

ABSTRACT

MULTILAYER THERMAL BARRIER COATING

The present invention relates to a multilayer ceramic coating for providing thermal barrier protection to a gas turbine outer air seal that opposes a blade tip or knife edge. The multilayer ceramic coating comprising an inner ceramic layer coating the gas turbine outer air seal, the inner ceramic layer having a plurality of macrocracks distributed throughout the inner ceramic layer, wherein the macrocracks comprise vertical segmentation macrocracks that extend at least one half the thickness of the inner ceramic layer and there are from about 7.5 to 75 vertical macrocracks per linear centimeter of coating width, and an outer ceramic abradable layer coating the inner ceramic layer, the outer ceramic abradable layer being substantially free of vertical macrocracks, and wherein said multilayer ceramic coating has a high speed tip-to-seal wear ratio of 0.1 or less, a thickness of at least about 0.2 mm, and cyclic thermal shock resistance up to a temperature of at least about 2500°F.