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Solder Wettability Improvement in Copper (Cu) Substrate using Direct Current Atmospheric Plasma

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Oxidation reaction has decreased the wettability of copper (Cu) substrate in soldering industries. The formation of native Cu oxide significantly reduced the solder-ability on Cu. Direct current atmospheric plasma (DC-AP) with the mixture of N_2/H_2 carrier gas can be carried out to reduce the surface oxide on Cu substrate and consequently improve its wettability. The plasma ion is producing an NH radicals and bombarding the oxide surface layer of Cu substrate. The wettability of SAC305 on Cu substrates with a dimension of 30 mm x 5 mm x 0.2 mm was tested by wetting balance following JIS Z 3198-4. The results show that the fast plasma scanning rates (30-60 mm/s) may well-cleaned the Cu surface and performed a good wetting. Furthermore, the mechanism of surface treatment and the effect of various gas sources will be discussed.

Keywords
oxidation
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