

Japanese Cypress (Hinoki)

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Group 1:

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Objectives

- Background / History of Material
- Properties
- Various Applications
- Standard Tests
- Economical and Cultural Impact
- Case Studies on Material
- Tangible and Intangible Factors
- Explain Importance of Material



History

- Binomial Name
 - *Chamaecyparis obtusa*
- Origin
 - Central East Japan and is widely culminated in the Northern Hemisphere
- Key material in Ancient Architecture
 - Horyu-ji Temple
- Considered a Sacred Material



Features

- Size
 - Grows on avg. about 75 to 150 ft in height and 3.3 ft in width
- Average weight
 - 32 lb/ft²
- Specific Gravity
 - 0.46
- Moisture Content
 - 12 percent
- Suitable for Heavy Construction



Other features

- Color
 - Reddish Brown tint to bark
 - Pale pink to wood
- Scent
 - Lavish Lemon-Scent



Properties

- Long Lasting Durability
- Rot Resistant
- Easily Manageable
- Absorbs Toxic Substances
- Resistance to Moisture
 - Kiln Drying Process
 - ASTM D4442
- Ability to be extracted and used as an essential oil



Feasibility

- Fungal Diseases
 - Cytospora Canker
 - Gymnosporangium Rusts
 - Fungal Scabs
- Cost
 - Inaccessibility
 - Valuable



Architectural Application

- Construction



Architectural Application

- Interior Design



Pecky Cypress

- Due to its unusual appearance, pecky cypress is considered a specialty wood and is very popular for unusual appearances.



Architectural Application

- Furniture



Essential Oils Application

- Extracted from
 - Wood Oil
 - Root Oil
 - Needle Oil



- Oxford University Study
- Ane Orchard & Sandy van Vuuren Study

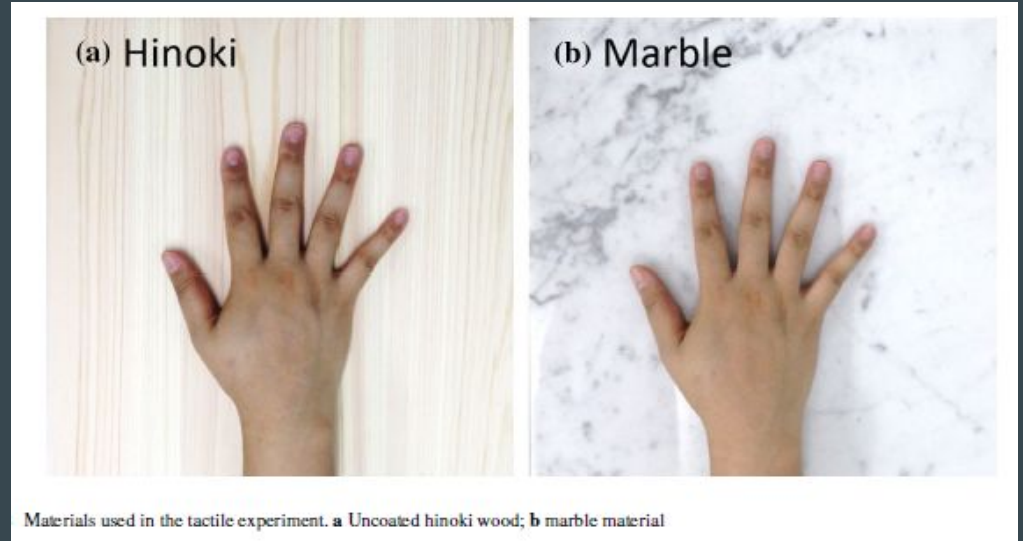
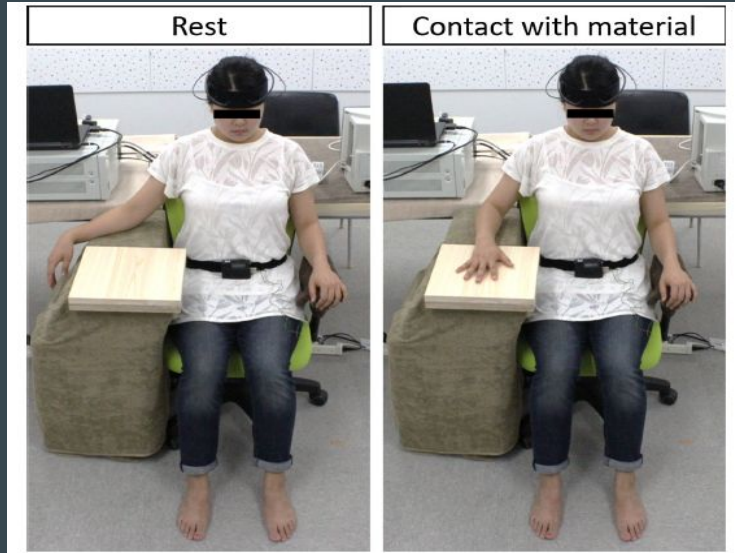
- Health Benefits
 - Antibacterial
 - Antimicrobial
 - Antifungal
 - Cellulite
 - Muscle Pains
 - Anxiety Stress
 - Wounds or Infections

Case Study

- “Physiological effect of olfactory stimulation by Hinoki cypress (*Chamaecyparis obtusa*) leaf oil”
- Tests were done to see the effect that the smell of Hinoki does to people
- Subjects: 13 female college students
- Subjects felt more comfortable and relaxed



Stress Relieving - ASTM 518-10



ASTM C518-10 (2003) Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus. ASTM, West Conshohocken

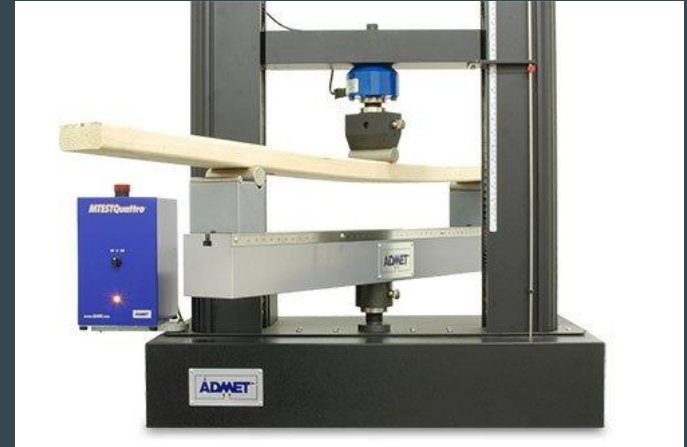
Moisture Readings - ASTM D4442

- Moisture Readings
 - Method A - Primary Oven - Drying Method
 - Method B - Secondary Oven - Drying Method
 - Moisture Meter



Strength Testing - ASTM D1037

- Determines strength values of different wood species
- Various Tests
 - Static Bending
 - Tensile Strength Parallel to Bending
 - Tensile Strength Perpendicular to Surface
 - Compression Strength Parallel to Surface



Economic Impact

- Kiso Valley, home of the only natural Hinoki Forests left in Japan
- Lumber Companies struggle to keep up with the consumption
- In March 2019 the Forestry Agency created a 17,000 hectare



Cultural Impact

- Shinto Shrines are very important in Japanese Culture and are visited during special events and to pray.
- Shrines are rebuilt every 20 years
- Cypress is also known as the “sacred plant” in Japanese Culture



Summary of Findings

- Valuable material only grows in certain part of the world
- Pale pink color
- Lemon scented
- Many benefits as an essential oil
- Tangible:
 - Durable, rot and moisture resistant
 - Different ways to test for moisture and strength
 - Many architectural applications
- Intangible:
 - Economic and cultural impacts



Citations

- <https://docs.google.com/document/d/1uBdCQivNQy8HN2t-NgtJaQxMtx-1j9kyEBCuUizFFXg/edit>

Thank You