TENSAMANG™ MANGANESE STEEL PLATE

Clifton Steel Tensamang™ is a genuine 11-14% Hadfield Grade Manganese Steel designed to work harder with impact while maintaining good ductility and toughness. With impact, Tensamang™ develops a hard surface that reaches 550 Brinell while maintaining a ductile core. As it wears, it acquires a polished surface with good lubricity, allowing an easy, positive flow of material across its surface.

Clifton supplies genuine Hadfield Grade Manganese steel. Our manganese steel products contain the requisite 1% carbon level. All of our manganese steel products are heat treated to 1,900° F and rapidly quenched to produce a true austenitic steel. Do not be fooled by a low-carbon or a non-heat-treated substitute.

NOTHING PERFORMS LIKE GENUINE TENSAMANG™
11-14% HADFIELD GRADE MANGANESE!

“Clifton’s fully-annealed Tensamang™ manganese optimizes toughness, ductility and work-hardening properties...which makes Clifton’s Tensamang™ the manganese of choice!”

TYPICAL CHEMICAL COMPOSITION

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CARBON</td>
<td>1.05 - 1.35%</td>
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<tr>
<td>MANGANESE</td>
<td>11.5 - 14%</td>
</tr>
<tr>
<td>SILICON</td>
<td>1.00 MAX</td>
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<tr>
<td>PHOSPHORUS</td>
<td>0.07 MAX</td>
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WE SPECIALIZE IN FABRICATING PARTS TO CUSTOMERS PRINTS

APPLICATIONS
- Magnetic Bottom Plates
- Magnetic Separator Drums
- Shot Blast Machine Parts
- Barrel Heads
- Screw Flights
- Crusher Liners
- Woven Wire Screens
- Fused Wire Screens
- Grates
- Perforated Plates
- Shot Blast Tables, Trees, Manipulator Arms, Hooks
- Rolls for Shot Cabinet Conveyors

PROVIDING SERIOUS PROTECTION FOR OVER 50 YEARS

MANGANESE STEEL

Clifton Tensamang™ is an austenitic, non-magnetic steel produced to A128 specifications.
**HARDNESS** to 550 BHN

**CUTTING**
Clifton Steel Tensamang™ Manganese Steel Plate can be cut with plasma, oxy-Acetylene, laser, and water jet as well as with abrasive cut off saws.

**MACHINING**
Tensamang™ is not considered a machinable grade. However, Clifton Steel has developed the ability to drill, tap, and grind this grade of steel. Consult with a Clifton Steel representative for your fabrication needs.

**FORMING**
Tensamang™ Manganese Steel Plate can be cold formed. Reheating will result in carbide precipitation and embrittlement. Hot forming is not recommended.

**WELDING**
Welding is easily accomplished with Clifton Steel's Tensaweld Mang-312 wire. Ductility will be increased in the fusion zone by peening. Preheating is not recommended.

**THERMAL TREATMENT**
Clifton Steel Tensamang™ is heated to 1,900°+ until temperature is uniform throughout and rapidly quenched in water to produce an austenitic structure. The as-quenched hardness is about 200 BHN.

**AVAILABILITY**

<table>
<thead>
<tr>
<th>PLATES</th>
<th>ROUND BARS</th>
<th>FLAT BARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS</td>
<td>WIDTHS</td>
<td>LENGTHS</td>
</tr>
<tr>
<td>1/8” through 2 1/2”</td>
<td>48” to 96”</td>
<td>288”</td>
</tr>
</tbody>
</table>

- Cut from plate and mill bars from 1/8” thickness
- Widths and lengths to customer specifications

**ANGLES**
- Stock mill angles
- Custom fabricated angles both formed and welded  
  *Contact Clifton Steel to discuss your needs*

**TUBING**
- Custom tubes from 3” diameter and 1/4” wall  
  *Contact Clifton Steel to discuss your needs*

**WEAR & IMPACT STEEL**
- CLIF-CLAD® Overlay  
  - Econalloy AR 250  
  - Tensalloy AR 400  
  - Tensalloy AR 450  
  - Tensalloy Blue AR 500  
  - Tensalloy Extra HY 80  
  - Tensamang 11-14% Hadfield Manganese Steel Plate

**HIGH STRENGTH STEEL**
- A514  
  - A656, Grade 80  
  - 100X  
  - A572, Grade 50

**ROUND BARS**
- Econalloy 1045  
  - Tensalloy 4150

**MILITARY**
- Steel Armor Plate  
  - Aluminum Armor Plate

**PIES**
- Induction Hardened Wear Pipe  
  - Clif-Clad® Overlay Pipe  
  - Cast Lined Pipe

**WELD WIRE**
- Ultra-100  
  - Workmate  
  - Ultra-200  
  - Mang-312  
  - Ultra-300  
  - Nickel-90