

Microwave-resistive hybrid thermal source for soldering alloys and metal-ceramics composites

Sursă termică hibridă microunde-rezistiv pentru lipirea aliajelor metalice și a compozitelor metal-ceramică

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Abstract

The paper aims to present preliminary results of research on application of hybrid thermal source Microwave– Resistive (MW-R) in soldering processes. The device to offer the hybrid heating system was designed to apply to type of heating: a. resistive preheating to improve the MW absorption followed by hybrid MW-R heating – C-MW-R and b. direct hybrid MW-R heating – MW-R for the materials which already manifest appropriate MW absorption.

The new hybrid system was used for soldering process of copper alloys dedicated to electrical purposes and for composites of class Fe-graphite. As soldering materials were used specific solution of 95.5%Sn-3.8%Ag-0.7%Cu and Al₂O₃ powder for the both copper alloys base metal and composites. The soldering process revealed distinct types of wetting which was influenced by the type of the heating (C-MW-R or MW-R) and by the composition of the soldering material.

Keywords

Microwave– Resistive hybrid heating, soldering, composites, SAC / Al₂O₃ solder