

# 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 a 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)
CSW60-S (Submerged arc welding plate)	4+4 (4 on 4)	Cr 25-35, C 3.5-5.0	58-63	1400x3000
	5+5 (5 on 5)	Cr 26-35, C 3.5-5.0	58-63	1400x3000
	6+6 (6 on 6)	Cr 27-37, C 3.5-5.0	58-63	1400x3500
	8+5 (5 on 8)	Cr 26-35, C 3.5-5.0	58-63	1400x3500
	8+6 (6 on 8)	Cr 27-37, C 3.5-5.0	58-63	1400x3500
	8+7 (7 on 8)	Cr 27-37, C 3.5-5.0	58-63	1400x3500
	8+8 (8 on 8)	Cr 28-38, C 3.5-5.0	58-63	1400x3500
	10+10 (10 on 10)	Cr 30-40, C 4.0-5.5	58-63	1400x3500
CSW60-O (Open arc welding plate)	12+12 (12 on 12)	Cr 30-40, C 4.0-5.5	58-63	1400x3500
	3+3 (3 on 3)	Cr 18-23, C 4.5-7.5	58-63	1000x3000
	5+5 (5 on 5)	Cr 20-25, C 4.5-7.5	58-63	1480x3000
	6+4 (4 on 6)	Cr 18-23, C 4.5-7.5	58-63	1480x3000
	6+6 (6 on 6)	Cr 22-27, C 4.5-7.5	58-63	1480x3000
	8+4 (4 on 8)	Cr 18-23, C 4.5-7.5	58-63	1480x3000
	8+5 (5 on 8)	Cr 20-25, C 4.5-7.5	58-63	1480x3000
	8+6 (6 on 8)	Cr 22-27, C 4.5-7.5	58-63	1480x3000
	8+7 (7 on 8)	Cr 22-27, C 4.5-7.5	58-63	1480x3000
	8+8 (8 on 8)	Cr 24-29, C 4.5-7.5	58-63	1480x3000
10+10 (10 on 10)	Cr 25-30, C 4.5-7.5	58-63	1480x3000	

## Features:

- Other sizes and thicknesses also available upon request
- Volume percent of Cr<sub>7</sub>C<sub>3</sub> in Microstructure is more than 35%
- Hardness as high as HRC 58-63, hardness equally distributed
- Thickness of overlay material equally distributed, tolerance below 0.5 mm
- Flatness below ±3mm/m
- Welding channels of submerged arc welding plates are along the length, welding channels of open arc welding plates are along the width
- 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:

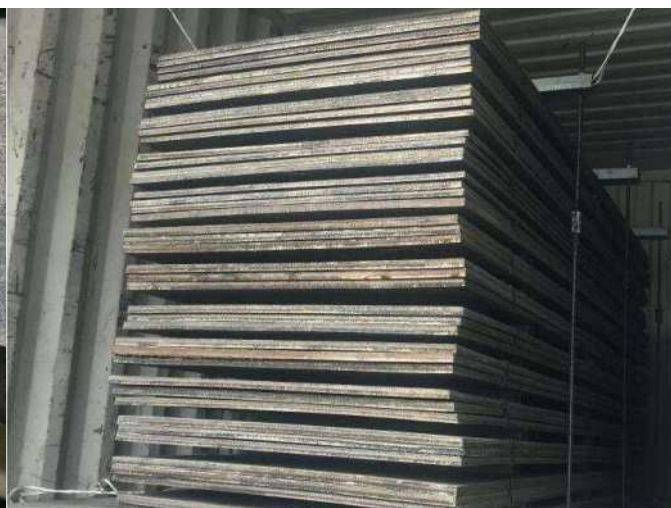
Plasma cutting is the recommended method for cutting CCO plate. It is preferable to cut CCO from the backing plate side to ensure a clean edge and to prevent carbide contamination.

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## Smooth and Crack-free Overlay Plates

CS Wear developed a brand new chromium carbide welding plates with a **smooth surface, crack-free, and no visible welding beads**, which are made through a distinctive 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 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 product developed to meet customer's extra requirement for wear life when conventional overlay plates can not meet the severe working conditions or an application that needs a smooth wear surface.



## Standard sizes

Material Grade	Thickness/Base+Wear(mm)	Standard sizes (mm)	Chemical Composition (%)	Application
M30	5+5 (5 on 5)	1000 x 3000	Cr 20-35%, C 2.5-5.0%, Mn<1.5% Si<1.2%, B<0.6% S< 0.033%, P<0.033% Nb+Mo+Ti+V+W<1.5% Hardness >670HV (60-64hrc)	Combination of excellent wear resistance and medium impact resistance
	6+6 (6 on 6)	1000 x 3000		
	8+8 (8 on 8)	1000 x 3000		
	10+10 (10 on 10)	1000 x 3000		
	12+12 (12 on 12)	1000 x 3000		
	13+17 (17 on 13)	1000 x 3000		
	13+20 (20 on 13)	1000 x 3000		
M70	10+10 (10 on 10)	1000 x 3000	Cr 18-28%, C 2.5-5.0%, Mn<1.5% Si<1.2%, B<0.4% S< 0.033%, P<0.033% Nb+Mo+Ti+V+W: 7-10% Hardness >670HV (60-64hrc)	Combination of excellent wear resistance and ultra high impact resistance
	12+12 (12 on 12)	1000 x 3000		
	13+17 (17 on 13)	1000 x 3000		
	13+20 (20 on 13)	1000 x 3000		
	13+25 (25 on 13)	1000 x 3000		

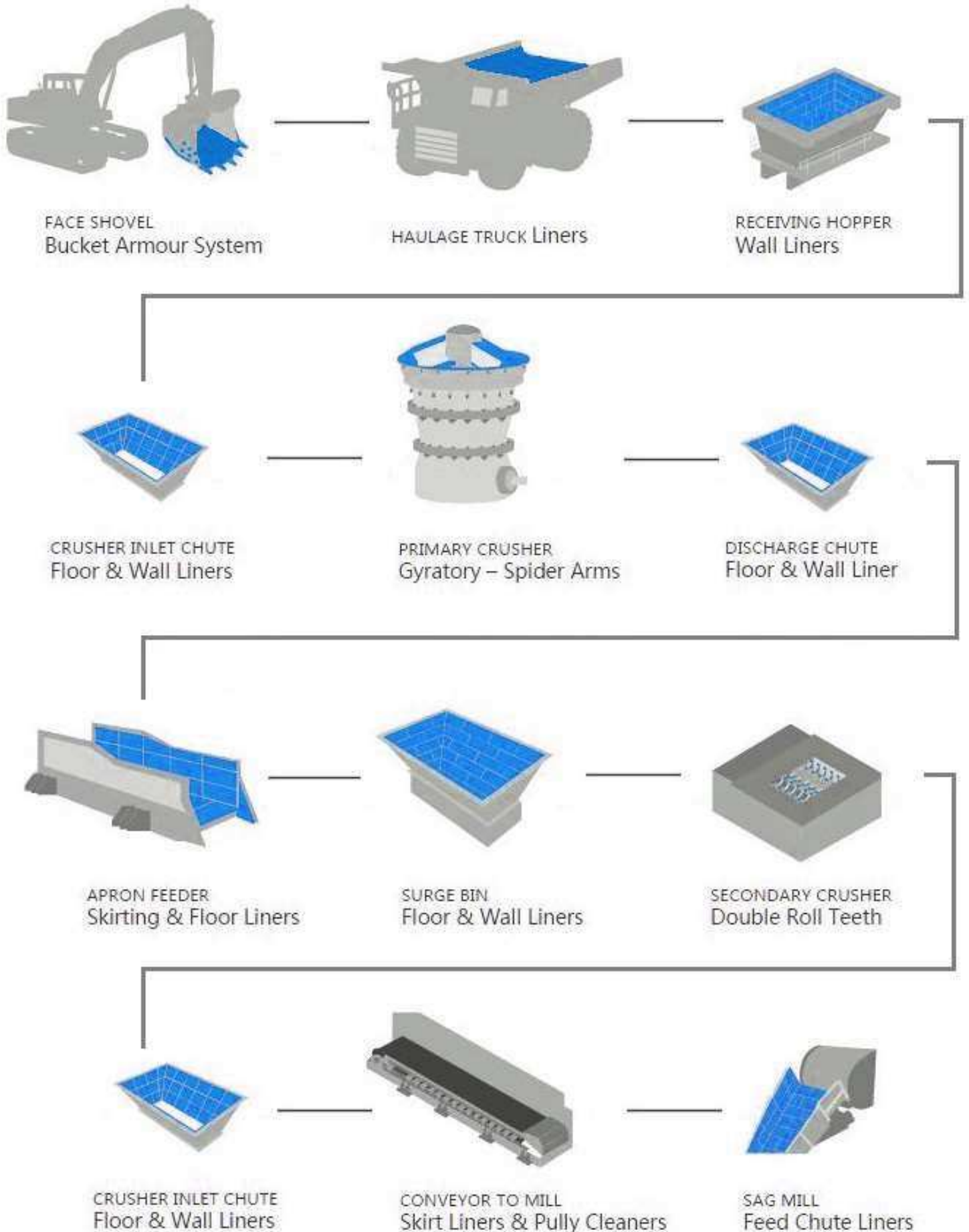
## Features:

- 1 Smooth surface, crack-free, no visible welding beads, low friction, excellent for reducing hang up or carry back
- 2 Plates are made by single pass overlay using carbide dispersion distribution technology, uniform microstructure and hardness equally distributed
- 3 2 times wear property than conventional overlay plate based on our experience
- 4 Depth of fusion dilution: around 0.5mm, very low overlay dilution with backing plate
- 5 Primary carbide volume: >37%
- 6 Flatness: ±2.5mm per 1.5 linear meters
- 7 Operating temperature: M30 < 500°C, M70< 600°C
- 8 1200x3000mm also available upon request, plates can be cut into other sizes/shapes upon request, studs and holes can be added or machined

# CHROME CARBIDE OVERLAY PLATES

## APPLICATIONS:

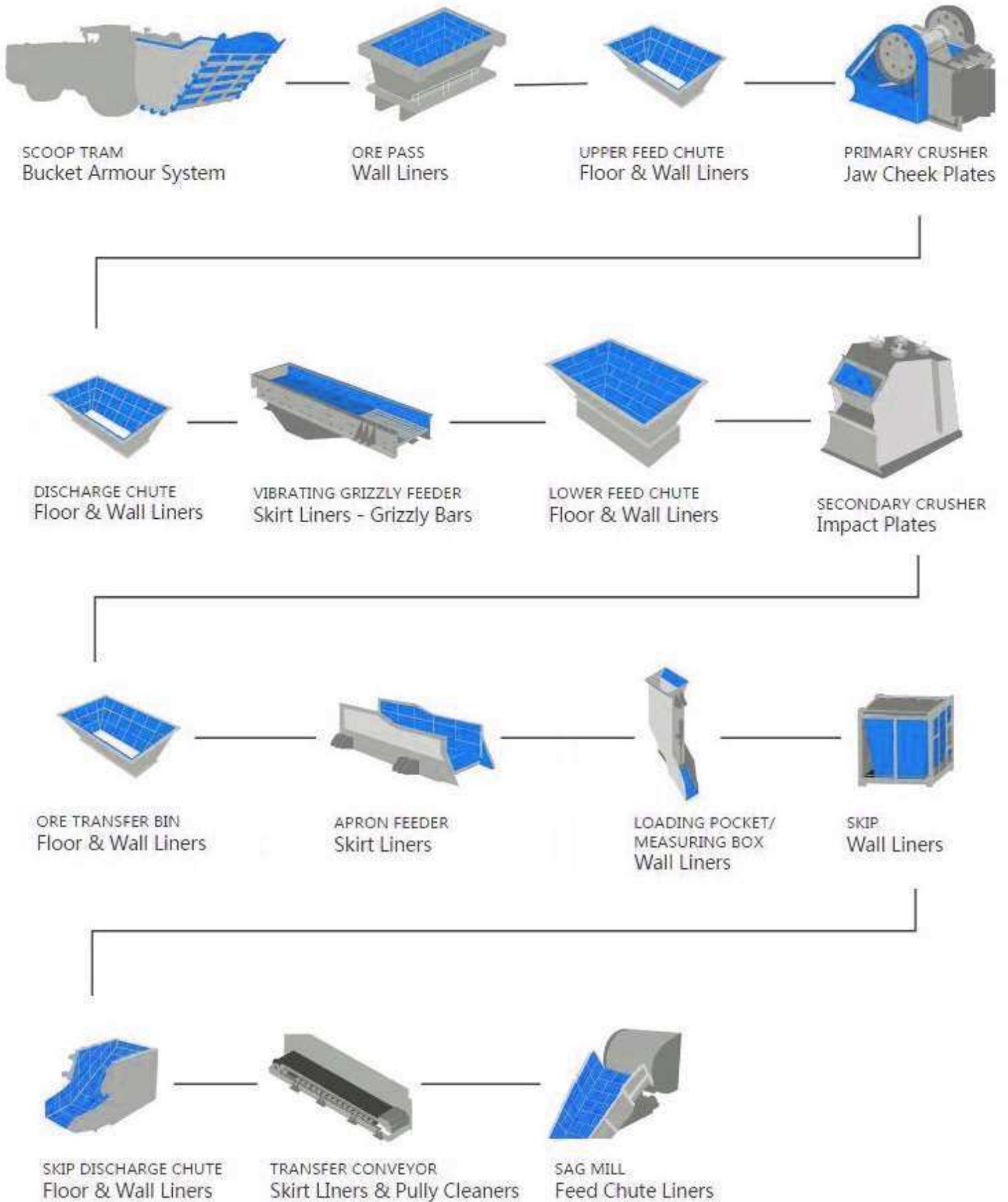
### Open Pit Mine Ore Flow



# CHROME CARBIDE OVERLAY PLATES

## APPLICATIONS:

### Underground Mine Ore Flow



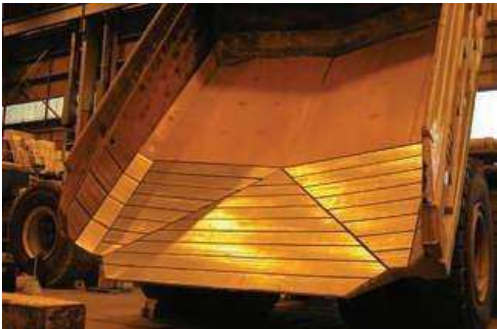
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## APPLICATION PHOTOS

Wear linings, chute liners, hopper liners



Truck Body Liner



Bucket and Shovel Liners



Dozer Liner

