

A Study on the Induced Drilling Stresses in the Centre-Hole Method of Residual Stresses Measurement

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Abstract

This paper aims at the improvement of the accuracy of the centre hole method of residual stress measurement by reducing the error caused by the drilling itself. Based on the results of an intensive experimental investigation, a new approach is proposed for the determination of the induced drilling stresses caused by the mechanical drilling process. In this study, the electric discharge machining (EDM) technique was utilised to obtain a stress free sample from the bulk material. As compared to the annealing heat treatment method for obtaining a stress free sample, it was found that the EDM technique does not cause the changes of the structures and machining properties of the parent material. Thus, the induced drilling stresses in centre hole method can be evaluated more accurately by using a stress free sample obtained by EDM technique than by using an annealed one.

Key words: Residual stress measurement; Centre hole method;
Induced drilling stress; Electric discharge machining