# ENGINEEREDWOOD AUTUMN 2015 Tournal







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## **ENGINEEREDWOOD** Journal

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#### **ENGINEERED WOOD JOURNAL**

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#### About the Cover Photo:

From research foundation to supporter of industry advancement, the Engineered Wood Technology Association celebrates 70 years. Left photo: Early Plywood Research Foundation Director Harold R. Evans and G.L. Oswald at an awards ceremony at APA's 1960 annual meeting in Sun Valley, Idaho. Right photo: EWTA members gather at the 2014 Info Fair supplier exhibition in San Antonio, Texas. See story on page 10.



How GHS Impacts Workplace Safety

APA Announces 2014 Safety Award Winners

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#### **Looking Back: EWTA Celebrates 70 Years**

I've never been much of a history buff, but researching the background of the Engineered Wood Technology Association for this month's *Engineered Wood Journal* (EWTA is celebrating its 70th anniversary!) was one of the most interesting assignments I've had in years.

As many of you know, EWTA got its start as the Plywood Research Foundation back in 1944. In its early years, PRF was focused solely on research projects benefitting the plywood industry, such as the Roto-Marker rolling trademarking printer, an air jet glue respreader and a continuous thickness gauge. While PRF's contributions certainly helped advance the industry, its focus shifted and changed over the years. Today, under the name of the Engineered Wood Technology Association, it functions as a conduit for suppliers to support, expand and build a more vibrant engineered wood industry. In partnership with APA members, its braintrust is being used to help assure a more prosperous engineered wood industry far and wide.

While EWTA is strong today (the association has been growing steadily since 2009 and membership is at an all-time high), that wasn't always the case. The foundation fell on hard times more than once through its history. For example, in the early 1990s, EWTA (then called the Engineered Wood Research Foundation) was facing falling membership with few resources available to help. APA, which oversaw the foundation, saw the value in the association and pushed hard to keep it going. Efforts were made to expand membership, add staff and introduce new programs that would ultimately bring the association back from the brink.

You can read more about the history of EWTA in this month's cover story, which starts on page 10. The piece came together through a combination of sources: meeting minute notes, old membership bulletins, hand-written memos and interviews with APA and EWTA employees.

The most solid information came from the dusty file cabinets in APA's offices, in which typed memos meticulously documented the efforts of APA employees and PRF board members as they sought to bring associate members on board (suppliers were welcomed to join PRF in 1968, and were brought on as voting members of the Advisory Committee in 1994). A typed, alphabetized list dated July 21, 1967, with the title, "Potential PRF Associate Members" includes the names of more than 70 companies that were undoubtedly courted for PRF membership. A letter dated February 26, 1968, written by PRF Executive Director Harold Evans, accompanied a PRF bulletin to members that outlines the "new framework of PRF." Despite the technology available today to create, save and send documents electronically, the old fashioned hard copy filing system was the most reliable in this effort.

Did our EWTA history feature bring back any memories for you? Share them by sending your photos or anecdotes to me at scain@engineeredwood.org.

#### Info Fair and APA Annual Meeting

It's that time of year again — EWTA's Info Fair and the APA Annual Meeting are right around the corner, and we look forward to reconnecting with many of you Oct. 17-20 at the Coeur d'Alene Golf and Spa Resort in Coeur d'Alene, Idaho. As always, the event is a great place to network, share ideas and catch up with old friends and colleagues.

scain@engineeredwood.org

## New Report Forecasts Forestry Equipment Demand

A recently released market research report predicts that world demand for forestry equipment will climb 4.5 percent annually to \$9.3 billion in 2019.

According to the "World Forestry Equipment to 2019" report, published by Freedonia, an industry market research group, this figure will represent moderation from the 2009-2014 pace of increase, a period during which market gains were bolstered by a rebound in roundwood production from lows posted during the 2009 global recession, as well as by the institution of new engine emissions standards in the European Union and U.S. Geographically, U.S. and Canada together

represent the largest forestry equipment market, accounting for one-third of global product demand in 2014. Western Europe is the second largest market, with a 22 percent share of all equipment sales in 2014.

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#### Engineered Wood Demand Predicted To Rise

The demand for North American engineered wood products will see significant growth over the next four years, according to APA's 2015 market forecast report. Structural panels are forecast to grow 19 percent, and other engineered wood products will see growth of 20 to 25 percent, the report said.

Driven by a 12 percent increase in housing starts in the U.S., demand for structural panels in residential construction in North America is expected to rise 10 percent in 2015, while growth in the other end-uses is projected to be 2.5 percent. North American production of OSB and plywood is predicted to hit 32.2 billion sq. ft. in 2015, an increase of nearly 8 percent over 2014.

Glulam production is on the rise, up 2 percent in 2014, and is projected to grow 8 percent this year to 255 million board feet. It is expected to continue to increase steadily through 2019.

In 2015, I-joist production is anticipated to increase to 750 million lin. ft. from 672 million lin. ft. in 2014. With steady increases in housing starts in the U.S., production is projected to reach 955 million lin. ft. by 2019.

LVL demand will also benefit from

#### **IN MEMORIAM**

#### **Mike Murray**

Mike Murray, 74, of Wilsonville, Ore., passed away on June 11 from complications related to cardiovascular disease. Mr. Murray is best known for his work with Disdero Lumber and as the founder of Wood-Lam Structures. He was a member of APA's Structural Roof Erectors Committee in the late 1990s. Mr. Murray was co-founder of the Structural Roof Erector Association, served in every leadership role of the association, and was an advocate for the panelized roof industry. He retired in 2001. He is survived by his wife, Diane, and two daughters.

#### Claire I. Vermedahl

Claire Vermedahl, 79, of Albert Lea, Minn., passed away July 19 from lung cancer. Mr. Vermedahl started his career at Rilco, which eventually became ALAMCO Wood Products. In 1982, Mr. Vermedahl and nine others purchased ALAMCO, from which he retired as CEO/CFO in 2009. He served on APA's Glulam Management Committee from 1995 to 2007. He is survived by his wife, Ruth, a daughter and a son.

sustained improvement in housing starts. LVL production in 2015 is forecast to reach 68.8 million cu. ft., from 63.9 million in 2014, and by 2019 output is projected to grow by 28 percent to 88 million cu. ft.

Additional forecast information is included in the 2015 Structural Panel and Engineered Wood Yearbook, available free to EWTA and APA members or \$250 for non-members at www.apawood.org.

## Success for CFEC In Texas Market

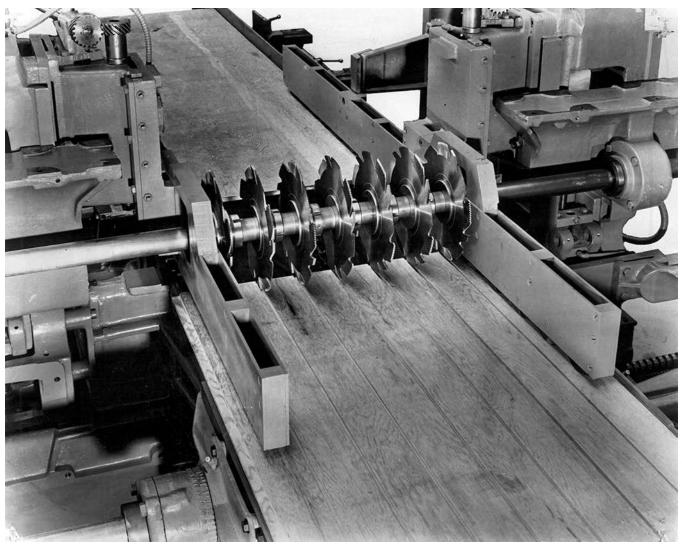
The Coalition for Fair Energy Codes (CFEC) announced success in the state of Texas when Governor Abbott signed Texas House Bill 1736 into law. The bill, backed by the Texas Association of Builders and supported by CFEC, addresses industry concerns with the state's update of the IECC. The more stringent 2015 IECC has now replaced the 2009 IECC; however, the law amends a popular performance path to code compliance so that wood structural panel sheathing will continue to remain a cost-effective option in Texas.

APA is developing a training module that will be presented as part of the Home Builders Association of Dallas-Fort Worth training programs scheduled to commence this fall. APA is also communicating with the State Energy Conservation Office and has expressed an interest in providing input to the energy code training that they are responsible for conducting.



## **EWTA Celebrating 70 Years**

Association Stronger Than Ever Through Name Changes, Transition by Sheila Cain



This photo shows the first piece of T 1-11 plywood siding ever cut at APA. T 1-11 is a siding groove pattern that became one of the most popular siding groove patterns — and remains so today. The device cutting the grooves was created through the Plywood Research Foundation.

ust over 70 years ago, on
May 15, 1944, five individuals
gathered with a notary public
in Tacoma, Wash., and approved the
Articles of Incorporation for the Plywood
Research Foundation (PRF). Alfred J.
Schweppe, J. Gordon Gose, Bernard Reiter, John N. Rupp and Florence Boswell
were witness to the start of an association
which, over the past seven decades, has

grown and morphed in scope and size, yet remained vital to the advancement of the engineered wood industry.

The Plywood Research Foundation's name has changed twice: to the Engineered Wood Research Foundation in 1994 and then to the name it holds today, the Engineered Wood Technology Association (EWTA), in 2004. The name changes have reflected the focus of the

organization throughout the years, from its beginnings as a plywood research association to a supporter of industry activity to a networking group supporting industry advancement and information transfer. Despite the changed name and various projects undertaken by EWTA, one constant has remained, which is the close partnership and shared goals with APA and its members.

Image courtesy of APA

#### **The Early Years**

The purpose of the PRF in its early years was to operate "exclusively for scientific and educational purposes," according to its Articles of Incorporation, with its members engaging "exclusively in research." Membership at this time was restricted to manufacturers of plywood, and dues — along with royalties from patents — were used to pay for the association's capital and operating budgets. Early PRF documents state that the foundation's purpose was to:

- Improve the production and properties of Douglas fir plywood through improvements of processing and processing equipment
- Use the waste woods resulting from the present processing at the plywood mills and in the forests, and
- Produce new products which the plywood mills can manufacture in addition to their present products

The fledgling foundation recognized the need for the development of advanced equipment and machinery and other technologies in the utilization of the raw material. It encouraged the creation of hardware for the application of new adhesives and acknowledged the increasing advancement of electronics in the industry. An early PRF program sought out inventive plywood industry workers, rewarding them for developing new machinery, processes or chemicals. If deemed feasible, these new innovations were financed and patented by the PRF, with the inventor given a 50 percent share of the royalties. The other 50 percent was retained by the foundation and used to pay for development and patent costs and for continuing general research.

Some of the early research projects developed through the foundation include the rough sawn plywood siding concept, the Roto-Marker for stamping plywood, and continuous moisture detection equipment.

#### **Associates Join the Fold**

While the contributions of these early innovators were crucial to the advancement of the plywood industry in PRF's early years, it soon became obvious that

#### **EWTA's Earliest Members**

In 1968, EWTA (then called the Plywood Research Foundation) voted to bring associate members into the foundation. (Before then, membership was open only to plywood manufacturers.) Associate involvement started with 23 supplier members, eight of which (in bold) remain EWTA members today.

A.W. Mortinsen Company Black Clawson-Sumner

#### Borden Inc. (today, Hexion Inc.)

Collinson Engineering E.V. Prentice Co. Inc.

#### Globe Machine Manufacturing Co.

Grenco Inc.

**Hercules Incorporated** (today, Ashland Specialty Ingredients)

Jeddeloh Bros. Sweed Mills Inc. (today, Sweed Machinery Inc.)

#### Kimwood Machine Co. (today, Kimwood Corporation)

Minnesota Mining and Manufacturing Company (3M)

#### Moore Dry Kiln Co. of Oregon (purchased by Coe; today, USNR)

Olympic Stain Company

Pacific Adhesives Co. Inc.

Pacific Resins & Chemicals Inc.

Pasquier Panel Products Inc.

Perkins Glue - Gulf Oil Corporation

#### **Reichhold Chemicals Inc.** (merged with Arclin)

Ron Dorsett Associates Inc.

#### The Coe Manufacturing Company (today, USNR)

The Sherwin-Williams Co.

Union Carbide Corp.

Welsh Panel Company



Coe Manufacturing (today, USNR) was one of EWTA's first supplier members. At right, Alan Knokey, USNR vice-president, stands at the Coe booth at one of the first Info Fair supplier exhibitions. At left is Knokey's father, the late Gene Knokey, who was vice president of Coe Manufacturing from 1976 to 2001.

the industry would need technical and creative input from beyond just plywood manufacturers. In a letter dated Dec. 8, 1967, PRF Executive Director Harold R. Evans reached out to plywood industry suppliers, detailing the challenges faced by the industry and welcoming them to join the fold.

"The plywood industry is facing a predictable future in the use of engineered wood," said Evans in his letter. "This future will involve radical new developments in production machinery, sophisticated automation and precise product control.

"This means that the industry, in meeting its challenges, will need the best efforts of machinery and adhesive suppliers; control and auxiliary manufacturers; and its own people. In short, a degree of joint endeavor considerably greater than has existed in the past."

The letter invited plywood industry suppliers to attend a PRF meeting January 24, 1968, at the Sheraton Motor Inn in Portland, Ore., where the opportunity to join PRF would be presented. Thus began an ever-strengthening bond between APA members and their suppliers.

## The Evolution of the Association

PRF leaders had been working behind the scenes for months before the invitation was extended to industry suppliers. In June 1967, PRF amended its by-laws establishing an "Associate Membership" classification. Soon after, an Oct. 17, 1967 "Associate Membership Proposal" outlined the benefits associate members would realize, which included:

- Participation in PRF Advisory Committee activities (although no seat on the committee, yet)
- Circulation of selected supplier literature to APA producers
- Annual Equipment Exposition
- Special PRF laboratory testing services
- Potential joint enterprises or investigations of industry problems of mutual interest



Early PRF Executive Director Harold R. Evans and G.L. Oswald at an awards ceremony at APA's 1960 annual meeting in Sun Valley, Idaho.

#### The Evolution of the Association

1944 — Plywood Research Foundation (PRF) founded

1945 — Operations begin

1968 — Associate member suppliers welcomed to join

1992 — Associate members authorized to participate more actively in the formulation and implementation of PRF programs.

1994 — Associate members officially join Advisory Committee / Association's name changed to Engineered Wood Research Foundation (EWRF)

2004 — Name changed to Engineered Wood Technology Association (EWTA)

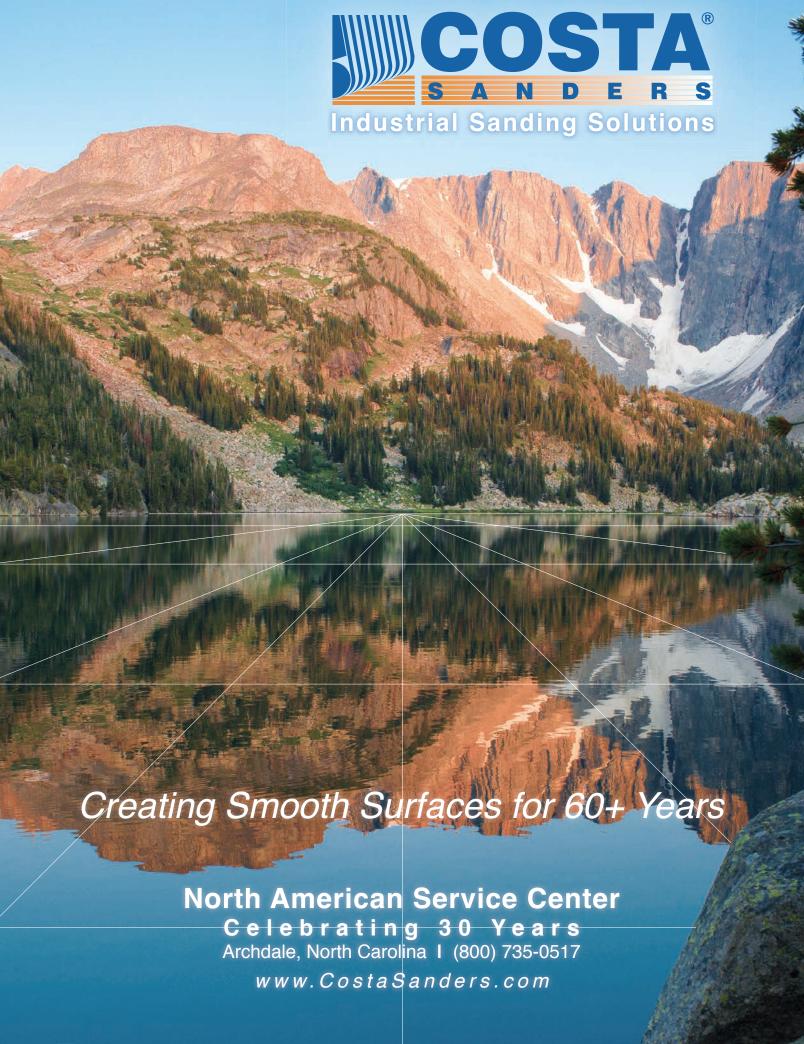
Planning documents for the Portland meeting noted interest in including supplier input in a number of future objectives, including the further mechanization of handling veneer, the elimination of "pressed in knots" in drying operations, electronic scanning of veneers for grade and repair, mechanized layup, and non-destructive testing as a quality control tool.

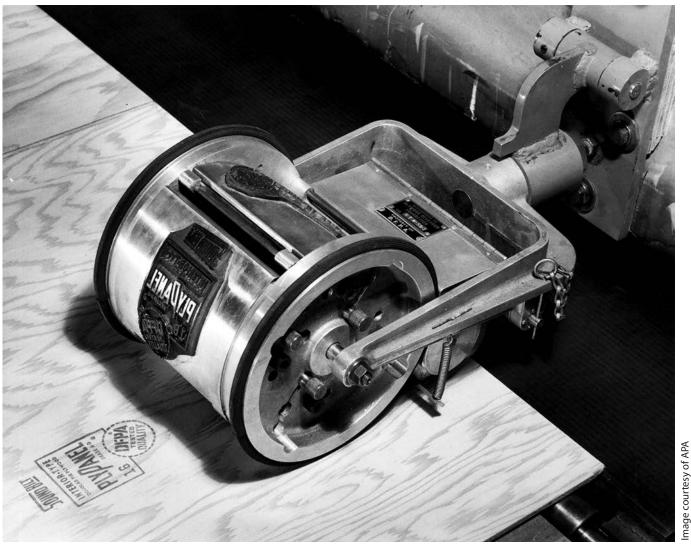
The invitation was well-received. Seventy-one representatives from 47 supplier companies attended.

Moderated by Tom Bentley, the chairman of PRF's Industry Advisory Com-

mittee and general manager of Dwyer Division of Publishers' Paper Company, the meeting included presentations by PRF's executive director, Harold R. Evans, along with James R. Turnbull, APA's top executive at the time. The group later broke into interest divisions for informal discussion under leadership of various members of the PRF Advisory Committee.

By May 1968, 23 companies were officially listed as the first PRF associate members (see side story, "EWTA's Earliest Members," page 11) and membership continued to grow. The first official





One of the Plywood Research Foundation's early projects was the Roto-Marker used to apply the APA grade stamp to plywood sheets. While some mills have transitioned to ink jet printing for this purpose, others still use the roller stamps.

PRF meeting that included associate members followed on June 1968 in conjunction with APA's annual meeting in Gearhart, Ore.

#### A Hotbed of Research

In the decades that followed, the foundation continued to serve as a place for engineered wood companies to propose projects that, if approved, would be funded by PRF. One such study examined the feasibility of producing plywood from high-moisture content veneers. The project looked at the use of various types of adhesives and additives. Another studied steam injection as a possible means of reducing hot-press time in the produc-

tion of plywood. PRF assisted with the research of dozens of studies, many of which went on to be developed into products, equipment and processes. (See side story, "Research Highlight: Veneer Clipper Studies," page 18)

While PRF presented many ground-breaking studies that helped further the success of engineered wood, by the early 1990s the foundation was falling on hard times. APA staff members assigned to organize and oversee PRF activities were spread thin, and the association didn't have a point person — beyond its Advisory Committee members — to dedicate sufficient energy to the foundation's efforts and further its mission. Membership was dropping, and at the PRF

Steering Committee's meeting at APA headquarters in April 1992, members agreed that PRF "must do a better job in identifying, guiding and implementing projects," according to the meeting minutes. It was agreed that the committee would revamp PRF brochures, survey the industry for ideas and projects, and solicit new members in an attempt to breathe new life into the slumping foundation.

A few months later, at a June 4 PRF board meeting, members adopted a resolution authorizing associate members to participate more actively in the formulation and implementation of PRF programs, opening the door for increased supplier involvement.

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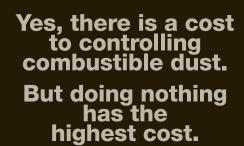
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Two years later, in 1994, PRF members amended the association's articles of incorporation to implement a name change. The Plywood Research Foundation became the Engineered Wood Research Foundation (EWRF). At the same time, APA (which stood for "American Plywood Association") changed its name to APA - The Engineered Wood Association. The reasons for the name changes were the same for both associations: to reflect the expertise of their members and the expanding scope of engineered wood products in the market.

#### **Committing to Success**

Efforts to better promote EWRF continued. Recognizing the value EWRF brought to APA members and the engineered wood industry — and well aware that membership numbers and financial resources were low — APA and the EWRF Advisory Committee convened an EWRF strategy meeting in May 1996. During the meeting, a plan was presented to reorganize EWRF by hiring a halftime staff advisor and using APA funds to pay for the advisor's salary for the first year. The committee agreed during the meeting that EWRF would have to be financially self-supporting within two years, including funding the half-time advisor's salary.

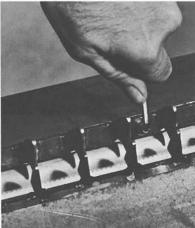
The funding, however, would be subject to two changes made in EWRF operations: first, committee attention and future research must be expanded to include OSB, glulam beams and other engineered wood products beyond just plywood. Second, EWRF's mission statement should include "information transfer" to the industry beyond just the research project results that were being disseminated. The group agreed that "Technical Forums" facilitated by EWRF would benefit both the industry and the EWRF's image within the industry.

#### **New EWTA Leadership**

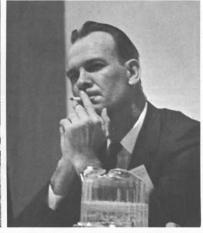
In 1996, APA hired EWRF's first paid, part-time executive vice-president (and the first non-APA person to implement and manage the imperatives articulated by the EWRF Advisory Committee). Ted LaDoux, who came to EWRF from the Evergreen Partnership, a northwest trade association representing building



Harold R. Evans, executive director of PRF...a clear assignment to begin.



The heart of PRF's new air knife . . . more than 550 holes in a 54-inch pipe.



Thomas L. Bentley, advisory committee chairman . . . a new direction for PRF.

## Plywood Research Foundation Projects Hold High Promise

There's a new vitality in the Plywood Research Foundation, a 20-year-old organization established by the industry to pursue important developmental projects beyond the scope of the plyw o o d association's technical activities.

One of the least-known arms of the industry's engineering establishment, Plywood Research Foundation was created to do what the association legally cannot: To improve the production and properties of plywood through improvements of processing and processing equipment, and to find ways to use waste woods resulting from the present processing of plywood with emphasis on reporting trends and developments to the industry.

Current projects at PRF include the development of three key devices that could be immensely valuable to the industry: An air jet glue respreader, a sophisticated blister detector, and a continuous thickness gauge.

#### Advisor Support

The foundation's advisory committee which has been very active in the last year and a half in reorganizing and directing PRF activities, recently directed the foundation staff to proceed with the design and engineering of a production line prototype of the air jet respreader. The recommendation includes instructions to build the first production machine.

The new air jet respreader, or air knife, is the result of several years of work by the foundation in attempting to develop a method of applying adhesive to veneer without direct contact between the applicator and the veneer. When such equipment is developed for production-line use it will result in the application of a uniform film thickness of adhesive on the surface of the veneer—irrespective of the tolerance variations in veneer thick-

ness. A direct benefit would be that the industry could use many of the veeners that today are impractical because of the necessity of over-spread to compensate for thickness variation.

At present, the design data for the air knife are a closely held secret. Generally, the knife is an attachment to fit on present spreaders. It redistributes the adhesive, removing the excess adhesive by returning it to the spreader rolls for redoctoring. Glue economies in pilot runs have been significant.

#### Ready to Market

The blister detector device is much closer to the production line. Developed through the combined efforts of the foundation and Automation Industries, Inc., of Los Angeles, the in-line device was first demonstrated this year at the plywood association's annual meeting in Salem, Oregon.

The device has dramatically proven that it can detect panel voids accurately and rapidly. At present Automation Industries, Inc., research teams are continuing developmental work on the rotary transducers in order to have equipment rugged and stable enough to work on the present high speed production lines. The device would be installed on saw lines in some plants, and on grade lines at others. Such equipment would be required to operate on rough panels up to speeds of 200 lineal feet per minute.

While the laboratory work

While the laboratory work continues, Automation Industries has commissioned an outside agency to conduct a market survey before establishing its own production line to produce the equipment.

A key feature of the detector: It can be set to pick up virtually any panel void, reporting instantly on the anatomy of each panel

moving along production line.

The third device, a continuous thickness gauge, already is on

the market and is being distributed by a Seattle firm. Developed by the foundation in cooperation with McCallum-Sperry Co., the machine includes a marking device which will allow a specified setting for any acceptable tolerance from the normal peel thickness. Besides serving as a tattletale on the lathe, it will permit the discarding of veneers which are outside the allowable tolerance before the expense of drying the unusable veneer is

Since out-of-tolerance veneers will be marked, they can be clipped out at the green clipper and the rejected veneers reduced to pulp chips rather than feeding through the production line, finally ending in the fuel pile.

#### Not Widely Known

As an organization, Plywood Research Foundation is much less familiar than its parent or-ganization (the plywood association), both within the industry and within the trade generally. However, the past projects of the foundation are impressive. They include hardboard and particle board production process development, infra-red dry-ing, edge gluing (thermoplastic), fiber and particle overlays for plywood, medium density overlay plywood (PRF took over the Harbor patent and made medium density overlay an indus-try product), PlyClip development, sign clip development. (Sign clips have been instrumental in helping the plywood industry recapture the highway and commercial sign market that wood products some years ago lost to metals.)

Other products originated at PRF: Texture 1-11, which was first produced on a jerry-rigged table at the Tacoma PRF labs in 1952; Texture 55, a product first produced in late 1954, well ahead of its day, was a textured siding material produced with saw-roughened faces. Texture 55 was made with a horizontal

type resaw with specially designed blades—the first rough sawn surface plywood was shown in a large display at the plywood industry's Golden Jubilee in Portland in 1955. Since then a host of rough-textured siding products have appeared on the market.

#### Products Known

In terms of production de-vices, PRF also is less widelyrecognized than are its products.

An example is the continuous moisture meter, which today is standard equipment in virtually all softwood plywood plants. The first such meter for wood products, and veneers in particular, was developed by the foundation in 1949 and 1950. The first commercial installation was at the St. Paul & Tacoma Lumber Co., Dec. 11, 1951. It would be difficult to the point of impossibility to estimate the savings to the industry in drying time-as well as elimination of blows and blisters—due to the use of this device.

From an organization standpoint, Plywood Research Foundation is chartered by the State of Washington to do business as a non-profit organization. It was organized by the plywood industry as a separate entity from the plywood association so that it could legally operate in areas other than plywood per se—such as utilization of wood resident

dues from the mills. It can own patents and operate a patent pool for the benefit of its members.

Responsibility for the association's liaison with PRF lies with the administrative offices of the association. James R. Turnbull, association executive vice president, has named Bronson Lewis, association secretary, as the chief liaison official.

#### Like Subsidiary

In effect, the foundation operates as a wholly-owned subsidi-ary of American Plywood Association and is governed by a board of trustees elected annually by the membership. In addition to the board, an advisory committee has been selected to assist the staff in outbeen lining projects. Membership in the foundation is comprised of all mills belonging to the American Plywood Association. Funds for operation are budgeted from American Plywood Association dues - the funds are supplemented by income from patented items. (In 1961, when many thousands of PlyClips were sold, there was no transfer of funds to Plywood Research Foundation by the association: PlyClips royalties paid the entire year's budget.) Association support to the foundation has varied from a high figure of \$150,000 in 1947 to the low of nothing in 1960. The support for 1965, through July, amounted to about

#### PLYWOOD RESEARCH FOUNDATION ADVISORY COMMITTEE

T. L. Bentley, Chairman, Dwyer Lumber & Plywood Co.; Don Burnet, Crown Zellerbach Corp.; A. B. Burdick, Tri-State Plywood Co.; Oscar Eklund, Everett Plywood Corp.; H. M. Preusser, Weyerhaeuser Co.; E. W. Hughes, Boise Cascade Corp.; Millard B. Hahn, Vancouver Plywood Co. of Oregon; Jack Hanson, Medford Corp.; Eugene W. Maw, Pope & Talbot, Inc., Jack Rowbotham, Fir-Ply Co.; Thomas Orth, Kirby Lumber Co.; Richard Neils, St. Regis; Don Baxter, Stevenson Co-Ply Inc.; Neal McCloud, Three Rivers Plywood & Timber Co.; B. G. Monteith, Tillamook Veneer Co.; Paul Walsh, Timber Products Co.; Plywood Research Foundation staff advisor, Harold Evans.

This 1968 PRF member bulletin outlines the changes to the association.

materials, service and wood product manufacturers, was selected for the job. Efforts made by LaDoux and the advisory committee during the months and years that followed helped breathe new life into EWRF.

"We started by putting more emphasis on building up membership and trying to coordinate more frequently with APA staff," said LaDoux. To that end, there were two early efforts to build the value of the association.

First was to bring management of the supplier exhibition, Info Fair, under EWRF. Today, Info Fair is one of the association's most popular and longest-running events. Launched in 1993 as an APA program by then-president Dave Rogoway, Info Fair was a way to enhance the value of APA's annual meeting. The exhibition provided an avenue for engaging suppliers and offset the increasing costs of the meeting. Because of the high level of involvement of EWRF members

#### **The Cost of Membership**

Membership dues for EWTA supplier members have, of course, risen throughout the years, but we think the price of membership is still a pretty good deal!

1970-1999:       \$250 for Suppliers/\$125 for Consultants and Researchers         1999-2004:       \$600 flat rate         2004-present:       \$1,200 flat rate	1968-1970:	\$500 for Suppliers/\$250 for Consultants and Researchers
	1970-1999:	\$250 for Suppliers/\$125 for Consultants and Researchers
2004-present: \$1,200 flat rate	1999-2004:	\$600 flat rate
	2004-present:	\$1,200 flat rate

(EWRF had also been a sponsor) and the financial success it brought, it made sense to transfer management of Info Fair to EWRF. The foundation began running the annual event in 1997 and it soon became its premier networking event for APA members and their suppliers. A side benefit for EWRF was a boost in membership as exhibitors discovered the value in joining the association and participating at the annual meeting. Eventually,

Info Fair became one of three primary sources of revenue to fund EWRF activities and programs in support of the industry (member dues and revenue from the Engineered Wood Journal are the other two).

Second was the launch of a series of technology forums in partnership with APA. Working together with APA staff, EWRF gathered information from APA

continued on page 22

#### Research Highlight: Veneer Clipper Studies

For the bulk of EWTA's early years, the association was focused solely on research projects that supported the engineered wood industry. Two of many such studies funded by the association (then the Plywood Research Foundation) were veneer clipper studies conducted from 1980 to 1986 through Oregon State University's Department of Wood Science and Engineering.

These studies, led by former department faculty member Jim Funck and involving graduate students Tom Sheffield and Mike Babb, originated after Funck saw the need for process improvement to veneer clipping operations during his visits to veneer mills.

"Mills had transitioned to throughbeam scanners, but mill personnel didn't understand the influence on veneer recovery of the scanner variables over which they had control," said Funck, who began working at APA in 2013 as the certification operations manager in the Quality Services Division. Potential gains and losses for each individual scanner setting couldn't be shown with traditional veneer recovery studies because the gains or losses were easily overshadowed by other factors, so the solution was to film veneer ribbons, digitize the images, and then simulate the veneer clipping logic.

"This allowed us to change scanner settings and rerun the same veneer ribbons over and over," said Funck. "We further backed up the results by actually running mill trials in the west and south U.S., where we made all the changes at once."

The success of the study led to the award of larger grants from the USDA, which allowed follow-up research on the clipping operation and then new research on automated veneer and panel grading.

PRF further supported Funck's study by publishing a report of its findings and disseminating it to APA members. Funck also joined APA employees on mill tours and presented the results directly to mill personnel. The research results showed that a typical mill could easily increase its green veneer recovery by about 5 percent, which translated to over \$400,000 per year in 1980s dollars.

"The beauty of that was there was absolutely no cost associated with making the changes," said Funck.

Those figures were backed up by a survey Funck conducted of Western U.S. mills a few years later that showed about 54 percent of the mills had made changes to their clipping strategies, and the average mill found a 4 percent recovery improvement.



Two PRF veneer clipper studies in the early 1980s helped improve veneer clipping operations at veneer mills.

mage courtesy of Jim Funck





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#### Info Fair: EWTA's Annual Gathering

As EWTA celebrates its 70th anniversary, the association's long-running annual supplier exhibition holds its 22nd event in 23 years this fall in Coeur d'Alene, Idaho. (Info Fair began in 1993 but the 2001 event was cancelled due to travel restrictions in the wake of the Sept. 11 terrorist attacks six days prior to the scheduled date.) Info Fair is an opportunity for EWTA members to gather, show their wares and services in a trade show setting, and network with APA members and each other.

The event is held in conjunction with the APA Annual Meeting. The first day includes an exhibitor meeting, an APA Board of Trustees Appreciation Reception, and an EWTA Welcome Reception where attendees can network and build relationships. The exhibition — where members can display products and literature — is open in a ballroom where food and beverages are served during two evening receptions (and one lunchtime event) during the annual meeting's run.

Some members take the opportunity to showcase their latest products and services, while others look forward to the annual



event as a chance to polish their game in the APA/EWTA golf tournament, the tennis tournament or the shooting competition. For all, it is an opportunity to reconnect with colleagues who, over the last two decades, have become friends.



EWTA's Info Fair supplier exhibition brings together suppliers with APA members on an annual basis.



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In recent years, EWTA's focus has been on information transfer and networking. EWTA members find the annual Info Fair supplier exhibition, held in conjunction with APA's Annual Meeting, to be a great place to do both.

members about emerging issues facing the industry. A wide range of expertise among academia, EWRF associate members and APA staff was called upon to bring meaningful information to the table. The first forum in 1997, entitled "Al-

ternative Resources for the New Millennium," drew 64 attendees. In 1998, when EWRF management duties were passed from LaDoux to Terry Kerwood (who continues to serve as the association's managing director today) a subcommit-



tee was formed to take the forums to the next level. Kerwood worked with APA staff, APA members and the subcommittee to design a "Solutions" series of forums that responded directly to APA member input. They included presentations by EWRF associate members and APA staff, followed by small work group discussions. These forums continued until 2004 when market conditions made travel more difficult and the Internet became more prominent. In recent years, smaller, more regionally focused programs (like the Western Plywood forums held in Seattle under APA leadership and cosponsored by EWRF) have emerged.

As the engineered wood industry as a whole continued to evolve, the focus of EWRF similarly shifted. As discussed in the strategy meeting a couple years earlier, the foundation had been performing less and less of its own research, instead focusing much of its efforts on supporting APA's research projects and facilitating information sharing amongst APA and EWRF members. EWRF responded by revisiting its own focus and mission.

# STRENGTH THROUGH COUNCILLOUS

Under Kerwood's direction, a subcommittee of 14 associate member companies was convened in January 2004 to discuss EWRF's future. The mission, vision, dues structure and benefits were all examined and a plan formulated to take the organization forward. The goals to make the association self-sustaining, build adequate reserves and funds to support industry needs, and increase connections between APA members and associate member suppliers emerged as priorities. The group recommended a doubling of dues and a redoubling of membership recruiting efforts. The revised plans were presented to APA staff and sent to the EWRF Advisory Committee for a vote, which was ultimately approved. Included in the new vision was an update to the association's name and the dba Engineered Wood Technology Association was created to reflect the move toward networking and information transfer, making connections between APA members and associate member suppliers the new focus. EWTA's "Strength Through Connections" mantra was born.

#### **EWTA Today**

More than a tag line, "Strength Through Connections" weaved its way into the mission and vision of EWTA. Efforts to support the association have paid off. In recent years, EWTA has not only become self-sufficient, it has become a significant contributor of funds towards APA research programs. Over the past 14 years, EWTA's research investment — paid with associate member contributions and program revenue — has totaled \$143,000. Its support will increase dramatically in 2015, with \$56,000 in new funding slated towards four projects benefitting the engineered wood industry.

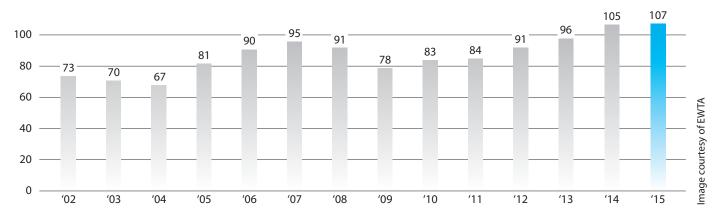
Membership has also been growing. After taking a dip during the recession in 2008, numbers have been on a steady incline. This year, EWTA reached an all-time high of 107 members -- and the association continues to grow.

While Info Fair and membership dues contribute significantly to the association's financial strength, the *Engineered Wood Journal* magazine has brought balance and stability to the EWTA bottom line. In April of 2009, EWTA assumed

management of the magazine, which had been overseen by APA and published by Naylor Publications (which also sold all of the advertising). In those years EWTA received a small royalty fee based on Naylor's sales, with Naylor retaining the lion's share. Royalties were less than \$1,000 that first year with Naylor. Beginning with the fall 2011 issue, EWTA brought the advertising and publishing services in-house, resulting in annual net revenues averaging more than \$25,000 ever since.

Driven by strong member support for Info Fair, the *Engineered Wood Journal* magazine and membership dues, EWTA continues to meet its mission to support the industry and make connections between APA members and their suppliers while maintaining a sustainable financial footing.

Kerwood attributes much of the association's success to strong support from APA staff, along with a commitment to the EWTA mission from the APA Board of Trustees and APA members on the EWTA Advisory Committee.



The Engineered Wood Technology Association has seen its share of ups and downs over the years, but membership has been steadily climbing since 2009

#### **EWTA Governance Today**

The details of EWTA membership can sometimes be confusing. APA members are automatically members of EWTA — although EWTA members are not automatically members of APA.

EWTA functions as a wholly-owned subsidiary of APA, governed by the APA Board of Trustees and by an Advisory Committee comprised of APA and EWTA associate members. The Advisory Committee, chaired by an APA member company representative, identifies, plans, authorizes and funds specific projects and activities. The day-to-day operations are run by a managing director whose services are funded by associate member dues and program revenue. The managing director and other EWTA staff serve under the terms of contractor agreements with APA.

"They've worked hard to build bridges between APA and EWTA," said Kerwood. "They've really helped improve awareness of who we are and what we do."

In addition to providing innovation and connections to the industry, APA staff has provided logistical support, oversight, publications and other member benefits.

"APA members and the APA Board of Trustees have reached out to our exhibitors and members at Info Fair," said Kerwood, "and with a trustee as Advisory Committee chair, we have a stronger connection than ever before between our associations."



#### Into the Future

Seven decades after its founding — and 48 years after associate members were welcomed into the fold — the focus of EWTA's mission and its association with APA continues to evolve. What began as a research-focused foundation has shifted and grown into an association that places great value on sharing information and advancing the engineered wood industry as a whole.

Ed Elias, APA president, has recognized the value of the intellectual capital embodied by EWTA members and has been working with the APA Board of Trustees to more effectively leverage the partnership between EWTA and APA, particularly in expanding the voice of the industry.

"EWTA's membership has grown steadily over the past several years, and networking relationships between the two organizations continue to expand," said Elias. "This sets the stage for sharing aggressive new goals."

The combined knowledge of EWTA and APA members can be used effectively to support a number of industry initiatives, from advancing processing technologies and systems and environmental compliance with regulators to product labeling and personnel recruitment, said Elias.

"Our partnership is strong," said Elias, "and we need only to define our boundaries."

Sheila Cain (scain@engineeredwood. org) is communications director of the Engineered Wood Technology Association and editor of its Engineered Wood Journal.



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## **DRIVING OUR FUTURE**

APA Annual Meeting and Info Fair Overview

t's been a bumpy road, but finally the economy and engineered wood industry is back on course. APA hosts its Annual Meeting with this in mind Oct. 17-20 at the Coeur d'Alene Golf and Spa Resort in Coeur d'Alene, Idaho.

The meeting's theme — Back to Our Future: Driving the Road to Success — will be prevalent throughout the four-day event, with guest speakers, workshops and roundtable discussions that highlight how our industry can continue on the path to prosperity. EWTA joins the line-up with its annual Info Fair supplier exhibition.

The extended weekend program begins on Saturday with the convening of a number of advisory, marketing and management committees — including the EWTA Advisory



Dr. Thomas Maness

Committee and the Adhesives and Technical Subcommittee. EWTA welcomes meeting attendees with a reception that evening from 5:30 to 7 p.m. Sunday is a day for social interaction and some healthy competition: the golf tourna-





Dr. John Innes

Dr. Paul Winistorfer

ment, tennis tournament and the Cripple Coot Shoot all take place in the morning. Info Fair kicks off Sunday evening with its supplier exhibition and a reception.

Monday's general session begins with a trio of panelists from the academic



community presenting perspectives on how the industry is changing, new approaches in forestry and wood products curricula, building material research and how it's applied, and the face of today's students who will be joining the industry. All deans at their respective universities, the panelists are:

- Dr. Thomas Maness, Cheryl Ramberg-Ford and Allyn C. Ford Dean of the College of Forestry and Director of the Oregon Forest Research Laboratory at Oregon State University;
- Dr. John Innes, Dean of the Faculty of Forestry at the University of British Columbia; and

Dr. Paul Winistorfer, Dean of the College of Natural Resources and Environment at Virginia Tech.

In a follow-up to the general session, the panelists will respond to additional questions and lead a conversation on the role universities play in defining the industry's future in a roundtable discussion format. A second roundtable discussion held later in the afternoon and will be led by representatives from the Composite Panel Association, APA and an adhesive expert to cover emerging environmental regulations surrounding VOCs and formaldehyde. Attendees will find out how emerging regulations may

expand the impact on the industry and how associations and manufacturers are responding.

Monday's day-long Safety and Health Workshop is anchored by a mid-morning safety presentation by Joe Estey, the national manager for Safety Engineering and Training Services for Advanced Technologies and Laboratories. In the presentation, entitled, "Safety Transformation: Engaging the Head and the Heart," Estey will discuss how transformation requires real effort on issues that matter equally to those responsible for leading organizations as well as those performing the work. Throughout the

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day, the Safety and Health Workshop will feature presentations on critical safety topics.

In addition to the Sunday evening reception, EWTA's Info Fair will be open on Monday from noon to 1:30 p.m. during the buffet lunch, featuring booths from dozens of equipment manufacturers, product suppliers and service providers. It will also be open Monday evening from 5:30 to 7 p.m., coinciding with a reception to kick off that evening's Chairman's Dinner and Safety Awards Program. Here, APA members who have made significant advances in mill safety will be honored, along with the winners of EWTA's Supplier Awards.

As always, the Annual Meeting allows plenty of time for networking and relaxing. The Spouses' Program offers three choices on Monday: shopping and lunch in downtown Spokane, a nature hike at Mineral Ridge, or a hands-on experience at a glass studio. The Coeur d'Alene Resort Spa also offers a number of services.

Registration for the Annual Meeting begins at the resort on Saturday at 10 a.m. and continues through 5:30 p.m. See the schedule of events at right for the complete meeting agenda.

### **Schedule of Events**

(As of publication. Check the APA meeting agenda for latest schedule.)

	SATURDAY, OCT. 17	
	10 am – 5:30 pm	APA Registration Desk Open
	10:30 am - Noon	EWTA Adhesives and Technical Subcommittee
	11 am – 1 pm	International Market Subcommittee (APA members only)
	12:30 – 3 pm	Glulam Management Committee (APA members only)
	2 – 2:30 pm	Info Fair Exhibitor Meeting (exhibitors only)
	3 - 4 pm	EWTA Advisory Committee
	3 – 5 pm	I-Joist Management Committee (APA members only)
	4 – 5:30 pm	Industrial Market Subcommittee (APA members only)
	4:30 – 5:30 pm	Chairman's Reception (invitation only)
	5:30 – 7 pm	EWTA Reception
	SUNDAY, OCT. 18	
	7:30 - 10 am	Nonresidential Market Subcommittee (APA members only)
	8 am – 2 pm	Cripple Coot Shoot
	10:30 am - 12:30 pm	Tennis Tournament
	10:30 am - 3:30 pm	GolfTournament
	11 am – 5:30 pm	APA Registration Desk open
	5– 7:30 pm.	Info Fair and Reception
	MONDAY, OCT. 19	
	7 – 8:30 am	Buffet Breakfast
	8 am – 5 pm	Registration Desk Open
	8 am – 5 pm 8:30 – 10:15 am	General Session
	·	<u> </u>
	·	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of
	8:30 – 10:15 am	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry
	8:30 – 10:15 am 10:30 – 11:30 am	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation
	8:30 – 10:15 am 10:30 – 11:30 am 10:30 – 11:30	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs
	8:30 – 10:15 am 10:30 – 11:30 am 10:30 – 11:30 10:30 am – 5 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop
	8:30 – 10:15 am 10:30 – 11:30 am 10:30 – 11:30 10:30 am – 5 pm 10:30 – Noon	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)
	8:30 – 10:15 am 10:30 – 11:30 am 10:30 – 11:30 10:30 am – 5 pm 10:30 – Noon 10:30 am – 3:30 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities
	8:30 – 10:15 am  10:30 – 11:30 am  10:30 – 11:30  10:30 am – 5 pm  10:30 – Noon  10:30 am – 3:30 pm  Noon – 1:30 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities  Buffet lunch and Info Fair
	8:30 – 10:15 am  10:30 – 11:30 am  10:30 – 11:30  10:30 am – 5 pm  10:30 – Noon  10:30 am – 3:30 pm  Noon – 1:30 pm  1 – 1:50 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities  Buffet lunch and Info Fair  Roundtable Discussion: Emerging Environmental Regulations
	8:30 – 10:15 am  10:30 – 11:30 am  10:30 – 11:30  10:30 am – 5 pm  10:30 – Noon  10:30 am – 3:30 pm  Noon – 1:30 pm  1 – 1:50 pm  2 – 4:30 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities  Buffet lunch and Info Fair  Roundtable Discussion: Emerging Environmental Regulations  Marketing Advisory Committee
	8:30 – 10:15 am  10:30 – 11:30 am  10:30 – 11:30  10:30 am – 5 pm  10:30 – Noon  10:30 am – 3:30 pm  Noon – 1:30 pm  1 – 1:50 pm  2 – 4:30 pm  5:30 – 7 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities  Buffet lunch and Info Fair  Roundtable Discussion: Emerging Environmental Regulations  Marketing Advisory Committee  Info Fair and Reception
	8:30 – 10:15 am  10:30 – 11:30 am  10:30 – 11:30  10:30 am – 5 pm  10:30 – Noon  10:30 am – 3:30 pm  Noon – 1:30 pm  1 – 1:50 pm  2 – 4:30 pm  5:30 – 7 pm  7 pm	General Session  Keynote: Back to Our Future: Defining the strategic rebirth of the forest products industry  Special Presentation: Spotlight on Safety Transformation  Roundtable Discussion: University Programs  Safety & Health Workshop  Residential Market Subcommittee (APA members only)  Spouses' Programs - three optional activities  Buffet lunch and Info Fair  Roundtable Discussion: Emerging Environmental Regulations  Marketing Advisory Committee  Info Fair and Reception
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The **2015 EXHIBIT FLOOR PLAN** with booth numbers is shown on page 38.

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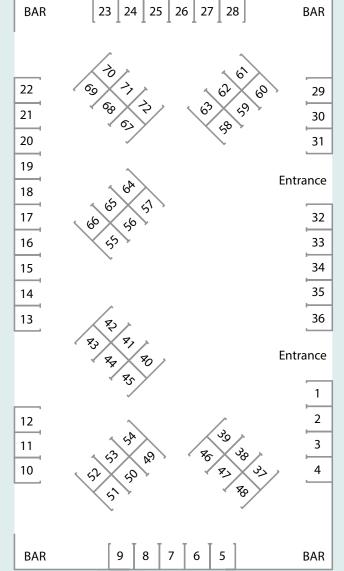
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# **SUPPLIER AWARDS 2015**

**Celebrating Member Accomplishments** 



The 2015 EWTA Supplier of the Year winners will be announced at the APA Annual Meeting in Coeur d'Alene, Idaho, in October, as well as in the Spring 2015 issue of the Engineered Wood Journal.

Supplier of the Year Awards are given to EWTA member companies and chosen by votes of APA members. The awards are based on quality, service and delivery of EWTA member products, equipment and services provided to APA members. Awards are presented in each

of EWTA's three membership categories: Equipment/Tooling, Materials/Supplies, and Consulting/Services.

At right is a list of Supplier of the Year Award candidates (sorted by member type).

# SUPPLIER OF THE YEAR AWARD CANDIDATES

APA members will choose Supplier of the Year winners in three categories (Consulting/Services, Equipment/Tooling, and Materials/Supplies) based on quality, service and delivery. Below is a list of the candidates (all EWTA members):

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# **HEATING UP**

# Thermal Modification Testing on Engineered Wood Products

by Matt Aro

ood used in adverse conditions is often treated with chemicals to prevent decay and improve water resistance. But even before the science of cell wall chemistry was understood, ancient Vikings knew that if they burned the outsides of their ships, the wood would resist water. Thermal modification of wood is an old idea that is meeting with modern technologies. Industrial-scale kilns have been developed to produce thermally modified wood for a wide variety of applications.

Thermal modification improves the dimensional stability and durability of wood products, and significant progress has been made in broadening its application over the last 20 years. The advantages of thermal modification include an attractive darker color, reduced equilibrium moisture content, improved dimensional stability and increased resistance to degradation from rot-inducing fungi. Thermal modification can also reduce environmental impacts by providing an eco-friendly alternative to some chemical preservatives.

Currently, thermally modified wood is used primarily for solid wood flooring, external cladding and decking products; and the vast majority of research has been conducted on solid wood. However, a survey project funded by the National Science Foundation and led by the University of Minnesota Duluth Natural Resources Research Institute (UMD NRRI) is exploring the effects of thermal-modification processing variables on engineered wood products.

This project has the potential to break the barrier from limited solid-wood-only applications while creating new knowledge that advances the platform toward new high-volume and in-demand engineered wood product markets. Key project partners include industry, research organizations, industrial engineering experts, academia and economic developers.



Laminated strand lumber (LSL) is removed from the thermal-modification kiln after treatment.

Photo courtesy of UMD NRRI

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# **Potential Industry Benefits**

So far, results are showing that thermal modification of finished engineered wood products can improve their water resistance and reduce swelling, whether used in conventional or new applications. However, some mechanical properties decreased significantly at treatment temperatures exceeding 160°C (320°F). More extensive performance testing is underway, including resistance to fungal decay, tensile and compression strength and shear strength. This testing, along with data analysis, is expected to be complete by the end of 2015.

These results provide a technical baseline that may help advance thermal modification technology from primarily solidwood-only applications toward new, high-volume engineered wood markets. With further research, it may be possible to optimize the treatment technique(s) to ensure that the products retain sufficient mechanical strength for the desired end-use applications. Project results, if ultimately brought to commercialization, may potentially bolster the critical U.S. forest products industry by increasing U.S. economic competitiveness, increasing the number of jobs (many of them in rural and lesser-populated areas, which greatly need them), increasing revenues for manufacturers and accelerating the export of new products.

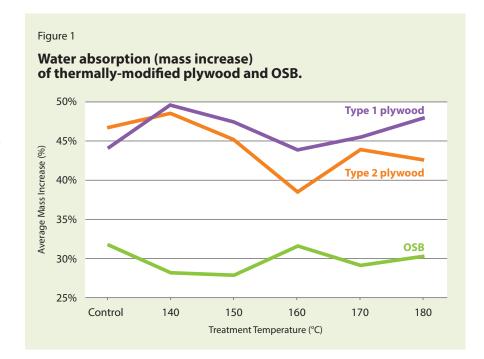
# Materials and Testing Methodology

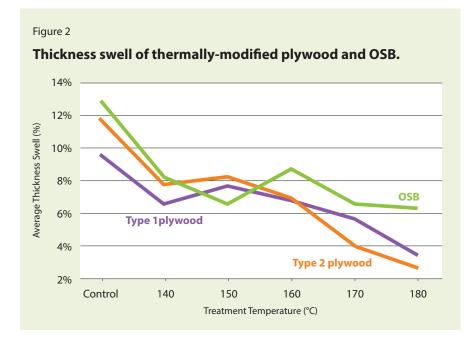
In this study — officially called the Thermal Modification Research for Engineered Wood Materials project — oriented strand board (OSB), Exposure 1-rated plywood (Type 1), Exterior-rated plywood (Type 2), 1.55E laminated strand lumber (LSL), and 2.0E laminated veneer lumber (LVL) were thermally modified as a post-treatment at 140°C (284°F), 150°C (302°F), 160°C (320°F), 170°C (338°F) and 180°C (356°F) using a hygrothermal modification method. After thermal modification, the materials were subjected to a range of mechanical

and physical performance tests according to industry-recognized standards, including water absorption/thickness swell (after a 24-hour water soak), bending strength, fastener-holding strength, internal bond and tensile strength testing.

Preliminary results show that thermal modification can substantially improve

the thickness swell and water absorption properties of these products, even at low treatment temperatures. The mass increase (via water absorption after a 24-hour water soak) and thickness swell of the thermally modified plywood and OSB are shown in Figures 1 and 2, respectively (below.)





# Thanks to APA





Metriguard President Jim Logan was honored to receive the 2014 Bronson J. Lewis Award and says thanks to APA – The Engineered Wood Association for the recognition. Metriguard is proud to be a member of the EWTA and appreciates the value of membership. Jim also wants to thank the Engineered wood products industry for supporting Metriguard over the last 4 decades.

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The thickness swell and mass increase (after a 24-hour water soak) of the thermally-modified LSL and LVL are shown in Figures 3 and 4, respectively (below.) The equilibrium moisture content (EMC) (at 20°C [68°F], 82 percent relative humidity) of thermally modified LSL and LVL decreased substantially. The EMC of the LSL improved from 9.8 percent (non-modified) to 7.0 percent and 5.3 percent at the 150°C and 180°C treatment temperatures, respectively. Similar results were found with the thermally modified LVL.

Bending strength of the thermally-modified plywood and OSB specimens tended to decrease with increasing treatment temperatures, while stiffness (modulus of elasticity, or MOE) was generally maintained. The bending strength of thermally modified LSL and LVL also generally decreased with increasing treatment temperatures, while stiffness increased with moderate treatment temperatures.

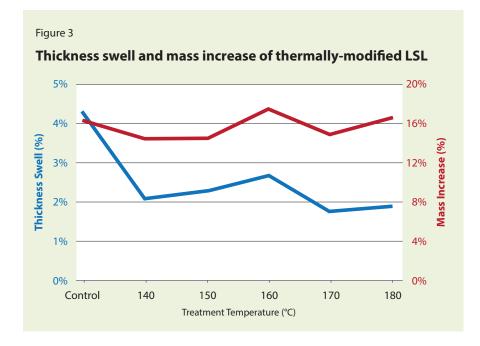
The average internal bond (IB) for the plywood generally decreased with increasing treatment temperatures, while the IB of the OSB increased slightly at the lower treatment temperatures before decreasing at the higher treatment temperatures. The IB of the LSL decreased slightly at the 150°C (302°F) treatment temperature before decreasing more drastically at the higher treatment temperature before decreasing more drastically at the higher treatment temperatures. The average nail-holding strengths for all products were not greatly affected by the thermal-modification treatments.

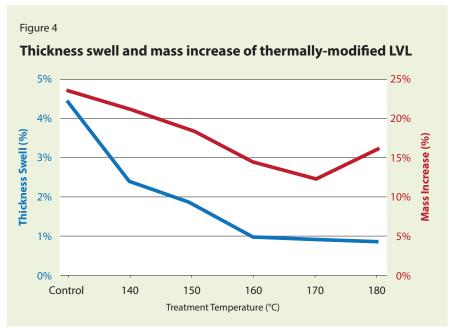
# **Possible Applications**

Based on the improved moisture resistance properties, these types of products could do well in environments with high precipitation and high humidity. However, as some of the mechanical properties degrade considerably at high treatment temperatures (which is true for almost all thermally modified wood), thermally modified plywood or OSB may potentially be best used as subfloors in wet areas such as a bathroom or mudroom in a home or as sink basins in a bathroom or kitchen. There is also strong potential for the products to be used in less traditional applications where the possible reduction in strength isn't as important, such as wood windows and doors.



A thermally-modified LVL specimen undergoes bending strength testing.





It is hoped that this study will bring about a greater understanding of the benefits — and drawbacks — of thermal modification on engineered wood, as well as foster potential opportunities for the use of such products in current and new applications.

Matt Aro is a research fellow at the UMD NRRI. For more information or to receive more extensive testing results not reported in this article, please contact Aro at (218) 720-2700; or maro@d.umn.edu.

#### DISCI AIMER

Our research results are based upon work supported by the National Science Foundation Partnerships for Innovation Building Innovation Capacity (PFI: BIC) subprogram under Grant No. 1237798. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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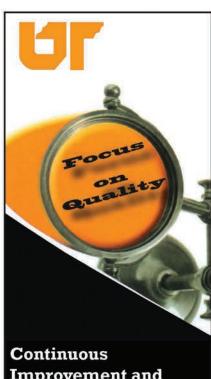
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# CHEMICAL REACTION

How GHS Impacts Workplace Safety

by Kim Stier

ccording to the Occupational Safety and Health Administration (OSHA), Hazard Communication (HazCom) violations are ranked among the 10 most frequently cited workplace violations. Violations of the HazCom standard include deficiencies in the written hazard communication program; employee information and training; developing and maintaining safety data sheets; and labeling of containers. These violations can result in expensive fines, but worse yet can result in employee injuries and/or fatalities.

In an effort to enhance worker protection and improve the handling and safe use of chemicals, OSHA recently adopted the United Nations' Globally Harmonized System of Classification

and Labeling of Chemicals (GHS). This update is intended to provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and safety data sheets internationally. It is also intended to improve the quality and consistency of hazard information in the workplace and likewise reduce trade barriers for American businesses -- including suppliers of the engineered wood products industry -- that regularly handle, store and use hazardous chemicals.

# **Baseline Definition**

As a starting point, what does being GHS compliant mean? It simply means that companies that have chemicals anywhere in their supply chain must be compliant with the guidance set forth according to their country's adoption of



Standardized GHS Pictograms shown with example hazard.

GHS guidelines. GHS aims to globally harmonize chemical safety information to drive continuous improvement of the working environment and reduce risks which may lead to an incident or injury. GHS compliance does not ensure safety under all circumstances, but strives toward improving knowledge of chemical hazards and encourages the elimination or substitution of hazardous chemicals, especially carcinogens, mutagens and reproductive toxins, with less hazardous alternatives.

While achieving GHS compliance does mean that certain standards have been met, there is no guarantee that a site will be compliant now and forever. Revisions to the UN GHS Purple Book every two years will continue to drive updates to agency regulations at varying intervals going forward. Also, the chemicals that a facility uses or produces along with

available chemical information will change over time and require reassessment of safety data sheets (SDSs) and labels. It can be challenging for organizations to keep up with the constant change, especially if there are large numbers of chemicals on site. To manage the change and potential vulnerabilities, implementation of management and reporting solutions -- along with chemical approval policies and technology -- are highly recommended.

# GHS Adoption Around the World

GHS has been implemented around the world starting with early adopters in Europe, Japan and New Zealand. Depending on the time of adoption, countries have implemented differ-

ent versions of GHS spanning from the original version to version 5. The United Nations is expected to release version 6 of GHS this year.

After years of research, committee meetings, and public hearings, the United States began its transition to GHS in 2012 which became effective in June of this year. The United States adopted GHS and is implementing under its Hazard Communication Standard (HCS) 2012, CFR 1910.1200.

In February, Canada announced it will be incorporating GHS by modifying WHMIS (1998), which is based on the requirements contained in the Hazardous Products Regulations (HPR) and Hazardous Products Act (HPA) (2014) to WHMIS 2015. Both Canada and the United States have adopted the third edition of GHS.

GHS compliance presents an enormous challenge to industry in creating compliant SDSs and labels for worldwide distribution. Each country has adopted different revisions and even endpoints from each revisions of the United Nation's Purple Book, which were the basis of their GHS implementation. Therefore, it is difficult to reuse GHS-compliant SDSs between countries. Understanding how GHS has been adopted and implemented in a specific jurisdiction by each country or region will help ensure organizations meet mandatory SDS and label requirements.

# The United States' Adoption of GHS

Under the new Hazard Communication Standard, an SDS (previously known as a material safety data sheet), must contain the new GHS classifications for health and physical hazards. Additionally, HazCom 2012 requires the use of GHScompliant labels, which must include mandated standardized information that allows users to quickly identify potential health and physical hazards that may result from exposure. The new information is presented as Hazard and Precautionary statements along with standardized pictograms.

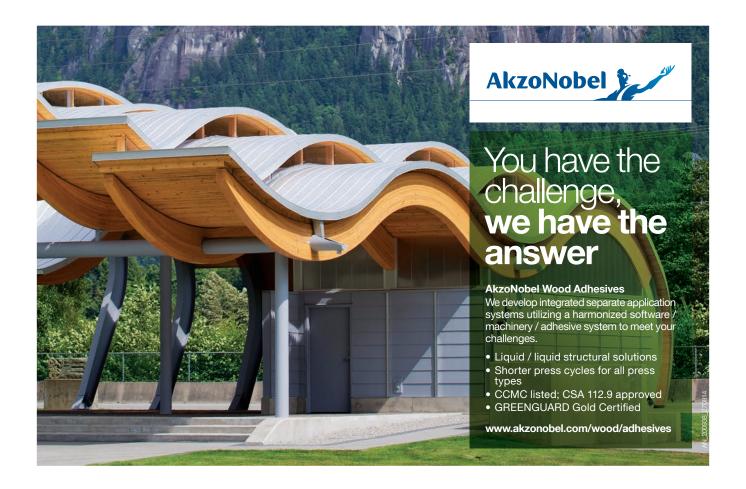
On July 20, 2015, OSHA published the "Inspection Procedures for the Hazard Communication Standard" CPL 02-02-079. The 124-page directive provides guidance on all areas of hazard communication including safety data sheets, labels and training.

Key points of the inspection procedures for Hazard Communication Standard include:

• SDS Creation. The manufacturer or importer must make a good faith effort to update their SDS documents to comply with HCS 2012 even when they do not receive the information required from their upstream suppliers. Manufacturers and importers must be able to provide documentation that they attempted to gain classification information and SDSs from upstream suppliers, looked to alternative sources

for chemical hazard information and attempted to classify data themselves.

- SDS Maintenance. A 16-section GHS compliant SDS must be distributed with the initial shipment of the material as well as the first shipment after an SDS has been updated. Employers must maintain SDSs for each of the hazardous chemicals they receive.
- Written HCS Program. A written Hazard Communication program is required. An OSHA inspector will review to determine if requirements are being met. These include the designation of person(s) responsible for labeling on shipment containers, workplace labeling, obtaining and maintaining SDSs, and conducting training. In addition, OSHA requires a chemical inventory to be included in the written program. The inventory must include all chemicals present including stored chemicals or those no longer in use. The inventory must include a product identifier for each chemical that corresponds to the SDS or label. Named party on an SDS



must also be the same named party on the label. If an employer is maintaining an SDS for a particular chemical but uses it from a different manufacturer, they are not in compliance.

• Labeling. Manufacturers and importers must comply with HCS labeling requirements as of June 1, 2015. Distributors will have until December 1, 2015, to comply with the labeling requirements unless they are relabeling the materials. If the distributor relabels or replaces the manufacturer or importer name with their own, the distributor must comply with requirements as of June 1, 2015.

# **Don't Fly Solo**

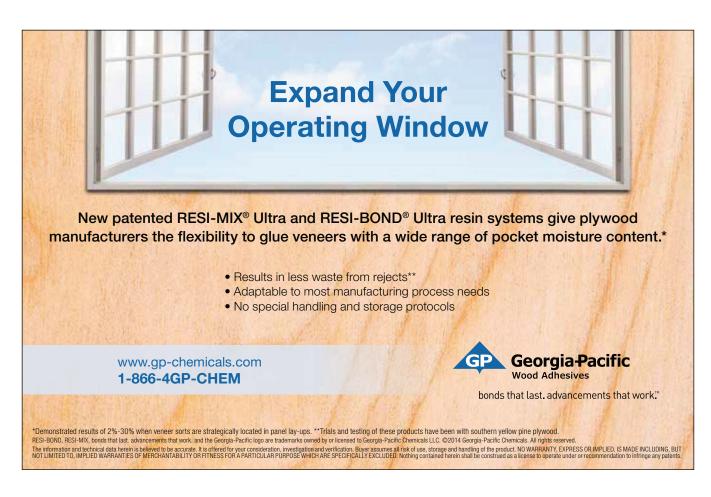
Inevitably, chemical inventories change whether used for maintenance or as a raw material in the production of an end product. Lack of proper chemical data management can lead to a vulnerable and unsafe environment for your workforce. Far from being complicit, the internal environmental, health and safety (EHS) resources responsible for hazard communications are often stretched thin.

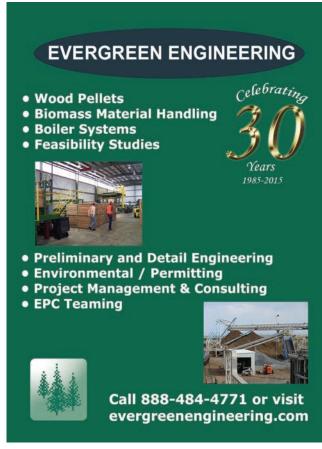
So what's the solution? Increasingly, managing chemical data through technology-based solutions has become attractive and necessary to save both time and money while providing additional

expertise. Organizations can benefit by centralizing their chemical information into one database that is accessible to their workforce, no matter where they are located. Smart and proactive organizations are realizing that a data-driven approach to becoming GHS compliant is the best way to protect their workforce. And a safe workforce is definitely a good thing.

Kim Stier is chief industry and innovation officer at SiteHawk, a chemical data management and compliance solutions provider. For more information about SiteHawk, visit www.SiteHawk.com.









# **SAFETY STAND-OUTS**

# APA Announces 2014 Safety Award Winners

PA recently announced the winners of its 2014 Safety and Health Awards, a program that encourages and recognizes safety and operational excellence in the North American structural panel and engineered wood industry. Anthony EACOM Inc. and LP won Safest Company Awards in their respective categories, while the coveted Innovation in Safety Award went to two winners: Weyerhaeuser of Grayling, Mich., for the Equipment-Based Innovation Award, and LP of Wilmington, N.C., for the Process-Based Innovation Award (now also known as the Jeff Wagner Award for Wagner's passion and dedication to improving safety in our industry).

LP earned top honors among companies with four or more mills, with a 2014 average Weighted Incident Rate (WIR) of 3.03. Anthony EACOM Inc., which produces I-joists, won its award in the category for companies with three or fewer mills. The company posted a perfect 0.00 WIR for 2014.

The Weyerhaeuser Grayling mill's original "Fire Hose Nozzle" equipment innovation and the LP Wilmington mill's "Pinch Point Safety" program took top honors out of 20 Innovation in Safety Award entries.

Seventy-six APA-member structural wood panel and engineered wood product facilities in the U.S., Canada, and abroad participated in the 2014 program. A total of 12 facilities representing seven APA member companies — Anthony EACOM Inc., Boise Cascade Company, Louisiana-Pacific Canada Ltd., LP, Norbord, RoyOMartin, and Weyerhaeuser — earned awards in various competition categories. Some of the mills were multiple award winners.

In addition to the Safest Company and Innovation awards, other competition categories include Safety Improvement, Annual Safety and Health Honor Roll, Three-Year Safety Award, and Incident Free Honor Society. Sixteen mills achieved a zero-incident rate for the year and thus were named to the Incident Free Honor Society. The annual honor roll, three-year average, and safety improvement categories are divided into three divisions based on the type of product manufactured at the mill.

The 2014 Safety and Health Awards program is coordinated through the APA Safety and Health Advisory Committee. Winning facilities and companies will be recognized and their safety accomplishments celebrated during the Chairman's Dinner at APA's annual meeting in October in Coeur d'Alene, Idaho.

INCIDENT FREE HONOR SOCIETY	Product	WIR	TIR
Abitibi – LP Engineered Wood Larouche, Quebec	IJ	0.00	0.00
Abitibi – LP Engineered Wood Saint Prime, Quebec	IJ	0.00	0.00
Anthony EACOM Inc. Sault Ste. Marie, ON	IJ	0.00	0.00
<b>Louisiana-Pacific Canada Ltd.</b> Fort St. John, BC	OSB	0.00	0.00
<b>Louisiana-Pacific Canada Ltd.</b> <i>Golden, BC</i>	LVL	0.00	0.00
<b>Louisiana-Pacific Canada Ltd.</b> <i>Maniwaki, QC</i>	OSB	0.00	0.00
<b>Louisiana-Pacific Canada Ltd.</b> Swan Valley OSB, Minitonas, MB	OSB	0.00	0.00
<b>LP</b> Panguipulli, Chile	OSB	0.00	0.00
<b>LP</b> Red Bluff, CA	EWP	0.00	0.00
<b>LP</b> Sagola, Michigan	OSB	0.00	0.00
<b>LP</b> Thomasville, AL	OSB	0.00	0.00
<b>LP</b> Wilmington, North Carolina	EWP	0.00	0.00
<b>LP Brasil</b> Ponta Grossa, PR, Brazil	OSB	0.00	0.00
<b>Norbord</b> Nacogdoches, TX	OSB	0.00	0.00
<b>Rosboro</b> Springfield, OR	Glulam	0.00	0.00
<b>Weyerhaeuser</b> Arcadia Plant, Simsboro, LA	OSB	0.00	0.00

# APA Safety and Health Advisory Committee Members

Mike Wacker, Chairman Plum Creek

**Greg Ellisor**, *Vice-chairman* Weyerhaeuser

Terry Evans Boise Cascade Company

Brian Goldade Potlatch Corporation

Keith Harned

Dwight Midles Olympic Panel Products LLC

Sam Newbill Hood Industries, Inc.

Peter Quosai Norbord

Randy Schillinger Pacific Woodtech Corp.

Terry Secrest Roy O. Martin

Curtis Swindell, Jr. Abitibi-LP Engineered Wood



INNOVATION	I IN SAFETY A	WARD			
•	haeuser – Grayling, MI ent-Based Innovation Winner: Fire Hose Nozzle				
LP – Wilmingt	ton, NC				
Jeff Wagner Pro	cess-Based Innov	vation Winner:		Pinch Poir	nt Safety
SAFEST COM	IPANY AWARI	OS .	AVERAGE WII	R AVERA	AGE TIR
Anthony EAG	OM, Inc.		0.00	0	00
(Companies wit	h three or fewer i	mills)	0.00	0.	
(Companies wit	h four or more m	nills)	3.03	0.43	
ANNUAL SAF	ETY AND HE	ALTH HONOR RO	DLL		
Division I (Pl	ywood)			WIR	TIR
1st Place Ro	yOMartin – (	Chopin, LA		3.34	0.71
2nd Place Bo	oise Cascade (	Company – Florie	n, LA	4.77	1.19
Division II (O	SB)			WIR	TIR
1st Place LP	– Thomasville	, AL		0.00	0.00
2nd Place <b>Lo</b>	uisiana-Pacif	ic Canada Ltd. –	Fort St. John, BC	0.00	0.00
Division III (GI	ulam, I-Joist a	nd SCL)		WIR	TIR
1st Place Lo	uisiana-Pacif	ic Canada Ltd. –	Golden, BC	0.00	0.00
2nd Place <b>LP</b>	– Wilmington	, NC		0.00	0.00
THREE-YEAR	SAFETY AWA	RD (2012-2014)			
Division I (Ply	wood)			Avg. WIR	Avg. TIR
RoyOMartin	– Chopin, LA			3.68	1.12
Division II (OS	5B)			Avg. WIR	Avg. TIR
LP – Sagola, MI			0.00	0.00	
Division III (Glulam, I-Joist and SCL)			Avg. WIR	Avg. TIR	
LP – Wilming	ton, NC			0.00	0.00
SAFETY IMP	ROVEMENT A	WARD (2012-20	14)		
Division I (Ply	wood)				
		Kettle Falls, WA		77.8% Impro	
2012 WIR 29.98	2013 WIR 26.41	2014 WIR 06.50	2012 TIR 7.19	2013 TIR 5.48	2014 TIR 2.50
		1 3.00			
Division II (OS				61 760/ Jeens	woment
Norbord – Co 2012 WIR	2013 WIR	2014 WIR	2012 TIR	<b>61.76% Impro</b> 2013 TIR	2014 TIR
6.33	4.13	2.54	0.88	0.83	0.85
Division III (Gl	ulam, I-Joist a	nd SCL)			
		<b>Ltd.</b> – Golden, BC		100% Impro	
2012 WIR 0.54	2013 WIR 0.43	2014 WIR 0.00	2012 TIR 0 54	2013 TIR 0.43	2014 TIR 0.00
0.54	0.43	0.00	0.54	0.43	0.00

# **EWTA Spring Meeting Featured APA Research Center**

The EWTA Advisory Committee held its Spring meeting April 23 at APA headquarters in Tacoma, Wash.; the day following the Washington State Universityhosted International Wood Composites Symposium in downtown Seattle the two days prior. Committee members heard a progress report on the Coalition for Fair Energy Codes from APA Field Services Director Tom Kositzky, an update on APA activities from APA President Ed Elias, and an overview on VOCs and current regulations from APA Quality Services Director Steve Zylkowski. The committee spent the latter half of the meeting touring the APA research center and learning about the programs and research APA is participating in.



Ben Herzog, lab manager in APA's Technical Services Division, led the tour of the APA research center for EWTA Advisory Committee members.



Aaron Bauer, lead technician in APA's Technical Services Division, talks to the EWTA Advisory Committee about projects underway in the APA lab.

# APA Joins Canadian Wood Council

APA was approved for membership in the Canadian Wood Council (CWC) at a meeting of the CWC Board of Directors in March. While APA has had a long-standing membership for glulam products, this new and expanded membership includes APA's wood structural panel interests.

"This expanded membership provides representation for the APA panel producers at the CWC," said CWC Chair Kent Fargey. Fargey is president of APA-member Western Archrib and has represented the APA glulam manufacturers on the CWC board for several years.

At the annual general meeting of the Canadian Wood Council in Quebec City, Quebec, the CWC Board of Directors elected APA Market Communications Director and Corporate Secretary Marilyn Thompson to serve as a director. APA members Robert Fouquet, Norbord; Mac Palmiere, LP; and Larry Broadfoot, Tolko; were elected to serve as member delegates. Kent Fargey, Western Archrib, is the current chair of the CWC and was re-elected as a director.

At the Canada Wood Group annual meeting in Ottawa, Quebec, APA President Ed Elias was re-elected as director to the board.

"The Canadian Wood Council is an important industry partner for APA, and we look forward to taking a more active role with CWC as we work to represent our members' interests in Canadian codes, standards, and market education initiatives," said Elias.

# Certification Approval Achieved by APA

An agreement between APA and BM TRADA was signed this past spring whereby APA member mills may be

approved for the use of CE marks upon demonstration of compliance to European product standards and the EU Construction Product Regulation (CPR) under BM TRADA's CE certification program. BM TRADA is a UK-based, international certification body accredited by major accreditation bodies. The CE mark is required for all construction products used in the 27 EU countries.

Under the agreement, APA has been approved to conduct testing and inspection of member mill products in accordance with European standards and the CPR. As part of the program, Niresh Somile, a technical expert from BM TRADA, traveled to APA's Tacoma, Wash., offices to conduct training of APA staff on the European standards and regulations as well as BM TRADA's inspection program. He also traveled to three APA members mills in order to observe APA auditors as they conducted





certification inspections to the European standards. As a result of this agreement and the BM TRADA approval of key APA auditing staff, successful testing and inspection of the mill's production and quality processes can provide approval of the mill to use CE marks under BM TRADA's certification program.

# **Recent APA Retirees: Staff Additions**

Three long-time APA staff members recently retired from the company, and several others have joined the association.

Quality Analyst Gene Zellner retired from APA in May after nearly 34 years. He held many positions within APA,

ranging from quality auditor to director and research technologist within the Quality Services Division. Zellner also served on the EWTA Advisory Committee.

Senior Engineer Ed Keith leaves APA after 31 years. Keith helped guide numerous code change proposals and also was the principal author of the 2009 and 2012 editions of Guide to the IRC Wood Wall Bracing Provisions.

Cheryl Weaver retired after 36 years as an administrative assistant with APA's Ouality Services, Market Communications and Technical Services Divisions. She has supported the quality auditing staff, helped start the Info Fair supplier exhibition, and assisted APA's engineers and scientists with documentation supporting the product certification services.

Several new and returning staff members have joined APA in recent months. They include:

- Diana Glassman, product support specialist in the Technical Services
- Tony Cameron, staff engineer in the Technical Services Division
- Julie Cutlip, payroll coordinator in the Financial and Administrative Services department
- Noriko Suzuki, quality analyst in the Quality Services Division
- Jared Hensley (located in the Denver area), Asma Momin (in Dallas), Nick Wortel (in Atlanta) and Daren Graham (in Houston), engineered wood specialists with the Field Services Division.
- Matt Brown, engineered wood specialist, transferring from Dallas to Chicago area
- Janet Blaisdell, administrative assistant, supporting the Field Services and Coalition for Fair Energy Code teams



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# **EWTA Welcomes Eight New Members**

EWTA recently welcomed eight new members to the association.

• Brunette Machinery Company Inc. (www.brunettemc.com) of Surrey, B.C., specializes in wood processing machinery and material handling systems for the forestry and biomass industries. President Kirk Forbes can be reached

at kirk@brunettemc.com.

- Dupré Minerals Limited (www.passivefirecoatings.com) of Staffordshire, England, manufacturers of both active and passive fire protection products. Export Sales Director John Whitehurst can be reached at jwhitehurst@goodwingroup.com.
- ESOT (www.esotx.com) of Waco, Texas, is the South Central U.S. distributor for SonicAire fans (www. iesclean.com) which provide continual and safety compliant cleaning of fugitive combustible dust and lint. President Darryll Cloudt can be reached at dcloudt@esotx.com.
- Flexpak Corp. (www.polycovers.com) of Bend, Ore., provides woven wrap and packaging solutions to wood, lumber, and composites markets. Sales manager Ryan Hackbarth can be reached at sales@polycovers.com.
- IMA America Corp. and Schelling America Inc., of Raleigh, N.C., engineer customized industrial manufacturing solutions as well as standard machinery solutions. Sales coordinator Samantha Clark can be reached at samantha.clark@ima.schelling.com.
- Kalesnikoff Lumber Co. (www.kalesnikoff.com) of Castlegar, B.C., offers more than 1,000 different products from lamstock to dimensional timbers, clears and commons. Marketing Coordinator Andrea Kennedy can be reached at andreak@kalesnikoff.

# • Meinan Machinery Works Inc.

(www.meinan.co.jp) of Nagoya, Japan, has been developing and manufacturing veneer and plywood machinery, including fully automatic veneer peeling lines, green veneer composers, scarf composers and automatic layup lines, for more than 60 years. Company representative Esturo Tame can be reached at e.tame@meinan.co.jp.

• Tebulo NA Ltd. (www.tebulo-na.com) of Hamilton, Ontario, Canada, provides technology for marking, labeling and barcoding, and uses robotics for stenciling sidewall identification as well as end striping and coding. Tebulo's Jon Vanspronsen can be reached at jvanspronsen@tebulo-na.com.





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# USNR Acquires Söderhamn Eriksson

USNR recently announced that is has acquired Söderhamn Eriksson of Mariannelund, Sweden, and all of its subsidiaries from Cellwoodgruppen AB. The Swedish company supplies machinery and systems to sawmills worldwide. It is known for its log lines and edger systems, as well as for its Cambio debarker.

USNR company leaders expect the acquisition will help USNR to more broadly introduce and support its products in Europe, according to a company press release.

Henrik Lefvert will continue as managing director of Söderhamn Eriksson, and no interruptions to ongoing projects, services, or other operations are expected as a result of this acquisition.

# Norbord and Ainsworth Complete Merger

Toronto, Ontario-based Norbord and Vancouver, B.C.-based Ainsworth Lumber Co. announced the completion of their merger April 1. This follows approval of the merger by shareholders in January.

Peter Wijnbergen, president and chief executive officer of Norbord, said in a press release that "with a larger mill network we will be in a better position to serve customers' evolving needs and meet increasing demand as the recovery in the U.S. housing market continues."

The two companies have said the allstock \$667 million (\$763 Canadian) deal will create one of the world's largest and lowest-cost producers of oriented strand broad.

# Bayer Material Science Changing Name

Bayer MaterialScience recently announced in a press release that the company is changing its name to Covestro.

The company's separation from Bayer AG will enable it to be floated on the stock market as a separate company by mid-2016.

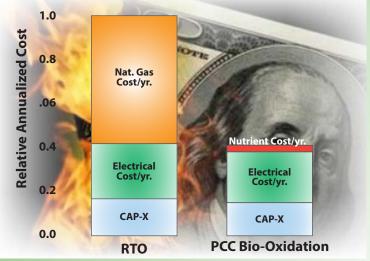
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# **UPCOMING** connections

# 2015

# **OCTOBER**

- **7-9** Southern Forest Products Association 2015 Annual Meeting, Myrtle Beach, S.C., www.sfpa.org
- **13-15** Southern Oregon Occupational Safety and Health Conference, Ashland, Ore., www.orosha.org
- **14-16** Under 40 Leadership Summit Building Design + Construction, Chicago, Ill., www.bdcnetwork.com
- **17-20** APA Annual Meeting and EWTA Info Fair, Coeur d'Alene, Idaho, www.apawood.org, www.engineeredwood.org

#### **NOVEMBER**

- **3-5** 2015 North American Association of Floor Covering Distributors + North American Building Materials Distribution Association Annual Convention, Orlando, Fla., www.nbmda.org
- 4-6 NAWLA Traders Market 2015, Dallas, Texas, www.nawla.org
- **11-12** International Fiber/Wood-Based Panels Conference 2015, Chicago, Ill., www.awa-bv.com/events
- 18-20 Greenbuild International Conference and Expo, Washington, D.C., www.greenbuildexpo.com
  - 19 WoodWorks Northwest Wood Solutions Fair, Seattle, Wash., www.woodworks.org

# DECEMBER

- **1-4** Western Pulp, Paper and Forest Products Safety and Health Conference, Portland, Ore., www.orosha.org
  - 9 WoodWorks Southern California Wood Solutions Fair, Anaheim, Calif., www.woodworks.org

# 2016

#### **JANUARY**

**19-21** National Association of Homebuilders International Builders' Show 2016, Las Vegas, Nev., www.buildersshow.com

# **APRIL**

- **7-8** Panel and Engineered Lumber International Conference and Expo (PELICE), Atlanta, Ga., pelice-expo.com
- **17-20** Composite Panel Association Spring Meeting, Tucson, Ariz., www.compositepanel.org

#### MAY

**19-21** American Institute of Architects Convention 2016, Philadelphia, Penn., convention.aia.org

# JUNE

27-29 Forest Products Society 70th International Convention, Portland, Ore., www.forestprod.org

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