

# Temperature Process Control and Process Documentation

## Typical Applications

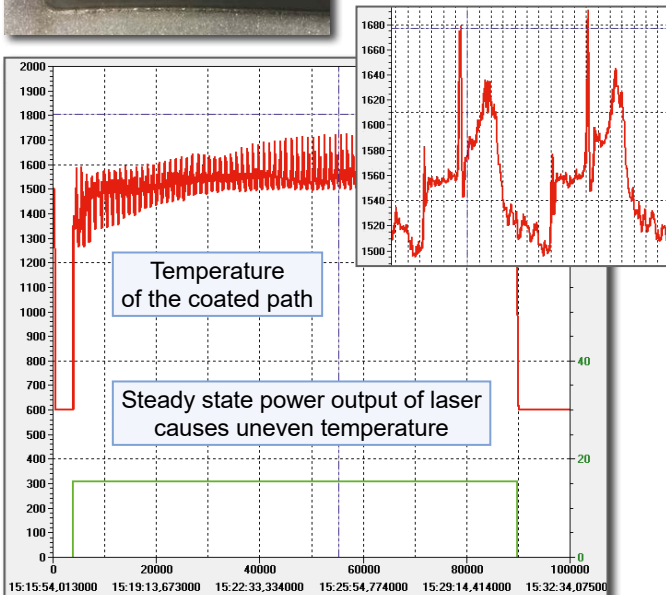
- Laser hardening
- Laser cladding (LMD process)
- Laser annealing
- Heat conduction welding

## Laser Cladding / Laser Metal Deposition (LMD)



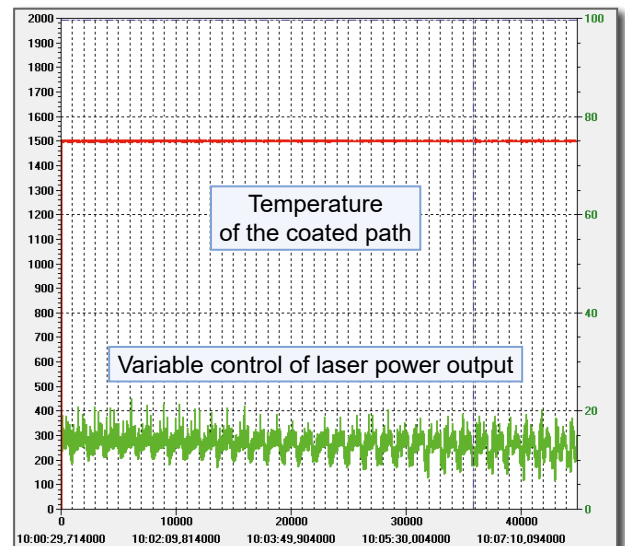
### Steady State Laser Output

causes uneven material coating particularly in directional changes

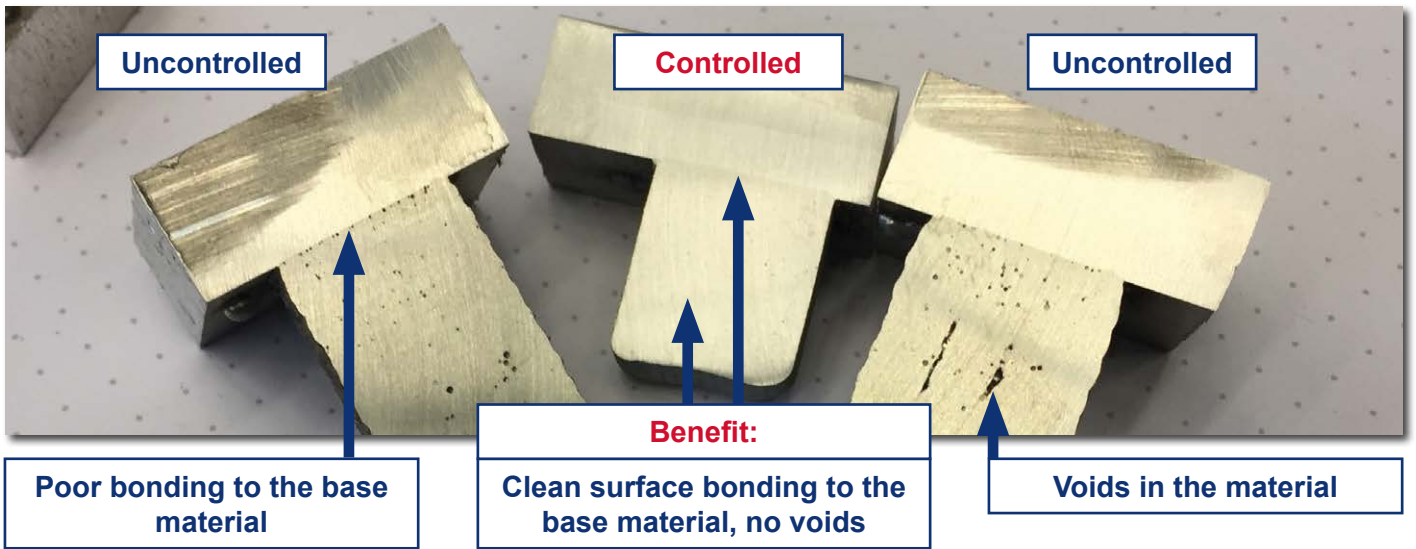


### Temperature Controlled Benefit:

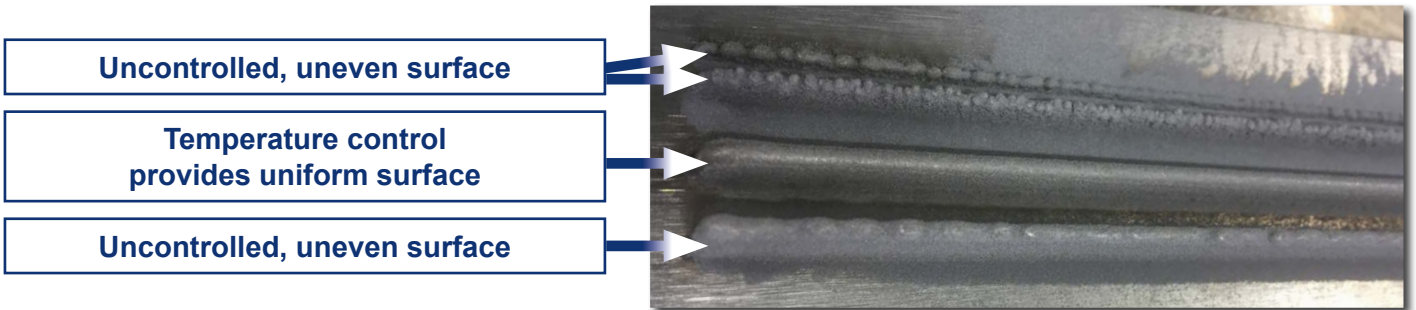
Uniform material coating even with directional changes



## LMD Processes

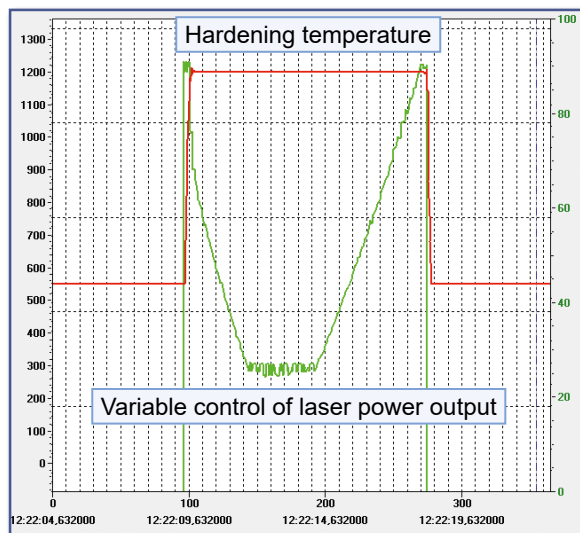


### Comparison of aluminum coatings



## Hardening Processes

### Example: Temperature control for variable changes in beamspread of laser



**Superior hardening results due to proper temperature control**

