

The Center for Plastics Processing Technology
321 Pioneer Tower
University of Wisconsin-Platteville

Background:

On Tuesday, September 25, 1990, the Department of Industrial Studies at the University of Wisconsin-Platteville had a dedication ceremony for its new plastic processing equipment in the plastics processing research laboratory. The laboratory is located in Russell Hall on the UW-P campus. This investment of approximately a quarter of a million dollars brings state-of-the-art plastic processing technology to UW-P students and faculty and complements the newly established Plastic Processing Technology minor.

The laboratory houses industrial grade injection molding and thermoforming equipment and it is designed for further expansion as additional equipment becomes available. The department is currently in the process of acquiring a compression molding, reaction injection molding, and an extruder to supplement this new equipment. The education grade equipment include: Plunger type injection molder, Vacuum thermoformer, Rotational molder, Compression molder, welding equipments, and lamination presses. At the present time, the laboratory is able to accommodate the most common plastics processing technology.

Up-to-date mission of your center or activity

The Department of Industrial Studies at the University of Wisconsin-Platteville extends this facility and its services to other state universities and regional industries. Facilities and services available include technical assistance, workshops, research, projects, and training programs. Special services offered may be secured through the Center for Plastic Processing Technology.

Purpose of your center or activity

The purpose of the plastics technology center is to disseminate knowledge and advance the practice of plastics processing technology to both traditional students as well as industrial practitioners, hence contribution to local, state, and regional industrial growth.

Intended student learning or university/public service outcomes

The existence of the center makes it possible for the department to focus on meaningful and relevant teaching in one of the most growing areas of material processing in the state. The plastic industry is approximately \$10 billion in businesses with over 55,000 employees in the state of Wisconsin. The program teaching is in the context of relevant courses and industrial training such as synthetics and composites processing technology, injection molding, thermoforming, extrusion, etc, while serving as an industrial problem-solving center for plastics industries in the region.

The students have an opportunity of being part of a production team in an actual production environment. Hence, they are become well trained, more aware, and ultimately, better individual thinker and decision makers. They are equipped with such educational tools which will help to make them potentially more productive upon their arrival to their real working environments.

The State of Wisconsin houses some of the largest plastics and plastics related industries with several thousand employee. These include industries such as Philips Plastics in Philips, Moldmaker Incorporated in Germantown, S.C. Johnson Wax in Racine, and Plastics Ingenuity in Cross Plains, Wisconsin. Nevertheless, the average employee size for the plastic industry is around fifty employees. The services which are offered by the center are essential for their survival of smaller plastic industries.

Utilization of the Polymer Processing Research lab can eliminate engineering and design costs and benefit the medium and small industries financially. It also helps the UW-Platteville faculty and staff to expose themselves to valuable experiences and industrial training within the plastics and composites fields.

Range of Equipment:

The plastic processing research laboratory is equipped with the latest industrial grade injection molding equipment, which includes a 55-ton Van Dorn injection molding machine and supporting equipment, as well as a state-of-the-art Hydro-trim thermoformer complete with necessary tooling and accessories, industrial grade blow forming, and a number of industrial extruders. Other equipment available in the laboratory includes; an educational grade injection molder, blow molder, thermoformer, extruder, rotational molder, and compression molder.

The testing equipment available makes it possible to analyze the properties, structures, and design limits of materials or products. Equipment available includes: computer software for design and testing flow analysis, ultraviolet tester, tensile tester, autoclave, hardness tester, abrasion tester, stress analysis, and basic equipment designed to ascertain the chemical composition of plastic products. A newly acquired scanning electron microprobe provides a power tool for investigating the microstructural characteristics of composites and refilled plastics.

There are several reasons for utilizing the UW-P plastics processing laboratory. These are time, expense, and availability of resources required to conduct training or research, in addition to the investment in equipment and manpower needed.

Workshop Availability:

The city of Platteville is located in the beautiful tri-state area: 20 miles from Dubuque, Iowa, 60 miles from Moline, Illinois, and 70 miles from Madison, Wisconsin. This is an ideal place for plastic and plastics related conference as the volume of plastic production in the state of Illinois is ranked third, Wisconsin is ranked 8 in the nation. The plastics industry is the third largest industry in the state of Iowa.

The University is equipped with up-to-date facilities including several conference and lecture halls and a closed circuit TV studio. There are several major hotels and motels to offer lodging for visitors. The university, particularly during the summer-session, can provide basic room and board at a minimal cost to facilitate industrial support training and conferences. To date the following industries have utilized the center for training their engineers:

- | | |
|-----------------------|--------------------------|
| 1. John Deer | 6. Generac |
| 2. Plastics Ingenuity | 7. Polyfab |
| 3. Cuba city Machine | 8. Lens crafter |
| 4. DMC Incorporate | 9. Loudspeaker Component |
| 5. 3M Corporation | 10. Others |

Remote Lab Runs and Research Projects:

If an industry is faced with a particularly tight schedule and/or budget constraints, a research or production project can be referred to the University for production and evaluation. A production process or research project will be designed and processed on the basis of specifications required by the industry. The faculty and students in the plastics program are willing to make every effort to accommodate your needs and your schedule. The following is partial list of companies which have used these resources in recent years.

- | | |
|---------------------------|-----------------------------------|
| 1. Molded Rubber Product | 6. Miniature Procession Component |
| 2. Plastics Ingenuity | 7. Polyfab |
| 3. Cuba City Machine | 8. Rubbermaid |
| 4. DMC Incorporate | 9. Loudspeaker Component |
| 5. Non-metallic Component | 10. Others |

Qualified Technical Support:

The University of Wisconsin-Platteville is one of the state's multi-purpose Universities emphasizing engineering and technical programs. University faculties have diverse interests and expertise ranging from mechanical engineering, chemistry, industrial studies, industrial engineering, and other engineering, technical, and professional areas. The faculty is willing to participate in various projects within their areas of interest.

The faculty and staff are actively involved in technical societies such as the Society of Plastics Engineers (SPE) and Society of Plastic Industries (SPI). Their involvement exposes them to the most up to date information, experience, and industrial practices. In addition, several research and development projects are being pursued in the areas of polymeric and composite materials. The internship program, required as part of the Industrial Studies program has helped the faculty, staff, and students in understanding industrial problems, and obtaining a solution which is feasible and practical in an industrial setting.

The technical support at UW-P is not limited to the faculty and staff. This lab was supported and updated by the Society of Plastics Engineers (SPE) and Society of Plastics Industries (SPI) with the idea of establishing a center not only for educating students but also as a center for the promotion of plastic processing and industrial problem solving for the region.

The department works closely with a group of professional consultants in the area of materials, processing, design and cost evaluation, and other areas of manufacturing. The facilities are available to industries for hands-on technical training, professional conferences, or updating the production processes. The training session may be conducted by the faculty, an industrial representative, or both in the interested area. Additional information related to independent consulting is available by contacting:

Center for Plastics Processing Technology
421 Pioneer Tower
University of Wisconsin-Platteville
Platteville WI 63818

Phone 608-342-1115
Fax 608-342-1254

E-mail Tabrizi@uwplatt.edu
Web site: www.uwplatt.edu/cfppt.

Assessment instruments and procedures to collect data regarding the achievement of the intended outcomes:

The center is a self sustaining organization with no internal support. Hence, its existence solely depends on external funding. Acquiring external funding is a powerful measure of performance of the center. Additionally, the interaction of the industries in refereeing an actual production problem to the center for possible solutions is another indication of the center's performance. The technical publication, the expressed opinion of students and industries can be used as a measure of success for the center.

Analysis and feedback procedures to determine if the outcomes are being achieved and, if not, what should be done to ensure they are:

The evaluation of the center performance is as follows:

1. Annual visitation by the board of director of the Society of Plastics Engineers:

The Society of Plastics Engineers (SPE), Milwaukee Section, as the representative of plastic industries, is the technical institute supporting the plastic program. The members of the Board of Directors of the SPE-Milwaukee Section are required by the SPE-International rules to have an annual visit of the program.

During this visit, the SPE boards evaluate the performance of the university in the plastic program. They interview the faculties and students to assure the integrity of the program to satisfy the institute's educational goal. This visitation usually takes place during the fall semester and the evaluation is performed by at least four board members: the president, the former president, the counselor, and the education secretary and a number of members of the board are participating in this visit. These groups of the practitioners are perhaps the most qualified group to evaluate the performance of the program and the Center for Plastics Processing Technology.

2. The financial assistance and donation for sustaining the center:

The Center for Plastic Processing Technology also serves as a mechanism for securing the flow of needed materials and supplies for the plastic program from the university. The limited budget allocated to materials, supplies, maintenance and equipment has placed a serious strain on the ability of the program to offer a meaningful curriculum. Through the years the Center has been able to secure the necessary financial resources from the plastics industry to allow the students to successfully acquire and finish a number of research projects or class activities.

The willingness of the plastic industries to actively and financially support the program is a serious indication of the quality of work at the Center. During the current semester, the program has been able to secure over \$30,000 of industrial funds for purchasing machinery, material, and travel expenses for students to attend the technical conferences.

3. Feedback from the alumni:

Perhaps the most qualified individual to evaluate the program are the alumni and the graduate students. This group of individuals which have had long term contact with the program and are working in the field are qualified to offer the best evaluation of the performance of the Center. A number of these alumni are keeping in touch with the program and offering their opinion on the center's level of performance. The Center through its dedicated web site is able to keep in touch with these students and if the need arises, a formal questionnaire can be prepared for formal evaluation.

4. The number of projects referred to the center:

The center encourages the plastics industries to utilize the center as a means for industrial problem solving, the transfer of technology, and industrial training. The volume of these projects, as well as the expressed opinion of the industry to the quality of work performed by the students and staff at the Center can be considered as a method of evaluation.

5. The number of publications and presentations offered by the center:

Perhaps, the most important goal for the Center for Plastics Processing Technology is to assist students in their education and their professional growth. An area of importance is the relative research and professional publication. The Center as a mechanism of gathering data, material, and outside support plays significant role in this important matter. Hence, the student scholarly activities, technical presentations, and publications, can be used as a means to evaluate the performance of the Center.