And Carbide Overlay- UHMW PLASTIC





Amera-Braze[®] 420

Amera-Braze 520

Ameralloy Plate And Strip

Ameralloy AR

American-50[™]

Amera-Mang[™]

Dura-Lugg™

Amera-Plex[™] Polyethylene

Amera-Thane[™] Polyurethane

Amera-Plex Mine Plate

Double-C[®] Chromium Carbide Overlay

Amera-Braze 420 ULTRA HIGH IMPACT ALLOY





Features And Advantages

- Ultra-high wear resistance
- Heat treated, quenched, and tempered to a high Brinell hardness
- Excellent weldability
- Depth hardened
- Fine grain structure
- High tensile strength
- Corrosion resistance six times greater than mild steel
- Can be formed, rolled, and drilled
- Abrasion, impact, and wear properties retained at weld joints

Amera-Braze 420 by Ameralloy is a heat treated, ultra-high impact and abrasion resistant alloy steel plate and strip. With a combination of excellent toughness and high hardness, Amera-Braze 420 has the capability to resist shock, impact, abrasion, stress, and vibration.

Because of its high strength formulation, a reduction of dead weight is achieved by using Amera-Braze in half the thickness of the original chute, liner, or wear area.

Ту	pic	al M	echan	ical I	Prope	rties	

Tensile strength psi	198,000
Yield point psi	165,000
Elongation in 2"	16%
Reduction of area	52%
Brinell hardness	390–420
Rockwell C hardness	39–46

Welding

Use low hydrogen high tensile electrodes: AWS specification E100XX, E110XX, or E120XX electrodes.

- Carbon .18/.28
- Manganese 1.15/1.50
- Silicon .20/.35
- Molybdenum .08/.28
- Aluminum .03 max.
- Typical Analysis May Vary By Heat Lot

- Chromium .40/1.00
- Nickel .25 max.
- Boron .0005 min.
- Phosphorus .025 max.
- Sulfur .040 max.

nera-Braze 420 **ULTRA HIGH IMPACT ALLOY**





Applications

- Agricultural types
- Agitator paddles
- Arms for lift trucks
- Backup plates
- Baffle plates
- Bucket lips
- Bulldozer blades
- Car plates
- Chain links
- Chain slide runners
- Chutes:
- Coal
- Coke
- Glass
- Grain
- Gravel
- l imestone Ore

- Refuse Rock
- Sand

Slag

- Slate

- Coke bins

- lips
- Concrete mixer liners
- Concrete pipe liners
- Deck plates
- Dredge pump liners
- Drag line buckets

- Dipper sticks
- Dump truck beds
- Eye bars
- Fan blades/housings
- Flotation plates
- Flume liners
- Funnels
- Furnace liners
- Grader blades
- Hoppers
- Launder plates
- Loaders
- Log-washer paddles
- Muller bottoms
- Mixers
- Oscillator Liners
- Ore car bodies/liners
- Ore pocket liners

- Pressure plates
- Scrap baler liners
- Scraper blades
- Shakeout liners
- Shot-blast liners
- Skip cars and liners
- Sluice plates
- Spiral castings
- Transfer car liners
- Truck box liners
- Vibrators
- Wear bars
- Wear plates
- Wearing strips
- Wheelabrator end plates

Available Sizes

Amera-Braze 420 Plates

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" 2-1/2" 3" Thicknesses over 3" upon request Widths: 48" 60" 72" 84" 96" or burned to your specifications Lengths: 96" 120" 144" 240" 288" or burned to your specifications

Amera-Braze 420 Wear Strips

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" Thicknesses over 2" burned to your specifications Widths: Burned to your specifications Lengths: Maximum of 24'

Fabrication & Machining

Forming, rolling, punching, and perforating to your specifications

- Classifier screens
- Conveyor buckets
- Crusher hammers
- Clam shell bucket

- Doors

Amera-Braze[®] 520 ABRASION RESISTANT ALLOY





Amera-Braze 520 is a heat treated, abrasion resistant alloy steel plate and strip. With a combination of excellent toughness and high hardness, a reduction of dead weight can be achieved by using Amera-Braze 520 in half the thickness of the original chute, liner, or wear area.

Typical Mechanical Properties

Tensile strength psi

Yield point psi

Elongation in 2"

Reduction of area

Brinell hardness

245,000

230,000

9%

40%

480-520

Features And Advantages

- Ultra-high wear resistance
- Heat treated, quenched, and tempered to a high Brinell hardness
- Good weldability
- Depth hardened
- Fine grain structure
- High tensile strength
- Corrosion resistance six times greater than mild steel
- Reduces dead weight

Welding

Use low hydrogen high tensile electrodes: AWS specification E100XX, E110XX, or E120XX electrodes. • Preheat to 300°–500°F on plates over 1/2" in thickness.

> Consult Ameralloy plant for welding and fabrication information. Special forming and fabrication procedures required.







Applications

- Backup plates
- Baffle plates
- Bucket lips
- Car plates
- Chain links
- Chain slide runners
- Chutes:
- Coal
- Coke
- Glass
- Grain
- Gravel
- Limestone
- Ore

Rock

Refuse

- Sand Slag Slate
- Classifier screens
- Coke bins
- Conveyor buckets
- Clam shell bucket lips
- Concrete pipe liners
- Deck plates
- Doors
- Dredge pump liners
- Drag line buckets
- Dipper sticks
- Dump truck beds
- Eye bars

- Fan blades & housings
- Flotation plates
- Flume liners
- Furnace liners
- Hoppers
- Launder plates
- Loaders
- Log-washer paddles
- liners
- Ore pocket liners

- Scrap baler liners
- Shakeout liners
- Skip cars and liners
- Sluice plates
- Transfer car liners
- Truck box liners
- Vibrators
- Wear bars
- Wear plates
- Wearing strips
- Wheelabrator end plates

Available Sizes

Amera-Braze 520 Plates

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" 2-1/2" 3" Thicknesses over 3" upon request Widths: 48" 60" 72" 84" 96" or burned to your specifications Lengths: 96" 120" 144" 240" 288" or burned to your specifications

Amera-Braze 520 Wear Strips

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" Thicknesses over 2" burned to your specifications Widths: Burned to your specifications Lengths: Maximum of 24'

- - Pressure plates
- Muller bottoms Mixers
 - Oscillator Liners • Ore car bodies &

Ameraloy PLATE AND STRIP





Ameralloy Plate And Strip is a medium manganese, heat treated, quenched and tempered alloy. Our balanced alloy content gives Ameralloy Plate And Strip excellent weldability and good resistance to atmospheric corrosion, when compared to original equipment and mild steel.

Features And Advantages

- Work hardening
- Reduction in dead weight
- Can be drilled with standard high speed tooling
- Excellent weldability
- Moderate cold forming
- Maximum resistance to impact and abrasion
- High tensile strength

Typical Mechanical Properties		
Tensile strength psi	190,000	
Yield point psi	156,000	
Elongation in 2"	14%	
Reduction of area	52%	
Brinell hardness	400	
Rockwell C hardness	42	

Welding

Use low hydrogen high tensile electrodes: AWS specification E100XX, E110XX, or E120XX electrodes.

- Carbon .10/.20
- Manganese 1.70 max.
- Silicon .10/.70
- Molybdenum .70 max.

Typical Analysis May Vary By Heat Lot

- Chromium 1.00 max.
- Boron .001/.005
- Phosphorus .020 max.
- Sulfur .010 max.

PLATE AND STRIP



- Agricultural discs
- Agricultural shoes
- Agitator paddles
- Anchors
- Baffle plates
- Bucket lips
- Bulldozer blades
- Car axles
- Car plates
- Cute liners
- Coke chutes
- Concrete mixer liners
- Concrete pipe liners
- Bucket lips
- Conveyor buckets
- Crusher hammers
- Dipper sticks
- Drag buckets

- Dredge pipes
- Dredge pump liners
- Dump truck beds
- Dust collectors
- Fan blades/housings
- machines
- Funnels
- Furnace liners
- Grader blades
- Grain chutes
- Grain mill hammers
- Gravel chutes

- Lawnmower cutter

- Limestone chutes
- Lift forks
- Liners
- Loaders
- Mixers
- Muller bottoms
- Ore chutes
- Ore spouts
- Ore washers
- Pangborn parts
- Picking tables
- Rock chutes
- Sand chutes
- Scrap baler liners
- Scraper blades
- Shear handles
- Shakeout liners
- Shaker plates

- Shot blast liners
- Shovel booms
- Shovels
- Skip liners
- Slag chutes
- Slate chutes
- Sluice ways
- Spouts
- Stabilizing bars
- Trailer bodies
- Truck box liners
- Vibrators
- Wheelabrator parts
- Wrenches
- Wear plates

Available Sizes

Ameralloy Plates

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" 2-1/2" 3" Thicknesses over 3" upon request Widths: 48" 60" 72" 84" 96" or burned to your specifications Lengths: 96" 120" 144" 240" 288" or burned to your specifications

Ameralloy Wear Strips

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" Thicknesses over 2" burned to your specifications Widths: Burned to your specifications Lengths: Maximum of 24'

Fabrication & Machining

Forming, rolling, punching, and perforating to your specifications

- - Hoppers
 - Launder plates
 - bars

• Flotation plates • Foundry shakeout

Ameraloy AR MACHINABLE ALLOY





Features And Advantages

- Easy to form–press brake 80° to 90° angles
- Machineability 75% compared to B-1112
- Impact resistant
- Wear resistant
- Medium hardness
- Shearing and punching in thicknesses up to 3/8"

Typical Mechanical PropertiesTensile strength psi140,000Yield point psi130,000Elongation in 2"16%Reduction of area45%Brinell hardness250–310Rockwell C hardness30–32

For applications where extensive forming is required. Ameralloy AR also provides good weldability, good machineability, while maintaining its abrasion and impact

resistance.

Welding

• Preheating not required in thicknesses up to 1/2".

Available Sizes

Ameralloy AR Plates

Thickness: 3/16" 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" 2-1/2" 3" Thicknesses over 3" upon request Widths: 48" 60" 72" 84" 96" or burned to your specifications Lengths: 96" 120" 144" 240" 288" or burned to your specifications

American-50 PLATE AND STRIP



130,000

90,000

16%

220-260

A medium range abrasion resistant plate for economy-minded applications, where the cost of initial materials and the reduction of downtime are important factors. Excellent weldability and workability make American-50 well suited to applications requiring quality materials at a significantly reduced cost.

Features And Advantages

- Excellent weldability
- Economical alternative to high cost AR plate
- Can be rolled and formed with ease
- Can be drilled and flame-cut with ease
- Abrasion resistant

Use 7016 or 8016 electrodes

- Asphalt plug mill liners
- Bucket lips
- Chute liners
- Clam shell bucket lips
- Concrete mixer liners
- Concrete pipe liners
- Conveyor buckets

- Conveyor flights

- Dust collector pipe

- Hoppers
- Ore trays
- Pan liners
- Plug mill mixer liners
- Screens
- Skip tub liners
- Skirt plates

Spades

Typical Mechanical Properties

Tensile strength psi

Yield point psi

Elongation in 2"

Brinell hardness

- Spouts
- Troughs
- Vibrating
 - conveyors

Available Sizes

American-50 Plates

Thickness: 1/8" through 8" Widths: 48" 60" 72" 84" 96" or burned to your specifications Lengths: 96" 120" 144" 240" 288" or burned to your specifications

American-50 Wear Strips

Thickness: 1/8" 3/16" 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" 1-1/2" 1-3/4" 2" 2-1/2" Thicknesses over 2-1/2" burned to your specifications Widths: Burned to your specifications Lengths: Maximum of 24'

Fabrication & Machining

Forming, rolling, punching, and perforating to your specifications

- Cylinders
- Dredge pipes
- sections
- Fan housings
- Flume liners
- Funnels

Amera-Mang





Amera-Mang is a balanced chemistry, high manganese (11–14%) work hardening alloy. Amera-Mang is specially formulated for high impact, extreme abrasion applications such as drag lines, dipper buckets, rock crushers, and shot and blast cleaning equipment.

Typical Mechanical Properties		
Tensile strength psi	140–170,000	
Yield point psi	120–135,000	
Elongation in 2"	11–19%	
Reduction of area	20–24%	
Brinell hardness	230–255	
Work hardens to	550–650 BHN	

Features And Advantages

- Non-magnetic
- High impact resistance
- Work hardening
- Self polishing
- Easy to torch cut and weld

Available Sizes

Amera-Mang Plates Thickness: 3/16" 1/4" 3/8" 1/2" 3/4" 1" 1-1/4" 1-1/2" 2" Widths: 48" 60" 72" Lengths: 120" 144" 240"

Amera-Mang Rounds

Diameter: 3/8" through 7" Standard Lengths: 20' R/L

Amera-Mang Strips

Cut to your specified length and thickness

Dura-Lugg FOUR-WAY PLATE





Dura-Lugg Four-Way Plate is a balanced alloy of manganese-chromium-vanadium combined in an extremely tough heat treated condition with high Brinell hardness. Dura-Lugg is suited for applications where lugs assist in deflecting abrasive particles off of fan blades, resulting in the elimination of straight-line wear and wash-out problems. Dura-Lugg offers excellent corrosion resistance properties considerably higher than structural carbon steels. It is also frequently specified to reduce the high cost of hard-facing or hard-surfacing.

Applications

- Fan blades
- Pulverizing equipment
- Ore handling equipment
- Pulverizing floats
- Coal handling equipment
- Ash handling equipment
- Rotor blades

Available Sizes

Dura-Lugg Plates Thickness: 1/4" 3/8" 1/2" Widths: 48" 72" Lengths: 120" 144"

Fabrication & Machining Forming, rolling, drilling, countersinking to your specifications

Typical Mechanical Properties		
Tensile strength psi	190,000	
Base plate hardness	350–360 BHN	
Lug hardness	390–410 BHN	

Amera-Plex ultra-high molecular weight polyethylene



Amera-Plex reduces maintenance problems with increased cost savings wherever excessive wear problems occur due to sliding action. Amera-Plex provides a cling-free surface, eliminating material buildup and corrosive action.



Features And Characteristics

High abrasion resistance

- Outwears AR steel 3 to 4 times longer
- Outwears stainless steel 6 times longer
- Outwears carbon steel 8 to 10 times longer
- Outwears Nylon, Teflon, Delrin, Nylatron

Resists fatigue

- No cracking when subjected to high mechanical stress or temperature variations
- Zero moisture absorption

Chemically inert

• Resists all acids, alkalies, and corrosive conditions

Lightweight, easily fabricated

- 1/8 the weight of steel
- Use standard wood or metal working tools to saw, turn, plane, drill, pierce, or mill

FDA And USDA Approved

- Odor-free
- Taste-free
- Noncorrosive
- Food industry approved for abrasion and chemical applications

High notch impact strength

- Retains excellent impact strength despite sub-zero temperatures or repeated impact of blunt medium
- Work hardens with repeated abuse

Superslippery

- Material will not stick, freeze, cake, or cause bridging
- Self-lubricating
- Low coefficient of friction
- Materials able to move faster in chutes

Electrical/Noise insulator

- Eliminates static charge buildup
- Reduces decibel level compared to steel

Available Sizes

Amera-Plex Sheets Thickness: 1/8" thru 5" Width/Length: 48" x 96" or 48" x 120"

Amera-Plex Rods Diameter: 1/2" thru 6" (in 1/4" increments) Length: 10'

Amera-Plex Bars Thickness: 1/4" x 4" Width: 1/2" x 24"

Tubing and profiles available

nera-Than IMPACT RESISTANT POLYURETHANE



Amera-Thane is our own outstanding formulation of thermo-set polyester polyurethane. It is uniquely molded to produce a superior impact resistant plate with the smoothest surface possible and a low coefficient of friction. Amera-Thane is certified as complying with FDA Article 121.2522, and can be used as the contact surface for grain and other dry bulk foods.

Amera-Thane is poured to order, and is also available with 16GA expanded steel backing for rigidity and installation.

Typical Mechanical Properties					
Property	Units	Test Method	Results		
Shore A hardness		ASTM D-2240-64T	87 ± 1		
Split tear strength	psi	Fed. spec. 601-M-4221 mod.	315+		
Tensile strength	psi	ASTM D-412-62T	7200+		
Ultimate elongation	%	ASTM D-412-62T	570–580		
Break set	%	ASTM D-412-62T	10		
100% modulus	psi	ASTM D-412-62T	725		
200% modulus	psi	ASTM D-412-62T	1100		
300% modulus	psi	ASTM D-412-62T	1500		
Compression set	%	ASTM D-395-61 (B)	35		
Compression deflection	psi	ASTM D-575-46	80		
2% deflection			170		
5% deflection			310		
10% deflection			440		
15% deflection			590		
20% deflection			740		
50% deflection			2150		
ASTM No. 1 oil (125°C, 70 hrs.)	% tensile retention	ASTM D-741-63T	43		
ASTM No. 3 Oil (125°C, 70 hrs.)	% tensile retention	ASTM D-741-63T	50		
Humidity aging (70°C, 100% R.H.)	% tensile retention/2 wks.	ASTM D-1349-62	60		
Humidity aging (121°C, 15 psi)	% tensile retention/24 hrs.	ASTM D-1349-62	25		
Heat aging (125°C, 150°C)	% tensile retention/72 hrs.	ASTM D-1564-65	83, 28		
Glass transition, Clashberg	°C	ASTM D-1043-61T	-35		
Solenoid impact	°C	ASTM D-746-57T	-35		
TMA penetrometer, melt transition	°C		+173		
(74 lb, 1800 min ¹ , 0.2" amp)	Minutes to failure	ASTM D-623-62	12		
Zwick flex life	Cycles to failure	ASTM D-813-59	105		
Taber abrasion	maloss	ASTM D 1044 56	9.5		
(H-18, 1 kg, 10 ³ cycles)		A311VLD-1044-30	0.5		
NBS abrasion index	% rubber standard	ASTM D-1630	250		
Outdoor aging	% tensile retention/1 yr.	ASTM D-412-62T	60		

Applications

- Belt skirting
- Cutting pads
- Impact pads
- Conveyor scrapers • Duct work elbow
- Gaskets • Guides
- Impact skirts
- Idler wheels Slides
- Spout linings • Strippers
- Sorter blocks • Truck bed liners
- Wear pads
- Wiper blades

Available Sizes

Amera-Thane Sheets Poured to order – 48" x 120" max. length/width

Amera-Thane Bars Molded to order

Amera-Plex Mine Plate





Amera-Plex is one of Ameralloy's new breed of extremely long chain polymeric-type materials. Amera-Plex Mine Plate provides a cling-free surface, eliminating material buildup and corrosive action. Far superior to conventional plastics, and with so many unique advantages, it has become the specification of choice for a growing number of diverse applications.

Amera-Plex Mine Plate was developed to replace and outperform less durable plastics, metals, and other conventional materials. Its uniqueness stems from its unusual properties. Amera-Plex has characteristics similar to those of both plastic and metal, and several unique properties that are found only in Amera-Plex Mine Plate.

The Ameralloy sales and engineering staff offer assistance with complicated or unusual applications. To get started, send us your blueprints and specifications.

Features And Advantages

- High abrasion resistance
- Outwears AR, stainless, and carbon steels
- Outwears Nylon, Teflon, Delrin, and Nylatron
- Chemically inert–resists all acids, alkalies, and corrosive conditions
- Lightweight, easily fabricated
- High notch impact strength
- Superslippery–low coefficient of friction
- Eliminates static buildup and reduces noise level compared to steel.

Typical Mechanical Properties					
Property	Env.	Test Method	Unit	Results	
Specific gravity		ASTM D-792	g/cm ³	0.950	
Yield strength	@73°F	ASTM D-638	psi	3300	
Ultimate tensile strength	@73°F	ASTM D-638	psi	6250	
Break elongation	@73°F	ASTM D-638	%	326	
Rockwell C hardness		ASTM D-785	—	64–70	
Environmental stress cracking	@F ₅₀	ASTM D-1693 Mod	hours	7000	
Water absorption		ASTM D-570		nil	

Amera-Plex Mine Plate

Applications

- Bumper blocks
- Bucket conveyor housing
- Bushings
- Cable guides
- Cam rollers & guides
- Chain guides
- Chutes: Coal Coke
 - Glass
 - Grain
 - Gravel
 - Limestone

- Ore
- Refuse
- Rock
- Sand
- Slag
- Slate
- Conveyor belt rollers
- Conveyor belt wipers & guides
- Conveyor slats
- Conveyor tracks
- Couplings & fittings
- Cutting boards

- Flat chain wear plates
- Gears
- Guide plates, rails, rollers
- Hopper linings
- Noise abatement–plastic + metal gears
- Sandblasting shields
- Screen wire guides
- Screen wire strips
- Vacuum pump valve cones
- Washer linings
- Wet side spur gears

Coefficient Of Friction

Amera-Plex Mine Plate has a lower coefficient of friction than glass. With its self-lubricating characteristics, it is an ideal material for bearings, bushings, valves, wear strips, or any application involving sliding contact.

Comparison of coefficient of friction on various materials:

Materials	Static	Test Method
Mild steel vs. mild steel	0.30–0.40	
TIVAR-100 vs. TIVAR-100	0.20–0.30	
Mild steel vs. Amera-Plex	0.15–0.20	
Amera-Plex vs. Amera-Plex Mine Plate	0.10-0.13	ASTM D-1894

Comparison of dynamic coefficient of friction on polished steel:

	Dry	Water	Oil
Amera-Plex Mine Plate	0.10-0.22	0.05–0.10	0.05–0.08
Nylon 6/6	0.15-0.40	0.14–0.19	0.02–0.11
Nylon 6	0.15-0.40	0.14–0.19	0.02–0.11
Teflon®	0.04–0.25	0.04–0.08	0.04–0.05
Delrin®	0.15-0.35	0.10-0.20	0.05-0.10
Nylatron GS®	0.12-0.20	0.10-0.12	0.08–0.10

Abrasive Resistance

Materials listed below were rotated 24 hours @ 1750 rpm in a 50/50 sand/water slurry. The weight loss for each material is relative to carbon steel = 100. The lower the value, the better the abrasive resistance.

Sand slurry test:

Amera-Plex™ Mine Plate	5	Polyacetal	110
Amera-Plex	15	TFE/glass fiber	113
Nylon	31	Normal MW polyethylene	125
High MW polyethylene	44	Phosphor bronze	193
TFE	72	Yellow brass	409
Stainless steel	84	Phenolic laminate	571
Polypropylene	87	Hickory wood	967
Polycarbonate 96		Carbon steel	100

Available Sizes

Amera-Plex Mine Plate

Thickness: 1/4" 3/8" 1/2" 5/8" 3/4" 1" 1-1/4" Widths: 48" Lengths: 120"

Fabrication & Machining Forming, rolling, punching, perforating

Also Available: Ceramic filled, rubber backed, tubing, profiles

Amera-Plex Mine Plate

Installation Instructions

• **Handling** Amera-Plex lightweight sheets (¼" thick x 4' x 10') weigh approximately 53 lbs. One or two workers can handle the sheet with ease. Amera-Plex can be cut and drilled with normal woodworking or metal tools.

• Fastening It is important that the material be firmly fastened to the substrate. The linear expansion of Amera-Plex (.0013" per inch/per 1°F) creates a force that moves the sheet. Proper spacing of fasteners according to sheet thickness will overcome this force and hold the sheet flat against the substrate. Improper fastening will result in surface ripples and gaps where sections are joined. Surface ripples will show excessive wear.

It is recommended that Amera-Plex be held in place with mechanical fasteners. Correct spacing of fasteners can be determined by the thickness of the sheet:

Sheet Thickness	Recommended Fastener Spacing (on centers)	
1/4	6" to 8"	
3/8″	8″ to 10″	
1/2, 5/8, 3/4	12" to 15"	
1" and over	15" to 20"	

For all thicknesses, fasteners should be no closer than 2" from the edges of the sheet. Tighten fasteners to hold the material securely against the substrate. Correct fastener strength and spacing will minimize warpage of Amera-Plex due to linear thermal expansion. Adjoining panels should be butted together as tightly as possible.

To allow for linear expansion and contraction, the diameter of the bolt should be 1/8" smaller than the diameter of the drilled hole. The bolt head should have a washer to prevent pull-out.

• Stainless steel flathead bolts These fasteners are easy to install and remove when replacing liners, and can hold sheets of Amera-Plex from 3/8" to 1" thick. Stainless steel is preferred for its higher abrasion and corrosion resistance compared to mild or carbon steel bolts. Flathead shape permits bolt to be flush with the surface.

• **Drive rivets** Blind fastening to metal and less dense materials like wood. Drive rivets are preferred in some cases to reduce installation time. Correct rivet size is determined by the combined thickness of the liner and the substrate. Place rivets in pre-drilled holds and sink with a hammer. The rivet head will flare out and provide a secure installation. Fast, effective, ideal for hard-to-reach areas.

Note: All fastening heads should be at least flush with the lining's surface. Protruding or exposed bolts will wear faster than Amera-Plex, which could result in loss of holding strength. Protrusion above the surface also causes upward deflection in the smooth flow of bulk material.

Fabrication & Machining

• Fabrication Amera-Plex can be fabricated using conventional wood and metal working equipment. Machining characteristics of Amera-Plex are very similar to yellow brass. Frictional heat is recommend when cutting or milling deep holes and slots. Amera-Plex can be drilled easily for inserting bolts or self-tapping screws. Installing chute and hopper liners does not require special training or equipment. One sheet of Amera-Plex weighs only 78 lbs., as compared to the same size sheet of AR weighing 480 lbs.

• **Milling** Milled shapes can be created using two high speed flute milling cutters. Sufficient clearance angle on cutting tooth is important to allow for chip clearance. Spindle speed and feed rate are determined by depth of cut and the amount of material to be removed.

• **Sawing** Use band saw with skip tooth blade or circular saw with carbide tipped blade.

• **Turning, boring** Conventional metal lathe recommended for machining Amera-Plex. Use high spindle speed and feed. Round-nosed boring and turning tools with increased top angle–up to 16°–provide excellent finishes.

• **Drilling** Use conventional twist drill. Drilling of deep holes is improved by using the use of low helix drills to improve chip removal.

• **Planing** Use conventional wood planer with high speed steel planer blade. High speed wood routers can also be used for high volume production of profile shapes.

• **Coolants** The use of mist or flood coolants is recommended when drilling or milling deep holes or slots. When machining Amera-Plex, it is important not to generate excessive heat.

Forming

• Although Amera-Plex is comparatively more rigid than urethane, with the use of heat it can be permanently bent to almost any configuration to fit corners and angles.

• Hot forming Amera-Plex can be custom-formed on site using a propane or blow torch. Keeping flame 3"-4" above the surface, heat material broadly over the surface to be formed. When the material becomes pliable, apply to contoured surface and allow to cool. After shape is set upon cooling, use normal fastening procedures as described. Amera-Plex will retain all of its original properties upon cooling.

For more complex forming, Amera-Plex blanks can be heated in an electric oven at 325°–350°F for varying lengths of time according to the thickness of the material. When it has plastified, apply material to a forming fixture built to form the desired shape. Clamp Amera-Plex to the form and cool.

Amera-Plex can be immersed in a preheated glycerine bath set at a controlled temperature of 302°F (150°C). Heating time varies according to sheet thickness:

Sheet Thickness	Heating Time @ 150°C
8mm (.3150″)	15 minutes
15mm (.600″)	25 minutes

In all cases, the sheet must be properly plastified. The material will assume a translucent glass-like condition when it reaches the proper temperature. Remove immediately from the bath. Form while hot, or place into a form or mold and allow to conform to the desired shape. If necessary, Amera-Plex may be pressed into shape after it is placed into the form or mold.

Cooling is performed at room temperature. Because of its heat dissipation characteristics, cooling time takes somewhat longer than the heating cycle. Once the sheet reaches 158°F (70°C), introduction of tap water at approximately. $68^{\circ}F$ (20°C) helps speed cooling. Tap water serves the dual purpose of removing the remaining glycerin from the surface.

• **Cold forming-rectangular** Amera-Plex may be cold formed through the use of breakpress, roll, hand forming, or by using bolts to draw and form in place. Due to the spring back effect of Amera-Plex, formed angles must be over bent by 75–100%. Cold forming is used for sheets less than 3/8" thick.

• **Cold forming-circular** Recommended minimum forming diameters for Amera-Plex sheets:

Sheet Thickness	Minimum Diameter
1/8″	8″
3/16″	10″
1/4″	12″
3/8″	24″

Double-C[®] CHROMIUM CARBIDE OVERLAY







Typical Analysis

- Carbon 4.8
- Silicon .50
- Chromium 26.8
- Manganese 2.06

Double-C Chromium Carbide Overlay is the perfect solution to premature equipment and part wear in extremely abrasive conditions with low to moderate impact. Double-C was engineered utilizing an innovative new cladding process to create the most wear-resistant surface available.



Double-C's low carbon steel base allows for weldments, bolts, and stud attachments. The alloy overlays provide a surface with superior wear resistance. Double-C reduces your maintenance costs and virtually eliminates unnecessary downtime.

Double-C has proven durability and value through punishing use in the mining industry, coke, cement, and asphalt plants, power utilities, and pulp & paper mills.

Available Sizes		
Standard Thickness	Cladding Overlay	A-36 Base Plate
3/8″	1/8″	1/4″
1/2″	1/4″	1/4″
5/8″	1/4″	3/8″
3/4″	3/8″	3/8″
7/8″	3/8″	1/2″
1″	1/2″	1/2″

All standard plate sizes, custom sizes, and strip sizes upon request.



fabrication

General Characteristics

Double-C is a fusion-clad chromium carbide composite overlay that has been permanently bonded to a carbon steel base. Double-C carries a hardness rating of Rockwell C 60–62. Characterized by a high chromium and high carbon content, this material is more resistant to wear, corrosion, and heat.

• **Base plate** ASTM A36 is used to enhance Double-C weldability and ductility.

• **Appearance** Double-C overlay is applied in 1" to 1-1/4" beads on the base metal, giving the product a ribbed appearance. The cladding process produces natural stress relief cracks, providing maximum wear life in heavily abrasive applications by relieving stresses in the plate. The stress relief cracks are limited to the overlay and do not extend to the base plate. Double overlay is recommended for severe wear applications.

• **Heat resistance** Double-C is effective up to 1250°F with an abrasion ratio of 20:1 over heat resistant steels. Repeated heating and cooling does not affect its wear-resistant properties.

• **Impact resistance** The mild steel base metal absorbs shock, providing moderate resistance to impact-type wear. The impact resistance of Double-C improves with the thickness of the base metal.

Fabrication Instructions

Using proper fabrication methods, the mild steel base and arc-welded overlay bends readily. Double-C can be specially rolled and formed to your specifications at our plant.

• **Cutting** Use plasma burning equipment, air arc, or abrasive saws when cutting, piercing, or beveling Double-C. Best results are obtained when cutting from the low carbon steel side.

• Welding When welding Double-C into position, it is recommended that the weld extend thicker than the mild steel base plate. The life of the weld joint can be enhanced by running a bead of hard surface along the welded area. These precautions will prevent wearing of the mild steel base plate as well as overlay chipping.

