

Sustainable Landscape Construction:

Materials and Products — Manufactured Lumber¹

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THERE ARE TWO types of manufactured lumber: plastic and composite. Plastic lumber is either single-resin or co-mingled plastic. Single-resin plastic lumber is made from just one type of plastic — either high-density polyethylene (HDPE) or polyvinyl chloride (PVC). HDPE plastic has a high recycled content, usually from milk, juice, water or margarine containers and from trash and retail bags. HDPE can be recycled into new products. PVC, however, is virgin material and is typically not recycled. Co-mingled plastic lumber is made of two or more plastics and its performance is sometimes more variable because different plastics have different tolerances for stress. Composite lumber blends other materials — such as fiberglass, wood, peanut hulls, or straw — with recycled plastics. Bio-composite lumber, which combines wood, flax, or rice hulls with a thermoplastic matrix, has a biological content greater than 50%. Bio-composite lumber is not recyclable due to the mix of plastic with biological materials. Both types of lumber are very durable. They will not splinter or peel, and they are very stain resistant. Both are also resistant to insects and decay. Lumber is available in hollow, solid and structural solid grades. Hollow grade is used for low-load deck surfaces, fences and deck rails. Solid grade is used for medium-load deck surfaces, benches, picnic tables, planters, and fences. Plastic and composite lumber is generally more expensive initially than similar wood products but when maintenance and life-style costs are factored in, plastics and composites are less expensive. Strategies and techniques for using manufactured lumber include:

DESIGN STRATEGIES:

- **Use a high-recycled-content product** made from recyclable resins such as HDPE and LDPE (low-density polyethylene).
- **Limit use of wood and plastic composites.** Because these mix biological and synthetic materials, they are not easily recycled.

- **Avoid products made with PVC, polystyrene, and non-recycled plastics.** These are associated with more chemical hazards.
- **Use manufactured lumber for projects near the ocean.** Both plastic and composite lumber are relatively non-toxic to aquatic animals and are appropriate for marine environments.

CONSTRUCTION TECHNIQUES:

- **Space joists closer together when using manufactured lumber.** For several reasons, manufactured lumber requires special joist spacing. Under high temperatures, plastic lumber, and, to a lesser extent, composite lumber, tends to bend or sag more than wood. Plastic lumber is also not as structurally strong as composites. Finally, plastic and composite lumber are both heavier than wood and their weight creates a heavier dead load (although hollow members can decrease the weight).
- **Use screws and bolts.** Screws and bolts are recommended for connections with plastic lumber, which has a high rate of expansion and contraction. Nails slowly work loose each time the boards expand.
- **Use manufactured lumber for ground contact.** Both plastic and composite lumber have very low moisture absorption and are resistant to decay, which makes them good for ground contact.
- **Use tools you have.** Most plastic and composite lumber can be cut and shaped with standard wood working tools.

Adapted from:

Calkins, M. (2009). *Materials for sustainable sites: A complete guide to the evaluation, selection, and use of sustainable construction materials*. Hoboken, NJ: John Wiley & Sons, Inc.

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