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 1000F. 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.

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