

Adopted: October 29 2013

**ACADEMIC SENATE
of
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, CA**

AS-771-13

**RESOLUTION ON
PROPOSAL FOR THE ESTABLISHMENT OF THE KENNETH N. EDWARDS
WESTERN COATINGS TECHNOLOGY CENTER**

- 1 **RESOLVED:** That the Academic Senate of Cal Poly endorse the attached proposal for the
2 establishment of the Kenneth N. Edwards Western Coatings Technology Center.

Proposed by: Dr. Raymond Fernando, Arthur C. Edwards
Endowed Chair, Director: Polymers and
Coatings Program, Chemistry and
Biochemistry Department, Cal Poly
Date: September 18, 2013



**Proposal to Establish a Kenneth N. Edwards Western Coatings
Technology Center
California Polytechnic State University**

Submitted by: Raymond H. Fernando, Ph.D

September 18, 2013

Introduction

The Department of Chemistry and Biochemistry at California Polytechnic State University (Cal Poly) has been planning to propose the establishment of a Kenneth N. Edwards Western Coatings Technology Center (WCTC) since 2002. Cal Poly has strong faculty expertise in polymers and coatings, long-standing partnerships with industry, as well as the equipment, space, and funding to support the proposed center.

The Department of Chemistry and Biochemistry has been offering a concentration in polymers and coatings for over 20 years. In addition, since 2002, the department has offered a unique Masters program in polymers and coatings, the only such program in California. Students in the MS program work closely with faculty and industry partners to develop the specialized skills they need for careers in the polymers and coatings technology industry.

Cal Poly's coatings and polymers faculty members are highly respected both nationally and internationally. The steady growth of Cal Poly's educational programs in polymers and coatings as well as the high caliber of applied research in polymers and coatings means that Cal Poly's faculty members are widely recognized by industry and educational partners as leaders. Cal Poly faculty and students have been engaging in applied research and outreach activities to industry since 2002 *as if* they were operating from a center. At this juncture, the formal establishment of the WCTC will allow faculty experts in polymers and coatings to expand their capacity in providing the educational and applied research opportunities it offers to students and industry partners. Through the WCTC, faculty members anticipate growth in several areas, such as:

- Additional capacity to do contract research;
- Additional capacity to provide coatings testing services;
- Ability to accommodate post-doctoral requests;
- Increasing "short courses" offerings (2 week industry certificate courses) in summer and throughout the academic year; and
- Increasing opportunities for students to do applied research and gain employment in polymers and coatings

Chemistry and biochemistry faculty members with expertise in coatings and polymers have a long track record of working collaboratively with faculty in other departments and colleges. For instance, faculty members from the Department of Chemistry and Biochemistry have done polymer film and surface coatings testing work in collaboration with the Center for Coastal Marine Sciences. They have an ongoing collaboration with the Global Waste Research Institute in the area of nanomaterial waste. Additionally, they have worked with faculty members in Dairy Products Technology Center, Graphic Communication Department, Materials Engineering Department, and the Industrial Technology Department. Through the

WCTC, chemistry and biochemistry faculty members intend to increase these kinds of productive collaborative efforts.

Mission

The WCTC at Cal Poly will provide a forum for faculty, students, and industry partners to elevate and bolster educational opportunities and applied research in polymers and coatings technology. The WCTC will accomplish this mission by:

- (1) Engaging faculty in teaching and research in polymers and coatings technology;
- (2) Engaging students in studying and applying skills associated with polymers and coatings technology; and
- (3) Engaging and developing relationships with members of industry involved in polymers and coatings technology.

The WCTC at Cal Poly will be self-supporting. Academic freedom will be practiced in all Center activities.

Funding and Facilities

Funding to support the WCTC is in place and no additional facilities are required:

- Together with industry, department members have raised 3 million dollars to support the WCTC. These funds have been used to build laboratories for polymer synthesis, coatings formulation, and instrumental analysis and a conference/student presentation room, all in the Warren J. Baker Center for Science and Mathematics. Together these facilities will serve as the operational base for the WCTC;
- Dr. Ray Fernando was hired in 2002 as Cal Poly's first endowed chair, the Arthur C. Edwards Chair in Coatings Technology and Ecology. Over \$1 million was raised to support the Arthur C. Edwards Chair, currently the only endowed chair in a California State University (CSU) chemistry department; and
- Over \$200,000 in funds has been raised for equipment. For instance, the KASM Equipment Endowment has been funded to ensure that academic and research activities are conducted on high quality equipment.

Polymers and Coatings Applied Research

Cal Poly faculty in the Department of Chemistry and Biochemistry receive frequent requests from industry partners and from other Cal Poly faculty members to provide testing services of coatings on a wide range of surfaces. Testing of coatings

is required for virtually all surfaces with which we come into contact. To name just a few examples, coatings testing is necessary for cars, bridges, appliances, bicycles, surfaces on which we walk, medical tubes used to collect blood, and guide wires used in surgical procedures. Cal Poly faculty members are active in coatings research and testing in many of these areas. Additionally, faculty members have done research in the engineering of polymers and biological polymer systems.

Faculty members have worked closely with industry for over a decade to raise funds to support applied research. Some projects are:

- Development of novel urethane elastomers for medical applications
- Accelerated weathering of marble and resin compatibility through conservation of Nice Muses Roman Sarcophagus
- Development of an advanced, lightweight, mesh and polymer-based splinting system for immobilization of fractures in tactical environments
- Zero VOC preparation of polystyrene-co-methyl methacrylate using Ionic solvents
- Effects of functional nanoparticles on coating performance
- Interactions of surfactants and polymeric surfactants on coating rheology
- Colorant effects on architectural coating rheology
- Polyelectrolyte and protein adsorption studies monitored via ATR/FTIR, QCM, and AFM
- Atomic force microscopy of thin films
- Membrane and surfactant biophysics
- Determination of exempt solvents by solid-phase microextraction (ASTM D6438)
- Validation of EPA Method 311 on HAP – Round Robin Testing
- ASTM VOC test method development
- Thermally responsive materials for development of insensitive munitions and self-healing coatings
- Self-Regulating, Self-Pressurizing Tubules for Integrated Circulatory Systems
- Nano-structuring of polymers
- Advanced corrosion detection methods on aluminum
- Paper based microfluidics
- Oxime ether surfactants
- Organic-inorganic hybrid nanocomposites
- Semi-conducting polymers

Learn by Doing

The establishment of the WCTC will increase applied research and educational opportunities for students. Student involvement has always been integral to applied

research in polymers and coatings at Cal Poly. The Department of Chemistry and Biochemistry has a long track record of actively seeking industry support to provide students with hands on experiences. For instance, concerted effort was devoted to funding the Bill Moore Research Fellowship Endowment, which is currently at approximately \$400,000, in order to support student research fellowships.

Students are hired regularly to do coatings testing work, which provides them not only with employment, but also with excellent field experience. Additionally, students are hired regularly to assist with contract research.

Polymers and coatings students have always been given opportunities to interact with industry partners, including presenting to the Cal Poly Polymers and Coatings Industrial Advisory Council (see section on "Governance").

Through the WCTC, faculty members expect to offer short industry certificate courses as well as host conferences on polymers and coatings. Students may be hired to assist in the preparation and delivery of short industry certificate courses and they may participate in conferences.

The WCTC will be unique not only to the CSU, but it will also have an international presence. For instance, the establishment of the WCTC may coincide with the establishment of a new partnership with the China National Coatings Industry Association (CNCIA). The CNCIA, through American Coatings Association (ACA) has requested that Cal Poly offer a Graduate Certificate Program in Polymers and Coatings Science to industry professionals in China. Cal Poly is not currently poised to offer the Certificate Program in China. However, there are plans underway to offer lecture courses to students in China as part of a certificate program in polymers and coatings. Students from China are expected to visit Cal Poly during summer for laboratory courses that make up the rest of the certificate program. The expectation is that Cal Poly students and faculty would interact with graduate certificate candidates from China during laboratory courses offered through the WCTC. Students in the China program who wish to complete the Cal Poly MS could formally apply to do so.

Governance

Director

The WCTC Director will be the occupant of the Arthur C. Edwards Chair in Coatings Technology and Ecology, who is currently Dr. Ray Fernando.

The WCTC Director will be responsible for management and oversight of all center activities. The Director will report to CSM Dean and indirectly to the Vice President for Research and Economic Development.

The WCTC Director will seek direction and support from a standing Polymers and Coatings Industrial Advisory Council. Responsibilities of the WCTC Director may include:

- **Oversee effective utilization of the WCTC facilities for the benefit of Cal Poly students and faculty, and professionals in polymers and coatings field;**
- **Develop and coordinate initiatives and activities of the WCTC with industry partners;**
- **Serve as the primary point of contact for the Polymers and Coatings Industrial Advisory Board (see below);**
- **Continue and grow partnerships with industry, national and international organizations, and other institutions;**
- **In collaboration with faculty members, develop goals and objectives for the assessment of WCTC activities;**
- **Actively raise funds to support WCTC activities;**
- **Oversee the development and offering of industry certificate courses;**
- **Uphold the highest principles of academic freedom;**
- **Collaborate with faculty and consult with industry partners to develop strategic directions for curriculum development in the polymers and coatings science;**
- **Collaborate with faculty and industry partners to increase learn by doing opportunities for students, including internships;**
- **Collaborate with faculty and industry partners in pursuing sponsored research; and**
- **Represent the WCTC in professional industry and educational environments.**

Faculty Experts in Polymers and Coatings

Cal Poly has several faculty members in the Chemistry and Biochemistry Department with expertise in polymers and coatings, including:

- **Dr. Phil Costanzo, Organic Chemistry**
- **Dr. Ray Fernando, Polymers and Coatings Science**
- **Dr. Derek Gragson, Physical Chemistry**
- **Dr. John Hagen, Biophysical Chemistry**
- **Dr. Chad Immoos, Chemistry**
- **Dr. Dane Jones, Physical Chemistry**
- **Dr. Kevin Kingsbury, Chemistry**
- **Dr. Alan Kiste, Chemistry and Education**

- Dr. Andres Martinez, Chemistry
- Dr. Hasan Palandoken, Organic Chemistry
- Dr. Shanju Zhang, Polymer Chemistry and Physics

Several other faculty members throughout the campus have collaborated with polymers and coatings faculty members in the Chemistry and Biochemistry Department:

- Dr. David Braun, Physics Department
- Dr. Trevor Harding, Materials Engineering Department
- Dr. Raphael Jimenez, Dairy Products Technology Center
- Dr. Xiaoying Rong, Graphic Communication Department
- Dr. Jay Singh, Industrial Technology Department
- Dr. Phil Tong, Dairy Products Technology Center
- Dr. Keith Vorst, Industrial Technology Department
- Dr. Dean Wendt, Center for Coastal Marine Sciences

Polymers and Coatings Industrial Advisory Board

The Department of Chemistry and Biochemistry has enjoyed a long and mutually beneficial relationship with a well established Polymers and Coatings Industrial Advisory Board. Together, faculty members from the department work with industry partners to develop strategies for creating and improving curricular offerings, identifying industry needs, and ensuring Cal Poly graduates are well positioned to have rewarding careers in polymers and coatings areas.

Due to the outstanding history of support the existing Polymers and Coatings Industrial Advisory Council has shown for polymers and coatings education and applied research at Cal Poly, the council will function as the industry advisory council for the WCTC as well as for the program. The council will be asked to advise the WCTC director and involved faculty members about industry needs and interests that might be met through WCTC activities.

The following is the current membership of the Polymers and Coatings Industrial Advisory Council:

- Ceriac Alexander, Senior Vice-President, Behr Process Corporation
- Jim Calkin, Vice-President, Marketing, Horn Company
- Joseph Cristiano, Director & Chairman of the Board, The MCM Group
- Steve DeVoe, President, Kelly-Moore Paint Company
- Robert Wendoll, Director of Environmental Affairs, Dunn-Edwards Corporation

- Myron Shaffer, Director, Product and Technical Service NAFTA, Bayer Material Science LLC
- Melinda K. Forbes, Sr. Accounts Manager, J.F. Shelton Company
- Thomas R. Hanna, Senior Technical Service Consultant, DuPont Titanium Technologies
- Patricia Jones, Key Accounts Manager West, DSM Coatings Resins Company
- Eunice Leung, Business Development Specialist, BYK USA, Inc.
- Jeff Norris, Product Manager, Lubrizol Corporation
- Joan Pinder, Alumni Association Board Member, Cal Poly
- Joseph Reilly, President, JCR Enterprises
- Robert Sypowicz, Technical Representative, Deft, Inc.
- Joseph Tashjian, Vice-President & General Manager, Operations, Ellis Paint Company
- Scott Van Remortel, Technical Sales Manager, Unimin Specialty Minerals
- Gary Velikanje, President, Wood Kote Products, Inc.

Assessment

As required by the California State University system, the WCTC will undergo regular and rigorous program review. The assessment of the WCTC is tied to the mission of the center. Thus, the focus of assessment will be to learn what the center accomplished and how that ties with what it set out to do. Quality, not just quantity of activities, will be reported in program review, along with performance metrics developed by faculty involved in the center. Performance metrics will be developed:

- To measure student involvement (output, e.g. how many students involved, how many student projects, and outcomes, i.e., learning objectives for center activities)
- To assess faculty activities (e.g., number of grants, workshops, conferences, contracts)

State of California
Memorandum

CAL POLY
SAN LUIS OBISPO

To: Steven Rein
Chair, Academic Senate

Date: January 21, 2014

From: Jeffrey D. Armstrong
President



Copies: K. Enz Finken
B. Kinsley
P. Bailey
D. Wendt
R. Fernando

Subject: Response to Academic Senate Resolution AS-771-13
Resolution on Proposal for the Establishment of the
Kenneth N. Edwards Western Coatings Technology Center

Based upon the above subject Resolution, the positive endorsement by the Academic Deans' Council at its September 9, 2013, meeting, as well as the recommendation of Provost Enz Finken, I am pleased to approve the establishment of the Kenneth N. Edwards Western Coatings Technology Center.