

## Normal Spectral Emissivity of Roughened Aluminum Alloy AL 6061 Surfaces at High Temperature

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**Abstract :** Normal spectral emissivity of Al 6061 alloys with different surface finishes was experimentally measured at 833°K. Four different samples were prepared by polishing the surfaces of the alloy by 80, 220, 600 grit sizes of SiC abrasive papers and diamond paste. The samples were heated in air for 6 h at 833°K, and the emissivity was measured during the process from pyrometers operating at wavelengths of 3.9, 5.14 and 7.8  $\mu\text{m}$ . The results indicated that the emissivity was increasing with heating time and the rate of increase was rapid during the initial stage of heating in comparison with the later stage. This appears to be because of the parabolic rate law followed by the process of oxidation. Further, it is found that the increase in emissivity with heating time was higher for rough surfaces than that for polished surfaces. Both the results were analyzed at all the three wavelengths, and qualitatively similar results were obtained for all of them. In this way emissivity of the alloy can be increased by roughening the surfaces and heating it at high temperature until the surfaces are oxidized.

**Keywords :** aluminum alloy, high temperature, normal spectral emissivity, surface roughness

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