

THERMAL BARRIER COATING SYSTEM AND METHOD THEREFOR

Abstract of the Disclosure

5 A thermal barrier coating system and a method for forming the coating system on an article designed for use in a hostile thermal environment, such as superalloy turbine, combustor and augmentor components of a gas turbine engine. The coating system includes a carburized zone at the surface of a component on which a thermal barrier coating system is to be formed. An aluminum-rich bond coat is then formed on the carburized surface, followed by
10 oxidation of the bond coat to form an aluminum oxide layer. A thermal insulating ceramic layer is then formed on the oxide layer, so as to be chemically bonded thereto. According to the invention, appropriately carburizing the surface of a component
15 serves to form carbides that tie up refractory metals present in the underlying superalloy substrate of the component, and thereby prevents the detrimental effects of these metals on the bond coat-oxide layer interface. The benefit of the carburized zone is
20 particularly notable where the component is a superalloy containing relatively high levels of one or more refractory metals, such as tantalum, tungsten, molybdenum, rhenium, titanium, chromium, hafnium and zirconium.

Figure 2