EFFECT OF PROCESSING/MICROSTRUCTURE ON THE THRESHOLD
FATIGUE CRACK GROWTH BEHAVIOR OF INCONEL 718 FORGING

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Abstract

The threshold fatigue crack growth behavior of Inconel 718 forging was
investigated from room temperature to 1000°F. For a fine grain condition (ASTM
10 or finer), the measured thresholds were insensitive to prior forging
processing history. For a given forging/heat treat practice, the measured
threshold stress intensities increased with increasing temperature. This
temperature effect became more pronounced with decreasing grain size. The
measured threshold stress intensities appear to be related to grain size (or
strength level); at a given temperature, the largest value of threshold stress
intensity was obtained for the coarse grain material (ASTM grain size 3). This
grain size (or strength level) effect was greatest at low temperature, and
diminished with increasing temperature.