G-TECH 405

SMAW

COPPER ALLOYS
CuAl

DESCRIPTION

Basic coated Cu-Al bronze electrode

Basic coated electrode for joining and surfacing on aluminum bronzes with up to 10% Al and for dissimilar joints between steels and CuAl-bronzes. Also recommended for overlays on cast iron, steels and copper alloys. Excellent weldability, stable arc, less spatters, easy to remove slag. Ship building, sea water applications, desalination plants, chemical industry, pump parts, which are attacked by salt water (propellers, bearings). It is excellent for cladding components undergoing metal to metal wear and for corrosion resistant surfaces.

SPECIFICATIONS

ISO	-	**AWS A5.6**	ECuAl-A2
DIN 1733	EL-CuAL9	**Werkstoff Number**	-
Certifications	-	**Shielding**	-
Positions	PA, PB, PC, PD, PF	**Current**	DC+

ASME QUALIFICATIONS

F-No (QW432)	36
A-No (QW442)	-

FERRITE

-

PREN

-

HARDNESS

170HB

CHEM. COMP. %

	DEFAULT
Mn	1
Al	9.1
Fe	0.7

MECHANICAL PROPERTIES

	MIN	VARIANT
Tensile strength R_m MPa	410	500
Yield strength $R_{p0.2}$ MPa	-	200
Elongation A (L_0=5d_0) %	20	35
Impact Charpy ISO-V	-	-
Impact Charpy ISO-V	-	-

WELDING PARAMETERS

	2.5 mm	3.2 mm	4 mm
Ampere	55A - 60A	80A - 90A	100A - 120A
Voltage	-	-	-
Packaging	pcs/kg	pcs/kg	pcs/kg
Packaging Type	Carton box	Carton box	Carton box

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DESCRIPTION

APPLICATION

This welding consumable is designed for welding 5-11% aluminum bronzes and various other copper alloys. In the case of brasses, the weld color closely matches, and the inclusion of aluminum in the filler effectively suppresses zinc volatilization during welding. Moreover, it proves versatile for overlaying carbon-manganese steels and cast irons, providing durable bearing surfaces resistant to wear and corrosion. Additionally, it facilitates the joining of these materials to a wide range of copper-based alloys. Applications for this consumable span a variety of industries, including the manufacturing of corrosion-resistant and spark-resistant pumps, castings, machinery parts, and heat exchangers. Its utility extends to offshore, marine, and mining equipment, where its capability to deliver wear and corrosion resistance makes it an excellent choice for demanding operational environments.

ALLOY TYPE

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

MICROSTRUCTURE

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

MATERIALS

Aluminum bronze. Beryllium copper: Cu+ 0.5-2%Be. Brass: Cu-Zn. Aluminum brass: e.g. Yorkalbro Cu-22%Zn-2%Al. Manganese bronze: Cu + 20-45%Zn + 1-3%Mn. Silicon bronze: Cu + 1-3.5%Si.

EN W.Nr.: 2.0916 (CuAl5), 2.0920 (CuAl8), 2.0928 (G-CuAl9), 2.0932 (CuAl8Fe3), 2.0936 (CuAl10Fe3Mn2), 2.0940 (CuAl10Fe2-C), 2.0960 (CuAl9Mn2), 2.0962 (G-CuAl8Mn), 2.0966 (CuAl10Ni5Fe4), 2.0970 (CuAl10Ni3Fe2-C), 2.0978 (CuAl11Ni6Fe5), 2.0980 (CuAl11Fe6Ni6-C).

UNS: C61400.

PROPRIETARY: Alloy D (Hastelloy).

WELDING & PWHT

Aluminum bronze alloys do not necessitate preheating, and the maximum interpass temperature should be maintained at 200°C. For welding brass, a preheat ranging from 100-300°C is recommended for thicker sections, with lower preheat temperatures applicable to high-zinc brasses. While the wire is suitable for various dissimilar combinations of copper and ferrous alloys, caution is essential to minimize dilution by high chromium alloys like stainless steels. The limited tolerance to chromium pick-up may lead to embrittlement and cracking, particularly when subjected to bend tests. Employing low heat input buttering proves beneficial in such scenarios.