Empire State Paper Research Institute provides centralized resources for industry

More than 55 companies in 15 countries look to ESPRI for new developments in pulp and paper research.

SUSAN M. CLITES

In 1944, concern about near-term shortages of coniferous wood in the northeastern United States and an emphasis on research and development to address post-World War II growth prompted Joseph S. Illick, acting dean of the New York State College of Forestry, to convene a "New Developments in Wood Products" conference. The October event drew 535 attendees from Australia, Canada, England, New Zealand, and the United States, who heard Illick's proclamation, "...we are now standing on the threshold of the greatest period of expansion in wood products research in the history of our country."

Illick, who believed that forestry colleges should play an important role in wood products development, proposed plans for new laboratories and buildings at the college, initiated an administrative reorganization, encouraged cooperative research with industry and government, and secured continuing state support for research.

At the same time, pulp and paper companies in the northeastern United States realized that research would be the foundation to improve wood procurement methods, product quality, and proficiency.

C. Earl Libby, a professor on the college's pulp and paper technology staff, and Arno W. Nickerson, a New York City-based consulting engineer, addressed growing redundancy in the college's research ventures with industry by visiting New York mills and proposing a cooperative research venture. In 1945, after several meetings between the college and industry companies, the Empire State Paper Research Associates (ESPRA) was formed as an organization representing a group of companies to carry out research in cooperation with the college.

Today, ESPRA is a nonprofit corporation based in J. Henry Walters Hall in what is now the State University of New York College of Environmental Science and Forestry (SUNY ESF) in Syracuse, NY. It is the world's only international pulp and paper research organization, and it represents the interests of more than 55 companies from Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Japan, Korea, The Netherlands, Norway, Portugal, South Africa, Sweden, and the United States.

SUNY College of Environmental Science and Forestry's J. Henry Walters Hall (photo courtesy of the College of Environmental Science and Forestry, Syracuse)

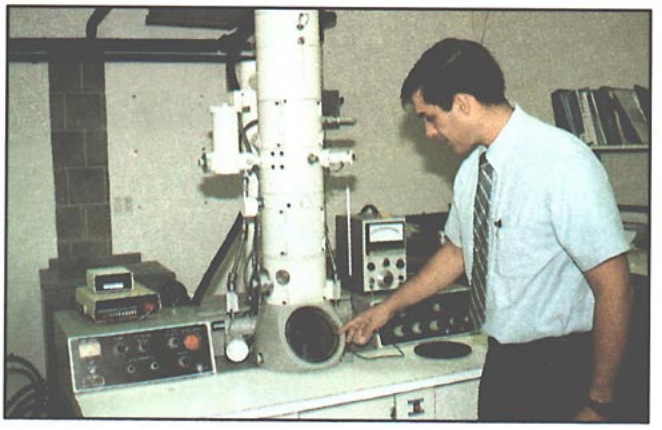
ESPRA's research program is also strongly supported by SUNY ESF, which contributes approximately 55% of the operating budget. The actual research is conducted by the Empire State Paper Research Institute (ESPRI) in conjunction with the faculty of the Paper Science and Engineering Department.

"We're a research institute affiliated with an orthodox academic environment," says ESPRI Director Leland R. Schroeder, who is also the chairman of the SUNY ESF Paper Science and Engineering Department.

The ESPRI research program is developed in consultation with representatives of ESPRA Steering Committees to ensure that the interests of the member companies are pursued by ESPRI researchers. The research program and a three-year plan are developed and distributed annually to the ESPRA membership.

ESPRI's 35-member staff includes 12 senior researchers. The 1993 research program consisted of 11 projects addressing environmental conditions, paper and board properties, papermaking processes, and conservation of raw materials.

Steven Keller, research support specialist, describes the modifications made to a transmission electron microscope at ESPRI that permit real-time imaging of the mass distribution (formation analysis) of paper using electron attenuation. This prototype instrument also permits a direct comparison of this type of analysis with formation analysis using light transmission.

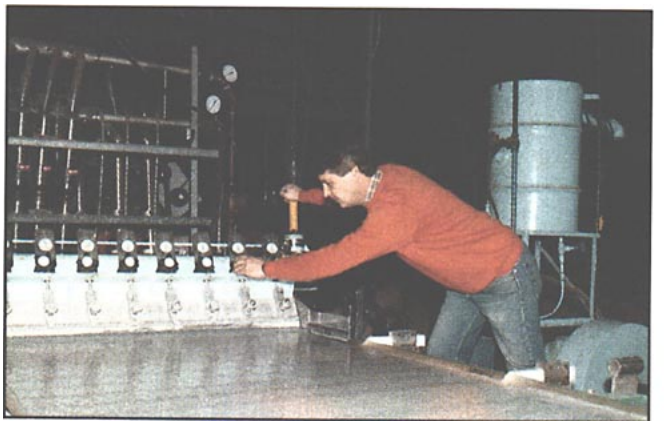


Steven Keller points out the operating principles of a laser-based, noncontact surface profilometer designed and constructed at ESPRI for measurement of paper surface topography and analysis of fiber shapes.

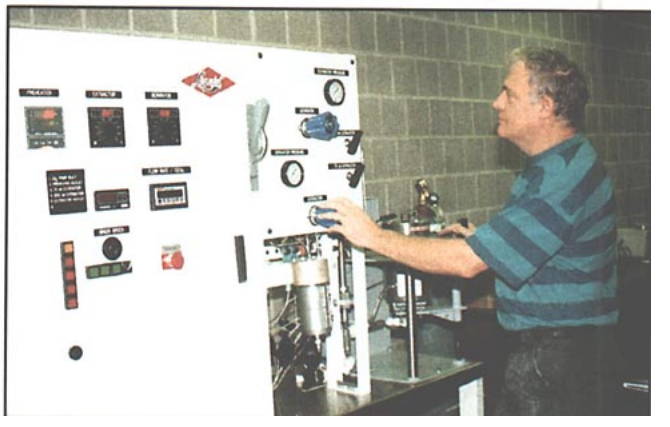
Kathrynn Wilson, research support specialist, prepares a paper sample for tensile analysis in an Instron instrument equipped with a rapidly variable environmental chamber designed and built at ESPRI. The equipment has been particularly useful in examining the role of cycling humidity on paper properties.

William Holtzman (bottom), professor and pilot plant director, and **Alton Brown**, research support specialist, examine the smaller No.2 fourdrinier paper machine. This machine has been used in numerous trials and ESPRI studies involving wet-end additives, sizing, size press behavior, calendering, and recycling.

Stephen Granzow, research support specialist, adjusts the headbox on the larger No.1 fourdrinier paper machine, which is used for trials, academic instruction, and ESPRI research. (Photo by R. Colasanto)



Alton Brown operates the supercritical fluid extraction equipment used in the ESPRI and academic research programs.



Leland R. Schroeder, professor, department chairman, and ESPRI director, and **Shigetoshi Omori**, research scientist, discuss part of the ESPRI research program. (Photo by R. Colasanto)

Two pilot paper machines, an environmental-engineering laboratory with recycled fiber processing and water treatment facilities, a variable-condition paper physics laboratory, Instron testing equipment, a pressurized 12-in. disc refiner, a pressurized 12-in. stone grinder, a Quantum high-intensity mixer for bleaching studies, computer-controlled digesters for chemical pulping research, supercritical fluid processing equipment, and pulp and paper evaluation and testing laboratories are available to the researchers. Modern gas and liquid chromatographic equipment, an ultraviolet-visible spectrophotometer, a Fourier-transform infrared spectrophotometer, and a computer-controlled atomic absorption spectrometer are also housed in Walters Hall. Nuclear magnetic resonance spectrometers (100 and 300 MHz), a gas chromatograph-mass spectrometer, an inductively coupled plasma spectrometer, several electron microscopes, and x-ray diffraction apparatus are available to ESPRI researchers in SUNY ESF analytical laboratories.

ESPRA member company representatives meet twice each year. A fall meeting is held at the college, and a spring meeting is held off campus. Before each meeting, ESPRI staff members prepare reports on the progress of selected projects. ESPRA members receive copies of the reports for review prior to the meetings, to prepare for in-depth discussions. Through the ESPRA Steering Committee, member companies can participate in development of the research program. Member company representatives can visit the ESPRI facilities and meet with ESPRI staff to discuss mutual interests. If new processes and inventions are patented, they may be used at substantially reduced royalty rates by ESPRA members of record on the date of disclosure.

"The advantages of industrial partnerships have been obvious to the academicians at SUNY ESF for a long time," says Schroeder. "In addition to the monetary support, the relationships keep professors abreast of the most recent developments and problems in the industry. This, in turn, makes the academic experience more relevant to the students, both undergraduate and graduate."

Working with ESPRI's technical personnel, ESPRA companies can leverage their research budgets. "By participating in ESPRA in 1993, companies leveraged their research dollars by a factor of 145 with research done at ESPRI," says Schroeder. TJ

***Clites is associate editor of* Tappi Journal.**