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(54) Title: COMPLEX OXIDE THERMAL BARRIER COATINGS WITH LOW THERMAL INERTIA AND LOW THERMAL CONDUCTIVITY

(57) Abstract: Compositions of highly complex oxides that exhibit low thermal inertia, which lead to decreased heat loss and increased engine efficiency, are provided for temperature swing coatings. The compositions include at least five constituent oxides greater than 5 mol%. The oxides may form single phase solid solutions or may form multiple phases. The oxide coating may be mixed with additional phases or have a high porosity to further decrease thermal inertia. The oxides may contain at least five of any of the following metals and/or semimetals: Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Ru, Co, Ni, Cu, Zn, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Lu, Be, Mg, Ca, Sr, Ba, Al, Ga, Sn, Sb, Tl, Pb, Bi, B, Si, Ge, As, Sb, Te, or Po.



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