

## **Issuance of a Life Cycle Assessment (LCA) Report for Amorphous Alloy MaDC-A™**

Proterial, Ltd. (hereinafter, “Proterial”) carried out a life cycle assessment (hereinafter, LCA) of MaDC-A, an amorphous alloy that is a material used in transformer cores, and it has published the LCA report. Proterial will contribute to the realization of decarbonized society by utilizing the publication of the report as an opportunity to popularize amorphous core transformers.

### **1. Background**

Since 2003, Proterial has provided the Metglas™ amorphous alloy that reduces transformer standby power consumption to about one third of the power consumed by conventional transformer cores such as magnetic steel sheet cores. The goal is to increase the use of Proterial’s amorphous alloy as a transformer core material to reduce CO<sub>2</sub> emissions by about 50,000 tons a year\*<sup>1</sup> compared to transformers using magnetic steel sheets as a core material. Proterial developed MaDC-A, a new amorphous alloy contributing to an increase of transformer efficiency, in March 2020, and has been providing it to customers around the world. The new material is attracting strong interest, as it helps reduce CO<sub>2</sub> emissions.

To enable customers to select materials appropriately from the perspective of reducing CO<sub>2</sub> emissions, the results of the LCAs of materials are important. A customer requested an LCA report, so Proterial performed the LCA and published the report.

### **2. Outline**

Proterial performed an LCA of MaDC-A, an amorphous alloy used as a transformer core material, from raw material procurement, manufacturing and transportation to waste disposal. The prepared LCA report was reviewed by a third-party LCA expert and then published. This is the first time that Proterial has conducted an LCA and published an LCA report.

If customers use the LCA report as evidence in their conducting life cycle assessments of the amorphous core transformers they manufacture, it will be possible to calculate the amount of CO<sub>2</sub> emitted throughout the life cycles of the amorphous core transformers. In addition, it will enable the calculation of the CO<sub>2</sub> emissions reduction achieved throughout the life cycle of amorphous core transformers compared to transformers using magnetic steel sheets as their core material.

Through this LCA report, Proterial will ensure that customers and other stakeholders have an accurate understanding of the excellent performance of the MaDC-A amorphous alloy and the amorphous core transformers that use MaDC-A and promote the popularization of amorphous core transformers and the realization of decarbonized society.

### **3. From the LCA report\*<sup>2</sup>**

The amount of GHGs emitted was calculated to be 3.10 kg CO<sub>2</sub>e per kilogram of the product. Examining the product by life cycle stage, emissions in the raw material procurement stage were 2.36 kg CO<sub>2</sub>e, accounting for 76.2% or about three quarters of the emissions from the entire life cycle of the product. By process, the environmental load related to raw materials manufacturing included in the raw materials procurement stage is 72.3% of the total environmental load. The next largest environmental load was related to energy consumption in the production stage, which was 23.1% of the total environmental load. These two types of environmental load are together over 95% of the total environmental load.

\*1 The CO<sub>2</sub> emissions reduction achieved by newly produced amorphous core transformers estimated based on annual shipment volume. Figures were calculated based on the product shipment volume and the difference in loss in transformer under Indian standards. For the CO<sub>2</sub> emission coefficient, we used the IEA’s World CO<sub>2</sub> Emissions from Fuel Combustion (2017).

\*2 To request the *Domain control Fe-based amorphous alloy MaDC-A®* LCA report (.PDF), please fill out the inquiry form at the following URL.

Web inquiry form: [https://www.cntct.proterial.com/contact/publish/inquiry\\_eng?g=01&c=010](https://www.cntct.proterial.com/contact/publish/inquiry_eng?g=01&c=010)

### **Proterial, Ltd.**

Toyosu Prime Square, 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan  
[www.proterial.com/e](http://www.proterial.com/e)

Media Inquiries: Corporate Communications Dept.

[https://www.entct.proterial.com/contact/publish/inquiry\\_eng?g=01&c=001-01](https://www.entct.proterial.com/contact/publish/inquiry_eng?g=01&c=001-01)

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## ■About PROTERIAL

# PROTERIAL

“Proterial” reflects the essence of our corporate philosophy, which consists of three elements: Mission: “Make the best quality available to everyone;” Vision: “Leading sustainability by high performance;” and Values: “Unfaltering integrity” and “United by respect.” It combines “**pro-**” with the word “**material.**”

“Pro-” represents our “three pros”:

- **Professional — work that exceeds expectations**
- **Progressive — a spirit that keeps challenging**
- **Proactive —an enterprising attitude**

“Material” refers to the high-performance materials that our original technologies produce and underpinned by the three pros. With our focus on solving customer issues and bringing new levels of value, we promise to contribute to the realization of a sustainable society through the products and services that embody our philosophy.

## ■Proterial, Ltd. — Company Overview

Established: April 1956

Head office: Toyosu Prime Square, 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan

Capital: 310 million yen (as of March 31, 2024)

Representative: Sean M. Stack

Representative Director, Chairman, President and Chief Executive Officer (CEO)

Sales revenue: 1,033.2 billion yen (Term ended March 2024)

History: 1910: Founded as Tobata Foundry Co.

1937: Merged with Hitachi, Ltd.

1956: Established separately as Hitachi Metals Industries, Ltd.

2023: Company separated from the Hitachi Group, and renamed from Hitachi Metals, Ltd. to Proterial, Ltd.

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Toyosu Prime Square, 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan

[www.proterial.com/e](http://www.proterial.com/e)