



HSM Wire International, Inc

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Alloy 412 - Stainless Steel AL 412™

Description: Al 412 alloy is a low carbon, nickel containing, dual phase 12% CR Stainless Steel. AL 412 has superior toughness when compared to fully ferritic stainless steel alloys.

Applications: Rail Cars, Coal Handling equipment, sugar processing equipment, mining equipment, storage bins and hoppers and bus frames.

| | | | | | | | |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Nominal Composition: | C | Mn | Si | P | S | Cr | Ni |
| | 0.02 | 0.90 | 0.70 | 0.040 Max | 0.030 Max | 11.75 | 0.40 |
| | N | Fe | | | | | |
| | 0.030 Max | Balance | | | | | |

Mechanical Properties - typical room temperature

| | English Units | Metric Units |
|-----------------------------------|-----------------------|---------------|
| Density | 0.280 lb/cu in @ 68°F | 7.75 gm/cu cm |
| 0.2% Offset Yield Strength | 60 ksi | 414 MPa |
| Ultimate Tensile Strength | 82 ksi | 565 MPa |
| Elongation in 2 inches | 24% | 24% |
| Rockwell Hardness | 87 RB | 87 RB |

WELDABILITY

ATI 412 material may be welded to carbon steel or other stainless steels. It is recommended that low carbon austenitic stainless steels, such as types 309L, 309 Mo, 316 L and 310 S, be used as filler material. The Schaeffler diagram can be used to determine the suitability of joint preparation / consumable type. The weld metal should be primarily austenitic.

CORROSION RESISTANCE

The presence of 12 percent chromium in the ATI 412 alloy makes it a more corrosion resistant which carbon steels, low alloy steels, or coated steels are not adequate. However, if ATI 412 alloy is placed in contact with carbon alternative for many applications in steel, it may cause the carbon steel to become susceptible to accelerated corrosion due to galvanic effects, especially when the ratio of ATI 412 material to carbon steel is high. For this reason, stainless steel fasteners (bolts, rivets, etc.) should be used for mechanical connections involving ATI 412 material.

Because of its ability to resist corrosion, ATI 412 alloy also exhibits improved wear resistance. It is well known that the presence of corrosion products can greatly accelerate the rate at which a steel will be lost by abrasion. In many mildly corrosive environments, ATI 412 alloy will exhibit a wear rate many times lower than a non-corrosion resistant alloy. In a similar vein, ATI 412 alloy will provide improved sliding characteristics for gravity feeding or dumping of bulk material from a rail car or through a hopper.

*To be used as a guideline only.