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Scots pine for Gluelam Panels
- a quality and consumer perspective

My research

Doctoral thesis: Means to measure the aesthetic properties of wood

15 articles with focus on methods to investigate people's preferences

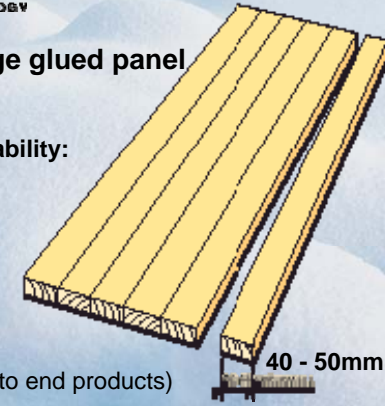
- Aesthetic properties of wood
- Computer images v.s real wood images
- Qualitative interviews, questionnaires, Internet studies....
- Floorings (not so often gluelam)



Gluelam panel = Edge glued panel

Improved dimension stability:

- cupping
- skewness
- bending (flat and edge)



A handy "raw" material

- Easy to process further (to end products)
- Large sheets
- Sized for different demands
- A lot of the wood aesthetics preserved



Indoor use:
Furniture
Kitchen cabinets
Doors (interior)
Furnishings
Floorings
Staircases
Panelings



In Sweden: most often made of Spruce (Picea Abies)

Forest-Sawmill-GlueLam Producer- manufacture ind.- Market place-End consumer

Quality requirements- Manufacturers

- Gluelam sheets are produced and sold to Manufacturers
- The quality requirements are formulated by M
- M think they know their end customers
- The default technical requirements are crucial
- The preferences of the consumers are not known
- The gluelam producer tries to buy the right raw material quality
- Quality dialog needed GLP - sawmill and GLP - Manufacturer

Possibilities!
Scanning techniques
Traceability methods
Improved consumer knowledge



Each manufacturer formulate their own glulam quality standard – e.g. IKEA:



Specification

Spec.no: IOS-MAT-0059
 Date: 2006-01-20
 Version no: AA-144160-2

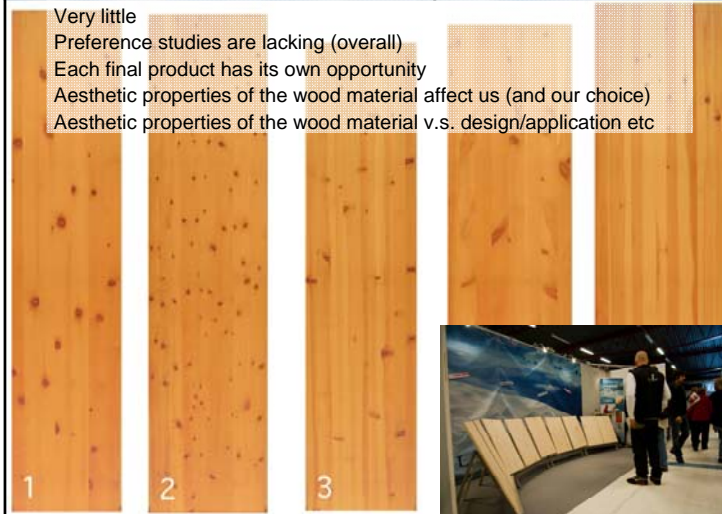
Solid pine, Quality standard for glued solid wood panels

C surface, Class 2 & 3

- Discolouration, included blue stain, accepted.**
- Finger joints:** Accepted.
- Width of lamellas:** 30-67 mm.
- Side boards:** Accepted.
- Accepted knots:** Sound knots, pin knots and firm black knots, no limits for number and size.
- Resinous wood:** Accepted.
- Heartwood pith:** No limits.
- Resin pockets:** To be cleaned and repaired.
- Cracks in knots:** Need not be repaired.
- Knot holes:** To be repaired.

What do we know about end consumer preference?

Very little
 Preference studies are lacking (overall)
 Each final product has its own opportunity
 Aesthetic properties of the wood material affect us (and our choice)
 Aesthetic properties of the wood material v.s. design/application etc



At least three group of consumers

- Lively: Wants wood that have a lot of character, a lot of visual activity
- Seen before: Those who choose the kind of wood-look that is most common (often middle way)
- Calmness: Those who prefer the wood quality to be low activity. Less big knots, clear surfaces.

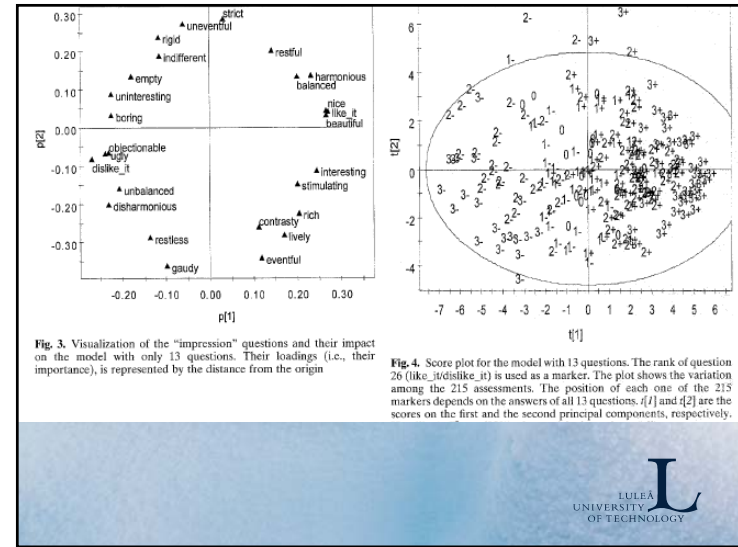
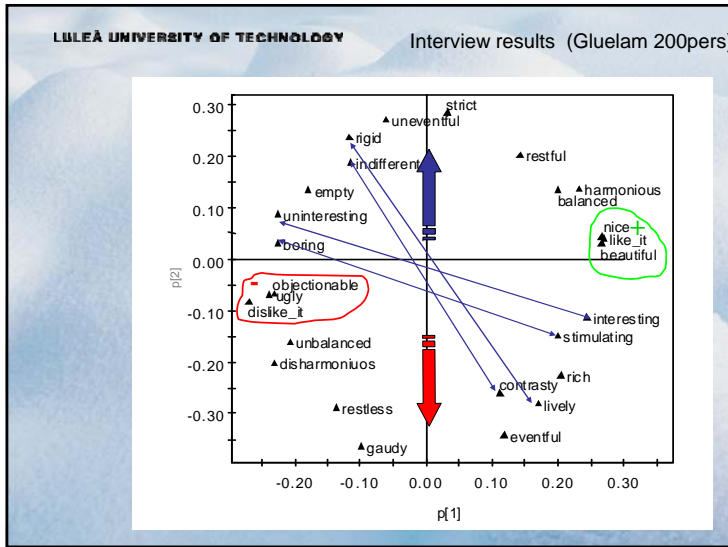
Two qualitative differences:

1. The overall blending (mix) of wood features
2. If there are divergent features that mismatch

..... People have different sensitivity for both

REMARK

- The average quality of the raw material affect 1
- It is important how the gluelam lamellas is put together , affect 1 & 2
- Visually and technically defects should be cut and thrown away, affect 2



Result: Ranking of gluelam surface qualities

FINGER JOINTS MAY OCCUR

HORIZONTAL FINGER JOINTS NON-STRUCTURAL WITH SHOULDER

N * J F I* D

L B * G * E

Conclusion
The overall blend of wood features more important than the presence of finger joints.

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Ongoing projects close to the issue

Log quality impact for finger jointed furniture components (Beds, IKEA)

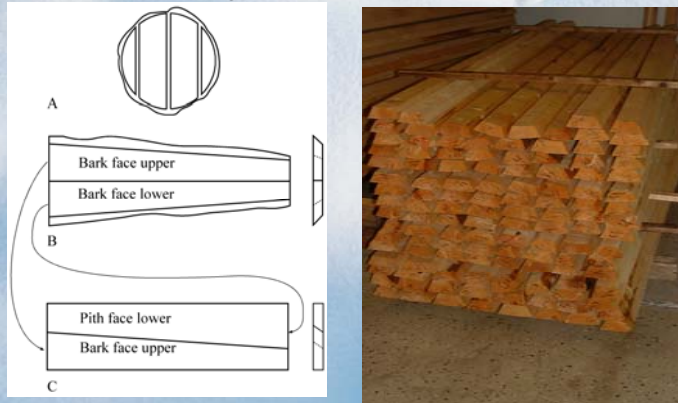
- Yield, causes for decutting, aesthetics, log types.

Log quality impact for production of gluelam components (Gluelam sheets for various products, IKEA)

- Yield, quality output, log lengths, log types, alternative production strategy.

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Trapeze sawing - Principle



A demo production plant was built



All kind of tests were carried out

.... It would take one day to present it

First test run

- Thickness 38 mm -- Yield = 36,4%
- Thickness 44 mm – Yield = 39,0%
- Thickness 50 mm – Yield = 41,4%

Second test run

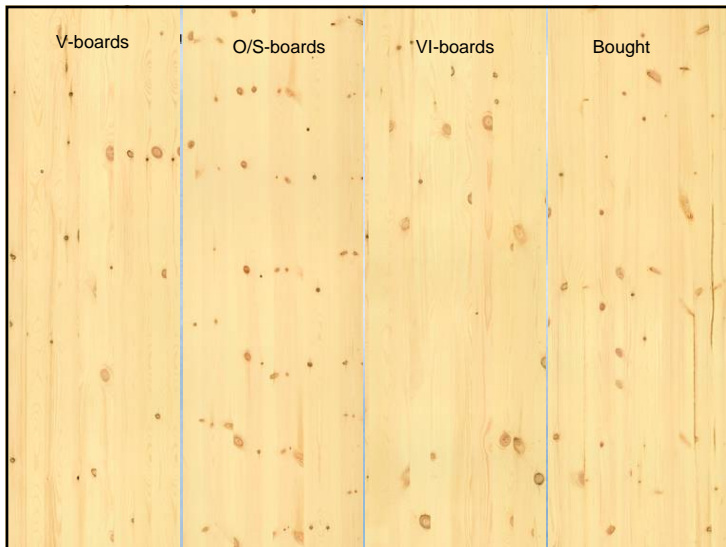
- Thickness 38 mm – Yield = 33,2%
- Thickness 50 mm – Yield = 39,8 %

Experiences

- High positioning accuracy important
- Drying performance crucial
- Routing of inclined surfaces works well
- High demands on machining accuracy
- Excessive warp can disturb handling

Conclusions

- Trapeze sawing best adapted for logs < 150 mm
- Complicated process but high yield
- If trapeze sawing will be profitable is not proved yet
- Technical product quality is satisfactory
- Aesthetic properties good, even better than traditional



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Finally
Is the gluelam production/products suitable for the scottish pine?

- ++ Fast growing trees/wood have sound knots up to some specific diameter interval. (thinning operation)
- ++ Clear wood surfaces (finger jointed) will always be easy to sell. Low yield.
- Fast growing trees/wood causes more problem in the production chain. Warp, bending, big knots with cracks etc.

.... I would like to see some photos of sawn planks and boards