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Nippon Light Metal Company, Ltd.

Nikkei MC Aluminium Co., Ltd.

Nippon Sanso Corporation

Toward Achieving a Carbon-Neutral Society —Demonstration of CO_2 Separation and Capture from Flue Gas of Secondary Aluminum Alloy Melting Process—

Nippon Light Metal Company, Ltd. (Headquarters: Minato-ku, Tokyo; President: Shuichi Asakuno; hereinafter "Nippon Light Metal"), Nikkei MC Aluminium Co., Ltd. (Headquarters: Minato-ku, Tokyo; President: Masashi Koyama; hereinafter "Nikkei MC Aluminium"), and Nippon Sanso Corporation (Headquarters: Shinagawa-ku, Tokyo; President: Kenji Nagata; hereinafter "Nippon Sanso"), a Japanese industrial gas business company in the Nippon Sanso Holdings Group, announce their successful demonstration of CO_2 separation and capture from flue gas of a large-scale secondary aluminum alloy melting furnace.

1. Background of the demonstration

Currently, reducing CO_2 emissions from various aluminum industrial furnaces poses a critical challenge for decarbonization, and the development of technologies to separate and capture CO_2 from flue gas is required as a solution to this challenge. Against this backdrop, focusing on large-scale secondary aluminum alloy melting furnaces, a joint demonstration was recently conducted by Nippon Sanso, Nippon Light Metal, and Nikkei MC Aluminium using the CO_2 capture system that Nippon Sanso began selling in April 2023 (a system developed to capture CO_2 from lime kilns, targeting new non-fossil CO_2 sources).

2. Overview and results of the demonstration

Nippon Light Metal and Nikkei MC Aluminium diverted a portion of the flue gas from a large-scale secondary aluminum alloy melting furnace currently in commercial operation to a CO_2 capture system developed by Nippon Sanso. This CO_2 separation and capture test project successfully demonstrated the separation, capture, and produced a concentrated CO_2 stream with a purity of up to 97.6%.

Through this demonstration, the three companies confirmed that CO_2 can be separated and captured continuously using a CO_2 capture system even while a large-scale secondary aluminum alloy melting furnace is

in continuous commercial operation. The demonstration also yielded valuable insights toward commercialization of this system, regarding non-CO_2 flue-gas constituents present in the flue gas generated from aluminum scrap melting, which is indispensable for achieving carbon neutrality.

Nippon Light Metal will incorporate the findings of this demonstration into the basic design of various hazardous and contaminant / catalyst poison removal processes, while advancing the development of technologies for efficient and economically viable capture of CO_2 emitted from various industrial furnaces used in the aluminum industry.

3. Roles of each company in the demonstration

Company name	Role
Nippon Sanso	Planning for the demonstration, design and manufacture of a CO_2 capture system, operation and management of a CO_2 capture system, and analysis of CO_2 separation and capture performance
Nippon Light Metal	Support for the demonstration planning, design and manufacture of utility equipment, and on-site installation of a CO_2 capture system Provision of expertise on secondary aluminum alloy melting furnaces
Nikkei MC Aluminium	Provision of a demonstration site, support for the demonstration planning

Nippon Sanso will continue to conduct research and development on CO_2 separation and capture technologies for a wide range of industrial furnaces in order to reduce CO_2 emissions from those furnaces, both in Japan and overseas, and contribute to the realization of a carbon-neutral society.

Nippon Light Metal and Nikkei MC Aluminium will continue to advance research and development toward carbon neutrality, not only through this highly efficient CO_2 separation and capture technology but also through the oxygen-enriched combustion technologies announced earlier.

[Reference: Press release]

Effort toward Oxygen-Enriched Combustion Technology in the Aluminum Melting Process—Demonstration of CO_2 Emissions Reduction by Up to 24.1% Compared to Conventional Air Combustion—
https://www.nikkeikinholdings.com/news/news/p2026012101hde.html

[Reference: Website of each company]

Nippon Light Metal Company Ltd.: https://www.nikkeikin.com/

Nikkei MC Aluminium Co., Ltd.: https://www.nmca.jp/en/index.html

Nippon Sanso Corporation: https://nsc.jp.nipponsanso.com/en/