Laser Chock Peening Technology for Surface Hardening and Residual Stress Control for Metallic Materials

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- Laser shock peening technology: Surface hardening and optimization of residual stress for metallic materials by pulsed laser irradiation
- Laser shock peening improves fatigue performance, abrasion resistance and corrosion resistance of high–precision component used in shipbuilding/offshore, automobile, and plants
  → Improve durability and service life of corresponding component

Client / Market

- High durability and high precision metal machine parts in defense and plant industries

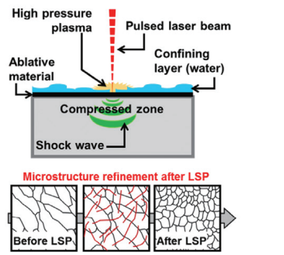
Necessity of this Technology

- Laser Shock Peening is a key technology capable of controlling residual stress as well as hardening with local nano–scale plastic deformation behavior.
- Laser shock peening technology is a non–heating process that does not change the dimension of the metal surface.
- In mechanical parts of defense and plant industries, it is often used in extreme environments for a long period → Maximizing the performance of machine parts by can be achieved by Laser Shock Peening technology

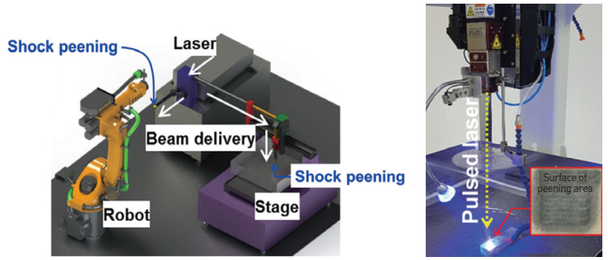
Technical Differentiation

- KIMM Laser Industrial Technology Research Group has the laser shocking peening technology and its system that can be connected with the robot and stage modes.
- KIMM Laser Industrial Technology Research Group has basic research DB and related core process for laser shock peening technology

Principle and Process of Laser Shock Peening



Laser Shock Peening System of KIMM



DESIRED PARTNERSHIP

Technology Transfer | Licensing | Joint Research | Other

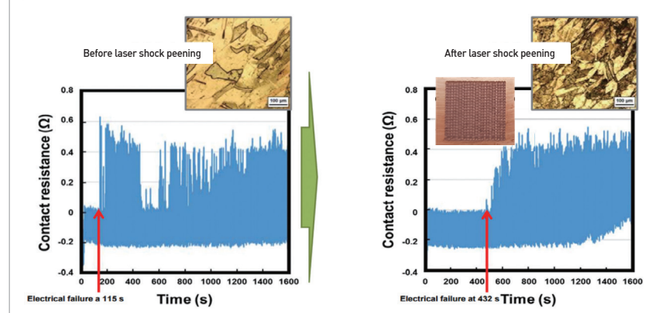
TECHNOLOGY READINESS LEVEL [TRL]

Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/ evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

Excellence of Technology

- As the result of the laser shock peening, 200% of abrasion resistance improvement was achieved for Cu alloys

Example of Improvement in Abrasion Resistance for Copper Alloy by Laser Shock Peening



Current Intellectual Property Right Status

KNOW–HOW

- Core technology of laser shock peening system development
- Metallurgical analysis and mechanical testing technology