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## 半固态挤压铝/镁合金双金属复合管的有限元模拟

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**摘 要:** 为了研究双金属复合管挤压参数及其结合面的情况与挤压参数的关系, 基于热力耦合的有限元原理, 采用ABAQUS有限元软件, 通过建立合理的有限元分析模型, 对Al/Mg双层复合管在半固态多坯料挤压工艺下进行数值模拟研究, 得到变形体在不同变形温度下的温度场和应力、应变分布, 确定界面比为37:时的挤压速度和初始温度, 优化挤压模具, 同时, 结合速度分析结合界面的结合情况。

**关键字:** 半固态成形; 多坯料挤压; 双层复合管; 有限元模拟; 热力耦合

## FEM simulation on extrusion of double-layer tube of aluminum and magnesium alloys

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**Abstract:** In order to study the extrusion parameters of the double-layer tube and the interaction between the interface and the extrusion parameters. The process of bonding for the double-layer tube of Al/Mg by thixo-co-extrusion was analyzed by ABAQUS FEM microsoft based on the thermal-mechanical coupling finite element method (FEM) theory and finite model. The temperature field and the distribution of the stress and the equivalent strain in the sample on the process of binding by thixo-co-extrusion were also achieved. The velocity laws of component metal on the deforming process of the extrusion were analyzed with three kinds of bonding proportions. The extrusion speed and the initial temperature at the bonding proportion of 37: are available. And the extrusion die is also optimized. At the same time the varying of the interface between inner and outer metal along with the velocity is obtained.

**Key words:** semi-solid forming; thixo-co-extrusion; double-layer tube; FEM simulation; thermal-mechanical coupling

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