

# LINOLEUM 101

[ A lesson in Linoleum...  
the natural floor covering

[ AIA Course Number: LNO101

# Learning Objectives

[ This lesson will cover the history of linoleum and its resurgence due to the sustainable nature of the product along with its durability, design, health aspects and ease of maintenance

[ Objective 1: The resurgence of Linoleum

[ Objective 2: Linoleum – A Uniquely Sustainable Product

[ Objective 3: Key Benefits

[ Objective 4: Cost Analysis

# LINOLEUM—

An inventive mind and a can of paint left open by accident were the co-founders of the great linoleum industry. Its manufacture is as strange as its origin.



In this machine the plastic mixture of linoleum begins to take shape as a rug. Burlap from the long roll in front passes into the "calender" and there huge rollers press the linoleum mixture into the fibers to form a strong backing. Circle—Here is the molded inlay table where colored linoleum mix is sifted through pattern stencils onto the burlap back. Each color has a stencil cut to match perfectly with others to fill design.



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BOROUGH OF RICHMOND, TOPOGRAPHICAL SURVEY.

New York, June 1912  
New 35

SHEET NO. 44



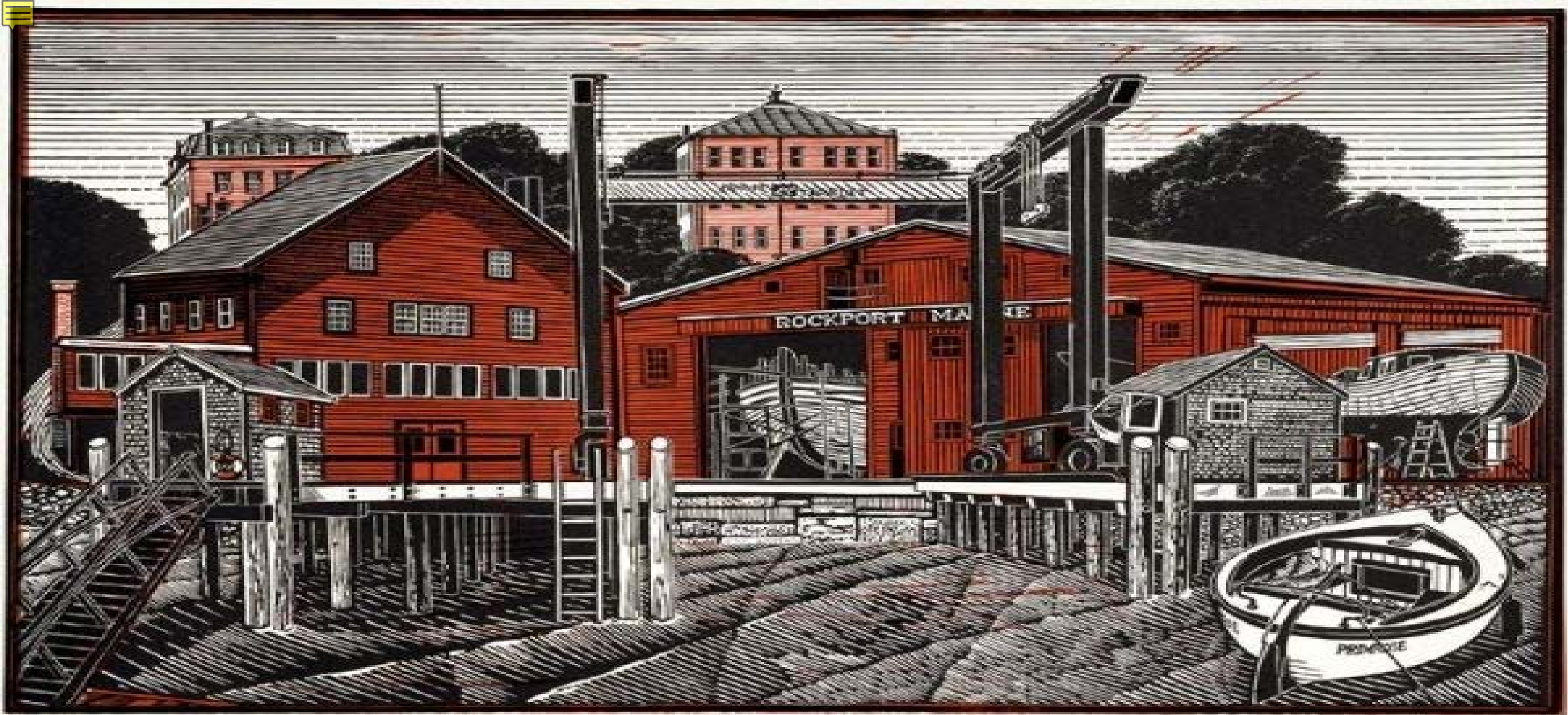
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# PLASTICS.

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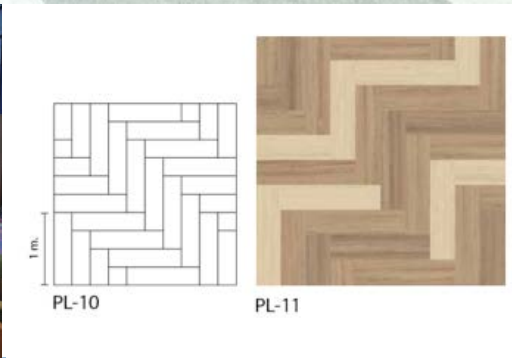






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# Linoleum - the Healthy Flooring Alternative

- [ With Americans spending 80-90% indoors, Linoleum is a Healthy alternative to traditional PVC flooring
  - [ Linoleum is naturally PVC and Phthalate Plasticizer Free
  - [ Natural Antimicrobial Efficacy\* with no added Biocide (pesticide/antimicrobial)\*\*
  - [ Recognized as a safe alternative to PVC for Asthma sufferers
  - [ Wet-set adhesive installation system reduces risk of mold growth under flooring compared to dry-set adhesive systems such as VCT







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+ tall oil



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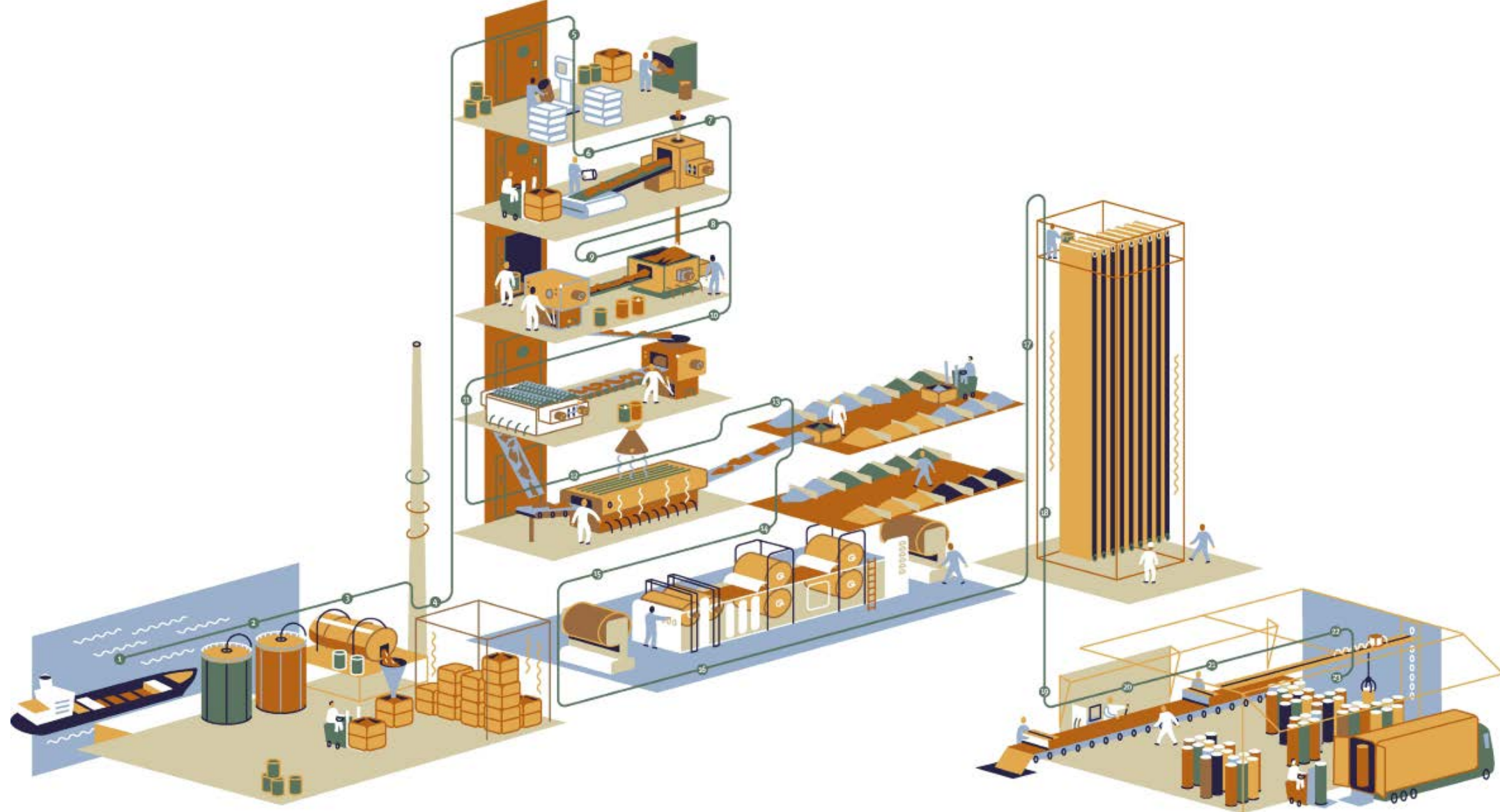






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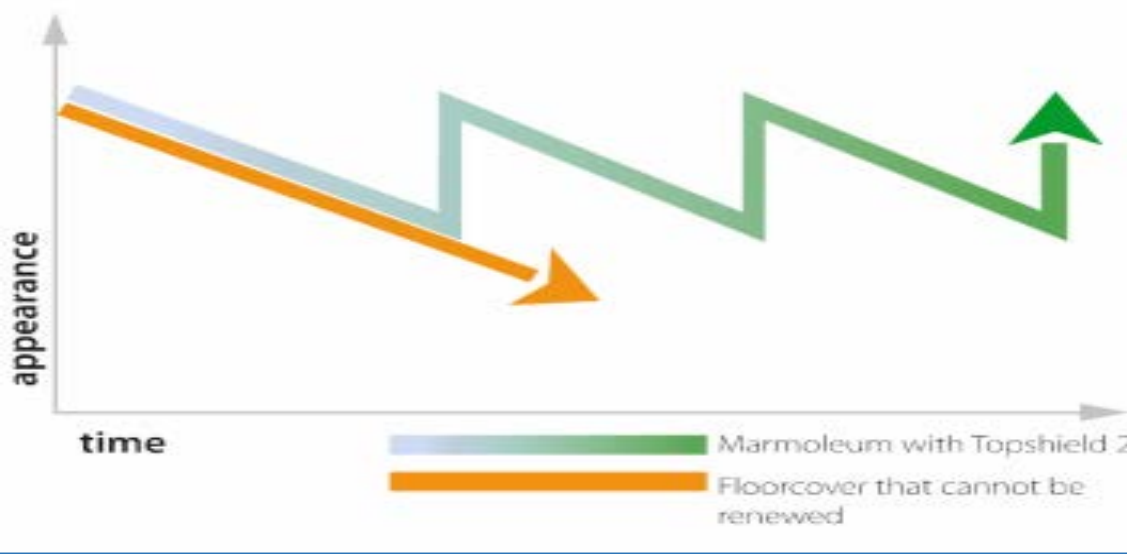


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# Installation



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# Benefits of eliminating heat welding are:

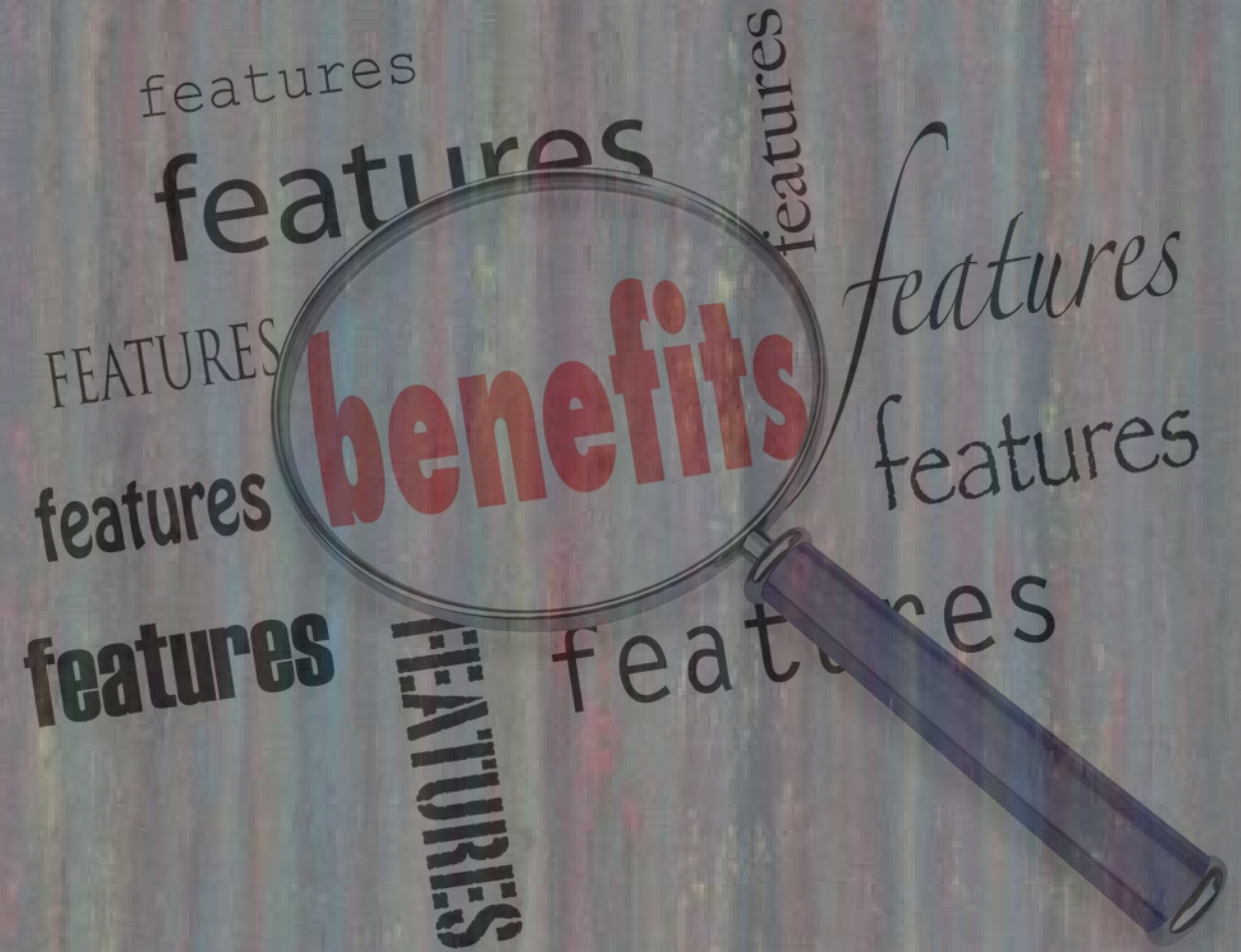
- [ 3rd party research shows that net fit seams are as hygienic as heat welded sheet vinyl.
- [ Reduced overall installed cost
- [ Improved aesthetics
- [ Improved environmental performance
- [ Improved Indoor Environmental Quality for installers/building occupants

**heat welded sheet vinyl**

**Marmoleum net fit seam**



- [ Linoleum becomes more resilient as time goes on
- [ linoleum prevents\* micro-organisms from multiplying themselves \*\*
- [ Dust will not accumulate on the surface
  - [ Ideal for children suffering from asthma
- [ Linoleum allows for a quiet, warm to the touch floor covering.







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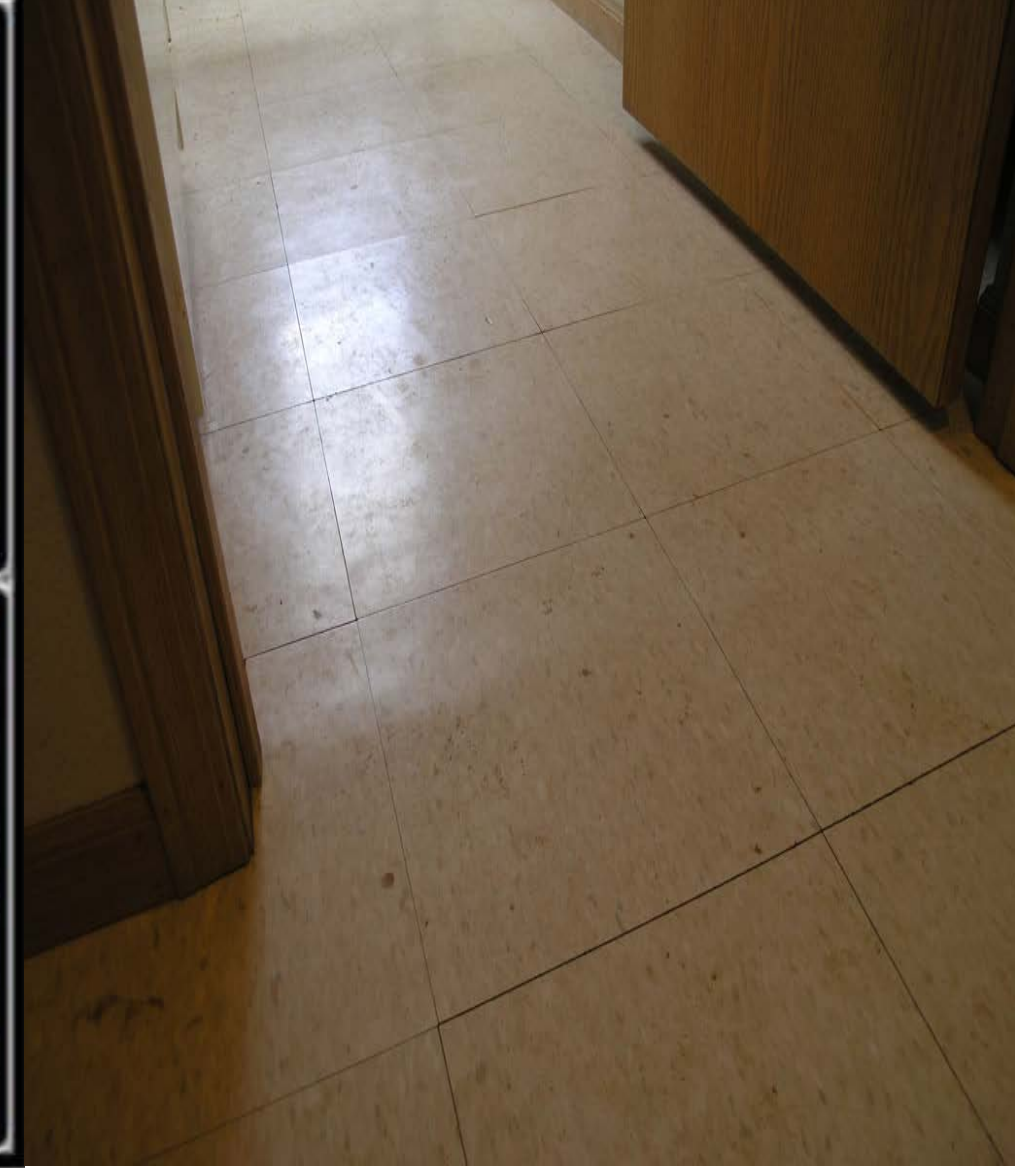
# First Cost



operation and  
maintenance costs,  
and replacement  
costs

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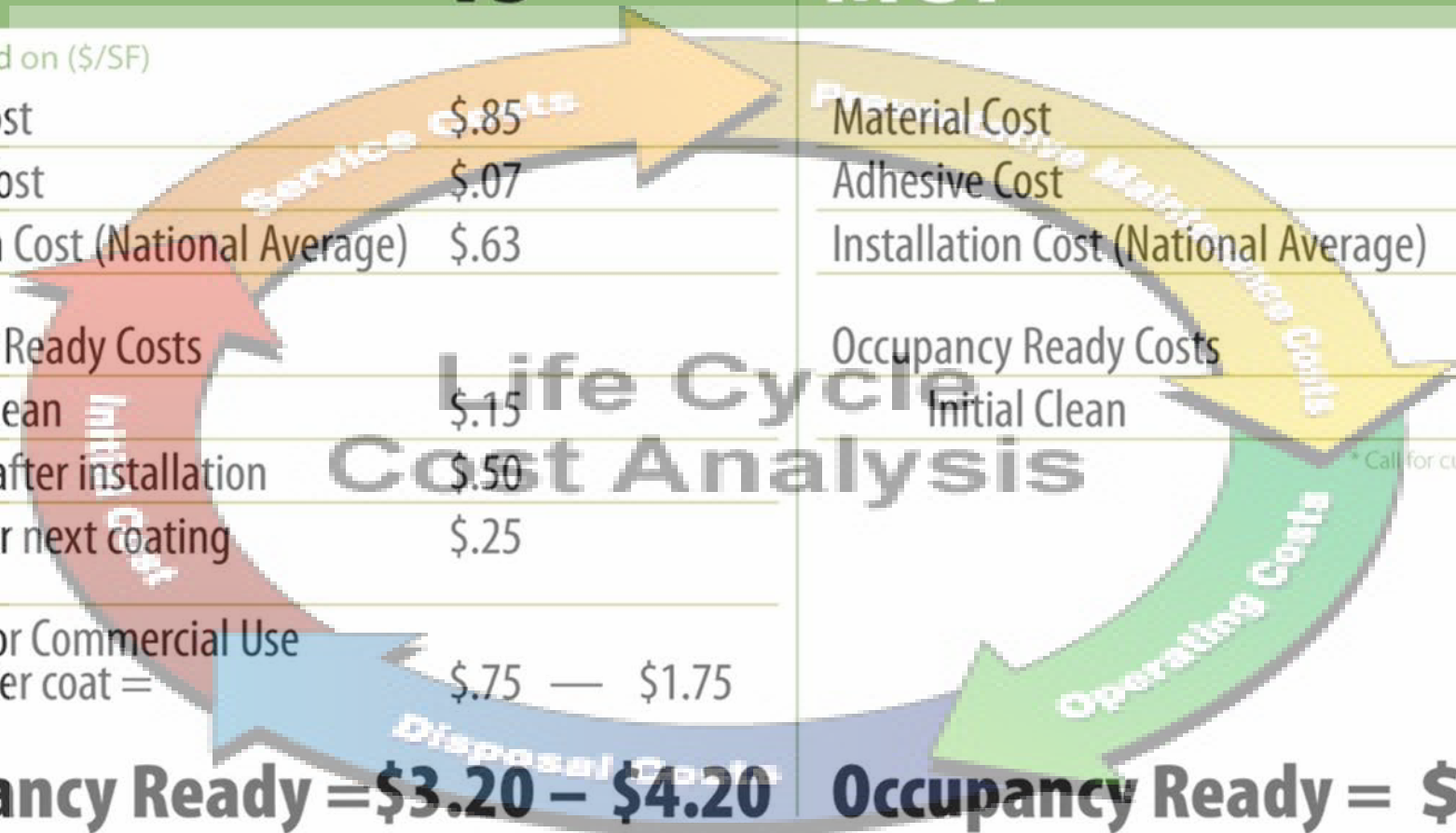


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VCT	vs	MCT
All cost based on (\$/SF)		
Material Cost	\$0.85	Material Cost \$2.25*
Adhesive Cost	\$0.07	Adhesive Cost \$0.25
Installation Cost (National Average)	\$0.63	Installation Cost (National Average) \$0.75
Occupancy Ready Costs		Occupancy Ready Costs
Initial Clean	\$0.15	Initial Clean \$0.15
2 coats after installation	\$0.50	
Scrub for next coating	\$0.25	
3-7 coats for Commercial Use @ 25¢ per coat =	\$0.75 — \$1.75	
<b>Occupancy Ready = \$3.20 – \$4.20</b>		<b>Occupancy Ready = \$3.40</b>







Transparency  
is The New  
Green.

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You wouldn't buy food without knowing what's in it, and how it affects your health. Why buy building products without the same information?





# LEED v4

## MR Credit Building Product Disclosure and Optimization

- [ Environmental Product Declarations

  - [ EPD (Dependent on Manufacturer)

- [ Sourcing of Raw Materials

  - [ Option 1. Raw Material Source and Extraction Reporting (1 point)

    - [ (Dependent on Manufacturer)

  - [ Option 2. Leadership Extraction Practices (1 point)

    - [ Bio-based materials

    - [ Recycled content

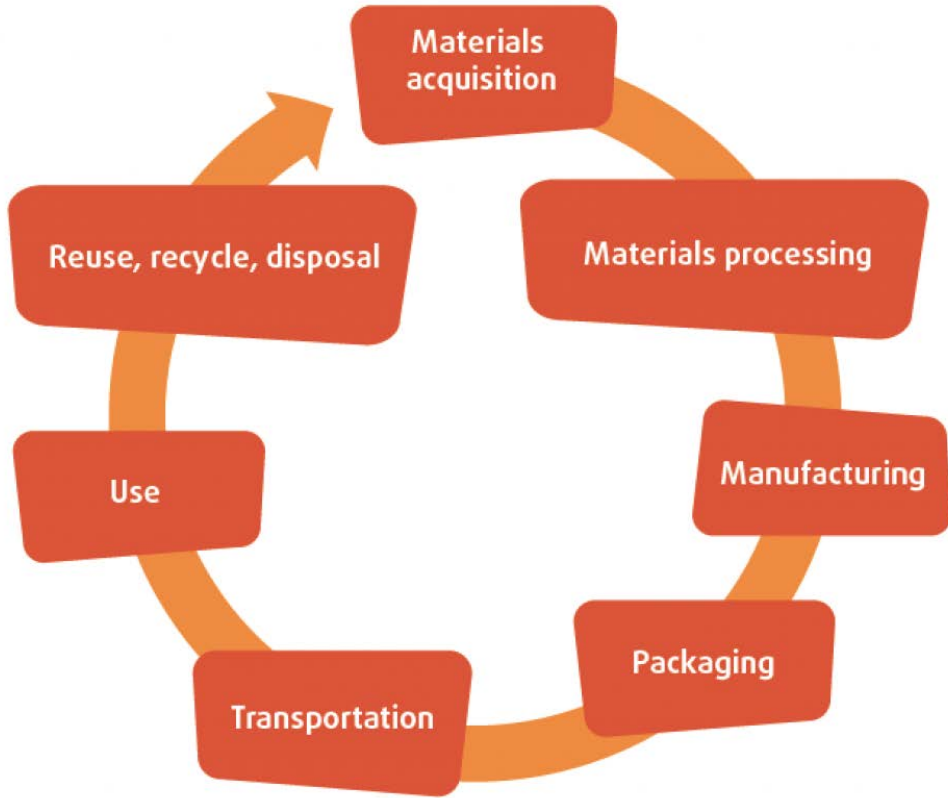
- [ Material Ingredients

  - [ Option 1. Material Ingredient Reporting (1 point)

    - [ Manufacturer Inventory, Health Product Declaration, C2C, Declare

  - [ Option 2. Material Ingredient Optimization (1 point)

  - [ EQ Credit Low-Emitting Materials



ENVIRONMENTAL PRODUCT DECLARATION

## MARMOLEUM 2.0 AND 2.5MM

FORBO FLOORING SYSTEMS  
RESILIENT LINOLEUM FLOOR COVERING



Marmoleum  
Color 3566 "Silent Sulphur"



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Marmoleum the most globally used brand of linoleum has been manufactured by Forbo for more than 150 years. Marmoleum is produced having low environmental impacts as a result of the combination of natural renewable materials and high recycle content.

Forbo was the first flooring manufacturer to publish a complete Life Cycle Assessment (LCA) report verified by CML in 2000. In addition Forbo is now to publish Environmental Product Declarations (EPD) for all products including full LCA reports. This EPD is using all recognized flooring Product Category Rules and is including additional information to show the impacts on human health and eco-toxicity. By offering the complete story we hope that our stakeholders will be able to use this document as a tool that will translate the environmental performance of Marmoleum into the true value and benefits to all our customers and stakeholders alike.

For more information visit:  
[www.forbo-flooring.com](http://www.forbo-flooring.com)



# Declare.

**Marmoleum Sheet**  
**Forbo Flooring Systems**

Final Assembly: Assendelft, Netherlands  
Life Expectancy: 25 Years  
End of Life Options: Recyclable 100%

Ingredients:

**Binder:** Tall Oil Rosin Ester (USA), Gum Rosin (Indonesia), Linseed Oil (Canada); **Filler:** Cellulose (Germany), Limestone-Calcium Carbonate (Germany); **Backing:** Jute Fiber; **Pigment:** Ferric Oxide, Iron Oxide, Ferric Oxide Yellow; **Finish:** Polyurethane, Acrylic Copolymer

Living Building Challenge Criteria:

FRB-0001	FXP: 03/01/2016
VOC Content: N/A	VOC Emissions: CDPH Compliant

**Declaration Status**

- LBC Red List Free
- LBC Compliant
- Declared

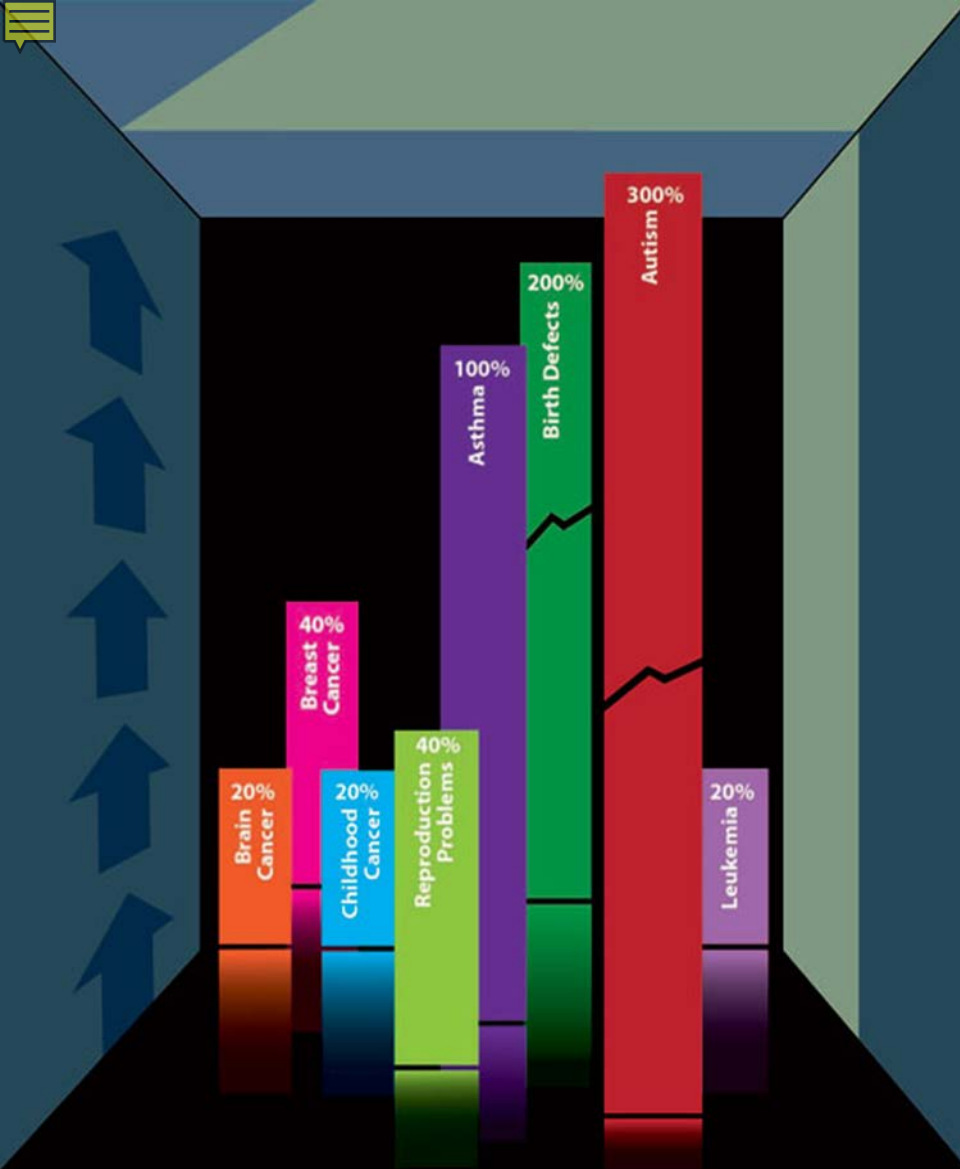
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# In Review

[ Naturally beautiful, durable, sustainable and healthy

[ 30 year System Service Life+

[ This natural linoleum floorcovering is made from++:

[ 97% natural raw materials

[ 70% of which are rapidly renewable

[ 43% recycled content.

[ Marmoleum is USDA certified 100% biobased

[ The key raw materials used in its production include linseed oil, which comes from the flax plant seeds, wood flour as production waste from controlled forestry plantations and jute, a crop whose fibers provide the material for the membrane onto which the linoleum is calendared.

[ The anti-bacterial qualities of linoleum\* won't diminish over time\*\*





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# Thank You!

[ Course Title:

[ **Linoleum 101: Lessons in Linoleum**

[ AIA Course Number:

[ **LN0101**





# Photo References

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LOVE  
LIFE  
MARMOLEUM  
LEUM



*Ohhh!*  
**marmoleum**

Floors that are...

- natural**
- strong**
- colourful**
- surprising**

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