PRIMETALS TECHNOLOGIES

Press

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Primetals Technologies and POSCO Sign Cooperation Agreement for HyREX Direct Reduction Plant

- **HyREX – a new process technology for low-carbon hot metal production**
- **Hydrogen-based direct reduction process**
- **Direct use of sinter feed**
- **Electric smelter furnace (ESF) used to melt DRI fines**

On July 22, 2024, Primetals Technologies and POSCO signed a cooperation agreement to design and implement a HyREX demonstration plant. Based on a memorandum of understanding (MoU) signed in 2022, POSCO and Primetals Technologies are now realizing the plant at POSCO's premises in Pohang, South Korea. A core aim of the plant is to test and verify certain details of the production process while determining the most cost-effective process parameters.

The global iron and steel industry is targeting a reduction of carbon dioxide emissions, and hydrogen-based direct reduction technologies based on the HyREX process will allow steel producers to replace carbon-intensive blast furnaces.

HyREX Process Overview

HyREX is a new process that combines the FINEX direct reduction process with an electric smelting furnace (ESF) to produce liquid hot metal. POSCO and Primetals Technologies started developing FINEX in 1992. The FINEX process charges iron ore and uses a cascade of fluidized-bed reactors to produce direct-reduced iron (DRI). While the FINEX process utilized reduction gas from coal gasification, HyREX uses hydrogen as reduction gas. In combination with an ESF, hot direct-reduced iron is transferred for the final reduction process, melting, carburization, and slag formation, to produce liquid hot metal of similar quality to that stemming from blast furnaces, but with significantly reduced carbon emissions.

HyREX Plant Overview

The HyREX industrial demonstration plant will consist of an ore dryer, fluidized-bed reactors arranged in a cascade, a hot DRI transport system, the ESF, a dedusting system, metal tapping, and slag granulation as key equipment. Seeking to replace blast furnace based ironmaking, HyREX can be fed with sinter feed, removing the environmentally intensive sintering process and the need for a coke plant. HyREX technology is suitable for more than 50 percent of globally available iron ore grades.

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Top management representatives from POSCO and Primetals Technologies at the occasion of the cooperation agreement signing ceremony.

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