

M
E
T
A
L

C
L
A
D
D
I
N
G

**Cladded & Weld Overlayed
Components for Oil & Gas, Refinery
and Petrochemical Industry**





CLADDING & WELD OVERLAY



Cladding & Weld Overlay provides protection against corrosion and wear for process and pipeline equipment. Weld overlay can be applied to extend the service life of new parts, or refurbish parts that have corroded or worn surfaces.

Crystals Integrated and advanced welding technologies provides effective welding solutions for:

- Oil & Gas Industries
- Sub-Sea Applications
- Petrochemicals & Refineries

CLAD & WELD OVERLAY MATERIALS :

BASE MATERIAL	Carbon Steel, Stainless Steel & Low Alloy Steel
CLAD MATERIAL	SS304, SS316L, SS317L, SS410, UNS N0 8825, UNS N0 6625, Hastelloy C22, Hastelloy C276, Hastelloy B3, UNS N0 4400
WELD OVERLAY MATERIAL	ER410S, 430, ER308L, 309L, ER309LMO, 316L, 317L, UNS N0 8825, UNS N0 6625, Hastelloy C22, Hastelloy C276, Hastelloy B3, UNS N0 4400

TYPES OF CLADDING PROCESS :

Weld Overlay :

Weld overlay is a fusion welding technique used to deposit weld metal on to component to achieve the desired dimensions or properties replacing lost material or providing a wear or corrosion resistance surface.

Explosion Bond :

Explosion bonding is a process of bonding two dissimilar materials with the help of pressure and heat produced by explosion. The explosive material is spread on the material to be cladded which is kept on top of the base material. On ignition of the explosive, resultant thrust bonds the clad plate on the base plate kept underneath. Various combination of clad plate and base plate thickness can be bonded, depending on the job requirements.



CLADDED PIPES, FITTINGS & FLANGES



Crystal offers following cladded & weldoverlayed components of various sizes & thicknesses with cladding by weld overlay or explosion bonding :

PIPES	DIAMETER	THICKNESS	CLAD / WELDOVERLAY THICKNESS
Welded Pipes	2" NB to 42"NB	Minimum 7mm & above	1.5 mm to 4.5 mm
Seamless Pipes	2" NB to 42"NB	Minimum 7mm & above	
FITTINGS	SIZE	THICKNESS	WELDOVERLAY THICKNESS
Elbows	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm
Reducers	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm
Tees	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm
Weldolets	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm
Sockolets	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm
FLANGES	SIZE	THICKNESS	WELDOVERLAY THICKNESS
WNRF, BLRF, WNRTJ	2" & above	Minimum 7mm & above	1.5 mm to 4.5 mm (or as req.)
VESSELS & HEADRES	DIAMETER	THICKNESS	WELDOVERLAY THICKNESS
VESSELS	600mm to 3500mm & upto 20mtr. Long	Minimum 7mm & above	1.5 mm to 4.5 mm



WELD SURFACING AND OVERLAY



Crystal has developed extensive range of procedures and techniques for weld overlay applications for the Oil & Gas, Petrochemical and Refineries .

To cater to the needs of its clients for weld overlayed items, Crystal has indigenous Automatic Overlaying Machines and Endless Torch Rotation (ETR) welding machine from Fronius which has advantage of overlaying on 3D curved surfaces.

The ETR-S combines the features of the conventional TIG Hot Wire Cladding System as regards weld quality, functionality and software features.

Function of Arc Voltage Control (AVC) aids in deposition of uniform thickness of weld overlay on various surfaces

Salient features of ETR-S

Maximum Bore Depth	: upto 4m
Weldable Bore Dia.	: 45 to 320mm
Welding Speed	: 340 to 450mm/min.
Deposition Rate	: 1.7 to 2.5kg/hr

Automatic Overlaying Machines (3 Nos.)

Maximum Bore Depth	: upto 3 mtrs
Weldable Bore Dia.	: 100 to 1000mm
Welding Speed	: 100 to 250mm/min.
Deposition Rate	: 1 to 2 kg/hr

Pipe ID overlaying Machine:

Maximum Pipe Length	: 1 2 mtrs
Size	: 200 to 1000mm



QUALITY CONTROL SYSTEM



FOR Clad Fabrication :

- Internal Ultrasonic Testing of plate before fabrication.
- Cleaning of clad surface after forming of head before heat treatment if required
- Heat treatment in electric or gas fired furnace in controlled atmosphere to avoid any Contamination and to prevent oxidation of surfaces.
- Ultrasonic testing of formed components for de-bond check between clad and base material.
- NDE testing, Radiography, Hydro test & PMI check

FOR Weld Overlayed Items

- Prior to overlay, grinding, cleaning and dye penetrant testing of surface of base material to be overlayed
- Overlaying as per qualified welding procedure.
- Dye penetrant testing of overlayed surfaces.
- Ultrasonic Testing from opposite surface for checking un-fused / disbond areas.



**Crystal
industrial**

QUALITY CONTROL SYSTEM

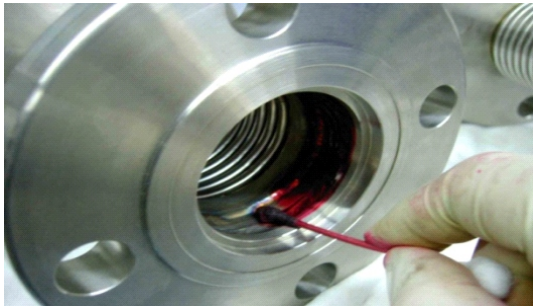
Crystal follows stringent quality control system so that all the parameters are complied and customer get high quality product:



ULTRASONIC TESTING



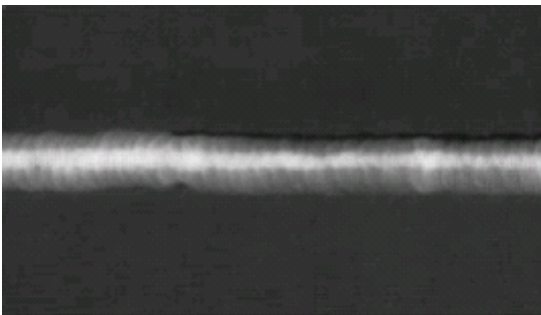
HARDNESS TESTING



DYE PENETRANT TESTING



MAGNETIC PARTICLE INSPECTION



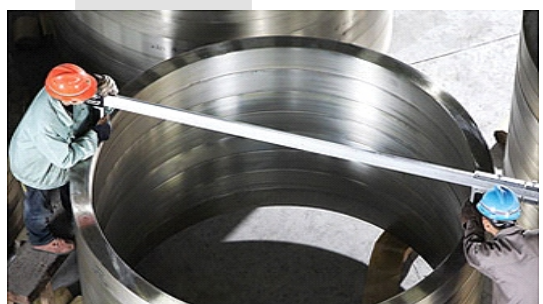
RADIOGRAPHY



HYDROTESTING



POSITIVE MATERIAL IDENTIFICATION



DIMENSIONAL INSPECTION

CERTIFICATIONS



- ✓ ISO 9001 : 2008 Certificate
- ✓ ISO 14001:2004 Certificate
- ✓ OHSAS 18001 : 2007 Certificate
- ✓ ASME Stamp Certificate
- ✓ National Board Registration
- ✓ IBR Approved

CLIENTS



Saipem



AKER KVAERNER



JACOBS ENGINEERING
Engineering at its best





**U
AUTHORIZED**



M E T A L C L A D D I N G

Regd. Office : 403,404,412, Raheja Arcade, Sector No. 11,
CBD Belapur, Navi Mumbai – 400614 .
Maharashtra, India.

Tel. : +91 22 6511 3814 / 3815

Fax : +91 22 6793 9439

Email : info@crystalindustrial.in

Web site : www.crystalindustrial.in

