Project name: Long-term stabilization of automotive adhesion and the interfacial design （2021～2024）

Entrusted party: National Institute of Advanced Industrial Science and Technology (AIST)

Outline of the Project

・**Background**: Significant CO_2 reduction, toward achieving a carbon-neutral society in 2050. Especially, light weighting of automotives, which has a large market (65 trillion yen), is promising for the CO_2 reduction.

・**Purpose**: The key is dissimilar material joint for using various types of lightweight members. We will solve long-term stability as challenge point of adhesion, and accelerate large-scale use in multi-material car body.

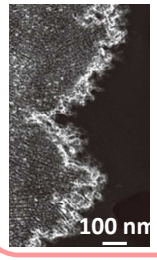
・**R&D**: Focus point is adhesive interface. Developing points for long-term stability are (1) original visual evaluation in adhesive mechanism, moisture deterioration, and interface strength, and (2) innovative laser surface treatment that brings selective adhesive interface.

Multi-material car body

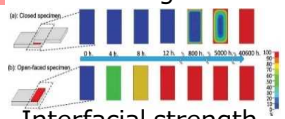
Long-term stability = Stable cohesive failure

Evaluation

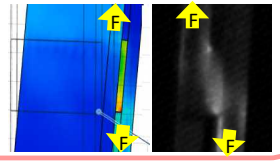
Mechanism



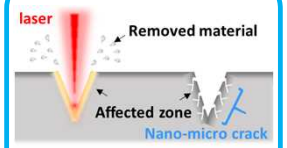
Moisture Degradation



Interfacial strength



Creation & design



Laser-treatment

Bonding between Steel, Al & FRP(resin)

Project Scheme

NEDO (New Energy and Industrial Technology Development Organization)

Funding

AIST National Institute of Advanced Industrial Science and Technology

Joint R&D contract

TU BS Technische Universität Braunschweig, Germany

Significance of International R&D

・**TU BS**, Germany's core institution that leads the world in automotive manufacturing and joining innovation. Their original laser surface treatment, the remarkable interface design technology, will be utilized.

・Collaboration between the two countries, which have a global presence in automobile manufacturing and adhesive research, will lead to the development of standards on long-term durability evaluation, and will accelerate the widespread use of adhesive bonding in mobility.

Expected Outcomes

・Accelerate large-scale use of adhesive in car body, and following light weighting, and CO2 reduction.

・**Expected CO_2 reduction effect**: 1.8 million ton-CO_2／year. (Premise: 100 kg lighter in 10% new cars at 2030). *100kg lighter for 1.5 billions world vehicles, which equivalent to the reduction potential of 300 million tons of CO_2/ year.

・Superiority and share in world market of Japanese multi-material car and the material of light weigh members.