

❖ Press Release ❖

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Horizontal Recycling of Aluminum for High-Speed Rail: A World First for the New N700S Shinkansen Train for the Tokaido Shinkansen Line “From Shinkansen to Shinkansen”

Harita Metals Co., Ltd. (based in Takaoka City, Toyama; representative director Makoto Harita) is proud to announce a horizontal recycling system established in collaboration with the Central Japan Railway Company, to provide materials for new high-speed Shinkansen trains, made from decommissioned Shinkansen trains.

◆ Overview

To date, Harita Metal has performed research on horizontal recycling of aluminum, through demonstration projects for both the Ministry of Economy, Trade, and Industry (METI) and the New Energy and Industrial Technology Development Organization (NEDO).

To build on the results of this project, the Central Japan Railway Company; Nippon Sharyo, Ltd.; Hitachi, Ltd.; and Sankyo Tateyama, Inc. have all come together to bring about horizontal recycling of the aluminum materials used for the Shinkansen. In the high-speed railway industry, safety is of the utmost importance; in the world's first project of its kind, we have horizontally recycled materials for use in new train cars.

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World Firsts:

- Use in new Shinkansen trains of recycled materials made from decommissioned Shinkansen train cars
(Used in new N700S trains for the Tokaido Shinkansen line, which began commercial operation in July 2020)
- Establishment of a horizontal recycling system for aluminum for high-speed rail (process authentication standard and recycled material standard)
- Development of LIBS (laser-induced breakdown spectroscopy) sorting of aluminum alloys by type (patented)
- Establishment of the Promotion Committee for Horizontal Recycling of Aluminum Trains at the Japan Aluminium Association



New N700S Shinkansen Train for the Tokaido Shinkansen Line



Standard Passenger Seating



Used for Luggage Racks and the Panels Below

Photos Courtesy of Central Japan Railway Company

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◆ Outline of NEDO Project and Its Connection to This Recycling System

Project Commissioned to Harita Metal in FY 2016

Demonstration Projects to Introduce Energy-Saving Resource Circulation Systems in Asia (Domestic)

Demonstration Project to Save Energy by Bringing About a Train Car Recycling System Combining Arterial and Venous Industries

Through the development of technologies that enable horizontal aluminum recycling by sorting aluminum alloys by type, and efforts to develop an authentication standard for schemes that combine both arterial and venous industries, we have developed a train car recycling system.

<Background and Objectives>
Roughly half of all train cars are made of aluminum in order to reduce their weight, and after decommissioning, this aluminum is cascade-recycled for use in applications such as automobile engine blocks. For high-degree applications of recycled aluminum, it is necessary to develop technology to perform solid sorting by alloy; through this, we aim to build an energy-saving closed loop, bringing about horizontal recycling.

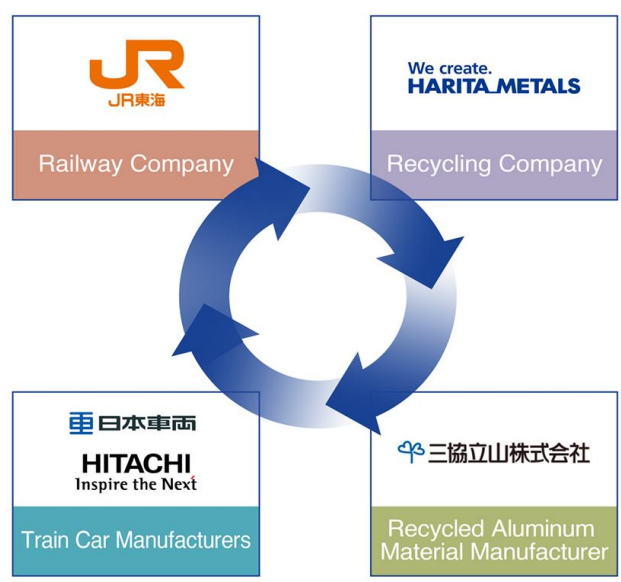
<Details of Demonstration Project >
We built an aluminum sorting system for train cars, using LIBS* sorting technology. We have also established the Promotion Committee for Horizontal Recycling of Aluminum Train Cars, which works with both arterial and venous industries, in order to explore the development of an authentication standard for recycled aluminum.

* LIBS: Laser-Induced Breakdown Spectroscopy

Source: New Energy and Industrial Technology Development Organization



Building a Horizontal Recycling System for Aluminum: From Shinkansen to Shinkansen

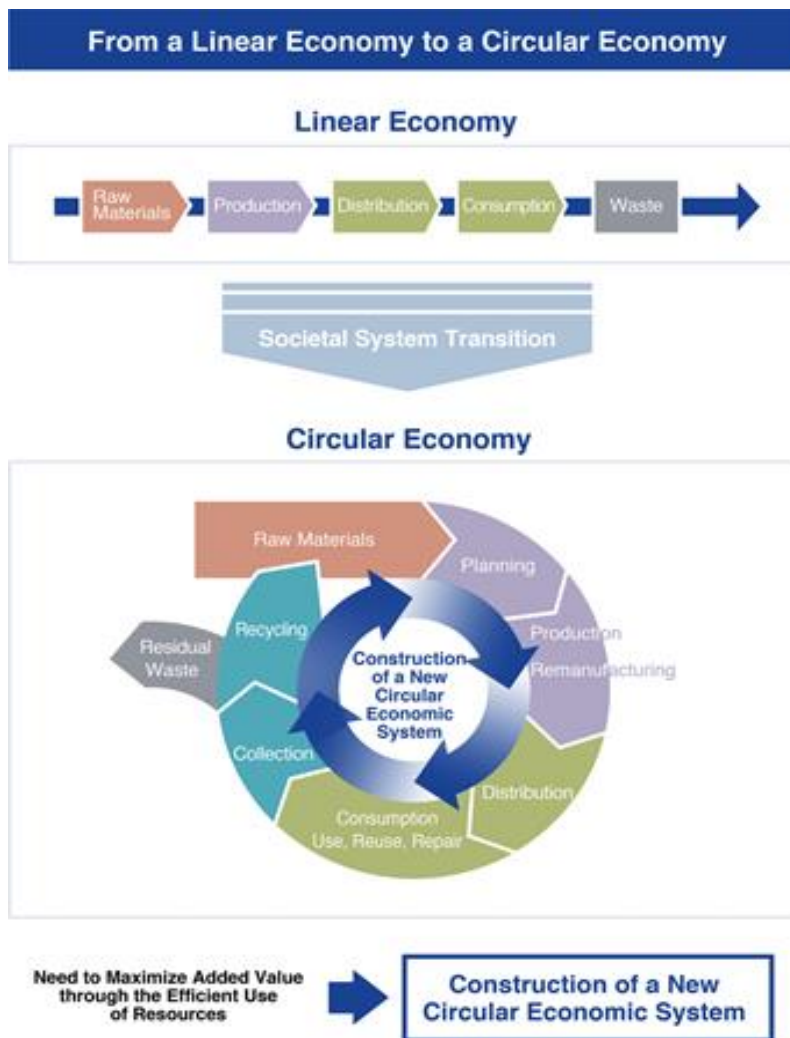


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◆ Looking Ahead

By bringing about this aluminum horizontal recycling system for Shinkansen trains, and furthering the technologies it uses, we aim to further develop recycling, such as by expanding the range of materials eligible for this process. There is also a need for the societal system to transition from a linear economy to a circular economy. While our project has been focused mainly on aluminum alloys, we are also engaged in research on applicability to other resources, such as steel and copper. This circular system and recycling technology can be expanded to other materials and used products, which will serve a role in the construction of broader circular economy systems in the future. We aim to maximize added value created through the efficient use of resources, and bring about a sustainable society with continuous economic growth and a reduced impact on the environment.

● Construction of Societal Systems



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◆ Related Materials

- Informational Page on the Harita Metal Website

Bringing About a Horizontal Recycling System for Aluminum: From Shinkansen to Shinkansen

<http://www.harita.co.jp/technology/advanced-recycling/shinkansen/>

- Presentation Materials from the 17th Lecture Meeting of the Japan Aluminium Association:
“Aluminum Train Cars: Technology and Information”

https://www.aluminum.or.jp/railway_vehicle/meeting/17/files/17_03.pdf

- Materials from the 3rd METI Circular Economy Vision Conference (Held Sep. 28, 2018)

https://www.meti.go.jp/shingikai/energy_environment/junkai_keizai/pdf/003_02_01.pdf