

State of California  
AIR RESOURCES BOARD

Resolution 02-27  
July 25, 2002

Agenda Item No.: 02-6-5

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, a proposal, number 02-29, entitled "High Performance Low VOC Coatings for 2006", has been submitted by Southwest Texas State University in response to the 2002 Innovative Clean Air Technologies (ICAT) Program solicitation;

WHEREAS, the proposal has been independently reviewed for technical and business merit by highly qualified individuals; and

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

Proposal Number 02-29, entitled "High Performance Low VOC Coatings for 2006", submitted by Southwest Texas State University, for a total amount not to exceed \$99,324.

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

Proposal Number 02-29, entitled "High Performance Low VOC Coatings for 2006", submitted by Southwest Texas State University, for a total amount not to exceed \$99,324.

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 \$99,324.

I hereby certify that the above is a true and correct copy of Resolution 02-27, as adopted by the Air Resources Board.

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Stacey Dorais, Clerk of the Board

## ATTACHMENT A

### Innovative Clean Air Technologies (ICAT) Grant Proposal: “High Performance Low VOC Coatings for 2006”

#### **Background**

Coatings are a major source of VOC emissions in California. Several air pollution control districts and air quality management districts have adopted regulations limiting the VOC contents of coatings. The South Coast Air Quality Management District's (SCAQMD) current VOC limits range from 100 to 420 grams per liter (g/L), depending on the coating category. For some categories, the SCAQMD will enforce stricter limits in 2006. Advances in paint technology are needed to meet the stricter limits. Hyper-branched, phosphate ester polyol resins potentially are one such technology. The goal for this technology is 100 g of VOC /L or less.

#### **Objective**

The objective of this project is to demonstrate the technical suitability and cost-effectiveness of hyper-branched vegetable oil polyol phosphate esters (POLYOL) to meet a VOC limit of 100 g/L in drum and wood coatings.

#### **Methods**

The Southwest Texas State University (SWT) has developed a resin that has desirable properties for paints. The resin is a hyper-branched phosphate ester polyol (POLYOL), which can be produced from vegetable oils. The POLYOL resin provides better adhesion to substrates, reduces the need for surfactant, and reduces the water sensitivity of the coating. As a result, it appears to be a promising technology for producing lower VOC coatings. SWT intends to combine its work in the area with the expertise of others in order to bring its resin technology to commercialization.

SWT will work with Atofina, Inc. in the construction, optimization, and evaluation of a pilot-scale process for the production of POLYOL. Atofina is a chemical company and a major manufacturer of epoxidized oils. Atofina will supply pilot plant development personnel and equipment to produce drum quantities of POLYOL for industry evaluation. SWT will supply much of the initial contacts with technical leadership at resin and paint manufacturers. The United States Soybean Board will fund much of this early work. POLYOL from the pilot-scale process should be available within a year.

Precision Coatings, Inc. will formulate prototype paints for drum coatings. The performance of the paints will be demonstrated at a Precision Coating's customer location. Another company would be selected for a demonstration on ambient-cured architectural wood coatings and Direct-to-Metal aqueous latex coatings. In the demonstration phase, the POLYOL-based coatings would be tested in head-to-head comparisons with metal coatings and wood coatings that are currently being used.

Following the demonstration, Atofina will supply technical service/marketing personnel to introduce the product to market and will follow-up on the industry evaluations of the POLYOL-based coating.

**Expected Results**

The project should show that drum and wood coatings that meet a VOC limit of 100 g/L, or less can be made from hyper-branched vegetable oil polyol phosphate ester resins.

**Significance to the Board**

The POLYOL resin technology could provide a cost-effective way of achieving additional VOC emissions reductions from coatings.

**Applicant:** Southwest Texas State University

**Project Period:** 24 months

**Principal Investigator:** John L. Massingill

**ICAT Funding:** \$99,324\*

\*\$20,000 provided by SCAQMD

**Co-funding**

SWT: \$44,000

United States Soybean Board: \$148,549

Paint Partners: \$25,000

Atofina, Inc.: \$120,000

**Past Experience with This Principal Investigator**

Staff has no prior experience with Southwest Texas State University. However, the extent of review of the ICAT proposal provides an adequate basis for recommending a grant. The application was reviewed externally by academic engineers and scientists, other agencies, and academic business reviewers and internally by the Stationary Source Division, Research Division, and the Executive Office.

**Prior ICAT Funding to Southwest Texas State University**

Year	2001	2000	1999
Funding	0	0	0

## BUDGET SUMMARY

Southwest Texas State University

### High Performance Low VOC Coatings for 2006

<u>Direct Costs and Benefits</u>	<u>ICAT</u>	<u>Total</u>
1. Labor	\$47,680	\$200,269
2. Employee Fringe Benefits	\$13,350	\$ 55,969
3. Subcontractors	\$ 0	\$ 0
4. Equipment	\$ 0	\$ 44,000
5. Travel and Subsistence	\$ 3,000	\$ 11,400
6. Materials and Supplies	\$ 4,000	\$ 34,100
7. Other Direct Costs	<u>\$ 0</u>	<u>\$ 26,000</u>
Total	\$68,030	\$371,738
 <u>Indirect Costs</u>		
1. Overhead	\$31,294	\$ 65,135
2. Other Indirect Costs	<u>\$ 0</u>	<u>\$ 0</u>
Total	<u>\$31,294</u>	<u>\$ 65,135</u>
<b>Total Project Costs</b>	<b>\$99,324*</b>	<b>\$436,873</b>

\* \$20,000 will be provided by SCAQMD