State of California
AIR RESOURCES BOARD

Resolution 01-6
January 25, 2001

Agenda Item No.: 01-01-2

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an augmentation request entitled "Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration", has been submitted by Industrial Ceramic Solutions, LLC; and

WHEREAS, the Research Division staff and the Executive Officer and Deputy Executive Officers have reviewed and recommend for funding:

> Augmentation request entitled "Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration", submitted by Industrial Ceramic Solutions, LLC, for a total amount not to exceed $58,557.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Executive Officer and approves the following:

> Augmentation Request entitled "Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration", submitted by Industrial Ceramic Solutions, LLC, for a total amount not to exceed $58,557.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and agreements for the efforts proposed herein, and as described in Attachment A, in an amount not to exceed $58,557.

I hereby certify that the above is a true and correct copy of Resolution 01-6, as adopted by the Air Resources Board.

Marie Kavan

Marie Kavan, Clerk of the Board

ATTACHMENT A

INNOVATIVE CLEAN AIR TECHNOLOGIES (ICAT) PROPOSAL FOR AUGMENTATION

"Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration"

Background

On May 27, 1999, the Air Resources Board approved a $338,007 contract under the Innovative Clean Air Technologies (ICAT) Program for the project entitled "Commercial Cooking Grease Emissions Control, Microwave Cleaned Ceramic Filter Technology Commercialization." This project is currently underway to develop and demonstrate a system for controlling particulate matter (PM) emissions from commercial food preparation facilities. The technology currently uses a PM filter made of silicon carbide fibers to trap and collect the offending PM, and then uses a microwave system to heat the fibers to sufficiently high temperatures to oxidize the grease and PM to water and carbon dioxide, thus efficiently regenerating the filter for reuse. Such PM controls are of special interest in the South Coast Air Basin. However, the South Coast Air Quality Management District (SCAQMD) has subsequently expressed its desire to require controls for volatile organic compound (VOC) emissions from many of these sources as well as PM controls, and has noted that a PM control system without a VOC control capability will probably not meet the goals of any such future rule . The applicant requests the augmentation of the ICAT portion of the project funding by $58,557 to allow the development and testing of a VOC control addition to their technology to permit it to be competitive in a regulated environment . The applicant plans to investigate VOC adsorbent, catalyst and ultraviolet destruction technologies to determine which is optimal for incorporation into their microwave regenerated filter technology.

Objective

The objective for this project is to prove that the Microwave Cleaned Ceramic Filter with VOC Control is a viable commercial low-cost control device. Detailed laboratory testing will be conducted to demonstrate compliance with SCAQMD Rule 1138, entitled "Control of Emissions from Restaurant Operations." Afterward, systems will be installed in up to three commercial restaurants, one in the Los Angeles area, for operational testing, further development, and operating cost information collection.

Expected Results

According to the SCAQMD, there are 11.6 tons per day of cooking-related PM and 1.6 tons per day of VOC grease emissions in the South Coast Air Basin. The fully developed Industrial Ceramic Solutions (ICS) microwave-regenerated filter system is expected to operate at 90 percent particulate removal efficiency and up to 80 percent VOC destruction efficiency. Therefore, it could eliminate 10.4 tons of air polluting grease PM emissions per day and up to 1.3 tons of VOC emissions per day, at a

combined capital and operating cost expected to be less than that for existing technologies, such as electrostatic precipitators or thermal incineration.

Significance to the Board
Over 95 percent of California's population live in areas that exceed the state's health-based ambient PM standards. In urban areas especially, commercial cooking facilities like restaurants are significant sources of PM and VOC emissions.

Supporting the development of cost-effective technologies for the control and reduction of such emissions provides the Board with new tools that can support the Board's continuing efforts to protect the public health from the risks of PM and VOC emissions. This project will complete the development and demonstration of one such simple, low cost technology.

Proponent:
Industrial Ceramic Solutions, LLC

Project Period:
30 months (currently underway)

Principal Investigator (PI):
Richard D. Nixdorf

ICAT Funding:
$58,557

Cofunding:

Industrial Ceramic Solutions	$ 39,108
Greenheck Fan Corporation	$ 17,080
Total	$ 56,188

Basis for Indirect Cost Rate: No indirect costs charged to ICAT

Past Experience with this Principal Investigator:
Experience with this Principal Investigator since the start of this project in July 1999 has been satisfactory.

Prior ICAT Funding to Industrial Ceramic Solutions, LLC:

Year	1999	1998	1997
Funding	$ 0	$ 338,007	$ 0

BUDGET SUMMARY

Grant Augmentation Request

Industrial Ceramic Solutions, LLC

Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration

DIRECT COSTS AND BENEFITS		ICAT	TOTAL
1.	Labor and Employee Fringe Benefits	$ 30,339	$ 30,339
2.	Subcontractors	$ 0	$ 17,080
3.	Equipment	$ 0	$ 0
4.	Travel and Subsistence	$ 5,623	$ 5,623
5.	Electronic Data Processing	$ 20	$ 20
6.	Reproduction/Publication	$ 95	$ 95
7.	Mail and Phone	$ 480	$ 480
8.	Supplies	$ 20,600	$ 20,600
9.	Analyses	$ 1,300	$ 1,300
10.	Miscellaneous	$ 100	$ 100
	Total Direct Costs	$ 58,557	$ 75,637
INDIRECT COSTS			
1.	Overhead	$ 0	$ 35,011
2.	General and Administrative Expenses	$ 0	$ 4,097
3.	Other Indirect Costs	$ 0	$ 0
4.	Fee or Profit	$ 0	$ 0
	Total Indirect Costs	$ 0	$ 39,108
TOTAL PROJECT COSTS		**$ 58,557**	**$ 114,745**

BUDGET SUMMARY

Grant Augmentation Request Combined With Previously Approved Budget

Industrial Ceramic Solutions, LLC

"Addition of Volatile Organic Compound (VOC) Control to Microwave Cleaned Ceramic Filter Technology Demonstration" and "Commercial Cooking Grease Emissions Control, Microwave Cleaned Ceramic Filter Technology Commercialization"

DIRECT COSTS AND BENEFITS	ICAT	TOTAL
1. Labor and Employee Fringe Benefits	$ 187,116	$ 196,044
2. Subcontractors	$ 119,807	$ 296,086
3. Equipment	$ 0	$ 5,600
4. Travel and Subsistence	$ 28,831	$ 30,091
5. Electronic Data Processing	$ 2,460	$ 2,460
6. Reproduction/Publication	$ 1,215	$ 1,215
7. Mail and Phone	$ 1,970	$ 1,970
8. Supplies	$ 42,400	$ 48,600
9. Analyses	$ 10,900	$ 22,900
10. Miscellaneous	$ 1,865	$ 1,865
Total Direct Costs	$ 396,564	$ 606,831
INDIRECT COSTS		
1. Overhead	$ 0	$ 165,693
2. General and Administrative Expenses	$ 0	$ 23,699
3. Other Indirect Costs	$ 0	$ 0
4. Fee or Profit	$ 0	$ 0
Total Indirect Costs	$ 0	$ 189,392
TOTAL PROJECT COSTS	**$ 396,564**	**$ 796,223**