



TOPCLAD®

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# LASER CLADDING

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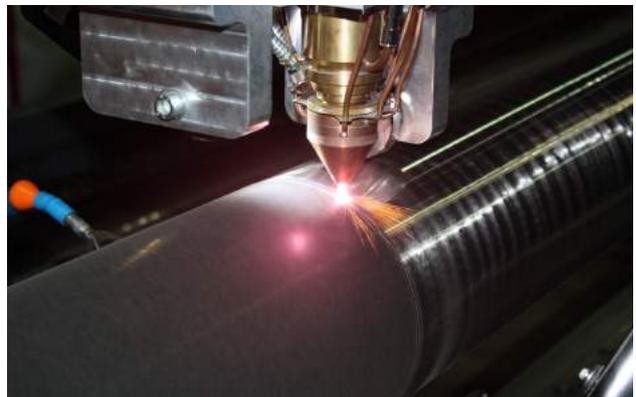
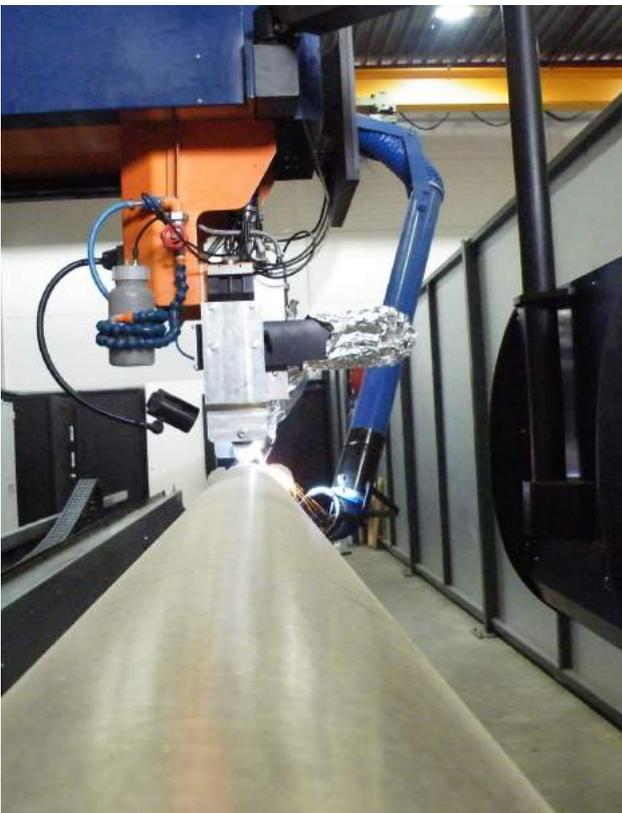
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## What is TopClad<sup>®</sup> laser cladding?

TopClad<sup>®</sup> is a unique laser surface treatment with a proven track record in heavy duty applications for demanding industries. By means of focused low-energy input, provided by laser technology, a selection of inter-metallic bonds of materials is melted to the substrate.

Depending on the choice of the inter-metallic bonds, highly dedicated surface improvements can be achieved, for example highly anti-corrosive and wear-resistant surfaces. Due to thorough laboratory and field testing, TopClad<sup>®</sup> is available in an extended mix of inter-metallic bonds, available for a wide range of heavy duty performances.

Due to the focused energy input on the melting spot, the substrate is only exposed to a very limited amount of heat. Structural changes to the materials are negligible and the treated part retains its shape and dimensions.



# Benefits of TopClad<sup>®</sup> laser cladding

## HIGHLY CORROSION RESISTANT

Unlike many other surface treatments, TopClad<sup>®</sup> is a surface treatment that combines an extremely dense, crack-free and non-porous microstructure layer with ductile characteristics. This makes the substrate highly durable in extreme aggressive environments.

## SUPERB METALLURGICAL BONDING

The added metallic bond is sprayed into the melting spot of the substrate, created by the focused energy of laser. This way of fusing materials makes delamination impossible and prevents sub-corrosion. This is a major advantage compared to many other alternatives of surface treatments. TopClad<sup>®</sup> is an outstanding, unequalled surface treatment for applications in which anti-corrosiveness and wear resistancy is crucial to the operational life time.

## HARDNESS

The surface hardness depends on the choice of the applied inter-metallic bond. Unlike many other surface treatments, TopClad<sup>®</sup> is available in a wide range of alloys and added hard faced carbides, each of which adds unique features, such as surface hardness. Despite that, the new surface remains ductile and non-brittle. As a result, TopClad<sup>®</sup> can be applied in a wide range of industries and applications, each with their own specific requirements.

## WEAR-RESISTANCE

Wear-resistance is closely related to the hardness and toughness of the materials created. In particular, a mix of extraordinary carbides in the inter-metallic bonds influences the balance between hardness and toughness. In this way, a TopClad<sup>®</sup> surface is highly resistant to wear and tear.

# CONTRIBUTION TO ECONOMIC SUCCESS

## UP-TIME & ENDURANCE

In the offshore, marine, dredging, oil & gas industries, steel & paper mills and many other industries, TopClad<sup>®</sup> has been applied to machine parts with great success. In these industries, the up-time of capital intensive equipment is crucial for economic success. TopClad<sup>®</sup> substantially increases the up-time of the related equipment. The 'cost of ownership' is reduced substantially.

## SUSTAINABILITY

TopClad<sup>®</sup> is an environmentally-friendly and sustainable process. The technology is fully in line with our mission to implement production processes which lead to a reduced carbon footprint. In contrast to other surface treatment methods, no chemicals are involved in the TopClad<sup>®</sup> process. Furthermore, the energy consumption required for applying TopClad<sup>®</sup> is extremely low compared to other, common technologies. The highly efficient process as well as the re-use of residual materials means there is no waste.

## REPAIR

Damage to machine parts always occurs non expected and at times that valuable production processes are running at full capacity. Consequently, any repairs must be carried out efficiently and adequately. Repairing the surface of a machine part that has been treated with TopClad<sup>®</sup> is an extremely straight-forward process which can be done on site. This guarantees maximum up-times. TopClad<sup>®</sup> is also highly suitable for extremely worn machine parts. The TopClad<sup>®</sup> technology restores the machine part to its original shape and quality, and even improves performance.

# COMPARISON SHEET

Laser cladding is the future when it comes to high corrosion resistance. Depending on the choice of the inter-metallic bonds, highly dedicated surface improvements can be achieved, for example highly anti-corrosive and wear-resistant surfaces. Due to thorough laboratory and field testing, TopClad® is available in an extended mix of inter-metallic bonds, available for a wide range of heavy duty performances.

Product	Alloy	Hardness	Wear Resistant	Ductility	Seawater Resistant	Chemical Resistance	Side Load
Quarite N	NiCr	◆◆	◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆
Quarite NR Plus	NiCr-W	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆
Quarite C	CoCr	◆◆◆	◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆◆	◆◆◆◆
Tardisphere	NiCr-WC	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Comparison galvanic and HVOF applications							
Hard Chrome	Cr	◆◆◆◆◆	◆◆◆	◆	◆◆	◆◆	◆◆◆◆◆
Nickel Hard Chrome	NiCr	◆◆◆◆◆	◆◆◆◆	◆	◆◆◆	◆◆◆	◆◆◆◆
HVOF Ceramic	NiCr-Hastelloy	◆◆◆◆◆	◆◆◆	◆	◆◆◆	◆◆◆◆	◆
HVOF Carbide	NiCr-Cr3C2-WC	◆◆◆◆◆	◆◆◆◆	◆	◆◆◆	◆◆◆	◆
HVOF Nickel based	NiCr-Hastelloy	◆◆◆◆◆	◆◆◆◆	◆	◆	◆◆◆◆	◆

# CERTIFICATION AND CLASSIFICATION

Laser cladding is the future when it comes to high corrosion resistance. Due to thorough laboratory and field testing, TopClad® is available in an extended mix of inter-metallic bonds, available for a wide range of heavy duty performances.

**"Our surface treatments have been tested to meet the highest standards in the industry"**

# APPLICATION

*Applications for laser cladding are endless.*

**"Unprecedented high tech laser surface treatment for high demanding industries."**

## REPAIRS

Unexpected damages can be recovered efficiently & adequately, on site with basic TIG welding equipment.

Thread ( damaged or not) can easily be replaced by a non-corrosive thread, for easy (dis)assembly.

Length measuring systems like LPM or CIMS can easily be intergrated.

## OFFSHORE

Cylinderrods for crane and positioning as well as jackup devices, provided with Quarite NR+ lasercladlayer.

## MARINE

Propeller shafts overhaul with Topclad Tardishere, inclusive Bureau Veritas procedure qualification.

## DREGGING

Cylinderrods for bottomdoors, overflow cilinders, spudcarrier and cutterhead are provide with Quarite N or Tardisphere lasercladlayer.

## OIL AND GAS

Sheaves for C-frame hoisting, provided with Quarite laserclad layer, Pipelayer "support and position" cylinders, provided with Quarite NR+ laserclad layer on the cylinder rod.

**"We are able to laser clad items with a maximum diameter of 2.200 mm and a length of 24.000 mm"**

# REFERENCES

The TopClad partners are some of the best managed companies in the world, across a wide range of industries.



# EXAMPLES

The TopClad coating has many applications which improves the overall quality in comparison to conventional coating systems.



# "TODAY PREPARED FOR TOMORROW"

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We ensure a solid line of communication between ourselves, our clients, contractors, suppliers, and everyone in between.

