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METHOD OF INERT-GAS METAL ARC-WELDING

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4 Claims. (Cl. 219—146)

This invention is concerned with methods of inert-gas metal-arc welding in which an electrode wire of an aluminum-bronze alloy is used. The term aluminum-bronze alloy as used in this specification refers to all copper-rich binary copper-aluminum alloys and includes within its scope complex aluminum-bronze alloys which contain, in addition to copper and aluminum, such elements as manganese, iron or nickel. Such methods using these electrode wires may be used for welding aluminum-bronze alloys or brass or may be used for the purpose of overlaying on steel and other metals.

In inert-gas metal-arc welding it is usual to introduce an electrical current into the electrode wire through a contactor tube which frictionally bears against the electrode wire. It has been found in practice, when using aluminum-bronze alloy electrode wire, that the oxide film on the surface of the wire leads to inferior working, due, mainly, to variations of contact resistance and to arcing between the contactor tube and the surface of the electrode wire.

According to this invention we provide a method of inert-gas metal-arc welding in which an electrode wire of an aluminium-bronze alloy is used, the surface of the wire having, adhering thereto, a coating of copper.

Preferably the copper is deposited electrolytically on the surface of the wire after cleaning and etching thereof, and has a minimum thickness of about 0.0002".

In one embodiment of the invention, which is given by way of an example, an aluminium-bronze electrode wire containing:

	Percent
Copper	92.5
Aluminium	6.85
Iron	0.1
Manganese	0.45

And unavoidable impurities,

was degreased in a mineral solvent and etched in an acid pickle containing sulphuric, phosphoric and nitric acids. The wire was then electroplated with copper in the usual

manner until the copper deposited on the wire, which is an adherent surface coating, had a thickness of substantially 0.0002".

We have found that when an electrode wire in accordance with this embodiment of the invention is used in an inert-gas metal-arc welding operation, there is an improved transference of the current from the contactor tube to the copper-coated electrode wire, and little or no arcing occurs, with a consequent improvement in operating characteristic, particularly a decrease in wire feed rate variation.

An electrode wire in accordance with the invention has a further advantage in that it can be stored over lengthy periods without the formation of such a deleterious oxide coating as would give rise to the operating difficulties mentioned.

We claim:

1. An electrode wire for use with a contactor tube in inert-gas metal arc welding; said wire comprising a base of aluminum bronze alloy metal, and a thin adherent coating of copper metal upon the exterior of said base.

2. An electrode wire for use with a contactor tube in inert-gas metal arc welding; said wire comprising a base of aluminum bronze alloy metal, and an adherent electrolytically deposited coating of copper metal upon the exterior of said base.

3. An electrode wire for use with a contactor tube in inert-gas metal arc welding; said wire comprising a base of aluminum bronze alloy metal, and an adherent electrolytically deposited coating of copper metal having a minimum thickness of 0.0002 inch upon the exterior of said base.

4. An electrode wire for use with a contactor tube in inert-gas metal arc welding; said wire comprising a base of aluminum bronze alloy metal, and an adherent coating of copper metal substantially 0.0002 inch thick upon the exterior of said base.

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