

汽车覆盖件破裂试验及基于广义成形技术仿真 Experiment of Auto Panel Surface Fracture and Simulation Base on Universal Formability Technology

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摘要: 针对汽车外覆盖件的A级表面, 设计并制造了4种不同试验模具, 在试验模具中包含了在汽车外覆盖件容易产生破裂的典型的反拉伸特征。通过冲压试验, 观察到表面破裂缺陷的产生, 并搜集产生表面破裂缺陷处的应变及位移的历程及在破裂区域的接触压力的数据。同时, 以自主开发的商品化冲压成形CAE软件KMAS/UFT模块为平台, 针对冲压过程中破裂缺陷进行精确预示, 并以CAE数值模拟软件LS-DYNA3D对比, 模拟计算结果与冲压试验结果基本一致。依据广义成形理论, 提出针对破裂控制方案的实施建议, 为进一步修正冲压模具奠定基础。In order to emerge the surface fracture of auto body panel, four kinds of experimental dies containing class A surface feature of auto body outer panel was designed. The fracture phenomenon was observed during the stamping experiment. At the same time, numerical simulation based on an independently developed commercial CAE software KMAS/UFT of sheet metal forming was carried out. Comparison between experimental and simulated results based on LS-DYNA3D was made which showed good consistence. And then a universal formability theory called UFT was introduced to optimize the adjustment amount of metal flow and the stamping dies for fracture. Some suggestions were given by investigating the adjustment amount and modification of the stamping die.

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