

03-21-2001



101642860  
RECORDATION COVER SHEET  
TRADEMARKS ONLY

3/2/01

TO: The Commissioner of Patents and Trademarks: Please record the attached original document(s) or copy(ies).

Submission Type

New

Resubmission (Non-Recordation)  
Document ID #

Correction of PTO Error  
Reel #  Frame #

Corrective Document  
Reel #  Frame #

Conveyance Type

Assignment  License

Security Agreement  Nunc Pro Tunc Assignment  
Effective Date  
Month Day Year

Merger

Change of Name

Other

Conveying Party

Mark if additional names of conveying parties attached

Name  Execution Date  
Month Day Year

Formerly

Individual  General Partnership  Limited Partnership  Corporation  Association

Other

Citizenship/State of Incorporation/Organization

Receiving Party

Mark if additional names of receiving parties attached

Name

DBA/AKA/TA

Composed of

Address (line 1)

Address (line 2)

Address (line 3)     
City State/Country Zip Code

Individual  General Partnership  Limited Partnership  Corporation  Association

Other

Citizenship/State of Incorporation/Organization

If document to be recorded is an assignment and the receiving party is not domiciled in the United States, an appointment of a domestic representative should be attached. (Designation must be a separate document from Assignment.)

RECEIVED  
2001 MAR 2 PM 4:03  
ASSIGNMENT PRACTICE  
DIVISION

FOR OFFICE USE ONLY

03/20/2001 BTCH11 00000145 76026481  
40.00 UP  
285.00 UP

Public burden reporting for this collection of information is estimated to average approximately 30 minutes per Cover Sheet to be recorded, including time for reviewing the document and gathering the data needed to complete the Cover Sheet. Send comments regarding this burden estimate to the U.S. Patent and Trademark Office, Chief Information Officer, Washington, D.C. 20231 and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Paperwork Reduction Project (0651-0027), Washington, D.C. 20503. See OMB Information Collection Budget Package 0651-0027, Patent and Trademark Assignment Practice. DO NOT SEND REQUESTS TO RECORD ASSIGNMENT DOCUMENTS TO THIS ADDRESS.

Mail documents to be recorded with required cover sheet(s) information to:  
Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231

TRADEMARK  
REEL: 002254 FRAME: 0651

**Domestic Representative Name and Address**

Enter for the first Receiving Party only.

Name

Address (line 1)

Address (line 2)

Address (line 3)

Address (line 4)

**Correspondent Name and Address**

Area Code and Telephone Number

Name

Address (line 1)

Address (line 2)

Address (line 3)

Address (line 4)

**RETURN TO:  
FEDERAL RESEARCH CORP.  
400 SEVENTH STREET NW  
SUITE 101  
WASHINGTON DC 20004**

**Pages**

Enter the total number of pages of the attached conveyance document including any attachments.

#

**Trademark Application Number(s) or Registration Number(s)**

Mark if additional numbers attached

Enter either the Trademark Application Number or the Registration Number (DO NOT ENTER BOTH numbers for the same property).

Trademark Application Number(s)			Registration Number(s)		
<input type="text" value="76026481"/>	<input type="text" value="75544604"/>	<input type="text"/>	<input type="text" value="1703088"/>	<input type="text" value="1844968"/>	<input type="text"/>
<input type="text" value="75457180"/>	<input type="text" value="75624519"/>	<input type="text"/>	<input type="text" value="0763741"/>	<input type="text"/>	<input type="text"/>
<input type="text" value="75369758"/>	<input type="text" value="75457180"/>	<input type="text"/>	<input type="text" value="2126905"/>	<input type="text"/>	<input type="text"/>

**Number of Properties**

Enter the total number of properties involved.

#

**Fee Amount**

Fee Amount for Properties Listed (37 CFR 3.41):

\$

Method of Payment:

Enclosed  Deposit Account

Deposit Account

(Enter for payment by deposit account or if additional fees can be charged to the account.)

Deposit Account Number:

#

Authorization to charge additional fees:

Yes  No

**Statement and Signature**

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

Kathie J. Kopczyk

Name of Person Signing

*Kathie J. Kopczyk*

Signature

Feb. 27, 2001

Date Signed

# INTELLECTUAL PROPERTY COLLATERAL ASSIGNMENT AGREEMENT

## 1. RECITALS.

ADVANCED CERAMICS CORPORATION, an Ohio corporation (together with its successors and assigns, "Pledgor"), the financial institutions listed on Schedule 1 to the Credit Agreement, as hereinafter defined, (collectively, "Banks" and, individually, "Bank") and KEYBANK NATIONAL ASSOCIATION, as agent for the Banks ("Agent"), are entering into the Credit Agreement.

Pledgor deems it to be in the direct pecuniary and business interests of Pledgor that Pledgor obtain from the Banks the Commitment, as defined in the Credit Agreement, and the Loans, as hereinafter defined, provided for in the Credit Agreement.

Pledgor understands that the Banks are willing to grant such financial accommodations to Pledgor only upon certain terms and conditions, one of which is that Pledgor grant to Agent, for the benefit of the Banks, a security interest in and collateral assignment of the Collateral, as hereinafter defined, and this Intellectual Property Collateral Assignment Agreement (as the same may from time to time be amended, restated or otherwise modified, this "Agreement") is being executed and delivered in consideration of each financial accommodation granted to Pledgor by the Banks and for other valuable considerations.

2. DEFINITIONS. As used in this Agreement, the following terms shall have the following meanings:

2.1. "Assignment" shall mean an Assignment in the form of Exhibit A attached hereto.

2.2. "Collateral" shall mean, collectively, all of Pledgor's existing and future (a) patents, patent registrations, patent applications, trademarks, trademark registrations, trademark applications and copyright registrations, whether federal or state, including, but not limited to, those listed on Schedule 1 hereto (as such Schedule 1 may from time to time be amended, supplemented or otherwise modified); (b) common law trademark rights, copyrights, improvements and inventions; (c) renewals, proceeds on infringement suits, and rights to sue for past, present and future infringements relating to any of the foregoing; (d) goodwill associated with any of the foregoing; and (e) proceeds of any of the foregoing.

2.3. "Credit Agreement" shall mean the Credit and Security Agreement executed by and among Pledgor, the Banks and Agent and dated as of the 2nd day of February, 2001, as the same may from time to time be amended, restated or otherwise modified or replaced.

2.4. "Debt" shall mean, collectively, (a) all Loans; (b) all other indebtedness now owing or hereafter incurred by Pledgor to Agent or any Bank pursuant to the Credit Agreement and any Note executed in connection therewith; (c) each renewal, extension, consolidation or refinancing of any of the foregoing, in whole or in part; (d) all interest from time to time accruing on any of the foregoing, and all fees or other amounts payable by Pledgor pursuant to the Credit Agreement; (e) all obligations and liabilities of Pledgor now existing or hereafter incurred to Agent or any Bank

under, arising out of, or in connection with any Hedge Agreement; (f) every other liability, now or hereafter owing to Agent or any Bank by Pledgor pursuant to the Credit Agreement or any other Loan Document; and (g) all Related Expenses.

2.5. "Event of Default" shall mean an event or condition that constitutes an event of default pursuant to Section 8 hereof.

2.6 "Hedge Agreement" shall mean any currency swap or hedge agreement, interest rate swap, cap, collar or floor agreement, or other interest rate management device entered into by Pledgor with Agent or any of the Banks, or any of their respective affiliates, in connection with the Debt.

2.7. "Loan" shall mean any Loan, as defined in the Credit Agreement, granted pursuant to the Credit Agreement.

2.8. "Person" shall mean any individual, sole proprietorship, partnership, joint venture, unincorporated organization, corporation, limited liability company, institution, trust, estate, government or other agency or political subdivision thereof or any other entity.

2.9. "Related Expenses" shall mean any and all reasonable costs, liabilities and expenses (including, without limitation, losses, damages, penalties, claims, actions, reasonable attorneys' fees, legal expenses, judgments, suits, and disbursements) (a) incurred by Agent or imposed upon or asserted against Agent or any Bank, in any attempt by Agent and the Banks to (i) obtain, preserve, perfect or enforce any security interest evidenced by this Agreement, the Credit Agreement or any Related Writing, as defined in the Credit Agreement; (ii) obtain payment, performance or observance of any and all of the Debt; or (iii) maintain, insure, audit, collect, preserve, repossess or dispose of any of the Collateral or any other collateral securing the Debt, including, without limitation, costs and expenses for appraisals, assessments and audits of Pledgor or any such collateral; or (b) incidental or related to (a) above, including, without limitation, interest thereupon from the date incurred, imposed or asserted until paid at the Default Rate, as defined in the Credit Agreement.

2.10. "USPTO" shall mean the United States Patent and Trademark Office in Washington D.C.

Except as specifically defined herein, capitalized terms used herein that are defined in the Credit Agreement shall have their respective meanings ascribed to them in the Credit Agreement.

3. GRANT OF ASSIGNMENT AND SECURITY INTEREST. In consideration of and as security for the full and complete payment of all of the Debt, Pledgor hereby agrees that the Banks shall at all times have, and hereby grants to Agent, for the benefit of the Banks, a security interest in and collateral assignment of all of the Collateral, including (without limitation) all of Pledgor's future Collateral, irrespective of any lack of knowledge by Agent or any Bank of the creation or acquisition thereof.

4. REPRESENTATIONS AND WARRANTIES. Pledgor represents and warrants to Agent and each Bank that:

(a) Pledgor owns all of the Collateral and, whether the same are registered or unregistered, no such Collateral has been adjudged invalid or unenforceable;

(b) The Collateral is valid and enforceable;

(c) Pledgor has no knowledge of any claim that the use of any of the Collateral does or may violate the rights of any Person.;

(d) Pledgor is the sole and exclusive owner of the entire and unencumbered right, title and interest in and to the Collateral, free and clear of any liens, charges and encumbrances except as expressly permitted in the Credit Agreement, including, without limitation, pledges, assignments, licenses, registered user agreements and covenants by Pledgor not to sue third Persons;

(e) Pledgor has full power, authority and legal right to pledge the Collateral and enter into this Agreement and perform its terms; and

(f) Pledgor has used, and shall continue to use, for the duration of this Agreement, proper statutory notice in connection with its use of the Collateral, except where the failure to do so will not have a Material Adverse Effect.

5. FURTHER ASSIGNMENT PROHIBITED. Pledgor shall not enter into any agreement that is inconsistent with Pledgor's obligations under this Agreement and shall not otherwise sell or assign its interest in, or grant any license or sublicense with respect to, any of the Collateral without Agent's prior written consent. Absent such prior written consent, any attempted sale or license is null and void.

6. RIGHT TO INSPECT. Pledgor hereby grants to Agent, for the benefit of the Banks, and its employees and agents the right, during regular business hours, to visit any location of Pledgor or, if applicable, any other location, and to inspect the products and quality control records relating thereto, at Pledgor's expense.

7. STANDARD PATENT AND TRADEMARK USE. Pledgor shall not use the Collateral in any manner that would jeopardize the validity or legal status thereof. Pledgor shall comply with all patent marking requirements as specified in 35 U.S.C. §287. Pledgor shall further conform its usage of any trademarks to standard trademark usage, including, but not limited to, using the trademark symbols ®, ™, and ™ where appropriate.

8. EVENT OF DEFAULT.

(a) The occurrence of any of the following shall constitute an "Event of Default" under this Agreement (i) an Event of Default, as defined in the Credit Agreement, shall occur under the Credit Agreement; (ii) any representation, warranty or statement made by Pledgor in or pursuant to

this Agreement or in any other writing received by Agent or the Banks in connection with the Debt shall be false or erroneous in any material respect; or (iii) Pledgor shall fail or omit to perform or observe any agreement made by Pledgor in or pursuant to this Agreement or in any other writing received by Agent or the Banks pursuant hereto.

(b) Pledgor expressly acknowledges that Agent, on behalf of the Banks, shall record this Agreement with the USPTO. Contemporaneously herewith, Pledgor shall execute and deliver to Agent the Assignment, which Assignment shall have no force and effect and shall be held by Agent in escrow until the occurrence of an Event of Default; provided, that, anything herein to the contrary notwithstanding, the security interest and collateral assignment granted herein shall be effective as of the date of this Agreement. After the occurrence of an Event of Default, the Assignment shall immediately take effect upon certification of such fact by an authorized officer of Agent in the form reflected on the face of the Assignment and Agent may, in its sole discretion, record the Assignment with the USPTO.

(c) If an Event of Default shall occur, Pledgor irrevocably authorizes and empowers Agent, on behalf of the Banks, to terminate Pledgor's use of the Collateral and to exercise such rights and remedies as allowed by law. Without limiting the generality of the foregoing, after any delivery or taking of possession of the Collateral, or any thereof, pursuant to this Agreement, then, with or without resort to Pledgor or any other Person or property, all of which Pledgor hereby waives, and upon such terms and in such manner as Agent may deem advisable, Agent, in its discretion, may sell, assign, transfer and deliver any of the Collateral, together with the associated goodwill, or any interest that Pledgor may have therein, at any time, or from time to time. No prior notice need be given to Pledgor or to any other Person in the case of any sale of Collateral that Agent determines to be declining speedily in value or that is customarily sold in any recognized market, but in any other case Agent shall give Pledgor no fewer than ten (10) days prior notice of either the time and place of any public sale of the Collateral or of the time after which any private sale or other intended disposition thereof is to be made. Pledgor waives advertisement of any such sale and (except to the extent specifically required by the preceding sentence) waives notice of any kind in respect of any such sale. At any such public sale, Agent or any Bank may purchase the Collateral, or any part thereof, free from any right of redemption, all of which rights Pledgor hereby waives and releases. After deducting all Related Expenses, and after paying all claims, if any, secured by liens having precedence over this Agreement, Agent may apply the net proceeds of each such sale to or toward the payment of the Debt, whether or not then due, in such order and by such division as Agent in its sole discretion may deem advisable. Any excess, to the extent permitted by law, shall be paid to Pledgor, and the obligors on the Debt shall remain liable for any deficiency. In addition, Agent shall at all times have the right to obtain new appraisals of Pledgor or the Collateral, the cost of which shall be paid by Pledgor.

9. TERMINATION. At such time as the Debt shall have been irrevocably paid in full, the Commitment, as defined in the Credit Agreement, terminated, and the Credit Agreement terminated and not replaced by any other credit facility with Agent and the Banks, Pledgor shall have the right to terminate this Agreement. Upon written request of Pledgor, Agent shall execute and deliver to Pledgor all deeds, assignments, and other instruments as may be necessary or proper to release Agent's security interest in and assignment of the Collateral and to re-vest in Pledgor full title

to the Collateral, subject to any disposition thereof that may have been made by Agent, for the benefit of the Banks, pursuant hereto.

10. **MAINTAINING COLLATERAL; ATTORNEYS' FEES, COSTS AND EXPENSES.** Pledgor shall have the obligation and duty to perform all acts necessary to maintain or preserve the Collateral, provided that Pledgor shall not be obligated to maintain any Collateral in the event Pledgor determines, in the reasonable business judgment of Pledgor, that the maintenance of such Collateral is no longer necessary in Pledgor's business. Any and all reasonable fees, costs and expenses, of whatever kind or nature, including, without limitation, the reasonable attorneys' fees and legal expenses incurred by Agent and the Banks in connection with the amendment and enforcement of this Agreement, all renewals, required affidavits and all other documents relating hereto and the consummation of this transaction, the filing or recording of any documents (including all taxes in connection therewith) in public offices, the payment or discharge of any taxes, counsel fees, maintenance fees, encumbrances or otherwise protecting, maintaining or preserving the Collateral, or in defending or prosecuting any actions or proceedings arising out of or related to the Collateral, shall be borne and paid by Pledgor, upon demand by Agent and, until so paid, shall be added to the principal amount of the Debt.

11. **PLEDGOR'S OBLIGATION TO PROSECUTE.** Except as otherwise agreed to by Agent in writing, Pledgor shall have the duty to prosecute diligently any patent application or trademark application pending as of the date of this Agreement or thereafter until the Debt shall have been paid in full, to file and prosecute opposition and cancellation proceedings and to do any and all acts that are necessary or desirable to preserve and maintain all rights in the Collateral, including, but not limited to, payment of any maintenance fees. Any expenses incurred in connection with the Collateral shall be borne by Pledgor. Pledgor shall not abandon any Collateral without the prior written consent of Agent, unless such abandonment will not have a Material Adverse Effect or such abandonment is in connection with the abandonment of a product or product line.

12. **AGENT'S RIGHT TO ENFORCE.** Pledgor shall have the right to bring any opposition proceeding, cancellation proceeding or lawsuit in its own name to enforce or protect the Collateral. Agent, on behalf of the Banks, shall have the right, but shall have no obligation, to join in any such action. Pledgor shall promptly, upon demand, reimburse and indemnify Agent and the Banks for all damages, reasonable costs and expenses, including reasonable attorneys' fees, incurred by Agent and the Banks in connection with the provisions of this Section 12, in the event Agent, on behalf of the Banks, elects to join in any such action commenced by Pledgor.

13. **POWER OF ATTORNEY.** Pledgor hereby authorizes and empowers Agent, on behalf of the Banks, to make, constitute and appoint any officer or agent of Agent as Agent may select, in its exclusive discretion, as Pledgor's true and lawful attorney-in-fact, with the power to endorse, after the occurrence of an Event of Default (unless waived by Agent and the Required Banks or cured to the satisfaction of Agent), Pledgor's name on all applications, documents, papers and instruments necessary for Agent, on behalf of the Banks, to use the Collateral, or to grant or issue any exclusive or nonexclusive license under the Collateral to any third party, or necessary for Agent, on behalf of the Banks, to assign, pledge, convey or otherwise transfer title in or dispose of the Collateral, together with associated goodwill to a third party or parties. Pledgor hereby ratifies

all that such attorney shall lawfully do or cause to be done by virtue hereof. This power of attorney shall be irrevocable for the life of this Agreement.

14. **AGENT'S RIGHT TO PERFORM OBLIGATIONS.** If Pledgor fails to comply with any of its obligations under this Agreement, Agent, on behalf of the Banks, may, but is not obligated to, do so in Pledgor's name or in the name of Agent, on behalf of the Banks, but at Pledgor's expense, and Pledgor hereby agrees to reimburse Agent, upon request, in full for all expenses, including attorneys' fees, incurred by Agent and the Banks in protecting, defending and maintaining the Collateral.

15. **ADDITIONAL DOCUMENTS.** Pledgor shall, upon written request of Agent, enter into such additional documents or instruments as may be required by Agent in order to effectuate, evidence or perfect the interest of Agent and the Banks in the Collateral as evidenced by this Agreement.

16. **NEW COLLATERAL.** If, before the Debt shall have been satisfied in full and the Credit Agreement terminated, Pledgor shall obtain rights to any new Collateral, the provisions of Section 1 shall automatically apply thereto as if the same were identified on Schedule 1 as of the date hereof and Pledgor shall give Agent prompt written notice thereof.

17. **MODIFICATION FOR NEW COLLATERAL.** Pledgor hereby authorizes Agent to modify this Agreement by amending Schedule 1 to include any future Collateral as contemplated by Sections 1 and 16 hereof and, at Agent's request, Pledgor shall execute any documents or instruments required by Agent in order to modify this Agreement as provided in this Section 17, provided that any such modification to Schedule 1 shall be effective without the signature of Pledgor.

18. **NO WAIVER.** No course of dealing between Pledgor and Agent or any Bank, nor any failure to exercise, nor any delay in exercising, on the part of Agent or any such Bank, any right, power or privilege hereunder or under any of the Loan Documents shall operate as a waiver thereof; nor shall any single or partial exercise of any right, power or privilege hereunder or thereunder preclude any other or further exercise thereof or the exercise of any other right, power or privilege.

19. **REMEDIES CUMULATIVE.** All of the rights and remedies of Agent and the Banks with respect to the Collateral, whether established hereby or by the Documents, or by any other agreements or by law shall be cumulative and may be executed singularly or concurrently.

20. **SEVERABILITY.** The provisions of this Agreement are severable, and, if any clause or provision shall be held invalid and unenforceable in whole or in part in any jurisdiction, then such invalidity or unenforceability shall affect only such clause or provision, or part thereof, in such jurisdiction, and shall not in any manner affect such clause or provision in any other jurisdiction, or any other clause or provision of this Agreement in any jurisdiction.

21. **MODIFICATIONS.** This Agreement may be amended or modified only by a writing signed by Pledgor and Agent. In the event that any provision of this Agreement is deemed to be



inconsistent with any provision of any other document, other than the Credit Agreement, the provisions of this Agreement shall control.

22. **ASSIGNMENT AND SUCCESSORS.** This Agreement shall not be assigned by Pledgor without the prior written consent of Agent. This Agreement shall bind the successors and permitted assigns of Pledgor and shall benefit the respective successors and assigns of Agent and the Banks. Any attempted assignment or transfer without the prior written consent of Agent shall be null and void.

23. **NOTICE.** All notices, requests, demands and other communications provided for hereunder shall be in writing and, if to Pledgor, mailed or delivered to it, addressed to the address of Pledgor specified on the signature pages of the Credit Agreement, and, if to Agent or any Bank, mailed or delivered to it, addressed to the address of Agent or such Bank specified on the signature pages of the Credit Agreement. All notices, statements, requests, demands and other communications provided for hereunder shall be deemed to be given or made when delivered or forty-eight (48) hours after being deposited in the mails with postage prepaid by registered or certified mail, addressed as aforesaid, or sent by facsimile with telephonic confirmation of receipt, except that notices from Pledgor to Agent or any Bank pursuant to any of the provisions hereof shall not be effective until received by Agent or such Bank.

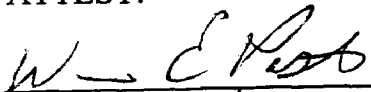
24. **GOVERNING LAW.** This Agreement shall be construed and enforced in accordance with, and the rights of the parties shall be governed by, the laws of the State of Ohio, without regard to principles of conflicts of law. Pledgor hereby irrevocably submits to the non-exclusive jurisdiction of any Ohio state or federal court sitting in Cleveland, Ohio, over any action or proceeding arising out of or relating to this Agreement, any Loan Document or any Related Writing, and Pledgor hereby irrevocably agrees that all claims in respect of such action or proceeding may be heard and determined in such Ohio state or federal court. Pledgor hereby irrevocably waives, to the fullest extent permitted by law, any objection it may now or hereafter have to the laying of venue in any action or proceeding in any such court as well as any right it may now or hereafter have to remove such action or proceeding, once commenced, to another court on the grounds of FORUM NON CONVENIENS or otherwise. Pledgor agrees that a final, nonappealable judgment in any such action or proceeding shall be conclusive and may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by law.

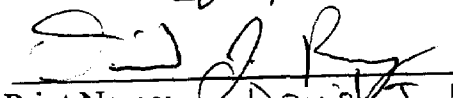
[Remainder of page intentionally left blank.]

25. JURY TRIAL WAIVER. PLEDGOR, AGENT AND THE BANKS, TO THE EXTENT PERMITTED BY LAW, EACH WAIVE ANY RIGHT TO HAVE A JURY PARTICIPATE IN RESOLVING ANY DISPUTE, WHETHER SOUNDING IN CONTRACT, TORT OR OTHERWISE, AMONG AGENT, THE BANKS AND PLEDGOR, OR ANY THEREOF, ARISING OUT OF, IN CONNECTION WITH, RELATED TO, OR INCIDENTAL TO THE RELATIONSHIP ESTABLISHED BETWEEN THEM IN CONNECTION WITH THIS AGREEMENT OR ANY NOTE OR OTHER INSTRUMENT, DOCUMENT OR AGREEMENT EXECUTED OR DELIVERED IN CONNECTION THEREWITH OR THE TRANSACTIONS RELATED THERETO. THIS WAIVER SHALL NOT IN ANY WAY AFFECT, WAIVE, LIMIT, AMEND OR MODIFY THE ABILITY OF AGENT OR ANY BANK TO PURSUE REMEDIES PURSUANT TO ANY CONFESSION OF JUDGMENT OR COGNOVIT PROVISION CONTAINED IN ANY NOTE, OR OTHER INSTRUMENT, DOCUMENT OR AGREEMENT AMONG PLEDGOR, AGENT AND THE BANKS, OR ANY THEREOF.


IN WITNESS WHEREOF, the undersigned has executed this Agreement as of the 2nd day of February, 2001.

ATTEST:

  
Print Name: William E. Post

  
Print Name: David J. Ray

ADVANCED CERAMICS CORPORATION

By:   
Gerard R. Weimann, President

ACKNOWLEDGMENTS

THE STATE OF OHIO                    )  
  ) SS:  
COUNTY OF CUYAHOGA                )

BEFORE ME, a Notary Public, the undersigned authority, on this day personally appeared Gerard R. Weimann, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of ADVANCED CERAMICS CORPORATION, an Ohio corporation, and that she/he executed the same as the act of such corporation for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 2nd day of February, 2001.

  
NOTARY PUBLIC

**JOHN E. MAZEY NOTARY PUBLIC**  
State of Ohio  
My Commission Has No Expiration

**SCHEDULE 1**

**SEE ATTACHED LISTS OF PATENTS, PATENT APPLICATIONS AND TRADEMARKS**

**Advanced Ceramics Corporation  
Active Trademarks and Service Marks**

<b>Trademark or Service Mark</b>	<b>Number</b>	<b>U.S. Filing Date</b>	<b>Registration Date</b>	<b>Describes</b>	<b>Countries Registered</b>
Boralloy	763,741 137,447 152,274		28 Jun 84 25 Sep 79 30 Nov 81	Pyrolytic Boron Nitride (renewal app. Aug 91)	Canada China
Boralectric	1,703,088 594,249		28 Jul 92 10 May 92	Resistance heating elements for industrial and commercial use comprised of pyrolytic graphite and pyrolytic nitride	China
MCP				Metal coated powders Labels to EL 21 Dec 00	
Polarsphere(s)	76/026481	14-Apr-00		Ceramic particles exhibiting high thermal conductivity and a substantially spherical shape, for use alone or as fillers in polymers or glasses. To EL 9 Mar 99.	
Polarthem	2,126,905 D-3329 75/173892	30 Sep 96	6-Jan-98	High thermal conductivity ceramic preparations and filler materials, namely, boron nitride filled polymers, graphite, ceramic oxide, and compositions of the foregoing for use in mft. of ceramic mats.	

SUPPLY SHIPPING LABELS

Q Coat D-3736 ca. 15 Sep 97 3-Aug-99 Ceramic flash evaporators for use in evaporating a metal coating of, for example, aluminum upon a product such as a picture tube or component of a product.  
75/369,758 75/369758

LABELS AND LITERATURE SUPPLIED

Softouch D-3892 28-Aug-98 9-Nov-99 Boron nitride as a chemical raw material in granular, particle or powder form for use as a component of packaging materials, plastic molding compounds, semiconductor related products and diverse cosmetic products.  
75/544,604

TC1050 D-3936 21-Jan-99 7-Mar-00 A structure for transferring heat which contains or encapsulates pyrolytic graphite within another solid material.  
75/624519 2,326,014

SUPPLY SHIPPING LABELS

TPG D-3816 25-Mar-98 28-Dec-99 Pyrolytic graphite having high thermal conductivity.  
75/457,180

RE-FILE BY DEC 99 UNDER ACC

Weld-R-White 1,844,968 12-Jul-94 Spatter guard stop-off compound in a water-based liquid (paste) form for use in welding, brazing and other hot metal working opns.  
74/263,405 7 Apr 92

Notes: Foreign trademark registrations will generally not be made, unless there is a specific benefit to be gained. Trademarks "Borallectric", "Boralloy", and "Weld-R-White" were assigned to ACC by Praxair S. T. Technology Inc. 2 Mar 93.

21 Dec 00 as PATDOC

Advanced Ceramics Corporation  
Active Foreign Patent Applications and Invention Disclosures

Docket No.	Lab No.	Subject	Inventor	Filing	Remarks	Sales Class
31815	J. Murrain	Articles Coated with Aluminum Nitride by Chemical Vapor Deposition	M.H. Gilbert	22 Nov 00 as PCT/US00/42236 21 Nov 00 as 60/166971		470
	G					
	J					
	K					
	UK					
4121		Evaporator for Projection Ray Tube	J.M. Morris	22 Mar 00 as 09/533,003		453
	Cl					
	G					
	K					
	Mal					
	NE					
	Tai					
3953		Heater for High Vacuum Optical View Port	T.J. Mattord M.H. Gilbert	2000-1117	US 5,977,526, 2 Nov 99 By 29 Feb 00 Before 17 Jul 00	430
	EPO					
	J					
4093		Pyrolytic Graphite Monochromator and Method for Improving Lattice Spacing Spread...	A.W. Moore	31 Aug 99 as 09/386,739 Rl. 01029 Fr. 0273, 31 Aug Fr. 00/11070, before 10 Oct 00 De 100 40 196.1, 7 Oct 00	BAR DATE: Eur. Conf. Neutron Diff. Budapest 1 Sep 99	471
	F					
	G					
	R					
3915	UNM-496	Spherical BN Particles	R. T. Paine W. J. Kroczke E.A. Pruss	US 09/315,097 16 May 00 as EPO00401328.0 19 May 00 as 2000-148893	22 Nov 00 as EP 1053973	452
	EPO					
	CMEM					
	J					
3967		Improved Compaction for Producing Densified BN Precursor for Cubic BN	G.W. Shaffer R.F. Hill	U.S. 6,048,511, 11 Apr 00	Division of D-3775	452
	EPO					
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3775		Method for Forming Boron Nitride and High-Density Agglomerated Boron Nitride Particles	G.W. Shaffer							
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EPO	Pyrolytic Boron Nitride Compact and Method of Manufacture	Assigned 6 Nov 98	430
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Advanced Ceramics Corporation  
Active U.S. Patent Applications and Invention Disclosures

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32014		J. Murtaugh Glass Sealed Two Piece PBN Crucible	J. T. Mariner N. J. Weiss	2 Nov 99 as 60/163,149 13 Nov 00 as 60/247,241		444
31815		J. Murtaugh Articles Coated with Aluminum Nitride by Chemical Vapor Deposition (CVD-AIN)	M.H. Gilbert	23 Nov 99 as 60/166,971	Provisional SN 60/166,971 By 23 Nov 00	470
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3855		Pyrolytic BoronNitride Radiation Heater	M.H. Gilbert	09/347,335, 2 Jul 99 Reel 010094 Frame 0853	Allowance 10 May 00	430

30860  
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High Density Flash Evaporator

J.T. Mariner  
D.A. Longworth

08/314,412  
08/603,498

12 Jan 01 as PATDOC

Final rejection 9 Feb 96  
2nd Continuation 17 Jun 96  
On appeal, ~Mar 98

US0006160042A

**United States Patent** [19][11] **Patent Number:** **6,160,042****Ishida**[45] **Date of Patent:** **Dec. 12, 2000**

[54] **SURFACE TREATED BORON NITRIDE FOR FORMING A LOW VISCOSITY HIGH THERMAL CONDUCTIVITY POLYMER BASED BORON NITRIDE COMPOSITION AND METHOD**

[58] **Field of Search** ..... 523-208, 415, 523-445; 428-703; 423-290; 524-404

[56] **References Cited**[75] **Inventor:** **Hatsuo Ishida, Shaker Heights, Ohio****U.S. PATENT DOCUMENTS**[73] **Assignee:** **Edison Polymer Innovation Corporation, Akron, Ohio**

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[21] **Appl. No.:** **09/164,927**[22] **Filed:** **Oct. 1, 1998***Primary Examiner—Eae Yoon**Attorney, Agent, or Firm—Anderson, Kill & Olick P.C.***Related U.S. Application Data**[57] **ABSTRACT**[63] **Continuation-in-part of application No. 08 846,457, May 1, 1997, Pat. No. 5,900,447.**[51] **Int. Cl.<sup>7</sup>** ..... **C08K 9/04; C08K 3/38; C08L 03/00; C01B 21/064**[52] **U.S. Cl.** ..... **523/445; 523 208; 523 415; 524 404; 428 703; 423 290**

A low viscosity high thermal conductivity polymer-based boron nitride composition and a surface-treated boron nitride material for use as a filler in this composition, and methods of preparation is described.

**8 Claims, 1 Drawing Sheet**



**United States Patent** [19]

[11] **Patent Number:** 6,048,511

**Shaffer et al.**

[45] **Date of Patent:** Apr. 11, 2000

[54] **METHOD FOR FORMING HIGH DENSITY BORON NITRIDE AND HIGH DENSITY AGGLOMERATED BORON NITRIDE PARTICLES**

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,064,589 11 1991 Ichikawa et al. 423 290

[75] **Inventors:** Gregory W. Shaffer, Strongsville; Richard Frank Hill, Chargin Falls, both of Ohio

*Primary Examiner*—Wayne Langel  
*Attorney, Agent, or Firm*—Eugene Lieberstein; Michael N. Meller

[73] **Assignee:** Advanced Ceramics Corporation, Lakeland, Ohio

[57] **ABSTRACT**

[21] **Appl. No.:** 09/225,820

A method of forming pellets or agglomerates of high density boron nitride from high purity hexagonal boron nitride by crushing the high purity hexagonal boron nitride into boron nitride particles extending over a size range of at least 100 microns with the majority of the particles having a particle size above 50 microns and cold pressing the crushed particles into a compacted form. The compacted form is then granulated into a granulated powder and again cold pressed to form pellets or agglomerates of boron nitride particles with the operations of cold pressing and granulation occurring in one or more stages.

[22] **Filed:** Jan. 5, 1999

**Related U.S. Application Data**

[62] Division of application No. 08,068,954, Nov. 12, 1997, Pat. No. 5,898,009, which is a continuation of application No. 08,618,361, Mar. 19, 1996, abandoned.

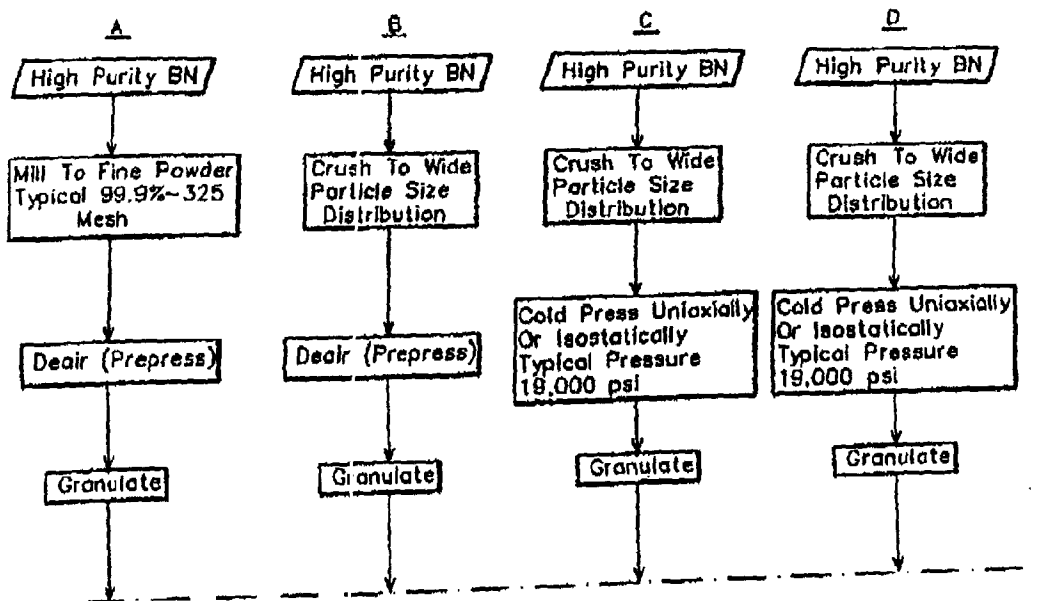
[51] **Int. Cl.:** B29C 67/02; C01B 21/064

[52] **U.S. Cl.:** 423/290; 264/117

[58] **Field of Search:** 423/290; 501.96.4; 264/65, 117, 118

6 Claims, 5 Drawing Sheets

**METHODS FOR PRODUCING HIGH GREEN DENSITY BN COMPACTS**



US006011904A

# United States Patent <sup>(19)</sup>

[11] Patent Number: **6,011,904**

**Mattord**

[45] Date of Patent: **Jan. 4, 2000**

[54] **MOLECULAR BEAM EPITAXY EFFUSION CELL**

WO96.19507 6/1996 WIPO.  
WO97.06292 2/1997 WIPO.  
WO98/51836 11/1998 WIPO.

[75] Inventor: **Torry J. Mattord, Austin, Tex.**

[73] Assignee: **Board of Regents, University of Texas, Austin, Tex.**

*Primary Examiner*—Richard Bueker  
*Attorney, Agent, or Firm*—Eugene Lieberstein; Michael N. Meller

[21] Appl. No.: **08/872,758**

[22] Filed: **Jun. 10, 1997**

[51] Int. Cl.<sup>7</sup> ..... **C23C 14/00**

[52] U.S. Cl. .... **392/309; 118/726**

[58] Field of Search ..... **118.726, 392.369**

## [57] ABSTRACT

A molecular beam epitaxy effusion cell for growing epitaxial layers upon a semiconductor substrate by control of a collimated beam of molecules generated from a source material in a high vacuum environment in order to control the hyper abrupt stoichiometry of the effusion flux. A heated control assembly is used to control the size of the exit openings of the effusion cell. The control assembly comprises a piezoelectric heating member such as a grating having a plurality of holes and a perforated cover which are adjustable relative to one another. The grating includes an internal heating element.

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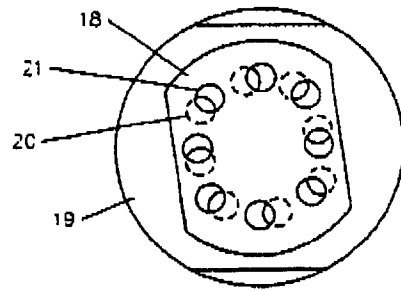
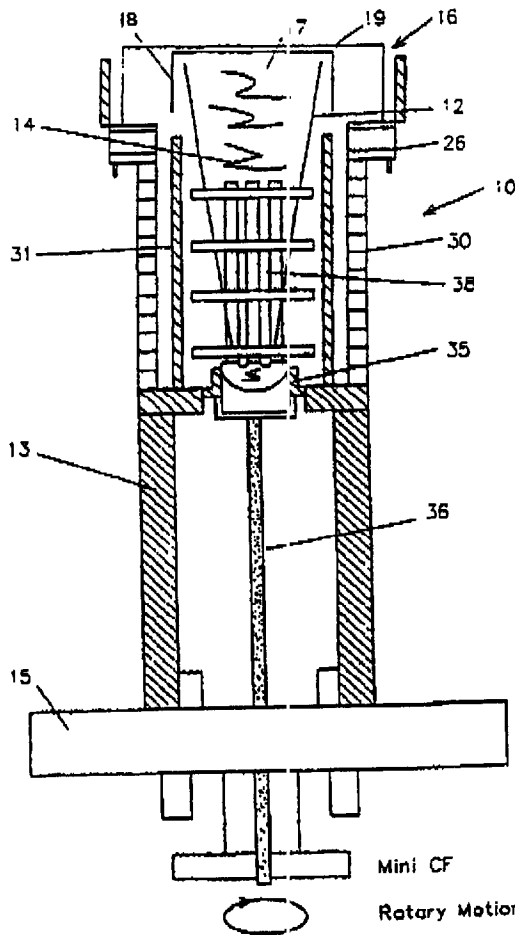
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**10 Claims, 9 Drawing Sheets**



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MR. MICHAEL N. HELLER (7M)  
ANDERSON, KILL, AND OLICK  
1251 AVENUE OF THE AMERICAS  
NEW YORK, NY 10036



CASE NUMBER 031291  
 CLIENT/DIVISION ATTORNEY YOUR REFERENCE NUMBER PRIORITY TITLE  
 96/0630041 PROCESS FOR FORMING PYROLYTIC SIBN COATINGS  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MOORE  
 COUNTRY USA  
 SUB CASE NO. TYPE STATUS APPLICATION NUMBER/ISSUE DATE  
 630041 02APR1996 GRNT  
 PATENT NUMBER/ISSUE DATE  
 5972511 26OCT1999  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRY DATE  
 26APR2000  
 TAX PAID AGENT SCHD THRU  
 EXPIR/ABAND ATTY DATE  
 02APR2015

DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

PAGE 1A

CASE NUMBER EPICAD3550 ADVAN

CLIENT/DIVISION ADVAN

PRIORITY TITLE

ASSIGNEE: ADVANCED CERAMICS INVENTOR: ISHIDA 846457 COMPOSITION FOR FORMING HIGH THERMAL CONDUCTIVITY POLYBENZO XINE-BASED MATERIAL AND METHOD

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE	ATTY
EUROPE		CASE	PEND	98601034.8 28APR1998		0875531 04NOV1998	28APR1998		28APR2018	
CANADA		CASE	PEND	2250511 15OCT1998			15OCT1998		15OCT2018	NILNE
JAPAN		CASE	PEND	122382798 01MAY1998					01MAY2018	KYOMU
TAIWAN		CASE	PEND	8711924 01DEC1998					01DEC2018	TSAI

UT-3689 ADVAN 97/0872758 MOLECULAR BEAM EPITAXY EFFUSION CELL

ASSIGNEE: UNIV OF TEXAS INVENTOR: HATTORI-UT

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE	ATTY
USA		CASE	GRNT	872758 10JUN1997	6011904 04JAN2000		04JUL2000 SE		10JUN2017	

002919 ADVAN EL 11996 CLAMP ASSEMBLY FOR VAPORIZATION BOAT

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MARINER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE	ATTY
EUROPE		CASE	PCT ABND	94927387.4 09SEP1994		0717786	09SEP1994		09SEP2014	
JAPAN		CASE	PCT ABND	5088906/95 09SEP1994					09SEP2014	
USA		CASE	GRNT	11996 10SEP1993	5410631 23APR1995		25OCT1995 SE		25APR2012	

002981 ADVAN 93/0164470 BORON NITRIDE VAPORIZATION VESSE  
 ASSIGNEE: ADVANCE CERAMICS CORPORATION  
 INVENTOR: MARINER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX/PAID THRU	AGENT	EXPIR/ABAND DATE
USA	14DEC1993	GRNT		164470 14DEC1993	3395180 07MAR1995		07SEP1995 SE			07MAR2012

003085 ADVAN 94/0314411 COATED FLASH EVAPORATOR  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER ET AL.

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX/PAID THRU	AGENT	EXPIR/ABAND DATE
USA	28SEP1994	GRNT		314411 28SEP1994	5537507 16JUL1996		16JAN1997 SE			16JUL2013

003086 ADVAN 314412 HIGH DENSITY FLASH EVAPORATOR  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER JT LONGWORTH DA

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX/PAID THRU	AGENT	EXPIR/ABAND DATE
EUROPE	US95/11787	PCT	ABND	18SEP1995			18SEP1995			18SEP2015
CHINA	95194450.1	PCT	GRNT	18SEP1995	95194450.1 07MAY1999	1167508 10DEC1997	18SEP1995			18SEP2015
GERMANY	P19581904.7	PCT	PEND	18SEP1995			18SEP1995			18SEP2015
JAPAN	517874796	PCT	PEND	18SEP1995					OKUYA	18SEP2015
RUSSIAN FEDERAT	971104924	PCT	GRNT	18SEP1995	2142021		18SEP1995			18SEP2015
UNITED KINGDOM	9718478.2	PCT	GRNT	18SEP1995	2313846 26MAY1999	2313846 10DEC1997	18SEP1995			18SEP2015
USA	314412	PCT	PEND	28SEP1994						SE

COMMENTS: +PLEASE VERIFY ISSUED DT PER AGENT.

003087 ADVAN 9470314314 EVAPORATOR HAVING MULTIPLE COATING  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER JY LONGWORTH DA

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	AGENCY	EXPIR/ABAND DATE
EUROPE	0895/11788	PCT	AMND	18SEP1995	95196451.8	1167509	18SEP1995			18SEP2015
CHINA	95196451.8	PCT	GRNT	18SEP1995	28AUG1999	10DEC1997	18SEP1995	CHINA		18SEP2015
GERMANY	P19381903.5	PCT	PEND	18SEP1995			18SEP1995			18SEP2015
JAPAN	531846/97	PCT	PEND	18SEP1995			18SEP1995			18SEP2015
RUSSIAN FEDERAT	97105370	PCT	GRNT	18SEP1995	2136778		18SEP1995	99		18SEP2015
	1852F1775				1852F1999					
UNITED KINGDOM	9717224.1	PCT	GRNT	18SEP1995	2313845	2313845	18SEP1995			18SEP2015
USA	314314		GRNT	28SEP1994	5493550	10DEC1997	27AUG1996 SE			27FEB2013

REMARKS: 99 PD THRU PER FAX - 70CT99

003088 ADVAN 9470314313 PBN COATED FLASH EVAPORATOR  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER ET AL,

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	AGENCY	EXPIR/ABAND DATE
USA	314313		GRNT	28SEP1994	5493630		20AUG1996 SE			20FEB2013

003129 ADVAN 630041 PROCESS FOR FORMING LOW THERMAL EXPANSION PYROLYTIC NITRIDE COATINGS ON LOW THERMAL EXPANSION MATERIALS AND COATED...

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	AGENCY	EXPIR/ABAND DATE
JAPAN	98120361	PCT	PEND	11SEP1996						11SEP2016
RUSSIAN FEDERAT	98120361	PCT	PEND	11SEP1996						11SEP2016

003130 ADVAN 94/0332924 IMPROVED INTERFACE COATING FOR CERAMIC FIBERS  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MOORE ET AL. DONELL, Michael

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING STRY DATE	TAX PAID AGENT SCRD THRU	EXPIR/ABAND ATTY DATE
EUROPE	95939594.8	PCT	GRNT	240CT1995	0828697 15MAR2000	0828697 18MAR1998	97		240CT2015
CHINA	95197074.7	PCT	PEND	240CT1995		1171095 21JAN1998	240CT1995 PA	CPA	240CT2015
FRANCE	95939594.8	EPC	GRNT	240CT1995	0828697 15MAR2000	0828697 18MAR1998	240CT1995		240CT2015
GERMANY	95939594.8	EPC	GRNT	240CT1995	0828697 15MAR2000	0828697 18MAR1998	240CT1995		240CT2015
JAPAN	51718776	PCT	PEND	240CT1995					240CT2015
RUSSIAN FEDERAT	97108678	PCT	PEND	240CT1995					240CT2015
UNITED KINGDOM	95939594.8	EPC	GRNT	240CT1995	0828697 15MAR2000	0828697 18MAR1998	240CT1995		240CT2015
USA	332924		GRNT	01NOV1994	5593728 14JAN1997		14JUL1997 SE		01NOV2014

003247 ADVAN 586326 LATERAL FLASH EVAPORATOR  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: FINICIE

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING STRY DATE	TAX PAID AGENT SCRD THRU	EXPIR/ABAND ATTY DATE
EUROPE	97100496.5		GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997			15JAN2017
FRANCE	97100496.5	EPC	GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
GERMANY	97100496.5	EPC	GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
NETHERLANDS	97100496.5	EPC	GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN2001 EP		15JAN2017
JAPAN	685197		PEND	17JAN1997					17JAN2017
KOREA (SOUTH)	1121197		PEND	16JAN1997					16JAN2017
TAIWAN	87203892	UTM	PEND	15JAN1997			UK		15JAN2009
UNITED KINGDOM	97100496.5	EPC	GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
USA	586326		GRNT	17JAN1996	3671322 23SEP1997		23MAR1998 SE		17JAN2016

003259 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY ET AL.  
 95/0524242 IMPROVED REFRACTORY BOAT & METHOD OF MANUFACTURE

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA	GRNT		524242 06SEP1995	5604164 18FEB1997		18AUG1997 SE	06SEP2015

003300 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: SHAFFER  
 METHOD FOR FORMING BORON NITRIDE AND HIGH DENSITY AGGLOMERA TED BORON NITRIDE PARTICLES

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA	PEND		618361 19MAR1996				19MAR2016

003301 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 610764 ENHANCED BORON NITRIDE COMPOSITION & POLYMER BASED HIGH THERMAL ETAL

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
EUROPE	PEND		97103424.4 03MAR1997		0794227 10SEP1997	03MAR1997	03MAR2017
CANADA	PEND		2178422 25FEB1997				05MAR2017
JAPAN	PEND		67472/97 05MAR1997			25FEB1997	26FEB2017
KOREA (SOUTH)	PEND		5958/97 26FEB1997				05MAR2017
MALAYSIA	PEND		P19700879 04MAR1997				25FEB2017
SINGAPORE	PEND		9700476-6 25FEB1997			25FEB1997	05MAR2017
TAIWAN	PEND		86102690 05MAR1997				05MAR2016
USA	GRNT		610764 05MAR1996	568188J 28OCT1997		28APR1998 SE	05MAR2016

003320 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORP  
 INVENTOR: HILL

COUNTRY USA  
 SUB CASE NO. 580860  
 TYPE CASE GRNT  
 STATUS GRNT  
 YOUR REFERENCE 29DEC1995  
 PRIORITY TITLE 95/0580860 BURON NITRIDE SEAL AND METHOD OF USE  
 APPLICATION NUMBER/ISSUE DATE 5678832 21NOV1997  
 PATENT NUMBER/ISSUE DATE 5863467 26JAN1999  
 PUBLIC NUMBER/DATE 5863467 26JAN1999  
 TAX/WORKING START DATE 21APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 29DEC2015

003406 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS COMPOSITE ET AL.  
 INVENTOR: MARINER

COUNTRY EUROPE  
 SUB CASE NO. 97107323.4  
 TYPE CASE GRNT  
 STATUS GRNT  
 YOUR REFERENCE 02MAY1997  
 PRIORITY TITLE 642469 HIGH THERMAL CONDUCTIVITY COMPOSITE AND METHOD  
 APPLICATION NUMBER/ISSUE DATE 0805463 02AUG2000  
 PATENT NUMBER/ISSUE DATE 0805463 02AUG2000  
 PUBLIC NUMBER/DATE 0805463 02MAY1997  
 TAX/WORKING START DATE 02MAY1997  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 02MAY2017

COUNTRY CANADA  
 SUB CASE NO. 2204331  
 TYPE CASE PEND  
 STATUS PEND  
 YOUR REFERENCE 02MAY1997  
 PRIORITY TITLE 03NOV1997  
 APPLICATION NUMBER/ISSUE DATE 03NOV1997  
 PATENT NUMBER/ISSUE DATE 03NOV1997  
 PUBLIC NUMBER/DATE 03NOV1997  
 TAX/WORKING START DATE 02MAY1997  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 02MAY2017

COUNTRY FRANCE  
 SUB CASE NO. 97107323.4  
 TYPE CASE EPC GRNT  
 STATUS EPC GRNT  
 YOUR REFERENCE 02MAY1997  
 PRIORITY TITLE 0805463  
 APPLICATION NUMBER/ISSUE DATE 0805463 02AUG2000  
 PATENT NUMBER/ISSUE DATE 0805463 02AUG2000  
 PUBLIC NUMBER/DATE 0805463 02MAY1997  
 TAX/WORKING START DATE 02MAY1997  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 02MAY2017

COUNTRY GERMANY  
 SUB CASE NO. 97107323.4  
 TYPE CASE EPC GRNT  
 STATUS EPC GRNT  
 YOUR REFERENCE 02MAY1997  
 PRIORITY TITLE 0805463  
 APPLICATION NUMBER/ISSUE DATE 0805463 02AUG2000  
 PATENT NUMBER/ISSUE DATE 0805463 02AUG2000  
 PUBLIC NUMBER/DATE 0805463 02MAY1997  
 TAX/WORKING START DATE 02MAY1997  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 02MAY2017

COUNTRY ITALY  
 SUB CASE NO. 97107323.4  
 TYPE CASE EPC GRNT  
 STATUS EPC GRNT  
 YOUR REFERENCE 02MAY1997  
 PRIORITY TITLE 0805463  
 APPLICATION NUMBER/ISSUE DATE 0805463 02AUG2000  
 PATENT NUMBER/ISSUE DATE 0805463 02AUG2000  
 PUBLIC NUMBER/DATE 0805463 02MAY1997  
 TAX/WORKING START DATE 02MAY1997  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 02MAY2017

COUNTRY JAPAN  
 SUB CASE NO. 115873/97  
 TYPE CASE PEND  
 STATUS PEND  
 YOUR REFERENCE 06MAY1997  
 PRIORITY TITLE 06MAY2017

COUNTRY KOREA (SOUTH)  
 SUB CASE NO. 17020/97  
 TYPE CASE PEND  
 STATUS PEND  
 YOUR REFERENCE 03MAY1997  
 PRIORITY TITLE 03MAY2017

COUNTRY TAIWAN  
 SUB CASE NO. 86105759  
 TYPE CASE PEND  
 STATUS PEND  
 YOUR REFERENCE 03MAY1997  
 PRIORITY TITLE 03MAY2017

COUNTRY USA  
 SUB CASE NO. 642469  
 TYPE CASE GRNT  
 STATUS GRNT  
 YOUR REFERENCE 03MAY1996  
 PRIORITY TITLE 5863467 26JAN1999  
 APPLICATION NUMBER/ISSUE DATE 5863467 26JAN1999  
 PATENT NUMBER/ISSUE DATE 5863467 26JAN1999  
 PUBLIC NUMBER/DATE 5863467 26JAN1999  
 TAX/WORKING START DATE 26JUL1999 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 03MAY2016

003414 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: MARINER

COUNTRY USA  
 SUB CASE NO. 603498  
 TYPE CASE PEND  
 STATUS PEND  
 YOUR REFERENCE 20FEB1996  
 PRIORITY TITLE 20FEB2016  
 APPLICATION NUMBER/ISSUE DATE 603498 20FEB1996  
 PATENT NUMBER/ISSUE DATE 603498 20FEB1996  
 PUBLIC NUMBER/DATE 603498 20FEB1996  
 TAX/WORKING START DATE 20FEB1996  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 20FEB2016

CASE NUMBER 003421 ADVAN ADVAN 630041 PROCESS FOR FORMING LOW THERMAL EXPANSION PYROLYTIC NITRIDE COATING

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MOORE, W. M. COUNTRY USA SUB TYPE STATUS ABND APPLICATION NUMBER/FILE DATE 332693 01NOV1994 PATENT NUMBER/ISSUE DATE PUBLIC NUMBER/DATE TAX/WORKING STRT DATE TAX PAID AGENT EXPIR/ABAND ATTY DATE

603447 ADVAN ADVAN MOLECULAR BEAM EPITAXY EFFUSION CELL ASSIGNEE: ADVANCED CERAMICS CORP. INVENTOR: HATTORD-U. COUNTRY USA SUB TYPE STATUS PRO PEND APPLICATION NUMBER/FILE DATE 019586 11JUN1996 PATENT NUMBER/ISSUE DATE PUBLIC NUMBER/DATE TAX/WORKING STRT DATE TAX PAID AGENT EXPIR/ABAND ATTY DATE 11JUN2016

003467 ADVAN ADVAN 728933 ADJUSTMENT OF MOSAIC SPREAD FOR HOPG MATERIAL ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MOORE COUNTRY USA SUB TYPE STATUS GRNT PEND PEND PEND GRNT APPLICATION NUMBER/FILE DATE 97120541.6 10OCT1997 97112761 13OCT1997 277743/97 09OCT1997 97116800 07OCT1997 9721351.6 09OCT1997 728933 11OCT1996 PATENT NUMBER/ISSUE DATE 9712761 28MAY1999 PUBLIC NUMBER/DATE 1180902 06MAY1998 2754547 17APR1998 TAX/WORKING STRT DATE 10OCT1997 PA 13OCT1997 TAX PAID AGENT EXPIR/ABAND ATTY DATE 10OCT2017 13OCT2017 09OCT2017 07OCT2017 09OCT2017 11OCT2016



CASE NUMBER 003502  
CLIENT/DIVISION ADVAN  
ATTORNEY YOUR REFERENCE PRIORITY TITLE  
ADVANCED CERAMICS CORPORATION 278269/95 PYROLYTIC BORDM NITRIDE COMPACT AND METHOD OF MANUFACTURE  
INVENTOR: HOMMA

COUNTRY EUROPE  
SUB TYPE CASE NO. PEND  
APPLICATION NUMBER/FILE DATE 96307144.4  
30SEP1996  
KOREA (SOUTH)  
SUB TYPE CASE NO. PEND  
APPLICATION NUMBER/FILE DATE 43613196  
20OCT1996  
TAIWAN  
SUB TYPE CASE NO. PEND  
APPLICATION NUMBER/FILE DATE 85112136  
03OCT1996  
USA  
SUB TYPE CASE NO. GRNT  
APPLICATION NUMBER/FILE DATE 725130  
02OCT1996  
PATENT NUMBER/ISSUE DATE 3693581  
02DEC1997  
PUBLIC NUMBER/DATE 0768389  
16APR1997  
TAX/ WORKING STRT DATE 30SEP1996  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 30SEP2016  
TAX/ WORKING STRT DATE 02JUN1998 SE  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 20OCT2016  
TAX/ WORKING STRT DATE 03OCT2016  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 02OCT2016

CASE NUMBER 003548  
CLIENT/DIVISION ADVAN  
ATTORNEY YOUR REFERENCE PRIORITY TITLE  
ADVANCED CERAMICS CORP.  
INVENTOR: MARINER  
COUNTRY USA  
SUB TYPE CASE NO. PEND  
APPLICATION NUMBER/FILE DATE 771373  
16DEC1996  
PATENT NUMBER/ISSUE DATE  
PUBLIC NUMBER/DATE  
TAX/ WORKING STRT DATE  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 16DEC2016

CASE NUMBER 003550  
CLIENT/DIVISION ADVAN  
ATTORNEY YOUR REFERENCE PRIORITY TITLE  
ADVANCED CERAMICS  
INVENTOR: ISHIDA  
COUNTRY USA  
SUB TYPE CASE NO. PEND  
APPLICATION NUMBER/FILE DATE 846467  
01MAY1997  
COMMENTS: +PLS VERIFY APPL. POSSIBLE ERROR  
1 846457 5900447  
01MAY1997 04MAY1999  
TAX/ WORKING STRT DATE 04NOV1999  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 01MAY2017  
COMPOSITION FOR FORMING HIGH THERMAL CONDUCTIVITY POLYBENZD  
XAZINE-BASED MATERIAL AND METHOD

CASE NUMBER 003554  
CLIENT/DIVISION ADVAN  
ATTORNEY YOUR REFERENCE PRIORITY TITLE  
ADVANCED CERAMICS CORPORATION  
INVENTOR: SHINKO  
COUNTRY USA  
SUB TYPE CASE NO. CIP PEND  
APPLICATION NUMBER/FILE DATE 770807  
20DEC1996  
TAX/ WORKING STRT DATE  
TAX PAID AGENT EXPIR/ABAND ATTY DATE  
THERMOMETRIC MEASURING DEVICE AND METHOD  
REMARKS: CIP OF 490304

003605 ADVAN 9770785082 CERAMIC ELECTROSTATIC CHUCK AND METHOD  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: HONMA ET AL.

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA		GRNT		765082 21JAN1997	5748436 05MAY1998		05NOV1998	21JAN2017

003751 ADVAN FLEXIBLE HEAT TRANSFER DEVICE AND METHOD  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: RICHEY

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA		PRO	PEND	059586 19SEP1997				19SEP2017

003775 ADVAN 96/0618361 METHOD FOR FORMING BORON NITRIDE END HIGH DENSITY AGGLOMERA  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: SHAFFER Hill, Richard F

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
EUROPE			PEND	98400361.6 16FEB1998		0937066 01SEP1999	16FEB1998	16FEB2018
JAPAN			PEND	47763/98 27FEB1998				27FEB2018
USA		DIV	GRNT	968959 12NOV1997	5898009 27APR1999		27OCT1999	

003782 ADVAN 97/0837299 METHOD FOR ELECTROPLATING OF MICROPARTICULATES WITH METAL  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: YIH

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA		CIP	GRNT	837299 11APR1997	5911865 15JUN1999		15DEC1999	

CASE NUMBER 003825  
 CLIENT/DIVISION ADVAN  
 ATTORNEY YOUR REFERENCE NUMBER  
 PRIORITY TITLE  
 164927 SURFACE TREATED BORON NITRIDE FOR FORMING A LOW VISCOSITY H ICH THERMAL CONDUCTIVITY POLYMER BASED BORON NITRIDE COMP..  
 INVENTOR: ISHIDA EDISON POLYMER INNOVATION CORP

COUNTRY EUROPE  
 SUB TYPE CASE NO.  
 STATUS PEND  
 APPLICATION NUMBER/ FILE DATE 99403250.6  
 PATENT NUMBER/ ISSUE DATE  
 PUBLIC NUMBER/ DATE  
 TAX/ WORKING STRT DATE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE  
 CIP PEND  
 8812593 21DEC1977  
 01OCT1998  
 COMMENTS: +PLS FORWARD COMPLETE FILING INFORMATION  
 21DEC2019

009711 ADVAN CFO  
 ASSIGNEE: UNION CARBID CORPORATION  
 553814 IMPROVED BORON NITRIDE CRUCIBLE  
 COUNTRY FRANCE  
 SUB TYPE CASE NO.  
 STATUS GRNT  
 APPLICATION NUMBER/ FILE DATE 76/05450 26FEB1976  
 PATENT NUMBER/ ISSUE DATE 76/05450 21APR1980  
 PUBLIC NUMBER/ DATE  
 TAX/ WORKING STRT DATE 26FEB1976  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 26FEB1996  
 ITALY  
 SUB TYPE CASE NO.  
 STATUS GRNT  
 APPLICATION NUMBER/ FILE DATE 48308A/76 26FEB1976  
 PATENT NUMBER/ ISSUE DATE 1057254 10MAR1982  
 PUBLIC NUMBER/ DATE  
 TAX/ WORKING STRT DATE 26FEB1976  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 26FEB1996  
 JAPAN  
 SUB TYPE CASE NO.  
 STATUS GRNT  
 APPLICATION NUMBER/ FILE DATE 033473/80 18MAR1980  
 PATENT NUMBER/ ISSUE DATE 1075401 30NOV1981 1526003 28DEC1978  
 PUBLIC NUMBER/ DATE 22APR1981  
 TAX/ WORKING STRT DATE 22APR1981 P2  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 26FEB1996  
 UNITED KINGDOM  
 SUB TYPE CASE NO.  
 STATUS GRNT  
 APPLICATION NUMBER/ FILE DATE 76/07586 26FEB1976  
 PATENT NUMBER/ ISSUE DATE 1526003 28DEC1978  
 PUBLIC NUMBER/ DATE 22APR1981  
 TAX/ WORKING STRT DATE 26FEB1976 OL  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 26FEB1996

CASE NUMBER	COUNTRY	CLIENT/DIVISION	ATTORNEY	YOUR REFERENCE	PRIORITY NUMBER	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE	
011468	FRANCE	ADVAN	EL			79/00445 09JAN1979	79/00445 26MAY1984		09JAN1979		09JAN1999	
		ASSIGNEE: UNION CARBIDE CORPORATION										
		868446 RESISTANCE-HEATED PYROLYTIC BORON NITRIDE COATED GRAPHITE BUA) FOR METAL VAPORIZATION										
	ITALY					47576A/79 10JAN1979	1113740 20JAN1986		10JAN1979		10JAN1999	
		YOUR REF: 011468-F REMARKS: ABND PER TMR 11NOV97 ABND										
	JAPAN					000460/79 09JAN1979	1249597 25JAN1985	02MAY1984	02MAY1984		09JAN1999	
		YOUR REF: 011468-J REMARKS: ABND PER TMR 11NOV97 EIP										
	SWEDEN					7900185-S 09JAN1979	7900185-S 25SEP1986		09JAN1979		09JAN1999	
		COMMENTS: +CPI ATTEMPTED 99 PYMNT/VERIFY PATENT EXPIRED FULL-TERM.										
	UNITED KINGDOM					79/00728 09JAN1979	2012251 04AUG1982		09JAN1979		09JAN1999	
		YOUR REF: 011468-S REMARKS: ABND PER TMR 11NOV97 ABND										
						82401744.6 27SEP1982	0076731 12NOV1986	0076731 13APR1983			27SEP2002	
	EUROPE											
013071		ADVAN	EL									
		ASSIGNEE: UNION CARBIDE CORPORATION										
		INVENTOR: SHINKO, JULIUS KEYES, THOM										
		306385 PROUS FREE STANDING PYROLYTIC BORON NITRIDE ARTICLES										
	COUNTRY											

CASE NUMBER

015155

CLIENT/DIVISION

ADVAN EL

ATTORNEY YOUR REFERENCE

ASSIGNEE: UNION CARBIDE CORPORATION  
INVENTOR: TERBOT, JOHN F HILL, RICHARD

PRIORITY TITLE NUMBER

911221 METHOD FOR PRODUCING LIQUID ALKOXIDES OF MIXED METALS

COUNTRY

EUROPE

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: CTRY'S DROPPED PER THR 8SEP97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

BELGIUM

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: ABAN PER DATA INB.4-29-97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

FRANCE

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

GERMANY

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

NETHERLANDS

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

ITALY

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: ABAN PER DATA INB.4-29-97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

JAPAN

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

2620253  
11MAR1997

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

11MAR1997 P3

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

UNITED KINGDOM

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

87201829.6  
23SEP1987

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

23SEP1987

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 23SEP2007

23SEP2007

COUNTRY

USA

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

4835298  
30MAY1989

REMARKS: DROP PER SOURCE 16DEC97

PATENT NUMBER/ ISSUE DATE

0261744  
08JAN1997

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

30NOV1989

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 30MAY2006

30MAY2006

015155-1

ADVAN

ASSIGNEE: UNION CARBIDE CORPORATION  
INVENTOR: TERBOT HILL

CORDIERITE COMPOSITION AND MET

COUNTRY

USA

SUB CASE NO.

ABND

TYPE STATUS

ABND

APPLICATION NUMBER/ FILE DATE

276807  
23NOV1988

YOUR REF: 015155-1

REMARKS: ABND PER THR 11NOV97

PATENT NUMBER/ ISSUE DATE

4835298  
30MAY1989

PUBLIC NUMBER/ DATE

0261744

TAX/ WORKING START DATE

07FEB1991

TAX PAID AGENT EXPIR/ABAND ATTY DATE

96 07AUG2007

07AUG2007

CASE NUMBER CLIENT/ DIVISION ATTORNEY YOUR REFERENCE PRIORITY TITLE

015155-2 ADVAN  
 ASSIGNMENT: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: TERBOT, JOHN F HILL, RICHARD  
 COUNTRY SUB TYPE STATUS APPLICATION NUMBER/ FILE DATE  
 USA ABND 09MAY1989 321214  
 REMARKS: DROP PER SOURCE 16DEC97  
 CORDIERITE COMPOSITION AND NET  
 PATENT NUMBER/ ISSUE DATE 5139976 18AUG1992  
 PUBLIC NUMBER/ DATE 18AUG1992  
 TAX/ WORKING START DATE 18FEB1993 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 18AUG2009

015155-3 ADVAN  
 ASSIGNMENT: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: TERBOT, JOHN F HILL, RICHARD  
 COUNTRY SUB TYPE STATUS APPLICATION NUMBER/ FILE DATE  
 USA ABND 06MAY1991 5173455  
 REMARKS: DROP PER SOURCE 16DEC97  
 LOW SINTERING CORDIERITE POWDER  
 PATENT NUMBER/ ISSUE DATE 5173455 22DEC1992  
 PUBLIC NUMBER/ DATE 22JUN1993  
 TAX/ WORKING START DATE 22JUN1993  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 22DEC2009

015650 ADVAN EL 015650  
 ASSIGNMENT: UNION CARBIDE CORP.  
 INVENTOR: PARRISH, LIEN, MONTGOMERY,  
 COUNTRY SUB TYPE STATUS APPLICATION NUMBER/ FILE DATE  
 EUROPE ABND 22DEC1989 89123722.4  
 REMARKS: ABND PER SOURCE 26DEC97  
 FRANCE EPC ABND 89123722.4 22DEC1989  
 REMARKS: ABND PER SOURCE 26DEC97  
 GERMANY EPC ABND 89123722.4 22DEC1989  
 JAPAN ABND 345016/89 28DEC1989  
 REMARKS: ABND PER SOURCE 26DEC97  
 UNITED KINGDOM EPC ABND 89123722.4 22DEC1989  
 REMARKS: ABND PER SOURCE 26DEC97  
 USA ABND 291605 29DEC1988  
 REMARKS: ABND PER SOURCE 26DEC97

291605 ALLOYED POWDER AND METHOD OF PREPARING SAME  
 PATENT NUMBER/ ISSUE DATE 0376179 10AUG1994  
 PUBLIC NUMBER/ DATE 0376179  
 TAX/ WORKING START DATE 22DEC1989  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 22DEC2009  
 PATENT NUMBER/ ISSUE DATE 0376179 10AUG1994  
 PUBLIC NUMBER/ DATE 0376179  
 TAX/ WORKING START DATE 22DEC1989  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 22DEC2009  
 PATENT NUMBER/ ISSUE DATE 0376179 10AUG1994  
 PUBLIC NUMBER/ DATE 0376179  
 TAX/ WORKING START DATE 22DEC1989  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 22DEC2009  
 PATENT NUMBER/ ISSUE DATE 0376179 10AUG1994  
 PUBLIC NUMBER/ DATE 0376179  
 TAX/ WORKING START DATE 22DEC1989  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 22DEC2009  
 PATENT NUMBER/ ISSUE DATE 5047372 10SEP1991  
 PUBLIC NUMBER/ DATE 10SEP1991  
 TAX/ WORKING START DATE 10MAR1992 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 10SEP2008



DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

PAGE 15

CASE NUMBER	CLIENT/DIVISION	ATTORNEY REFERENCE	YOUR REFERENCE	PRIORITY TITLE NUMBER				
016068	ADVAN EL ASSIGNEE: UNION CARBIDE COATINGS SERVICE INVENTOR: MOORE			318349 PROLYTIC BORDN NITRIDE WITH COLUMNAR CRYSTALLINE MORPHOLOGY				
	COUNTRY	SUB TYPE STATUS	APPLICATION NUMBER/ISSUE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
	EUROPE	GRNT	90302178.0 01MAR1990	0385772 18AUG1993	0385772 05SEP1990	01MAR1990		01MAR2010
	FRANCE	EPC GRNT	90302178.0 01MAR1990	0385772 18AUG1993	0385772 05SEP1990	01MAR1990		01MAR2010
	GERMANY	EPC GRNT	90302178.0 01MAR1990	P69002778.B 12AUG1993	0385772 05SEP1990	01MAR1990		01MAR2010
	JAPAN	EPC GRNT	047257790 01MAR1990	1913134 09MARI995	041367794 01JUN1994	01JUN1994 10	KURAU	01MAR2010
	RUSSIAN FEDERAL	GRNT	ASSIGNEE: ADVANCED CERAMICS CORPORATION 4743242	2033964 30APR1995				
	UNITED KINGDOM	EPC GRNT	90302178.0 01MAR1990	0385772 18AUG1993	0385772 05SEP1990	01MAR1990	95	SDJUZ 01MAR2010
	USA	EPC GRNT	YOUR REF: 016068-CB ASSIGNEE: PRAJAIR S T TECHNOLOGY, INC.	5004708 02MARI989				01MAR2010
		GRNT	ASSIGNEE: PRAJAIR S.T. TECHNOLOGY, INC.	02APR1991		02OCT1991		02APR2008



CASE NUMBER	COUNTRY	ADVAN	EL	ASSIGNEE: ADVANCED CERAMICS CORP. INVENTOR: MONTGOMERY, LI	CLIENT/ DIVISION	ATTORNEY REFERENCE	YOUR REFERENCE	PRIORITY NUMBER	TITLE
016233	EUROPE								458347 METHOD FOR FORMING A HIGH DENSITY METAL BORIDE COMPOSITE
	FRANCE								
	GERMANY								
	JAPAN								
	UNITED KINGDOM								
	USA								
016234	EUROPE								66909 PROCESS FOR PRODUCING TITANIUM DIBORIDE AND BORON NITRIDE P OWNERS
	GERMANY								
	JAPAN								
	UNITED KINGDOM								
	USA								

CASE NUMBER

CLIENT/DIVISION

ATTORNEY REFERENCE

PRIORITY TITLE NUMBER

016237

ADVAN EL

564108 PYROLYTIC BORON NITRIDE COATING FOR OXIDATION PROTECTION OF CARBON-COMPOSITES

ASSIGNEE: ADVANCED CERAMICS, CORP.  
INVENTOR: MOORE, ARTHUR

COUNTRY	SUB CASE NO.	TYPE CASE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
EUROPE	91918125.5	PCT	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992			08AUG2011
CANADA		FR DE GB PCT	GRNT	2067145 08AUG1991	2067145 16FEB1999		08AUG1991	97 SIM	08AUG2011
FRANCE	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
GERMANY	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
JAPAN		PCT	GRNT	516606/91 08AUG1991	2729289 19DEC1997		19DEC1997	06	08AUG2011
UNITED KINGDOM	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
USA			PEND	564108 08AUG1990					

COMMENTS: +PLEASE CONFIRM GERMAN NATIONAL # IS P69116847.4 PER AGENT.  
ASSIGNEE: ADVANCED CERAMICS CORPORATION

016237-1

ADVAN EL

564108 PYROLYTIC BORON NITRIDE COATING FOR OXIDATION PROTECTION OF CARBON-COMPOSITES

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
INVENTOR: MOORE, ARTHUR.

COUNTRY	SUB CASE NO.	TYPE CASE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
USA	819647		GRNT	10JAN1992	5275844 04JAN1994		04JUL1994		04JAN2011

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.

016311 ADVAN ADVAN 431191 PONDER COATING COMPOSITIONS  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: OSBORNE, TINDI

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHE THRU	EXPIR/ABAND DATE
EUROPE	90312018.6	GRNT	GRNT	02NOV1990	0426485 11JAN1995	0426485 08MAY1991			02NOV2010
CANADA	2029232	FR DE GB	GRNT	02NOV1990	2029232 03DEC1996		02NOV1990	SIM	02NOV2010
FRANCE	90312018.6	EPC	GRNT	02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV1990	94	02NOV2010
GERMANY	90312018.6	EPC	GRNT	02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV1990	94	02NOV2010
JAPAN	295577/90	GRNT	GRNT	02NOV1990	2709862 24OCT1997		24OCT1997 11		02NOV2010
UNITED KINGDOM	90312018.6	EPC	GRNT	02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV1990	94	02NOV2010
USA	431191	GRNT	GRNT	03NOV1989	5026422 25JUN1991		25OCT1991 SE		03NOV2009

REMARKS: FR DE GB  
 ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
 COMMENTS: PLEASE VERIFY PATENT IS A SMALL ENTITY--PER PTO

016328 ADVAN CFD 516910 BORDON NITRIDE TEXTURED BOAT AND PROCESS FOR PRODUCING IT  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: FINICLE, ROBER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHE THRU	EXPIR/ABAND DATE
EUROPE	91303625.7	GRNT	GRNT	24APR1991	0457444 07JUN1995	0457444			24APR2011
CANADA	2041427	GRNT	GRNT	29APR1991	2041427 24FEB1998		29APR1991	97 SIM	29APR2011
GERMANY	91303625.7	EPC	GRNT	24APR1991	0457444 07JUN1995	0457444	24APR1991	95	24APR2011
JAPAN	124492/91	GRNT	GRNT	30APR1991	2681551 08AUG1997		08AUG1997 02		30APR2011
UNITED KINGDOM	91303625.7	EPC	GRNT	24APR1991	0457444 07JUN1995	0457444	24APR1991	95	24APR2011
USA	516910	GRNT	GRNT	30APR1990	5032366 16JUL1991		16JAN1992		16JUL2008

REMARKS: \*\*DO NOT CHANGE FILE DATE\*\*\*  
 ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.

CASE NUMBER CLIENT/ DIVISION ATTORNEY YOUR REFERENCE PRIORITY TITLE

016328-1 ADVAN BORDN NITRIDE BOAT AND PROCESS  
ASSIGNEE: PRAXAIR S.I. TECHNOLOGY, INC.  
INVENTOR: FINICLE, ROBER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND DATE
USA	01MAR1991	CASE	GRNT	662954 01MAR1991	5182149 26JAN1993		26JUL1993 SE	26JAN2010

016329 ADVAN CFD 533816 BORDN NITRIDE CRUCIBLE AND PROCESS FOR PRODUCING IT  
ASSIGNEE: ADVANCED CERAMICS CORPORATION/ UNION CARBIDE  
INVENTOR: FINICLE, ROBER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND DATE
EUROPE	91305100.9	CASE	GRNT	05JUN1991	0460943 24AUG1994	0460943 11DEC1991		05JUN2011
CHINA	91104641.0	CASE	GRNT	05JUN1991	19DEC1997	1038091 22JAN1992	05JUN1991 DL	05JUN2006
GERMANY	91305100.9	CASE	GRNT	05JUN1991	P69103579.2	0460943 11DEC1991	94	05JUN2011
JAPAN	159883791	CASE	GRNT	05JUN1991	2520060 17MAY1996		17MAY1996 09	05JUN2011
RUSSIAN FEDERAT	4895648	CASE	GRNT	05JUN1991	2059025 27APR1996		05JUN1991	05JUN2011
UNITED KINGDOM	91305100.9	CASE	GRNT	05JUN1991	PER AGENT			
USA	91305100.9	CASE	GRNT	05JUN1991	0460943 24AUG1994	0460943 11DEC1991	94	05JUN2011
USA	533816	CASE	GRNT	05JUN1990	5075055 24DEC1991		24JUN1992 SE	24DEC2008

016329-1 ADVAN BORDN NITRIDE CRUCIBLE (AMENDED)  
ASSIGNEE: PRAXAIR S.I. TECHNOLOGY, INC.  
INVENTOR: FINICLE, ROBER

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND DATE
USA	750296	CASE	GRNT	27AUG1991	5158750 27OCT1992		27APR1993	27OCT2009

CASE NUMBER 016459  
 ADVAN CF0  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: SHAFFER, GREGO  
 COUNTRY EUROPE  
 SUB TYPE CASE NO. A3ND  
 REMARKS: DE G3 A3ND  
 COUNTRY CANADA  
 SUB TYPE CASE NO. A3ND  
 REMARKS: DROP PER THR 21FEB97  
 COUNTRY GERMANY  
 SUB TYPE CASE NO. A3ND  
 REMARKS: A3ND PER THR 21FEB97  
 COUNTRY JAPAN  
 SUB TYPE CASE NO. A3ND  
 REMARKS: A3ND PER SOURCE 26DEC97  
 COUNTRY UNITED KINGDOM  
 SUB TYPE CASE NO. A3ND  
 REMARKS: A3ND PER THR 21FEB97

693545 NULITE/BORON NITRIDE COMPOSITE BREAK RING

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
EUROPE	A3ND		92303848.3 29APR1992	0511840 25OCT1995	0511840	29APR1992	29APR2012
CANADA	A3ND		2067532 29APR1992	2067532 09JUL1996	SIN	29APR1992	29APR2012
GERMANY	A3ND		92303848.3 29APR1992	P69205618.1 25OCT1995	0511840	29APR1992	29APR2012
JAPAN	A3ND		135693/92 30APR1992	2772305 24APR1998		24APR1998 02	30APR2012
UNITED KINGDOM	A3ND		92303848.3 29APR1992	0511840 25OCT1995	0511840	29APR1992	29APR2012

016459-1 ADVAN  
 MULTITE/BORON NITRIDE COMPOSITE  
 COUNTRY USA  
 SUB TYPE CASE NO. A3ND  
 ASSIGNEE: PRAIRIE S.I. TECHNOLOGY, INC.  
 REMARKS: A3ND PER SOURCE 26DEC97

016465 ADVAN EL  
 ASSIGNEE: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: GILBERT MH WALSH PJ  
 COUNTRY JAPAN  
 SUB TYPE CASE NO. A3ND  
 REMARKS: DROP PER SOURCE 16DEC97  
 COUNTRY KOREA (SOUTH)  
 SUB TYPE CASE NO. A3ND  
 REMARKS: DROP PER FAX 18MAR98

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
JAPAN	A3ND		418179/90 25DEC1990	2536397 05SEP1996	20NOV1996	05SEP1996	25DEC2010
KOREA (SOUTH)	A3ND		215718/90 24DEC1990	102429 23JUL1996	3734/96 21MAR1996	21MAR1996	21MAR2011

544611 A GRAPHITE CHUCK FOR A STARTER FILAMENT IN THE MANUFACTURE OF POLYCRYSTALLINE SILICON AND METHOD OF PROTECTION

CASE NUMBER 016465-1 CLIENT/DIVISION ADVAN EL ATTORNEY YOUR REFERENCE PRIORITY TITLE

ASSIGNEE: ADVANCED CERAMIC CORPORATION INVENTOR: GILBERT MICHAEL HEDGE JOHN B WALSH PAUL J

COUNTRY USA SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/ FILE DATE 790079 13NOV1991 11JAN1994 PATENT NUMBER/ ISSUE DATE 5277934 11JUL1994 TAX/ WORKING STRT DATE 11JUL1994 TAX PAID AGENT EXPIR/ABAND ATTY DATE 11JAN2011

016496 ADVAN EL 570739 NOMAQUEOUS BINDER COMPOSITION FOR SLIP CASTING OR COLD FORMING AND METHOD

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MONTGOMERY, LI

COUNTRY JAPAN SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/ FILE DATE 232407791 21AUG1991 14367791 21AUG1991 PATENT NUMBER/ ISSUE DATE 2767657 10APR1998 PUBLIC NUMBER/ DATE 22AUG1996 TAX/ WORKING STRT DATE 10APR1998 TAX PAID AGENT EXPIR/ABAND ATTY DATE 21AUG2011

COUNTRY KOREA (SOUTH) SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/ FILE DATE 837606 21FEB1992 24AUG1993 PATENT NUMBER/ ISSUE DATE 5238984 24AUG1993 PUBLIC NUMBER/ DATE 22AUG1996 TAX/ WORKING STRT DATE 24FEB1994 TAX PAID AGENT EXPIR/ABAND ATTY DATE 22AUG2011

COUNTRY USA SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/ FILE DATE 044677 09APR1993 04JUL1995 PATENT NUMBER/ ISSUE DATE 5429781 04JUL1995 PUBLIC NUMBER/ DATE 04JAN1996 TAX/ WORKING STRT DATE 04JAN1996 TAX PAID AGENT EXPIR/ABAND ATTY DATE 04JUL2012

016496-1 ADVAN NON AQUEOUS BINDER COMPOSITION METAL

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MONTGOMERY

COUNTRY USA SUB TYPE STATUS CASE NO. DIV GRNT APPLICATION NUMBER/ FILE DATE 044677 09APR1993 04JUL1995 PATENT NUMBER/ ISSUE DATE 5429781 04JUL1995 PUBLIC NUMBER/ DATE 04JAN1996 TAX/ WORKING STRT DATE 04JAN1996 TAX PAID AGENT EXPIR/ABAND ATTY DATE 04JUL2012

CASE NUMBER 016708  
 CLIENT/DIVISION ADVAN CFO  
 ATTORNEY YOUR REFERENCE NUMBER 693546  
 PRIORITY TITLE MULLITE/YTRIA STABILIZED ZIRCONIA/BORON NITRIDE COMPOSITES  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: SHAFFER, GREGO

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
EUROPE	92303849.1	ABND		29APR1992	0511841 08NOV1995	0511841	29APR1992		29APR2012
CANADA	2067531	ABND		29APR1992			29APR1992	SIM	29APR2012
GERMANY	92303849.1	ABND		29APR1992	69205882.6 08NOV1995	0511841	29APR1992		29APR2012
JAPAN	135694/92	ABND		30APR1992					30APR2012
UNITED KINGDOM	92303849.1	ABND		29APR1992	0511841 08NOV1995	0511841	29APR1992		29APR2012
USA	693546	ABND		30APR1991	5120683 09JUN1992		09DEC1992		09JUN2009

016708-1 ADVAN  
 ASSIGNEE: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: SHAFFER, GREGO

METHOD OF PRODUCING MULLITE/YT

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
USA	824219	ABND		23JAN1992	5134098 28JUL1992		28JAN1993		26JUL2009

ASSIGNEE: UNION CARBIDE CANADA LTD.  
 REMARKS: ABANDONED PER TMR 09710799

CASE NUMBER 016891  
CLIENT/DIVISION ADVAN EL  
ATTORNEY REFERENCE YOUR PRIORITY TITLE  
810910 METHOD FOR RESISTANCE HEATING OF METAL USING A PYROLYTIC  
BORON NITRIDE COATED GRAPHITE BOAT

ASSIGNEE: ADVANCED CERAMIC CORP.  
INVENTOR: MORRIS, JOSEPH

COUNTRY	SUB CASE TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
EUROPE	GRNT	GRNT	93303212.0 23APR1993	0621351 07JUL1999	0621351 26OCT1994			23APR2013
CHINA	GRNT	GRNT	93107926.8 03JUL1993	93107926.8 25MAR1999	45697 11JAN1995	03JUL1993	CFA	03JUL2013
GERMANY	EPC	GRNT	93303212.0 23APR1993	0621351 07JUL1999	0621351 26OCT1994	23APR1993		23APR2013
HONG KONG	REG	PEND			0621351			23APR2013
JAPAN	GRNT	GRNT	23APR1993 119228/93	2665873 27JUN1997		27JUN1997 02	KURAU	23APR2013
KOREA (SOUTH)	GRNT	GRNT	23APR1993 7043/93	177836 19NOV1998		19NOV1998	NAH	19NOV2013
TAIWAN	GRNT	GRNT	27APR1993 82103377	NI-69830	19NOV1998 239250	21JAN1995		30APR2013
UNITED KINGDOM	EPC	GRNT	30APR1993 93303212.0	0621351 07JUL1999	0621351 26OCT1994	23APR1993		23APR2013
USA	GRNT	GRNT	23APR1993 810910	20DEC1991 24AUG1993		24FEB1994		24AUG2010

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.



CASE NUMBER 016969  
 COUNTRY ADVAN EL  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: GILBERT, Michael; J.L., TIMOTHY,  
 953156 PYROLYTIC BORON NITRIDE HEATING UNIT

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
EUROPE	93922354.1	PCT	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138 19JUL1995			24SEP2013
CANADA	2141340	PCT	GRNT	2141340 24SEP1993	2141340 12JAN1999		24SEP1993	NILNE	24SEP2013
FRANCE	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138	24SEP1993		24SEP2013
GERMANY	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138	24SEP1993		24SEP2013
JAPAN	509175/94	PCT	GRNT	509175/94 24SEP1993	030CT1997		030CT1997 05		24SEP2013
KOREA (SOUTH)	701156/93	PCT	GRNT	701156/93 24SEP1993	174587		05NOV1998		05NOV2013
SWEDEN	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138	24SEP1993 EF	PATRA	24SEP2013
UNITED KINGDOM	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138	24SEP1993		24SEP2013
USA	953156	GRNT		953156 29SEP1992	30AUG1994		28FEB1995		30AUG2011

REMARKS: DE FR GB SE  
 ASSIGNEE: PRAAIR S.T. TECHNOLOGY, INC.

020000 ADVAN EL  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: LENHARTZ, Jeffe  
 69801 FLUIDIZED BED REACTOR ARRANGEMENT AND METHOD FOR FORMING A METAL CARBIDE COATING ON A SUBSTRATE CONTAINING GRAPHITE...

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
EUROPE	94920036.4	PCT	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995			25MAY2014
CHINA	94190542.1	PCT	GRNT	94190542.1 25MAY1994	16JUL1999	1112790 29NOV1995	25MAY1994		25MAY2014
GERMANY	94920036.4	EPC	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995	25MAY1994		25MAY2014
UNITED KINGDOM	94920036.4	EPC	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995	25MAY1994		25MAY2014
USA	069801	ABND		069801 01JUN1993					25MAY2014

REMARKS: ABAND PER SOURCE 1/20/99

CASE NUMBER 020000-1  
 CLIENT/DIVISION ADVAN  
 ATTORNEY YOUR REFERENCE PRIORITY TITLE  
 95/0396875 FLUIDIZED BED REACTOR ARRANGEMENT AND METHOD FOR FORMING A  
 METAL CARBIDE COATING ON A SUBSTRATE CONTAINING GRAPHITE...  
 ASSIGNOR: ADVANCED CERAMICS CORPORATION  
 INVENTOR: LENNARTZ

COUNTRY USA  
 SUB TYPE STATUS CASE NO. CDN GRNT  
 APPLICATION NUMBER/FILE DATE 01MARI1995 396875  
 PATENT NUMBER/ISSUE DATE 12MAR1996 5498442  
 PUBLIC NUMBER/DATE 12SEP1996  
 TAX/WORKING START DATE 12SEP1996  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 12MAR2013

020014 ADVAN EL  
 REMARKS: CON OF 069801  
 037751 BORDN NITRIDE COMPOSITES BASED ON ALUMINUM NITRIDE AND MULLITE  
 ASSIGNOR: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY, L.

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE
EUROPE	ABND			94301845.7 15MARI1994	0616988 13AUG1997	0616988	13AUG1997	15MAR2014
CHINA	ABND			94103604.9 26MARI1994	0616988 13AUG1997	0616988	26MARI1994 PA	26MAR2014
GERMANY	ABND			94301845.7 15MARI1994	0616988 13AUG1997	0616988	15MARI1994 97	15MAR2014
JAPAN	ABND			5185794 23MARI1994	2645216 02MAY1997	2645216	02MAY1997 05	23MAR2014
UNITED KINGDOM	ABND			94301845.7 15MARI1994	0616988 13AUG1997	0616988	15MARI1994	15MAR2014
USA	ABND			037751 26MARI1993	5336454 09AUG1994	5336454	09FEB1995	09AUG2011

020014-1 ADVAN EL  
 REMARKS: ABND PER THR 11NOV97  
 ASSIGNOR: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY

COUNTRY USA  
 SUB TYPE STATUS CASE NO. ABND  
 APPLICATION NUMBER/FILE DATE 11MARI1994 212501  
 PATENT NUMBER/ISSUE DATE 28MARI1995 5401696  
 PUBLIC NUMBER/DATE 28SEP1995 SE  
 TAX/WORKING START DATE 28SEP1995 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 28MAR2012

GERAMIC COMPOSITE & METHOD

EXHIBIT A

FORM OF ASSIGNMENT

THIS DOCUMENT SHALL BE HELD BY AGENT, FOR THE BENEFIT OF THE BANKS, IN ESCROW PURSUANT TO AND IN ACCORDANCE WITH THE PROVISIONS OF THE INTELLECTUAL PROPERTY COLLATERAL ASSIGNMENT AGREEMENT (THE "AGREEMENT"), DATED AS OF FEBRUARY 2, 2001, EXECUTED BY ADVANCED CERAMICS CORPORATION, AN OHIO CORPORATION ("PLEDGOR"), IN FAVOR OF KEYBANK NATIONAL ASSOCIATION, AS AGENT FOR THE BANKS, AS DEFINED IN THE AGREEMENT (TOGETHER WITH ITS SUCCESSORS AND ASSIGNS, "AGENT"). BY SIGNING IN THE SPACE PROVIDED BELOW, THE UNDERSIGNED OFFICER OF AGENT CERTIFIES THAT AN EVENT OF DEFAULT, AS DEFINED IN THE AGREEMENT, HAS OCCURRED AND THAT AGENT HAS ELECTED TO TAKE POSSESSION OF THE COLLATERAL, AS DEFINED BELOW, AND TO RECORD THIS DOCUMENT WITH THE UNITED STATES PATENT AND TRADEMARK OFFICE. UPON RECORDING OF THIS DOCUMENT WITH THE UNITED STATES PATENT AND TRADEMARK OFFICE, THIS LEGEND SHALL CEASE TO HAVE ANY FORCE OR EFFECT.

KEYBANK NATIONAL ASSOCIATION,  
as Agent

By: \_\_\_\_\_  
John P. McKelvey, Senior Vice President

Date: \_\_\_\_\_

ASSIGNMENT

WHEREAS, ADVANCED CERAMICS CORPORATION, an Ohio corporation ("Pledgor"), is the owner of the Collateral, as hereinafter defined;

WHEREAS, Pledgor has executed an Intellectual Property Collateral Assignment Agreement, dated as of February 2, 2001 (as the same may from time to time be amended, restated or otherwise modified, the "Agreement"), in favor of KEYBANK NATIONAL ASSOCIATION as Agent for the Banks, as defined in the Agreement (together with its successors and assigns, "Agent"), pursuant to which Pledgor has granted to Agent, for the benefit of the Banks, a security interest in and collateral assignment of the Collateral as security for the Debt, as defined in the Agreement;

WHEREAS, the Agreement provides that the security interest in and collateral assignment of the Collateral is effective as of the date of the Agreement;

WHEREAS, the Agreement provides that this Assignment shall become effective upon the occurrence of an Event of Default, as defined in the Agreement and Agent's election to take actual title to the Collateral;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, Pledgor, its successors and assigns, subject to the limitations stated in the paragraph immediately following, does hereby transfer, assign and set over unto Agent, for the benefit of the Banks, and their respective successors, transferees and assigns, all of its existing and future (a) patents, patent registrations, patent applications, trademarks, trademark registrations, trademark applications and copyright registrations, whether federal or state; (b) common law trademark rights, copyrights, improvements and inventions; (c) renewals, proceeds on infringement suits, and rights to sue for past, present and future infringements relating to any of the foregoing; (d) goodwill associated with any of the foregoing; and (e) proceeds of any of the foregoing (collectively, the "Collateral"), including, but not limited to, the Collateral listed on Schedule 1 hereto that is registered in the United States Patent and Trademark Office in Washington D.C. or that is the subject of pending applications in the United States Patent and Trademark Office.

This Assignment shall be effective only upon certification of an authorized officer of Agent, as provided above, that (a) an Event of Default, as defined in the Agreement, has occurred, and (b) Agent, on behalf of the Banks, has elected to take actual title to the Collateral.

IN WITNESS WHEREOF, the undersigned has caused this Agreement to be executed by its duly authorized officer on February 2, 2001.

ATTEST:

ADVANCED CERAMICS CORPORATION

\_\_\_\_\_  
Print Name: \_\_\_\_\_

By: \_\_\_\_\_  
Gerard R. Weimann, President

\_\_\_\_\_  
Print Name: \_\_\_\_\_

THE STATE OF OHIO                    )  
  ) SS:  
COUNTY OF CUYAHOGA                )

BEFORE ME, a Notary Public, the undersigned, on this day personally appeared Gerard R. Weimann, known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of ADVANCED CERAMICS CORPORATION, an Ohio corporation, and that she/he executed the same as the act of such corporation for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 2nd day of February, 2001.

---

Notary Public

SCHEDULE 1

[TO EXHIBIT A]

SEE ATTACHED LISTS OF PATENTS, PATENT APPLICATIONS AND TRADEMARKS

**Advanced Ceramics Corporation  
Active Trademarks and Service Marks**

<b>Trademark or Service Mark</b>	<b>Number</b>	<b>U.S. Filing Date</b>	<b>Registration Date</b>	<b>Describes</b>	<b>Countries Registered</b>
Boralloy	763,741		28 Jun 84	Pyrolytic Boron Nitride (renewal app. Aug 91)	Canada China
	137,447		25 Sep 79		
	152,274		30 Nov 81		
Boralectric	1,703,088		28 Jul 92	Resistance heating elements for industrial and commercial use comprised of pyrolytic graphite and pyrolytic nitride	China
	594,249		10 May 92		
MCP				Metal coated powders Labels to EL 21 Dec 00	
Polarsphere(s)	76/026481	14-Apr-00		Ceramic particles exhibiting high thermal conductivity and a substantially spherical shape, for use alone or as fillers in polymers or glasses. To EL 9 Mar 99.	
Polartherm	2,126,905		6-Jan-98	High thermal conductivity ceramic preparations and filler materials, namely, boron nitride filled polymers, graphite, ceramic oxide, and compositions of the foregoing for use in mft. of ceramic mats.	
	D-3329 75/173892	30 Sep 96			

SUPPLY SHIPPING LABELS

Ceramic flash evaporators for use in evaporating a metal coating of, for example, aluminum upon a product such as a picture tube or component of a product.

LABELS AND LITERATURE SUPPLIED

Boron nitride as a chemical raw material in granular, particle or powder form for use as a component of packaging materials, plastic molding compounds, semiconductor related products and diverse cosmetic products.

A structure for transferring heat which contains or encapsulates pyrolytic graphite within another solid material.

SUPPLY SHIPPING LABELS

Pyrolytic graphite having high thermal conductivity.

Spatter guard stop-off compound in a water-based liquid (paste) form for use in welding, brazing and other hot metal working opns.

RE-FILE BY DEC 99 UNDER ACC

Notes: Foreign trademark registrations will generally not be made, unless there is a specific benefit to be gained. Trademarks "Boralectric", "Boralloy", and "Weld-R-White" were assigned to ACC by Praxair S. T. Technology Inc. 2 Mar 93.

21 Dec 00 as PAIDOC

Q Coat D-3736 ca. 15 Sep 97 3-Aug-99 Ceramic flash evaporators for use in evaporating a metal coating of, for example, aluminum upon a product such as a picture tube or component of a product.  
75/369,758 75/369758

Softouch D-3892 28-Aug-98 9-Nov-99 Boron nitride as a chemical raw material in granular, particle or powder form for use as a component of packaging materials, plastic molding compounds, semiconductor related products and diverse cosmetic products.  
75/544,604

TC1050 D-3936 21-Jan-99 7-Mar-00 A structure for transferring heat which contains or encapsulates pyrolytic graphite within another solid material.  
75/624519 2,326,014

TPG D-3816 25-Mar-98 28-Dec-99 Pyrolytic graphite having high thermal conductivity.  
75/457,180

Weld-R-White 1,844,968 12-Jul-94 Spatter guard stop-off compound in a water-based liquid (paste) form for use in welding, brazing and other hot metal working opns.  
74/263,405 7 Apr 92



Advanced Ceramics Corporation  
Active Foreign Patent Applications and Invention Disclosures

Docket No.	Lab No.	Subject	Inventor	Filing	Remarks	Sales Class
31815	J. Murrough	Articles Coated with Aluminum Nitride by Chemical Vapor Deposition	M.H. Gilbert	22 Nov 00 as PCT/US00/42236 21 Nov 00 as 60/166971		470
	G					
	J					
	K					
	UK					
4121		Evaporator for Projection Ray Tube	J.M. Morris	22 Mar 00 as 09/533,003		453
	CI					
	G					
	K					
	Mal					
	NE					
	Tai					
3953		Heater for High Vacuum Optical View Port	T.J. Mattord		US 5,977,526, 2 Nov 99	430
EPO			M.H. Gilbert	2000-1117	By 29 Feb 00 Before 17 Jul 00	
	J					
4093		Pyrolytic Graphite Monochromator and Method A.W. Moore for Improving Lattice Spacing Spread...		31 Aug 99 as 09/386,739 R.L. 01029 Ft. 0273, 31 Aug Fr. 00/11070, before 10 Oct 00 De 100 40 196.1, 7 Oct 00	BAR DATE: Eur. Conf. Neutron Diff. Budapest 1 Sep 99	471
	F					
	G					
	R					
3915	UNM-496	Spherical BN Particles	R. T. Paine	US 09/315,097		452
EPO	CMIEM		W. J. Kroenke	16 May 00 as EPO0401328.0	22 Nov 00 as EP 1053973	
	J		E.A. Pruss	19 May 00 as 2000-148893		
3967		Improved Compaction for Producing Densified BN Precursor for Cubic BN	G.W. Shaffer	U.S. 6,048,511, 11 Apr 00	Division of D-3775	452
			R.F. Hill			
3909		Flexible Heat Transfer Device and Method	J.B. Richey III	US:09/154,253, 16 Sep 98		435
EPO						

F						Prior to 12 Sep 00	
J						Response filed prior to 17 Aug 00	
R							
3855		Pyrolytic Boron Nitride Radiation Heater	M.H. Gilbert	09/347,335, 2 Jul 99			430
EPO				22 May 00 as 00 401 406.4			
J				13 Apr 00 as 2000-117191		Pub. 3 Jan 01 as 1065913, 24 Nov 00	
K				Prior to 11 May 00		Translation and priority 19 Aug 00	
3825		Surface Treated Boron Nitride for Forming a Low Viscosity High Thermal Conductivity Polymer Based Boron Nitride Composition	K. Ishida	US 6,160,042, 12 Dec 00			452
CAN				99403250.6		Search report by 7 Sep 00	
EPO				88122593, 1 Oct 98			
J				EPO 99 904 502.4		EPO 1051543, 15 Nov 00	458
TAI				PCT/US99/02112 29 Jan 99		Favorable prelim exam, 29 Mar 00	
3807		Method for Electroplating Metal Coatings on Particulates at High Coating Speed with High C.D.	Pay Yih	2000-530647, 19 Jul 00		Request exam. 13 Oct 2000	
PCT				24 May 00 as 0012441.2			
J				98400361.6, 16 Feb 98		Germany, Sweden, UK 3-30-00	
UK				47768/98, 27 Feb 98			
3775		Method for Forming Boron Nitride and High-Density Agglomerated Boron Nitride Particles	G.W. Shaffer				
EPO				H. Inoue, H. Miyata 21 Jan 97			430
J				K. Mine, J. Honma		Per EL, joint filing with 3502	
3605		Ceramic Electrostatic Chuck	T.J. Mattord	SN60/19586, 11 Jun 96			444
3447		UTA98-02 Molecular Beam Epitaxy Effusion Cell (Variable Aperture)		PCT/US98/11730, 5 Jun 98		Prelim exam 10 Sep 99	
3689				98925296.0 -Feb 00			
PCT							
EPO							
F							
G							
UK							
3550		Composition for Forming High Thermal Conductivity Polybenzoxazine-based	K. Ishida (to EPIC)				452
PCT						Apr-98	

CAN	Material and Method	Assigned 6 Nov 98	430	
CH	Pyrolytic Boron Nitride Compact and Method of Manufacture	Prior to 11 May 00	"Discretionary Resistivity" J278269 EP 0 768 389, 16 Aug 00 By 18 Sep 00 By 5 Jul 00 Power to Kim & Lee 22 Nov 96	
F		Prior to 11 May 00		
G		Prior to 11 May 00		
I		Prior to 11 May 00		
J		Prior to 11 May 00		
SW		Prior to 11 May 00		
TAJ	Assigned 6 Nov 98	Prior to 11 May 00	EP 96 307144.4 30 Sep 96	
UK		Prior to 11 May 00		
3502	Method for the Precise Adjustment of the Mosaic Spread of HOPG	A.W. Moore	471	
EPO				EP 96 307144.4 30 Sep 96
F				K96-43613 20 Oct 96
G				Tai85112116 by 13 Dec 96
K				
TAI				
3467	High Thermal Conductivity Composite and Method	J.T. Martinez H. Sayir	435	
CI				97120541, 10 Oct 97
J				277743/97, 9 Oct 97
R				97116800, 7 Oct 97
UK				9721351.6, 9 Oct 97
3406	Boron Nitride Composition and Polymer Based High Conductivity Molding Compound	R.F. Hill S. DeVanzo	452	
CAN				C2204331, 2 May 97
F				J115873/97, 6 May 97
G				97-17020, 2 May 97
I				30 Apr 97 as 86105759
J				
K				
TAI				
3301	Boron Nitride Composition and Polymer Based High Conductivity Molding Compound	R.F. Hill S. DeVanzo	452	
CAN				25 Feb 97 as 2198422
EPO				3 Mar 97 as 97103424.4

Active	Docket No.	Inventors	Title	Applicant	Priority Dates	Exam date	Status
J K MAL SING TAI	3247	R.L. Finicle	Improved PBN Coated Flash Evaporator		5 Mar 97 as 67472/1997 28 Feb 97 as 97-5958 P19700879, 4 Mar 97 25 Feb 97 as 9700476-6 5 Mar 97 as 86102690	26 Feb 02	432
J K TAI	31300	A.W. Moore M.B. Dowell	Improved Interface Coatings for Ceramic Fibers		US5,671,322, 23 Mar 98 J006851/1997, 17 Jan 97 1121/97, 16 Jan 97 87203892, 15 Jan 97	3/2/98	470
CI J R	31290 AC-91-2 34210	A.W. Moore	Process for Forming Pyrolytic SiBN Coatings on Low Thermal Expansion Materials		95197074.7, 24 Oct 95 514716-1996, 24 Oct 95 97108678, 24 Oct 95	Modified claim offered by 1 Nov 99 CI US 5,972,511 26 Oct 99	470
PCT F G J UK	30870	J.T. Mariner D.A. Longworth	Multiple Layer Flash Evaporator		PCT/US96/14561, 11 Sep 96	Written Opinion 9 Oct 97	435
G J	30860 3413 3548C	J.T. Mariner D.A. Longworth	High Density Flash Evaporator		EPC/US95/11788 P19581904.7, 18 Sep 95 517874/96, 18 Sep 95 PCT/US95/11787	abandoned for national filings Rejection 28 Jan 96	435
J	3915 UNM-4 CMEM	J. Murt			18 Sep 95 as P19581904.7 18 Sep 95 as 517874/96		

12 Jan 01 as PAIDOC

3855

Advanced Ceramics Corporation  
Active U.S. Patent Applications and Invention Disclosures

Docket No.	Lab No.	Subject	Inventor	Filing	Remarks	Sales Class
		PBN Neutron Detector	J.R. Leist		To EL 12 Jun 00	441
		TLP052000A High Thermal Conductivity BN Filled Polymers and Processing the Same	A.Y. Sane T.J. Fox		Received 8 Jun 00	452
32014		J. Murtaugh Glass Sealed Two Piece PBN Crucible	J. T. Mariner N. J. Weiss	2 Nov 99 as 60/163,149 13 Nov 00 as 60/247,241		444
31815		J. Murtaugh Articles Coated with Aluminum Nitride by Chemical Vapor Deposition (CVD-AIN)	M.H. Gilbert	23 Nov 99 as 60/166,971	Provisional SN 60/166,971 By 23 Nov 00	470
		Surface Modified BN Powders and Methods for Making Them	A. Y. Sane		First discussion 10 Feb 00	452
4093		Pyrolytic Graphite Monochromator and Method for Improving Lattice Spacing Spread...	A. W. Moore	31 Aug 99 as 09/386,739 RI. 01029 Fr. 0273, 31 Aug	Claims allowed 31 Jul 00	471
4121		Evaporator for Projection Ray Tube	J.M. Morris	22 Mar 00 as 09/533,003		453
		J. Murtaugh Omnibus CVD AIN Patent	M.H. Gilbert J.W. Lennartz	Process Description due at JM by 15 June		470
3915	UNM-496 CMEM	Spherical BN Particles	R.T. Paine W. J. Kroenke E.A. Pruss	US 09/315,097	Examiner's 2nd response 6 Dec 00 Reply 6 Mar 01	452
3855		Pyrolytic BoronNitride Radiation Heater	M.H. Gilbert	09/347,335, 2 Jul 99 Reel 010094 Frame 0853	Allowance 10 May 00	430

30860  
34130  
35480

High Density Flash Evaporator

12 Jan 01 as PATDOC

J.T. Mariner  
D.A. Longworth

08/314,412  
08/603,498

Final rejection 9 Feb 96  
2nd Continuation 17 Jun 96  
On appeal, ~Mar 98

US006160042A

**United States Patent** [19][11] **Patent Number:** **6,160,042****Ishida**[45] **Date of Patent:** **Dec. 12, 2000**

[54] **SURFACE TREATED BORON NITRIDE FOR FORMING A LOW VISCOSITY HIGH THERMAL CONDUCTIVITY POLYMER BASED BORON NITRIDE COMPOSITION AND METHOD**

[58] **Field of Search** ..... 523-208, 415, 523-445; 428-703; 423-290; 524-404

[56] **References Cited**[75] **Inventor:** **Hatsuo Ishida, Shaker Heights, Ohio****U.S. PATENT DOCUMENTS**[73] **Assignee:** **Edison Polymer Innovation Corporation, Akron, Ohio**

5,152,939 10 1992 Ishida ..... 264 29-1  
5,221,783 6 1993 Hujn et al. .... 524 701  
5,385,989 1 1995 Obya ..... 525 502

[21] **Appl. No.:** **09/164,927**[22] **Filed:** **Oct. 1, 1998**

*Primary Examiner*—**Lee Yoon**  
*Attorney, Agent, or Firm*—**Anderson, Kill & Olick P.C.**

**Related U.S. Application Data**[57] **ABSTRACT**[63] **Continuation-in-part of application No. 08 846,457, May 1, 1997, Pat. No. 5,900,447.**[51] **Int. Cl.<sup>7</sup>** ..... **C08K 9/04; C08K 3/38; C08L 63/00; C01B 21/064**[52] **U.S. Cl.** ..... **523/445; 523 208; 523 415; 524 404; 428 703; 423 290**

A low viscosity high thermal conductivity polymer-based boron nitride composition and a surface-treated boron nitride material for use as a filler in this composition, and methods of preparation is described.

**8 Claims, 1 Drawing Sheet**

US006048511A

**United States Patent** [19]

Shaffer et al.

[11] Patent Number: **6,048,511**[45] Date of Patent: **Apr. 11, 2000**

[54] **METHOD FOR FORMING HIGH DENSITY BORON NITRIDE AND HIGH DENSITY AGGLOMERATED BORON NITRIDE PARTICLES**

[75] Inventors: **Gregory W. Shaffer, Strongsville; Richard Frank Hill, Chargin Falls, both of Ohio**

[73] Assignee: **Advanced Ceramic Corporation, Lakeland, Ohio**

[21] Appl. No.: **09/225,820**

[22] Filed: **Jan. 5, 1999**

**Related U.S. Application Data**

[62] Division of application No. 08/968,559, Nov. 12, 1997, Pat. No. 5,898,009, which is a continuation of application No. 08/618,361, Mar. 19, 1996, abandoned.

[51] Int. Cl.<sup>7</sup> ..... **B29C 67/02; C01B 21/064**

[52] U.S. Cl. .... **423/290; 264/117**

[58] Field of Search ..... **423/290; 501/96.4; 264/65, 117, 118**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

5,964,589 11/1991 Ichikawa et al. .... 423/290

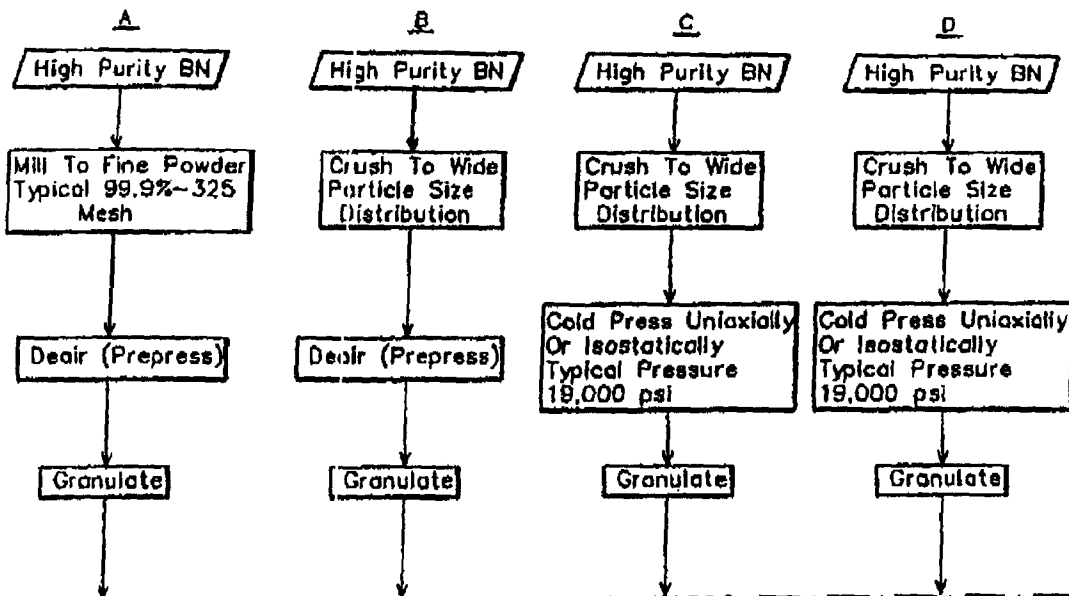
*Primary Examiner*—Wayne Lange

*Attorney, Agent, or Firm*—Eugene Licherstein; Michael N. Meller

[57] **ABSTRACT**

A method of forming pellets or agglomerates of high density boron nitride from high purity hexagonal boron nitride by crushing the high purity hexagonal boron nitride into boron nitride particles extending over a size range of at least 100 microns with the majority of the particles having a particle size above 50 microns and cold pressing the crushed particles into a compacted form. The compacted form is then granulated into a granulated powder and again cold pressed to form pellets or agglomerates of boron nitride particles with the operations of cold pressing and granulation occurring in one or more stages.

6 Claims, 5 Drawing Sheets

**METHODS FOR PRODUCING HIGH GREEN DENSITY BN COMPACTS**



US006011904A

# United States Patent [19]

[11] Patent Number: **6,011,904**

**Mattord**

[45] Date of Patent: **Jan. 4, 2000**

[54] **MOLECULAR BEAM EPITAXY EFFUSION CELL**

WO96/19597 6/1996 WIPO.  
WO97/106292 2/1997 WIPO.  
WO98/51836 11/1998 WIPO.

[75] Inventor: **Terry J. Mattord, Austin, Tex.**

*Primary Examiner*—Richard Bueker  
*Attorney, Agent, or Firm*—Eugene Lieberstein; Michael N. Meller

[73] Assignee: **Board of Regents, University of Texas, Austin, Tex.**

[21] Appl. No.: **08/872,758**

### [57] ABSTRACT

[22] Filed: **Jun. 10, 1997**

A molecular beam epitaxy effusion cell for growing epitaxial layers upon a semiconductor substrate by control of a collimated beam of molecules generated from a source material in a high vacuum environment in order to control the hyper abrupt stoichiometry of the effusion flux. A heated control assembly is used to control the size of the exit openings of the effusion cell. The control assembly comprises a piezoelectric heating member such as a grating having a plurality of holes and a perforated cover which are adjustable relative to one another. The grating includes an internal heating element.

[51] Int. Cl.<sup>7</sup> ..... **C23C 14/00**

[52] U.S. Cl. .... **392/389; 118/726**

[58] Field of Search ..... **118/726, 392/369**

### [56] References Cited

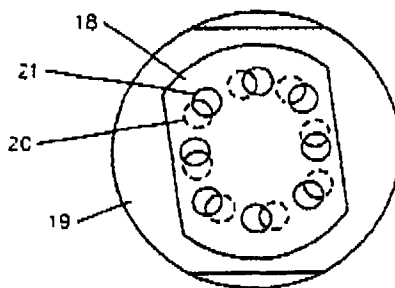
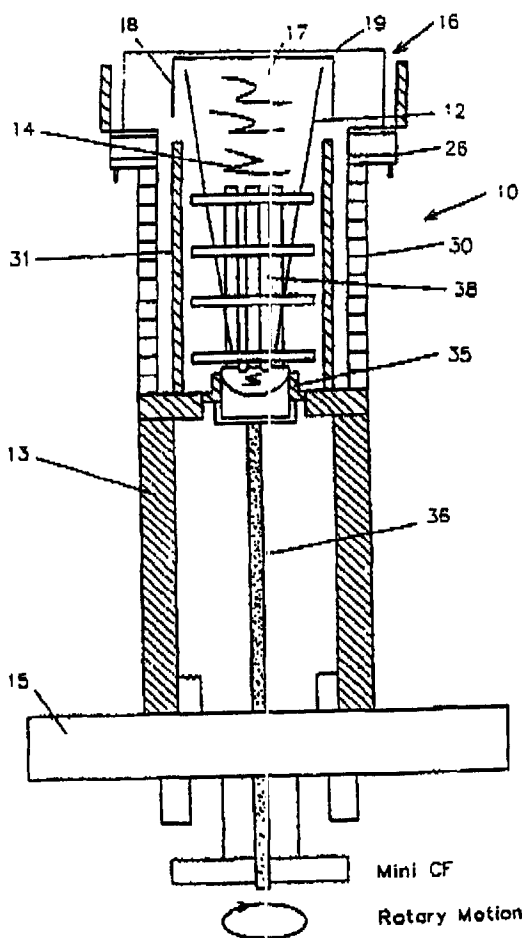
#### U.S. PATENT DOCUMENTS

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5,478,401 12/1995 Shimizu .

#### FOREIGN PATENT DOCUMENTS

2 534 933A1 4/1984 France .

**10 Claims, 9 Drawing Sheets**





CLIENT: 7M

CASE NUMBER 031291  
CLIENT/DIVISION  
ATTORNEY REFERENCE  
PRIORITY TITLE

96/0630041 PROCESS FOR FORMING PYROLYTIC SIBN COATINGS

ASSIGNEE: ADVANCED CERAMICS CORPORATION  
INVENTOR: MOORE

COUNTRY	USA	SUB CASE NO.	630041	STATUS	GRNT	APPLICATION NUMBER/ISSUE DATE	630041 5972511	PATENT NUMBER/ISSUE DATE	5972511 26OCT1999	PUBLIC NUMBER/DATE		TAX WORKING START DATE	26APR2000	TAX PAID AGENT SCHD THRU		EXPIR/ABAND ATTY DATE	02APR2016
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CASE NUMBER EPICAD3350 ADVAN  
 CLIENT/DIVISION ADVAN YOUR REFERENCE PRIORITY TITLE  
 846457 COMPOSITION FOR FORMING HIGH THERMAL CONDUCTIVITY POLYBENZOXINE-BASED MATERIAL AND METHOD

ASSIGNEE: ADVANCED CERAMICS  
 INVENTOR: ISHIDA

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
EUROPE		PEND	98401034.8 28APR1998		0875531 04NOV1998	28APR1998	28APR2018
CANADA		PEND	2250511 15OCT1998				NILME 15OCT2018
JAPAN		PEND	122382/98 01MAY1998				KYOMU 01MAY2018
TAIWAN		PEND	87119924 01DEC1998				TSAI 01DEC2018

UT-3689 ADVAN 97/0872758 MOLECULAR BEAM EPITAXY EFFUSION CELL  
 ASSIGNEE: UNIV OF TEXAS  
 INVENTOR: MATTORD-UT

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA		GRNT	872758 10JUN1997	6011904 04JAN2000		04JUL2000 SE	10JUN2017

002719 ADVAN EL 119996 CLAMP ASSEMBLY FOR VAPORIZATIIN BOAT  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
EUROPE		PCT ABND	94927387.4 09SEP1994		0717786	09SEP1994	09SEP2014
JAPAN		PCT ABND	508806/95 09SEP1994				09SEP2014
USA		GRNT	16DEC98 10SEP1993	5410631 25APR1995		25OCT1995 SE	25APR2012

ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 REMARKS: DROP PER FAX 10APR98  
 PCT ABND  
 REMARKS: ABAND PER FAX 16DEC98  
 GRNT

CASE NUMBER	COUNTRY	CLIENT/DIVISION	ATTORNEY REFERENCE	YOUR REFERENCE	PRIORITY TITLE NUMBER	ASSIGNEE: ADVANCE CERAMICS CORPORATION INVENTOR: MARINER	ADVAN	93/0166470 BORON NITRIDE VAPORIZATION VESSE		
002961	USA			GRNT	14DEC1993	166470	5395180	07MAR1995	07SEP1995 SE	07MAR2012
003085	USA			GRNT	28SEP1994	314411	5337507	16JUL1996	16JAN1997 SE	16JUL2013
003086	USA			PEND	314412	1167508	10DEC1997			
	EUROPE			PCT ABAND	0595711787					
	CHINA			PCT GRNT	95194450.1	95194450.1	07MAY1999			
	GERMANY			PCT PENDING	18SEP1995					
	JAPAN			PCT PENDING	517574796					
	RUSSIAN FEDERAT			PCT GRNT	97104924	2142021				
	UNITED KINGDOM			PCT GRNT	9718478-2	2313846	28MAY1999			
	USA			PENDING	314412	2313846	10DEC1997			
										SE

314412 HIGH DENSITY FLASH EVAPORATOR

314412 HIGH DENSITY FLASH EVAPORATOR

COMMENTS: +PLEASE VERIFY ISSUED DT PER AGENT.

OKUYA

SE

TRADEMARK

REEL: 002254 FRAME: 0719

2165293954 ADVANCED CERAMICS

CLIENT: 7N  
 CLIENT/ DIVISION ATTORNEY YOUR REFERENCE PRIORITY TITLE  
 NUMBER NUMBER NUMBER

003087 ADVAN 94/0314314 EVAPORATOR HAVING MULTIPLE COATING  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER JT LONGWORTH DA

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID THRU	AGENT	EXPIR/ABAND DATE
EUROPE		PCT	ABND	US95/11788 18SEP1995			18SEP1995			18SEP2015
CHINA		PCT	GRNT	95196451.8 28AUG1999	95196451.8 28AUG1999	1167509 10DEC1997	18SEP1995	CHINA		18SEP2015
GERMANY		PCT	PEND	P19581905.5 18SEP1995			18SEP1995			18SEP2015
JAPAN		PCT	PEND	511846797 18SEP1995						18SEP2015
RUSSIAN FEDERAT		PCT	GRNT	97105370 18SEP1995	2136778 10SEP1995		18SEP1995	99		18SEP2015
UNITED KINGDOM		PCT	GRNT	9717224.1 18SEP1995	2313845 26MAY1999	2313845 10DEC1997	18SEP1995			18SEP2015
USA			GRNT	314314 28SEP1994	5495550 27FEB1996		27AUG1996 SE			27FEB2013

REMARKS: 99 PD THRU PER FAX - 70CT99

003088 ADVAN 94/0314313 PBN COATED FLASH EVAPORATOR  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MARINER ET AL.

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID THRU	AGENT	EXPIR/ABAND DATE
USA			GRNT	314313 28SEP1994	5495630 20FEB1996		20AUG1996 SE			20FEB2013

003124 ADVAN 630041 PROCESS FOR FORMING LOW THERMAL EXPANSION PYROLYTIC NITRIDE COATINGS ON LOW THERMAL EXPANSION MATERIALS AND COATED...

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID THRU	AGENT	EXPIR/ABAND DATE
JAPAN		PCT	PEND	115EP1996 98120361						11SEP2016
RUSSIAN FEDERAT		PCT	PEND	115EP1996						11SEP2016

DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

CASE NUMBER 003130  
 CLIENT/DIVISION ADVAN  
 ATTORNEY YOUR REFERENCE NUMBER PRIORITY TITLE  
 SUB CASE NO. PCT GRNT

94/0332924 IMPROVED INTERFACE COATING FOR CERAMIC FIBERS  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MOORE ET AL. DOWELL, Michael

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT THRU	AGENT EXPIR/ABAND DATE
EUROPE	95939594.8	GRNT	24OCT1995	0828697 15MAR2000	0828697 18MARI998	97		24OCT2015
CHINA	95197074.7	PCT PEND	24OCT1995		1171095 24OCT1995	PA	CPA	24OCT2015
FRANCE	95939594.8	EPC GRNT	24OCT1995	0828697 15MAR2000	21JAN1998 0828697 18MARI998	24OCT1995		24OCT2015
GERMANY	95939594.8	EPC GRNT	24OCT1995	0828697 15MAR2000	18MARI998 0828697 18MARI998	24OCT1995		24OCT2015
JAPAN	514716/96	PCT PEND	24OCT1995	15MAR2000	18MARI998			24OCT2015
RUSSIAN FEDERAT	97108678	PCT PEND	24OCT1995					24OCT2015
UNITED KINGDOM	95939594.8	EPC GRNT	24OCT1995	0828697 15MAR2000	0828697 18MARI998	24OCT1995		24OCT2015
USA	332924	GRNT	01NOV1994	5593728 14JAN1997		14JUL1997	SE	01NOV2014

083247  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: FINICLE

586326 LATERAL FLASH EVAPORATOR

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT THRU	AGENT EXPIR/ABAND DATE
EUROPE	97100496.5	GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997			15JAN2017
FRANCE	97100496.5	EPC GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
GERMANY	97100496.5	EPC GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
NETHERLANDS	97100496.5	EPC GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN2001	EP	15JAN2017
JAPAN	6851/97	PEND	17JAN1997					17JAN2017
KOREA (SOUTH)	1121/97	PEND	16JAN1997					16JAN2017
TAIWAN	87203892	VTH PEND	15JAN1997			UK		15JAN2009
UNITED KINGDOM	97100496.5	EPC GRNT	15JAN1997	0785290 07APR1999	0785290 23JUL1997	15JAN1997		15JAN2017
USA	586326	GRNT	17JAN1996	5671322 23SEP1997		23MARI998	SE	17JAN2016

CASE NUMBER 003259  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY ET AL.  
 COUNTRY USA  
 CLIENT/DIVISION ADVAN  
 ATTORNEY REFERENCE YOUR REFERENCE  
 PRIORITY TITLE  
 95/0524242 IMPROVED REFRACTORY BOAT & METHOD OF MANUFACTURE

ADVAN  
 SUB CASE NO. 524242  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 06SEP1995  
 524242  
 PATENT NUMBER/ISSUE DATE 18FEB1997  
 3604164  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 18AUG1997 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 06SEP2015

003300  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: SHAFER  
 COUNTRY USA  
 SUB CASE NO. 618361  
 TYPE CASE PEND  
 STATUS  
 APPLICATION NUMBER/FILE DATE 19MAR1996  
 618361  
 PATENT NUMBER/ISSUE DATE 19MAR2016  
 19MAR2016  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE

003301  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1996  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003302  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003303  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003304  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003305  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003306  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003307  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016

003308  
 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: HILL  
 COUNTRY USA  
 SUB CASE NO. 610764  
 TYPE CASE GRNT  
 STATUS  
 APPLICATION NUMBER/FILE DATE 05MAR1997  
 610764  
 PATENT NUMBER/ISSUE DATE 28OCT1997  
 5681883  
 PUBLIC NUMBER/DATE  
 TAX/WORKING STRT DATE 28APR1998 SE  
 TAX PAID AGENT EXPIR/ABAND ATTY DATE 05MAR2016



CASE NUMBER 003320 ADVAN  
CLIENT/DIVISION ADVAN  
ATTORNEY REFERENCE YOUR PRIORITY TITLE  
95/0588860 BORDN NITRIDE SEAL AND METHOD OF USE

ASSIGNEE: ADVANCED CERAMICS CORP  
INVENTOR: HILL  
COUNTRY USA  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 29DEC1995  
PATENT NUMBER/ ISSUE DATE 5678832 21DEC1997  
TAX/ WORKING SCHED THRU DATE 21APR1998 SE  
TAX/ PAID AGENT EXPIR/ABAND ATTY DATE 29DEC2015

003406 ADVAN  
ASSIGNEE: ADVANCED CERAMICS COMPOSITE  
INVENTOR: MARINER ET AL.  
642469 HIGH THERMAL CONDUCTIVITY COMPOSITE AND METHOD

COUNTRY EUROPE  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 97107323.4 02MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
CANADA  
SUB TYPE STATUS CASE CASE NO. PEND  
APPLICATION NUMBER/ FILE DATE 97107323.4 02MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
FRANCE  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 97107323.4 02MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
GERMANY  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 97107323.4 02MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
ITALY  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 97107323.4 02MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
JAPAN  
SUB TYPE STATUS CASE CASE NO. PEND  
APPLICATION NUMBER/ FILE DATE 115873/97 06MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
KOREA (SOUTH)  
SUB TYPE STATUS CASE CASE NO. PEND  
APPLICATION NUMBER/ FILE DATE 17920/97 03MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
TAIWAN  
SUB TYPE STATUS CASE CASE NO. PEND  
APPLICATION NUMBER/ FILE DATE 86105739 03MAY1997  
ISSUE DATE 0805463 05NOV1997  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
USA  
SUB TYPE STATUS CASE CASE NO. GRNT  
APPLICATION NUMBER/ FILE DATE 642469 03MAY1996  
ISSUE DATE 5863467 26JAN1999  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997

003414 ADVAN  
ASSIGNEE: ADVANCED CERAMICS CORP.  
INVENTOR: MARINER  
COUNTRY USA  
SUB TYPE STATUS CASE CASE NO. PEND  
APPLICATION NUMBER/ FILE DATE 603498 20FEB1996  
ISSUE DATE 5863467 26JAN1999  
PATENT NUMBER/ 02AUG2000  
COMMENTS: +PLS CONFIRM GRANT INFORMATION & DESIGNATED COUNTRIES  
2204331 02MAY1997  
TAX/ WORKING SCHED THRU DATE 20FEB2016  
TAX/ PAID AGENT EXPIR/ABAND ATTY DATE 20FEB2016

003421 ADVAN 630041 PROCESS FOR FORMING LOW THERMAL EXPANSTION PYROLYTIC NITRIDE COATING  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MOORE, W.

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA	332693	ABND	01NOV1994			SE	
			REMARKS: ABAND PER SOURCE 11/09/98				

003447 ADVAN MOLECULAR BEAM EPITAXY EFFUSION CELL  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: MATTORD-UI

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
USA	019586	PEND	11JUN1996				11JUN2016

003467 ADVAN 728933 ADJUSTMENT OF MOSAIC SPREAD FOR HOPG MATERIAL  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MOORE

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY DATE
CHINA	97120541.8	PEND	10OCT1997				10OCT2017
FRANCE	9712761	GRNT	13OCT1997	9712761	1180902	10OCT1997 PA	13OCT2017
JAPAN	277743/97	PEND	09OCT1997	28MAY1999	2754547	13OCT1997	09OCT2017
RUSSIAN FEDERAT	97116800	PEND	07OCT1997				07OCT2017
UNITED KINGDOM	9721351.6	PEND	09OCT1997				09OCT2017
USA	728933	CRNT	11OCT1996	5798075	2319519	09OCT1997	11OCT2016
				25AUG1998	27MAY1998	25FEB1999	

CASE NUMBER 003502 ADVAN ADVAN  
CLIENT/DIVISION ADVAN  
ATTORNEY REFERENCE YOUR PRIORITY TITLE  
278269/95 PYROLYTIC BORDM NITRIDE COMPACT AND METHOD OF MANUFACTURE

ASSIGNEE: ADVANCED CERAMICS CORPORATION  
INVENTOR: HOMMA  
COUNTRY EUROPE KOREA (SOUTH) TAIWAN USA  
SUB CASE NO. 9A307144.4 30SEP1996 43613/96 200CT1996 85112116 030CT1996 725130 020CT1996  
TYPE STATUS PENDING PENDING PENDING GRANT  
APPLICATION NUMBER/FILE DATE 9A307144.4 30SEP1996 43613/96 200CT1996 85112116 030CT1996 725130 020CT1996  
PATENT NUMBER/ISSUE DATE 5693581 02DEC1997  
PUBLIC NUMBER/DATE 0768389 16APR1997  
TAX/WORKING STRT DATE 30SEP1996  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 30SEP2016 200CT2016 030CT2016 020CT2016

003548 ADVAN ADVAN  
ASSIGNEE: ADVANCED CERAMICS CORP.  
INVENTOR: MARINER

COUNTRY USA  
SUB CASE NO. 771373 16DEC1996  
TYPE STATUS PENDING  
APPLICATION NUMBER/FILE DATE 771373 16DEC1996  
PATENT NUMBER/ISSUE DATE  
PUBLIC NUMBER/DATE  
TAX/WORKING STRT DATE  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 16DEC2016

003550 ADVAN ADVAN  
ASSIGNEE: ADVANCED CERAMICS  
INVENTOR: ISHIDA

COUNTRY USA USA  
SUB CASE NO. 846467 01MAY1997 846467 01MAY1997  
TYPE STATUS PENDING GRANT  
APPLICATION NUMBER/FILE DATE 846467 01MAY1997 846467 01MAY1997  
PATENT NUMBER/ISSUE DATE 5900447 04MAY1999  
PUBLIC NUMBER/DATE  
TAX/WORKING STRT DATE 04NOV1999  
TAX PAID AGENT EXPIR/ABAND ATTY DATE 01MAY2017 01MAY2017

003554 ADVAN ADVAN  
ASSIGNEE: ADVANCED CERAMICS CORPORATION  
INVENTOR: SHINKO

COUNTRY USA  
SUB CASE NO. 770807 20DEC1996  
TYPE STATUS PENDING PENDING  
APPLICATION NUMBER/FILE DATE 770807 20DEC1996  
PATENT NUMBER/ISSUE DATE  
PUBLIC NUMBER/DATE  
TAX/WORKING STRT DATE  
TAX PAID AGENT EXPIR/ABAND ATTY DATE  
REMARKS: CIP OF 490304

COMPOSITION FOR FORMING HIGH THERMAL CONDUCTIVITY POLYBENZOXAZINE-BASED MATERIAL AND METHOD

THERMOGNETRIC MEASURING DEVICE AND METHOD

CASE NUMBER 003605 ADVAN 97/0785082 CERAMIC ELECTROSTATIC CHUCK AND METHOD

ASSIGNEE: ADVANCED CERAMICS CORP. INVENTOR: HONMA ET AL. ADVAN 97/0785082 CERAMIC ELECTROSTATIC CHUCK AND METHOD

COUNTRY USA SUB CASE NO. 059586 PRO PENDING STATUS GRNT APPLICATION NUMBER/FILE DATE 785082/21JAN1997 PATENT NUMBER/ISSUE DATE 5748436/05MAY1998 PUBLIC NUMBER/DATE 05NOV1998 TAX/WORKING START DATE 05NOV1998 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 21JAN2017

003751 ADVAN FLEXIBLE HEAT TRANSFER DEVICE AND METHOD

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: RICHEY ADVAN 96/0618361 METHOD FOR FORMING BORON NITRIDE END HIGH DENSITY AGGLOMERATA TED BORON NITRIDE PARTICLES

COUNTRY USA SUB CASE NO. 195E1997 PRO PENDING STATUS PENDING APPLICATION NUMBER/FILE DATE 059586/195E1997 PATENT NUMBER/ISSUE DATE 059586/195E1997 PUBLIC NUMBER/DATE 01SEP1999 TAX/WORKING START DATE 16FEB1998 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 195E1997

003775 ADVAN 96/0618361 METHOD FOR FORMING BORON NITRIDE END HIGH DENSITY AGGLOMERATA TED BORON NITRIDE PARTICLES

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: SHAFER HILL, Richard F ADVAN 96/0618361 METHOD FOR FORMING BORON NITRIDE END HIGH DENSITY AGGLOMERATA TED BORON NITRIDE PARTICLES

COUNTRY EUROPE SUB CASE NO. 47763/98 PENDING STATUS PENDING APPLICATION NUMBER/FILE DATE 98400361/16FEB1998 PATENT NUMBER/ISSUE DATE 47763/98 PUBLIC NUMBER/DATE 0937066/01SEP1999 TAX/WORKING START DATE 16FEB1998 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 16FEB2018

JAPAN SUB CASE NO. 27FEB1998 PENDING STATUS PENDING APPLICATION NUMBER/FILE DATE 47763/98 PATENT NUMBER/ISSUE DATE 47763/98 PUBLIC NUMBER/DATE 0937066/01SEP1999 TAX/WORKING START DATE 16FEB1998 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 16FEB2018

USA SUB CASE NO. 968959 DIV GRNT STATUS GRNT APPLICATION NUMBER/FILE DATE 12NOV1997/3/19/96 PATENT NUMBER/ISSUE DATE 5898009/27APR1999 PUBLIC NUMBER/DATE 01SEP1999 TAX/WORKING START DATE 27OCT1999 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 27FEB2018

REMARKS: DIV OF 618361; 3/19/96

003782 ADVAN 97/0837299 METHOD FOR ELECTROPLATING OF MICROPARTICULATES WITH METAL COATINGS

ASSIGNEE: ADVANCED CERAMICS CORP. INVENTOR: YTH ADVAN 97/0837299 METHOD FOR ELECTROPLATING OF MICROPARTICULATES WITH METAL COATINGS

COUNTRY USA SUB CASE NO. 837299 CIP GRNT STATUS GRNT APPLICATION NUMBER/FILE DATE 837299/11APR1997 PATENT NUMBER/ISSUE DATE 5911865/15JUN1999 PUBLIC NUMBER/DATE 15DEC1999 TAX/WORKING START DATE 15DEC1999 TAX PAID AGENT EXPIR/ABAND ATTY SCHED THRU DATE 15DEC1999

REMARKS: CIP OF 796204

CASE NUMBER 003825  
 CLIENT/DIVISION ADVAN  
 ATTORNEY REFERENCE YOUR PRIORITY TITLE  
 ADVAN

ASSIGNEE: ADVANCED CERAMICS CORP./ EDISON POLYMER INNOVATION CORP  
 INVENTOR: ISWIDA  
 164927 SURFACE TREATED BORON NITRIDE FOR FORMING A LOW VISCOSITY HIGH THERMAL CONDUCTIVITY POLYMER BASED BORON NITRIDE COMP..

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT SCHE THRU	EXPIR/ABAND ATTY DATE
EUROPE		PEND	79403250.6					
CANADA		PEND	COMPLETE FILING INFORMATION					
JAPAN		PEND						
TAIWAN		PEND						
USA		PEND						21DEC2019
			88122593					
			21DEC1999					
			010CT1998					

009711 ADVAN CFO 553814 IMPROVED BORON NITRIDE CRUCIBLE  
 ASSIGNEE: UNION CARBID CORPORATION

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT SCHE THRU	EXPIR/ABAND ATTY DATE
FRANCE		GRNT	76/05450	76/05450		26FEB1976		26FEB1996
ITALY		GRNT	48308A/76	1057254		26FEB1976		26FEB1996
JAPAN		GRNT	033473/80	1075401		22APR1981	P2	26FEB1996
UNITED KINGDOM		GRNT	76/07586	1526003	22APR1981	26FEB1976	OL	26FEB1996
			26FEB1976	28DEC1978				
			10MAR1980					
			10MAR1982					
			YOUR REF: 009711-F					
			YOUR REF: 009711-1					
			YOUR REF: 009711-1					
			YOUR REF: 009711-CB					

DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

011468 ADVAN EL 868446 RESISTANCE-HEATED PYROLYTIC BORON NITRIDE COATED GRAPHITE BOAT FOR METAL VAPORIZATION

ASSIGNEE: UNION CARBIDE CORPORATION

COUNTRY	SUB TYPE STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRY DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE
FRANCE	ABND	79/00445 09JAN1979	79/00445 20MAY1984		09JAN1979		09JAN1999
ITALY	YOUR REF: 011468-F REMARKS: ABND PER TMR 11NOV97 ABND	47576A/79 10JAN1979	1113740 20JAN1986		10JAN1979		10JAN1999
JAPAN	YOUR REF: 011468-1 REMARKS: ABND PER TMR 11NOV97 EXP	000460/79 09JAN1979	1249597 25JAN1985	02MAY1984	02MAY1984		09JAN1999
SWEDEN	COMMENTS: +CPI ATTEMPTED ABND	7900185-5 09JAN1979	7900185-5 25SEP1986		09JAN1979		09JAN1999
UNITED KINGDOM	YOUR REF: 011468-5 REMARKS: ABND PER TMR 11NOV97 ABND	79/00728 09JAN1979	2012251 04AUG1982		09JAN1979		09JAN1999

013071 ADVAN EL 306385 PRODS FREE STANDING PYROLYTIC BORON NITRIDE ARTICLES

ASSIGNEE: UNION CARBIDE CORPORATION  
INVENTOR: SHINKO, JULIUS KEYES, THOM

COUNTRY	SUB TYPE STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRY DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE
EUROPE	GRNT	82401744.6 27SEP1982	9076731 12NOV1986	0076731 13APR1983	0076731		27SEP2002

DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

CASE NUMBER	COUNTRY	CLIENT/DIVISION	ATTORNEY	YOUR REFERENCE	PRIORITY TITLE NUMBER	EL	SUB CASE NO.	TYPE CASE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE	ATTY
015155	EUROPE	ADVAN				EL	87201829.6	ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987	96	23SEP2007	
	BELGIUM	ASSIGNEE: UNION CARBIDE CORPORATION INVENTOR: TERBOT, JOHN F HILL, RICHARD					87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987	96	23SEP2007	
	FRANCE						87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987	96	23SEP2007	
	GERMANY						87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987	96	23SEP2007	
	NETHERLANDS						87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1997 EP		23SEP2007	
	ITALY						87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987 EP	96	23SEP2007	
	JAPAN						239912787	ABND		239912787 24SEP1987	2620253 11MAR1997	0261744	11MAR1997 P3		KYOMA 24SEP2007	
	UNITED KINGDOM						87201829.6	EPC ABND		87201829.6 23SEP1987	0261744 08JAN1997	0261744	23SEP1987	96	23SEP2007	
	USA						911221	ABND		911221 24SEP1986	4835298 30MAY1989	0261744	30NOV1989		30MAY2006	
015155-1	USA	ADVAN					274807	ABND		274807 23NOV1986	4946976 07AUG1990	0261744	07FEB1991		07AUG2007	
		ASSIGNEE: UNION CARBIDE CORPORATION INVENTOR: TERBOT HILL					274807	ABND		274807 23NOV1986	4946976 07AUG1990	0261744	07FEB1991		07AUG2007	

CORDIERITE COMPOSITION AND NET

YOUR REF: 015155-1  
REMARKS: ABND PER TMR 11NOV97

CASE NUMBER 015155-2  
 CLIENT/DIVISION ADVAN  
 ATTORNEY REFERENCE YOUR PRIORITY TITLE  
 ASSIGNEE: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: TERBOT, JOHN F HILL, RICHARD

COUNTRY USA  
 SUB CASE NO. 321214  
 TYPE CASE ABND  
 STATUS PER SOURCE 09MAR1989  
 APPLICATION FILE DATE 18AUG1992  
 NUMBER/ISSUE DATE 5139976  
 PATENT NUMBER/ISSUE DATE 18AUG1992  
 PUBLIC NUMBER/DATE 18FEB1993 SE  
 TAX/WORKING START DATE 18AUG2009  
 PAID AGENT SCHO THRU DATE 18AUG2009  
 EXPIR/ABAND ATTY DATE 18AUG2009

CORBIERITE COMPOSITION AND NET

CASE NUMBER 015155-3  
 CLIENT/DIVISION ADVAN  
 ATTORNEY REFERENCE YOUR PRIORITY TITLE  
 ASSIGNEE: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: TERBOT, JOHN F HILL, RICHARD

COUNTRY USA  
 SUB CASE NO. 876087  
 TYPE CASE ABND  
 STATUS PER SOURCE 08MAY1991  
 APPLICATION FILE DATE 22DEC1992  
 NUMBER/ISSUE DATE 5173435  
 PATENT NUMBER/ISSUE DATE 22DEC1992  
 PUBLIC NUMBER/DATE 22JUN1993  
 TAX/WORKING START DATE 22DEC2009  
 PAID AGENT SCHO THRU DATE 22DEC2009  
 EXPIR/ABAND ATTY DATE 22DEC2009

LOW SINTERING CORBIERITE POWDER

291605 ALLOWED POWDER AND METHOD OF PREPARING SAME

CASE NUMBER 0151650  
 CLIENT/DIVISION ADVAN  
 ATTORNEY REFERENCE YOUR PRIORITY TITLE  
 ASSIGNEE: UNION CARBIDE CORP.  
 INVENTOR: PARRISH, LIEN, MONTGOMERY,

COUNTRY EUROPE  
 SUB CASE NO. 89123722.4  
 TYPE CASE ABND  
 STATUS PER SOURCE 22DEC1989  
 APPLICATION FILE DATE 10AUG1994  
 NUMBER/ISSUE DATE 0376179  
 PATENT NUMBER/ISSUE DATE 0376179  
 PUBLIC NUMBER/DATE 0376179  
 TAX/WORKING START DATE 22DEC1989  
 PAID AGENT SCHO THRU DATE 22DEC2009  
 EXPIR/ABAND ATTY DATE 22DEC2009

291605 ALLOWED POWDER AND METHOD OF PREPARING SAME

P68917446.2

COUNTRY FRANCE  
 SUB CASE NO. 89123722.4  
 TYPE CASE ABND  
 STATUS PER SOURCE 22DEC1989  
 APPLICATION FILE DATE 10AUG1994  
 NUMBER/ISSUE DATE 0376179  
 PATENT NUMBER/ISSUE DATE 0376179  
 PUBLIC NUMBER/DATE 0376179  
 TAX/WORKING START DATE 22DEC1989  
 PAID AGENT SCHO THRU DATE 22DEC2009  
 EXPIR/ABAND ATTY DATE 22DEC2009

345916789

COUNTRY GERMANY  
 SUB CASE NO. 89123722.4  
 TYPE CASE ABND  
 STATUS PER SOURCE 22DEC1989  
 APPLICATION FILE DATE 10AUG1994  
 NUMBER/ISSUE DATE 0376179  
 PATENT NUMBER/ISSUE DATE 0376179  
 PUBLIC NUMBER/DATE 0376179  
 TAX/WORKING START DATE 22DEC1989  
 PAID AGENT SCHO THRU DATE 22DEC2009  
 EXPIR/ABAND ATTY DATE 22DEC2009

291605

COUNTRY JAPAN  
 SUB CASE NO. 291605  
 TYPE CASE ABND  
 STATUS PER SOURCE 29DEC1988  
 APPLICATION FILE DATE 10SEP1991  
 NUMBER/ISSUE DATE 5047372  
 PATENT NUMBER/ISSUE DATE 10SEP1991  
 PUBLIC NUMBER/DATE 10MAR1992 SE  
 TAX/WORKING START DATE 10SEP2008  
 PAID AGENT SCHO THRU DATE 10SEP2008  
 EXPIR/ABAND ATTY DATE 10SEP2008

291605



CASE NUMBER 015730  
CLIENT/DIVISION ADVAN EL  
ATTORNEY YOUR REFERENCE PRIORITY TITLE  
NUMBER NUMBER

ASSIGNEE: PRAAIR S.T. TECHNOLOGY INC.  
INVENTOR: SARA, RAYMOND  
272419 METHOD FDR SINTERED SHAPES WITH CONTROLLED GRAIN SIZE

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
EUROPE	ABND	89311849.7	16NOV1989	0375148 08SEP1993	0375148	16NOV1989	16NOV2009	
FRANCE	REMARKS: ABND PER EPC	89311849.7	16NOV1989	0375148 08SEP1993	0375148	16NOV1989	16NOV2009	
GERMANY	REMARKS: ABND PER EPC	89311849.7	16NOV1989	0375148 08SEP1993	0375148	16NOV1989	16NOV2009	
JAPAN	REMARKS: ABND PER ABND	295309/89	16NOV1989	2027033 26FEB1996	7-045342 17MAY1995	17MAY1995	16NOV2009	
UNITED KINGDOM	REMARKS: ABND PER EPC	89311849.7	16NOV1989	0375148 08SEP1993	0375148	16NOV1989	16NOV2009	
USA	REMARKS: ABND PER ABND	635383	01FEB1991	5045269 03SEP1991		03MAR1992	03SEP2008	

015845 ADVAN CFD  
ASSIGNEE: UNION CARBIDE CORPORATION  
INVENTOR: SHAFFER, GREGG  
180578 BORON NITRIDE CONTAINING VESSEL HAVING A SURFACE COATING OF TITANIUM-IRON SILICON THEREON

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND ATTY DATE
EUROPE	GRNT	89106412.3	11APR1989	0337391 22JUL1992	0337391 18OCT1989	11APR1989	11APR2009	
FRANCE	EPC	89106412.3	11APR1989	0337391 22JUL1992	0337391 18OCT1989	11APR1989	11APR2009	
GERMANY	EPC	89106412.3	11APR1989	0337391 22JUL1992	0337391 18OCT1989	11APR1989	11APR2009	
ITALY	EPC	89106412.3	11APR1989	0337391 22JUL1992	0337391 18OCT1989	11APR1989	11APR2009	
JAPAN	GRNT	089882/89	11APR1989	1951563 28JUL1995	073933/94 21SEP1994	21SEP1994	11APR2009	
UNITED KINGDOM	ASSIGNEE: ADVANCED CERAMICS CORPORATION EPC	89106412.3	11APR1989	0337391 22JUL1992	0337391 18OCT1989	11APR1989	11APR2009	
USA	GRNT	180578	12APR1988	4884788 05DEC1989		05JUN1990	05DEC2006	

CASE NUMBER 016068  
 CLIENT/DIVISION ADVAN EL  
 ATTORNEY YOUR REFERENCE 318349 PROLYTIC BORDON NITRIDE WITH COLUMNAR CRYSTALLINE MORPHOLOGY  
 PRIORITY TITLE  
 NUMBER  
 ASSIGNOR: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: MEDRE  
 COUNTRY EUROPE  
 SUB CASE NO. 90302178.0  
 TYPE EPC  
 STATUS GRNT  
 APPLICATION NUMBER/ISSUE DATE 90302178.0 01MAR1990  
 FILE DATE 0385772 18AUG1993  
 PATENT NUMBER/ISSUE DATE 0385772 18AUG1993  
 PUBLIC NUMBER/DATE 0385772 05SEP1990  
 TAX/WORKING STRT DATE 01MAR1990  
 PAID AGENT EXPIR/ABAND ATTY DATE 01MAR2010  
 TAX SCHD THRU 01MAR1990  
 TAX/WORKING STRT DATE 01MAR1990  
 AGENT EXPIR/ABAND ATTY DATE 01MAR2010  
 KURAU 01MAR2010  
 SOJUZ 01MAR2010  
 95 01MAR1990  
 01JUN1994 10 01JUN1994  
 01MAR1990 95 01MAR1990  
 01MAR1990 0385772 05SEP1990  
 01MAR1990 041367794 01JUN1994  
 1913134 09MAR1995  
 2033964 30APR1995  
 90302178.0 0385772 18AUG1993  
 01MAR1990 18AUG1993  
 047257190 1913134  
 01MAR1990 09MAR1995  
 4743242 2033964  
 01MAR1990 30APR1995  
 90302178.0 0385772 18AUG1993  
 01MAR1990 18AUG1993  
 YOUR REF: 016068  
 EPC GRNT  
 YOUR REF: 016068-F  
 EPC GRNT  
 YOUR REF: 016068-G  
 GRNT  
 ASSIGNOR: ADVANCED CERAMICS CORPORATION  
 GRNT  
 RUSSIAN FEDERAT  
 UNITED KINGDOM  
 EPC GRNT  
 YOUR REF: 016068-CB  
 ASSIGNOR: PRAJAIR S T TECHNOLOGY, INC.  
 GRNT  
 318349 5004708  
 02MAR1989 02APR1991  
 ASSIGNOR: PRAJAIR S.T. TECHNOLOGY, INC.

016233 ADVAN EL 458347 METHOD FOR FORMING A HIGH DENSITY METAL BORIDE COMPOSITE  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: MONTGOMERY, LI

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND DATE
EUROPE	90314330.3	ABND		90314330.3 27DEC1990	0435672 14DEC1994	0435672	27DEC2010	
FRANCE	90314330.3	ABND	EPC	90314330.3 27DEC1990	0435672 14DEC1994	0435672	27DEC2010	
GERMANY	90314330.3	ABND	EPC	90314330.3 27DEC1990	0435672 14DEC1994	0435672	27DEC2010	
JAPAN	415287790	ABND		415287790 27DEC1990	7-055861 14JUN1995	7-055861	27DEC2010	08JAN2008
UNITED KINGDOM	90314330.3	ABND	EPC	90314330.3 27DEC1990	0435672 14DEC1994	0435672	27DEC2010	
USA	458347	ABND		458347 28DEC1989	4983340 08JAN1991	4983340	08JUL1991	08JAN2008

REMARKS: ABND PER SOURCE 26DEC97  
 REMARKS: ABND PER SOURCE 26DEC97  
 REMARKS: ABND PER SOURCE 26DEC97  
 REMARKS: ABND PER SOURCE 26DEC97  
 REMARKS: ABND PER SOURCE 26DEC97  
 ASSIGNEE: PRAAIR S.T. TECHNOLOGY, INC.  
 REMARKS: ABND PER SOURCE 26DEC97

016234 ADVAN 669009 PROCESS FOR PRODUCING TITANIUM DIBORIDE AND BORON NITRIDE P  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY, LI

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/ FILE DATE	PATENT NUMBER/ ISSUE DATE	PUBLIC NUMBER/ DATE	TAX/ WORKING STRT DATE	TAX PAID AGENT EXPIR/ABAND DATE
EUROPE	92302103.4	GRNT		92302103.4 12MAR1992	0503930 25SEP1996	0503930 16SEP1992		12MAR2012
GERMANY	92302103.4	GRNT	EPC	92302103.4 12MAR1992	0503930 25SEP1996	0503930 16SEP1992	12MAR1992	12MAR2012
JAPAN	087497792	GRNT		087497792 12MAR1992	2528056 14JUN1996		14JUN1996	12MAR2012
UNITED KINGDOM	92302103.4	GRNT	EPC	92302103.4 12MAR1992	0503930 25SEP1996	0503930 16SEP1992	12MAR1992	12MAR2012
USA	669009	GRNT		669009 13MAR1991	5100845 31MAR1992		30SEP1992	31MAR2009

YOUR REF: 016234-EP  
 REMARKS: DE CB  
 REMARKS: ABND PER SOURCE 26DEC97  
 ASSIGNEE: PRAAIR S.T. TECHNOLOGY, INC.

DATE 21AUG2000

CLIENT: 7M

REPORT 31A101

CASE NUMBER

CLIENT/DIVISION

ATTORNEY

YOUR REFERENCE NUMBER

PRIORITY TITLE

016237

ADVAN EL

564108 PYROLYTIC BORON NITRIDE COATING FOR OXIDATION PROTECTION OF CARBON-COMPOSITES

ASSIGNEE: ADVANCED CERAMICS, CORP.  
INVENTOR: MOORE, ARTHUR,

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
EUROPE	91918125.5	PCT	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992			08AUG2011
CANADA	2067145	PCT	GRNT	08AUG1991	2067145 16FEB1999	09FEB1992	08AUG1991	97	08AUG2011
FRANCE	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
GERMANY	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
JAPAN	516606/91	PCT	GRNT	08AUG1991	516606/91 2729289 19DEC1997	0495095 22JUL1992	PER AGENT 19DEC1997 06		08AUG2011
UNITED KINGDOM	91918125.5	EPC	GRNT	08AUG1991	0495095 31JAN1996	0495095 22JUL1992	08AUG1991		08AUG2011
USA	564108	PEND		08AUG1990	564108				

COMMENTS: +PLEASE CONFIRM GERMAN NATIONAL # IS P69116847.4

ASSIGNEE: ADVANCED CERAMICS CORPORATION

016237-1

ADVAN EL

564108 PYROLYTIC BORON NITRIDE COATING FOR OXIDATION PROTECTION OF CARBON-COMPOSITES

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
INVENTOR: MOORE, ARTHUR,

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX WORKING START DATE	TAX PAID AGENT SCHED THRU	EXPIR/ABAND DATE
USA	819647	GRNT		10JAN1992	5275844 04JAN1994		04JUL1994		04JAN2011

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.

016311 ADVAN 431191 POWDER COATING COMPOSITIONS  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: OSBORNE, TINDT

COUNTRY	SUB CASE NO.	TYPE CASE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE
EUROPE	90312018.6	GRNT	GRNT	90312018.6 02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV2010		
CANADA	2029232	FR DE GB	GRNT	2029232 02NOV1990	2029232 03DEC1996	04MAY1991	02NOV2010	SIN	
FRANCE	90312018.6	EPC	GRNT	90312018.6 02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV2010	94	
GERMANY	90312018.6	EPC	GRNT	90312018.6 02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV2010	94	
JAPAN	29557790		GRNT	29557790 02NOV1990	2709862 24OCT1997		02NOV2010		
UNITED KINGDOM	90312018.6	EPC	GRNT	90312018.6 02NOV1990	0426485 11JAN1995	0426485 08MAY1991	02NOV2010	94	
USA	431191		GRNT	431191 03NOV1989	5026422 25JUN1991		03NOV2009	25DEC1991 SE	

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
 COMMENTS: PLEASE VERIFY PATENT IS A SMALL ENTITY--PER PTO

016328 ADVAN 516910 BORO NITRIDE TEXTURED COAT AND PROCESS FOR PRODUCING IT  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: FINICLE, ROBER

COUNTRY	SUB CASE NO.	TYPE CASE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE
EUROPE	91303625.7	GRNT	GRNT	91303625.7 24APR1991	0457444 07JUN1995	0457444	24APR2011		
CANADA	2041427		GRNT	2041427 27APR1991	2041427 24FEB1998		29APR1991	97 SIN	29APR2011
GERMANY	91303625.7	EPC	GRNT	91303625.7 24APR1991	0457444 07JUN1995	0457444	24APR1991	95	24APR2011
JAPAN	124492791		GRNT	124492791 30APR1991	2681551 08AUG1997		08AUG1997 02		30APR2011
UNITED KINGDOM	91303625.7	EPC	GRNT	91303625.7 24APR1991	0457444 07JUN1995	0457444	24APR1991	95	24APR2011
USA	516910		GRNT	516910 30APR1990	5032366 16JUL1991		16JAN1992		16JUL2008

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
 COMMENTS: \*\*\*DO NOT CHANGE FILE DATE\*\*\*

016328-1 ADVAN  
 ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
 INVENTOR: FINICLE, ROBER

BORON NITRIDE BOAT AND PROCESS

COUNTRY USA  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 662954 01MARI991  
 PATENT NUMBER/ ISSUE DATE  
 5182149 26JANI993  
 TAX/ WORKING START DATE  
 26JUL1993 SE  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 26JAN2010

016329 ADVAN  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION/ UNION CARBIDE  
 INVENTOR: FINICLE, ROBERT

53316 BORON NITRIDE CRUCIBLE AND PROCESS FOR PRODUCING IT

COUNTRY EUROPE  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 91305100.9 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 0460943 24AUG1994  
 TAX/ WORKING START DATE  
 11DEC1991  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 05JUN2011

COUNTRY CHINA  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 91104641.0 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 19DEC1997  
 TAX/ WORKING START DATE  
 05JUN1991  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 05JUN2006

COUNTRY GERMANY  
 SUB CASE NO. EPC GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 91305100.9 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 P69103379.2 24AUG1994  
 TAX/ WORKING START DATE  
 05JUN1991  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 94 05JUN2011

COUNTRY JAPAN  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 159883/91 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 2520060 17MAY1996  
 TAX/ WORKING START DATE  
 17MAY1996 09  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 KURAU 05JUN2011

COUNTRY RUSSIAN FEDERAT  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 4875648 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 20919025 27APR1996  
 TAX/ WORKING START DATE  
 05JUN1991  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 05JUN2011

COUNTRY UNITED KINGDOM  
 SUB CASE NO. EPC GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 91305100.9 05JUN1991  
 PATENT NUMBER/ ISSUE DATE  
 0460943 24AUG1994  
 TAX/ WORKING START DATE  
 11DEC1991  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 94 05JUN2011

COUNTRY USA  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 533816 06JUN1990  
 PATENT NUMBER/ ISSUE DATE  
 3075055 24DEC1991  
 TAX/ WORKING START DATE  
 24JUN1992 SE  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 24DEC2008

016329-1 ADVAN  
 ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.  
 INVENTOR: FINICLE, ROBER

BORON NITRIDE CRUCIBLE (AMENDED)

COUNTRY USA  
 SUB CASE NO. GRNT  
 TYPE STATUS  
 APPLICATION NUMBER/ FILE DATE  
 750296 27AUG1991  
 PATENT NUMBER/ ISSUE DATE  
 5156750 27OCT1992  
 TAX/ WORKING START DATE  
 27APR1993  
 TAX PAID AGENT EXP/IR/ABAND ATTY  
 SCHED THRU DATE  
 27OCT2009

CASE NUMBER 016459 ADVAN EL 544611 A GRAPHITE CHUCK FOR A STARTER FILAMENT IN THE MANUFACTURE OF POLYCRYSTALLINE SILICON AND METHOD OF PROTECTION

CLIENT/DIVISION ADVAN CFC ASSIGNEE: ADVANCED CERAMICS CORP. INVENTOR: SHAFER, GREG

PRIORITY TITLE 693545 MULLITE/BORON NITRIDE COMPOSITE BREAK RING

YOUR REFERENCE NUMBER 92303848.3

COUNTRY EUROPE

APPLICATION NUMBER/ISSUE DATE 29APR1992 0511840

STATUS ABND

FILE DATE 29APR1992

REMARKS: DE CJ

REMARKS: DROP PER THR 21FEB97

REMARKS: EPC ABND

REMARKS: ABND PER THR 21FEB97

REMARKS: ABND PER SOURCE 26DEC97

REMARKS: EPC ABND

REMARKS: ABND PER THR 21FEB97

REMARKS: ABND PER SOURCE 26DEC97

REMARKS: EPC ABND

REMARKS: ABND PER THR 21FEB97

REMARKS: ABND PER SOURCE 26DEC97

PATENT NUMBER/ISSUE DATE 2067532 09JUL1996

PATENT NUMBER/ISSUE DATE 0511840 25OCT1995

PATENT NUMBER/ISSUE DATE 277205 24APR1998

PATENT NUMBER/ISSUE DATE 0511840 25OCT1995

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

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PATENT NUMBER/ISSUE DATE 102429 23JUL1996

PATENT NUMBER/ISSUE DATE 102429 23JUL1996

TAX/WORKING STRT DATE 29APR1992

TAX/WORKING STRT DATE 29APR1992

TAX/WORKING STRT DATE 24APR1998

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

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TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

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TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX/WORKING STRT DATE 29APR1992

TAX/WORKING STRT DATE 29APR1992

TAX/WORKING STRT DATE 24APR1998

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

TAX/WORKING STRT DATE 0511840 29APR1992

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TAX/WORKING STRT DATE 0511840 29APR1992

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 30APR2012

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TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

TAX PAID AGENT EXPIR/ABAND ATTY DATE 29APR2012

CASE NUMBER 016465-1 CLIENT/DIVISION ADVAN EL ATTORNEY YOUR REFERENCE PRIORITY TITLE

016465-1 ADVAN EL A GRAPHITE CHUCK FOR A STARTER FILAMENT IN THE MANUFACTURE OF POLYCRYSTALLINE SILICON AND METHOD OF PROTECTION

ASSIGNEE: ADVANCED CERAMICO CORPORATION INVENTOR: GILBERT MICHAEL HEDGE JOHN B WALSH PAUL J

COUNTRY USA SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/FILE DATE 790079 13NOV1991 11JAN1994 PATENT NUMBER/ISSUE DATE 5277934 11JUL1994 PUBLIC NUMBER/DATE TAX/WORKING STRT DATE 11JUL1994 TAX PAID AGENT EXPIR/ABAND ATTY DATE 11JAN2011

016496 ADVAN EL 570739 NONAQUEOUS BINDER COMPOSITION FOR SLIP CASTING OR COLD FORMING AND METHOD

ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MONTGOMERY, LI

COUNTRY JAPAN SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/FILE DATE 232407/91 21AUG1991 10APR1998 KOREA (SOUTH) SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/FILE DATE 14367/91 21AUG1991 111032 PATENT NUMBER/ISSUE DATE 2767657 10APR1998 111032 USA SUB TYPE STATUS CASE NO. GRNT APPLICATION NUMBER/FILE DATE 837606 21FEB1992 24AUG1993 TAX/WORKING STRT DATE 22AUG1996 04 24FEB1994 PUBLIC NUMBER/DATE 22AUG1996 TAX PAID AGENT EXPIR/ABAND ATTY DATE 21AUG2011 22AUG2011 24AUG2010

016496-1 ADVAN ASSIGNEE: ADVANCED CERAMICS CORPORATION INVENTOR: MONTGOMERY NON AQUEOUS BINDER COMPOSITION METAL

COUNTRY USA SUB TYPE STATUS CASE NO. DIV GRNT APPLICATION NUMBER/FILE DATE 044677 09APR1993 04JUL1995 PATENT NUMBER/ISSUE DATE 5429781 04JUL1995 PUBLIC NUMBER/DATE TAX/WORKING STRT DATE 04JAN1996 TAX PAID AGENT EXPIR/ABAND ATTY DATE 04JUL2012

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.

ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.



DATE 21AUG2000

CLIENT: 7M

MASTER LIST

REPORT 31A101

016708 ADVAN CFC 693546 MULLITE/YTRIA STABILIZED ZIRCONIA/BORON NITRIDE COMPOSITES  
 ASSIGNEE: ADVANCED CERAMICS CORP.  
 INVENTOR: SHAFFER, GREGO

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID THRU	AGENT	EXPIR/ABAND DATE
EUROPE	92303849.1	ABND		29APR1992	0511841 08NOV1995	0511841	29APR1992			29APR2012
CANADA		ABND		2067531			29APR1992	SIM		29APR2012
GERMANY		ABND		29APR1992						
		ABND		92303849.1	69205882.6 08NOV1995	0511841	29APR1992			29APR2012
JAPAN		ABND		135694/92						30APR2012
UNITED KINGDOM		ABND		30APR1992						
		ABND		92303849.1	0511841 08NOV1995	0511841	29APR1992			29APR2012
USA		ABND		29APR1992						
		ABND		693546	5120683 09JUN1992		09DEC1992			09JUN2009

016708-1 ADVAN  
 ASSIGNEE: UNION CARBIDE COATINGS SERVICE  
 INVENTOR: SHAFFER, GREGO

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING STRT DATE	TAX PAID THRU	AGENT	EXPIR/ABAND DATE
USA		ABND		824219	5134098 28JUL1992		28JAN1993	SE		28JUL2009
		ABND		23JAN1992						

METHOD OF PRODUCING MULLITE/YT

CASE NUMBER 016891

CLIENT/DIVISION ADVAN EL  
 ATTORNEY REFERENCE YOUR PRIORITY TITLE  
 810910 METHOD FOR RESISTANCE HEATING OF METAL USING A PYROLYTIC BORON NITRIDE COATED GRAPHITE BOAT

ASSIGNEE: ADVANCED CERAMIC CORP.  
 INVENTOR: MORRIS, JOSEPH

COUNTRY	SUB TYPE CASE NO.	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT SCHD THRU	EXPIR/ABAND DATE
EUROPE	GRNT	GRNT	93303212.0 23APR1993	0621351 07JUL1999	0621351 26OCT1994			23APR2013
CHINA	GRNT	GRNT	93107926.8 03JUL1993	93107926.8 25MAR1999	45697 11JAN1995	03JUL1993	CPA	03JUL2013
GERMANY	EPC	GRNT	93303212.0 23APR1993	0621351 07JUL1999	0621351 26OCT1994	23APR1993		23APR2013
HONG KONG	REG	PEND			0621351			23APR2013
JAPAN	GRNT	GRNT	23APR1993 119228793	2665873 27JUN1997		27JUN1997 02	KURAU	23APR2013
KOREA (SOUTH)	GRNT	GRNT	23APR1993 7043793	177836 19NOV1998		19NOV1998	NAM	19NOV2013
TAIWAN	GRNT	GRNT	27APR1993 82103377	NI-67830	19NOV1998 239250	21JAN1995		30APR2013
UNITED KINGDOM	EPC	GRNT	38APR1993 93303212.0	0621351 07JUL1999	0621351 26OCT1994	23APR1993		23APR2013
USA	GRNT	GRNT	23APR1993 810910	5239612 24AUG1993		24FEB1994		24AUG2010

ASSIGNEE: PRAYAIR S.T. TECHNOLOGY, INC.

CASE NUMBER 016969 ADVAN EL  
 CLIENT/DIVISION ADVAN EL  
 ATTORNEY YOUR REFERENCE NUMBER PRIORITY TITLE  
 953156 PYROLYTIC BORON NITRIDE HEATING UNIT

ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: GILBERT, MICHAEL J., TIMOTHY,  
 ADVAN EL

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT EXPIR/ABAND DATE
EUROPE	93922354.1	PCT	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138 19JUL1995		24SEP2013
CANADA	2141340	PCT	GRNT	2141340 24SEP1993	2141340 12JAN1999		NILNE	24SEP2013
FRANCE	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138		24SEP2013
GERMANY	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138		24SEP2013
JAPAN	509175/94	PCT	GRNT	509175/94 24SEP1993	2702609 03OCT1997		03OCT1997 05	24SEP2013
KOREA (SOUTH)	701356/95	PCT	GRNT	701356/95 24SEP1993	174587 05NOV1998		05NOV1998	05NOV2013
SWEDEN	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138		24SEP2013
UNITED KINGDOM	93922354.1	EPC	GRNT	93922354.1 24SEP1993	0663138 15JAN1997	0663138		24SEP2013
USA	953156	GRNT		953156 29SEP1992	5343022 30AUG1994		28FEB1995	30AUG2011

REMARKS: DE FR GB SE  
 ASSIGNEE: PRAXAIR S.T. TECHNOLOGY, INC.

020000 ADVAN EL  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: LENNARTZ, Jeffe

COUNTRY	SUB CASE NO.	TYPE	STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT EXPIR/ABAND DATE
EUROPE	94920036.4	PCT	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995		25MAY2014
CHINA	94190542.X	PCT	GRNT	94190542.X 25MAY1994	94190542.X 16JUL1999	1112790 29NOV1995	25MAY1994	25MAY2014
GERMANY	94920036.4	EPC	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995	25MAY1994	25MAY2014
UNITED KINGDOM	94920036.4	EPC	GRNT	94920036.4 25MAY1994	0658219 24MAR1999	0658219 21JUN1995	25MAY1994	25MAY2014
USA	069801	ABND		069801 01JUN1993			25MAY1994	25MAY2014

COMMENTS: +PLEASE VERIFY CASE ISSUED ON 16JUL99 PER AGENT.  
 REMARKS: ABAND PER SOURCE 1/20/99

ADVANCED CERAMICS 2165293954

CASE NUMBER 020000-1  
 CLIENT/DIVISION ADVAN  
 YOUR REFERENCE 95/0396875  
 PRIORITY TITLE FLUIDIZED BED REACTOR ARRANGEMENT AND METHOD FOR FORMING A METAL CARBIDE COATING ON A SUBSTRATE CONTAINING GRAPHITE...

ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: LENNARTZ  
 COUNTRY USA  
 SUB CASE NO. 01MARI995  
 TYPE STATUS CON GRNT  
 APPLICATION NUMBER/FILE DATE 396875  
 PATENT NUMBER/ISSUE DATE 5498442  
 PUBLIC NUMBER/DATE 12MARI996  
 TAX/WORKING START DATE 12SEP1996  
 TAX PAID AGENT EXPIR/ABAND ATTY SCHD THRU DATE 12MAR2013

020014 ADVAN EL 037751 BORON NITRIDE COMPOSITES BASED ON ALUMINUM NITRIDE AND MULLITE  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY, L.

COUNTRY	SUB CASE NO.	TYPE STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY SCHD THRU DATE
EUROPE	ABND	ABND	94301845.7 15MARI994	0616988 13AUG1997	0616988	0616988	15MAR2014
CHINA	ABND	ABND	94103604.9 26MARI994	0616988 13AUG1997	0616988	26MARI994 PA	26MAR2014
GERMANY	ABND	ABND	94301845.7 15MARI994	0616988 13AUG1997	0616988	15MARI994	15MAR2014
JAPAN	ABND	ABND	51859794 23MARI994	2645216 02MAY1997	0616988	02MAY1997 05	23MAR2014
UNITED KINGDOM	ABND	ABND	94301845.7 15MARI994	0616988 13AUG1997	0616988	15MARI994	15MAR2014
USA	ABND	ABND	037751 26MARI993	5336454 09AUG1994	0616988	09FEB1995	09AUG2011

020014-1 ADVAN EL CERAMIC COMPOSITE & METHOD  
 ASSIGNEE: ADVANCED CERAMICS CORPORATION  
 INVENTOR: MONTGOMERY

COUNTRY	SUB CASE NO.	TYPE STATUS	APPLICATION NUMBER/FILE DATE	PATENT NUMBER/ISSUE DATE	PUBLIC NUMBER/DATE	TAX/WORKING START DATE	TAX PAID AGENT EXPIR/ABAND ATTY SCHD THRU DATE
USA	ABND	ABND	212501 11MARI994	5401676 28MARI995	0616988	28SEP1995 SE	28MAR2012