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## GH169高温合金孔挤压强化层的微观结构

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## MICROSTRUCTURE OF THE HOLE EXPANSION STRENGTHENED LAYER OF HIGH TEMPERATURE ALLOY GH169

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摘要

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**摘要** 采用透射电子显微术, 研究了GH169高温合金孔挤压强化层的微观结构。实验结果表明, 强化层内位错呈现平面状滑移和交滑移混合特征。随距孔边距离的增加, 滑移带变得不甚明显, 位错胞的直径略有增加。强化层内的孪晶数量很少, 孪生不是GH169合金的主要变形方式。在合金中的 $\gamma'$ 、 $\gamma''$ 及 $\delta$ 相周围, 存在着高密度的位错缠结结构; GH169合金具有较大范围的孔挤压强化层, 约为3 mm的深度

**关键词:** 耐热合金 孔 挤压 微观结构

**Abstract:** By TEM analysis, the microstructure of the hole expansion strengthened layer of high temperature alloy GH169 was studied. The results revealed that the dislocations show planar and cross-slip characteristics. With increasing the distance from the hole edge, the slip bands were getting obscure, while the diameter of the dislocation cell increased a little. Few of twins in the strengthened layer were present, and thus the twinning was not the main deformation mode in the alloy. It was observed that many dislocations were tangled around the  $\gamma'$ ,  $\gamma''$  and  $\delta$  phases in the regions with high density of dislocations. According to the experimental results, it was shown that the alloy GH169 has a strengthened layer with nearly 3 mm depth from the hole edge.

**Keywords:** heat resistant alloy hole expansion microstructure

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