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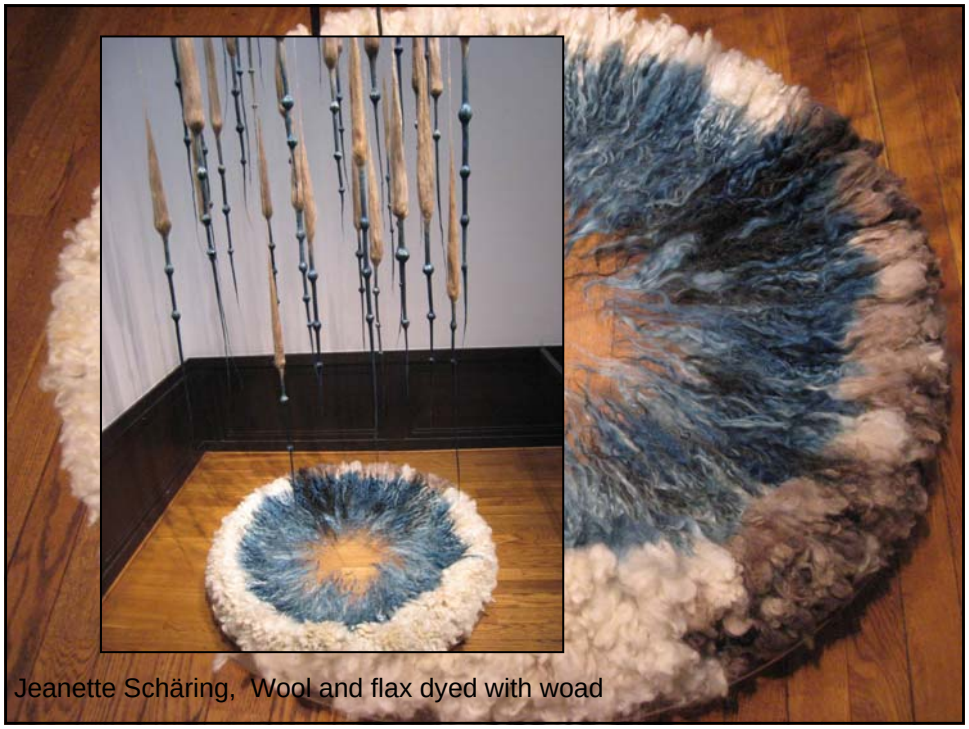
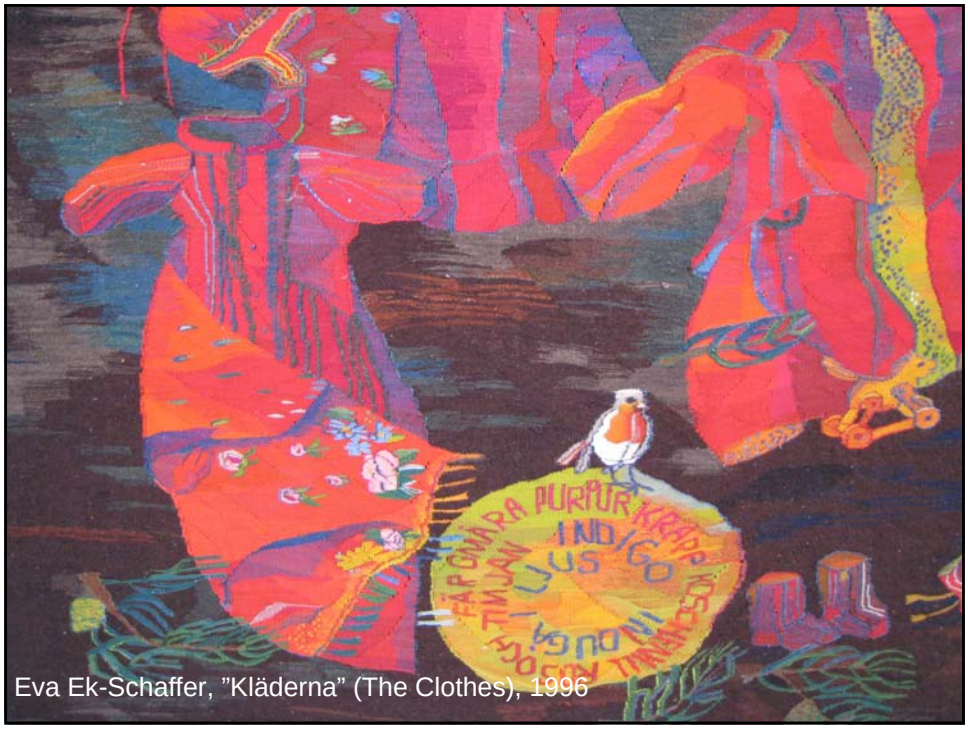
RIKSANTIKVARIEÄMBETET

Yes, it is beautiful - but is it light-fast? The Micro-fade Tester as a tool to evaluate light fastness of natural dyes.

Dr. Judith Bannerman
Margareta Bergstrand
Jeanette Schäring



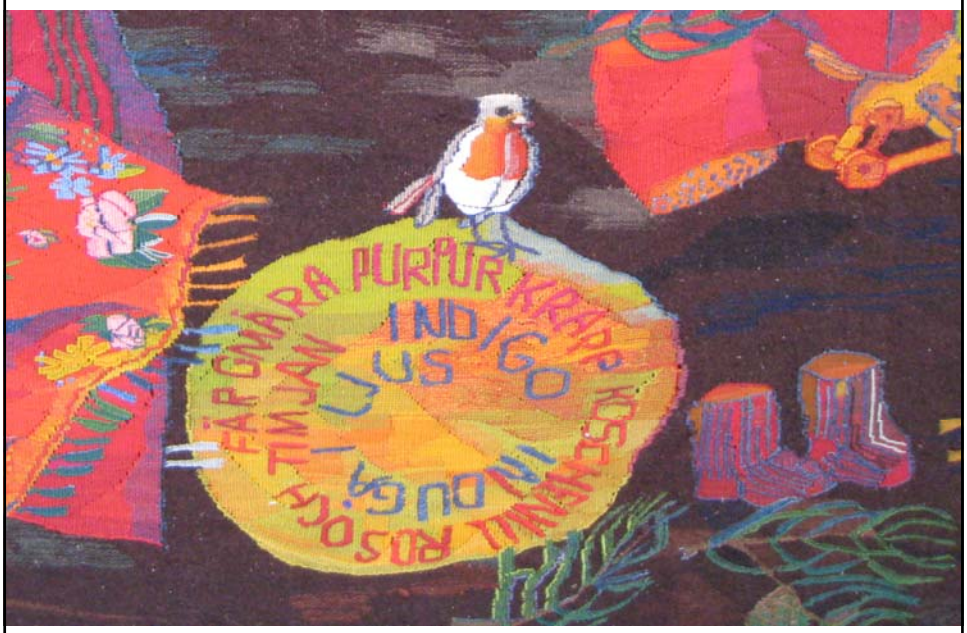
Jeanette Schäring, Wool and flax dyed with woad



Eva Ek-Schaffer, ”Kläderna” (The Clothes), 1996


Eva Ek-Sch

Hannah Ryggen (1894-1970)



Comparing:

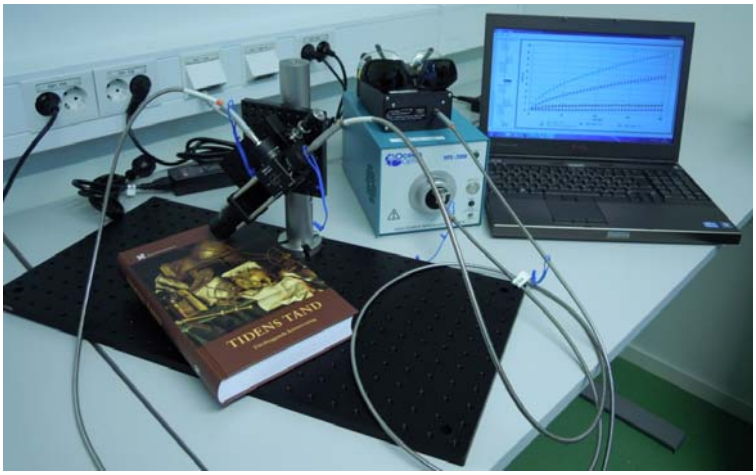
- Woad on cotton test weave to woad on wool test weave
- Woad on wool test weave to indigo on wool test weave

- Evaluating indigo yarn dyed by fermentation vat

- New lighting LED

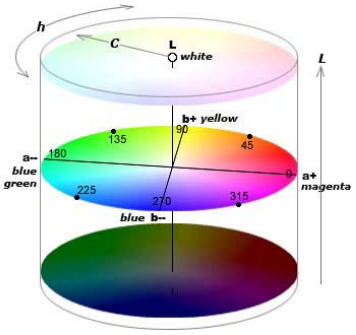
- MFT Micro- fade testing a tool in predicting and giving advice on lighting

Micro-Fade Testing



Interpretation

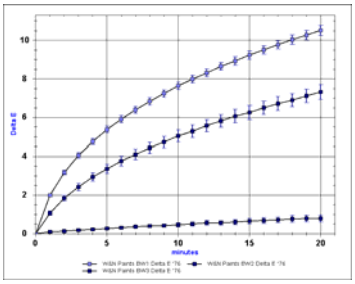
- Based on CIE L*a*b*
- L* = Lightness
- a* = Red (positive), Green (negative)
- b* = Yellow (positive), Blue (negative)
- Delta E* or colour difference



Bruce Ford, National Museum of Australia, Canberra, Australia.

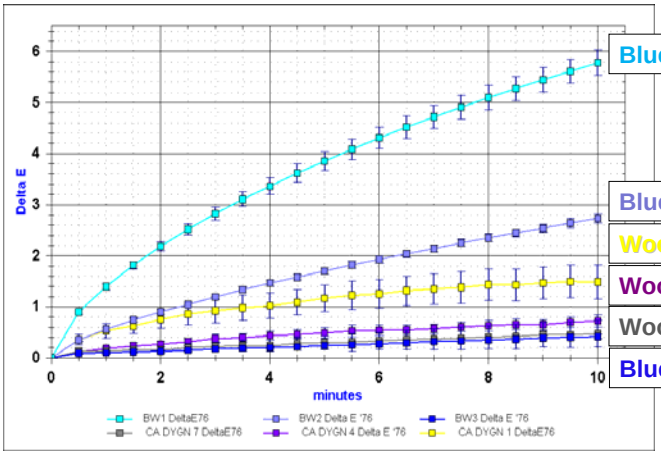
Blue Wool Standards

- Standards of lightfastness
- All tests are compared to the behaviour of Blue Wools #1-#4
- Web based light exposure calculator (CCI)
- Predict how the object will behave under specific lighting conditions



Case Study: Woad and Indigo

Wool Yarn Dyed with Indigo
7 (darkest) – 1 (lightest) compared to Blue Wool Standards



Blue Wool 1

Blue Wool 2

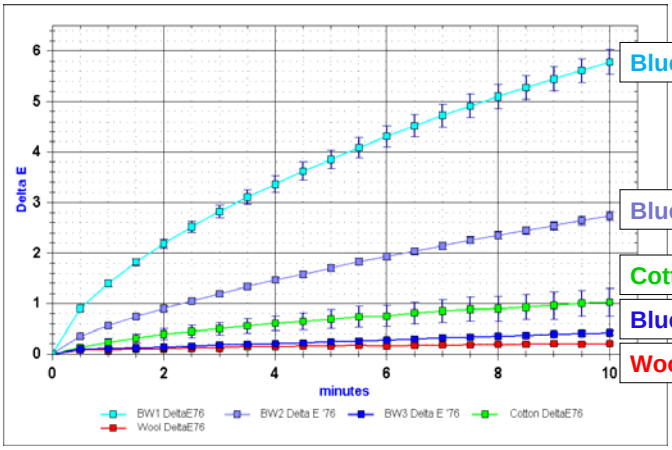
Wool 1 Light

Wool 4 Medium

Wool 7 Dark

Blue Wool 3

Undyed Wool Test Weave and Undyed Cotton Test Weave compared to Blue Wool Standards



Blue Wool 1

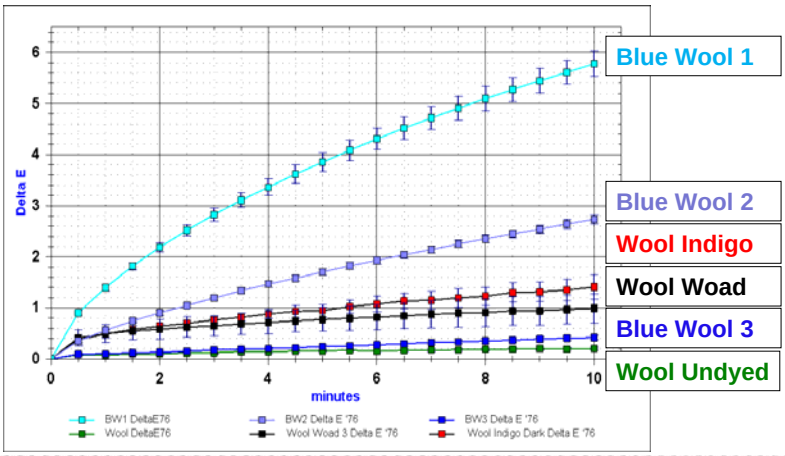
Blue Wool 2

Cotton Undyed

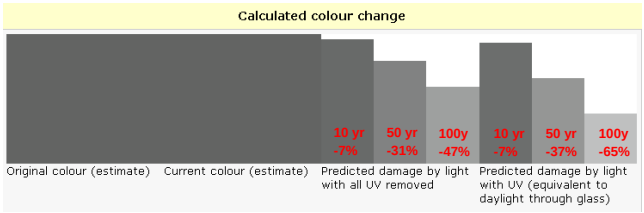
Blue Wool 3

Wool Undyed

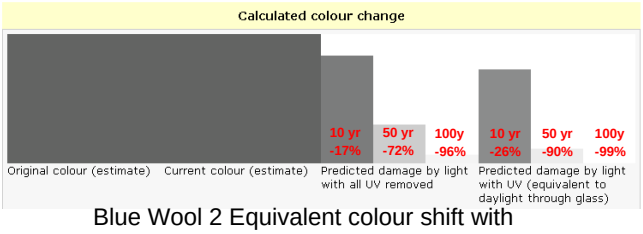
Wool Textile Undyed, Dyed with Woad and Dyed with Indigo compared to Blue Wool Standards



Light Damage Calculations Blue Wool 2 Equivalent

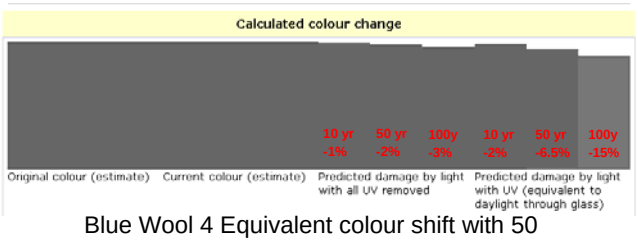


Blue Wool 2 Equivalent colour shift with 50 Lux exposure at 10, 50 and 100 years.

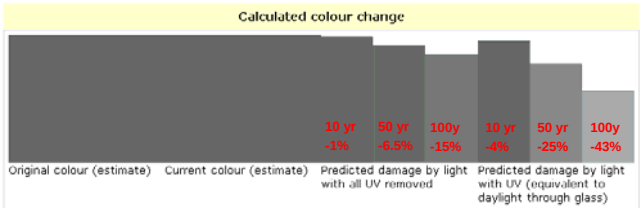


Blue Wool 2 Equivalent colour shift with 200 lux exposure at 10, 50 and 100 years.

Light Damage Calculations Blue Wool 4 Equivalent



Blue Wool 4 Equivalent colour shift with 50 lux exposure at 10, 50 and 100 years.



Blue Wool 4 Equivalent colour shift with 200 lux exposure at 10, 50 and 100 years.

Results

- Indigo dyed yarn: The lighter the dye the more fugitive
- Cotton in its undyed state is more fugitive than wool in its undyed state
- Wool test weave dyed with Indigo is more fugitive than dyed with Woad
- Woad and Indigo are most fugitive between a Blue Wool #2-#3 equivalent
- After 50 years there will be a colour shift of 30 % if exposed to 200 lux
- Damage will occur during exhibition and loan
- Textile art objects should not be placed in areas with direct light from windows

Conclusions

- Micro-fade testing:
  - Provides information on light sensitive dyes and textiles
  - Predict how dyes will colour shift
  - Predict long term public life of textile art
  - Provide lighting level risk assessment
- Aid in decision making about lighting policies
- A tool in preventative museum policies and practices
- Further research is needed into how other materials behave during micro-fade testing

Thank you

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