Greener Fabric Possibilities at Williams

Introduction

Williams uses a lot of fabric in dorms to cover furniture, but how durable is that fabric, how sustainable is it, and is there a better, “greener” yet just as aesthetically pleasing option? This question applies to primarily dorms, but it could be applied to any building on campus that houses furniture. I am defining “green” as non-harmful for the environment in material use, production, daily use (including cleaning), and able to be recycled, or at least has a non-harmful impact on the environment. There are different ways green fabric can be discussed or used, including in fashion (as examples: fabric made from bamboo, recycled cotton), carpeting (which must include recycled fabric), and textiles for home or business upholstery furnishings (including recycled fabrics, low-emission fabrics, and the utilization of heavy-metal-free dyes). I’m going to focus on upholstery for commercial grade fabrics. Upholstery fabrics are used all over campus, and take up a large amount of finances. They also are more of a factor in our everyday lives than we’re potentially aware of—mostly in common rooms, playing a role in the comfort level and atmosphere of these spaces. Two examples of green fabrics include Crypton, and Climatex Lifecycle, made by DesignTex.¹

When talking about green textiles, it is not only the fabric itself that needs to be low-emitting, and made with elements that are environmentally friendly (such as heavy-

¹ See Appendix A and B for more information on these two products.
metal-free dyes and recycled fibers), but also the manufacturing plants in which they are made. Emissions related to the factory, as well as the water used for dyeing (and thus considered waste after the dyeing process) are big issues related to green fabrics: the greener the process, the greener the fabric. The amount of water used is also an issue, as there is a lot of water needed for the dyeing process, the more factories can cut down, the greener the process becomes. And if those factories can use dyes and fibers that are green (heavy-metal-free, or recycled) then the water becomes non-hazardous, as do the trimmings that come from the waste of the textiles, and the water can be run on a closed loop system, thus using clean, and less water.

Method

I conducted an interview with Tim Reisler at Williams College Facilities to begin my research. He is in charge of buying furniture, including what fabric goes on those pieces. I also did some research into possible “green” fabric options. I watched the film The Next Industrial Revolution and also spoke with a representative at Crypton to inquire as to pricing and what other schools are currently using their product, DesignTex representatives were not available or never responded to my inquiries.

Results and discussion

Things to be taken into account

“An estimated 11.9 million tons of textiles were generated in 2007”²

According to the Sustainable Furniture Council, there are five important things to consider when choosing which fabrics to use. Their first suggestion is to “choose fabrics

that are ‘organic fabrics’ not simply fabric made from organic fibers.”³ Textile production uses a great amount of chemicals and water.

“Water is used at every stage in fabric manufacturing: to dissolve chemicals to be used in one step, then to wash and rinse out those same chemicals to be ready for the next step” (SFC). The chemicals needed for production can weigh between 10% and 100% of the weight of the fabric. A lot of these chemicals are known to cause health problems in humans, if they have even been tested for toxicity at all. “The Toxics Releasee Inventory of the US EPA reports that over 25,000,000 lbs. of toxic chemicals were released by US textile mills in 1995,” (SFC) and that’s just taking into account the tested, known, toxic chemicals that were released. And taking into account the fact that textile mills in the US are not very prevalent, imagining what the issue is like world-wide is chilling.

The SFC also recommends searching “for a fabric or product that is certified by any textile certification agency” (SFC).⁴ And the third recommendation is to buy “eco-friendly fibers” (SFC), and as a general rule, to simply pay attention to the fiber being used in the textiles you are buying. It is best to buy fabric made from natural fibers, but if you have to pick a synthetic fiber, “insist on recycled polyester, and, best of all, in antimony free polyester” (SFC). Antimony is a chemical used in the production of most polyester and is extremely toxic at the end of fabric lifecycles. One big issue is to avoid buying anything made with conventional cotton.

There are many problems associated with conventional cotton. “The cultivation of cotton is such a thorough environmental and health disaster as to be almost unbelievable” (SFC). The cultivation of conventional cotton uses an absurd amount of

³ Sustainable Furniture Council. This will be parenthetically cited as (SFC) from now on.
⁴ See Appendix E for table on certain certifications.
herbicides, pesticides, and fungicides; it “accounts for 25% of all the pesticides used globally…and on average…farmers apply seven times more chemical fertilizer on cotton crops than they do pesticides; and they use 10% of all herbicides used in the world” (SFC). All these chemicals and toxins enter the groundwater and consequently make their way into the food chain, not to mention that “many of the chemicals used on cotton are listed among the most hazardous pollutants by the [EPA]” (SFC).

There are water issues associated with conventional cotton as well: it requires large amounts of water, “resulting in soil salinization, aquifer depletion and desertification of large tracts of entire countries” (SFC). The SFC recommends plainly keeping yourself educated on the “progress of the eco-textile community” and making sure to look for SFC membership in the furniture you are buying. And their last recommendation is to “demand organic textiles.” By doing this, you, the buyer, are creating the demand, telling the vendor what you want and what you are willing to pay, for what is important to you: sustainability. Green fabrics are expensive right now, but that is “mostly because of low volume but also because of the slower production speeds in production without chemicals” (SFC). It seems that this is a fair trade-off for the positive environmental impacts associated with greener textiles.

DesignTex suggests using three categories in choosing upholstery (or fabric in general). These are: origins, safety in use, and end of life. For the origins they advise to consider design and creation of the fabric; for safety in use, the chemistry present in the fabric, and the emissions associated with it; and for end of life, to consider what happens to the fabric after it’s done being used.
Williams has spent a total of $327,847 on furniture for student housing, out of a total $2,745,588 for furniture across campus over the fiscal years 2006 to 2009. In the student-housing category, the average percentage upholstered was about 37%.\textsuperscript{5}

One of the first things to consider is the typical ten year replacement cycle we’ve been seeing here at Williams—either that or as needed.

Fire Codes are the next big issue. There are two main ones that furniture pieces must take into account, depending on sprinkler systems. The first is the CAL 117 code, which assesses products with sprinkler systems (like Williams). In this code the fabric, structure, and foam of the piece must all pass a burn test individually. The CAL 133 code deals with furniture going in places with no sprinkler systems. According to the CAL 133 code, all the tests for CAL 117 must be met, but all three elements put together must also pass the test as well.

Although Williams has sprinkler systems, we also use COM fabrics, resulting in the fact that we have to pay for burn tests ourselves if the combination has not been tested already. The burn test itself isn’t too expensive, but we also have to pay for the piece itself to simply be burnt. There was an example last year of folding chairs for the Faculty House needing fabric. It cost us about $700 to pay for the chair and the test, but the chair failed, and we ended up having to pick a pre-graded-in fabric due to time constraints anyway.

The issues as to why we need to move towards more sustainable also need to be taken into account. Some of these include the harmful effects of emissions from fabrics, the potentially hazardous waste in the water after dyeing processes, and the potentially

\textsuperscript{5} Williams Furniture Expenditure numbers provided by Tim Reisler (see Appendix F).
hazardous waste products from the textiles themselves, such as trimmings from the fabrics. Water use and emissions are big issues in the textiles business. Crypton and DesignTex, as examples, have figured out ways to help with or eliminate these issues.

*Rohner Story and Climatex Lifecycle*

The Rohner story can help us see why going green in textiles is important. William McDonough, a green architect, said, “design is the first signal of human intention” and also that “food equals waste.” In *The Next Industrial Revolution* the story of a small, Swedish textile factory called Rohner Textile AG is explored. At this mill, before McDonough’s intervention with Susan Lyons (from DesignTex), the trimmings from the fabrics were deemed hazardous waste. Rohner wanted to burn them to heat the water they used for dyeing the fabrics, but they couldn’t due to their unsafe nature. They ended up having to ship them to Spain for disposal.

Lyons and McDonough eventually posed the question, could this small mill in Switzerland transform an entire industry? It became their goal to at least make this start. By working with Rohner and their dye suppliers they found out that only 167 of the 16,000 dyes they worked with that were made by CIBA-GEIGY passed their environmental and health safety tests. But they also discovered that they could work with just these 16 dyes without compromising aesthetic choice or quality. Rohner quickly decided to only use these dyes and the outcome was unbelievable. The water going out of the mill was as clean as the water going in, so they could just turn the pipe around. The trimmings, once hazardous, could now be sold to local farmers for compost, and also made into felt.

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6 *The Next Industrial Revolution*
7 38 dyes passed these tests, according to DesignTex website.
The fabric eventually produced by DesignTex and Rohner was Climatex Lifecycle, which was launched in 1995. It is the “first biological nutrient textile, with McDonough Braungart Design Chemistry and…Rohner” (DesignTex). Climatex is compostable, which came about from McDonough’s idea of “waste equals food”; it is “designed to break down and return safely to the earth after its useful life—its nutrients thereby becoming ‘food’ for the soil” (DesignTex). Not only were Rohner and DesignTex able to come up with a new, innovative fabric, but Rohner increased their total output by 30%, had a drastic reduction in costs, and could claim responsibility for “the production of the first 100% biodegradable commercial fabric.” Rohner was also able to improve working conditions for its employees and the surrounding neighborhood as well as receive an European Eco-Tex certification, “indicating that all of its textile products were ecologically safe for human use” (Case Study).

By 2002, Rohner and DesignTex’s Climatex fabric brought in over $8 million in revenue for Rohner. It had drastically reduced the finances used to export and deal with hazardous waste because the waste was no longer hazardous. The overall production costs were also lowered drastically because Rohner no longer needed to filter dyes and chemicals in production (Case Study).

What Williams is currently using

According to Tim Reisler, the top three reasons he picks the fabric he does are stain resistance, durability, and comfort. He explained to me that fabrics are normally “graded-in” for furniture, which means just that that particular piece of furniture comes

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8 Investor Environmental Health Network Case Studies: Rohner Textiles http://www.iehn.org/publications.case.rohner.php. This will be cited paranthetically as (Case Study) from this point on.
9 See Appendix G for fabric samples of current projects at Williams.
with specific choices for fabrics. He also explained that these choices are usually limited in desirability due to their limited number of choices. So Williams typically goes with the choice of COM or Customer’s Own Material, trying to stay within a range of $30-$45 per yard.

Right now the “greenest” option we are using, according to Tim, is the fabric in Willy and Sage because the furniture has Velcro upholstery. This is not necessarily green in the materials used, but it does cut down on the cost and materials being thrown away at the end of a life cycle. One doesn’t have to be an upholsterer to upholster the furniture, and it cuts the cost to about 1/3 of the price compared to simply buying a new chair or couch, whatever the need may be. It also cuts down on the amount of waste we’re going through. Imagine throwing away an entire couch instead of just the fabric covering it—it makes a big difference.

A typical side chair costs anywhere in the range of $700 to $1000 per chair; a couch can be about $1500. They are so expensive because they are commercial pieces as opposed to residential, having to withstand elements such as excessive movement, abuse, and numbers to which residential pieces aren’t exposed.

The commercial fabrics we use generally need to stay in the range of 45 to 50 thousand double rubs (DR). This number is calculated through a “double rub test”. There is actually a machine that comes down on the fabric and rubs up and then down, counting one double rub; the number of double rubs the material can withstand is its double rub number. Residential fabrics usually are around 15000 DR.
Recommendations/conclusions

Can Williams implement the use of better fabrics for the environment?

Yes, Williams could use green textiles (such as Crypton or Climatext Lifecycle for example) across campus. Crypton is more expensive than what we have been using, but it’s durability and therefore longer lifecycle cuts down on replacement costs. It’s also environmentally friendly from factory to how it’s manufactured to the substances used to its use and also the fact that it’s recyclable. Climatex is also a good green option. Both products are environmentally friendly, which take the college in the right direction—towards sustainability. If a green textile standard is not implemented, the Velcro option is a good start in moving towards a more sustainable and greener use of fabric on campus. It cuts down on whole piece replacements, which cuts costs and also materials thrown away, thus also making Williams a more sustainable campus.

But, if the college really wants to take a big step towards sustainability, it is important to not only do things like reducing energy use and waste, but also take a firm stance on supporting industries that are trying to move towards a more sustainable future in their manufacturing and products. While by just looking at an upholstered chair one might not be able to tell whether or not it was made by sustainable means, it will make a huge difference in the long run, not only for that chair’s immediate environment, but also for the environment on a larger scale. If Williams wants to present support for and an image of sustainability, making sure we use green textiles in upholstery decisions is a must.
Appendix:

A: Crypton facts and information

B: DesignTex facts and information

C: Lists of green certifications in DesignTex’s fabrics used

D: Environmental Design Criteria for DesignTex

E: Textile Certification Analysis

F: Furniture Expenditure numbers for Williams College provided by Tim Reisler

G: Fabric samples for examples of current projects