Material Choices in Public Playground Development

Great Lakes Park Training Institute
Tim Madeley, Presenter
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Playground Material Choices
Overview

• CCA Treated Wood
• Recycled Plastic Lumber
• Polyvinyl Chloride (PVC)
Green Playgrounds
CCA wood treatment

CCA
Treated Wood
Green Playgrounds
CCA wood treatment

CCA = Chromated
   Copper Arsenate

• Chromium  66%
• Copper     18%
• Arsenate   16%

• Applied with pressure treatment process
green Playgrounds
CCA wood treatment

• CCA wood treatment has been in use since the 1930’s

• Majority of treated wood since 1970’s contained CCA

• CCA is a registered chemical pesticide
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CCA wood treatment

• Growing concern about the possibility of arsenic exposure

• Arsenic exposure over time can lead to lung or bladder cancer

• In addition to treated wood, CCA exposure occurs naturally in food, air and soil around us all
Actual impact to children is based on several factors:

• number of days they play on the CCA treated playgrounds each year

• number of years they play on the CCA treated playground

• amount of arsenic picked up on their hands while they play

• amount of arsenic they ingest from their hands during play
In June 2001, the Consumer Product Safety Commission (CPSC) was petitioned to ban CCA from use on playground equipment. CCA producers reached a voluntary agreement with the EPA to end the manufacture of CCA for non-industrial uses by December 31, 2003.
| Green Playgrounds  
CCA wood treatment |
<table>
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<td>• According to the EPA and the CPSC, existing CCA treated playground equipment does <strong>not</strong> need to be removed</td>
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<td>• Penetrating stains and sealants have proven effective in reducing exposure to arsenic</td>
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<td>• Oil and water based stains and sealants are preferable to film forming coatings such as paint</td>
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Green Playgrounds
CCA wood treatment

If you chose to modify or maintain your existing CCA treated equipment such as benches, tables, play equipment, etc…

• All sawdust and debris should be disposed of properly

• Avoid frequent or prolonged inhalation of sawdust from treated wood

• After working with treated wood wash all exposed areas thoroughly
Green Playgrounds
CCA wood treatment

If you chose to dispose of your existing CCA treated playground equipment, etc...

- Disposal of treated wood by ordinary trash collection is allowed in many areas
- Do not burn treated wood in open fires or in fireplaces
- Treated wood can be burned in industrial incinerators
Several alternatives now exist for CCA treated wood:

- **Copper Azole** is made from 98% copper and 2% azole,

- **Ammonium Copper Quaternary (ACQ)**

- Both treatments can be more corrosive to plated fasteners – galvanized or stainless fasteners should be used.

- Both are approved for use on playgrounds by the EPA.
CCA Handout:

CCA-Treated Wood Fact Sheet

Prepared by CPSC / EPA Staff
Plastic lumber comes in a variety of different formulations. Some factors to consider are:

- Recycled content
- Materials used in its production
- Potential to be recycled
- Durability and load bearing capacity
Recycled content can vary from 0% to 100%:

- Post-consumer vs. post-industrial
- PlasTeak and Select from Bedford Technologies are examples of plastic lumber with 100% recycled content
- Boardwalk from CertainTeed and Forever-Wood are examples of materials with no recycled content
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Recycled Plastic Lumber

The material used in its production varies widely:

- Appropriate plastics vs. other plastics
- Single resin vs. composite materials

![Composite](image1.png) ![Single Resin](image2.png)
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Recycled Plastic Lumber

- Fiberglass reinforced material should be used in all load bearing applications.
- The addition of short strands of fiberglass doubles the strength and reduces the expansion and contraction by 50%.
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Recycled Plastic Lumber

Single resin manufacturers fall into two categories – extruders and low-pressure injection molders:

- Length of material
- Surface texture – slip resistance
- Issues with fiberglass reinforcement
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Recycled Plastic Lumber

Favor products:
- with high recycled content
- made from HDPE and LPDE

Limit use of products:
- made from wood-plastic composites
- made from commingled plastics

Avoid products made with:
- PVC and polystyrene
- fiberglass for non-structural uses
- virgin plastics
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Recycled Plastic Lumber

Plastic Lumber Handout:

Healthy Building Network
Plastic Lumber Product Ratings
Green Playgrounds
Polyvinyl Chloride

Polyvinyl Chloride (PVC)
Green Playgrounds
Polyvinyl Chloride

- Polyvinyl Chloride (PVC) is used in a variety of park and playground applications
- Most common form is plastisol – a pliable form of PVC
<table>
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<th>Polyvinyl Chloride (PVC) plastic poses problems throughout its life cycle:</th>
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<td>• Production</td>
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<td>• Use</td>
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<td>• Disposal</td>
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Green Playgrounds
Polyvinyl Chloride

Production Issues:

• Primary chemical component, Vinyl Chloride, is listed as a known carcinogen by the World Health Organization
• Poses health risks to workers and surrounding communities
• Terrorist concerns associated with the transportation of this chemical
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Polyvinyl Chloride

Use Issues:

- PVC contains many chemicals that evaporate or “off-gas”
- Phthalates are added to make the PVC flexible
- These additives leach out over time and can be ingested by children who come in contact
- Can cause kidney, liver and reproductive damage
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Polyvinyl Chloride

**Disposal Issues:**

- Due to the additives, it is very costly to recycle this material
- Less than ½ of 1% is recycled each year
- Cannot be incinerated due to the substances created by burning
Dioxin is an unintentional by-product of PVC combustion, and would most likely be left behind in ash and debris from a PVC fire.
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Polyvinyl Chloride
Green Playgrounds
Polyvinyl Chloride

- Maintenance workers must wear protective gear when handling burned PVC coated metal or contaminated resilient material.

- All contaminated debris should be disposed of properly.

- The local health department should inspect the area before the public is allowed access.
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Polyvinyl Chloride
Green Playgrounds
Polyvinyl Chloride

- Increasing public awareness on PVC subject
- Many cities are now banning or discouraging use
- Trend will be slow to build like CCA, but eventually force changes
A variety of alternative materials exist for use in playground applications:

- Recycled plastic lumber (reinforced where necessary)
- Treated lumber
- Polyurethane coated steel (textured where necessary)
Green Playgrounds
Recycled Plastic Lumber

PVC Handout:

General Environmental Concerns

Playground Specific Concerns
Sound environmental practices involve making informed decisions about the materials we use in our parks and playgrounds:

- CCA wood treatment
- Recycled plastic lumber
- Polyvinyl Chloride (PVC)
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