

Out of the woods

Plastic lumber products can be an environmentally responsible purchasing choice

by Robert Waters

IN BRITISH COLUMBIA, the cabinet-directed Climate Change Action Plan has provided the impetus behind recent changes to the provincial procurement guidelines to support provincial economic, social and environmental priorities that include a myriad of growth and beautification plans leading up to the 2010 Olympics.

In BC, whose identity has long been associated with the beauty of Canada's natural forests, the call for environmentally responsible procurement represents a unique emotional challenge. The use of virgin wood has come under scrutiny. This may be especially true when it comes to the iconic red cedar picnic tables and benches seen everywhere one looks. However, the BC public sector is finding its way out of the woods by using a readily available, cost-effective and environmentally conscientious alternative that has come of age.



Plastic lumber is now a viable substitute for virgin wood in many public sector applications. The latest generation of plastic lumber is ideal for picnic tables, park benches, decking, gazebos, boardwalks, walkways, and pedestrian bridges. Landscaping uses include bollards (thick post to secure hawsers or lines to), posts, fencing, edging, borders, retaining walls, and raised beds.

The composition of the plastic lumber used for these applications is high-density polyethylene (HDPE) and polypropylene (PP) recovered from post-industrial and/or post-consumer waste streams. The material is superior to wood in that it is resistant to wear, impact, water, salt, oils, chemicals, fungus, insects, graffiti and UV rays. It is virtually maintenance free; – it will not warp, crack, splinter, rot, flake, stain, chip or blister, and it resists absorption of moisture and bacteria. It is non-toxic, requires no chemical coatings, and is easily washed. It requires no special tools, cuts like wood, can be drilled,

mitred, routed, sanded, works with any deck fastener, and can hold screws and nails better than wood.

There are three important factors to consider when deciding when to use plastic lumber and which type to use:

1. the structural characteristics of the material;
2. the load-bearing requirement of the application; and
3. the environment in which it will be used.

Plastic lumber expands and contracts when temperatures fluctuate, and has a lower stiffness and strength than wood. Depending upon the application, these characteristics may dictate design changes, or prohibit its use in load-bearing structures or extreme climates. Higher-priced fibreglass reinforced plastic lumber offers more strength and stiffness, but one should inquire about whether it meets engineering standards for your application.



2x6 "plastic wood" picnic table installed at Golden Ears Provincial Park, BC.

The term "plastic lumber" is also used to refer to plastic/wood composite products, which typically contain 50 percent low-density polyethylene (LDPE) and 50 percent sawdust or other recycled wood. They are more wood-like in appearance, and are frequently used for decking applications. The wood content in composites makes them susceptible to colour-fading, insect and moisture damage.

The economic benefits of using plastic lumber are significant.

- Over the last few years, the market price of red cedar has reached the price of plastic lumber.
- Throughout North America municipalities and parks boards have substantially reduced their maintenance and replacement costs by installing plastic lumber picnic tables and benches that will last 25 years or more with little to no maintenance.

The environmental benefits of using plastic lumber may be the most important.

- In environmentally responsible procurement, the emphasis is on dematerialization (using less "stuff" and striving for 100 percent recycled content) and substitution (using less harmful material and/or more easily renewable). Plastic lumber made from recycled plastic lasts longer and is easier to renew than wood, requires no harmful preservatives, and is recyclable.
- The production of plastic lumber utilizes plastic being recovered from municipal waste streams. The millions of tons of plastics that are being incinerated or sent to Canada's landfill sites each year are a potential supply of raw materials for plastic lumber. Plastic recycling has become more economical and prevalent as the market for recycled plastic has grown. The benefits to municipalities of the demand for recycled plastic include reduced litter, reduced costs for litter cleanup, reduced use of landfill space and the avoidance of incineration.
- Using plastic lumber reduces pressure on our forests and atmosphere. Plastic lumber reduces demand on red cedar from our natural forests, and pine from our plantations. The use of plastic lumber also decreases the amount of

wood that ends up in landfills. Once in the landfill, wood contributes to methane gas emissions. Methane is a greenhouse gas that remains in the atmosphere for approximately 9-15 years, and is over 20 times more effective in trapping heat in the atmosphere than carbon dioxide (CO₂).¹

- The use of plastic lumber avoids the use of harmful wood preservatives. Virgin wood used for landscaping and site furnishings is typically treated with chemicals to protect it from insects and the elements. Effective January 1, 2004, Health Canada² and the US Environmental Protection Agency (EPA) banned the treatment of certain wood products with chromated copper arsenate (CCA), including all products with intended use in residential locations, such as play-structures, decks, picnic tables, landscaping timbers, patios, and walkways/boardwalks.³ The industry replaced CCA with ACQ (ammoniacal copper/quaternary ammonium compound), which has since been found to have its own environmental challenges.⁴

The revised procurement guidelines of the BC government are a good example of public policy encouraging the use of plastic lumber. The foremost environmental objective to be met during the procurement of goods or services by provincial ministries is “to provide an



4x6 wheelchair accessible “plastic wood” table at Golden Ears Provincial Park, BC.

environmental role model for government procurement by making it a priority to use environmentally responsible products and services, where feasible and cost effective.” The guidelines refer to “recycled plastic outdoor-wood substitutes” as an example of an environmentally preferable product category.⁵

In 2007, the Resort Municipality of Whistler was recognized with the Green City Award for exemplary planning and development that balances protection of the natural environment and promotion of the tourism economy. The town’s sustainable procurement guidelines provide a process for identifying a required product and its contents, assessing the sustainability impact, and identifying and choosing alternatives. The guidelines recommend plastic lumber as a preferred substitute for virgin wood in building fences, decks, picnic tables, benches and children’s playground structures.⁶

¹ US EPA. *Climate Change: Methane*

Online: <http://www.epa.gov/methane/index.html> (Apr. 27, 2007)

² Health Canada. *Fact Sheet on Chromated Copper Arsenate (CCA) Treated Wood*

Online: http://www.pmra-arla.gc.ca/english/pdf/fact/fs_cca-e.pdf (May 2005)

³ US EPA. *Regulating Pesticides: Chromated Copper Arsenate (CCA)* Online:

<http://www.epa.gov/pesticides/antimicrobials/reregistration/cca/> (April 16, 2008)

⁴ US EPA. Comparison of Environmental Emissions from ACQ (Type B) and CCA Wood-Treating Operations

Online: <http://www.p2pays.org/ref/18/17473.pdf>

⁵ BC Government. *Guidelines for Procurement of Environmentally Responsible Products and Services* Online:

<http://pss.gov.bc.ca/psb/environmentally-responsible-procurement.html>

⁶ Resort Municipality of Whistler. *Whistler2020 Moving Toward a Sustainable Future, Sustainable Purchasing Guidelines*

Online: <http://www.whistler2020.ca/whistler/site/genericPage.acds?context=1967998&instanceid=1967999>

Other municipalities are following suit. Over 50 municipalities in BC have made the decision to

purchase plastic lumber site furnishings and have started installing them. 

Robert Waters has provided business consulting and project management services to wholesalers/distributors, and to ministries of the BC government. One of his clients, Wishbone Industries, is a manufacturer and distributor of plastic lumber and site furnishings located in Langley, BC. He can be contacted at rewaters@telus.net.