

## Title (en)

Coating for cylinder friction surface part of a piston engine

## Title (de)

Beschichtung einer Zylinderlauffläche einer Hubkolbenmaschine

## Title (fr)

Revêtement pour partie d'usure d'un cylindre d'un moteur à pistons

## Publication

**EP 0896073 A1 19990210 (DE)**

## Application

**EP 98113380 A 19980717**

## Priority

DE 19733205 A 19970801

## Abstract (en)

A reciprocating piston engine cylinder running face coating consists of a hypereutectic aluminium-silicon alloy or aluminium-silicon composite material which has a heterogeneous structure of an aluminium solid solution, intermetallic phases such as Al<sub>2</sub>Cu and Mg<sub>2</sub>Si, oxides and (i) silicon precipitates, (ii) embedded silicon particles or (iii) silicon precipitates and embedded silicon particles, the mean size of the primary silicon precipitates or embedded silicon particles being less than 10 µm and the mean oxide size being less than 5 µm. Also claimed are processes for producing the above coatings by thermal (especially atmospheric plasma) spraying with parameters adjusted for formation of oxides. Preferably, the spraying material has the composition (by wt.) (A) (for coating type (i)) 23-40 (especially 25)% Si, 0.8-2.0 (especially 1.2)% Mg, NOTGREATER 4.5 (preferably 3.9)% Cu, NOTGREATER 0.6% Zr, NOTGREATER 0.25% Fe, NOTGREATER 0.01% each of Mn, Ni, Cu and Zn and balance Al; (B) (for coating type (i)) as (A) but containing 23-40 (especially 25)% Si, 1-5 (especially 4)% Ni and 1.0-1.4 (especially 1.2)% Fe; (C) (for coating type (ii)) 5-50% Si particles and 50-95% alloy particles of composition (A) but containing 0-11.8 (especially 9)% Si; (D) (for coating type (ii)) 5-50% Si particles and 50-95% alloy particles of composition (B) but containing 0-11.8 (especially 9)% Si; (E) (for coating type (iii)) 5-50% Si particles and 50-95% alloy particles of composition (A) but containing 11.8-40 (especially 17)% Si; or (F) (for coating type (iii)) 5-50% Si particles and 50-95% alloy particles of composition (B) but containing 11.8-40 (especially 17)% Si.

## Abstract (de)

Die Erfindung betrifft Beschichtungen einer Zylinderlauffläche einer Hubkolbenmaschinen auf einer Eisen-, Aluminium- oder Magnesium-Basis mit einer übereutektischen Aluminium/Silizium Legierung sowie Verfahren zu deren Herstellung. <IMAGE>

## IPC 1-7

**C23C 4/04; C23C 4/12**

## IPC 8 full level

**F02F 1/00** (2006.01); **C22C 21/02** (2006.01); **C23C 4/04** (2006.01); **C23C 4/12** (2006.01); **C23C 4/134** (2016.01); **C23C 28/00** (2006.01); **C23C 30/00** (2006.01); **F16J 10/04** (2006.01)

## CPC (source: EP KR US)

**C23C 4/04** (2013.01 - EP US); **C23C 4/134** (2016.01 - EP US); **C23C 28/00** (2013.01 - KR); **C23C 30/00** (2013.01 - EP US)

## Citation (search report)

- [A] US 4707379 A 19871117 - NEUFUSS KAREL [CS], et al
- [A] WO 9713884 A1 19970417 - FORD MOTOR CO [GB], et al
- [A] PATENT ABSTRACTS OF JAPAN vol. 006, no. 054 (C - 097) 9 April 1982 (1982-04-09)
- [A] PATENT ABSTRACTS OF JAPAN vol. 009, no. 088 (C - 276) 17 April 1985 (1985-04-17)
- [A] PATENT ABSTRACTS OF JAPAN vol. 005, no. 178 (C - 078) 14 November 1981 (1981-11-14)
- [A] PATENT ABSTRACTS OF JAPAN vol. 095, no. 002 31 March 1995 (1995-03-31)
- [A] PATENT ABSTRACTS OF JAPAN vol. 007, no. 155 (C - 175) 7 July 1983 (1983-07-07)
- [A] PATENT ABSTRACTS OF JAPAN vol. 018, no. 108 (M - 1564) 22 February 1994 (1994-02-22)

## Cited by

EP1176228A3; EP0987339A1; US6329021B1; WO0141942A3

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