

vinyl in design



Solutions to Today's Design Challenges

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IDCEC

www.myncidq course #5958
CEU's 0.1 classification Basic, Designation : Welfare

Learning Objectives

Participants will be able to

- Identify the two raw ingredients used to make vinyl
- List two vinyl products that save energy in use
- Name the ingredient that makes vinyl naturally fire resistant
- Introduce AchieveGreen website

What if there was a material you could design with that...

- was **recyclable**
- was **durable, strong** and **lightweight**
- required **almost no maintenance**
- didn't support combustion
- was **safe** and **inert** to use
- helped **conserve energy** and other natural resources
- was made from one of the **most abundant** natural materials on the planet
- and that played a major role in the **health, safety, and welfare** of billions of people and **saved lives** around the world every day

Wouldn't you **want to know more?**

We thought **you would.**

vinyl in design

- Durability
- Maintenance
- Infrastructure
- Fire Safety
- Efficiency
- Aesthetics
- Recyclability
- Healthcare
- Sustainability
- Community
- Innovation

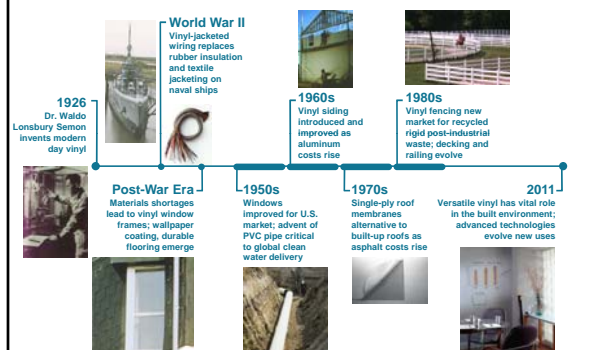


Basics

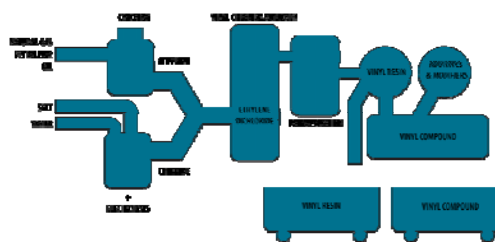
What is vinyl?

- A plastic material also known as polyvinyl chloride, or PVC
- Vinyl is made from salt—one of the most abundant materials on earth
- Uses less fossil fuel than any other plastic
- Comes in many versatile forms
- Largest volume plastic in buildings and construction

Vinyl Timeline



Production



Typical Uses

- Electrical insulation, boxes
- Supply, drain, waste and vent pipe
- Fencing, decking, railing
- Flooring—sheet, tile, plank, carpet backing
- Roofing and waterproofing membrane
- Cladding
- Wall covering and upholstery
- Windows and doors



Durability

- Vinyl solutions provide a long service life, ease of cleaning, reduced labor, mold resistance, improved facility quality and lower operating costs
- Minimal contribution to waste stream
- Improved facility quality, low operating cost
- Reinforced vinyl roofing lasts over 30 years
- Buried pipe has a theoretical service life of hundreds of years



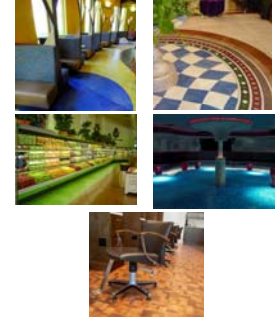
Maintenance

- No coatings required for cladding and frames
- Vinyl floor and wall covering are the preferred choice for installations that are subject to heavy traffic
- Vinyl coatings make other substrates safer and easier to maintain



Aesthetics

- Dining spaces
- Amazing vinyl designs
- Public spaces
- Fun spaces
- Hair salons
- Flooring, upholstery, case goods, wallcovering



Aesthetics

- Flooring, upholstery, casegoods, wallcovering



Ceiling



Railing



Infrastructure: Pipe

- Almost half of all vinyl goes into making pipe
- Vinyl pipe is the easiest to maintain
- Fewer breaks than any alternative
- Buried vinyl pipe has a theoretical service life of hundreds of years
- No buildup, scaling, pitting or corrosion
- Pumping through smooth vinyl pipe requires less energy
- Certified by NSF



Standard for the Design of High-Performance Green Buildings

Optimal Compliance Path to the IgCC 189.1 and 189.2 (healthcare)

ASHRAE/USGBC/IES Standard 189.1-2009

Fire Safety

- Widely tested to meet code requirements
- Inherently flame resistant
- Does not support combustion and reduces fire spread
- Combustion by-products are no more dangerous than other common building materials
- UL approved for cable and wiring insulation
- CPVC sprinkler systems commonly used



The National Fire Protection Association headquarters in Quincy, Massachusetts

What About PVC and Fire

- All materials that burn give off carbon monoxide (CO) and other toxic products
- Most, if not all fire victims die from exposure to CO
- After CO, other toxic products from smoke of any material are not significant in terms of what kills people in fires
- HCl from vinyl
 - Irritating warning smell
 - Condenses, dissolves in water

Wood	CO, benzene, acrolein
Nylon	CO, hydrogen cyanide
PU Foam	CO, hydrogen cyanide
PVC	CO, hydrogen chloride
Silk	CO, hydrogen cyanide
Polyolefins	CO, polyaromatic hydrocarbons, acrolein
SB Latex	CO, benzene, polyaromatic hydrocarbons
SBR Rubber	CO, benzene, sulphur dioxide
Wool	CO, hydrogen cyanide

Source: International Study of the Sublethal Effects of Fire Smoke on Survivability and Health
Richard G. Gann, et. al. for NIST, August 2001
<http://fire.nist.gov/bfrlpubs/fire01/PDF/F01080.pdf>

Energy Efficient Systems

- Vinyl windows and roofs are often Energy Star rated
- Vinyl windows, doors and pipes offer lower u-values than alternatives
- White roofs are reflective, lowering cooling loads and reducing heat island effect



Windows



Aesthetics

The Gates in Central Park had to be:

- Recyclable
- Lightweight
- Strong
- Easy to clean
- A single, precisely matched integral color



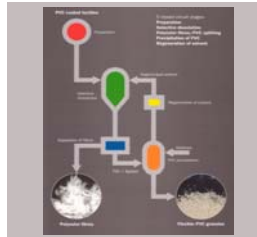
Recyclability

- Less than half petroleum
- Can be recycled repeatedly
- Resource efficient
- Millions of pounds recycled annually
- 99% manufacturing efficiency—vinyl cuttings, scrap easily heated, remolded
- Far less than 1% of materials in landfills



Recyclability

- Vinyl Loop or Taxy Loop



Performance

- Slip resistance
- Water proof
- No need for paints or harsh cleansers



Fun

- Window cover



The Gates

The Gates, Central Park, NYC
All vinyl was recycled

- Most of the "Gates" were recycled into a fence.
- Some were made into architectural scales.



Indoor Air Quality



Indoor Environmental Quality

- Acoustic windows
- Sound-block systems



Healthcare

- Environments of Care
 - 2006 Guidelines for Design and Construction of Healthcare Facilities
- Evidence Based Design
 - Support of CHER Research arm for The Center For Health Design
 - Infection Control Study
- AAHID (American Association of Healthcare Designers)
 - Industry Partner



Sustainability

- *"Vinyl is generally better for the environment than alternative materials."*
Life Cycle Assessment of PVC and of Principal Competing Materials, a six-year study by the European Commission, released June 2004
- *"No single material shows up as the best across all the human health and environmental impact categories, nor the worst"*
Final report study by USGBC, released February, 2007



Material Innovations

- New formulations advance performance capabilities
- Testing
- Technical



Aesthetics

- Amazing vinyl designs



