

ROLLER ANTI WEAR SOLUTION

Laser-cladding process technology and welding cladding

The target is to maximize roll life. Danieli welding technologies and roll cladding materials are developed in a perfect mix in order to balance production performance and working conditions.

Based on extensive experience, research and regular follow-up on roll performance at customers' plants, Danieli has developed its weld overlay materials, focusing on pitting corrosion resistance, thermal fatigue cracking resistance and wear and bruise resistance, whilst ensuring the best weldability features.



AWS
>anti wear solution<



Potentially unlimited roll body lifetime. Once the roll is grind to minimum diameter the body will be used again for cladding, and consequently the will be restored to original size.



Performance driven custom-made coatings. Designed especially for improvement of roll lifetime performances and not bound by standard material solutions.



Huge mid to long term cost savings thanks to improved lifetime performances and re-cladding reconditioning instead of new roll purchase.



Environmental friendly re-manufacturing concept introduces significant energy saving and pollution knockdown due to worn component scraping, re-melting, casting, machining and heat treatment cut-off from the roll manufacturing process.

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LASER CLADDING

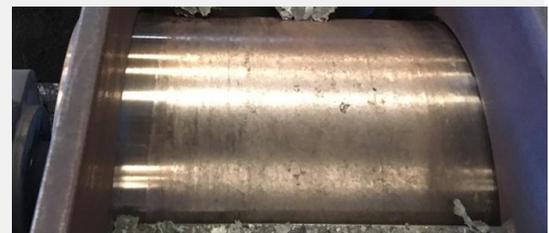
Laser Cladding is a technology whose uses include the creation of protective coatings to reduce wear and corrosion on parts. Laser cladding is carried out by depositing a thin layer of the desired metal on a moving substrate. The material can be deposited using powder injection, pre-placed powder on substrate or by wire feeding. Powder injection can be used on a variety of deposition materials in layer thicknesses ranging from 0.05 to 2mm and widths of 0.4 mm.



Advantages	Limitations
1. Highest precision (complex claddings on complex surfaces are feasible)	1. Reduce maximum deposition rates
2. Highest reproducibility (high process stability due to the stability of the laser beam)	2. Wear performance is not optimal at high temperatures in case of furnace outlet rollers with large surface area since only a thin layer is provided in areas subject to impact.
3. Lowest thermal load (dilution zone and heat affected zone are minimal)	
4. Wider choice of materials with powder coating	
5. Suitable for small items	
6. It is harmless to the health of the operators	

WELDING CLADDING

The Weld Cladding process is less expensive than laser cladding and WC insert rollers. Weld Cladding is an operation which joins metals by means of heat or pressure or both in such a way that there is continuity in the nature of the metals being joined. A filler metal with the same melting temperature as the parent metal may be used, and the result is a weld. The current roller design has been modified by applying an anti-wear weld overlay, recommended when customers require longer life but cannot use carbide inserts.



The picture shows the roller after 100,000 tons: preliminary mechanical treatment with anti-wear coating with filler material by mechanized process, and Weld Clad finishing. Where working conditions didn't allow the application of carbide inserts but Customers require better durability performance, we decided to modify the design of the current rollers by adding a surface treatment with weld overlays for anti-wear purposes.

Advantages	Limitations
1. Improves both surface and internal quality	1. Long application time
2. Improves rolling yield	2. Limited availability of electrode materials
3. Reduces surface inspection before rolling	3. It requires highly specialized operators
4. Reduces roll grinding / conditioning	4. Not suitable for small items