Abstract

A Zn-alloy casting failed during use, displaying a macroscopically brittle fracture. Failure analysis investigation determined the origin of fracture, located on the top corner of the component, while an extensive amount of gas porosity was identified. The subsurface porosity seems that triggered the crack initiation and the internal porosity reduced severely the fracture toughness, leading to fast and unstable crack propagation. Careful review and revision of the component casting conditions are recommended in order to prevent gas evolution and entrapment and to increase the component lifetime.