



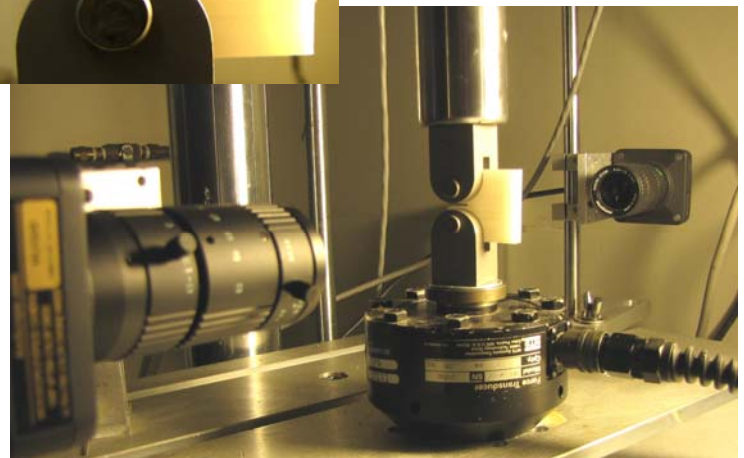
Fatigue Crack Propagation in Plastics

Summary

Plastic components subjected to cyclical loading cycles during their use can sometimes failure through fatigue crack formation. A plastic that shows good toughness in static testing may have brittle behavior when exposed to millions of fatigue cycles, particularly in parts with a sharp notch. Fatigue crack propagation testing helps to determine if a material is resistant to crack formation, and to compare different formulations of materials.

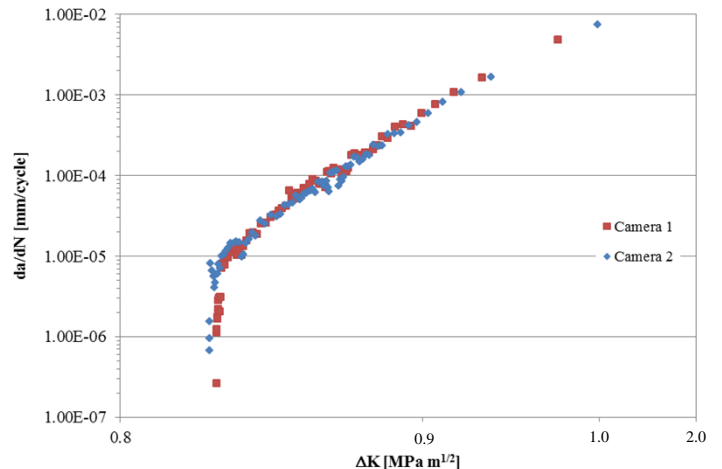
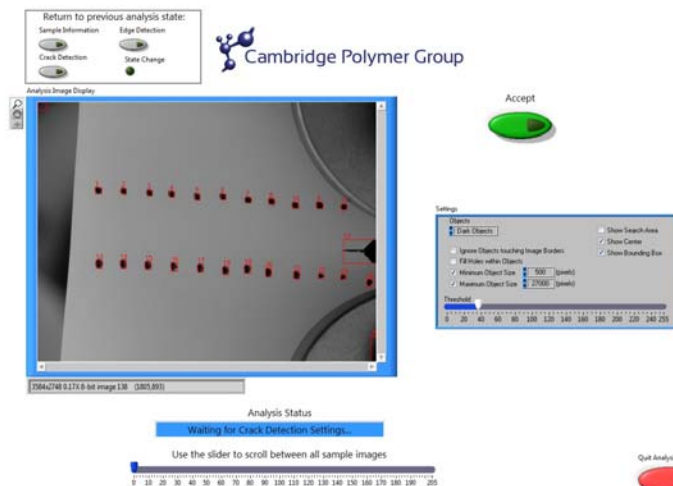
Description

ASTM E647 describes the general protocol for fatigue crack propagation testing in materials using a pre-notched compact tensile specimen. The test requires simultaneous measurements of crack propagation after the application of tensile fatigue cycles. CPG engineers have developed an automated optical system that captures thousands of images of the propagating crack during the fatigue experiment from a dual camera system. The accompanying analysis software then determines the crack length in each image, outputting the da/dN vs. ΔK curve described in ASTM E647.



Key Points

- Automated crack propagation measurements
- Rapid throughput of specimens
- More accurate crack measurements, less prone to user interpretation
- Less labor



Results from two cameras on an UHMWPE sample

Custom software designed by LabView™ certified CPG engineers

