

원주방향 노치형태 감육부를 가진 배관의 손상거동 평가

Failure Behavior of Pipe with Circumferential Notch Type
Wall Thinning

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Abstract

To understand a failure behavior of a pipe with notch type wall thinning defect by flow accelerated corrosion, in the present study, the pipe failure tests were performed using the pipe specimen with artificial notch. Both monotonic and cyclic bending moment were applied to the pipe specimens under constant internal pressure. From the results, the failure mode, load carrying capacity, deformability, and fatigue life were investigated and compared with those obtained from circular type of a wall thinned pipe tested previously. The failure mode of notched pipe was similar to that of the pipe contained defect of a circular type wall thinning under monotonic bending load. However, the failure under cyclic bending load was caused by plastic collapse, which is deferent from circular type wall thinned pipe cracked by fatigue. The load carrying capacity of the notched pipe was dependent on the stress type and circumferential angle. When the thinning area was subjected to tensile stress, it was similar or slightly lower than that of the circular type thinned pipe. When the thinning area was subjected to compressive stress, it was higher than that of circular type thinned pipe. However, the deformability and fatigue life decreased with decrease in axial thinning length and they were the lowest in the notch type thinned pipe.