

Heating Behavior of Ni-Embedded Thermoplastic Polyurethane Adhesive Film by Induction Heating

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Abstract : The heating behavior of nanometer and micrometer sized Nickel particle-imbedded thermoplastic polyurethane adhesive (TPU) under induction heating is examined in present study. The effects of particle size and content, TPU film thickness on heating behaviors were examined. The correlation between heating behavior and magnetic properties of Nickel particles were also studied. From the results, heat generation increased with increase of Nickel content and film thickness. However, in terms of particle sizes, heat generation of Nickel-imbedded TPU film were in order of $70\text{nm} > 1\mu\text{m} > 20\mu\text{m} > 70\mu\text{m}$ and this results can explain by increasing ration of eddy heating to hysteresis heating with increase of particle size.

Keywords : induction heating, thermoplastic polyurethane, nickel, composite, hysteresis loss, eddy current loss, curie temperature

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