

News Release

October 29, 2025
Proterial, Ltd.

Minister of Education, Culture, Sports, Science and Technology Award at the Chugoku Region Invention Honors for Fiscal Year 2025 Received for High-performance Surface Modification Technology That Contributes to Extending the Service Life of Dies

Proterial, Ltd. (hereinafter “Proterial”) has been awarded the Minister of Education, Culture, Sports, Science and Technology Award, a prize of the highest rank, at the Chugoku Region Invention Honors hosted by the Japan Institute of Invention and Innovation for its high-performance surface modification technology that contributes to extending the service life of dies (invented by Fumiaki Honda).

1. Patent name

High-performance surface modification technology that contributes to extending the service life of dies (Patent number: 6015663)

2. Awardees

“Minister of Education, Culture, Sports, Science and Technology Awards (MEXT Minister’s Award)”
Fumiaki Honda, Engineer, New Material Group, Processing Dept., Yasugi Works, Specialty Steel Business Unit, Proterial, Ltd.

3. Background

Modifying a metal surface by coating it with a film is an effective technology for increasing the strength, durability, and sliding properties of dies and auto parts. When applied to a die, it can significantly extend the service life of the die.

In recent years, the load on dies has been increasing due to the growing strength of processed materials, including high-tensile steel sheet, increased processing accuracy, and the increasing speed of casting cycles. This has made surface modification even more important than before. Before this invention, however, galling*¹ would occur suddenly during surface modifications in some use conditions, reducing the service life of the die, which was an issue.

4. Outline

The inventor of this patent discovered that the sudden occurrence of galling in the tough usage environments of dies is attributable to a metallic powder from the die material and abrasion powder generated during sliding adhering to the die, and he studied method to prevent the powder from adhering and enable dies to have excellent sliding properties even after they have been used for a long time. As a result, he invented a surface modification with the optimal elemental composition and film structure, which can inhibit the occurrence of galling by making excellent sliding properties possible in a wide range of use environments, from cold to warm.

This surface modification creates a hard film on the surface of the die. The film consists of a laminated film composed of alternating layers of chromium nitride and vanadium nitride films (layer A), and a

Proterial, Ltd.

Toyosu Prime Square, 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan
www.proterial.com/e

vanadium nitride film (layer B) that is applied over layer A. This hard film structure inhibits the local adhesion of the processed material and the jamming of abrasion powder, which causes galling damage, through the action of the low-melting oxide that is generated on the surface layer of the film in the die usage environment. It thus extends the service life of dies.

Proterial provides the proprietary Tribec™ high-functional surface modifications applying hybrid PVD*2 technologies that ensure high abrasion resistance, excellent lubricity, and heat resistance required of dies. This invention has been used practically as Tribec™ Kagari, one of the Tribec series of coatings, contributing greatly to extending the service life of dies.

The Tribec logo is written in a bold, red, sans-serif font. A registered trademark symbol (®) is located at the top right of the word.

Media Inquiries: Corporate Communications Dept.

https://www.cntct.proterial.com/contact/publish/inquiry_eng?g=01&c=001-01

Customer Inquiries: https://www.cntct.proterial.com/contact/publish/inquiry_eng?g=01&c=002&

- *1 galling: Unpredictable localized seizure (heat generated by friction causing the surface to become rough or the friction surface to weld together) or damage that occurs suddenly due to vibration or friction.
- *2 PVD: A method of forming a coating by physically attaching metals such as titanium and chromium to the surface of a workpiece in a vacuum.

Tribec are registered trademarks of Proterial, Ltd.

■About PROTERIAL

PROTERIAL

The Thinking Behind our Company Name
“Proterial” combines “**pro-**” with the word “**material.**”
“Pro-” represents elements of our Values:

- **Unparalleled Professionalism**
- **Unbounded Progressiveness**
- **Unleashing Proactiveness**

“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, 2025)

Representative : Sean M. Stack

Representative Director, Chairperson, President, & CEO

Sales revenue: 768.6 billion yen (Term ended March 2025)

History: 1910: Founded as Tobata Foundry Co.

1937: Merged with Hitachi, Ltd.

1956: Established separately as Hitachi Metals Industries, Ltd.

2023: Renamed from Hitachi Metals, Ltd. to Proterial, Ltd.

Proterial, Ltd.

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

www.proterial.com/e

Proterial is a participant of the United Nations Global Compact and adheres to its principles-based approach to responsible business. In January 2025, Proterial received a Silver rating in the EcoVadis Sustainability Assessment.