

MAXCLAD™ is manufactured with high quality materials as a bulk overlay of high chromium, high carbon, tungsten alloy onto a base plate utilising submerged arc welding — a wear resistant plate for material handling applications where fine particle abrasion is present.

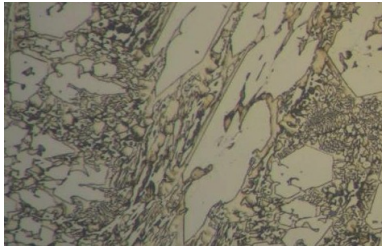
Specification

MAXCLAD™ overlay is manufactured to ensure compliance with the microstructure, chemistry, hardness and dry abrasion test values for specific customer requirements.

Microstructure: Each MAXCLAD™ grade has a distinct overlay microstructure:

MAXCLAD 6000

Primary M_7C_3 carbides and fused WC in a eutectic matrix of austenite and eutectic M_7C_3 carbide.



MAXCLAD 8000

Higher tungsten chemistry with a dense dispersion of fused WC filling the inter-carbide spacing.

Micrograph — MAXCLAD 8000

Chemical Composition: A typical deposit consists of the chemistry limits (%) shown below.

Grade	C	Cr	W	Si <	Bal.
MAXCLAD 6000	4.4–7.5%	23–35%	2–7%	0.9%	Fe
MAXCLAD 8000	3.5–7.0%	23–35%	3–7%+	0.9%	Fe

Typical Properties

Property	MAXCLAD 6000	MAXCLAD 8000
Duty	Fine particle abrasion & impact	Most severe erosive duties
Bulk hardness	>700 HV30	on request
Primary M_7C_3 carbide	~1500 HV0.5	~1500 HV0.5
Primary carbide volume fraction	20–40%	25–45%
Total carbide volume (incl. WC)	>37%	>45%
Abrasion resistance (ASTM G65-04 Proc. A)	<0.15 g	on request
Temperature range	up to 595 °C	up to 595 °C
Impact resistance	Continuous impact	Continuous impact

Plate Characteristics: The overlay surface consists of welded beads of varying widths with relief check cracks evenly dispersed that protrude to the backing plate only; these check cracks assist in thermal expansion and contraction of the plate in service.

Flatness: Within 1 mm over 300 mm and within 5 mm over 1000 mm.

Surface Roughness: Standard smooth finish $Ra < 7 \mu m$; Ultra Polish $Ra < 0.5 \mu m$ (if requested).

Density: *Average is $\sim 7440 \text{ kg/m}^3$. (*Varies depending on proportion of overlay to backing plate.)

Base Plate: The standard base material is mild steel plate of varying thickness, ensuring the finished parts are readily weldable. Alternative base plate grades can be incorporated with the MAXCLAD™ overlay to meet specific customer requirements.

Cutting

Plate is preferably cut with plasma arc — 200 A is sufficient to cut most available thicknesses. All cutting should be performed from the mild steel side to eliminate carbon contamination of the backing plate. Other suitable methods include arc air / carbon arc, abrasive disc, water jet and abrasive saw.

Machining

Plate can be surface ground using an abrasive grinding disc only.

Cold Forming

Roll or press MAXCLAD™ perpendicular to the weld bead direction. A wide-set bottom die with rounded corners and a rounded press tool should always be used. Minimum bending radius is 75 mm for thin overlays and 1000 mm for thicker overlays — please consult your QAME technical expert, as specific methods can be adopted during manufacture to ensure a quality formed product.

Forming plate with the overlay on the outside will place the hardface layer in tension; surface cracks will open up, requiring repair.

Welding

Backing plate side — Use low hydrogen electrode or MIG wire. Weld size must not exceed the thickness of the backing plate. Where the weld would exceed the backing plate thickness, use an ER307 consumable with Argoshield 69 shielding gas.

Hardface side — Use QARC™ 6000 hardfacing wire.

Attachment Methods

MAXCLAD™ can be attached using the following methods:

- Plug weld holes
- Countersink, counterbore, taper and tapped holes
- Threaded studs
- Perimeter fillet weld