International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

Balapur P.O., Hyderabad – 500005, Telangana, India

Refurbishment of components made of High Tensile Steel

Overview

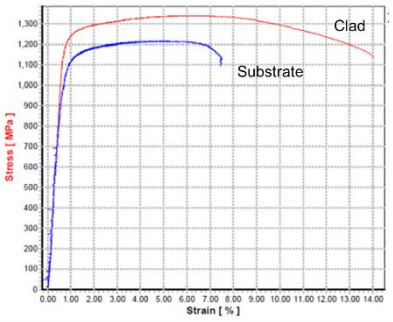
High tensile steels are commonly used in aerospace, automotive, energy and general engineering sectors for various power transmission gears shafts, connecting rods propeller shafts, and heavy forgings such as rotors, shafts, disc etc. Such components can be damaged during operation due to wear at the contact areas and refurbishment of such components using laser cladding can save the replacement cost. Also, refurbishment technology can be beneficial in countering environmental concerns.
Refurbishment technology using laser cladding for one of such component was developed that faces wear during operation due to relative movement between the contact surfaces. A post heat treatment was developed that can homogenise the clad and HAZ microstructure without creating dimensional and microstructural variation in the component. Microstructural, mechanical, and wear properties were found on par with the substrate. Component successfully completed the simulated field trial

Key Features

- Negligible porosity
- Controlled heat input
- Minimal heat affected region
- Precise and controlled process
- Special post heat treatment for improved properties

Potential Applications

- Pinion housing of Helicopters
- Components made of high tensile steels



Micro Tensile Test Results

Technology Readiness Level 100%

Preliminary	*Proof of concept*	*Scale-up*	*Prototyping*	*Validated*
20%	40%	60%	80%	100%

Major Publications

1. A patent is filed

Centre for Laser Processing of Materials (CLPM)
ARCI, Balapur PO., Hyderabad 500005, Telangana, India
Tel : +91 40 24452450 / 24452304; Fax : +91 40 24442699
Email: manish [at] arci [dot] res [dot] in / director [at] arci [dot] res [dot] in