

Product description

9% Al bronze for welding similar 5-11% Al alloys.

Specifications

AWS A5.7 ERCuAl-A2
BS EN ISO 24373 S Cu 6180 / CuAl10Fe
BS 2901 pt 3 (C13)
DIN 1733 (SG-CuAl8, SG-CuAl10Fe)

ASME IX Qualification

QW432 F-No 36

Materials to be welded

Aluminium bronze: UNS C61400, BS CA101-103, BS 1400 AB1 (cast), Alloy D.
Beryllium copper: Cu + 0.5-2%Be; closest strength.
Brass: Cu-Zn.
Aluminium brass: eg. Yorkalbro Cu-22%Zn-2%Al.
Manganese bronze: Cu + 20-45%Zn + 1-3%Mn.
Silicon bronze: Cu + 1-3.5%Si, (also see data sheet E-31).

Applications

For welding 5-11% Al bronzes plus other copper alloys as listed above. For brasses the weld colour is similar and the presence of aluminium in the filler helps to suppress zinc volatilisation during welding.

It can also be used to overlay CMn steels and cast irons to give wear and corrosion resistant bearing surfaces, or to join these to most copper base alloys.

Applications include **corrosion resistant and spark resistant pumps, castings, machinery parts, heat exchangers** for **offshore, marine and mining equipment**.

Microstructure

In the as-welded condition consists of a duplex $\alpha + \beta$ microstructure.

Welding guidelines

For aluminium bronze alloys preheat is not required and maximum interpass temperature should be 200°C.

When welding brass a preheat of 100-300°C should be

used on thicker sections, the lower preheat temperatures being used for the high-zinc brasses.

Although this wire is suitable for many dissimilar combinations of copper and ferrous alloys, care is necessary to minimise dilution by high chromium alloys such as stainless steels. The limited tolerance to chromium pick-up may cause embrittlement and cracking especially if bend tests are applied. In this situation low heat input buttering is beneficial.

Composition (wire wt %)

| | Cu | Al | Fe | Zn | Si | Pb |
|-----|-----|------|-----|-------|------|-------|
| min | -- | 8.5 | 0.5 | -- | -- | -- |
| max | bal | 11.0 | 1.5 | 0.02 | 0.10 | 0.02 |
| typ | 90 | 9 | 1.0 | <0.01 | 0.02 | 0.004 |

All-weld mechanical properties

| Typical as welded | TIG | |
|-------------------|-----|---------|
| Tensile strength | MPa | 550-615 |
| 0.2% Proof stress | MPa | 250-350 |
| Elongation on 4d | % | 21 |
| Reduction of area | % | 25 |

Typical parameters

| | TIG | MIG |
|------------|-----------|------------------|
| Shielding | Ar | Ar, He or Ar-He |
| Current | AC | Pulsed |
| Diameter | 2.4mm | 1.2mm |
| Parameters | 250A, 15V | 235A, 25V (mean) |

Packaging data

| ø mm | TIG | MIG |
|------|------------|------------|
| 1.2 | -- | 15kg spool |
| 2.4 | 2.5kg tube | -- |

Storage

Recommended ambient storage conditions: < 60% RH, >18°C.

Fume data

Fume composition, wt % typical (TIG fume negligible):

| Fe | Mn | Cr | Ni | Mo | Cu | OES (mg/m ³) |
|----|----|------|------|------|----|--------------------------|
| 3 | 1 | <0.1 | <0.1 | <0.1 | 80 | 0.3 |

Beryllium has a very low OEL (0.002mg/m³) so special precautions may be required when welding beryllium coppers.