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Thermal Fatigue Behavior of Austenitic Stainless Steels

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Abstract : Continually increasing working temperature and growing need for greater efficiency and reliability of automotive exhaust require systematic investigation into the thermal fatigue properties especially of high temperature stainless steels. In this study, thermal fatigue properties of 300 series austenitic stainless steels have been evaluated in the temperature ranges of 200-800°C and 200-900°C. Systematic methods for control of temperatures within the predetermined range and measurement of load applied to specimens as a function of temperature during thermal cycles have been established. Thermal fatigue tests were conducted under fully constrained condition, where both ends of specimens were completely fixed. Load relaxation behavior at the temperatures of thermal cycle was closely related with the thermal fatigue property.

Keywords : austenitic stainless steel, automotive exhaust, thermal fatigue, microstructure, load relaxation
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