Useful Lifetime Prediction of Rail Pads for High Speed Trains

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Abstract : Useful lifetime evaluations of rail-pads were very important in design procedure to assure the safety and reliability. It is, therefore, necessary to establish a suitable criterion for the replacement period of rail pads. In this study, we performed properties and accelerated heat aging tests of rail pads considering degradation factors and all environmental conditions including operation, and then derived a lifetime prediction equation according to changes in hardness, thickness, and static spring constants in the Arrhenius plot to establish how to estimate the aging of rail pads. With the useful lifetime prediction equation, the lifetime of e-clip pads was 2.5 years when the change in hardness was 10% at 25°C; and that of f-clip pads was 1.7 years. When the change in thickness was 10%, the lifetime of e-clip pads and f-clip pads is 2.6 years respectively. The results obtained in this study to estimate the useful lifetime of rail pads for high speed trains can be used for determining the maintenance and replacement schedule for rail pads.

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