

# CHROME CARBIDE OVERLAY PLATES



**Chromium Carbide Overlay (CCO)** is chromium carbide composite cladding that is fusion bonded to a backing material, which is well known for being one of the most abrasive resistant material. The overlay material is an austenitic chromium carbide iron deposited by an submerged arc welding or open arc welding process, the microstructure consists of primary Cr<sub>7</sub>C<sub>3</sub> carbides in a carbide austenite eutectic matrix. The high abrasion resistance is provided by the hard chromium carbides that protect the matrix from abrasive wear. The standard backing material for CCO is mild steel, the backing plate acts as a ductile base, which offers good impact resistance & toughness and allows CCO to be formed and shaped without damage to the overlay material.

## Standard sizes

Material Grade	Thickness (mm) Base+H/F layer	Composition of key elements(%)	Hardness (HRC)	Standard Size (mm)
Submerged arc welding plates	4+4 (4 on 4)	Cr 27-35, C 3.5-5.0	58-62	1400*3000
	5+5 (5 on 5)	Cr 27-35, C 3.5-5.0	58-62	1400*3000
	6+6 (6 on 6)	Cr 27-37, C 3.5-5.0	58-62	1400*3500
	8+5 (5 on 8)	Cr 27-37, C 3.5-5.0	58-62	1400*3500
	8+6 (6 on 8)	Cr 27-37, C 3.5-5.0	58-62	1400*3500
	8+8 (8 on 8)	Cr 28-38, C 3.5-5.0	58-62	1400*3500
	10+9 (9 on 10)	Cr 30-40, C 4.0-5.5	58-62	1400*3500
	10+9 (9 on 10)	Cr 30-40, C 4.0-5.5	58-62	2100*3500
	10+10 (10 on 10)	Cr 30-40, C 4.0-5.5	58-62	1400*3500
	10+10 (10 on 10)	Cr 30-40, C 4.0-5.5	58-62	2100*3500
	12+7 (7 on 12)	Cr 28-38, C 3.5-5.0	58-62	1400*3500
	12+7 (7 on 12)	Cr 28-38, C 3.5-5.0	58-62	2100*3500
	12+8 (8 on 12)	Cr 28-38, C 3.5-5.0	58-62	1400*3500
	12+8 (8 on 12)	Cr 28-38, C 3.5-5.0	58-62	2100*3500
	12+12 (12 on 12)	Cr 30-40, C 4.0-5.5	58-62	1400*3500
	12+12 (12 on 12)	Cr 30-40, C 4.0-5.5	58-62	2100*3500
	10+15 (15 on 10)	Cr 32-42, C 4.0-5.5	58-62	2000*3500
	10+15 (15 on 10)	Cr 32-42, C 4.0-5.5	58-62	1350*3500
	12+17 (17 on 12)	Cr 35-45, C 4.0-5.5	58-62	2000*3500
12+17 (17 on 12)	Cr 35-45, C 4.0-5.5	58-62	1350*3500	

## Features:

- 1 Above sizes are submerged arc welding plates, open arc welding plates also available upon request
- 2 Other Sizes and Thinkness also available upon request
- 3 Volume percent of Cr<sub>7</sub>C<sub>3</sub> in Microstructure is more than 30%
- 4 Hardness as high as HRC 58-62, hardness equally distributed
- 5 Thickness of overlay material equally distributed, tolerance below 0.5 mm
- 6 Flatness below ±3mm/m
- 7 Welding channels along the length
- 8 Plates can be cut into other sizes/shapes. studs, holes can be added or machined upon request

## Welding:

The base material can be welded with standard mild steel or low hydrogen welding consumables with no pre-heating required. However, care should be taken to avoid contacting the overlay material.

## Cutting:

Plasma cutting is the recommended method for cutting CCO plate. It is preferable to cut CCO from the backing plate side to ensure a clean edge and to prevent carbide contamination.

# CHROME CARBIDE OVERLAY PLATES



## Smooth and Crack-free Chromium Carbide Overlay

CS Wear developed a brand new chromium carbide welding plates with a **smooth surface, crack-free, and no welding beads**, which are made through advanced fusion bond welding technology to apply a highly abrasive resistant chromium carbide on to a steel substrate producing consistent chemistry and microstructure with smooth overlay deposit. The Smooth overlay deposit contains a consistent chemistry and microstructure down to the fusion line. The uniform distribution of chromium rich primary carbides, in a carbide-austenite eutectic matrix, produces a wear plate that obtains high abrasion resistance and excellent impact properties, the Smooth overlay normally has a 2 times wear property than conventional chrome carbide overlay plates, this products developed to meet customer's extra requirement for wear life, when conventional overlay plates can not meet the severe working conditions, or a application that need a smooth wear surface.



## Standard sizes

Material Grade	Thickness/Base+Wear (mm)	Standard sizes (mm)	Chemical Composition(%)	Application
CSW-M30	5+5 (5 on 5)	1000 x 3000	Cr 20-35%, C 2.5-5.0% Nb+Mo+Ti+V+W<1.5% Hardness > 670HV	Suitable for both high wear and impact application
	7+6 (6 on 7)	1000 x 3000		
	9+8 (8 on 9)	1000 x 3000		
	9+10 (10 on 9)	1000 x 3000		
	11+10 (10 on 11)	1000 x 3000		
	11+12 (12 on 11)	1000 x 3000		
CSW-M70	9+8 (8 on 9)	1000 x 3000	Cr 18-28%, C 2.5-5.0% Nb+Mo+Ti+V+W: 7.0-10% Hardness > 670HV	Suitable for both extreme wear and impact application
	11+10 (10 on 11)	1000 x 3000		
	11+12 (12 on 11)	1000 x 3000		
	11+17 (17 on 11)	600 x 3000		
	11+20 (20 on 11)	600 x 3000		
	13+24 (24 on 13)	600 x 3000		

**Note:** Other sizes also available upon confirmation

## Features:

- 1 Hardness: >670HV (60-64HRC)
- 2 Smooth surface, crack-free, no welding beads, low friction, excellent for reducing hang up or carry back
- 3 Plates are made by single pass overlay using carbide dispersion distribution technology, uniform microstructure and hardness equally distributed
- 4 2 times wear property than conventional overlay plate based on our experience
- 5 Depth of fusion dilution: around 0.5mm, very low overlay dilution with backing plate
- 6 Primary carbide volume: >37%
- 7 Flatness: ±2.5mm per 1.5 linear metres
- 8 Operating temperature < 600°C
- 9 Plates can cut into other sizes/shapes upon request. studs, holes can be added or machined