

DEVELOPMENT OF ELECTRICAL INSULATING SURFACE ON
COPPER-NICKEL ALLOY WIRE USED IN NAVAL INSTRUMENTS(*)

G. Venkateswarlu and
K.K. Shetty,
Naval Chemical & Metallurgical
Laboratory, Defence Research &
Development Organisation,
Bombay.

The copper nickel alloy wire used in the Naval instruments is a 60/40 alloy wire with oxide layer on its surface for providing the necessary electrical insulation to 15 volts.

The work carried out at Naval Chemical and Metallurgical Laboratory consists of studying the oxide surfaces produced on the alloy wire under various conditions of temperature, flow rate of oxygen and time. The temperatures studied were from 600°C to 1000°C at intervals of 50 degrees. The flow rate was varied from 1 litre per minute to 10 litres per minutes. The time of oxidation was from 1 minute to 20 minutes.

The electrical insulation offered by the oxide was evaluated by applying gradually increased voltage across the cross section of the wire and noting the voltage at which the insulation becomes ineffective as indicated by a large current shown in the ammeter of the Test Circuit.

The work carried out here indicated that the oxide layer formed on the wire at a temperature of 750° by passing oxygen for one minute at the rate of 5 litres/minute would be suitable for developing a process to oxidise the wire for the purpose envisaged.

(*) Paper for presentation at the Symposium on "Recent Developments in Non-Ferrous Metals' Technology" -4th to 7th December, 1968, Jamshedpur.

Not to be reproduced in any media (C) National Metallurgical Laboratory, Jamshedpur.