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Effect of temperature and erodent velocity on Erosion-Oxidation Behavior of Steels AISI 1020, 410, 304 and 310.

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The erosion-oxidation (E-O) behavior of commercial steels AISI 1020, 304, 310, and 410 was determined in a test rig in which a specimen assembly was rotated through a fluidized bed of erodent particles. Alumina powder (200 μ m) was used as the erodent. The E-O tests were carried out at various temperatures in the range 25- 600°C, with particle impact velocities of up to 40 m/s. The E-O wastage of the steels exposed to 6 m/s particle impact did not vary appreciably with temperature up to 300° C. The E-O wastage of the different steels exposed to particle impact at higher velocities was high up to 100° C and quite similar, due mainly to removal of surface oxide and substrate metal. Above this temperature wastage decreased due to the combined effect of new oxide formation and particle impregnation. E-O maps were plotted for the four steels to help aid material selection.