

PULSED-VAPOR PHASE ALUMINIDE PROCESS FOR HIGH TEMPERATURE OXIDATION-RESISTANT COATING APPLICATIONS

ABSTRACT

An improved process for applying aluminide coatings to superalloy components (10) used in gas turbine applications resulting in a more uniform coating with less hazardous waste by-products. The process involves the steps of placing the superalloy components (10) into a retort (20) with an aluminum-containing source (30), evacuating air from the retort (20) and introducing an inert gas (50), heating the retort (20) to a preselected temperature, while maintaining the preselected temperature purging the inert gas (50) from the retort by introducing hydrogen gas (60), while maintaining the preselected temperature, pulsing, by reducing the retort pressure to a preselected pressure below atmospheric pressure, followed by introducing a halide-containing gas (42) to react with the aluminum-containing source (30) to create an aluminum-rich vapor that deposits aluminum on the components, then reintroducing hydrogen gas (60) into the retort (20) to purge the gases within the retort (20); and cooling the retort (20).

Figure 2



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