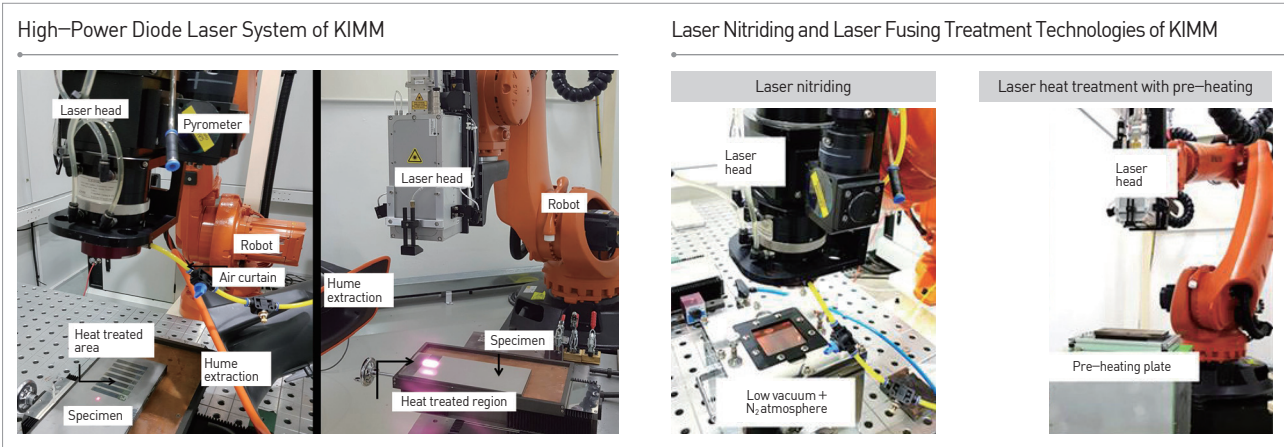


# Surface Hardening and Homogenization Technology for Metallic Materials Using High-power Diode Lasers

Dr. Su Jin Lee  
Laser Industrial Technology Research Group  
T. +82 – 51 – 310 – 8133  
E. leesj@kimm.re.kr

- ⇒ Surface hardening and homogenization technology of metallic materials with high-power diode lasers (beam dimension: 20–2500 mm<sup>2</sup>)
- ⇒ Numerical computation and real-time control technology of optimum laser heat treatment temperature



Client / Market

- Mold manufacturing and high-performance coating industry

Necessity of this Technology

- Unlike conventional heat treatment technology, it is possible to selectively harden and homogenize the surface of molds
- Maximization of durability for various die molds under demanding service environment

Technical Distinctiveness

- KIMM Laser Industrial Technology Research Group has a high-power (4, 8 kW) diode laser system together with key processing technologies of laser surface hardening and homogenization
- The key processing technologies are combined with laser nitriding and special coating processes

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

Other

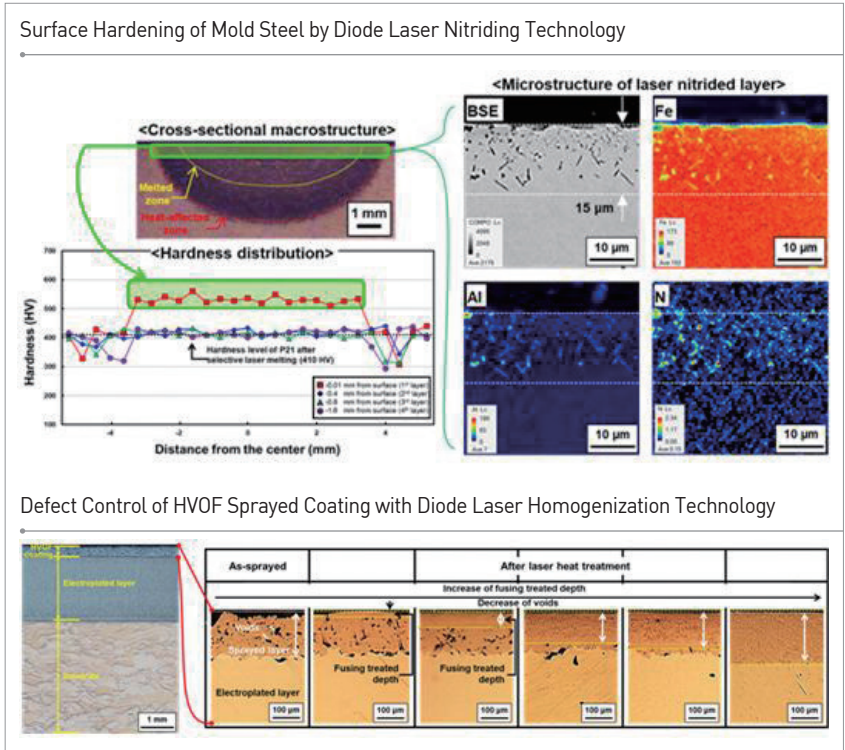


TECHNOLOGY READINESS LEVEL [TRL]



Excellence of Technology

- Laser nitriding: In the case of mold steels, the surface hardness can be improved by 200% linked with the formation nitriding layer
- In laser homogenization treatment for HVOF sprayed coating, it is confirmed that inherent defects (pore, macrosegregation) are removed as compared with the as-sprayed



Current Intellectual Property Right Status

KNOW-HOW

- Key processing technology of surface hardening and homogenization with high-power diode lasers (beam dimension: 20 to 2500 mm<sup>2</sup>)
- Metallurgical analysis and mechanical testing after surface hardening and homogenization treatment