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.

### 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

### Typical Mechanical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>198,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>165,000</td>
</tr>
<tr>
<td>Elongation in 2&quot;</td>
<td>16%</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>52%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>390–420</td>
</tr>
<tr>
<td>Rockwell C hardness</td>
<td>39–46</td>
</tr>
</tbody>
</table>

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

Typical Analysis May Vary By Heat Lot
Amera-Braze® ABRASION / IMPACT RESISTANT ALLOYS

AMERALLOY® ABRASION / IMPACT RESISTANT ALLOYS

• AMERA-BRAZE 420

Page 2 of 2

Applicatios

• Agricultural tynes
• 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
  Limestone
  Ore

Refuse
Rock
Sand
Slag
Slate
- Classifier screens
- Coke bins
- Conveyor buckets
- Crusher hammers
- Clam shell bucket lips
- Concrete mixer liners
- 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
- 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 bale 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
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.

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

Typical Mechanical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>245,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>230,000</td>
</tr>
<tr>
<td>Elongation in 2&quot;</td>
<td>9%</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>40%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>480–520</td>
</tr>
</tbody>
</table>

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.
Amera-Braze 520
ABRASION RESISTANT ALLOY

Applications

- Backup plates
- Baffle plates
- Bucket lips
- Car plates
- Chain links
- Chain slide runners
- Chutes:
  - Coal
  - Coke
  - Glass
  - Grain
  - Gravel
  - Limestone
  - Ore
  - Refuse
  - Rock
- 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
- Muller bottoms
- Mixers
- Oscillator Liners
- Ore car bodies & liners
- Ore pocket liners
- Pressure plates
- 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’
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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>190,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>156,000</td>
</tr>
<tr>
<td>Elongation in 2&quot;</td>
<td>14%</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>52%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>400</td>
</tr>
<tr>
<td>Rockwell C hardness</td>
<td>42</td>
</tr>
</tbody>
</table>

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

• 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
• Flotation plates
• Foundry shakeout machines
• Funnels
• Furnace liners
• Grader blades
• Grain chutes
• Grain mill hammers
• Gravel chutes
• Hoppers
• Launder plates
• Lawnmower cutter bars
• 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
Thickens: 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
Ameralloy® AR
MACHINABLE ALLOY

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

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 Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>140,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>130,000</td>
</tr>
<tr>
<td>Elongation in 2”</td>
<td>16%</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>45%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>250–310</td>
</tr>
<tr>
<td>Rockwell C hardness</td>
<td>30–32</td>
</tr>
</tbody>
</table>

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

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

**Typical Mechanical Properties**
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>130,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>90,000</td>
</tr>
<tr>
<td>Elongation in 2”</td>
<td>16%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>220–260</td>
</tr>
</tbody>
</table>

**Applications**
- Asphalt plug mill liners
- Bucket lips
- Chute liners
- Clam shell bucket lips
- Concrete mixer liners
- Concrete pipe liners
- Conveyor buckets
- Conveyor flights
- Cylinders
- Dredge pipes
- Dust collector pipe sections
- Fan housings
- Flume liners
- Funnels
- Hoppers
- Ore trays
- Pan liners
- Plug mill mixer liners
- Screens
- Skip tub liners
- Skirt plates
- Spades
- 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’

**Welding**
- Use 7016 or 8016 electrodes

**Fabrication & Machining**
- Forming, rolling, punching, and perforating to your specifications
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.

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

**Typical Mechanical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>140–170,000</td>
</tr>
<tr>
<td>Yield point psi</td>
<td>120–135,000</td>
</tr>
<tr>
<td>Elongation in 2”</td>
<td>11–19%</td>
</tr>
<tr>
<td>Reduction of area</td>
<td>20–24%</td>
</tr>
<tr>
<td>Brinell hardness</td>
<td>230–255</td>
</tr>
<tr>
<td>Work hardens to</td>
<td>550–650 BHN</td>
</tr>
</tbody>
</table>

**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 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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength psi</td>
<td>190,000</td>
</tr>
<tr>
<td>Base plate hardness</td>
<td>350–360 BHN</td>
</tr>
<tr>
<td>Lug hardness</td>
<td>390–410 BHN</td>
</tr>
</tbody>
</table>
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

**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

**FDA And USDA Approved**
- Odor-free
- Taste-free
- Noncorrosive
- Food industry approved for abrasion and chemical applications

**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
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**

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Test Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shore A hardness</td>
<td></td>
<td>ASTM D-2240-64T</td>
<td>87 ± 1</td>
</tr>
<tr>
<td>Split tear strength</td>
<td>psi</td>
<td>Fed. spec. 601-M-4221 mod.</td>
<td>315+</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>psi</td>
<td>ASTM D-412-62T</td>
<td>7200+</td>
</tr>
<tr>
<td>Ultimate elongation</td>
<td>%</td>
<td>ASTM D-412-62T</td>
<td>570–580</td>
</tr>
<tr>
<td>Break set</td>
<td>%</td>
<td>ASTM D-412-62T</td>
<td>10</td>
</tr>
<tr>
<td>100% modulus</td>
<td>psi</td>
<td>ASTM D-412-62T</td>
<td>725</td>
</tr>
<tr>
<td>200% modulus</td>
<td>psi</td>
<td>ASTM D-412-62T</td>
<td>1100</td>
</tr>
<tr>
<td>300% modulus</td>
<td>psi</td>
<td>ASTM D-412-62T</td>
<td>1500</td>
</tr>
<tr>
<td>Compression set</td>
<td>%</td>
<td>ASTM D-395-61 (B)</td>
<td>35</td>
</tr>
<tr>
<td>Compression deflection</td>
<td>psi</td>
<td>ASTM D-575-46</td>
<td>80</td>
</tr>
<tr>
<td>2% deflection</td>
<td></td>
<td></td>
<td>170</td>
</tr>
<tr>
<td>5% deflection</td>
<td></td>
<td></td>
<td>310</td>
</tr>
<tr>
<td>10% deflection</td>
<td></td>
<td></td>
<td>440</td>
</tr>
<tr>
<td>15% deflection</td>
<td></td>
<td></td>
<td>590</td>
</tr>
<tr>
<td>20% deflection</td>
<td></td>
<td></td>
<td>740</td>
</tr>
<tr>
<td>50% deflection</td>
<td></td>
<td></td>
<td>2150</td>
</tr>
<tr>
<td>ASTM No. 1 oil (125°C, 70 hrs.)</td>
<td>% tensile retention</td>
<td>ASTM D-741-63T</td>
<td>43</td>
</tr>
<tr>
<td>ASTM No. 3 Oil (125°C, 70 hrs.)</td>
<td>% tensile retention</td>
<td>ASTM D-741-63T</td>
<td>50</td>
</tr>
<tr>
<td>Humidity aging (70°C, 100% R.H.)</td>
<td>% tensile retention/2 wks.</td>
<td>ASTM D-1349-62</td>
<td>60</td>
</tr>
<tr>
<td>Humidity aging (121°C, 15 psi)</td>
<td>% tensile retention/24 hrs.</td>
<td>ASTM D-1349-62</td>
<td>25</td>
</tr>
<tr>
<td>Heat aging (125°C, 150°C)</td>
<td>% tensile retention/72 hrs.</td>
<td>ASTM D-1564-65</td>
<td>83, 28</td>
</tr>
<tr>
<td>Glass transition, Clashberg</td>
<td>°C</td>
<td>ASTM D-1043-61T</td>
<td>-35</td>
</tr>
<tr>
<td>Solenoid impact</td>
<td>°C</td>
<td>ASTM D-746-57T</td>
<td>-35</td>
</tr>
<tr>
<td>TMA penetrometer, melt transition</td>
<td>Minutes to failure</td>
<td>ASTM D-623-62</td>
<td>12</td>
</tr>
<tr>
<td>(74 lb, 1800 min⁻¹, 0.2° amp)</td>
<td></td>
<td></td>
<td>173</td>
</tr>
<tr>
<td>Zwick flex life</td>
<td>Cycles to failure</td>
<td>ASTM D-813-59</td>
<td>105</td>
</tr>
<tr>
<td>Taber abrasion (H-18, 1 kg, 10⁴ cycles)</td>
<td>mg loss</td>
<td>ASTM D-1044-56</td>
<td>8.5</td>
</tr>
<tr>
<td>NBS abrasion index</td>
<td>% rubber standard</td>
<td>ASTM D-1630</td>
<td>250</td>
</tr>
<tr>
<td>Outdoor aging</td>
<td>% tensile retention/1 yr.</td>
<td>ASTM D-412-62T</td>
<td>60</td>
</tr>
</tbody>
</table>

**Applications**

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

**Available Sizes**

<table>
<thead>
<tr>
<th>Amera-Thane Sheets</th>
<th>Poured to order – 48” x 120” max. length/width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amera-Thane Bars</td>
<td>Molded to order</td>
</tr>
</tbody>
</table>
Amera-Plex Mine Plate

ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

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
- Superslippy–low coefficient of friction
- Eliminates static buildup and reduces noise level compared to steel.

Typical Mechanical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Env.</th>
<th>Test Method</th>
<th>Unit</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td></td>
<td>ASTM D-792</td>
<td>g/cm³</td>
<td>0.950</td>
</tr>
<tr>
<td>Yield strength</td>
<td>@73°F</td>
<td>ASTM D-638</td>
<td>psi</td>
<td>3300</td>
</tr>
<tr>
<td>Ultimate tensile strength</td>
<td>@73°F</td>
<td>ASTM D-638</td>
<td>psi</td>
<td>6250</td>
</tr>
<tr>
<td>Break elongation</td>
<td>@73°F</td>
<td>ASTM D-638</td>
<td>%</td>
<td>326</td>
</tr>
<tr>
<td>Rockwell C hardness</td>
<td></td>
<td>ASTM D-785</td>
<td>—</td>
<td>64–70</td>
</tr>
<tr>
<td>Environmental stress cracking</td>
<td>@F_90</td>
<td>ASTM D-1693 Mod</td>
<td>hours</td>
<td>7000</td>
</tr>
<tr>
<td>Water absorption</td>
<td></td>
<td>ASTM D-570</td>
<td>—</td>
<td>nil</td>
</tr>
</tbody>
</table>
**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:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Static</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild steel vs. mild steel</td>
<td>0.30–0.40</td>
<td></td>
</tr>
<tr>
<td>TIVAR-100 vs. TIVAR-100</td>
<td>0.20–0.30</td>
<td></td>
</tr>
<tr>
<td>Mild steel vs. Amera-Plex</td>
<td>0.15–0.20</td>
<td></td>
</tr>
<tr>
<td>Amera-Plex vs. Amera-Plex Mine Plate</td>
<td>0.10–0.13</td>
<td>ASTM D-1894</td>
</tr>
</tbody>
</table>

Comparison of dynamic coefficient of friction on polished steel:

<table>
<thead>
<tr>
<th></th>
<th>Dry</th>
<th>Water</th>
<th>Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amera-Plex Mine Plate</td>
<td>0.10–0.22</td>
<td>0.05–0.10</td>
<td>0.05–0.08</td>
</tr>
<tr>
<td>Nylon 6/6</td>
<td>0.15–0.40</td>
<td>0.14–0.19</td>
<td>0.02–0.11</td>
</tr>
<tr>
<td>Nylon 6</td>
<td>0.15–0.40</td>
<td>0.14–0.19</td>
<td>0.02–0.11</td>
</tr>
<tr>
<td>Teflon*</td>
<td>0.04–0.25</td>
<td>0.04–0.08</td>
<td>0.04–0.05</td>
</tr>
<tr>
<td>Delrin*</td>
<td>0.15–0.35</td>
<td>0.10–0.20</td>
<td>0.05–0.10</td>
</tr>
<tr>
<td>Nylatron GS*</td>
<td>0.12–0.20</td>
<td>0.10–0.12</td>
<td>0.08–0.10</td>
</tr>
</tbody>
</table>

**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:**

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

**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
Installation Instructions

- **Handling** Amera-Plex lightweight sheets (¼” thick x 4’ x 10’) weigh approximately 35 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:

<table>
<thead>
<tr>
<th>Sheet Thickness</th>
<th>Recommended Fastener Spacing (on centers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>6” to 8”</td>
</tr>
<tr>
<td>3/8”</td>
<td>8” to 10”</td>
</tr>
<tr>
<td>1/2, 5/8, 3/4</td>
<td>12” to 15”</td>
</tr>
<tr>
<td>1” and over</td>
<td>15” to 20”</td>
</tr>
</tbody>
</table>

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 sheet thickness (on centers).

For all thicknesses, fasteners should be no closer than 3⁄16” to 1/8” 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.

- **Cold forming** Amera-Plex may be cold formed through the use of breakpress, roll, hand forming, or by using 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.

- **Millling** 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.

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. Keep 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:

<table>
<thead>
<tr>
<th>Sheet Thickness</th>
<th>Heating Time @ 150°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>8mm (.3150”)</td>
<td>15 minutes</td>
</tr>
<tr>
<td>15mm (.600”)</td>
<td>25 minutes</td>
</tr>
</tbody>
</table>

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°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:

<table>
<thead>
<tr>
<th>Sheet Thickness</th>
<th>Minimum Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8”</td>
<td>8”</td>
</tr>
<tr>
<td>3/16”</td>
<td>10”</td>
</tr>
<tr>
<td>1/4”</td>
<td>12”</td>
</tr>
<tr>
<td>3/8”</td>
<td>24”</td>
</tr>
</tbody>
</table>

AMERALLOY® ABRASION / IMPACT RESISTANT ALLOYS • AMERA-PLEX MINE PLATE
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.

**Typical Analysis**
- Carbon 4.8
- Silicon .50
- Chromium 26.8
- Manganese 2.06

**Available Sizes**

<table>
<thead>
<tr>
<th>Standard Thickness</th>
<th>Cladding Overlay</th>
<th>A-36 Base Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8”</td>
<td>1/8”</td>
<td>1/4”</td>
</tr>
<tr>
<td>1/2”</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td>5/8”</td>
<td>1/4”</td>
<td>3/8”</td>
</tr>
<tr>
<td>3/4”</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
<tr>
<td>7/8”</td>
<td>3/8”</td>
<td>1/2”</td>
</tr>
<tr>
<td>1”</td>
<td>1/2”</td>
<td>1/2”</td>
</tr>
</tbody>
</table>

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

**Plug Welding**

![Diagram of Plug Welding](image-url)