

# ER410

ER410 wire feedstock is commonly used for Wire-arc additive manufacturing components made from martensitic stainless steel, such as turbine blades, valves, pump shafts, and tooling.

Suitable for use in environments containing mild acids, alkalis, and atmospheric conditions, ER410 provides high strength and hardness as a residual effect of the WAM® process. While often used for applications requiring resistance to wear, abrasion, and moderate impact, material properties can be improved within ARCEMY®'s patented WAM® production process and further supported with heat treatment.

## Wire Classification

AWS A5.9 ER410NiMo

## Wire Diameter

1.2 mm

## Shielding Gas

Argon Mix

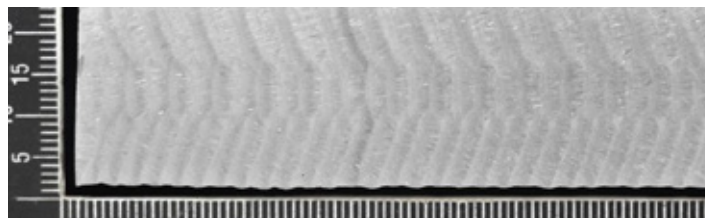
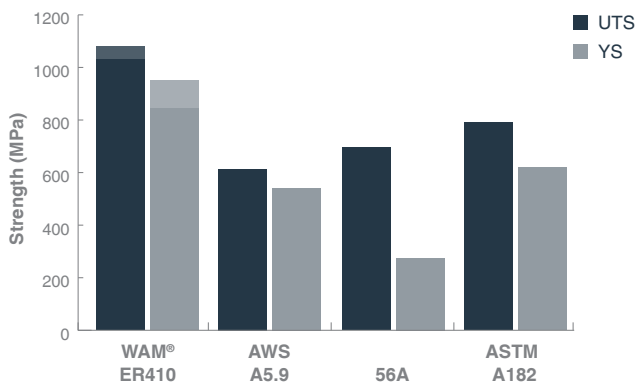
## Process

WAM® – DED-Arc

## Equivalent Designations

UNS S41000, X12Cr13, STS410, SUS410, S40310, S41001, SS2302, 1H13, ASTM A276, 56A, 410S21.

## WAM® ER410 Tensile Strength Comparison



ER410 macro examination photo.

WAM® Test Number 210014AM-31 & 35. Mechanical property values for the 'as-deposited WAAM' values are based on the median value and repeatability testing. Deposited density can be lower than wire density. AWS data source: D20.1/D20.1M:2019 Specification for Fabrication of Metal Components Using Additive Manufacturing.

## Properties

Composition	Amount %
Carbon	≤ 0.06
Manganese	≤ 0.60
Nickel	4.0 - 5.0
Chromium	11.0 - 12.5
Molybdenum	0.4 - 0.7
Silicon	≤ 0.5
Copper	≤ 0.75
Phosphorus	≤ 0.03
Sulfur	≤ 0.03

Mechanical	WAM® X & Z Typical	AWS PWHT
Ultimate Tensile Strength (MPa)	1040 - 1080	≥ 760
0.2% Proof stress (MPa)	1850 - 950	541
Reduction in area (%)	45 - 50	-
Elongation (%)	14 - 15	≥ 15
Condition	as built	
Classification	AWS A5.90	
Density (kg/m³)	7750	

Note:

- **AWS PWHT:**  
Heat to 595-620°C, hold for 1 hour, air cool to ambient



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