

Title (en)  
Investment and mould casting in carbon and organic aerogels

Title (de)  
Fein- und Formguss in Kunststoff/Kohlenstoffaerogelen

Title (fr)  
Moulage de précision et en châssis dans des aérogels organiques ou en carbone

Publication  
**EP 1036610 A1 20000920 (DE)**

Application  
**EP 00104214 A 20000301**

Priority  
DE 19911847 A 19990317

Abstract (en)  
Open-pored aerogel mold material is obtained by sol-gel polymerization e.g., resorcinol/formaldehyde with a polymerization catalyst such as ammonium or sodium carbonate, followed by complete or partial pyrolysis of the resultant aerogel. Fillers, e.g. aluminum oxide, titanium oxide, quartz, polystyrene particles, carbon or silicon carbide fibers can be added. Independent claims are also included for the following precision casting processes for metals or alloys: (a) a wax mold is coated with a sol of suitable composition and a catalyst and converted to a gel at a temperature below the melting point of the wax. The process is repeated to build up the mold, after which the gel is dried. The temperature is then raised to melt or burn out the wax; (b) a wax pattern is placed in a container which is then filled with the synthetic sol and heated to below the wax melting point. The resultant gel is dried and the temperature raised to melt or burn out the wax.

Abstract (de)  
Gegenstand der Erfindung ist ein Formstoff für den Fein- und Formguss von Metallen oder Metall-Legierungen umfassend Kunststoff- und/oder Kohlenstoffaerogele sowie ein Verfahren zur Herstellung von entsprechenden Formstoffen. Der Formstoff umfasst hochporöse, offenporige Kunststoff- und/oder Kohlenstoffaerogele, erhältlich durch Sol-Gel-Polymerisation von organischen Kunststoffmaterialien gegebenenfalls gefolgt von teilweise oder vollständiger Pyrolyse des erhaltenen Kunststoffaerogels.

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**B22C 1/00**; **B22C 1/16**

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CPC (source: EP US)  
**B22C 1/00** (2013.01 - EP US); **B22C 1/165** (2013.01 - EP US)

Citation (search report)

- [XY] DE 19738466 C1 19981224 - DEUTSCH ZENTR LUFT & RAUMFAHRT [DE]
- [Y] DE 19721600 A1 19981126 - HOECHST AG [DE]
- [Y] US 4873218 A 19891010 - PEKALA RICHARD W [US]
- [PY] TSCHUEUSCHNER D ET AL: "Investment casting in silica aerogels", MATERIAL SCIENCE FORUM, vol. 329-330, 2000, pages 479 - 486, XP000925267
- [A] ALLKEMPER J ET AL: "Chill casting into aerogels", SCRIPTA METALLURGICA ET MATERIALIA, vol. 29, 1993, pages 1495 - 1500, XP000925332
- [A] HRUBESH L W: "Aerogel applications", JOURNAL OF NON-CRYSTALLINE SOLIDS,NL,NORTH-HOLLAND PUBLISHING COMPANY, AMSTERDAM, vol. 225, no. 1-3, 15 April 1998 (1998-04-15), pages 335 - 342, XP004178562, ISSN: 0022-3093
- [A] FRICKE J ET AL: "Aerogels: production, characterization, and applications", THIN SOLID FILMS,CH,ELSEVIER-SEQUOIA S.A. LAUSANNE, vol. 297, no. 1-2, 1 April 1997 (1997-04-01), pages 212 - 223, XP004125997, ISSN: 0040-6090

Cited by  
EP1077097A1; CN109675620A; CN104399446A; EP2204246A3; CN102351506A; DE102004027382A1; DE102004027382B4; CN107498003A; DE10216403A1; DE10216403B4; CN102343285A; WO2005046909A1; WO2017102231A1

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