

**APPENDIX A. U.S. DEPARTMENT OF ENERGY COVER PAGE FOR SMALL BUSINESS INNOVATION RESEARCH (SBIR) AND SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAMS**

Select Phase for this Application: Phase II

**SOLICITATION NO.** Enter Number

**Application Number (Phase II ONLY)** 76999B04-I

**DOE Grant Number (Phase II ONLY)** DE-FG04-02ER0000

09/13/04

NOTICE FOR HANDLING GRANT APPLICATIONS. This submission is to be used only for DOE evaluation purposes. All government and non-Government personnel handling this submission shall exercise extreme care to ensure that the information contained herein is not duplicated, used, or disclosed in whole or in part for any purpose other than to evaluate the submission, without the written permission of the offeror (except that if a grant is awarded on the basis of this submission, the terms of the grant shall control disclosure and use). This is a Government notice, and shall not by itself be construed to impose any liability upon the Government or Government personnel for any disclosure or use of data contained in this submission.

TITLE: Complex Coolant Fluid for PEM Cell Systems		Topic No.: 01 Subtopic: a
		Amount Requested (not to exceed Phase I \$100,000 or Phase II \$750,000): \$ 728,270

**SMALL BUSINESS**

FIRM NAME: Acme, Inc.	I.R.S Entity ID: 01-2345678	Address 123 First Street	City Anytown
WEB ADDRESS: www.acmeinc.com	DUNS #: 012-345-678	Suite A	State MD
		Zip 20876-4567	

Principal Investigator Dr. John C. Doe Title: Research Scientist Email: doe@acmeinc.com Phone Number: (301) 555-1234 ext. 123	Corporate/Business Authorized Representative Mr. Robert P. Smith Jr. Title: President Email: smith@acmeinc.com Phone Number: (301) 555-1234 ext. 124
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**Certification and Acceptance:** I certify that the statements herein are true and complete to the best of my knowledge, and accept the obligation to comply with DOE terms and conditions if an award is made as the result of this submission. A willfully false certification is a criminal offense. (U.S. Code, Title 18, Section 1001)

Signature: DR. JOHN C. DOE Date: 1/4/05 Signature: MR. ROBERT P. SMITH, JR. Date: 1/4/05

**RESEARCH INSTITUTION**

<p><b>Required for Phase I Only</b></p> <p>Select from the drop-down field the type of application.</p> <p>If this grant application contains substantial collaboration with a research institution: select whether this application is STTR only or both SBIR and STTR.</p> <p>If this application does NOT use a Research Institution, then select SBIR only.</p> <p>Type of Application:</p>	NAME OF RESEARCH INSTITUTION: University of Science	Amount of Subcontract \$300,000
	Address Department of Contracts 321 Second Street MS-32	City Anytown
		State MD
		Zip 20876-6141
	Certifying Official: Ms. Jane Jones	
	Title: Director of Contracts	
	Email: jones@science.edu	
	Phone number: (301) 555-4895 ext. 25	
<p><b>Certification:</b> If this grant application is selected for award, I certify that the above research institution will conduct the work herein attributed to it.</p> <p>Signature: MS. JANE JONES Date: 1/4/05</p>		

**OTHER SUBCONTRACTORS: INDICATE NAME AND DOLLAR AMOUNT**

**CERTIFICATIONS AND QUESTIONS: Y (YES) OR N (NO) (See the DOE Solicitation Reference at the top of the page.)**

<p><b>Y</b> 1. The above applicant organization certifies that it is a small business and meets the definition stated in Section 2.3.</p> <p><b>Y</b> 2. The applicant small business will comply with the provisions regarding: (1) lobbying, (2) debarment, suspension, and other responsibility matters, and (3) drug-free workplace requirements. (See Certifications Section.) Inability to certify to any or all statements requires explanation.</p> <p><b>Y</b> 3. The Principal Investigator will have his/her primary employment with the small business at the time of the award.</p> <p><b>N</b> 4. The application includes a subcontract with a Federal Lab?</p> <p><b>N</b> 5. The applicant has received more than 15 Phase II SBIR awards in the preceding five fiscal years. (If yes, please provide information requested in Section 3.3.4.)</p>	<p><b>N</b> 6. The applicant and/or Principal Investigator has submitted applications containing a significant amount of essentially equivalent work under other federal program solicitations, or received other federal awards containing a significant amount of equivalent work? If "yes", the application must include the required information requested in Section 3.3.2i.</p> <p><b>Y</b> 7. If the proposed project does not result in an award, does the applicant permit the government to disclose the technical abstract of the application, and the name, address, and telephone number of the business official to any inquiring parties?</p> <p><b>N</b> 8. Is the small business delinquent on any Federal debt? (If "yes," please include an explanation.)</p> <p><b>Y</b> 9. All research by the applicant, research institution, consultants, and subcontractors will be performed in the United States.</p>
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**PROPRIETARY NOTICE (SECTION 5.4)** For any purpose other than to evaluate this submission, these data shall be protected to the extent allowed by law and not disclosed outside the Government. The Government shall have the right to duplicate, use, or disclose the data to the extent provided in the grant. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data in this submission subject to this restriction are contained on pages

Describe the problem or situation being addressed - be sure that the DOE interest in the problem is clear. (Typically, one to three sentences)

As solid oxide fuel cell technology matures, it is becoming increasingly important to lower the cost of insulation. Currently available low-cost insulation cannot be used in these applications because it contains silica, which volatilizes and degrades the anode. Therefore, new low-cost, net-shape options for solid oxide fuel cell (SOFC) insulation are needed.

How is this problem being addressed? - i.e, What is the overall approach of the combined Phase I/Phase II project? (Typically, one to two sentences).

This project will develop a novel castable ceramic material with properties that make it ideal for SOFC insulation. These properties include net-shape fabrication capability, very low thermal conductivity, thermochemical stability up to 1000 C, and very good thermal shock resistance.

For Phase I grant applications: What is planned for Phase I? For Phase II: What was done in Phase I? (Typically, two or three sentences).

In Phase I, the feasibility of using the castable ceramic materials as fuel cell insulation was demonstrated through specific experiments. These experiments showed that the candidate insulation materials provide thermochemical stability under fuel rich environments; very low thermal conductivity (0.3-0.4 W/mK), as required for SOFC insulation; and reliable performance of SOFCs when the insulation was exposed to the air/fuel mixture at high temperatures.

For Phase I grant Applications: Leave blank. For Phase II grant applications: What is planned for the Phase II project? (Typically, two to three sentences.)

In Phase II, two net-shape insulation concepts from Phase I will be optimized and tested to demonstrate product commercial viability. Activities will include materials and process optimization, component fabrication, and long term testing in SOFC systems.

Commercial Applications And Other Benefits as described by the applicant. (Limit to space provided).

Commercial sales of insulation materials SOFCs should exceed \$3 million dollars by the year 2010. It is anticipated that these new materials can capture a 40% market share, leading to annual sales of over \$1.25 million to SOFC manufacturers and system integrators. By partnering with a commercial SOFC manufacturer in Phase II, the chances of developing a commercially viable SOFC insulation technology will be maximized.

Key Words:

Net shape insulation, solid oxide fuel cells

Summary For Members Of Congress: (Layman's Terms, Two Sentences Max.)

The lack of inexpensive insulation materials is one of the factors delaying the achievement of cost targets for commercialization of solid oxide fuel cells for power generation. This project is targeted at development of a new insulation material for solid oxide fuel cells that will meet both performance and cost targets.

**GRANT APPLICATION BUDGET**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT THIS FORM

A. PERSONNEL (Employees) NAME	ROLE IN PROJECT	EST. HOURS	HOURLY RATE	FRINGE BENEFITS	TOTAL COST
J. Doe	Principal Investigator	2000	\$50.00	1.10	\$110,000.00
R. Smith	Physicist	1000	\$40.00	1.10	\$44,000.00
C. Gordon	Technician	1000	\$20.00	1.10	\$22,000.00
D. Phillips	Secretary	400	\$15.00	1.10	\$6,600.00
				1.00	\$0.00
				1.00	\$0.00
<b>TOTAL PERSONNEL COST</b>					<b>\$182,600.00</b>
B. CONSULTANTS NAME	ROLE IN PROJECT	EST. HOURS	HOURLY RATE		
E. Conrad	Consultant	500	\$50.00		\$25,000.00
<b>C. LEASED EQUIPMENT (Specify Time and Rate, or Other Basis)</b>					
<b>ITEM</b> Oscillator 5 months @ 1000/month					\$10,000.00
<b>D. PURCHASED EQUIPMENT</b>			<b>AMOUNT</b>		
<b>ITEM</b> Test Station (details on budget explanation page)			\$25,000.00		\$25,000.00
			\$0.00		
			\$0.00		
<b>E. TRAVEL</b> 3 trips to University of Science					\$3,000.00
<b>F. OTHER DIRECT COSTS</b>					
1. Materials and Supplies				\$8,000.00	
2. Publication Costs				\$0.00	
3. Testing Services (Including work at Government Installations)				\$0.00	\$308,000.00
4. Computer Services				\$0.00	
5. Research Institution University of Science 300,000				\$300,000.00	
6. Other Subcontracts				\$0.00	
7. Other				\$0.00	
<b>G. TOTAL DIRECT COSTS (A through F)</b>					<b>\$553,600.00</b>
<b>H. INDIRECT COST (Specify Rate and Base)</b> OH (50% labor) = \$91,300 G&A (10% of 553,600) = \$55,360					
<b>TOTAL INDIRECT COSTS</b>					<b>\$146,660.00</b>
<b>I. TOTAL COSTS (G plus H)</b>					<b>\$700,260.00</b>
<b>J. FEE OR PROFIT</b>			Enter percentage (as decimal) to calculate based on TOTAL COST (Item I)	4.00%	\$28,010.00
<b>K. TOTAL AMOUNT OF THIS REQUEST (Item I plus J)</b>					<b>\$728,270.00</b>
<b>L. Has any executive agency of the United States Government performed any review of your accounts or records in connection with any other grant or contract within the past year? Select Yes or No: Yes If Yes, give name, address, and phone number of reviewing office and official:</b> DCAA, Washington, D.C. Walter Walters (202) 555-4444					

# FOR PHASE I APPLICATIONS ONLY

Applicant:

## APPLICATION CHECKLIST

APPENDIX D

09/13/04

(Not Counted in the 25-page Limitation)

### DOES THE APPLICATION SATISFY THE FOLLOWING REQUIREMENTS:

Use Drop-down  
Menus

- √ DUNS # on cover page, if appropriate.
- √ One, and only one, topic from the Technical Topics Section identified on the cover page.
- √ One, and only one, subtopic from the Technical Topics Section identified on the cover page.
- √ The cover page is completed and signature blocks filled with **ALL CAPITAL NAME OF SIGNING AUTHORIZING PARTIES.**
- √ Principal Investigator will work a minimum of 195 hours or at least 5 hours/wk on the project.
- √ All certifications and questions on cover page marked Y (Yes) or N (No).
- √ Amount requested from Government is not in excess of Phase I (\$100,000) or Phase II (\$750,000) limit.
- √ Abstract contains no proprietary information and does not exceed space provided on the Project Summary Page (Appendix B).
- √ Main Text (technical content) is included as requested in Section 3.3.2
- √ Application should not be more than 25 pages. However, this checklist (Appendix D) and the Documentation of Multiple Phase II Awards (Section 3.3.4) will not be included in the 25-page count.
- √ No font smaller than 12 point times new roman in main text.
- √ Level of effort in compliance with Section 3.3.1c. (For SBIR, the small business must perform at least 2/3 of the research and analytical effort. For STTR, the small business must perform at least 40% and the research institution must perform at least 30%.)\*

\* For grant applications that are to be considered for both SBIR and STTR, prepare the grant application to meet the requirements of the SBIR Program. If the application is selected for STTR, budgetary adjustments can be completed during the negotiation period before the grant begins.

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**ATTENTION: GRANT APPLICATIONS NOT MEETING ALL THE ABOVE REQUIREMENTS WILL BE DECLINED WITHOUT FURTHER ACTION.**

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### STATISTICAL INFORMATION

Use Drop-down  
Menus

The proposing firm certifies that it is a socially and economically disadvantaged small business.

The proposing firm certifies that it is a woman-owned small business.

The proposing firm is located in a HUB Zone.

**WORKSHEET**

For calculating the percent of the research and analytical effort performed by the small business, the research institution, if any, and other consultants or subcontractors.

	<b>Small Business</b>	<b>Research Institution (if any)</b>	<b>Other Consultants and/or Subcontractors</b>	<b>TOTAL</b>
<b>(1) Total Value of Project</b>	<i>(A+C+D+E+FI+F2+F7+H+J)</i> 403,270	<i>(F5)</i> 300,000	<i>(B+F3+F4+F6)</i> 25,000	<i>(line I + line J from budget page)</i> 728,270
<b>(2) Value of leased, purchased, or in-kind equipment, and materials &amp; supplies</b>	<i>(lines C+D+FI from budget page)</i> 43,000	<b>(Applicable portion of Research Institution's subcontract)</b> 0	<b>(Applicable portion of consultant and/or other subcontracts)</b> 0	43,000
<b>(3) = (1) - (2) Research or analytical effort</b>	360,270	300,000	25,000	685,270
<b>(4) Percentages (Divide entries on line (3) by total for line (3).)</b>	53%	44%	4%	100%

**NOTE: You may include commercial and/or in-kind contributions on this worksheet to determine the level of effort performed by all parties. We realize that the total value of the project may exceed the Phase I limit of \$100,000 or Phase II limit of \$750,000. However, the total request from DOE (Line K) must not exceed for Phase I (\$100,000) or Phase II (\$750,000) limit.**