

Title (en)

IN-SITU DUCTILE METAL/BULK METALLIC GLASS MATRIX COMPOSITES FORMED BY CHEMICAL PARTITIONING

Title (de)

IN-SITU DUKTILER METALLISCHER GLAS-MATRIX-VERBUNDWERKSTOFF HERGESTELLT DURCH CHEMISCHE TRENNUNG

Title (fr)

COMPOSITES DE METAL DUCTILE IN SITU/ MATRICE EN VERRE METALLIQUE EN MASSE FORMES PAR PARTAGE CHIMIQUE

Publication

EP 1183401 A2 20020306 (EN)

Application

EP 00959118 A 20000501

Priority

- US 0011790 W 20000501
- US 13197399 P 19990430

Abstract (en)

[origin: WO0068469A2] A composite metal object comprises ductile crystalline metal particles in an amorphous metal matrix. An alloy is heated above its liquidus temperature. Upon cooling from the high temperature melt, the alloy chemically partitions, forming dendrites in the melt. Upon cooling the remaining liquid below the glass transition temperature it freezes to the amorphous state, producing a two-phase microstructure containing crystalline particles in an amorphous metal matrix. The ductile metal particles have a size in the range of from 0.1 to 15 micrometers and spacing in the range of from 0.1 to 20 micrometers. Preferably, the particle size is in the range of from 0.5 to 8 micrometers and spacing is in the range of from 1 to 10 micrometers. The volume proportion of particles is in the range of from 5 to 50 % and preferably 15 to 35 %. Differential cooling can produce oriented dendrites of ductile metal phase in an amorphous matrix. Examples are given in the Zr-Ti-Cu-Ni-Be alloy bulk glass forming system with added niobium.

IPC 1-7

C22C 16/00; **C22C 45/10**

IPC 8 full level

C22C 47/00 (2006.01); **C22C 16/00** (2006.01); **C22C 33/00** (2006.01); **C22C 45/10** (2006.01); **C22C 49/02** (2006.01); **C22C 111/00** (2006.01)

CPC (source: EP KR)

C22C 16/00 (2013.01 - KR); **C22C 33/003** (2013.01 - EP); **C22C 45/10** (2013.01 - EP)

Cited by

CN102888572A

Designated contracting state (EPC)

DE FR GB IT

DOCDB simple family (publication)

WO 0068469 A2 20001116; **WO 0068469 A3 20010125**; AU 7049300 A 20001121; EP 1183401 A2 20020306; EP 1183401 A4 20020918; EP 1183401 B1 20110706; JP 2002544386 A 20021224; JP 2009263797 A 20091112; JP 2014088622 A 20140515; JP 5462537 B2 20140402; JP 6092763 B2 20170308; KR 100715137 B1 20070510; KR 20010113904 A 20011228

DOCDB simple family (application)

US 0011790 W 20000501; AU 7049300 A 20000501; EP 00959118 A 20000501; JP 2000617237 A 20000501; JP 2009155626 A 20090630; JP 2013257353 A 20131212; KR 20017013925 A 20011030