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**Successful Demonstration Test of a Hydrogen-Oxygen Combustion Burner for Steel reheat
Furnaces at ArcelorMittal Olaberria site.
- a crucial step toward the decarbonization of the steel industry -**

Taiyo Nippon Sanso Corporation (Head office: Shinagawa-ku, Tokyo; President: Kenji Nagata; hereinafter "TNSC"), a Japanese industrial gas business company in the Nippon Sanso Holdings Group, and Nippon Gases Euro-Holding S.L.U. (Head office: Madrid, Spain; President: Raul Giudici; hereinafter "NGE") have successfully completed the first demonstration test of the "Innova-Jet Hydrogen" hydrogen-oxygen combustion burner for steel reheat furnaces at a customer's production facility in Europe (ArcelorMittal Olaberria).

In order to reduce CO₂ emissions from the many industrial furnaces in Japan and contribute to the realization of a carbon-neutral (CN) society, we are promoting technological development aimed at applying oxyfuel combustion technology to various industrial furnace processes.

1. Overview

TNSC and NGE conducted a demonstration test using the "Innova-Jet Hydrogen (Figure 2)" at a walking beam steel reheating furnace (Figure 1) owned by steel manufacturer ArcelorMittal at Olaberria site. Together with our partner Sarralle, two air burners were replaced by the Innova-Jet Hydrogen, using 100% green hydrogen generated by water. The CO₂ emission reduction efficiency, furnace temperature distribution, and NO_x suppression were verified.

The reheating furnaces in steel plants are most energy-intensive, consuming up to 80% of a factory's fuel. The oxy-fuel technology represents an important step toward the decarbonization. The steel industry now releases around 9% of global CO₂ emissions.

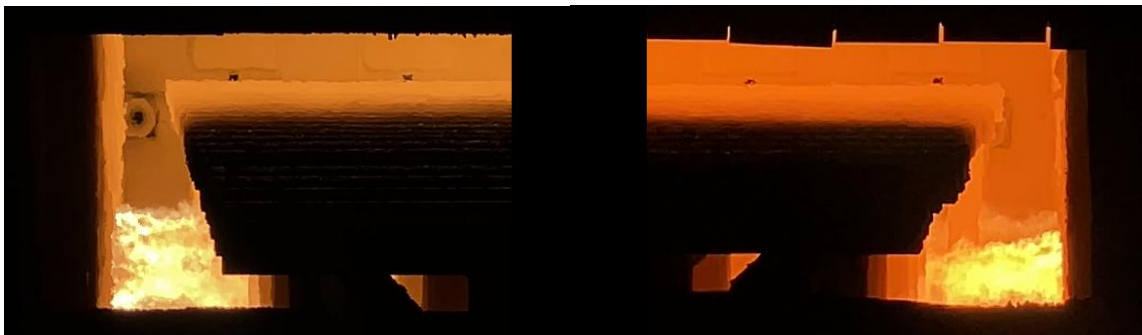


Figure 1 Reheat furnace



Figure 2 Innova-Jet Hydrogen



Figure 3 Valve Skid

2. Key Characteristic of Hydrogen-oxygen Combustion Burner

The Innova-Jet Hydrogen was designed for use in steel reheating furnaces. The Innova-Jet Hydrogen has a wide turn down ratio and can be used with everything from preheated air combustion to oxygen combustion, and from LNG combustion to hydrogen combustion. Figure 4 shows an example of the fire flame of Innova-Jet Hydrogen. The Innova-Jet Hydrogen is a burner that provides uniform temperature heat distribution and low NOx emissions.



Figure 4 Fire flame of Innova-Jet Hydrogen(Fuel:NG 50%/H₂ 50%, Oxidizing:O₂ 100%)

3. Commitment to innovation and sustainability:

With this milestone, TNSC reaffirms its leadership in hydrogen-based solutions and its commitment to developing technologies that drive the energy transition and sustainability of the steel industry, consolidating its position as a trusted partner for decarbonization projects worldwide.

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