

Diffusion aluminide layer and method of producing such diffusion aluminide layer

Description of the solution:

The aluminide layer, obtained by the new method, contains separations of either a nickel-rhenium-tungsten coating or a cobalt-rhenium-tungsten coating, which increases the oxidation resistance of the aluminide layer. The presence of an internal nickel-rhenium-tungsten coating or a cobalt-rhenium-tungsten coating provides a diffusion barrier to block oxidation of the aluminium from the layer and retards corrosion processes during high-temperature operation. The rhenium contained in the coating dissolves during operation at elevated temperatures and strengthens the layer matrix and consequently increases the phase transition temperature and stabilises the phase components of the microstructure.

Benefits of the solution:

- Reducing the cost of manufacturing the hot part of aircraft engines by replacing platinum or palladium in the aluminide layer manufacturing process with significantly cheaper rhenium.
- Increased resistance to oxidation of the aluminide layer (the new aluminide layer contains rhenium particles).

Area of application:

Aviation (aircraft engine turbines).

Technology readiness level:

6

Intellectual property:

Invention: P.443822

Owner:

KGHM Polska Miedź S.A.,
Sieć Badawcza Łukasiewicz
- Instytut Metali Nieżelaznych,
Politechnika Wroclawska,
Politechnika Rzeszowska im. Ignacego Łukasiewicza,
Akademia Górniczo - Hutnicza
im. Stanisława Staszica w Krakowie,
Politechnika Warszawska,
Sieć Badawcza Łukasiewicz - Instytut Spawalnictwa,
Uniwersytet Mikołaja Kopernika w Toruniu,
Sieć Badawcza Łukasiewicz
- Instytut Technologii Eksploatacji,
Plasma System S.A. w restrukturyzacji

Contact:

wlasnosc.intelektualna@kghm.com

