

# ERCuNiAl

ERCuNiAl, or Nickel Aluminium Bronze (NAB) wire feedstock, is a specific type of welding wire used in Wire-arc Additive Manufacturing (WAM®) processes. NAB wire feedstock typically consists of copper (Cu) as the base metal, with additions of aluminium (Al), nickel (Ni), and iron (Fe). The specific composition may vary slightly, depending on manufacturing standard required, but the alloy is designed to provide a balance of balance of high strength and ultimate corrosion resistance when used for part production.

## Wire Classification

AWS.A5.7 ERCuNiAl, UNS C63280

## Wire Diameter

1.2 mm

## Shielding Gas

Argon

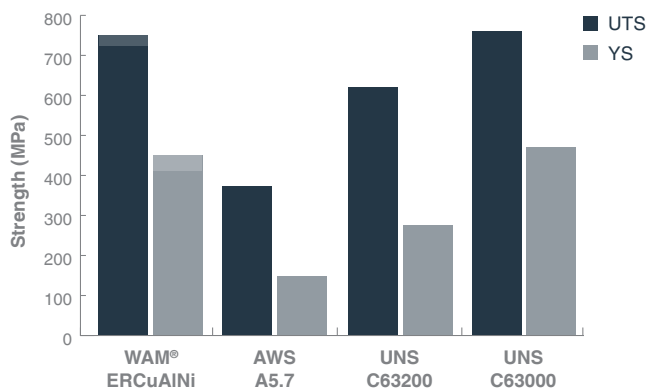
## Process

WAM® – DED-Arc

## Equivalent Designations

ASME SB150, ASME SB171, ASTM B124, ASTM B150, ASTM B171, ASTM B283, ASTM F467, ASTM F468, MIL B-16166, QQ C450, SAE J461, SAE J463, UNS C63200, UNS C6300.

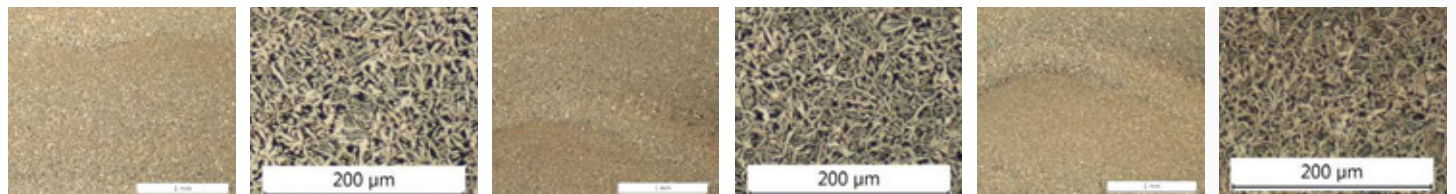
## WAM® ERCuAlNi Tensile Strength Comparison



## Properties

Composition	Amount %
Copper	Rest
Zinc	≤ 0.10
Manganese	0.60 - 3.50
Iron	3.0 - 5.0
Silicon	≤ 0.10
Nickel	4.0 - 5.5
Aluminium	8.50 - 9.50
Lead	≤ 0.02
Other	≤ 0.50

Mechanical	WAM® X, Y & Z Typical	AWS Typical
Ultimate Tensile Strength (MPa)	720 - 750	≥ 480
0.2% Proof stress (MPa)	420 - 450	148
Reduction in area (%)	25 - 30	-
Elongation (%)	23 - 29	32
Condition	as built	
Classification	AWS A5.7	
Density (kg/m³)	7650	
Charpy Impact Test (J)	21	
Peak Vickers Hardness (HV)	214 - 218	
Corrosion Resistance (mm/yr)	0.03 - 0.04	
Fatigue Limit (MPa / Cycles)	280 - 330 @10 <sup>8</sup>	
Stress Analysis (mm) (Neutron Detection)	Comp. > 25	



X-Direction macro examination photo.

Y-Direction macro examination photo.

Z-Direction macro examination photo.

WAM® Test Number RP10340828-A. 230793FA. Mechanical property values for the 'as-deposited WAM' 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.



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