

Exploring a new method to obtain the 3D abrasive water jet profile

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摘要

As high-pressure water combined with abrasive particles together comes out from a nozzle, a high-energy abrasive water jet beam is formed. And this high-energy water jet beam could be used as a sharp knife to cut all types of material. Different from a rigid knife, whose profile is fixed, this high-energy beam's profile is changing as the cutting parameters change. Therefore, if this knife is used to cut a workpiece accurately and precisely, the knife's profile under each set of cutting conditions has to be searched out. And further, based on the jet profile, compensation on the jet profile has to be carried out. In the past, a 2D model for the kerf profile cut by jet has been built; then, compensation on the jet based on the 2D model of the kerf profile has been carried out. However, using a 2D model to describe a 3D profile is definitely not enough. In this paper, a new method generating a 3D kerf profile through scanning an integrated sample has been provided. With this method, complete 3D abrasive water jet profiles under each cutting conditions could be obtained through the kerf profiles. With these precise 3D abrasive water jet profiles, better compensating the cutting errors becomes possible in future.

关键词

作者关键词: AWJ; 3D model of jet profile; Kerf profile; Scanning; Curve fitting

KeyWords Plus: CUT

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