



FIRMEX STEEL

ARE YOU SEARCHING FOR THE FAMOUS FIRMEX BLUE, FIRMEX ORANGE, AND FIRMEX RED STEEL?

IF SO, YOUR SEARCH IS OVER. I CARRY THE ORIGINAL FIRMEX PRODUCTS THAT HAVE SAVED COUNTLESS HOURS OF DOWNTIME IN YOUR ABRASION WEAR APPLICATIONS. ORIGINALLY DESIGNED AS A CROSS OVER PRODUCT BETWEEN A TOOL STEEL AND A WEAR RESISTANT PLATE, THE FIRMEX LINE HAS PROVEN ITSELF FOR WELL OVER 30 YEARS. THE RICH CHEMISTRY IN ALL THREE FIRMEX STEEL LINES, GIVES YOU NOT ONLY WEAR RESISTANCE IN FIELD SERVICE, BUT A TOUGHNESS THAT IS UNMATCHED IN THE STEEL INDUSTRY TODAY.

CONTACT FOR QUOTE:

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Why Mangabrazed Plate (Firmex Blue)?

Mangabrazed (Firmex Blue) is an engineered alloy, not generic AR plates with a fancy name. The high levels of Nickel (1 1/2%) and Manganese (2%) allow special mill processing which increases depth of hardness.

Mangabrazed is made in controlled electric furnaces to minimize impurities, which detract from a material's toughness. The molten metal is vacuum-degassed to draw off impurities (e.g. sulfides). Any microscopic impurities that remain are then refined to neutralize their effects upon the steel. This process is known as "inclusion shape control," and is the same type of process used in refining impurities in the most critical applications (e.g. airplane landing gear). This process also increases the ability of the plate to resist weld cracks.

High levels of Manganese are added to allow the formation of extremely hard alloy carbides which resist wear similar to the way carbide tool bits resist wear.

High levels of Nickel are added to promote deeper, more uniform hardening. Not having such high levels of Nickel, commercial AR plate products are only able to develop irregular surface levels of hardness. Note that in recent mill evaluations heavy sections of Mangabrazed actually displayed increased hardness toward the mid-area of thickness.

Manganese and Nickel together, present in the levels established for Mangabrazed, allow the employment of a very high-temperature tempering process, which follows heat treatment. This process removes mill rolling stresses and has the unique ability to add toughness to the steel. In steels that do not have the rich chemistry of Mangabrazed, a lower temperature tempering process must be used to remove the thermal stress caused by heat treatment. Lower temperature in this process results in decreased toughness in the steel.

In severe service this combination of Manganese and Nickel also promotes additional "cold-working" hardness of up to 17% of the as-delivered hardness. This additional hardening allows the plate to "self-polish," providing the added benefit of minimizing drag when moving bulk materials.

There are many AR plate products that are economically produced to what is commonly referred to as the "Chrome-Manganese-Boron" formula. This formula does not produce a steel in the class of Mangabrazed. Close inspection of their composition reveals that they are all very similar. The hardening ability of moderate amounts of Boron to achieve an erratic, not uniform, low-depth hardness that lacks toughness and is unpredictable in service.

Firmex Blue Applications

- Back Up Plates
- Bucket Lips
- Bucket Liners
- Bulldozer Blades
- Floor Grates
- Carriage Rails
- Hanger Rods
- Room Blast
- Deflector Plates
- Formed Coal Pipe
- Classifier Veins
- Conveyor Wear Strips
- Tooth Base Adapters
- Chutes
- Hoppers
- Feeders
- Scales
- Screens
- Shake-Out Decks
- Coal Bin Liners
- Coke Bin Liners
- Concrete Mixer Liners
- Scrape Baler Liners
- Scraper Blades
- Grader Blades
- Shot Blast Liners
- Skip Car Liners
- Truck Box Liners
- Wear Bars
- Wear Plates
- Wear Strips
- Hammers
- Muller Bottoms

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Why E-Z Braze Plate (Firmex Orange)?

E-Z Braze Plate (Firmex Orange) is an engineered alloy, not generic AR plates with a fancy name. The high levels of Nickel (1.3%) and Manganese (1.8%) allow special mill processing which increases depth of hardness.

E-Z Braze is made in controlled electric furnaces to minimize impurities, which detract from a material's toughness. The molten metal is vacuum-degassed to draw off impurities (e.g. sulfides). Any microscopic impurities that remain are then refined to neutralize their effects upon the steel. This process is known as "inclusion shape control," and is the same type of process used in refining impurities in the most critical applications (e.g. airplane landing gear). This process also increases the ability of the plate to resist weld cracks.

High levels of Manganese are added to allow the formation of extremely hard alloy carbides which resist wear similar to the way carbide tool bits resist wear.

High levels of Nickel are added to promote deeper, more uniform hardening. Not having such high levels of Nickel, commercial AR plate products are only able to develop irregular surface levels of hardness. Note that in recent mill evaluations heavy sections of E-Z Braze actually displayed increased hardness toward the mid-area of thickness.

Manganese and Nickel together, present in the levels established for E-Z Braze, allow the employment of a very high-temperature tempering process, which follows heat treatment. This process removes mill rolling stresses and has the unique ability to add toughness to the steel. In steels that do not have the rich chemistry of E-Z Braze, a lower temperature tempering process must be used to remove the thermal stress caused by heat treatment. Lower temperature in this process results in decreased toughness in the steel.

In severe service this combination of Manganese and Nickel also promotes additional "cold-working" hardness of up to 17% of the as-delivered hardness. This additional hardening allows the plate to "self-polish," providing the added benefit of minimizing drag when moving bulk materials.

There are many AR plate products that are economically produced to what is commonly referred to as the "Chrome-Manganese-Boron" formula. This formula does not produce a steel in the class of E-Z Braze. Close inspection of their composition reveals that they are all very similar. The hardening ability of moderate amounts of Boron to achieve an erratic, not uniform, low-depth hardness that lacks toughness and is unpredictable in service.

Firmex Orange Applications

- Back Up Plates
- Bucket Lips
- Bucket Liners
- Bulldozer Blades
- Chutes
- Coal Bin Liners
- Coke Bin Liners
- Concrete Mixer Liners
- Scrape Baler Liners
- Scraper Blades
- Grader Blades
- Shot Blast Liners
- Skip Car Liners
- Truck Box Liners
- Wear Bars
- Wear Plates
- Wear Strips
- Hammers
- Muller Bottoms

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Why Tuffbrazed 500 Plate (Firmex Red)?

Tuffbrazed 500 Plate (Firmex Red) is an high strength abrasion resistant alloy.

Tuffbrazed 500 Plate (Firmex Red) is the ultimate in high hardness abrasion resistant plate. It is engineered for cut-and-weld applications where severe, low-stress (smaller particle) abrasion is the main cause of failure.

Firmex Red Applications

- Bucket Heel Plates
- Bucket Lips
- Chipper Components
- Chutes
- Cones
- Conveyor Components
- Crushing Mill Liner Plates
- Cyclone Components
- Drag Line Bucket Liners
- Fan Blades
- Fan Housing Components
- Farm Machinery & Components
- Flat Back Elbows
- Grizzly Bars
- Hoppers
- Impact Plates
- Impellers
- Pug Mill Paddles
- Railroad Maintenance Equipment
- Screen Plates
- Screw Conveyor Flights
- Shot and Sand Blast Equipment
- T-Injectors
- Target Plates
- Transitions
- Truck Body liners
- Wheelabrator

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