Title (en)

Bond coat for a thermal barrier coating system

Title (de)

Haftbeschichtung für wärmedämmendes Beschichtungssystem

Title (fr)

Couche de liaison pour système de revêtement de barrière thermique

Publication

EP 0985745 A1 20000315 (EN)

Application

EP 98307244 A 19980908

Priority

- EP 98307244 A 19980908
- JP 26927098 A 19980924

Abstract (en)

A thermal barrier coating system (20) for the surface of an article (22) designed for use in a hostile thermal environment, such as turbine, combustor and augmentor components of a gas turbine engine. The thermal barrier coating system (20) employs a bond coat (24) of a nickel aluminide alloy over which a thermal-insulating ceramic layer (26) is deposited. The nickel aluminide bond coat (24) contains zirconium, but is otherwise predominantly of the beta (beta) NiAl phase. The bond coat (24) is preferably deposited by a physical vapor deposition process (PVD), such as by magnetron sputtering, electron beam physical vapor deposition (EBPVD), jet vapor deposition (JVD) and plasma spray. The NiAl bond coat (24) with zirconium additions of between 0.05 and 0.5 atomic percent have been shown to exhibit drastically improved thermal fatigue life over prior art bond coats, with optimal results appearing to be obtained at or near 0.1 atomic percent zirconium. <IMAGE>

IPC 1-7 (main, further and additional classification)

C23C 28/00

IPC 8 full level (invention and additional information)

B23P 9/00 (2006.01); **C23C 4/10** (2006.01); **C23C 8/20** (2006.01); **C23C 14/14** (2006.01); **C23C 28/00** (2006.01)

CPC (invention and additional information)

C23C 28/00 (2013.01)

Citation (search report)

- [X] WO 9729219 A2 19970814 - INTERTURBINE NV [NL], et al
- [A] US 5759640 A 19980602 - MANNAVA SEETHARAMAIAH [US], et al
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- [A] PATENT ABSTRACTS OF JAPAN vol. 10, no. 203 (C - 360) 16 July 1986 (1986-07-16)

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Designated contracting state (EPC)

DE FR GB IT NL

EPO simple patent family

EP 0985745 A1 20000315; EP 0985745 B1 20060712; JP 2000096259 A 20000404; JP 3579262 B2 20041020

INPADOC legal status

2014-04-30 [REG DE R107] PUBLICATION OF GRANT OF EUROPEAN PATENT RESCINDED
- Document : DE 69835208
- Effective date : 20140430

2014-03-26 [27W] PATENT REVOKED
- Effective date : 20131011

2014-03-26 [GBPR] GB: PATENT REVOKED UNDER ART. 102 OF THE EP CONVENTION DESIGNATING THE UK AS CONTRACTING STATE
- Effective date : 20131011

2013-12-31 [PGFP IT] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : IT
- Payment date : 20130925
- Year of fee payment : 16

2013-11-29 [PGFP GB] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : GB
- Payment date : 20130927
- Year of fee payment : 16

2013-11-29 [PGFP FR] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : FR
- Payment date : 20130919
- Year of fee payment : 16

2013-10-31 [PGFP DE] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : DE
- Payment date : 20130927
- Year of fee payment : 16

2013-10-11 [REG DE R064] EPO'S REVOCATION DECISION NOW FINAL
- Document : DE 69835208

2013-10-11 [REG DE R103] PATENT REVOKED BY EPO
- Document : DE 69835208

2013-03-20 [R26] OPPOSITION FILED (CORRECTION)
- Opponent name : SIEMENS AKTIENGESELLSCHAFT
- Effective date : 20070201

2008-06-02 [NLV4] NL: LAPSED OR ANULLED DUE TO NON-PAYMENT OF THE ANNUAL FEE
- Effective date : 20080401

2008-05-30 [PG25 NL] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : NL
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20080401

2007-07-02 [NLR1] NL: OPPOSITION HAS BEEN FILED WITH THE EPO
- Opponent name : SIEMENS AG

2007-04-25 [26] OPPOSITION FILED
- Opponent name : SIEMENS AG
- Effective date : 20070201

2007-01-26 [ET] FR: TRANSLATION FILED

2006-09-24 [PGFP NL] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : NL
- Payment date : 20060924
- Year of fee payment : 9

2006-08-24 [REF] CORRESPONDS TO:
- Document : DE 69835208 P 20060824

2006-07-12 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : B1
- Designated State(s) : DE FR GB IT NL

2006-07-12 [REG GB FG4D] EUROPEAN PATENT GRANTED

2003-01-02 [17Q] FIRST EXAMINATION REPORT
- Effective date : 20021115

2000-11-22 [AKX] PAYMENT OF DESIGNATION FEES
- Free text : DE FR GB IT NL

2000-11-15 [17P] REQUEST FOR EXAMINATION FILED
- Effective date : 20000915

2000-03-15 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : A1
- Designated State(s) : DE FR GB IT NL

2000-03-15 [AX] REQUEST FOR EXTENSION OF THE EUROPEAN PATENT TO:
- Free text : AL;LT;LV;MK;RO;SI