, and the effects on glass quality and furnace materials, and on control of flame temperature[*1], furnace temperature[*2], nitrogen oxide (NOx) emissions were verified.

In the future, the project plans to conduct demonstration tests under various conditions, as well as further scaled-up burner tests and demonstration tests at other AGC sites. By doing so, the aim is to fully introduce ammonia combustion technology into glass melting furnaces after assessing the scope of its application. In the future, the company will also consider expanding its application beyond glass to other materials, such as steel and aluminum, to widely help reduce GHG emissions in the production process of the materials industry.

Glass melting furnace
in which this demonstration test was conducted



Storage tank for ammonia fuel

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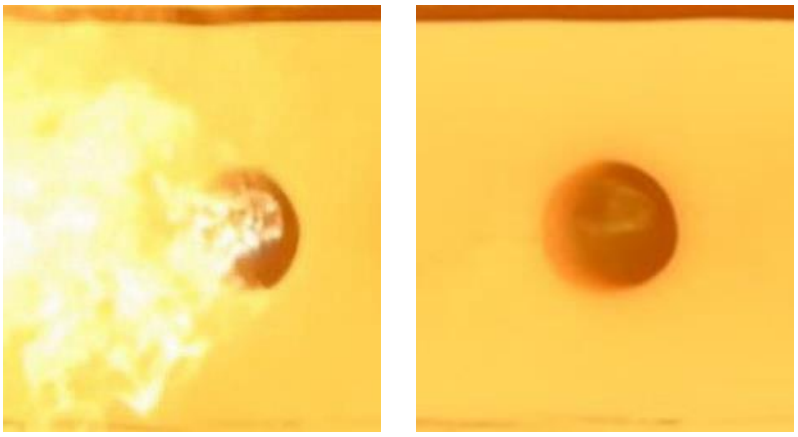
This time, a pair of burners developed by Taiyo Nippon Sanso to prevent a rapid rise in flame temperature through multi-stage combustion were installed in the glass melting furnace (actual production furnace) used to produce architectural glass at the AGC Yokohama Technical Center, and the world's first demonstration test using ammonia as fuel was conducted for two days from June 18 to 19th, 2023. In the demonstration test, compared with conventional combustion methods using heavy oil as fuel under various conditions, the effects on the quality of glass, furnace materials, and control of the flame temperature, furnace temperature, and NOx emissions were verified. In this test, the NOx concentration in the exhaust gas was found to be below the environmental criterion value while maintaining the required temperature of the glass melting furnace.



Natural gas 100% Ammonia 100%

(Ammonia flames are hard to see because of low brightness)

Inside a glass melting furnace burning
with a specialized burner

The plan for 2023 is to continue conducting technical verification using ammonia as fuel under various conditions, using the glass melting furnace that produces architectural glass at the AGC Yokohama Technical Center. After 2024, plans are to conduct scaled-up burner tests and demonstration tests using glass melting furnaces at other AGC sites. The goal is to fully introduce ammonia combustion technology in 2026 or later after determining the scope of its use.

*1: Temperature of flame burning at burner tip installed in furnace

*2: Temperature of gas inside the furnace and inner wall surface

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