

Thermal Fatigue Behavior of 400 Series Ferritic Stainless Steels

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Abstract : In this study, thermal fatigue properties of 400 series ferritic stainless steels have been evaluated in the temperature ranges of 200-800oC and 200-900oC. 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. It has been revealed that load relaxation behavior at the temperatures of thermal cycle was closely related with the thermal fatigue property. Thermal fatigue resistance of 430J1L stainless steel is found to be superior to the other steels.

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

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020