

Title (en)

Method of making a heat treated spray formed superalloy article

Title (de)

Verfahren zur Herstellung von wärmebehandelten, sprühgegossenen Superlegierungsgegenstände

Title (fr)

Procédé de fabrication des objets en superalliage formés par projection et traités thermiquement

Publication

EP 1013790 A2 20000628 (EN)

Application

EP 99309128 A 19991117

Priority

US 21690498 A 19981221

Abstract (en)

Heat treated, spray formed articles are disclosed which exhibit crack growth rates and resistance to stress rupture comparable to corresponding, forged articles. The articles are first formed by depositing molten metal droplets, e.g., of a superalloy having a composition in weight percent of about 18-21 w/o Cr, 3.5-5 w/o Mo, 12-15 Co, 2.75-3.25 w/o Ti, 1.2-1.6 w/o Al, 0.01-0.08 w/o Zr, 0.003-0.010 w/o B, balance generally nickel, on a substrate to form a rough article. The articles are HIP'ed and then processed by heat treating, which includes solution, stabilization and precipitation heat treatments. The resultant articles have fine average grain sizes compared to forged and conventionally heat treated material, as well as yield and tensile strengths comparable to forged material. Importantly, the articles also exhibit low crack growth rates and stress rupture resistance, e.g., comparable to forged material, and have an isotropic microstructure. The articles can be used in place of forged articles. <IMAGE>

IPC 1-7

C23C 4/12; **C22C 19/05**

IPC 8 full level

C23C 4/08 (2006.01); **C22C 19/05** (2006.01); **C22C 38/22** (2006.01); **C22C 38/30** (2006.01); **C23C 4/12** (2006.01)

CPC (source: EP KR)

C21D 9/50 (2013.01 - EP); **C22C 19/05** (2013.01 - EP); **C22C 19/055** (2013.01 - EP); **C22C 19/056** (2013.01 - EP);
C22C 38/22 (2013.01 - EP KR); **C22C 38/30** (2013.01 - EP KR); **C22F 1/10** (2013.01 - EP); **C23C 4/08** (2013.01 - EP);
C23C 4/123 (2016.01 - EP); **C23C 4/18** (2013.01 - EP)

Cited by

CN104057085A; EP1580047A1

Designated contracting state (EPC)

CH DE ES FR GB LI NL

DOCDB simple family (publication)

EP 1013790 A2 20000628; **EP 1013790 A3 20000726**; **EP 1013790 B1 20040428**; DE 69916763 D1 20040603; DE 69916763 T2 20050331;
JP 2000192218 A 20000711; JP 3905674 B2 20070418; KR 100603882 B1 20060725; KR 20000047783 A 20000725

DOCDB simple family (application)

EP 99309128 A 19991117; DE 69916763 T 19991117; JP 36208399 A 19991221; KR 19990053743 A 19991130