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材料工程

汽车防撞梁超高强钢热成形工艺研究

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摘要：
采用数值模拟与试验相结合的方法研究了防撞梁热冲压成形工艺。根据BR1500HS材料特性,通过数值模拟优化工艺参数,建立了冲压力与初始成形温度和冲压速度的关系模型,指出了冲压力变化趋势,并通过防撞梁热冲压试验验证了冲压力模型的可靠性。零件性能测试结果显示,热冲压件的厚度和硬度分布较为
均匀:平均硬度为47 6HRC,最大减薄率为17%,零件抗拉强度达到1545MPa,最大残余应力只有抗拉强度的20%左右,回弹较小,组织为均匀板条状马氏体。

关键词：
热成形;防撞梁;数值模拟;模型

Research on Ultra-high-strength-steel Hot Stamping Process of Automotive Anti-collision Beam

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Abstract:
Ultra-high-strength-steel hot stamping process of
 automotive anti-collision beam combining with numerical simulation and experiments
were completed were completed.Through analyzing the properties of the material
BR1500HS,process parameters were optimized and a relational model among
forming force,initial deformation temperature and pressing speed
was built with the help of computer simulation as example of door beam,
and the variation trend of forming force was also shown clearly.The mechanical property testing shows that the hardness and thickness distribution of formed parts are uniformity; the average hardness is 47.6HRC and the largest
thinning ratio is 17%, tensile strength of formed parts achieves 1545MPa which is 5
times as the maximum residual stress with little spring-back,and that microstructure of lath martensite is homogenous.

Keywords: hot stamping;anti-collision beam;numerical simulation;modelzz')" href="#"> hot stamping;anti-collision beam;numerical simulation;model

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