

UNS K30960 is a chromium-molybdenum low-alloy steel welding wire classified under AWS A5.28/A5.28M:2022 as ER90S-B3 (imperial) and ER62S-B3 (metric). This creep-resistant filler metal is designed for gas shielded arc welding processes and is commonly used in high-temperature applications in the chemical, petrochemical, and power generation industries.

## Standards and Specifications

- **AWS:** A5.28 ER90S-B3 / A5.28M ER62S-B3
- **UNS:** K30960
- **ASME:** SFA-5.28/SFA-5.28M
- **Base Metal:** SA 387 Grade 22 (UNS K21590)

UNS K30960 is a high-performance welding consumable designed for joining and repairing 2.25Cr-1Mo steel components in high-temperature service. Proper welding procedures, including preheat, interpass temperature control, and PWHT, are essential to ensure weld integrity and performance.

## Applications

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## Equivalent or Similar Grades - Chemical Composition

The chemical composition of UNS K30960 conforms to the requirements for AWS ER90S-B3/ER62S-B3 electrodes and rods:

Element	Content (%)
C	0.07-0.12
Mn	0.40-0.70
Si	0.40-0.70
P	≤ 0.025
S	≤ 0.025
Cr	2.30-2.70
Mo	0.90-1.20
Ni	≤ 0.20

Element	Content (%)
Cu	≤ 0.35
Other Elements	≤ 0.50

Its composition is nearly identical to **SA 387 Grade 22** (UNS K21590), making it an ideal match for welding similar base materials.

## Mechanical Properties

UNS K30960 weld metals exhibit the following minimum tensile properties per AWS A5.28:

- **Tensile Strength:** 90,000 psi (620 MPa)
- **Yield Strength:** 78,000 psi (540 MPa)
- **Elongation:** 17%

These high-strength properties make it suitable for high-pressure and high-temperature service.

## Processing Performance

## Welding Considerations

Due to its alloy content and high strength, UNS K30960 requires careful welding practices:

- **Preheat Temperature:** 375–425°F (190–220°C)
- **Interpass Temperature:** 375–425°F (190–220°C)
- **Post-Weld Heat Treatment (PWHT):** Typically performed at 1275°F (690°C) for at least 1 hour to reduce residual stresses and temper the weld metal.

Welding in the as-welded condition requires special attention to avoid cracking due to high strength and residual stresses.

## Base Metal Compatibility

UNS K30960 is commonly used to weld ASTM **SA 387 Grade 22** (UNS K21590) steel, a 2.25% Cr-1% Mo low-alloy steel widely used in pressure vessels and piping systems.

## Shielding Gas Requirements

Welding must be performed using a shielding gas mixture such as **Argon with 1-5% Oxygen** (Classes SG-AO-1 through SG-AO-5 per AWS specification).