Wind-Up

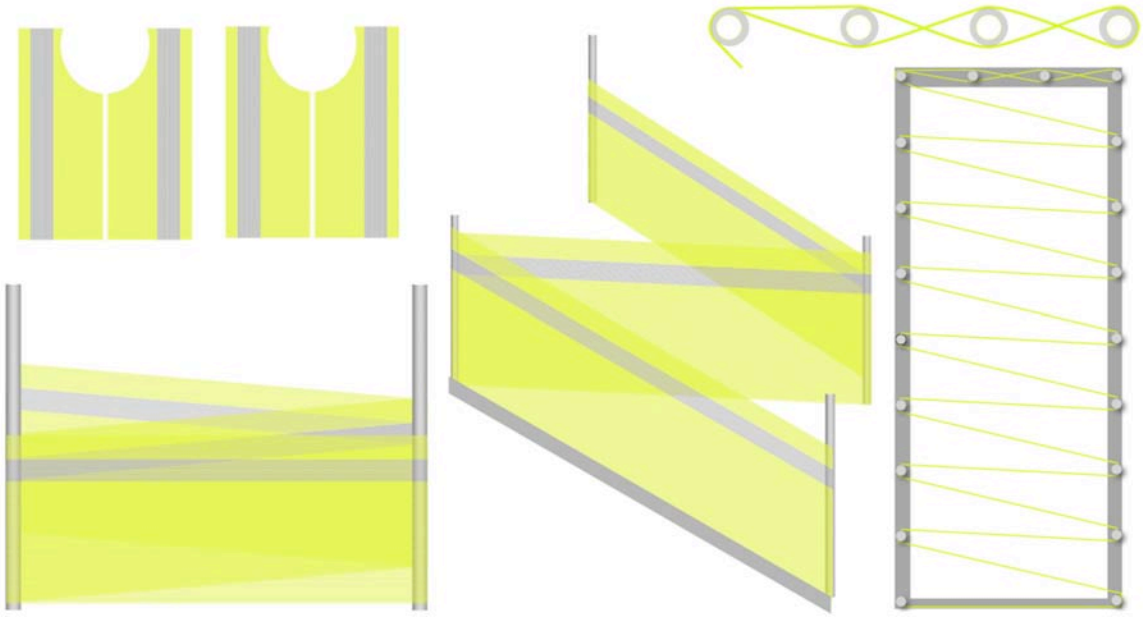
The definition of a weave structure is the interlacement of two sets of threads at right angles. The first set of threads, organized with a cross, is called the "warp." The second set of threads, the "weft," weaves through the warp to create a cloth. The making of a warp is performed in the sculpture project titled *Wind-Up.*

credits

Anne Wilson, *Wind-Up*, 2008. *Wind-Up* is a collaborative project. The warping team to date includes Sara Rabinowitz (also the project lead post Rhona Hoffman exhibition), Annie Egleson, Emily Ensminger, JongOck Kim, Rosemary Lee, Rachel Moore, and Rana Anne Siegel. Jeroen Nelemans will assist with documentation, and Surabhi Ghosh with publication guidance.

drawings

by Sara Rabinowitz



research notes

Anne Wilson's co-op studio intern Rosemary Lee researches utilizing the Internet, libraries, studio practices, and conversations with Wilson. This is an in-process compilation of information.

POLYESTER

The fiber used to make the warp in *Wind-Up* is a polyester thread (Polyneon) produced by the German company Madeira. Madeira says: "Polyneon is constructed of a specially developed raw material which eliminates looping, puckering and virtually all thread breaks. Suitable for almost any application, Polyneon's unique formula makes this thread extremely durable and smooth running. Vibrant colors which are silky and luxurious as well as resistant chlorine bleach make Polyneon the ideal thread for embroidering on uniforms, safety garments, and commercial linens."

http://www.madehow.com/Volume-5/Thread.html
Polyester thread is a petroleum product. During the cracking process, crude oil is broken down into a number of components that will be processed into a range of products from gasoline to plastics including polyester. Xylene, a hydrocarbon compound, is generated during cracking. Nitric acid and glycol are added to modify the xylene by a series of chemical reactions. The fluid is heated and condensed in an autoclave, and the molecules align to form long molecules called polyester. The resulting mass is extruded, cooled with water, and cut into chips. These chips are shipped from the refinery to the thread manufacturer for spinning.

http://www.swicofil.com/thread.html
Nylon and polyester are the only threads that can be made from a single yarn or a single ply.

Polyester fiber characteristics:

- Strong
- Resistant to stretching and shrinking
- Resistant to most chemicals
- Quick drying
- Crisp and resilient when wet or dry
- Wrinkle resistant
- Mildew resistant
- Abrasion resistant
- Retains heat-set pleats and crease
- Easily washed

Waste use and environmental impact of polyester production
The process of making polyester produces two types of wastes (i) liquid waste that is treated in the wastewater treatment plant and (ii) solid waste, known as RG-Residue. Before the implementation of cleaner production technologies, in this sector the RG-Residues was disposed by incineration.

Companies have been working with polyester producing companies to reduce their environmental impact, and found the RG-Residues could be used in other production. **Polyester fiber is recyclable!** The solid waste from polyester production, RG-residues, has been successfully recycled as an additive to composite materials like soundproof panels, the carpet sheet used in roofing, and other construction materials.

It is relatively difficult to dye polyester, and the dye process involves considerable pollution. New processes are being developed, with different flaws, such as the use of toxic substances, the large amount of water pollution they produce, or compromising the structure of the fiber itself.

http://www.fibersource.com/f-tutor/polyester.htm
The most common polyester for fiber purposes is poly (ethylene terephthalate), or simply PET. This is also the polymer used for many soft drink bottles and it is becoming increasingly common to recycle them after use by remelting the PET and extruding it as fiber. This saves valuable petroleum raw materials, reduces energy consumption, and eliminates solid waste sent to landfills.

DAY-GLO COLOR (neon, florescent)
Fluorescent substances absorb the ultraviolet light and then re-emit it almost instantaneously. Some energy gets lost in the process, so the emitted light has a longer wavelength than the absorbed radiation, which makes this light visible and causes the material to appear to 'glow'.

Fluorescent whitening agents (referred to as FWA's) are commonly added to everyday objects, such as white paper and fabric to make them appear whiter.

In assessing the medical effects of FWA's, it appears that they do not absorb past the outer layers of skin and are quite harmless when ingested. Environmentally, studies strongly suggest that residues of FWA's are metabolized by natural systems of elimination, so that no ecological risks exist when FWA's are properly used.

Fluorescent colors eventually lose their fluorescent quality, so permanence is a problem.

There are also threads that, instead of fluorescent whitening agents, have minute glass beads distributed within the polymer. These glass beads, when exposed to light, reflect light back to its source. This is called retroreflectivity. (more on this below under safety cloth / high-visibility clothing.)

SAFETY CLOTH / HIGH-VISIBILITY CLOTHING
http://en.wikipedia.org/wiki/Construction_site_safety
Construction is the most dangerous land based work sector (the fishing industry is more dangerous). In the European Union, the fatal accident rate is nearly 13 workers per 100,000 as against 5 per 100,000 for the all sector average.

http://en.wikipedia.org/wiki/High-visibility_clothing
This has led to the creation of high-visibility clothing, to reduce risk of accident or injury. High-visibility clothing is a type of personal protective equipment (PPE) and is any clothing worn that has highly reflective properties or a color that is easily discernable from any background. The two main colors used in high-visibility clothing are chartreuse yellow and safety orange. For greater visibility at daytime, very bright colors are obtained with the aid of fluorescence.

> http://en.wikipedia.org/wiki/Chartreuse_yellow
> A random tidbit on where the official name of chartreuse yellow came from, just thought it was interesting..... Chartreuse yellow is the color that was traditionally known simply as chartreuse before the web color chartreuse (named after green Chartreuse liqueur) was invented in the mid 1990s. Nowadays this color is called chartreuse yellow to distinguish it from the web color. Chartreuse yellow is a color that was named because of its resemblance to the yellow color of one of the French liqueurs called yellow chartreuse, introduced in 1838.

Though fluorescent materials offer maximum effectiveness in twilight and overcast conditions, they are very inefficient and not considered high-visibility when contacted by car headlights at night.

Part of the surface of clothes may be made retroreflective. This way they become much more visible in the dark for observers near a light source, such as the driver of a car with its headlights on. The pattern of the retroreflecting parts also helps to distinguish between objects and people. The retroreflective material commonly used in traffic safety gear is called Scotchlite.

http://www.3m.com/intl/ph/ExploreMore/Scotchlite/index.html
Scotchlite™ is a material made by the 3M company that is made of millions of glass beads affixed to the surface. Each glass bead is covered with a metallic reflective layer on half of its surface (the "back" half) and this, combined with the spherical nature of the glass beads, gives the materials their reflective properties.

The use of retroreflective bands is most effective when they are placed at or below waist level, and even more so when attached to parts of the body such as the feet, which move more as one walks.

http://www.safetyequipment.org/workzone/wz_high_viz.html
There are different classifications for safety apparel, based on worker hazards and tasks, complexity of the work environment or background, and vehicular traffic and speed. Class 1 garments are intended for use in activities that permit the wearer's full and undivided attention to approaching traffic. There should be ample separation of the worker from traffic, which should be traveling no faster than 25 miles per hour. Class 2 and 3 garments are used for jobs involving greater risk and may need to provide enhanced visibility to more of the body, such as the arms and legs. The higher classifications also require a larger amount of retroreflective material and are not made of the breathable mesh, in order to increase their effectiveness.

http://arts.guardian.co.uk/features/story/0,11710,1390742,00.html
Cool article! It discusses the use of fluorescents to make one's self invisible, since people are so accustomed to seeing high-visibility outfits.

http://www.safetyequipment.org/workzone/wz_high_viz.html
Here are the current standards for street safety clothing. -SR

bibliography

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Danto, Arthur. "Weaving as Metaphor and Model for Political Thought," *Sheila Hicks: Weaving as Metaphor* (Nina Stritzler-Levine, editor). New Haven, CT: Yale University Press, for The Bard Graduate Centre for Studies in the Decorative Arts, Design, and Culture, New York, 2006, pp. 23 - 36.
Danto analyzes the metaphorical uses Plato makes of weaving.

Crowe, Donald and Washburn, Dorothy. *Symmetry Comes of Age, The Role of Pattern in Culture.* Seattle & London: University of Washington Press, 2004, pp. 188 - 193 (on warping).