

# DC ECI90 CHROMIUM CARBIDE OVERLAY TECHNICAL DATA SHEET

## ECI90

Is manufactured with high quality materials as a bulk overlay of high chromium, high carbon alloy onto a base plate utilising submerged arc welding to achieve a wear resistant plate for use in a variety of material handling applications, where fine particle abrasion is present. **ECI90** is manufacture with a single layer to achieve optimum metallurgical properties.

### SPECIFICATION

**ECI90 overlay** has been manufactured to ensure compliance with the microstructure, chemistry and hardness requirements of AS/NZS 2576:2005 Grade 2560, as per Group 2 Alloys (Table 2.2) Type 25 alloy matrix.

### MICROSTRUCTURE

The **ECI90 overlay** consists of primary  $M_7C_3$  carbides in a eutectic matrix of martensite and eutectic  $M_7C_3$  carbide.

### CHEMICAL COMPOSITION

A typical deposit consists of the following chemistry limits.

Cr = 21-35      C = 4.0-6.5      B = 2 max Fe      and others = Balance

### TYPICAL PROPERTIES

Bulk Hardness:	700 - 780 HV30 (60 - 64 HRC)
Primary $M_7C_3$ carbide:	~1500 HV <sub>0.5</sub>
Volume fraction Primary Carbides:	25% to 40%
Temperature range:	up to 150°C

### IMPACT RESISTANCE

**ECI90** is not recommended for continuous impact

### PLATE CHARACTERISTICS

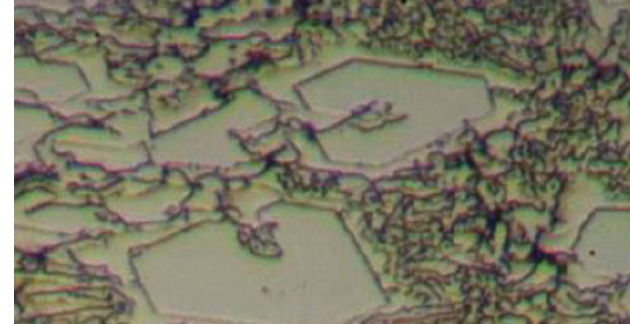
The overlay surface consists of welded beads (of varying widths) with relief check cracks evenly dispersed that protrude to the backing plate only. These check cracks assist in thermal expansion and contraction of the plate in service.

### FLATNESS (PLATES)

Within 1mm over 300mm and within 5mm over 1000mm

### SURFACE ROUGHNESS

Standard smooth Finish Ra <7 µm, Ultra Polish Ra <0.5 µm



### DENSITY

- \* Average is 7700 Kg / m<sup>3</sup>
- \* This changes 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 **ECI90 overlay** to meet specific customer requirements.

### CUTTING

Plate is preferably cut with plasma arc. A 100amp to 200amp is sufficient to cut most thickness's available. All cutting should be from the mild steel side to eliminate carbon contamination of the backing plate. Other methods used to cut the plate are Arc Air or Carbon Arc, Abrasive Disc, water Jet and abrasive saw.

### MACHINING

Plate can be surface ground using abrasive grinding disc only.



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## COLD FORMING

When cold forming it is recommended that pressing be perpendicular to the weld bead direction. Rolling can be done in any direction. A wide set bottom die with rounded corners should always be used and rounded press tool. Minimum bending radii for thin overlays is 75mm and thicker overlays is 1000mm.

Please consult your **DGC AFRICA** Technical expert for details as specific methods can be adopted during manufacture to ensure quality formed product can be produced. Forming plate with the overlay on the outside will place the hardface layer in tension and surface cracks will open up requiring repair.

## WELDING

### BACKING PLATE SIDE

Use low hydrogen electrode or mig wire.

This must not exceed the thickness of the backing plate.

Where the weld would exceed the thickness of the backing plate use a ER307 consumable with Argoshield 69 shielding gas.

### HARDFACE SIDE

Use **ECI90** wire.

## ATTACHMENT METHODS

- **ECI90** can be attached using the following methods.
- Plug weld holes.
- Countersink, Counter bore holes , Taper Holes and Tapped holes.
- Threaded Studs.
- Perimeter fillet weld.



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