

Title (en)  
SURFACE TREATMENT TECHNIQUES

Title (de)  
VERFAHREN ZUR OBERFLÄCHENBEHANDLUNG

Title (fr)  
TECHNIQUES DE TRAITEMENT DE SURFACE

Publication  
**EP 0752018 A4 19980902 (EN)**

Application  
**EP 95927112 A 19950511**

Priority  
• US 9505941 W 19950511  
• US 24193094 A 19940512

Abstract (en)  
[origin: WO9531584A1] Energy, such as from a UV excimer laser (712), an infrared Nd:YAG laser (714) and an infrared CO2 laser (716) is directed through a nozzle (722) at the surface of a substrate (702) to mobilize and vaporize a carbon constituent (e.g., carbide) within the substrate (e.g., steel). An additional secondary source (e.g., a carbon-containing gas, such as CO2) (720) and an inert shielding gas (e.g., N2) are also delivered through the nozzle. The vaporized constituent element is reacted by the energy to alter its physical structure (e.g., from carbon to diamond) to that of a composite material which is diffused back into the substrate as a composite material.

IPC 1-7  
**C23C 16/48**; **C23C 16/26**; **H05B 7/00**

IPC 8 full level  
**B81C 99/00** (2010.01); **C23C 14/22** (2006.01); **C23C 14/28** (2006.01); **C23C 16/26** (2006.01); **C23C 16/27** (2006.01); **C30B 25/10** (2006.01)

CPC (source: EP)  
**C23C 14/22** (2013.01); **C23C 14/28** (2013.01); **C23C 16/26** (2013.01); **C23C 16/27** (2013.01); **C30B 25/105** (2013.01); **C30B 29/04** (2013.01)

Citation (search report)  
• [X] EP 0578232 A1 19940112 - SUMITOMO ELECTRIC INDUSTRIES [JP]  
• [X] PATENT ABSTRACTS OF JAPAN vol. 015, no. 403 (C - 0875) 15 October 1991 (1991-10-15)  
• [X] PATENT ABSTRACTS OF JAPAN vol. 013, no. 115 (C - 578) 20 March 1989 (1989-03-20)  
• [X] REBELLO J H D ET AL: "DIAMOND GROWTH BY LASER-DRIVEN REACTIONS IN A CO/H2 MIXTURE", APPLIED PHYSICS LETTERS, vol. 62, no. 8, 22 February 1993 (1993-02-22), pages 899 - 901, XP000338603  
• [X] "LASER-ASSISTED, CHEMICAL VAPOR DEPOSITION OF HIGH-PURITY GRAPHITE", IBM TECHNICAL DISCLOSURE BULLETIN, vol. 33, no. 10B, 1 March 1991 (1991-03-01), pages 30, XP000109867  
• [X] PATENT ABSTRACTS OF JAPAN vol. 017, no. 693 (C - 1144) 17 December 1993 (1993-12-17)  
• See references of WO 9531584A1

Designated contracting state (EPC)  
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**WO 9531584 A1 19951123**; AU 3124295 A 19951205; EP 0752018 A1 19970108; EP 0752018 A4 19980902

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**US 9505941 W 19950511**; AU 3124295 A 19950511; EP 95927112 A 19950511