

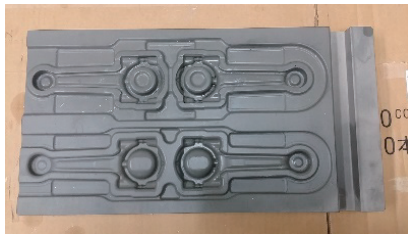
Innovative Design / Manufacturing Technologies

Applying Innovative Metal Surface Treatment Technologies for Common Materials Available in the Market (Improvement on Wear Resistance, Corrosion Resistance and Sliding Performance)!

About this Project

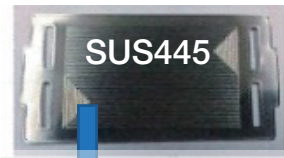
“Super Metal” conversion technologies

Improving wear resistance

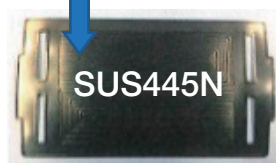


Sulfurnitriding

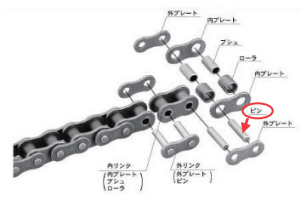
Improving corrosion resistance



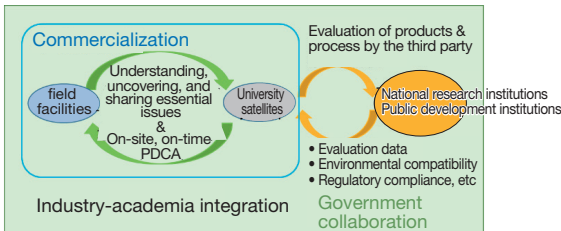
Heat treatment in Nitrogen atmosphere



Improving sliding performance

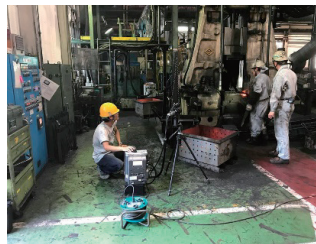


New Industry-academia integration manufacturing style based on the fields



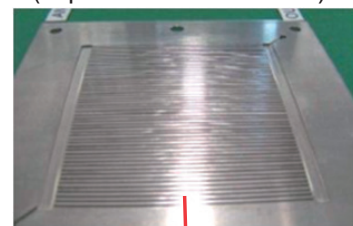
Collaboration of the Industry-academia integration and the government organization accelerates development, approvals, and the progress of commercialization

On-site, on-time research with university staff at the SMEs site



Test Uses / Application Examples

Applications for energy devices (separators of fuel cells)



Surface corrosion is not observed after continuous power generation

Improving sliding performance

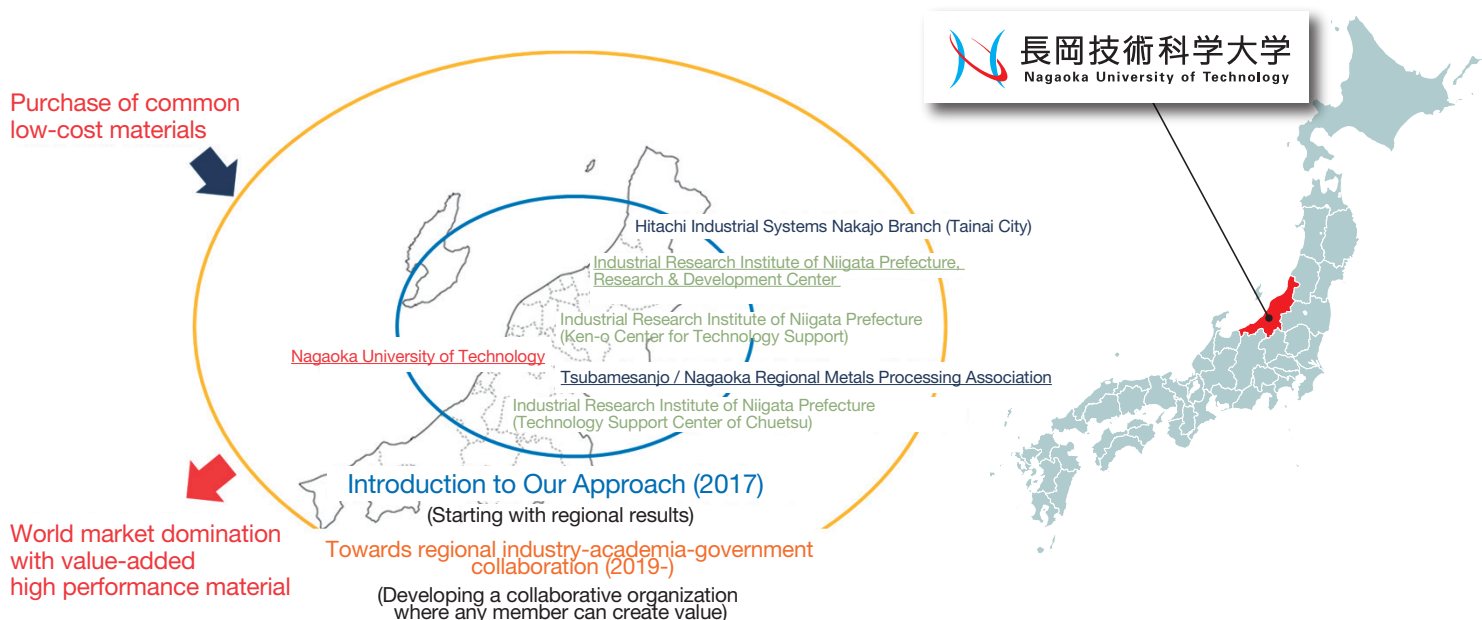
Improving corrosion resistance

Research Achievements

item	Goals	Results	Implementation approach
wear resistance	Increase in die lifetime	Extend life by 150%	Sulfonitriding
corrosion resistance	Higher than SUS316	20-100x	Heat treatment in Nitrogen atmosphere
sliding performance	High hardness and High sliding performance	Dry friction coefficient 0.06	Nano-diamond particle dispersion plating
	Near-net shape processing	Uniform plating thickness	Plating thickness distribution simulation

item	Existing technology	Advantages of developed method	Application
wear resistance	Carburizing, Nitriding	Extension of lifetime	Molding dies
corrosion resistance	Au plating on SUS316	Gold/nickel usage reduction Stack cost reduction of fuel cell	Electrochemical energy conversion devices
sliding performance	Hard chromium plating	Cr-free plating Wear resistance: over twice that of chrome plating	Components of automobiles and industrial machines
	Polishing post treatment	Polishing process reduction Improved production yield	

Future Outlook



Research Theme : Development of “Super Metals” conversion technologies by processing of common metallic raw materials

Members : Nagaoka University of Technology, Nagaoka Densi, Johetsu Industry Co., Ltd., NAKATSUYAMA NETSUSHORI Co., Ltd., NIHON MEKKI INDUSTRY Co., Ltd., Konishi Mekki, EYETEC Co., Ltd.

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