



Involving people in creating a sustainable future through local efforts to reduce, reuse, and recycle

LUMBER: A Recycling Market For Plastic

By Lori Stole

A new annual conference was launched this past February by Resource Recycling; Plastics Recycling 2006, The North American Plastics Recycling Conference. Among the many sessions was one on recycled plastic lumber (RPL). Presenters included Dr. Prabhat Krishnaswamy of Engineer Mechanics Corporation, Dr. Jennifer Lynch of Rutgers University and Alan Robbins from The Plastic Lumber Company. They provided a picture of the recycled plastic lumber industry.

Lumber made from recycled plastic has been manufactured for over 15 years. Initially the quality of RPL varied greatly lot-to-lot and between manufacturers so it was used for non-load bearing applications such as picnic tables, benches, parking stops and landscape objects. Its use in structural applications has been impeded by a lack of standards and specifications, but those are being developed now. Today, RPL and RPL composites are an industry of about \$700 MM/year, and projected to triple by 2010. There are more than 50 products, including ones sold by large lumber companies such as Weyerhaeuser, Louisiana Pacific and Georgia Pacific.

Use of recycled plastic resin for lumber has the potential for turning large volumes of post-consumer plastics into end products. It is effective in wet high- environments with no added chemicals. It's splinter-free but needs to be pre-drilled. On the downside there are flammability issues to consider, it's heavier than wood and more expensive. The leading use of RPL today is for decking applications.

Initially this market was dominated by single polymer resin systems, primarily high density polyethylene (HDPE). More recently, biocomposites have made huge market gains, partly due to the high price of HDPE, and these now lead the market. Biocomposite systems combine plastic with wood, flax, rice hulls, etc. These products are suitable for decking, railing and other applications.

Research efforts are looking at how to improve properties using various polymer blends and processing methods. Fiberglass reinforced PL has a small share of the market. Immiscible polymer blends are being developed at Rutgers University. They are looking at products using the mix of curbside plastic left after removing the more useful PET and HDPE. New polystyrene PL products are being introduced into specialty lumber markets.

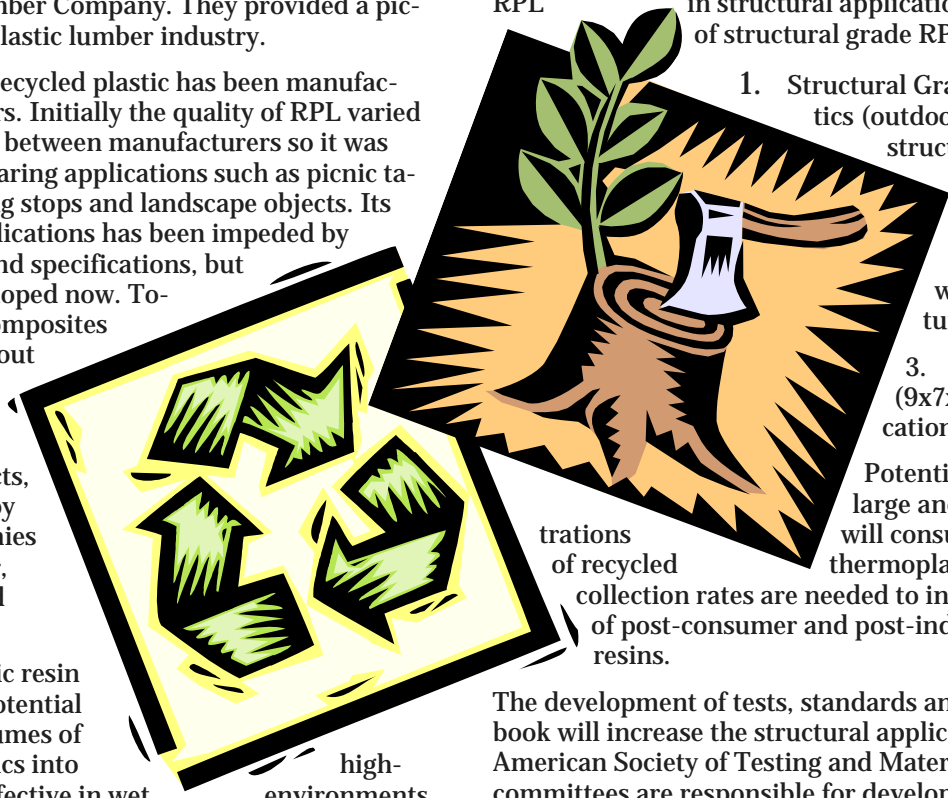
RPL in structural applications: Three classes of structural grade RPL are recognized:

1. Structural Grade Recycled Plastics (outdoor commercial structures, 2xs and 3xs)
2. Recycled composite timbers (6x and larger for waterfront structures)
3. Railroad ties (9x7x102 for RR applications)

Potential markets are very large and even small pen- will consume large volumes thermoplastic resins. Greater collection rates are needed to increase the supply of post-consumer and post-industrial recycled resins.

The development of tests, standards and a design handbook will increase the structural applications of RPL. American Society of Testing and Materials (ASTM) sub-committees are responsible for developing plastic lumber standards and nine standards have been developed to date. In the case of railroad ties, the American Railway Engineering and Maintenance-of-way Association (AREMA) is responsible for standards, and they are also being developed.

A design handbook for structural grade RPL will be published later in 2006. It will account for the unique properties of RPL that differ from wood: mechanical properties such as stiffness, temperature effects, time and sustained load effects, hygrothermal cycling and fastener and bolted



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designs.

There are 175,000 miles of railway track in the U.S. with 3,000 ties/mile. Wood ties rot, require chemical treatment and wood quality is not as good as it used to be. This leads to 10-15 million ties being replaced annually. For these reasons plastic is a good option. Plastic railroad ties are mostly made from a primary matrix of HDPE reinforced with other recycled plastic such as polystyrene (PS). This market is growing, doubling in the last 5 years, but still inhibited by cost. In 2004 only 0.05% of the new ties installed were made from plastic lumber.

A plastic lumber trade association was created in 1993, (www.plasticlumber.org) with goals to:

- establish standard testing procedures
- promote standards of quality within the industry
- promote the use of recycled plastics
- strive to facilitate cooperative projects
- aim to facilitate public awareness and promote the acceptance of PL

In summary, RPL is an opportunity for using large quantities of otherwise waste plastic. It can be used in some structural applications and offers some advantages over the traditional wood lumber, but there are some differing properties to consider. Initial materials cost is higher but plastic lumber lasts longer so the life cycle cost is lower. At end-of-life most thermoplastic recycled lumber can in turn be recycled if there is a system in place to do so.

Plastic lumber from PVC, rubber/plastic composites and the few formulations using thermoset plastic can't be recycled. Unfortunately those materials must be landfilled.

PVC: While production of PVC plastic lumber systems has increased markedly in the last 3 years, they do not utilize recycled plastic. It requires special dedicated tooling, both because it's corrosive and because it's a contaminate to other systems. Also the many fillers used in some PVC recipes inhibit recyclability. There are now over 13 varieties of PVC or PVC/bio composite decking products, using virgin PVC.

To learn more about next year's Plastics Recycling 2007 conference in Dallas, Texas see: www.plasticsrecycling.com.

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From the President with Betty Patton



Dear Members,

This is the month when I think about gardening. I probably should have thought of it earlier so ours wouldn't be in such bad shape. But more and more things are budding and blooming now. I love spring.

Metro provides us with information on healthy soils, benevolent bugs, alternatives to pesticides, and lots of great guides on making compost. But nothing is more inspiring than touring successful pesticide-free gardens. So put July 16th on your calendar. That is when Metro highlights beautiful gardens throughout the region by opening dozens of household gardens for tours. Nothing beats

teaching by example. There will also be lots of knowledgeable volunteers on hand at each site to answer your questions about how to duplicate the highlighted successes.



Until July though, check out Metro's website for instructions and inspiration. There are guides for making worm bins, tips on how to care for a lawn, and ideas for planting native plants. It makes sense that plants that are native to our region require less care and are naturally resistant to gardening problems in the Pacific Northwest. This translates into reduced pesticide use and water savings, too.

I want to thank all of the good gardeners in this area. Your efforts make our city gorgeous! And our planet livable.

Sustainably, - Betty

Common agenda established by Oregon environmental community

For the 2005 session of the Oregon Legislature, the approximately 70 members of the Oregon Conservation Network (OCN) decided for the first time to come together to create a common environmental agenda of legislative priorities. Because that experiment was deemed to be successful, OCN members have again begun crafting a common agenda for the 2007 session.

On Monday, April 3, about 40 members of OCN groups met to start the process of deciding what proposals would be selected for 2007 legislative agenda. Recycling Advocates, the Association of Oregon Recyclers, and OSPiRG jointly submitted a proposal entitled "Solving the E-waste Dilemma - Creating an electronic waste recovery system in Oregon." Thanks to RA Board member Katy Daily for taking the lead on drafting that proposal.

A total of 15 proposals were submitted by the various OCN member groups for consideration on April 3. After presentations from the nominating groups (consultant Pamela Brody-Heine graciously agreed to make our presentation), all of the groups voted on which bills were to be selected for the common agenda.

And while the final decision on what bills made the cut won't be made until a second meeting in June, our proposal came in third in the voting in two separate straw polls! Indeed, after the first vote, it appeared E-waste had gotten enough votes to qualify for the common agenda outright. Ultimately, it was decided to re-evaluate the proposals that came in third through sixth, but it does seem quite likely our E-waste bill will be selected.

Each of the proposals will be under much more scrutiny in June and we will need to be much further along in lining up sponsors and supporters by that time, let alone deciding on the correct approach (right now, we're leaning toward an approach that is similar to the legislation that recently passed in Washington). So while it definitely isn't a given that we will make the cut, we do appear to be positioned really well.

- Rhett Lawrence

2005 a record year for paper recovery

A report issued this week by the Washington-based American Forest & Paper Association (AF&PA) announced that 51.5 percent of the 99.6 million tons of paper consumed in the U.S. last year was recovered for recycling, a record high. These figures include the various grades of paper and paperboard.

With China and India's demand for recovered paper on the rise, the paper recycling market in the U.S. has awak-

ened from a mid '90s slumber when a glut of paper on the market depressed prices. The growing market for recovered paper will allow U.S. cities to expand paper recycling programs with office paper being the biggest target for these efforts. The AF&PA has set a 55 percent paper recovery goal for 2012.

-Resource Recycling Magazine

Local partnership to recycle electronics scarp announced

Far West Fibers, Inc (FWF) and Total Reclaim announce a partnership to accept and recycle electronic scrap. All four of the FWF facilities are accepting e-scrap for a fee. All material collected is transferred to Total Reclaim for recycling at their Seattle facilities. FWF joined with Total Reclaim because both organizations have similar views regarding product stewardship. Total Reclaim offers a wide variety of e-scrap recycling and has the ethic of local recycling for jobs in the Pacific Northwest. Total Reclaim was involved in developing and passing Washington's new e-scrap legislation.

- Rick Paul

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Recycling Advocacy Calendar for May 2006

◆ Master Recycler's Plastics Roundup

Saturday, May 6

When: Saturday, May 6th, 8:00am-1:00pm
(volunteer shifts: 7:00am-11:00am and
11:00am-2:30pm)

Where: SE PCC Center (2305 SE 82nd), PCC
Sylvania Campus (12000 SW 49th Ave), Sunset
Presbyterian (14986 NW Cornell Road)

Volunteers are still needed. Please contact Pat
Pullen-Jones nmppj@comcast.net to sign up.
Indicate your location and time preference -
flexibility is appreciated.

◆ Putting Sustainability into Action

Tuesday, May 9

Half-day morning workshop in Portland on
using sustainability assessments to set priori-
ties and make measurable progress in chemical
management, greenhouse gas and energy au-
dits, etc. Sponsored by the Oregon Natural Step
Network and Zero Waste Alliance. \$125 - \$140.
Register at www.ortns.org or call 503-241-1140.

◆ Annual WSRA Conference

Sunday – Wednesday, May 21 – 24

Annual conference of the Washington State

Recycling Association.

In Spokane. Call 206-244-0311 or go to www.wsra.net/Conference/Conference.html for info.

◆ Recycling Advocates May board meeting

Tuesday, May 30, 7:30 p.m.

For location and information call 503-777-0909



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