

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

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## Life Enhancement of Thermal Power Plant Components by Laser Cladding

### Overview

In power plants, degradation of various components like coal nozzle tips, boiler tubes, burner spreaders, etc, due to various modes of wear, erosion and corrosion, is a common problem leading to their replacement during maintenance schedules. Such tribological systems, working in high temperature aggressive environments, require suitable surface modification solutions for life enhancement.

A high temperature erosion corrosion resistance coating was developed using laser cladding process. The metal matrix composite coating demonstrated excellent high temperature erosion resistance compared to conventional weld overlay process. Field trial in an actual power plant showed negligible wear after 15 month of service. The coating can extend the service life of the boiler components to double compare to existing life.

### Key Features

- Highly controlled process
- Flexibility to adopt the process for different components
- Selective clad coating where needed
- Excellent metallurgical bond between coating and surface
- No post clad heat treatment required



*Erosion in Burner tip plates*

### Potential Applications

- Baffle plates
- Boiler tube
- Burner spreaders etc



*Burner tip plates after 15months of field trials showing intact laser clad plate and worn out uncoated plate at top*

### Intellectual Property Development Indices (IPDI)

- Field trial in an actual power plant showed negligible wear after 15 month of service

Status	1	2	3	4	5	6	7	8	9	10
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### Major Publications

1. "A novel method of pulsed laser cladding for effective control of melting of WC particulates in NiCr-WC composite coatings" Manish Tak, SM Shariff, Vikram Sake, G Padmanabham, *Proceedings of 31<sup>st</sup> International Congress of Laser & Electro optic (ICALEO)*, p515-523, 2012
2. "Characteristics and erosive wear performance of Ni-Cr based coatings on SS-310 steel by diode laser cladding and weldoverlay processes", *Proceeding of International conference on Surface Modification Technologies (SMT-23)*

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