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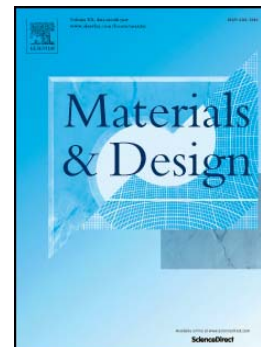
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# On crack propagation in the welded polyolefin pipes with and without presence of weld beads

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## Abstract

The main aim of the paper is to study the influence of both material inhomogeneity and weld bead geometry on crack propagation in welded polyolefin pipes. Axially and circumferentially oriented cracks are studied and the stress intensity factors are compared considering different positions of the cracks. Two cases of the welded pipe system are compared, one considering the optimal weld bead geometry and the other one considering the geometry after removing the weld bead once the welding process is finished. In both cases the inhomogeneous distribution of material properties inside the welded region is considered. The results show that the weld might have a negative effect on the lifetime especially when the weld bead is removed. Though the weld bead increases the stress concentration near the notches due to which a circumferential crack may appear the resulting lifetime is still comparable to that of an axial crack propagating in a homogeneous pipe.

## Keywords

Slow crack growth, Butt weld, Lifetime estimation, Polyolefin pipes, Weld bead

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