Master Degree, The Swedish School of Textiles, University College of Borås

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Idle and Hang Around  Foldable Textile Furnishing
Idle and Hang Around

- Foldable Textile Furnishing -

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Abstract

This thesis deals with foldable, portable and eco-friendly textile furnishing for students. Students move quite often and therefore big and heavy furniture is sometimes a problem. In this project prototypes of a hanging sofa called Idle and a hanging storage system called Hang Around are presented. These products can be pulled up to the ceiling when there is no use for them and taken down when needed.

The idiom of the products communicates stability and security even though they are suitable for living in motion. The aim has been to create sustainable products that can help to maintain the feeling of home and security in the middle of a hectic and mobile life. The forms of the products and the textile patterns have been developed simultaneously. The inspiration for the pattern design comes from Northern forests. The patterns are digital printed on woollen fabric. The materials and techniques used in this project were chosen because of their limited environmental impacts.

Idle and Hang Around are designed to suit the concept house Nestet, which is an eco-friendly exhibition house with solid wood construction. The house, where Idle and Hang Around appear, was built in the centre of Borås in June 2005.

Keywords: foldable furnishing, sofa, storage system, sustainable design, living in motion, digital printing
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1. Introduction

The objective of this graduation thesis is to design and make prototypes of light and eco-friendly textile furniture for a student apartment. The products made in this project are easy to pack and store. They are designed for students who move very often. The focus is on a hanging sofa called “Idle”. A hanging storage system called “Hang Around” is made as a companion for the sofa. The aim is to use textile materials and patterns in a new creative way, keeping in mind that textiles can play a part of furniture construction, not only decoration. I have studied in my previous projects the relationship between upholstery patterns and furniture. In this thesis both of these aspects are developed simultaneously.

Today young people are living in the junction of two temptations: to settle down and carry out the dream of house and family, or to travel around the world and collect experiences. Globalisation has made it easier than ever before to move and to study abroad. This project seeks a solution for the dilemma of combining these two life styles. The purpose is to design products that are suitable for living in motion, but that can still help to maintain the feeling of safety and cosiness.

Idle and Hang Around are designed to suit a concept house called Nestet, which is an exhibition house built in the centre of Borås in June 2005. The products are exhibited in the Nestet house during the rest of the year 2005.

1.1 Aim and the Problem Definition

The aim was to design products that are suitable for students, who move often. The purpose was to explore possibilities of using textile materials as a part of furniture construction to achieve light products that can be folded and packed in a relatively small space.

As a textile designer I tried to offer a new perspective in furniture design. Very often the furniture form is designed first and only then is the upholstery material chosen for it. In this project the pattern, material and form are developed simultaneously in order to create a dialogue between form and pattern, function and decoration.

The intention was to design ecologically sustainable textile products. That means that the whole lifespan of the products was taken into consideration when choosing form, materials and production techniques. The products are designed in a way that they are suitable for serial production, but this project deals only with the prototypes, made in one colouring.
The connection between contemporary design and traditional design is an important theme in the visual work. The Nestet house, where the products appear, is a modern continuation of the Swedish wood building tradition. The textile products made in this project share the same ideology and idiom by combining modern and traditional aspects.

1.2 Concept House Nestet

“Idle” and “Hang Around” are designed for the concept house called “Nestet”. It is an eco-friendly house which combines Swedish wood building tradition with modern design. The exhibition house is built in the centre of Borås (Stora Torget) in June 2005. Nestet is a cooperation project between Borås town, Fristad Bygg and University Collage in Borås. Nestet is designed by architects Anders Landström and Thomas Sandell.

The purpose of the Nestet project is to exhibit an industrial wooden house, which is based on principles of ecology and good design. The good qualities of wood are used together with modern production methods. Nestet is the centre of a five-credit course called “Design for the Good Life”, and it is one of University College’s inputs for Design year 2005. The house has three different purposes:
1. To exhibit of the house and the wood construction technique.
2. To exhibit interior and design products inside the house
3. To serve as the centre for the course Design for the Good Life

Professor Johan Huldt and administrative leader for CTF (Centrum for Textile Research) Larsh Eriksson from Textilhögskolan are involved in this project. I heard about Nestet in autumn 2004 and started then to create the concept for this thesis and ideas for the furnishing the house.

In autumn 2004 the plan was to furnish Nestet-house as a student house/dorm. This student theme fit well with the house, which was quite small and corresponded to students’ need for compact living. The student aspect also created a logical connection to the University College in Borås. Later the student theme was abandoned for the house, but still students stayed as the target group for my project. The construction of the house, the ecological values and the aesthetics of Nestet had to be integrated with the features of student life.

Drawing for the Nestet house
2. Background

This background study seeks answers for key questions regarding ecologically sustainable design and how it can be reached. The design method from a Swedish group called Design with Care (Design med Omtanke) provides a philosophical frame for the design process and a starting point for sustainable design. In addition, a designer also needs concrete guidelines and facts about the environmental effects of the specific materials and techniques used in a certain project. These concrete aspects are also part of the background research.

The background chapter Living in Motion focuses on different ways of mobile living, which appears in many cultures in various ways. Modern globalisation moreover gives reasons for designers to rethink what living actually means. Does living mean something stable and constant or can living also be mobile? An interview about student life reveals some aspects of how students live and what they think about today’s mobile and hectic life.

2.1 Sustainable design

As mentioned earlier, the Nestet house is connected to a design course *Design for the Good Life*. The name of the course is ambitious; who can define the good life? And how can design help us to reach the good life? Since everything in society is designed - services, products and even landscapes - it is evident that design affects our life quality as much as nature does. To me the theme “design for the good life” means most of all sustainability in design; good products, with function, aesthetics, ethical production process and human-friendly design. These issues play an important role in this project.

Sustainability in design can be seen as a part of sustainable development, which is a global aim. The United Nations has a division for sustainable development which promotes for the integration of social, economic and environmental dimensions of sustainable development in policy making (www.un.org/esa/desa/sustdev).

Designers have an essential role in this global aim of sustainable development. Designers are responsible for designing products and services that don’t cause negative environmental or social effects. Sustainable design includes aspects of ecology, ergonomics, ethics, social aspects, economy and aesthetics. All these terms have several meanings depending on one’s point of view. Following are short explanations of what these terms mean in this thesis.

To take ecology into consideration in design means most of all designing the best possible product. There has to be a need for the product, it has to be functional, otherwise it will be soon abandoned. To design a product with ideals and respect for the material can help to create products with a long lifespan.
Aesthetics is an important part of product’s function. Designer and design theoretic Victor Papanek has made a six-sided function matrix, where he divides function into six aspects: association, method, aesthetics, consequences, need and use. According Papanek a product can not be completely functional if it doesn’t also fulfil our need for aesthetical experience (Papanek, 1995). Aesthetics is usually the reason why we create personal connections to products, why we like them and why they become meaningful for us. Aesthetics is a way of extending a product’s lifespan. Design classics often combine seamlessly the aspects of function and aesthetics. For example Charles and Ray Eames’ lounge chair (picture 2) is very comfortable to sit on and its special form makes it visually appealing object.

The economical point of view in sustainable design is very much connected to waste elimination. Waste means not only discarded materials but also wasted money, time, loss of materials (into the air and down the drain), excessive use of energy and water, and overuse of packages and containers (Muierhead, 1999). On average more than 30 tons of non-renewable natural resources are invested today for every ton of goods and that trend is increasing. People in the western world consume more than the earth can provide. 20 percent of world’s population consume 80 percent of world’s natural resources (Nilsson, 2004). The German Factor 10 Institute seeks ways of reducing the material use in the western consumption-oriented society. According to The Factor 10 Institute, in order to approach ecological sustainability the resource productivity in western countries has to be increased by at least a factor 10 compared today (Schmidt-Bleek, 2004). That means naturally that the amount of unnecessary waste needs to be cut down dramatically. Questions of economy are important in the design process; how to use materials and natural resources effectively? Saving resources is economical but also ecological. There is also a commercial demand for ecological products. Therefore eco-labels are also a good marketing advantage (Nilsson, 2004).

Social aspects and ergonomics are related to both users and producers of the product. The product must be designed for the users. In public spaces the social aspects are really demanding: Can physically disabled people use the products? Is the environment good for children and elderly people? If the target group is limited, there are fewer but more exact questions. Does the product respond the needs of the target group?

Naturally ethics includes all the aspects mentioned above. I believe that for a designer, ethics means being aware how the product affects nature and people during its whole life cycle. The most important is to be honest and open to face the problematic issues. This honesty also concerns aesthetics. If a designer has an honest idiom, it is possible to create long-lasting products. Products based only on trends and transient phenomena can hardly ever be ecologically sustainable.
Designers should have a good connection to the manufacturers and production’s environmental personnel. The lack of environmental information and communication between designers and production is a typical obstacle to environmentally friendly design (Fletcher, 1999). Today when the textile production has very much shifted to cheap labour countries and the design and the marketing still are located in western countries, it is easier than ever to ignore the ethics in production. In some cases it is impossible for a designer to have any contact at all with the production.

When striving for sustainable design, ecology, ergonomics, ethics, social aspects and economy should be combined into a product so that they support each other.

2.2 Design Method

A design method created by a Swedish group, Design with Care, had a great influence on this project and it provided the ground for the design work. This method is presented in the group’s recent book, Design med Omtanke, 2004.

The Design with Care -method strives for good design which is available for everyone. Design with Care is built on principles of aesthetics, ethics, ecology, economy and engagement (Nilsson, 2004). The method takes into consideration both ecological and social sustainability. In this project the ecological values got more attention, because the products were not designed for public spaces or contract markets. The target group was defined and the products didn’t have to be suitable for everyone. However people were in the centre of the design process, because comfort was an important aim.

In a nutshell the method is based on four steps:

1. Common ground
2. Sustainable starting point
3. View for the future
4. From idea to practise

Common ground means that all the members of design team as well as the users of the products have a good relationship from the beginning of the project. When creating long-lasting and sustainable products, the anchoring of the project is important. The design team together defines aims and time frames. The different skills in the team are defined. It is important that the group has the right skills for the assignment.

Sustainable starting point includes need analyses and sustainability analysis. At this stage needs and functions are more important than products. Important questions are why we design and make products and services, for whom we design them and what our priorities
are. In sustainability analysis the ecological, economical and social aspects are taken into consideration.

At the View for the future stage thoughts can be totally free. This stage can include brainstorming and new visions for the future are created. On the other hand, demand specifications are also written; which demands the product will face in the future? Vision work is also important. What kind of product we are creating, what is the character of the product?

From idea to practise is the last step and only then can the concrete sketching begin. The challenge is to apply the collected information and aims to the real product.

Design with Care is a holistic method. It starts from the very first idea and leads all the way to the user of the product. It is a design philosophy as well as method and it includes very strong ethical values. This method emphasizes the meaning of the background research before visual design work. In this project, the background studies included discussions with Nestet team, an interview with students and a literature review.

### 2.3 Guidelines for Ecologically Sustainable Product Design

A designer must collect a lot of practical information about materials, processes and their environmental effects. These studies are part of the second phase of the design method, Sustainable starting point. In this project the sustainability analyses are focused on ecological questions. PhD student Kate Fletcher from Chelsea College of Art and Design has made a figure (picture 3) with guidelines for environmentally responsible design (Fletcher, 1998 p.274).
These aspects were the foundation for the sustainability analysis for the products designed in this project. To choose the right raw textile materials is very difficult, since there are no unambiguous answers. All materials have their good and bad sides. It is extremely difficult to compare different materials and qualities with each other. For example it is almost impossible to judge if biodegradability is more important than durability. It is very unlikely to find materials that are perfect in every ecological aspect as well as in performance. The question is more to find the right materials for a specific product. (In an Attachment 1 different materials are compared with each other according to the needs of the products made in this project.)

In this project I was trying to find a strong, long-lasting material, with a production that wouldn’t cause toxic emissions into air, water or soil. Materials should be recyclable or at least degradable. The use of high-energy materials should be also avoided. For example the production of oil based polymers requires a lot of energy, but on the other hand some of them are very durable and even recyclable. However the use of non-renewable resources is dangerously high. During 2002 we used as much oil in 6 weeks as we used during the whole year of 1950 (Nilsson, 2004).

Avoiding unnecessary material combinations makes recycling easier. On the other hand there is no point in designing recyclable products, if there is no effective recycling system created for the materials. In principle the recycling of textile fibres is possible, but it is not that common. For example there is only one company in Finland, Dafecor Oy, which uses recycled textile materials as raw material for their production. Dafecor produces industrial felts and isolation materials. They can even mix different fibres into one product. Most of their raw material is cutting spills, which Dafecor Oy receives directly from other textile industries (E-mail from Risto Saha, Dafecor Oy 11.04.2005).

Recycling and disposal are already partly thought through when the materials are chosen. By using constructions that make it possible to dismantle materials easily, and by adding information about materials, designers / producers can help consumers to dispose of the product in the right way. However it is more important to design products with a long lifespan than to make products that are easy to recycle, but that break down too soon. The performance of the product must be good; it has to correspond to the need that it was created for. It has to give aesthetical, functional and ethical value for the buyer.

2.4 Living in Motion

The products designed in this project are for students, who move often. Their life can be sometimes close to a nomadic lifestyle. Living in motion is present in everyday life in many cultures and it can appear in several different ways. In 2002, Vitra Design Museum in German had an exhibition called Living in Motion. They also published a book under the same title that includes articles from eight authors. The book and the exhibit objects were a great source of information and inspiration for this project.
“Every nomadic lifestyle has its settled moments, just as every settled lifestyle has nomadic aspects.” (Schwartz-Clauss, 2002, p. 17)

Stephan Rammler writes that living in motion is a paradoxical concept. The word living can be associated with stability and security, whereas motion is its contrast. Feelings of stability, physical security and well-being and social integration are also associated with home (Rammler, 2002). Mobility, however, is very often a must in student’s life. I wrote in my field notes quite early in this project:

*I have had 9 apartments during last 8 years, 5 in Finland and 4 abroad.*  
*Field notes October 2004*

Most people want to have a home and security, but they need to move for many different reasons. Therefore solutions that make it easier to move and travel without losing the feeling of security and cosiness were sought in this project.

Even those who don’t have a permanent home still need to settle down at least for short moments and those who have home need to leave it from time to time. Living in motion often is a way to survive. Nomads are forced to move to find a good pasture ground, circus workers travel from city to another to perform and in today’s global world people are willing to move to even other countries to get a better job or a better education. Families pack cars to drive to the countryside for weekends. At the same time we have a need to settle down.

History and different cultures are full of fascinating solutions for mobile living. Nomads have created products in which maximum functionality and flexibility is combined with minimal material use. North American Plains Indians have the tipi, Bedouins have black tents and the nomadic herders in central Asia have their yurts (Bunn, 2002). These dwellings are foldable and portable. Textile or leather is usually the most important building material of these dwellings. Living in motion is extremely wide concept. There are even people who live on water. All kinds of boats from luxurious cruisers to tiny boats are used for living and working. Bajo sea nomads in Indonesia have tiny boats for living and fishing. The hammock is a well-known textile product for mobile living. It is originated with the native populations of South America, where hammocks are still commonly used. The hammock in the picture is from Brazil and it can be folded up to a package of about 15 sq. cm.
Eduard Böhtlingk has designed *Markies* (picture5) a flexible house trailer with two fold-out rooms: a sleeping area and a living area. The furniture can also be folded out from the walls. The living area has a transparent roof and the sleeping area has a yellow hood. This design gives added value to a normal trailer (Kronenburg, 2002).

**Modular Living**

In this thesis modular living means a kit for flexible dwelling or for a flexible interior. In architecture, a module is an arbitrary unit adopted to regulate the dimensions, proportions, or construction of the parts of a building. The Nestet house is made of industrial modules and it is a kind of a building kit that is relatively easy to build up and to take down and build again. Industrial elements, or modules, provide opportunities to construct unique houses. There are certain similarities with Lego houses, like playfulness. Modular systems in design can also be ecologically sustainable, because they enable variations and updating of the product. Instead of buying a totally new product (or even a house) it is possible to buy only new parts for the existing system. There are lot of architects and designers working with the idea of modular living.

For instance Andreas Fredrikson designed a furniture kit called Modern Nomad as a graduation project from Danmark’s Designskole in Copenhagen spring 2004. He designed ten pieces of furniture that can be packed in a case of 1050 x 970 x 280 mm that weighs only 60 kg. The building doesn’t require any tools or screws, because they would probably despair when moving often. Fredrikson’s target group was also young people who move often from one country to another (Form 2/2005).

Modulome is an idea for flexible and modular living created by the design group Nottoscale. Modulome is a prefabricated housing system that provides flexible and affordable housing solutions for different income levels. The idea is that Modulome is flexible enough to adapt to different environments, climates and to the needs of the owner (www.nottoscale.com).
The interior solutions can also be modular. For example Seiler-Baldinger writes about the Japanese multifunctional rice mat, tatami. It is the basic unit in Japanese architecture. Room sizes have been determined by combinations of rice mats called tatami. The size of a room can be described by telling how many tatamis it is, for example four- or six-tatami room. Tatami comes from the word meaning “to fold” and it was earlier used for sitting and sleeping. (Seiler-Baldinger, 2002) Tatami is a good example of a flexible and modular textile product. Softness, comfort and fold-ability are combined in a very practical way in tatamis.

Different cultures and times have created fascinating solutions for mobile living. The basic human need to feel security and stability is the reason why plenty of inventions and designs are made for mobile homes. Modular constructions often offer flexibility to change a product’s form, size or function. This flexibility can be used to add mobility to a product. For instance the houses Modulome and Nestet are relatively easy to move from one place to another.
2.5 An Interview about Student Life

The Design with Care method emphasizes the importance of understanding the target group’s needs. Therefore I conducted an interview among students as the first step in this project. It can be seen as a part of the first stage in the design method, establishing Common ground. I sent the questions by e-mail to many students in Sweden and in Finland. Ten of them responded with written answers. The interview together with my own experiences created the base for the demand specifications for the products. To understand students was quite easy for me, since I was a student myself, as were most of my friends. I still wanted to know what students miss in their home environments and how student dormitories could be cosier. Most of all, I wanted to find out, what turns an apartment into a home?

The aim of the interview was also to find out if student life really is living in motion and how could the feeling of home still be maintained? In the following some of the questions and the answers are briefly presented. My own image of student life before interview was as follows:

“Life can be a little unorganised during studies. You might have a room in a student dorm in Helsinki, but your boyfriend lives in Tampere. On the other hand you miss your hometown Turku. You just came back from Stockholm, where you did your internship. Some of your furniture is in grandmother’s basement in Vantaa, and some pieces have been are lent to Anna, who just came back from an adventure trip in Indonesia. You are planning to travel to study for a year in Tokyo and at the moment every single object seems like a huge problem.”
Field notes, October 2004

In the interview, I asked if the students felt that the life was too hectic, or if they felt like they were living on the road. The answers were pretty homogenous; life is hectic and most of students had moved many times during their studies. One student wrote that she had lived in four different countries and in 9 different apartments. Still almost everyone thought that it was just ordinary life. One student wrote: “Who needs normal life??? Normal life can be on the road”.

My second question was what turns an apartment into a home. One of answers was: “At home you can be yourself in your own way.” Having your own stuff and memories connected to them seemed to be quite important. Many students mentioned that it was important to keep at least books and photos with them when moving. Only one wrote that objects don’t have any symbolic value. Home was described to be the best place in the world and a student wrote that it is essential to have a good coming home –feeling. Home is foremost a safe place to relax. A very illustrative answer was: “At home you can rest your soul”.

Social life was a big issue. Almost everyone had lived in a student dormitory or had shared a flat with a friend. Social life was experienced both as positive and negative. Most of students thought that it is great to have friends around, but sometimes one might miss privacy.
Students didn’t find it difficult to live in a small apartment. More important was the light in the room. Some answers were like “Small can be practical!” “A small space is easier to turn into a home. You don't need that many things.” More problematic were questions of storage and physical moving: where to store furniture and how to move from one country to another. Even though students move a lot, the need to settle down is one of human basic needs. One student wrote that she had been living in 9 different apartments during her studies, but she still always wanted to have a real home. Another student wrote: “I have a need to settle down, even for short times, it doesn’t matter where I am.” It really seemed that the home didn’t have that strong a physical boundary.

When students bought new furnishings, ecological questions were not the first aspect they considered. Most of students wrote that price and aesthetics are usually more important. On the other hand some of them favoured second-hand shops and recycling. A few students mentioned that usually there are no eco-labels on furniture, which makes it almost impossible to know what would be an eco-friendly purchase.

A few things were emphasised in the answers: students generally do move quite often and therefore storage is a problem. Storage means both the temporary storing of furnishing and the storing of everyday objects in small apartments. Friends and social life have a big role in student life. Home is a place to relax in the middle of a hectic life. Home also is a place to meet friends.

### 2.6 Summary of Background Research

The background research was done to clarify why and how the design project can be carried out. The design method, Design with Care, together with concrete environmental knowledge creates the foundation for the design process. The concrete guidelines for sustainable product design mean considering the environmental effects of a product during its whole lifespan, from raw materials to the product’s disposal. The most difficult moment for a designer is when she or he has to compare the different aspects of function with each other; should I choose a beautiful material or a durable material? Can I find solution for both of these? The background studies were the design method’s second phase: Sustainable starting point.

The studies about mobile living gave inspiration for the design process. In many cultures and times, different products and design solutions have helped people to lead mobile lives. Background research showed that mobile living gives rise also for its opposite: stability. Therefore the aim of this project is not only to design products that are suitable for living in motion but also to design sustainable furniture that helps to maintain the feeling of home and cosiness.
3. Design Process

This section of the thesis includes the Design with Care method’s two last parts; View for the future and From idea to practice. The design process for the sofa Idle was long and it has many steps whereas design process for the storage system Hang Around was much more straightforward.

The design process includes two aspects; the form and the pattern design. Very often the form of a piece of furniture is designed first and only then is the upholstery material chosen for it. In this project the pattern, material and form were developed simultaneously. The pattern is an essential part of the form. The aim is to combine form and pattern into a dialog that tells a story about ecologically sustainable design, respect for traditions and Nordic landscape as well as contemporary design. However, in this thesis the description of the form design comes first and then later the description for pattern design. In the actual process these aspects were melted into each other.

3.1 The Selection of Products

After the background themes were explored and students’ needs and wants were analysed, it was time to choose which products would be designed and made for the Nestet house. Two aspects of daily life were chosen: relaxing and storage. A student’s home environment, usually one room, is for everything from working to sleeping, but above all it is the chance to relax that turns an apartment into a home. Social life plays an important role too. I decided to design a sofa because it is for more than one person, it is good for relaxing and it is often the most difficult piece of furniture to move or to store. Students have often rather small apartments and storage was one of the problems mentioned in the interview, so I also decided to design a storage system for all the possible and impossible things that one might find in a home.

The project’s aim was to use textile as a construction material for furniture. Because of its softness, textile constructions need an additional solution to support the shape. Basically there are three ways to do that: to build a frame out of harder material, to fill the shapes with wadding (or air) or to hang textile products from a ceiling or walls. Filling with wadding was out of question, because it did not solve the storage problem. Light frames and hanging were better options. Hanging was also an appropriate possibility for the Nestet house, because it is made out of solid wood and the ceiling as well as the walls are suitable for hooking even heavy items. It was essential to design an entity with ideology; a kit that could be developed further on with new products.
3.2 Product Character and Demand Specifications

I described the intended character of products in writing before the concrete sketching began. What kind of feeling and mood should the products have? Writing down the product characters was verbal sketching and gave a starting point for the visual work. This is a part of the third step in the design method; View for the Future. The purpose was to create not just another product, but a product with personality. The following notes are from my field notes from January 2005.

Idle’s character

How do I feel when sitting on the sofa?

I feel idle and light. It is Sunday morning; there is no hurry to go anywhere. I take a good book and a cup of coffee and I can just lie back, maybe I could doze off for a moment…

It is a party. I’m sitting on the sofa with my friends, right now and right here. We can take it easy and enjoy the evening.

I’m in my private place. I’m home in my own nest. I’m in my dream world. I’m swinging calmly and dreaming of being on a paradise island, swimming in a warm sea…

What does the sofa look like?

The sofa looks cosy and perfect for lazy moments. It looks quite light and simple and it is not too big for a small apartment. It is though a real piece of furniture. It is more than a hammock.

What do I sense when sitting on the sofa?

The sofa is soft, the textile surface is soft and the shape is soft. I can feel the silent movement, it is like a cradle.

Hang Around’s character

Who needs Hang Around?

Hang Around is for people who love order, but have trouble keeping it. Hang Around is good for hiding mess and all the possible and impossible items that one might end up owning! But still can’t throw them away… Hang Around also is a perfect system for fast cleaning. Guests will be at the door in five minutes and the chaos is indescribable. Hang Around takes care of sport wear, laundry, papers and extra hats, gloves and shoes!

Maybe there could be one system by the door in and another system beside a desk?

What does it look like?

It looks pretty neat, but relaxed, maybe even a bit lazy. It looks nicer than storing systems usually do. It is made of nice high quality fabric with beautiful patterns.
Demand specifications

While creating the visions and characters for the products, I wrote the demand specifications too. The products should all be light, easy to pack and fold, so that they are easy to transport and store temporarily. The idiom of the products should still be quite harmonious and calm to create a feeling of home and security. The products cannot be too expensive - no luxury products for students – but they should be sustainable products that are usable also after graduation. The materials must be ecologically acceptable and right for the products. The aim is to design the best possible products. The products must allow flexible use.

Both products, Idle and Hang Around also had their own specific demands. Idle had to be comfortable to sit on and the materials had to be dimensionally stable, they should not stretch and lose their shape because of weight. Hang Around had to be ergonomic too. It shouldn’t be too heavy to lift and it shouldn’t hang so low that people cannot walk under it.

Images in the mood board (picture 7) collect visual images of the background research: foldable textile solutions, hectic student life in cities, the natural and harmonious feeling and compact mobile living.
3.3 The First Version of Idle

The concrete visual design work, *From Idea to Practice* is the last step in the Design with Care method. In this phase all the background information and the visions are fused into a concrete material product.

**Scale models**

I started to work first with the idea of a sofa. The sketches were made in 3D form (picture 8). All the ideas were of furniture hung from the ceiling. That made it possible to use very little other material beside textiles. The idea was that the products can be pulled up to the ceiling when there is no use for them and taken down when needed. This might be very practical in small student apartments.

Some sketches were built out of many pieces, like small cushions. A modular construction was the idea behind these sketches. The designs were based on the idea that the size of the sofa could be increased or decreased. Cushions also could be used as floor cushions, if it was not possible to hang the sofa from the ceiling. Other sketches were simpler. There was just a wadded textile between two bars hung from the ceiling. In these sketches the shape was really simple, so simple that it provided the possibility for multifunction. What if the sofa was an extra bed too? Or maybe the textile could be used as a blanket or sleeping bag?
The full-size prototype

Since comfort and relaxing were demands for the sofa, a prototype in full-size was needed to test if the idea was workable. The first prototype was made with wooden bars and with a straight piece of fabric. I decided to carry out the simplest version of my earlier sketches, because this gave space for interesting pattern design. The sofa had four ropes that were fastened in the sofa’s four corners. Flexibility was added with cleats in the ropes. These cleats were originally made for sailing ropes. They were the perfect system that enabled to adjust the height and sitting angle. The cleats also made it possible to raise the sofa up to the ceiling if there was a need for empty floor space (picture 9).

The prototype was very comfortable. Its swinging movement remained me of a rocking chair and it created a nice link back to the traditional furnishing. The only problem was that getting up from the sofa was slightly difficult. On the other hand the cleats make it possible to change the sitting angle so that everybody could adjust it for themselves. Some small children also tested the sofa and they enjoyed a lot the swinging movement.

Materials and pattern techniques

I had decided to use a quilting technique to achieve a soft appearance. I compared possible materials for wadding and for the fabric (see Attachment 1). The first version was made of ecological cotton canvas with cotton wadding and cotton ropes. Only one material was used to make recycling easier and to keep all materials biodegradable. The shape was a square of 140cm x 140cm. That meant that there was very little spill material, since the whole width of the fabric was used. The wooden bars were made of birch.

The pattern motif for the sofa was designed to suit the ecological wooden house. Therefore a Nordic pine forest was the inspiration source for the pattern. First I photographed pines and inspired by them I made a very simple contour drawing. The pattern was very simple and graphical since the aim was to combine modern design with ecological values and traditions. Three cushions were made for the sofa and the same pine-motif was embroidered on them.
The project’s time schedule and technical possibilities created limitations for the first prototype. The aim was to present the first version at Stockholm’s Furniture Fair, which was already held in the middle of February, whereas the project deadline was not until June. The first idea was to quilt the pattern directly on the fabrics to bind the materials together, but there was no Swedish company that could help with that kind of free quilting pattern. To program an electronic quilting machine is very expensive and time-consuming. Therefore I decided to use a simple and plain check pattern for quilting and embroider the tree pattern on it with a sewing machine.
Stockholm Furniture Fair 2005

When the first version of Idle was presented at Textilhögskolan’s stand at Stockholm Furniture Fair, it got a good response from the visitors at the fair. I worked at the stand during four days, interviewing and listening to people’s opinions about Idle. Different people saw different things. Textile designers and students immediately saw the embroidered tree pattern on the sofa and on the cushions. Product designers were more interested in the sofa’s function, the technical solutions and the ropes. On Sunday, when the fair was open for everyone, visitors were looking for furniture for their own homes. Many visitors said then that Idle looked welcoming and cosy. They also liked the simplicity of the shape. But there were a few comments like “that I would like to have in my garden or veranda.” Idle was seen as a lawn swing. That was not the purpose, because the aim was to create a real piece of furniture that would help to turn the student apartment into a home. In the next phase I needed to figure out how to change Idle to create the feeling of a real sofa made for an apartment not for a garden.

3.4 New Demands and Solutions for Idle

I decided to continue working with the volume of the sofa. The material for the first version was quilted, but it didn’t look soft and cosy enough. It was still very flat and that might have been one reason why people thought that it was a lawn swing. New aims were needed for Idle:

- Idle had to become softer, fluffier and more imposing (but still light).
- The connection between the construction, textile and the pattern had to become even more interesting and creative. The dialogue between pattern and the form was still missing.

The sofa should be simple to produce (to ensure a good price for students and avoid wasted materials) and the form should also allow an interesting textile design on the fabric. Only few materials should be blended to permit recycling, or the materials should be bio-degradable. The simplicity had to be preserved but more volume was needed.

Material solutions

To add volume and comfort demanded new material solutions. PLA (poly-lacto-acid) material was an interesting and new possibility for both the fabric and the wadding. PLA is a biodegradable polymer, which is made out of renewable resources. I choose to use PLA wadding, since it was light and very feathery. By using PLA wadding it was possible to make a softer and bigger form without losing the lightness of the product. However I could not find a good PLA- upholstery material, but I found one strong PLA fabric. I decided to build the bearing construction out of PLA fabric and then upholster the sofa with woollen fabric. I chose to use wool because of its warm feeling. Wool is a traditional, beautiful material that corresponds to the aim of a feeling of security. A good quality wool fabric has also sufficient abrasion durability and flame resistance for domestic use without any chemical coatings.
After combining PLA and wool the difficult questions were: Is the product still washable? Is the textile material still recyclable? At least the sofa was still easy to pack and take to cleaner. The sofa could still be recycled as mixed textile waste or even with little extra work the sofa could be divided into wool and PLA. All the materials were biodegradable.

**Construction solutions**

I wanted to exaggerate the sofa’s soft form with the help of quilting so that it would have a more imposing character. I made new sketches for the sofa’s form (picture 11).

I chose again to work further with the simplest sketch. If the sofa had wadded forms that were too big, it would require more space and it would not be so easy to fold and pack. The sketch with long horizontal wadded forms was interesting, but it gave a feeling that one might easily fall off from the sides of the sofa. The strong direction in the wadding didn’t feel imposing at all. The form couldn’t be dynamic; by contrast it needed to be stable and safe. To achieve this stable feeling I decided to gather the sides of the sofa to achieve more round form, more like a cup.

To add a little bit of comfort the wooden front bar got a new flatter shape that wouldn’t press the thighs of a person sitting on the sofa. To keep the composition harmonious, the back bar got the same flat shape.
3.5 Hang Around’s Form

The design process for the Hang Around storage system was faster than the design process for Idle. That is because the hanging system was already designed for Idle and Hang Around’s construction was much easier. Hang Around was created as a companion to Idle to show that the idea of hanging furniture can be taken further. The idea was to make a set of bags that used the same hooking system as Idle. The same hooks on ceiling could be used both for Idle and for Hang Around if the furniture arrangement was changed.

Hang Around got a very simple cubic form, because I wanted it to be as multifunctional as possible. The function of Hang Around was to hide mess and various bits and pieces. The other reason for making it a simple cube was that I wanted to add a pattern on the bottom of it. Since Hang Around was supposed to be close to the ceiling, it needed to look calm. It could not irritate or have strong patterns, or it would affect to the atmosphere of the whole room. It had to look light and uncomplicated. That was one of the reasons why I wanted to add a pattern only on the bottom of the bag. When seen from the side, Hang around is calm and one-coloured, but when seen from beneath a surprising pattern appears.
3.6 Pattern Design

In the Nestet house, traditional materials are combined with modern design in a very inventive way. My aim was to find this same association for Idle and Hang Around. Woollen upholstery represented the traditional and natural material, and therefore the pattern design needed to be contemporary in a delicate way.

The challenge in pattern design was to find a pattern that would be interesting and suitable for a specific form. The pattern and the form needed to interact with each other. The idioms of form and surface needed to have a dialogue that tells a story about ecologically sustainable design, respect for traditions and Nordic landscape as well as contemporary design. I wanted to surprise with the patterns. The upholstery material didn’t need to have a repeating pattern made in ten different colourings to be wrapped around the forms. Rather, the patterns needed to be an essential part of the forms. The other point was that the products were hanging. It was necessary that they looked light, but still strong. The pattern design needed to support this feeling.

The themes for the pattern design are presented in the mood board (Picture 13). Louekari’s new pattern “Kaiku” for Marimekko is a modern interpretation of Nordic landscape and Margot Barolo’s lamp “Lampel” combines design and natural vegetation. The Northern forest has many expressions from strong pines to the most delicate light green buds. The old embroidery in the mood board reminds me of digital pixel graphics.
I considered two techniques for adding the pattern to the textile: embroidery and printing. I embroidered a few tests with a domestic sewing machine (picture 14), but soon I realised that industrial embroidery possibilities were not flexible enough to handle this pattern. In Sweden there wasn’t any company that could have embroidered enough big patterns for the sofa, since about 25 cm x 25 cm was the maximum size of the pattern for embroidery machines. Quite soon I decided to use digital printing, which provided almost limitless possibilities both in pattern size and colour amount.

I wanted to use trees and forest as a motif, since trees can be associated with peace, nature and reliability. Trees also represented the ecological values of the products and the Nestet house. I started to work again with the photos of pines. I used computer programs to turn them into colourful patterns with visible pixels. I wanted to achieve a light and fresh image.

In the first sketches for Idle the pattern images of the pine forest were either big areas that covered the whole sofa or small images that covered only one quilting square or rectangle. The directions from which the patterns are seen became an important consideration in the design process. The sofa is seen horizontally and the storage system is seen from beneath. To really reach the dialogue between form and pattern, these directions need to be considered. Directions affected how the patterns were composed. When sitting on the sofa, one can feel that one is in the middle of the pattern.

*The sofa is like a tree-house, a secret place in the middle of branches*

*Field notes March 2005*

The pattern composition on the sofa needed to support the feeling of being in the middle of branches. That meant that the pattern had to be in natural size. The next sketches had only one branch placed on the sofa.
When looking the pattern on the bottom of the Hang Around storage system, one is looking upwards. I made some sketches (picture 16) of trees seen from beneath and some sketches with very blurry image, where I tried to achieve the feeling of light filtering through the leaves. Some sketches had a similar branch as the one on the sketches for the sofa.
The patterns and colours were designed for the Nestet house, and therefore they were made only in one colouring that suited the interior. The walls in Nestet are light pine wood and calm grey, and the unbleached white wool with bright green prints was chosen to create a fresh image together with the walls. White woollen fabric accentuated the digitally printed pattern in a beautiful way. In the early sketches also other colours beside green were tested. I found the green colouring most interesting, because it provided the feeling of a tree in a nice naive way. The Nestet house has big windows and the house is filled with day light. I wanted the products to share the light feeling. Hanging furniture in home environment is not very usual. It also might be a little annoying for our sense of balance to see these hanging elements. Therefore I wanted to use harmonious colour scale and light colours to create a calm entity that would also suit relatively small student apartments.
Printing tests on wool

Different woollen materials were tested for digital printing. The natural creases and the hairs sticking out of the fabrics surface can make it difficult to digital print on wool. After a few tests one material was found that provided both a beautiful appearance and great print results. The woollen material made the prints look livelier and the colours stronger than on the paper.

The first printing test showed that the blurry images for Hang Around and the strong pixel image for Idle made the best pair. They both were computer images, but they were each other’s opposites. That created an interesting tension between them.

Left: final pattern for Idle. Right: final patterns for Hang Around
3.7 Important Details

When prints and textile materials were chosen it was time to work with details: ropes, wooden parts and a storage bag for Idle.

**Ropes and wooden bars**

The ropes had to be quite simple to offer a harmonious feeling, but they needed to be visually suitable for the products. I choose to use natural white cotton rope with green dots. I blended a few different greens with each other to create a livelier image. The samples and final ropes were made industrially.

Idle’s wooden bars needed to match the textiles and the mood of the sofa. I decided to use Swedish birch, because it has beautiful light colour itself without paint or other surface treatments. For that reason it was an ecological choice too. Birch was also hard enough to be used in the construction. Birch felt like the right material, because it reminded of the Northern nature and it suited well together with the pattern.

**Storage bag for Idle**

Since the idea was that the sofa could be packed and stored relatively easy, a storage bag was sewn for it. This bag protects the sofa during transportation and possible storage. The size of the packed bag is about 155cm x 30cm x30cm and it weighs 10 kg. The material information is written on the product labels fastened to the Idles storage bag and the lining of Hang Around. Material helps consumers to maintain and dispose the products in the right way.
4. Results

The result of this project is a concept for a hanging furnishing system, which includes prototypes for a sofa called Idle and a storage system called Hang Around. These products can be seen as a starting point for a complete furnishing collection.
Idle and Hang Around are designed for home environment, but they were shot outdoors to show clearly the connection between patterns and their inspiration source. The product pictures communicate idleness, relaxing and the peace of nature.

Both products can be hung to the ceiling with help of sailing blocks. The cleats of Idle are fastened on the ropes and the cleats of Hang Around can be fastened on the walls (picture 21).
4.2 Materials and Techniques

**Wool**

The woollen upholstery fabric used for Idle and Hang Around is from a Danish company, Kvadrat, which has quality and environmental system accreditation to ISO 9001 and ISO 14001. The material has very good abrasion fastness. Originally the wool is from New Zealand. Sheep in warmer climates are often handled with strong pesticides. Intensive sheep farming erodes land and can cause erosion. Therefore it would be better to use wool from Northern countries, if only it was available. The washing process of raw wool uses also a lot of water.

**PLA**

The bearing construction and the wadding are made of polylactide polymer, PLA. This is a new and interesting fibre made of renewable resources, like corn. It is possible to produce PLA also from other plants that produce lot of sugar. First the plant sugars are produced then the sugars are fermented in a process similar too yoghurt making. The fermentation is transformed into polymers and then into fibres. According to North American PLA producer, Ingeo Fibers, the process needs 25-55% less energy than the production of oil based polymers. PLA can be composted or recycled chemically back into polymers again (www.ingeofibers.com).
Cotton

The ropes are made of cotton. In production, the cotton should be ecological. For the prototype it was not possible to make ecological cotton ropes, since the company who made the ropes is not working with ecological materials.

The lining of Hang Around is made of ecological cotton as well as the storage bag for the Idle.

Digital printing

Digital printing is a more ecological technique than screen printing. Typical emission sources in printing processes include printing paste residues, waste water from wash-off and cleaning operations and volatile organic compounds from drying and fixing. (European Commission, 2003) When using digital printing the waste of printing paste and washing water for machines can be avoided. Digital printing also provides more possibilities for pattern design. There are no exact repeats or limitations to the number of colours that can be used. Digital printing is still very expensive compared with screen printing.

Different digital printers use different dyes. For example Tobex Ab in Borås prints with pigment colours and a design school Evtek in Vantaa uses reactive dyes in their digital printer. Both these techniques have advantages and problems. Printing with pigment dyes is easier and the process is simple. Pigment print can be fixed with heat, whereas reactive dyes need to be fixed with steaming and after that the textiles need to be washed twice. Reactive printing needs also a separate printing paste coated on the fabric before printing (discussion with Tuiti Paju, 31.03.2005). On the other hand reactive dyes create a strong chemical bond with textile material and the pattern has a great abrasion fastness. Pigment dyes are not usually used on wool and the abrasion fastness depends on the printing paste. Pigment prints have still very good light fastness. I decided to use pigment printing because Tobex Ab is located in Borås and I had a better change to make tests before printing the final fabrics. If the product were in production it would probably be better to use reactive dyes or acid dyes. Tests for the abrasion fastness would be needed before the final solution.
5. Discussion

5.1 Sustainability Analysis

Ecology

Transportation is one of the themes in this project. The aim was to design products that are easy to transport when moving, but the light weight is also an advantage for ecological transportation from factory to the customer. If the products are relatively light and easy to pack in small spaces that reduces the emissions from transportation. It would have been good to favour local raw-materials to avoid unnecessary transportation. The products could be even lighter, if other materials were used. For example the wooden bars could be replaced with aluminium bars. However that kind of change would radically affect the character of the product and would also cause other environmental problems.

If compared with a traditional sofa, Idle is light, which means that relatively little raw materials are used for it. The sizes and the simple forms of Hang Around and Idle are dimensioned by the width of the fabric, so that they cause only very little spill material.

The upholstery wool used in the prototypes comes from New Zealand. It could be replaced with wool produced in Northern countries. That would reduce unnecessary transportation and the wool would be produced with less pesticides. However the used wool has very high quality and good durability.

The bearing construction and the wadding are made of polylactide polymer, PLA. The fibre is from a North American company Cardill Dow: Ingeo Fibers. This material is clearly more environmentally friendly than oil-based polymers. However the material is relatively new and there aren’t many companies working with it. That means that it is also hard to get objective information about the material’s qualities and performance.

All the materials but sewing threads are biodegradable and made from renewable sources. In the future the sewing thread should be replaced with a biodegradable alternative. In the construction of Idle two materials, PLA and wool are sewn together. That might cause troubles for recycling, but if compared with traditional sofa, Idle has only very few materials blended. The material information is written on the product label fastened to the Idle’s storage bag and in the Hang Around’s lining. That helps consumers to dispose of the products in the right way.

If the products were in production, many tests would be needed before deciding upon the final solution. High quality is the main aspect when striving sustainability in design. Idle and Hang Around are still on prototype level.


**Economics**

To calculate the price for a product is impossible if the producer and the production system are unknown. The price depends on the selling volume, the machinery and techniques, and of course the production country. However, Idle and Hang Around have simple constructions, which mean that the production should not be too complicated or expensive. The materials are also reasonable and functional. The price of the PLA wadding is higher than the price of polyester, but it is still quite realistic, for example compared with down. If these products were in production, a research would be needed to find the suitable producers for the materials. The price and ecological aspects should be in balance. Digital printing is today much more expensive than screen printing, but its design and ecological advantages are remarkable.

When talking about economics and ecology at the same time one has to take a clear standpoint and answer to the question: what do economics mean to me? I believe that we in consumption-oriented countries are used to buying products far too cheaply. The respect for the material is very low. Of course also Idle and Hang Around could be produced very cheaply, without thinking through any ethical dilemmas. But in a long run, is that really economical when thinking globally about our earth? Maybe the future generations have to invest much more money in solving ecological problems. With this I want to say that I see the question of economics in much bigger context than as a price of a single prototype.

**Ergonomics and social aspects**

The design method used here, Design with Care, emphasizes that good design is available for everyone. The both products, Idle and Hang Around have some drawbacks in this aspect. For elderly people it might be difficult to get up from the sofa, because it is unstable. Pulling up Hang Around requires some strength. On the other hand the target group in this project was students, who are leading a mobile life. The sitting angle and the height of the sofa are adjustable, which is an ergonomic advantage. The silent rocking movement of the Idle sofa is very comfortable and relaxing. That also creates a nice link to the traditional rocking chairs. Children, who have tried the sofa, have enjoyed the rocking too.

Social aspects also concern the production of the product and the raw materials. The origins of the materials used in this project is known. (Only the origin of the cotton of the ropes is unknown.) There should not be any child labour or other human misuses in the production of these materials.

**5.2 Making Decisions**

This project has been very educational both in design and in theory. This project has taught me to see the complexity of design process and its impacts on people, society and nature. The design task that I chose was a conscious risk; it was close to furniture design and as a textile designer I didn’t have much experience in that field. However I believe that it is sometimes necessary to cross the lines between different design areas, because that creates deeper
understanding for design. A textile designer needs also to understand the form and the space. For me the ideal situation would be to work in a design team, where different skills could be shared. The biggest problem in the project was that I needed a lot external help, for example with wooden bars, sewing constructions and digital printing. Since I couldn’t make and test everything by myself, I felt from time to time that I didn’t have full control over the process. Therefore to be completely satisfied I would need to make prototypes one more time. On the other hand if the products were industrially produced the constructions and techniques should be designed to suit the production system and machinery of the producer.

Since functionality is one condition for sustainable product design, one might ask if it is really that practical to hang furnishing. That is not even possible in every apartment. However I consider this project also as an exercise in seeing design briefs from different point of view; in this case up side down: what if all furnishing was hung from ceiling and taken down only when needed? Why don’t we more often look upwards? Why don’t we make more of the vertical space in interiors? It is true that the products are not suitable for every student apartment, but if they are, they provide some solutions for students’ storage problems.

I feel that the products made in this project provide an interesting platform for new pattern designs. The products can be varied by creating new patterns for the products. For example the pattern could be printed on the backside of the sofa too. That way the pattern could be seen also when the product is pulled up to the ceiling. The connection between pattern and form provides endless possibilities to play and test different designs.

Andreas Erikson managed in his graduation project to fit ten pieces of furniture in a suitcase (picture 8). That is much more impressive than fitting only one sofa in the approximately same size of package. On the other hand the aim of this project also was to design cosy and warm products, which give feeling of stability. To use the best qualities of textiles, the softness and the warmth, I needed to give up reaching for extremely foldable and light products. I’ve made many compromises, but I tried not to lose the beauty and the warmth of textiles. The products should create feeling of home and seduce one to be idle for a moment. Like one student wrote in her answer “At home you can rest your soul.”

The function of beauty

The aim of this thesis was to study a sustainable approach in the design process. In the chapter 3.1 Sustainable Design, I wrote that it is most important that designer faces ethical questions and is honest in her/his work. This was the most demanding task in this thesis. During the whole design process I needed to compare different aspects with each other. For example is it more important for sustainability to emphasize aesthetics and tactile feeling or durability? These are not opposite aspects rather different sides of same question. There are no right answers for such questions and it is these questions that are the critical points, when a designer needs to take responsibility for the work. Papanek wrote that when honesty, beauty and utility meet each other we can talk about the spiritual in design (Papanek, 1995).
Papanek's function analysis, which includes aesthetics as a part of function, is very comforting for a textile designer. Textiles are often seen as decorative design. In the beginning of this project I wanted to emphasize the constructional and functional role of textiles, but the further the process went the decorative side became more and more important. Papanek writes: “Decoration is deeply satisfying to human beings and has been through history.” (Papanek, 1995, p. 51). Decorative is not same as aesthetical. Functional form can be beautiful, but decoration is always something which is additional. Decoration has no utility, but it might have a function of creating beauty. Something which is additional means though always more production processes and therefore more ecological impacts. The designer must consider carefully if decoration is really necessary for the product. Does it add something essential? The prints on the sofa and on the storage bags are purely decorative; they are added onto the product. But on the other hand I also wanted to make patterns that are an essential aspect of the form.

I believe that I managed to create at least a connection between decorative and functional, pattern and form. I have to admit that I enjoy creating decorations. Is that purely a hedonistic standpoint or can decoration really improve products? Once again this is the critical question, which I have to answer and take responsibility of my choice. At least I hope that the patterns and forms have a dialogue with each other and with the user of the product and by this dialogue patterns become meaningful.

**Nature, future and new technology**

New technology is providing lot of solutions for more ecological production. Industrialism brought mass production. Material became less expensive and that led us to mass consumption. I believe that new technology can help us to create small series, unique products that will be more meaningful for their owners. For example digital printing has no limitations for pattern repeat or for the number of colours. It doesn’t require any investments (beside the design work) that would force production of huge amounts of the same product. That means that patterns can be designed easily to suit a certain product, exactly the right shapes can be printed. The lines of a print can that way easily follow the lines of a product. Almost limitless electronic jacquard techniques are available also for knitting and weaving. I hope that we designers will manage to use these advantages to create better design, not only more products.
References:


Ingeo Fibers, the producer of PLA fibres, www.ingeofibers.com (14.05.2005)


Picture Credits:

1. Nestet
2. Eames’ Lounge Chair, www.eamesgallery.com (14.05.2005)
Bajo Sea Nomad from Indonesia, photo Milda Drüke in Living in Motion (2002) Vitra Design Museum (p. 159). Ditzingen: GZD.
7. Mood board:
Kvarnhusen/NOD landkaparkitekter. Photo: James Silverman, Arkitektur, 2004, issue 5, cover page
Barcelona, Photo: Gustaf Grapengiesser Arkitektur, 2004, issue 5 (p. 58)
Caravan, Photo: Scarlet Coten, View on Colour, 2005, issue 27 (p. 48)
8. First sketches
9. Prototype
10. The first version of Idle, photo: Ida Jönsson / Tiia Eronen
11. New sketches for the form of the sofa
12. Sketch for Hang Around
14. Embroidered sketches
15. Pattern composition sketches for Idle
16. Pattern sketches for Hang Around
17. Final patterns
18. Product labels
19. Idle, Photo: Ida Jönsson
20. Hang Around
21. Details of the products

photos by Tiia Eronen, if not other reference is mentioned
### Environmental effects

**Cotton (ecological)**
- Ecological, krav – label. Trustable
- A lot of water use
- Biodegradable
- Good
- Doesn't need as much energy to produce as the traditional polymers

**Flax**
- Biodegradable
- Rather krav flax
- Doesn't need strong fertilizers or pesticides, but the soaking of plants can cause ecological effects.

**Wool**
- Acceptable
- Biodegradable
- Possible to find ecological wool, but sheep in warmer climates are often handled with strong pesticides.
- The washing process of raw wool uses a lot of water. Intensive sheep farming erodes land and can cause erosion.

### Lightness

<table>
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<th>Wool</th>
<th>Flax</th>
<th>PLA (ecological)</th>
</tr>
</thead>
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<td>Keeps its appearance for a long time</td>
<td>Not so good</td>
<td>Very good</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Looks soft and warm</td>
<td>Not so good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Easy to find a lot of cotton and wool, but it's not easy to find ecological cotton.</td>
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<td>Good for a upholstery not for a bearing</td>
<td>Good for a upholstery not for a bearing</td>
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### Function

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<td>Biodegradable</td>
<td>Biodegradable</td>
<td>Biodegradable</td>
<td>Biodegradable</td>
</tr>
<tr>
<td>Good usage in wet conditions</td>
<td>Good usage in wet conditions</td>
<td>Good usage in wet conditions</td>
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<td>Softener than polyester, but might still have a bit of shrinkage</td>
<td>Softener than polyester, but might still have a bit of shrinkage</td>
<td>Softener than polyester, but might still have a bit of shrinkage</td>
<td>Softener than polyester, but might still have a bit of shrinkage</td>
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### Sustainability

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<td>Acceptable tensile strength</td>
<td>Good tensile and abrasion strength</td>
<td>Good tensile and abrasion strength</td>
</tr>
<tr>
<td>Acceptable abrasion strength</td>
<td>Acceptable abrasion strength</td>
<td>Good abrasion and abrasion strength</td>
<td>Good abrasion and abrasion strength</td>
</tr>
<tr>
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<td>Not dimensional stable; sacking problem</td>
<td>Not dimensional stable; sacking problem</td>
<td>Not dimensional stable; sacking problem</td>
</tr>
<tr>
<td>According to Cargill Dow, but ageing by hydrolysis. If the environment is humid might degrade over time.</td>
<td>Good according to Cargill Dow, but ageing by hydrolysis. If the environment is humid might degrade over time.</td>
<td>Good according to Cargill Dow, but ageing by hydrolysis. If the environment is humid might degrade over time.</td>
<td>Good according to Cargill Dow, but ageing by hydrolysis. If the environment is humid might degrade over time.</td>
</tr>
</tbody>
</table>

### Price

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<th>Material</th>
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<th>Flax</th>
<th>PLA (ecological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ok, easy to purchase, but difficult to find several qualities</td>
<td>Ok, but difficult to purchase</td>
<td>Ok, but difficult to purchase</td>
<td>Ok, but difficult to purchase</td>
</tr>
</tbody>
</table>

### Aesthetics

<table>
<thead>
<tr>
<th>Material</th>
<th>Wool</th>
<th>Flax</th>
<th>PLA (ecological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosy and soft, but not perfect as</td>
<td>Cosy and soft, but not perfect as</td>
<td>Cosy and soft, but not perfect as</td>
<td>Cosy and soft, but not perfect as</td>
</tr>
<tr>
<td>Several qualities</td>
<td>Several qualities</td>
<td>Several qualities</td>
<td>Several qualities</td>
</tr>
<tr>
<td>Ok, but difficult to purchase</td>
<td>Ok, but difficult to purchase</td>
<td>Ok, but difficult to purchase</td>
<td>Ok, but difficult to purchase</td>
</tr>
</tbody>
</table>

### Folding

<table>
<thead>
<tr>
<th>Material</th>
<th>Wool</th>
<th>Flax</th>
<th>PLA (ecological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Not so good</td>
<td>Not so good</td>
<td>Good</td>
</tr>
<tr>
<td>As felt material gets bad, as worn</td>
<td>As felt material gets bad, as worn</td>
<td>As felt material gets bad, as worn</td>
<td>As felt material gets bad, as worn</td>
</tr>
</tbody>
</table>

### Lighnessness

<table>
<thead>
<tr>
<th>Material</th>
<th>Wool</th>
<th>Flax</th>
<th>PLA (ecological)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ok</td>
<td>Ok</td>
<td>Ok</td>
<td>Ok</td>
</tr>
</tbody>
</table>

### Notes

- This is an overview of some textile materials. All the ecological and performance questions depend on the production system and the quality of the material. These aspects are general information, which helped to find the right choices for the products.

- ATTACHMENT 1