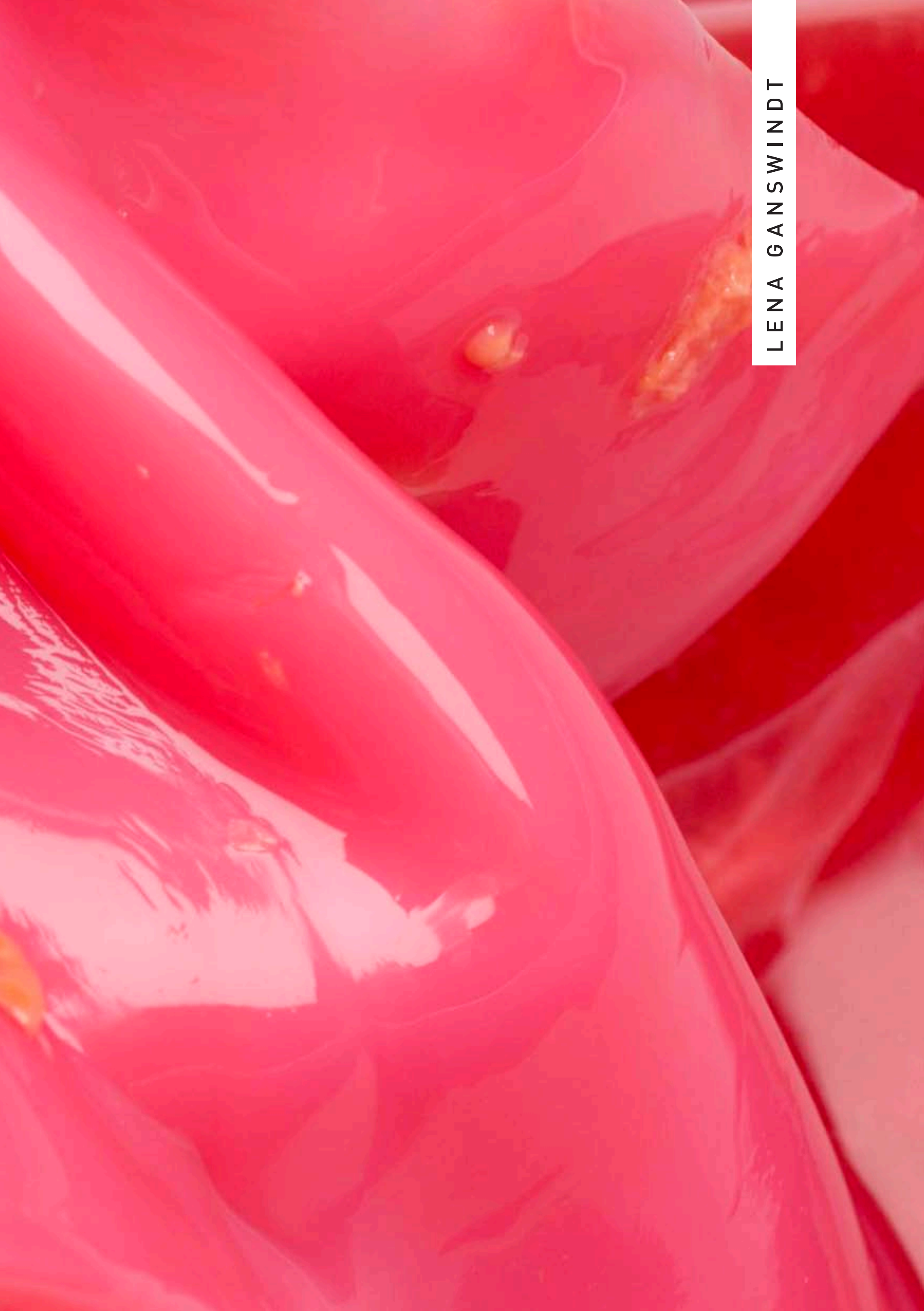
SCOBY

Untersuchung eines
organischen Materialkreislaufs



LENA GANSWINDT

SCOBY

UNTERSUCHUNG EINES ORGANISCHEN MATERIALKREISLAUFS

Scoby ist das Akronym für „Symbiotic culture of bacteria and yeast“ und bezeichnet ein milchiges, gelartiges Material, das während der Fermentierung des Kombuchatees entsteht. Dieser Prozess wird durch Hefen und Essigsäurebakterien gesteuert, die in einer natürlichen Symbiose leben. Die Bakterien synthetisieren dabei Nanocellulose-Fasern, die sich wie ein Vlies an der Oberfläche des Kombuchatees ansammeln.

Bei der Herstellung bedarf es keinerlei spezieller Technologien, sondern lediglich verschiedener Zutaten aus dem alltäglichen Bedarf, wodurch die Herstellung unabhängig von der Industrie und für jeden möglich ist. Der Vorgang ist dazu vollkommen ökologisch, und es werden keine für die Umwelt schädlichen Nebenprodukte erzeugt.

Optisch erinnert der Scoby an Haut oder Leder, weshalb es auch als „veganes Leder“ Aufmerksamkeit erlangte und viele Designer motivierte, mit ihm zu experimentieren. Die möglich herstellbare Flächengröße und Form ist anpassungsfähig, und auch Farbe und Strukturen sind beeinflussbar. Dies bietet eine ausgezeichnete Grundlage für eine Art „Slow Prototyping“ Verfahren, bei dem der Hersteller entsprechend des Einsatzbereichs den Scoby während des Wachstums noch beeinflussen, aber auch nach dem Wachstum weiter verändern kann.

Bei jedem Wachstumsprozess wird der Hersteller routinierter und kann neue Parameter ermitteln, die Möglichkeiten zur Produktoptimierung- und Veränderung eröffnen. Der Hersteller baut dabei eine Art Beziehung zu dem Material auf, die von einer anfänglichen Skepsis aufgrund von Aussehen und Geruch bis zu Sympathie und vielleicht sogar Faszination reicht.

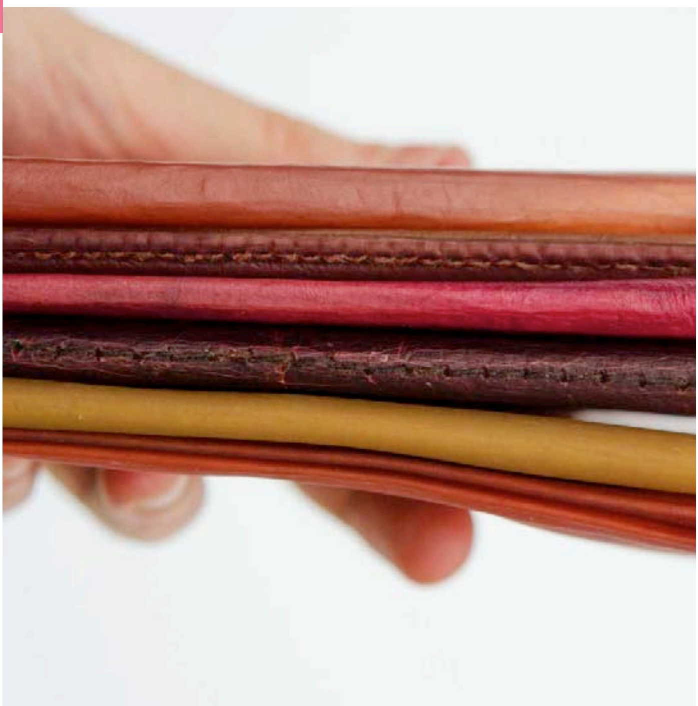
Der Kreislauf zur Herstellung des organischen Materials wurde einmal komplett durchlaufen, wobei eine Vielzahl von Proben entstanden, an denen visuelle, haptische und olfaktorische Merkmale empirisch zusammengefasst werden konnten. In diesem Prozess haben sich drei Kategorien herauskristallisiert, in die die Proben eingeordnet werden können: „Natural Scobys", „Coloured Scobys" und „Smart Scobys".

Das Projekt ist ein stetiger Prozess und befindet sich an diesem Punkt lediglich am Ende des Versuchsstadiums. Es galt dem Material selbst und verlief auf der Materialebene. Das Produkt dieses Projekts ist daher die Gesamtheit der Proben und ein Bericht, in denen ihre Eigenschaften notiert und Auffälligkeiten im Wachstumsprozess, beim Ernten und beim Trocknen festgehalten wurden. Im nächsten Schritt wird die praktische Verwendung weiter in den Vordergrund treten und ein Kontext für das vielseitige Material gesucht.

Experimente mit dem Cellulosematerial:

v.l.o.n.r.u.

culinary hacking - Carolin Schulze,
Skin - Sammy Jobbins,
Cellulose Cellphonecover - Ellen Rykkelid,
Biocouture - Suzanne Lee,
Xylinum Cones -Jannis Hülsen



Verschiedene Tests und Experiemente wurden bisher mit dem Material im Bereich der Mode und des Porduktdesigns durchgeführt. Dabei wurde es nach dem Wachstum geformt und strukturiert oder mit Hilfe von pflanzlilichen und synthetischen Farbstoffen gefärbt. Jannis Hülsen und Carolin Schulze haben sogar damit begonnen, Scobys schon während des Wachstums in dreidimensionale Formen zu bringen.

Biocouture
Suzanne Lee entwickelte Mode aus Bakterieller Cellulose

The Kernels of Chimaera
Stefan Schwabe

WAS SIND DIE **EINFLUSSFAKTOREN** FÜR DIE VERÄNDERUNG DES MATERIALS?

WIE KANN ICH DAS MATERIAL VISUELL, HAPTISCH UND OLFAKTORISCH **MANIPULIEREN**?

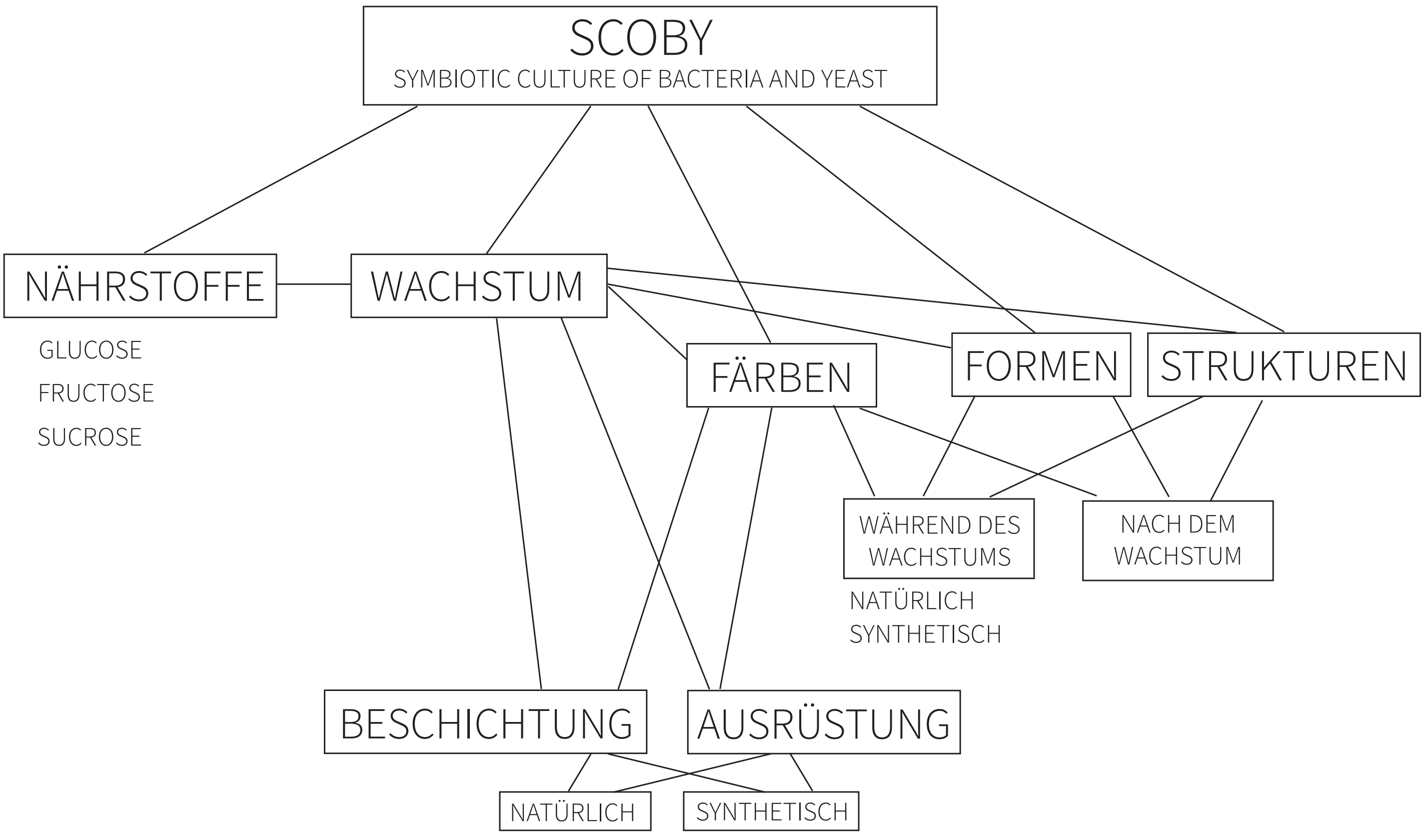
Mit diesen Fragen startete der Prozess, und anhand einer Matrix wurde ermittelt, auf welchen Ebenen eine Manipulation stattfinden kann und mit welchen Parametern dies möglich ist:

Wachstum, Ernte, Trocknung. Damit wurde ein Anhaltspunkt für die Durchführung der Versuche geschaffen. Am Anfang der Versuchsreihe lag der Fokus vor allem auf der Wachstumsebene, in der durch farbgebende Zutaten die Erscheinung des Scobys beeinflusst werden sollte.

Mindmap

Eine frühe Übersicht der möglichen Testinhalte

PLANUNG


SCOBY
SYMBIOTIC CULTURE OF BACTERIA AND YEAST
NÄHRSTOFFE
GLUCOSE
FRUCTOSE
SUCROSE
WACHSTUM
FÄRBEN
FORMEN
STRUKTUREN
WÄHREND DES WACHSTUMS
NATÜRLICH
SYNTHETISCH
NACH DEM WACHSTUM
BESCHICHTUNG
AUSRÜSTUNG
NATÜRLICH
SYNTHETISCH

Die Herstellung eines Scobys

>> Bring einen Liter destilliertes Wasser zum Kochen und schütte unter ständigem Rühren 90g Zucker hinzu. Rühre so lange, bis der Zucker vollständig aufgelöst ist, und schalte anschließend die Wärmequelle aus. Lass einen Beutel Grüntee für 10 Minuten in der Flüssigkeit ziehen und warte, bis der Tee auf 30°C abgekühlt ist. Gieße 88ml Branntweinessig in den Tee und verrühre, bis er vollständig aufgelöst ist.
Anschließend wird dieses Gemisch zusammen mit 100ml Kombucha-Essenz und einem kleinen Stück Scoby in einen sauberen Behälter gegossen und drei bis vier Wochen bei Zimmertemperatur ruhen gelassen.
Nach einigen Tagen sollte sich an der Oberfläche der Flüssigkeit eine wabbelige Schicht bilden, die mit der Zeit immer dicker wird.
Um diesen Prozess nicht zu stören, solltest du achtgeben, dass der Behälter nicht bewegt wird. Sorge dafür, dass die Temperatur im Raum nicht unter 22°C fällt. Stelle den Behälter aber auch nicht in die direkte Sonne. <<

In dieser Zeit findet ein Fermentierungsprozess statt, bei dem die in der Kombucha-Essenz enthaltenen Hefekulturen und Bakterienstämme mikroskopisch kleine Cellulose-Fasern erzeugen. Diese Fasern sammeln

PROZESS: ZUBEREITUNG

Kombucha Zutaten

Wasser, Zucker, Tee, Essig, Kombucha Essenz und ein kleines Stück Scoby Starter

Scoby während des Wachstums
Im Fermentierungsprozess wird der Zucker zu Kohlenstoff abgebaut (Bläschen)

sich an der Oberfläche wie bei einem Vlies zu einem gelartigen und milchigen Material an. Das Produkt dieses Prozesses wird mithilfe des Bakteriums Acetobacter Xylinum synthetisiert und nennt sich Bakterielle Nanocellulose. Im getrockneten Zustand wird es transparent, ist flexibel und gleichzeitig stabil.

>> Wenn das Material eine Dicke von 0,5–1cm erreicht hat, kannst du es ernten. Dafür nimmst du es vorsichtig mit Handschuhen aus dem Gefäß heraus, wäschst die verbliebene Flüssigkeit mit Wasser und Seife ab und legst es zum Trocknen auf eine Holz- oder Gipsunterlage.
Du kannst das Material auch direkt in eine Form oder auf eine strukturierte Unterlage legen. Wenn es getrocknet ist, behält es die Form oder Struktur, in die es gelegt wurde, bei. Falls du es einfärben möchtest, kannst du vorher zum Beispiel Beeren oder rote Beete hinzufügen.
Im Sommer bietet es sich an, das Material zum Trocknen in die Sonne zu legen. Dann sollte es aber mit Papier abgedeckt werden, da sich sonst gerne kleine Fruchtfliegen darauf niederlassen. <<

Der Wachstumsprozess ist beeinfluss- und somit individualisierbar: Größe, Form, Farbe und Funktion können je nach Bedarf variiert werden. Dadurch ergibt sich die Möglichkeit, vollkommen organisch und unabhängig von der Industrie in einem Arbeitsgang einen Prototypen herzustellen, nicht in einem „Rapid Prototyping“-, sondern einer Art „Slow Prototyping“-Verfahren. Der ausgedehnte Herstellungszeitraum bedingt auch eine andere Beziehung zwischen dem Material und seinem Hersteller. Zudem können in dieser Zeit auch die Parameter, die das Wachstum, die Farb- und Formgebung und die Trocknung des Materials beeinflussen, nicht nur ermittelt, sondern auch verändert werden.

>> Falls du planst weitere Cellulose wachsen zu lassen, solltest du ein Stück des frischen Materials aufheben, um es später zur Züchtung von weiterem Material einsetzen zu können.
Ist während der ganzen Zeit an der Oberfläche der Flüssigkeit jedoch keine milchig wabbelige Masse entstanden, hast du bei der Zubereitung wahrscheinlich einen Fehler gemacht. Versuche es noch einmal von vorne, verwende aber eine neue Kombucha Essenz. <<

Der Prozess ist ein Kreislauf: ein vergängliches Material entsteht über den Faktor Zeit und kann wieder als Grundlage für die Erzeugung eines neuen Materials verwertet werden.
Jeder hat die Möglichkeit es herzustellen.

Scoby kurz vor der Ernte

Die Oberfläche ist unregelmäßig und weist einige Löcher auf

Färben
v.l.o.n.r.u.

Zusammen mit der frischen Kombucha Lösung wurden Früchte und Gemüse in einen Container gegeben. Die Früchte haben ihre Farbpigmente im Wachstum an den Scoby abgegeben und nachhaltig gefärbt. Die Bilder zeigen den Prozess mit Himbeeren, roter Beete, Mango und Spargen. (Von oben nach unten)

Scoby ernten

Das Kombucha Gemisch enthält Himbeeren, die zu einer intensiven Färbung des Scobys führen.

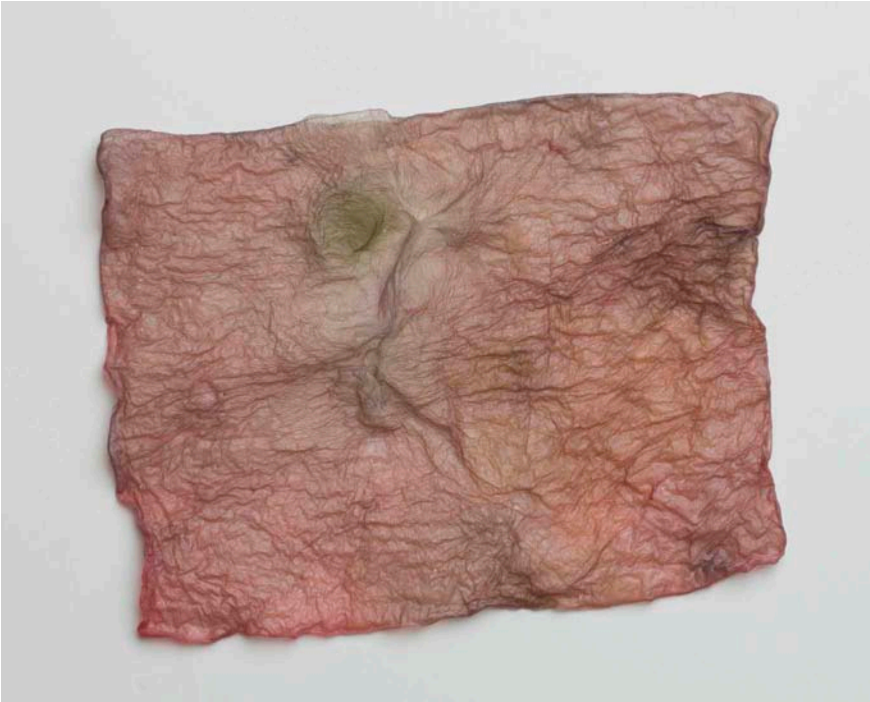
Scoby trocknen

Der Scoby wird zur Trocknung auf eine frische Multiplex-Platte gelegt

Die Versuche zeigen deutlich, dass der Trockenuntergrund einen starken Einfluss auf die Struktur und Beschaffenheit des Materials nimmt. Es wurden Tests mit Gips und verschiedenen Holzarten durchgeführt, und mit jedem Trocknungsmedium wurde eine andere Materialqualität erzeugt.

Medium:	**Dauer:**	**Oberflächenbeschaffenheit:**
Fichtenholz, gehobelt:	2-3 Tage	ledrig, flexibel
Spanplatte:	3-5 Tage	klebrig, flexibel, kompressibel
Multiplex-Holzplatte:	3-5 Tage	trocken, glatt, biegbar
Gips:	1 Tag	sehr trocken, steif, strukturiert

PROZESS: TROCKNUNG



oben:
"Himbeerbrett"
Nr. 12
Scoby auf Gips
getrocknet

unten:
"Himbeerblatt"
Nr. 13
Scoby auf Multiplex-
Platte getrocknet

Während des Experimentierens wurde eine Gestaltungsmöglichkeit entdeckt, mit der sowohl Ästhetik als auch Funktion geschaffen werden kann. Wenn mehrere Scobys übereinandergelegt werden, entsteht ein größerer zusammenhängender Scoby. Durch die transparente Optik des Materials, sind die einzelnen Lagen deutlich zu erkennen und können genutzt werden, um Kompositionen zu erstellen.

Diese Methode kann außerdem für die Isoliereung leitfähiger Materialien, wie zum Beispiel Garne, verwendet werden. Das Material umschließt dabei das Garn vollständig und fixiert es.

Charlotte I, Nr. 2

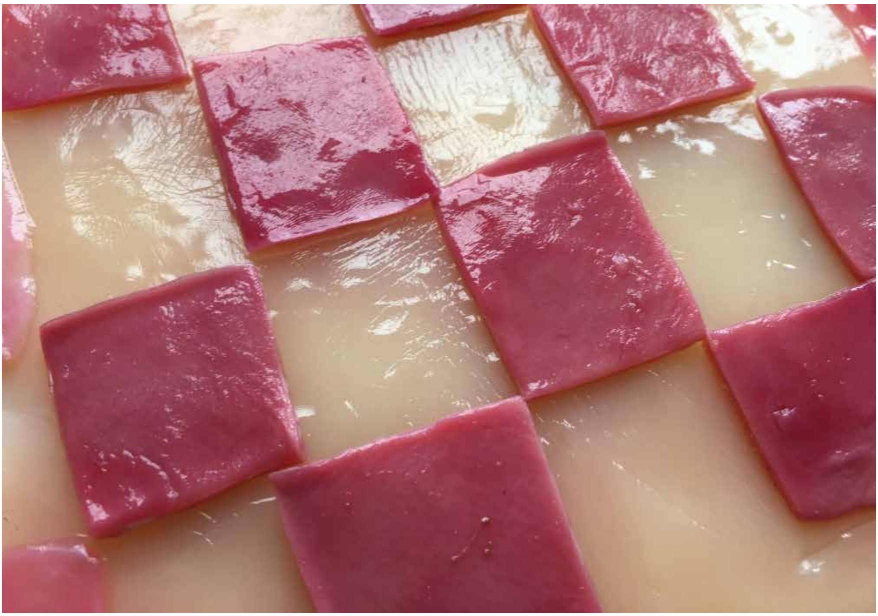
Scoby bestehend aus mehreren einzelnen Scobyschichten

Tomatenmark

Ein Behälter wurde am Boden mit Tomatenmark bedeckt und mit einem frischen Kombucha Gemisch und einem Starter Scoby befüllt.

v.l.o.n.r.u.

frisches Tomatenmark ohne Kombucha,
frischer Scoby im Behälter,
geernteter Scoby,
Scoby in Blütenblättern und Essig eingelegt,
gefärbter Scoby



Schachbrett Scoby

Zwei verschiedene Scobys (gefärbt und naturbelassen) in einer Schachbrett Komposition angelegt

Drei Kategorien haben sich während des Prozesses herauskristallisiert, in denen die Proben einzuordnen sind. In Kategorie **„Natural Scobys“** wurde das Wachstum nicht wissentlich beeinflusst und auch das entstandene Produkt nicht verändert.

In der nächsten Kategorie **„Coloured Scobys”** wurde die Farbe und Form bewusst beeinflusst. Dabei konnten das Farbaufnahmevermögen und die Möglichkeiten zur Farbwahl untersucht werden.

In der letzten Kategorie **„Smart Scobys”** wurde dem Material eine Funktion hinzugefügt, indem Komponenten zur elektrischen Leitfähigkeit während oder nach dem Wachstum integriert wurden

Natural Scobys

Coloured Scobys

Smart Scobys

Verlauf v.l.o.n.r.u.

leitfähiges Garn,
Kohle, Graphit,
Kohle, ummanteltes
Silbergarn, FGL,
Silbergarn mit SMD
LEDs

Charlotte II, Nr. 7

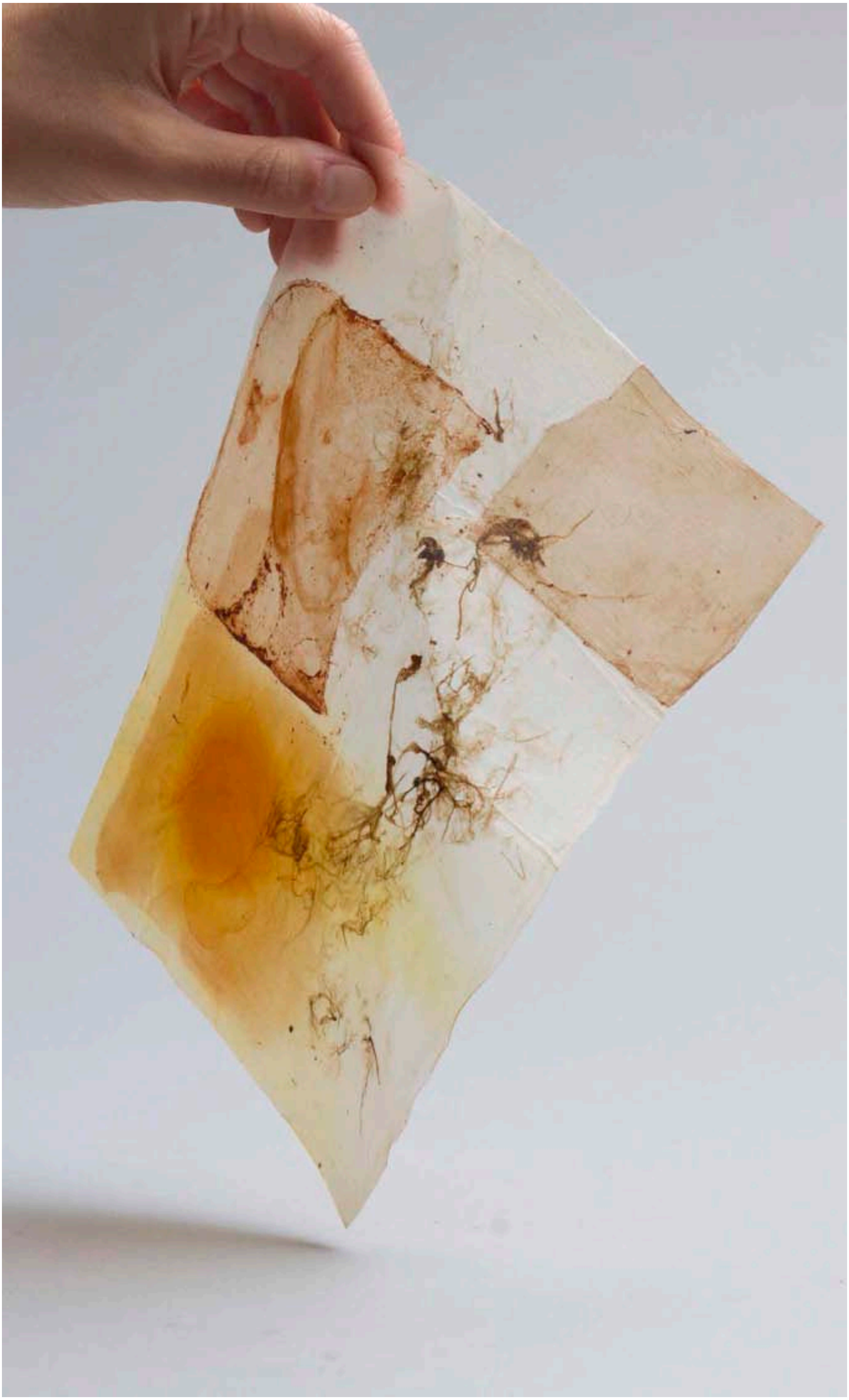
Nach dem Ernten bestand dieser Scoby aus einer hauchdünnen Schicht, die mit runden, kugelförmigen Erhebungen übersehen war.

Charlotte II, Nr. 7

Nach der Trocknung haben die Erhebungen sich geglättet und hinterließen kreisförmige Strukturen auf der Fläche.

Scoby Oberfläche

Die Oberfläche eines natürlichen und unbehandeltem Scobys hat einen ledrigen Charakter.



Scoby Collage

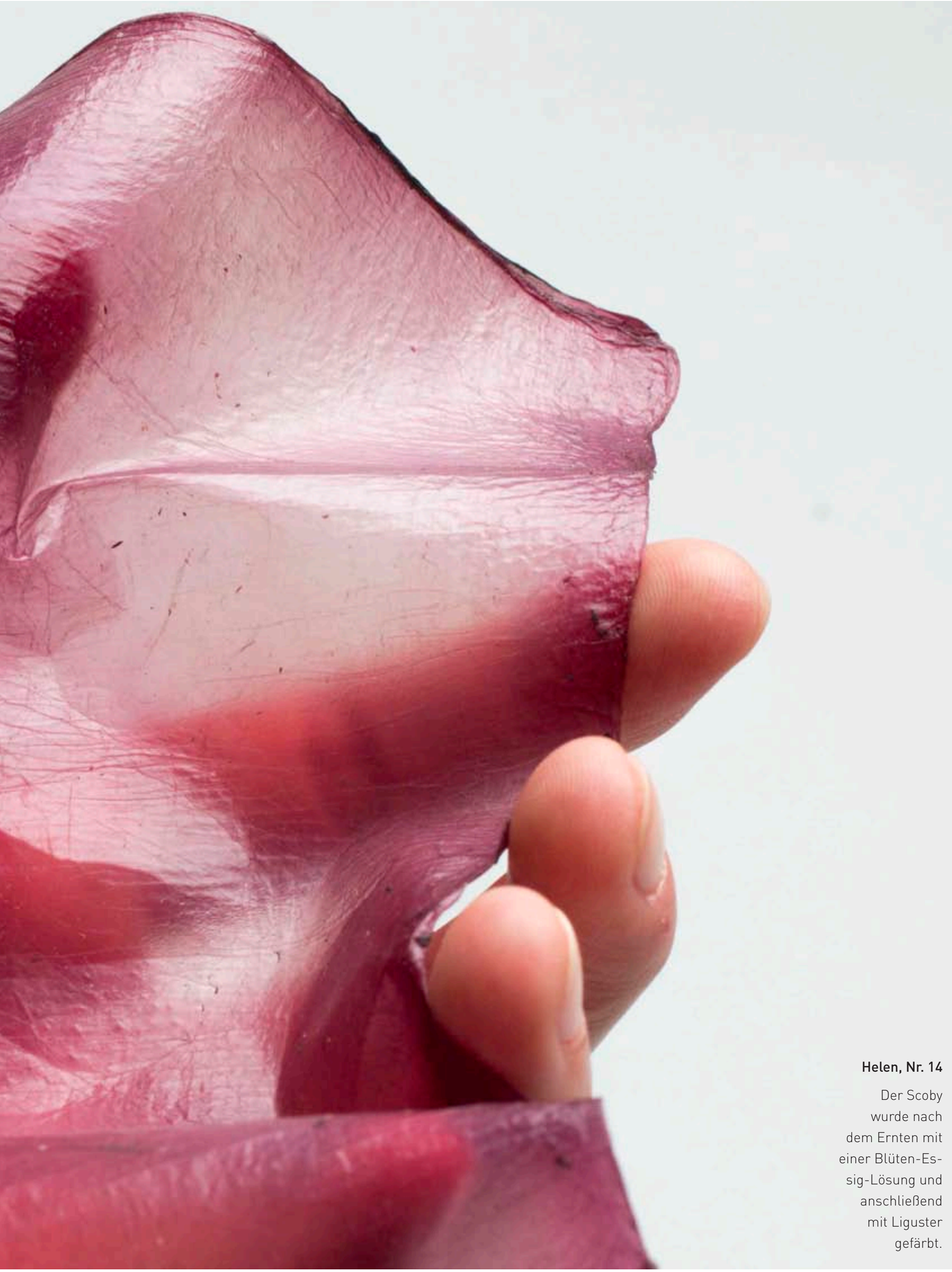
Der Scoby entstand aus mehreren Scobyteilen, die nach der Trocknung zu einem zusammenhängenden Scoby wuchsen.

quadr. Fruchtkombo, Nr. 10

Der Scoby entstand durch Überlagerung einzelner Scobys, die während des Wachtums mit Himbeere, roter Beete und Nektarinen gefärbt wurden. Beim Trocknen sind die Farben stark verlaufen und ausgeblichen.

Sams, Nr. 32

Der Scoby wurde nach dem Ernten mit Tinte gefärbt.



Helen, Nr. 14

Der Scoby wurde nach dem Ernten mit einer Blüten-Essig-Lösung und anschließend mit Liguster gefärbt.

Beerensymbiose, Nr. 20

Der Scoby besteht aus zwei Teilen, die in einem Kombucha Gemisch mit Himbeeren und Blaubeeren gewachsen sind. Die beiden Scobys wurden überlagert und dazwischen ein ummanteltes Silbergarn gelegt. Im trocknen Zustand umschließt der Scoby das Garn vollkommen und gibt ihm eine zusätzliche Isolierung .

FGL Scoby I, Nr. 25

Der Scoby wurde nach dem Ernten mit Cochenille gefärbt, anschließend gefaltet und ein FGL Draht dazwischen gelegt.

DANKE

PROF. DR. ZANE BERZINA

PAULA VAN BRUMMELEN

DR. FLAVIA BARRAGAN

STEFAN MARIA ROTHER

ANDREAS KALLFELZ

HELEN RINCKENS

YASHI FREITAG

PAUL RINCKENS

HANS SCHULTZE

IMPRESSUM

LENA GANSWINDT

SCOBY

UNTERSUCHUNG EINES ORGANISCHEN MATERIALKREISLAUFS

FOTOS

PROZESS: LENA GANSWINDT & STEPHAN MARIA ROTHER

EXPERIMENTE: LENA GANSWINDT

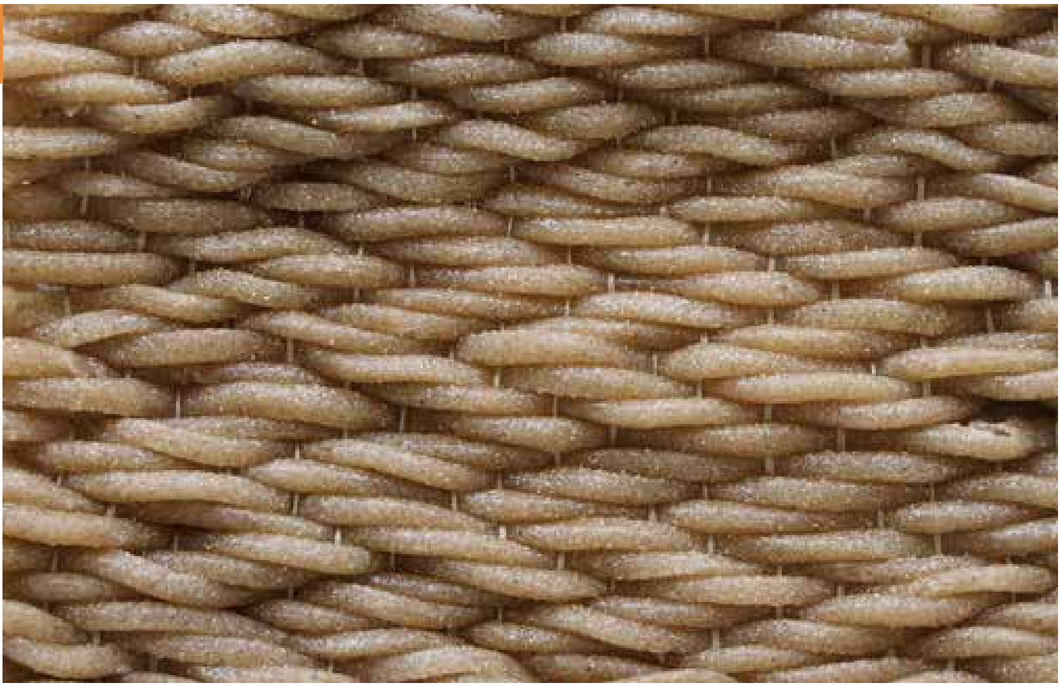
ERGEBNIS: LENA GANSWINDT & STEPHAN MARIA ROTHER

TEXTE

LENA GANSWINDT & ANDREAS KALLFELZ

MOMENT

PHILIPPA LORENZEN



SAND

Sand ist für uns ein Teil unserer Umgebung. Er ist überall zu finden, aber außer im Urlaub oder in der Kindheit kommen wir selten mit ihm in direkten, bewussten Kontakt. Das unscheinbare Material ist gleichzeitig hart und instabil, einfarbig und bunt, homogen und heterogen. All dies wird aber von niemandem wahrgenommen. Stattdessen fließen unvorstellbare Mengen weltweit in unsere Bauten, in denen der Sand „verschwindet".

Dieses Projekt zielt darauf, den Sand durch besondere Transformationen in den persönlichen Wahrnehmungsbereich hineinzuholen. Im Wesentlichen funktioniert das darüber, den Sand auf Oberflächen zu fixieren und ihn über eine Verbindung mit einem anderen Material entgegen seiner üblichen Eigenschaften flexibel zu machen.

In zahlreichen Proben mit unterschiedlichen chemischen oder natürlichen Bindemitteln konnte getestet werden, welche neuen Zustände das Ausgangsmaterial annehmen kann. Zudem wurde Sand auf Stoff fixiert, was in Bezug auf die Eigenschaften und Funktionen der Materialien eigentlich eine paradoxe Kombination darstellt.

Der Sand ist auf der textilen Fläche zwar sofort identifizierbar und in gewisser Weise auch vertraut, andererseits wirkt er in diesem Kontext irritierend, und die ganze Kombination vermittelt auch eine sehr ungewohnte Haptik. Parallel dazu wurde ein Garn aus Silikon und Sand entwickelt, mit dem sich verstrickte oder verwebte Flächen erzeugen lassen.

Die entstandene Materialkollektion stellt ungewohnte Bezüge her und verschiebt das Element Sand in einen neuen (Anwendungs-) Kontext. Dekontextualisierung und die individuelle Wahrnehmung spielen hierbei eine bedeutende Rolle. Es geht weniger um eine konkrete Funktion als um die temporäre Performance und Manipulation eines Materials, welches überall auf der Welt zu finden ist. Momente, in denen am Strand eine dünne Schicht Sand auf der Haut kleben bleibt, erzeugen für kurze Dauer eine andere, persönliche Beziehung zu diesem Material. Der Sand wird auf der Haut gebunden und wirkt als eine Art Beschichtung. Dieses „Phänomen" soll in dem Projekt eingefangen und fixiert werden.

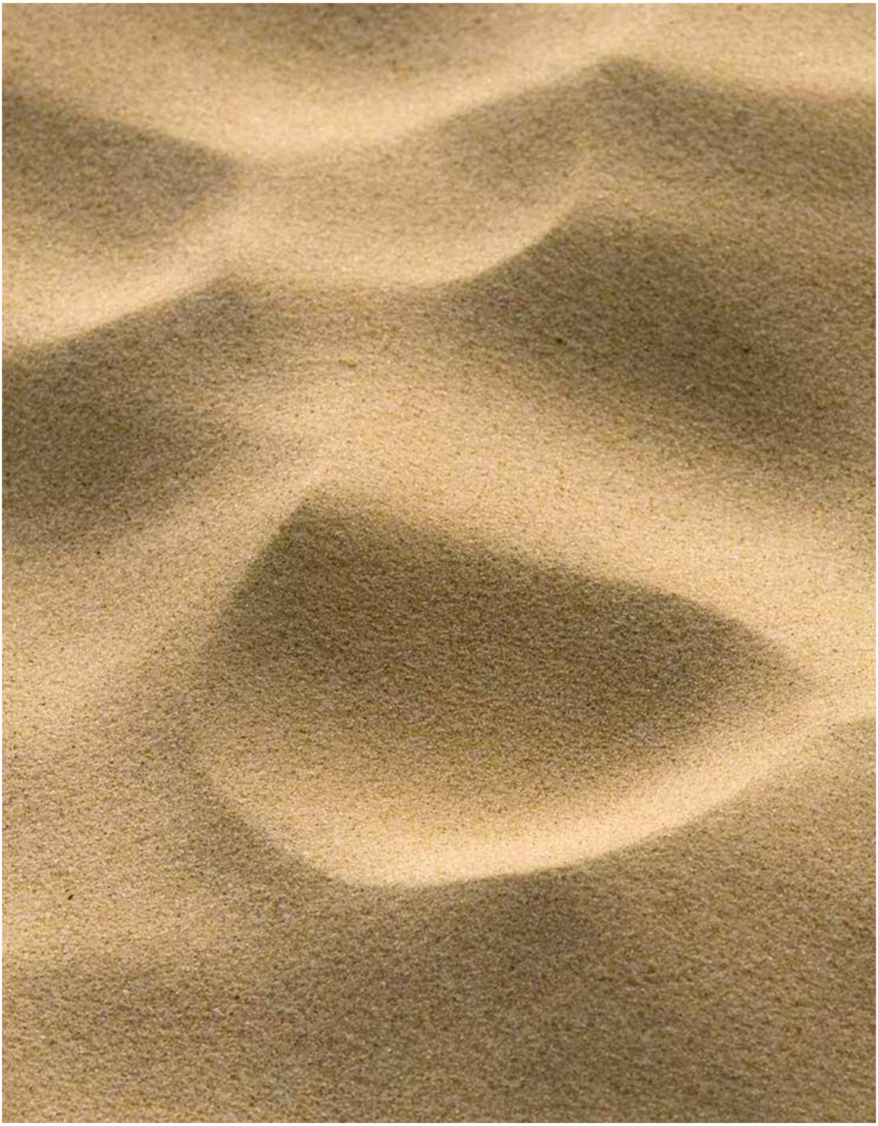
SAND ALS ROHSTOFF

Vielen ist gar nicht bewusst, dass Sand neben Wasser der am meisten genutze natürliche Rohstoff ist. Jedes Jahr werden ca. 15 Milliarden Tonnen Sand für den Straßenbau, Betonherstellung, in der Glas- und Halbleiterindustrie, für die Chemieindustrie und Solarzellen gebraucht.

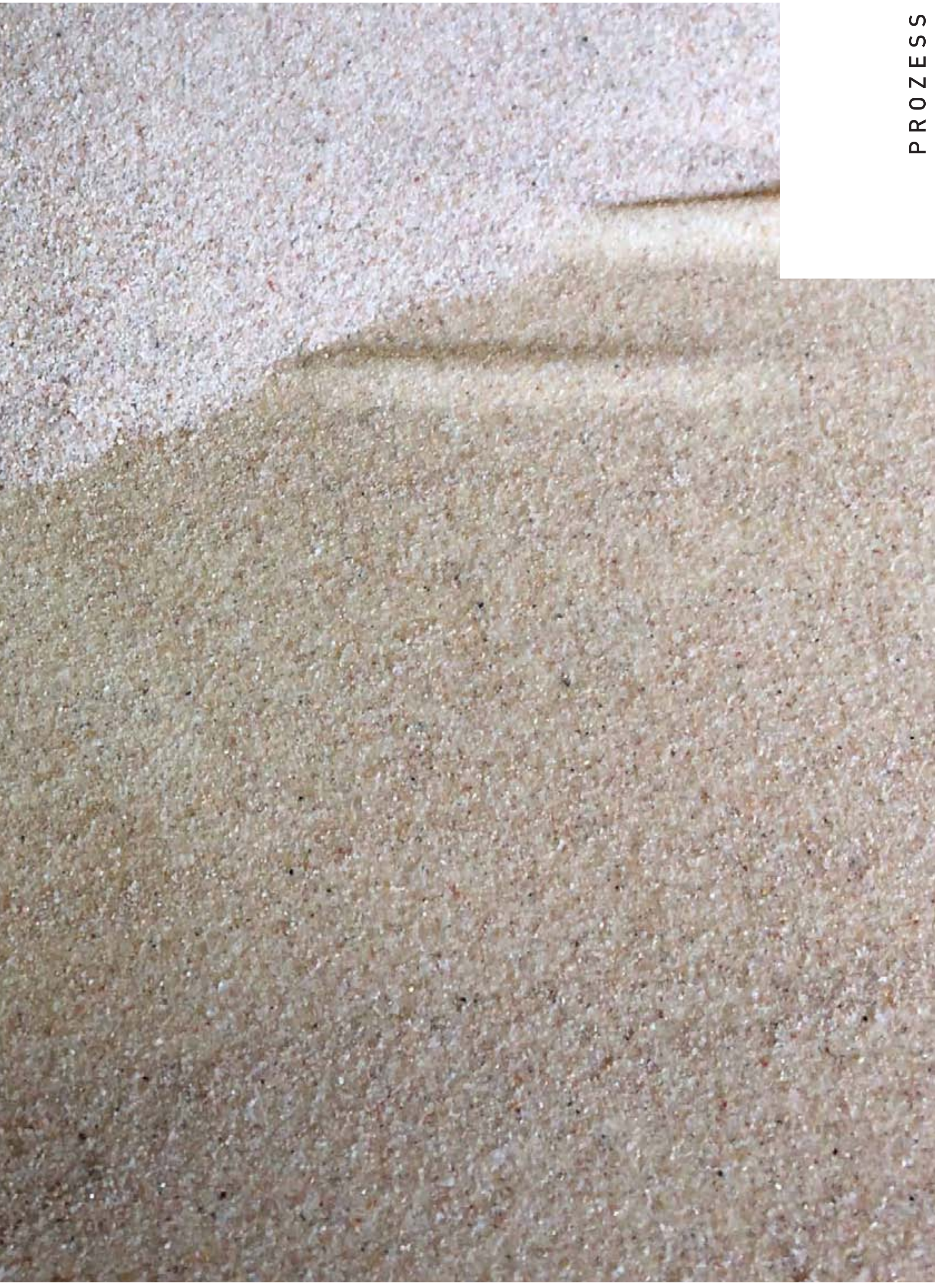
Dabei kann nicht jeder Sand verwendet werden. Der größte Teil wird von Stränden und vom Meeresboden abgetragen. Das hat zur Folge, dass mittlerweile ganze Inseln verschwunden sind, sich Ökosysteme verändern und der natürliche Sandkreislauf am Meer blockiert wird.

Quelle: http://www.deutschlandfunkkultur.de

Wüstensand hingegen gibt es zwar in Unmengen, dieser kann jedoch nicht für die Bauindustrie genutzt werden, da er zu fein und rund ist.



Wüstensand



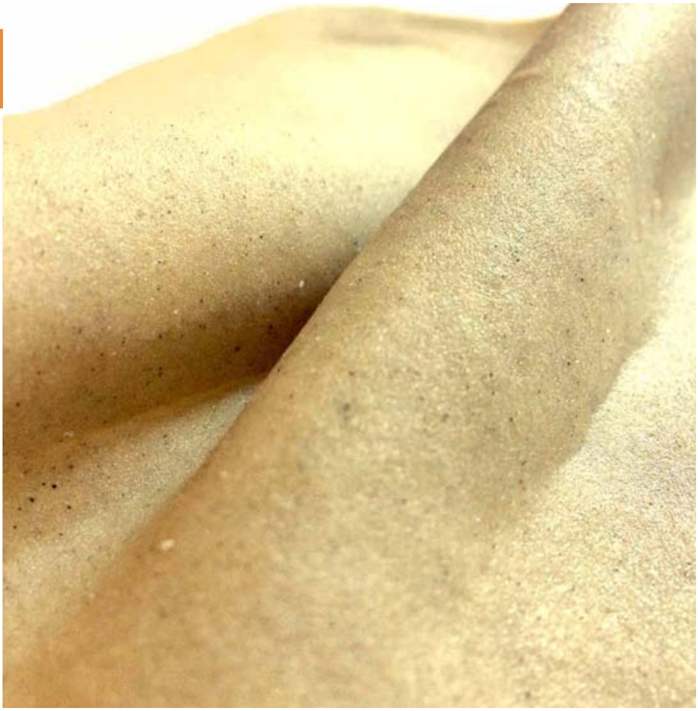
EXPERIMENTE

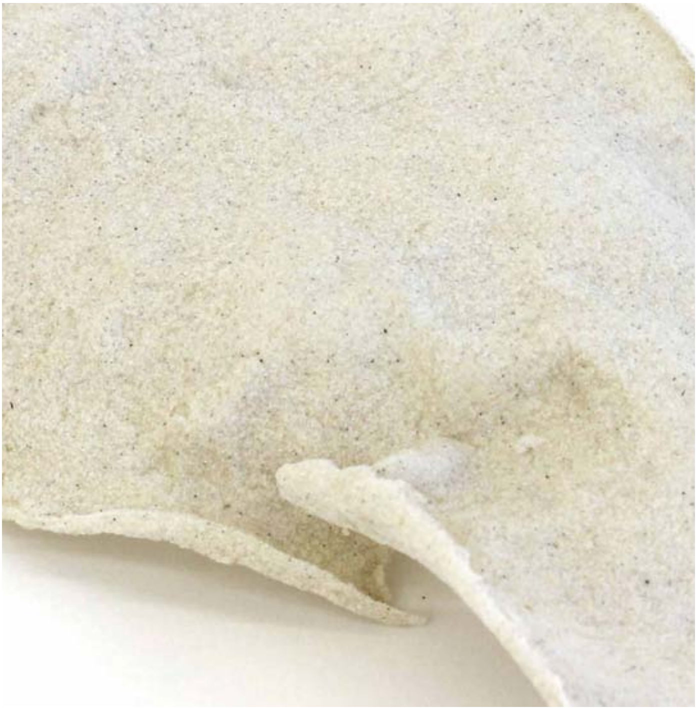
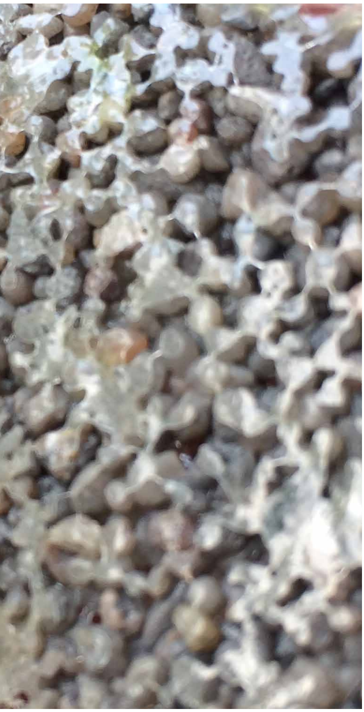
Materialien

Sand mit verschiedenen Bindemitteln

v.l.o.n.r.u.

Silikon
natürliches Bindemittel aus Stärke
Buchbinderleim
Siebdruck Bindemittel (GD200)
Bastelkleber




v.l.o.n.r.u.:

Sand auf Stoff fixiert
Material aus Sand
& Latex

Garn aus Sand &
Silikon

Innerhalb der Versuche wurden verschiedene natürliche und chemische Bindemittel getestet, um den Sand zu fixieren und flexibel zu machen. Die Versuche haben sich in drei verschiedene Bereiche aufgeteilt. So entstanden Proben mit unterschiedlichen Stoffen, bei denen der Sand als eine Beschichtung aufgetragen wird. Das Trägermaterial spielt hierbei eine bedeutende Rolle. Zusätzlich entstanden Materialproben, bei denen Sand und verschiedene Bindemittel Flächen erzeugen - und eine Art Garn aus Sand und Silikon.

Verarbeitung

links:
gewebtes Sandgarn

rechts:
gestricktes Sandgarn

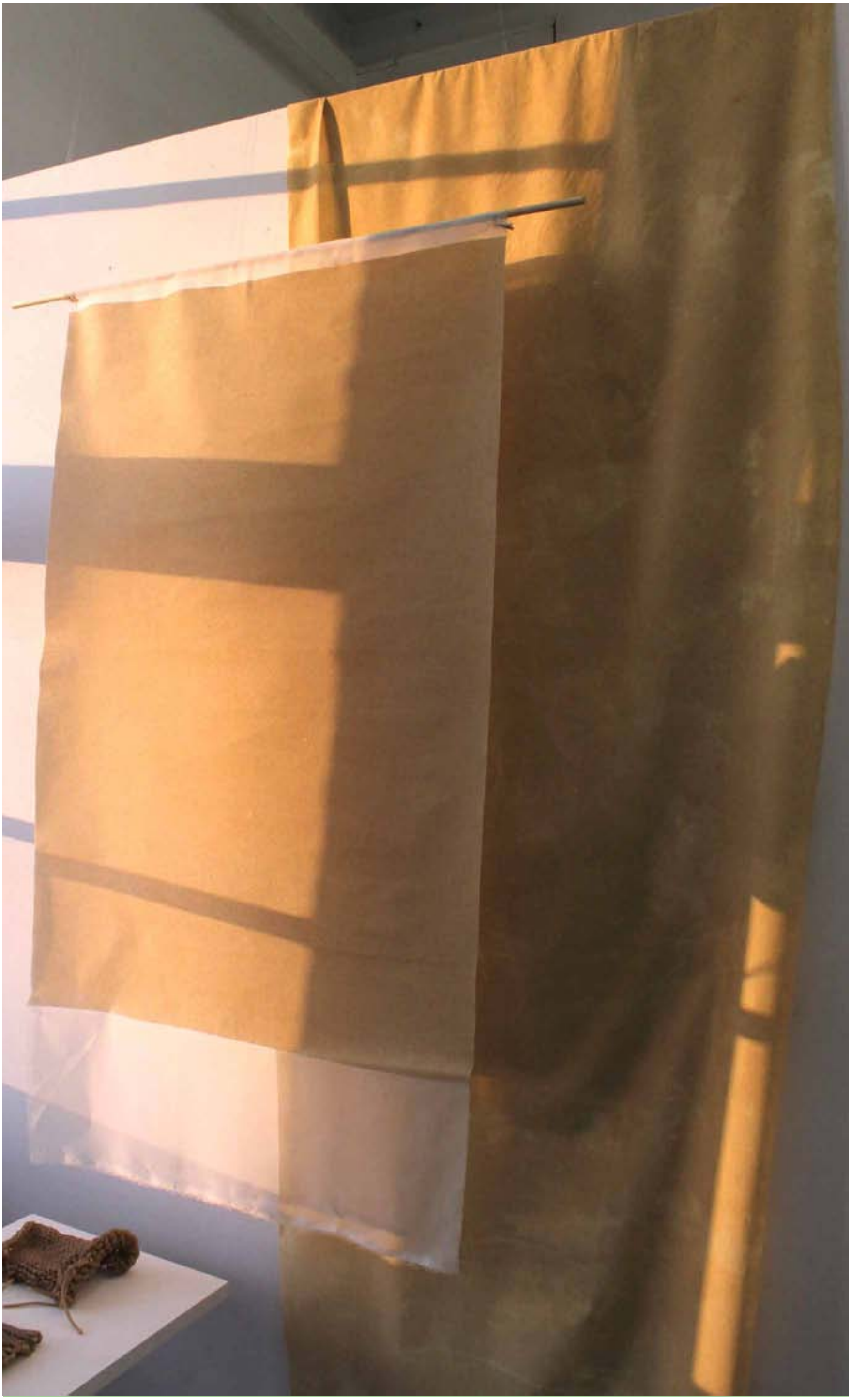
Sandbeschichtung

Ein Kleber wird auf den Stoff (Chiffon) aufgetragen und der Sand danach mit Hitze darauf fixiert.

Stoffe

v.l.o.n.r.u.:

Vlies
Tüll (mehrere Schichten Sand)
Chiffon (Sandflächen überlagern sich)



DANKE

PROF. DR. ZANE BERZINA

FÜR DIE TATKRÄFTIGE UNTERSTÜTZUNG

ANDREAS KALLFELZ

PAULA VAN BRUMMELEN

VERONIKA AUMANN

JULIA WOLF

IMPRESSUM

PHILIPPA LORENZEN

MOMENT

FOTOS

PROZESS: PHILIPPA LORENZEN

EXPERIMENTE: PHILIPPA LORENZEN

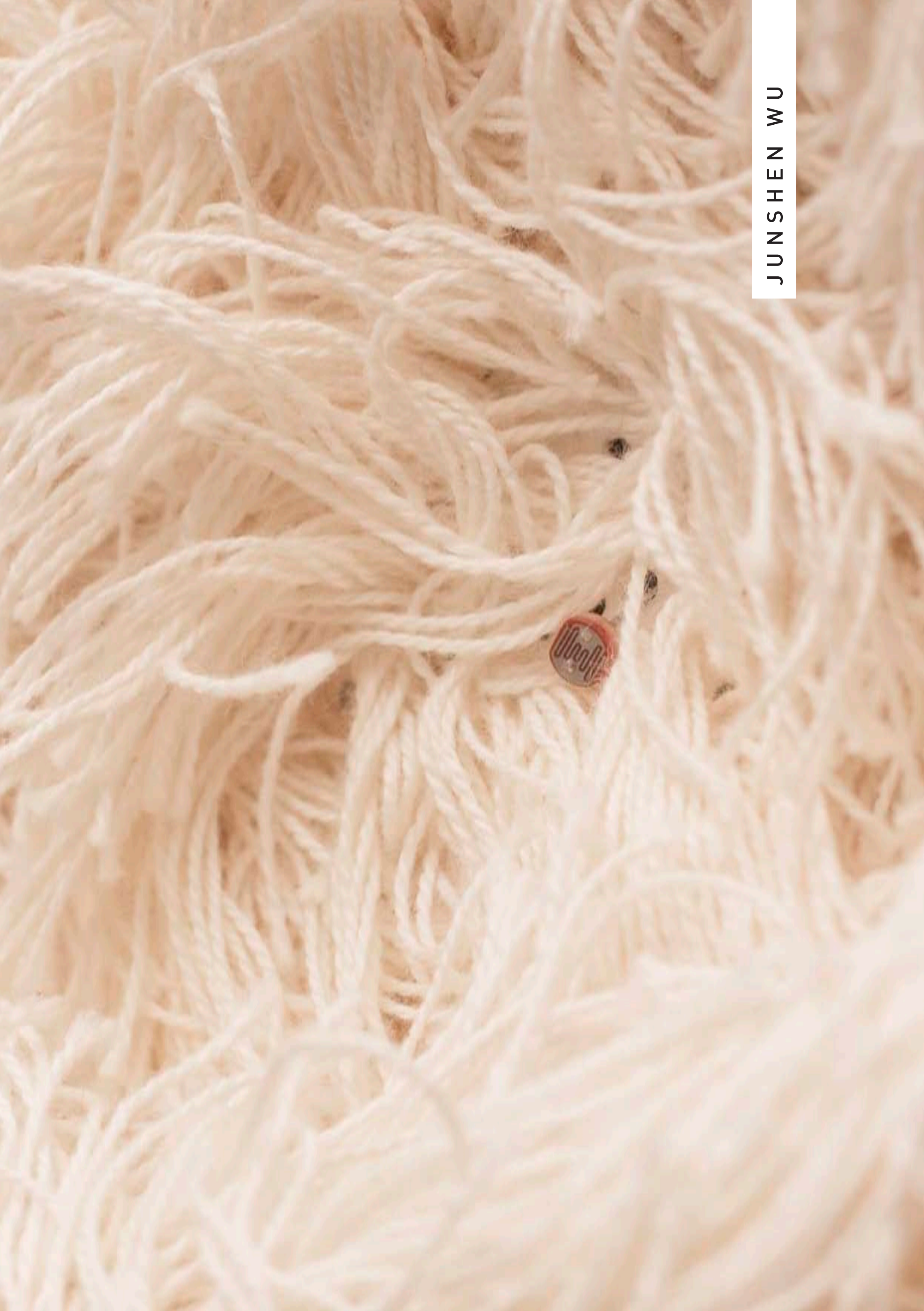
ERGEBNIS: JUNSHEN WU & PHILIPPA LORENZEN

TEXTE

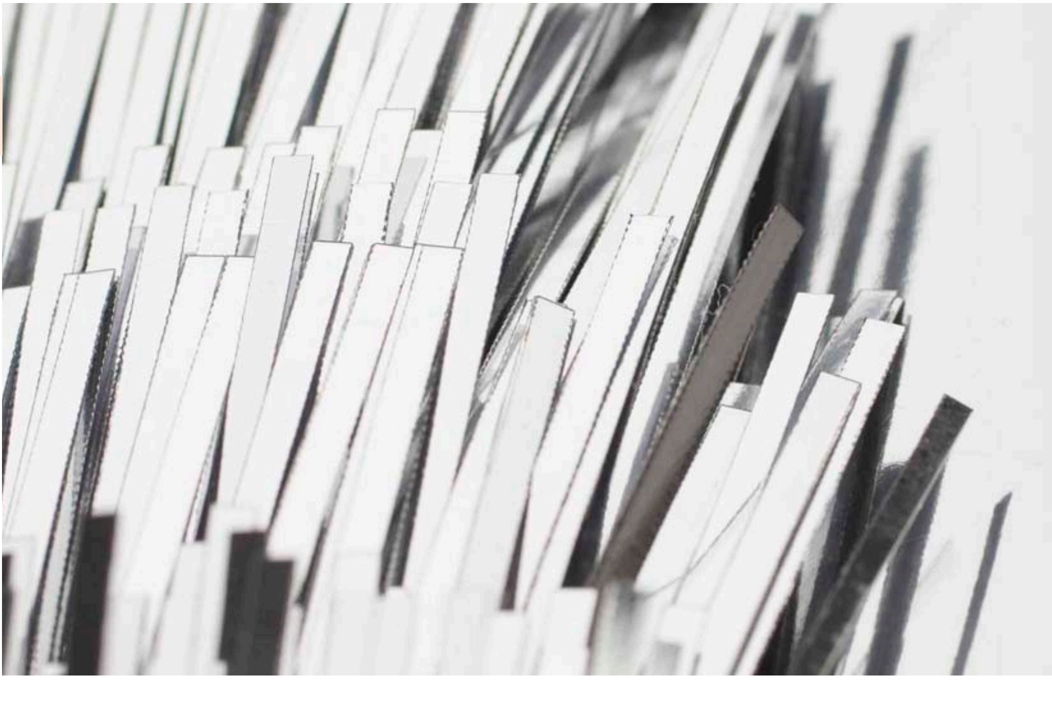
PHILIPPA LORENZEN & ANDREAS KALLFELZ

NATURE IS AN ELASTIC HEART:

0.0.1



JUNSHEN WU



NATURE IS AN ELASTIC HEART:

0.0.1

We are made of flesh and bones. We are carbon based lives. We can't stand heat and can't bear cold. We need oxygen to survive. But what makes humans so special is this inner dimension of ours. Human intelligence is a wonderful thing, with which we have managed to create extensions of every body part of ours: what we call „tools". And as one day these „tools" became more complex as to help us with more specific „needs", „machines" are born.

We never give up needing. Anything we can't do because of the limits of our nature, we hand over to machines. They are born with elastic hearts, fulfilling those tasks for us which are beyond our nature. The capacity of our machines are becoming so big, that our picture of the world has been turned upside down and back again — that we begin to have difficulties to track and trace them. And look at us today: we find ourselves in different scales everyday and constant changes of time and space are not a fantasy anymore. As a modern human, multitasking is a must, and everybody has more than one identity and is transforming from one to another fluidly. We want to keep up with the machines we created, with everything we do to make this flesh heart more elastic.

It is hard to see them as „tools" anymore, but to define them again might bring us into an uncomfortable place. A hypothesis called „Uncanny Valley" by Japanese roboticist doctor Masahiro Mori suggests that the response to robotic similarity to human appearance and movement is not always positively increasing as the similarity draws closer. If it reaches a completely human „look", the emotional response is strongly negative. That's when the borders of nature and non-nature begin to blur within our knowledge system. But what if one day we could know more, or we would have a completely new system or a brand new way of knowing? One of the reasons why we are always so attracted to the unknown, is the knowledge that there might be a possibility that one day we will know. So it even starts to make sense to ask questions like: What is the nature of machines? Is there a nature in them? Do they have a character? Could they have their individual characters? It is like in the popular TV series „Mr. Robot", when one character asks „Alexa"—the intelligent voice assistant developed by Amazon—: „Alexa, what is your favorite color?", and Alexa says, „Infrared is super pretty. "

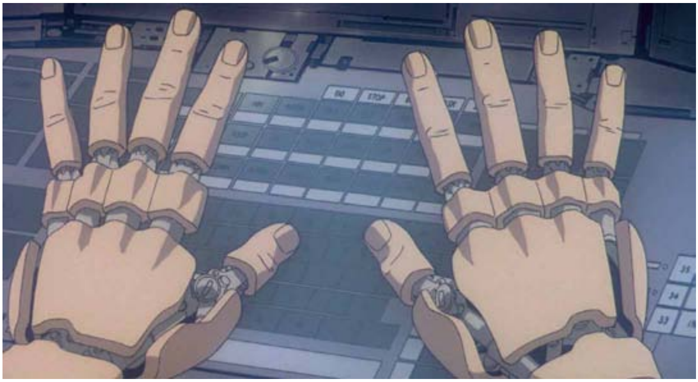
nature is an elastic heart: 0.0.1 is a project trying to create surfaces integrated with simple robotic parts. The robotic parts provide movement supported by shape memory alloys as an actuator. It also has the possibility of interactive responses with additional sensors.

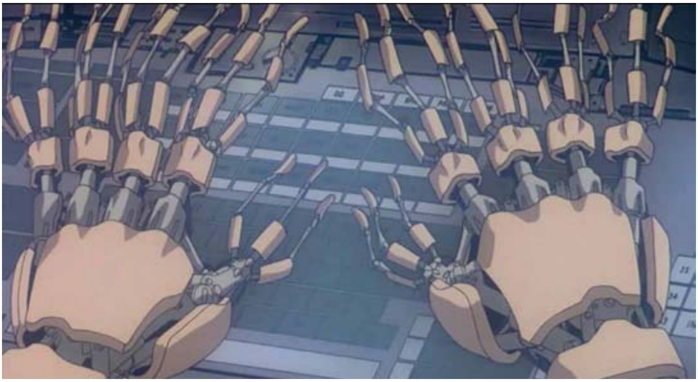
Silvia B.
Lily Lucinda, 2001
Spotty, 1999

Mamoru Oshii
Ghost in the Shell,
1995

Luc Besson
Lucy, 2014

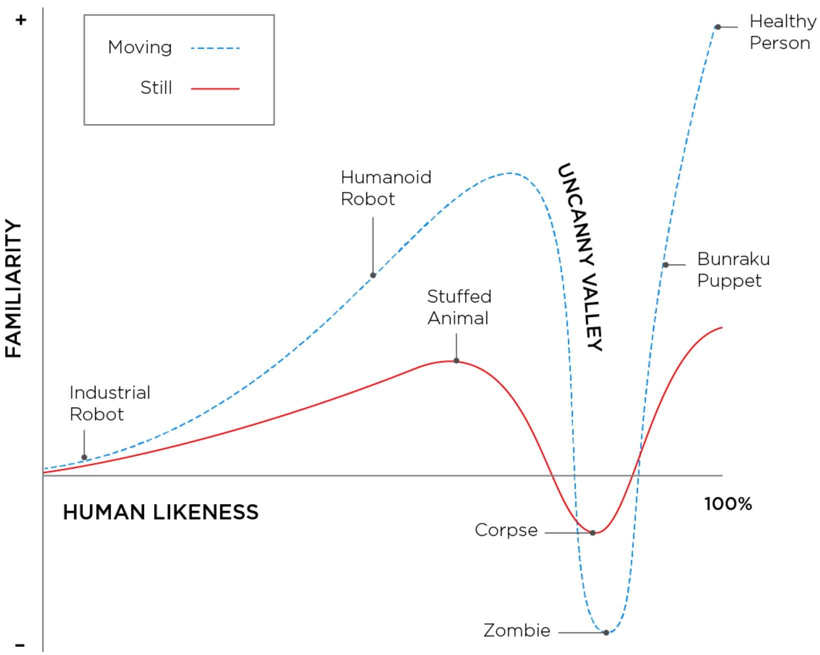
INSPIRATION





“THE UNCANNY VALLEY”

The uncanny valley is a hypothesis by Japanese roboticist doctor Masahiro Mori. It suggests that the response to general similarity to human appearance and movment is not always positively increasing as the similarity draws closer. If it reaches a completely human “look“, the emotional response is strongly negative.



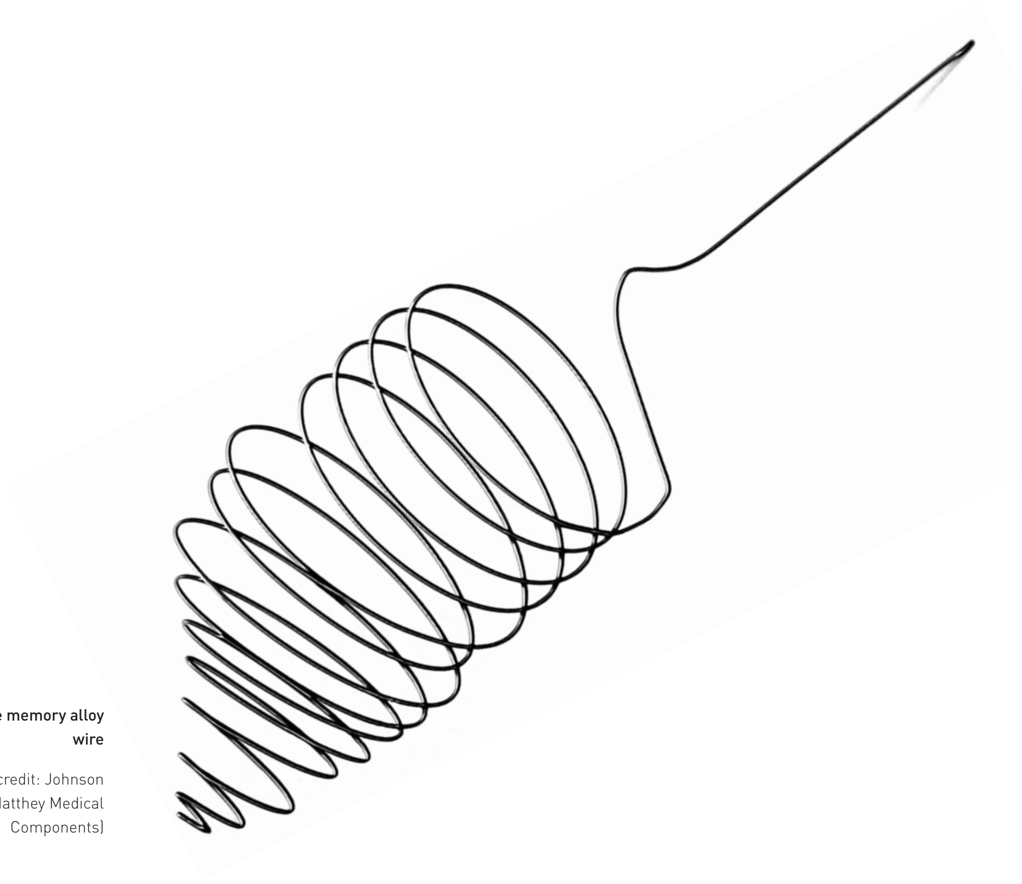
The Uncanny Valley

(credit: Masahiro Mori)

SHAPE MEMORY ALLOYS

Shape memory alloys are metals that have the capacity to undergo a mechanical transformation and then, by a rise in temperature, recover their initial shape. This phenomenon is one of the astonishing thermomechanical properties of the reversible martensitic-type structural transformation that occurs at a point between the temperature at which the specimen was deformed and the temperature at which it returns to its original shape.

(European Space Agency)



Shape memory alloy wire

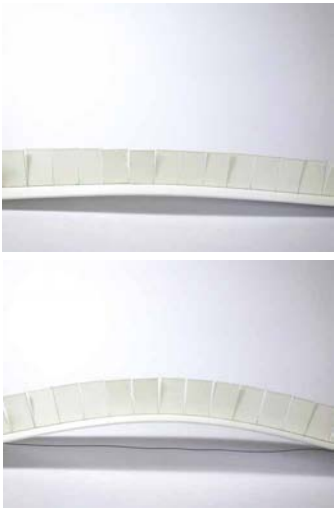
(credit: Johnson Matthey Medical Components)

SMA

Flexinol LT, 250 µm,
100 mm, untrained

with

Italian Cord, 90% CO
PVC back

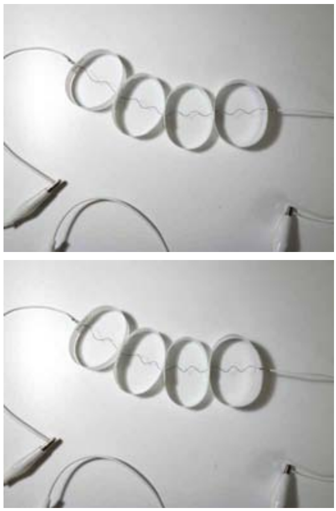


SMA

Flexinol LT, 250 µm,
200 mm, trained

with

Paper, 100g/m^2
PVC back

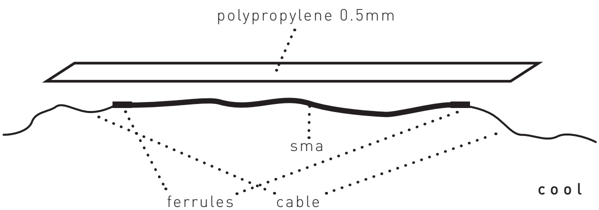


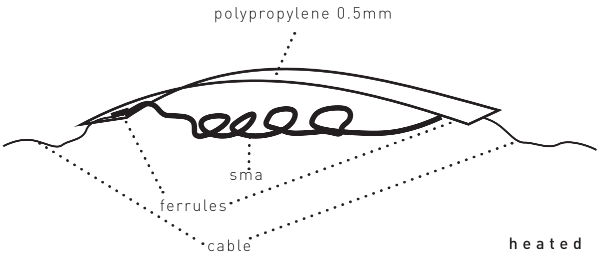
SMA

Flexinol LT, 250 µm,
150 mm, trained

with

PVC, 0.5 mm





SMA

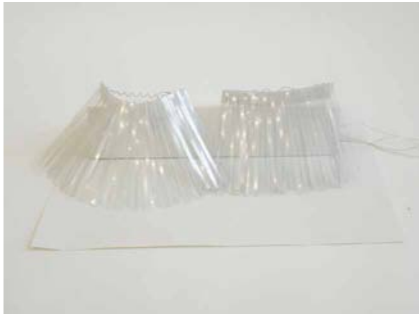
Flexinol LT, 250 μm,
100 mm, trained

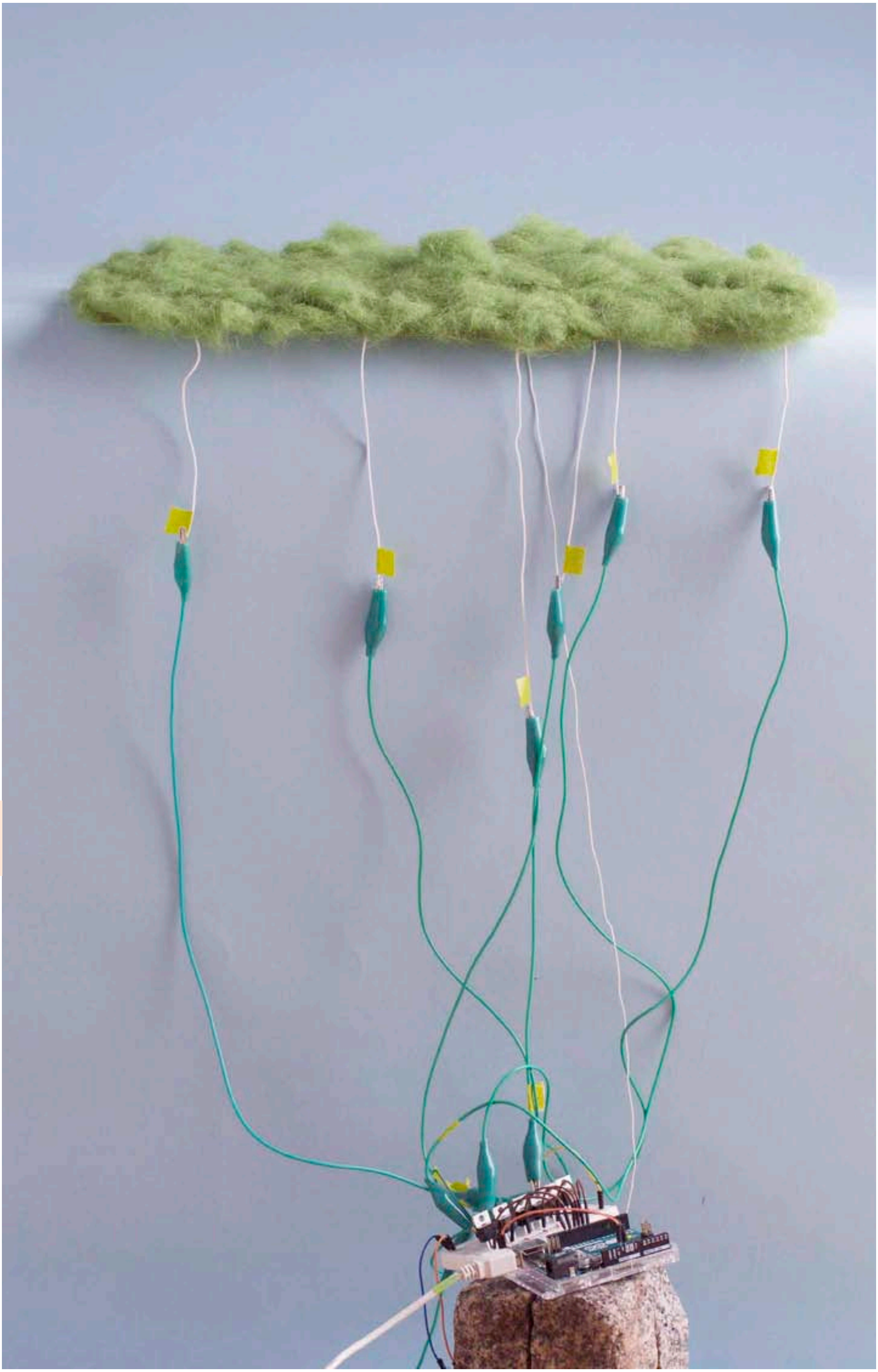
with

Foam, 5 mm
PVC back

Materials applied to the structure:

vliesfaser yarn
wool fiber
bio-cotton
coated paper
uncoated paper
pvc 0.03 mm
pvc 0.05 mm
coated pvc





Prototype 1

ca. 300 mm x 420 mm,
virgin wool

6 robotic elements,
each with 1 x 100 mm
sma spring

OUTCOME

Prototype 2

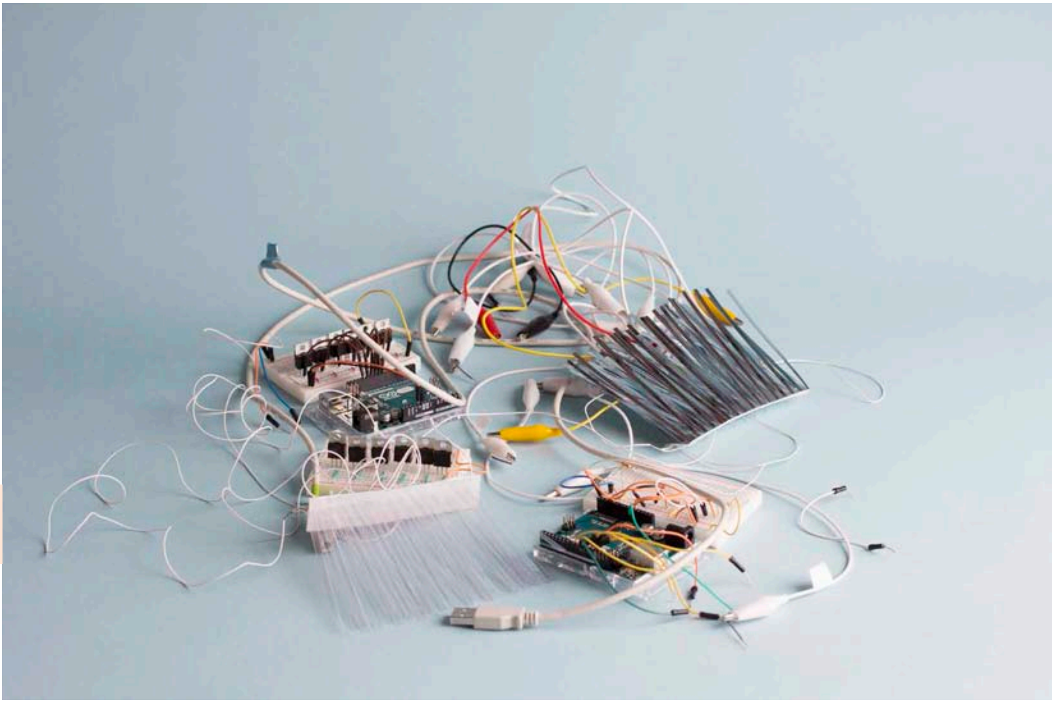
ca. 310 mm x 440 mm,
bio-cotton

6 robotic elements in 3 groups controled by 3 photocell sensors, each with 1 x 110 mm sma spring

Prototype 3

ca. 300 mm x 450 mm,
coated pvc

7 robotic elements,
each with 2 x 120 mm
sma spring



ACKNOLEDGEMENT

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JULIA WOLF

PAULA VAN BRUMMELEN

ANDREAS KALLFELZ

STEFAN MARIA ROTHER

JACK RANDOL

IMPRESSUM

JUNSHEN WU

NATURE IS AN ELASTIC HEART: 0.0.1

PHOTOS

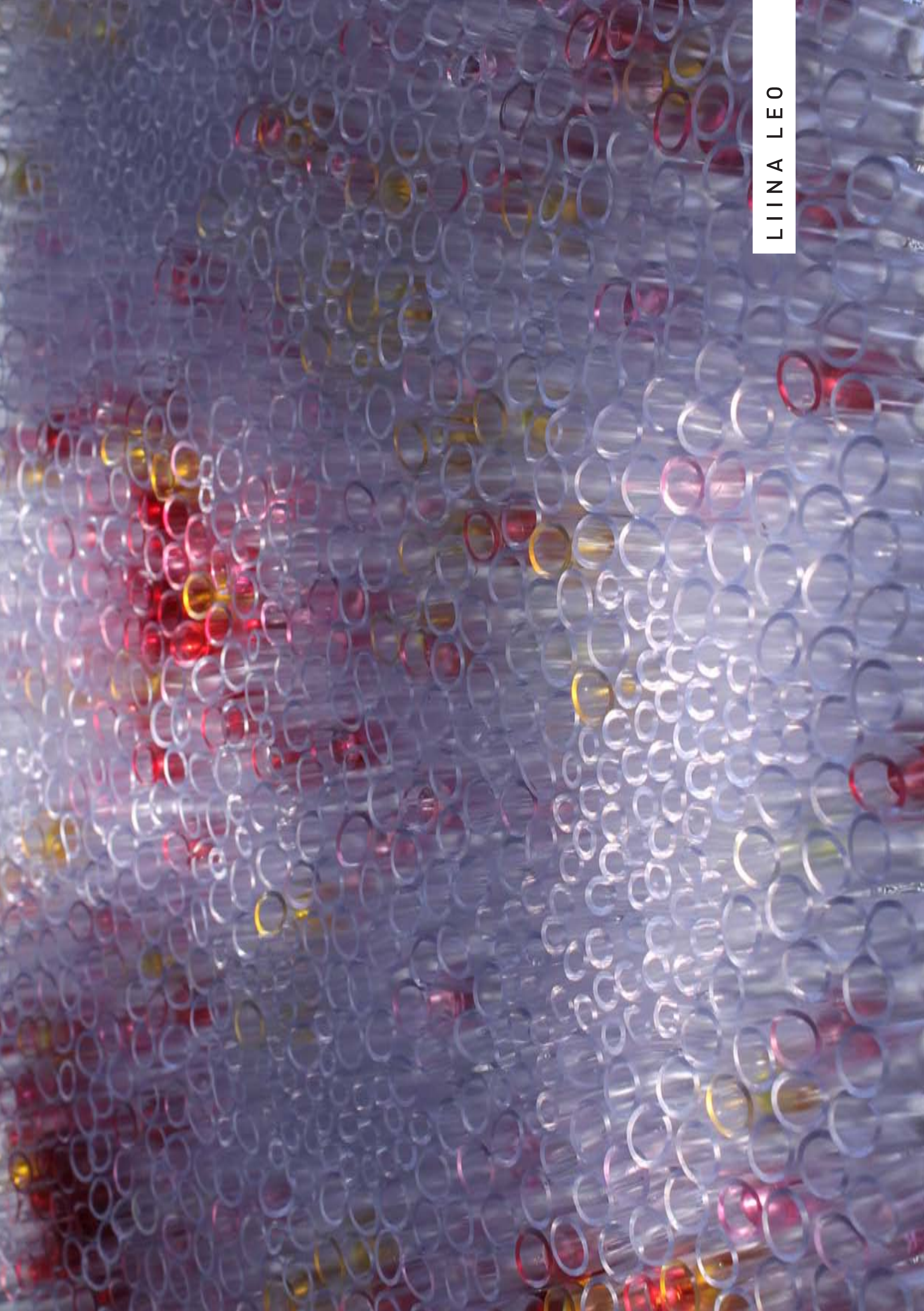
PROCESS: JUNSHEN WU

OUTCOME: STEFAN MARIA ROTHER & JUNSHEN WU

TEXTS

ANDREAS KALLFELZ & JUNSHEN WU

THE ACT OF SEEING



LIINA LEO

up left
Nadine Goepfert
"The garments may vary"

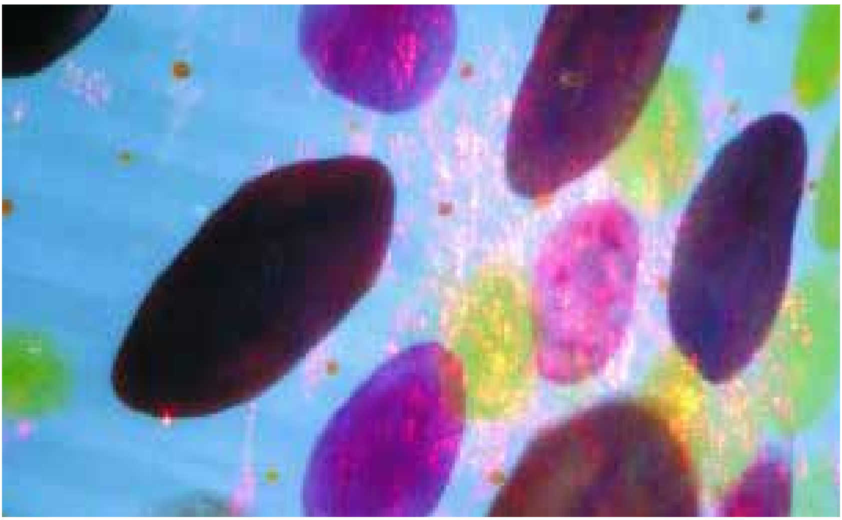
down left
Chromatophores

Source:
http://comm.archive.mbl.edu/news/press_releases/images/chrom_irido_lg.jpg

up right
Squid

Source:
https://pbs.twimg.com/media/CpqY-QoIW8AADjTo.jpg

down right
Olafur Elliasson
"One-way colour tunnel"



THE ACT OF SEEING

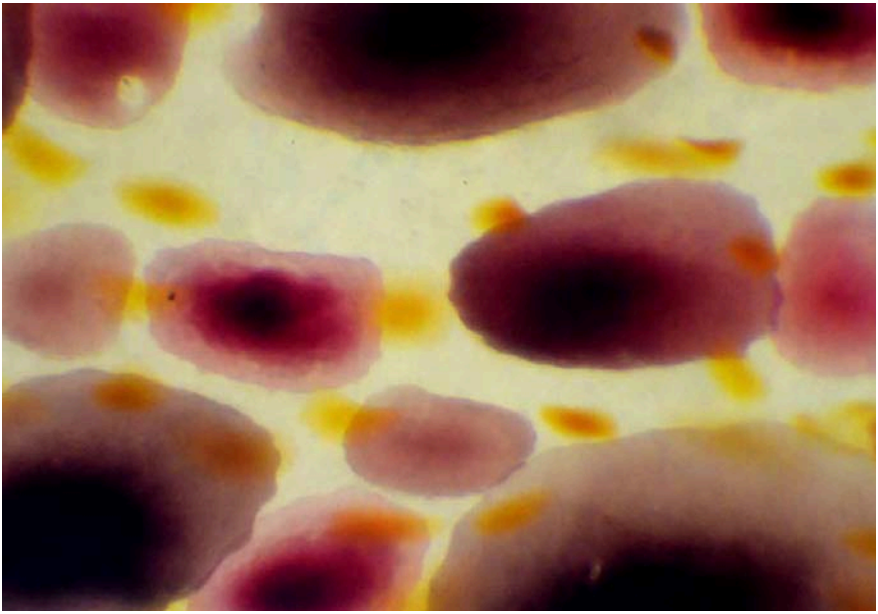
Colour is nothing more than different frequencies of an electromagnetic wave modulated by a reflection on a surface. While perceived by each individual being differently, they don't just produce aesthetic impressions in them, but often also serve distinct functions. Some animals, e.g. squids even use them actively as signals.

Squid skin is a complex system interacting with light by using colour containing and light reflecting pigment cells. Those cells are able to expand and contract in accordance to produce colours and patterns. This skin system allows it to create an optical illusion and provide an active camouflage to remain hidden from view.

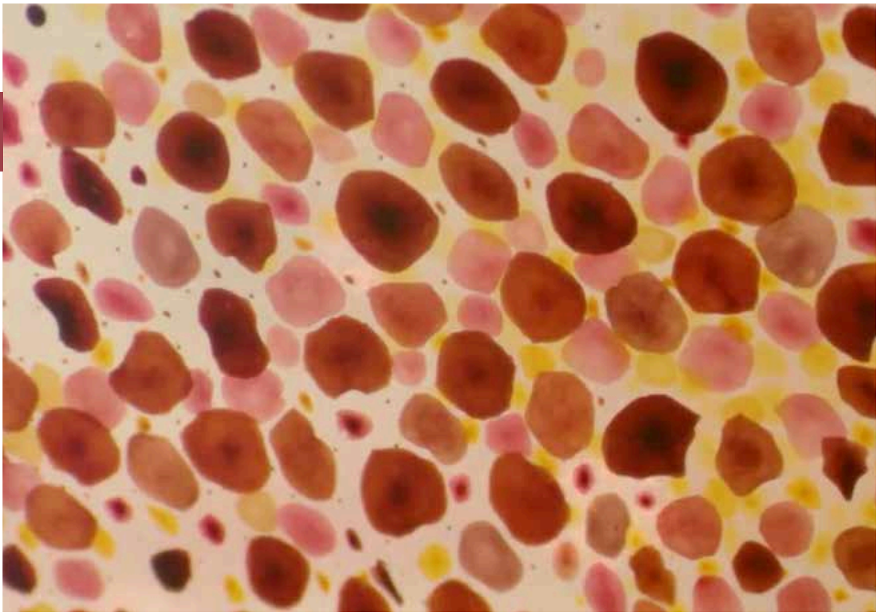
The new material in a similar way includes colour containing cells, in which the colour remains active and controllable. By looking at the surface from different angles, the light that is reflected constantly changes, creating an optical illusion which is distracting the viewer's perception. The use of thermochromic pigments furthermore allows a change of colour in response to heat.

CONCEPT

This collection represents a visual experience inspired by the unique system of the squid skin. The goal was to create a material which is beyond being just decorative and would establish an intuitive experience in the act of seeing. Colour and the changeability of perception is the main essence of the surfaces, showing it as an active medium and almost a means of communication.



Chromatophores
Source:
https://img.purch.com/o/aHR0cDovL3d3dy5saXZlc2NpZW5jZS5jb20vaW1hZ2VzL2kvMDAwLz



CHROMATOPHORES

Chromatophores are small pigment containing and light reflecting cells directly under the skin of squids. The center of each chromatophore contains an elastic sac full of pigment, rather like a tiny balloon, which may be colored black, brown, orange, red or yellow. A complex array of nerves and muscles are controlling the size of the cells. This system can vary their color and even create changing patterns, whether for signalling or providing active camouflage.

Squid camoflage

Source: https://www.flickr.com/photos/calvintang/438432758//186/48432758_78075a9d29_b.jpg

BIOPLASTICS

240 ml water + 48 g gelatine + 12 g glycerol = one A3 sheet of bioplastic.

The experiments with gelatine and glycerol based bioplastics included tests with natural and thermochromic colours. To create the cell structures different molds were used. Adding soap during the process of making the bioplastic enabled the possibilty to capture the structure of air bubbles. Gelatine based bioplastics are not waterproof, therefore, liquid pigments were not used inside the cells.

Materials:

Water, gelatine, glycerol, thermochromic pigment

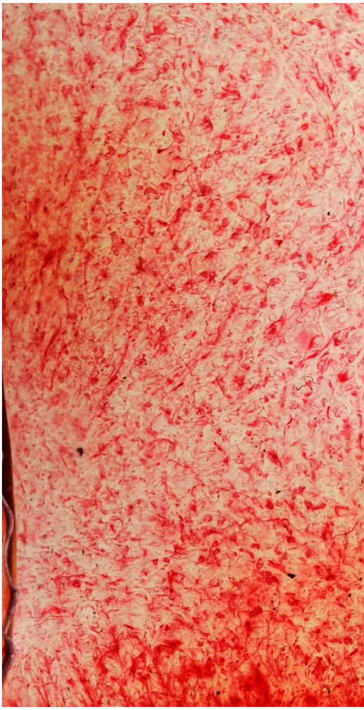
Size: 8 x 13 cm

Materials:

Water, gelatine, glycerol, thermochromic pigment, soap

Size: 14 x 14 cm

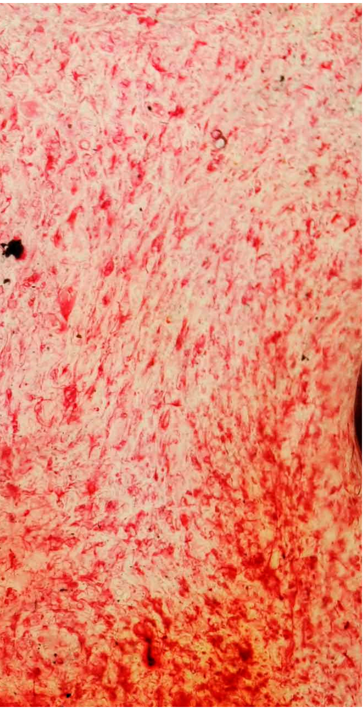
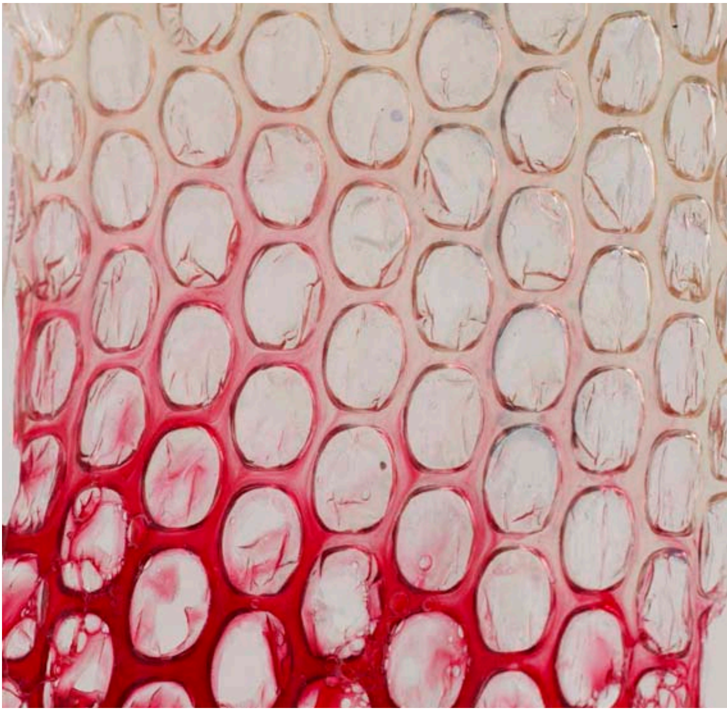
EXPERIMENTS

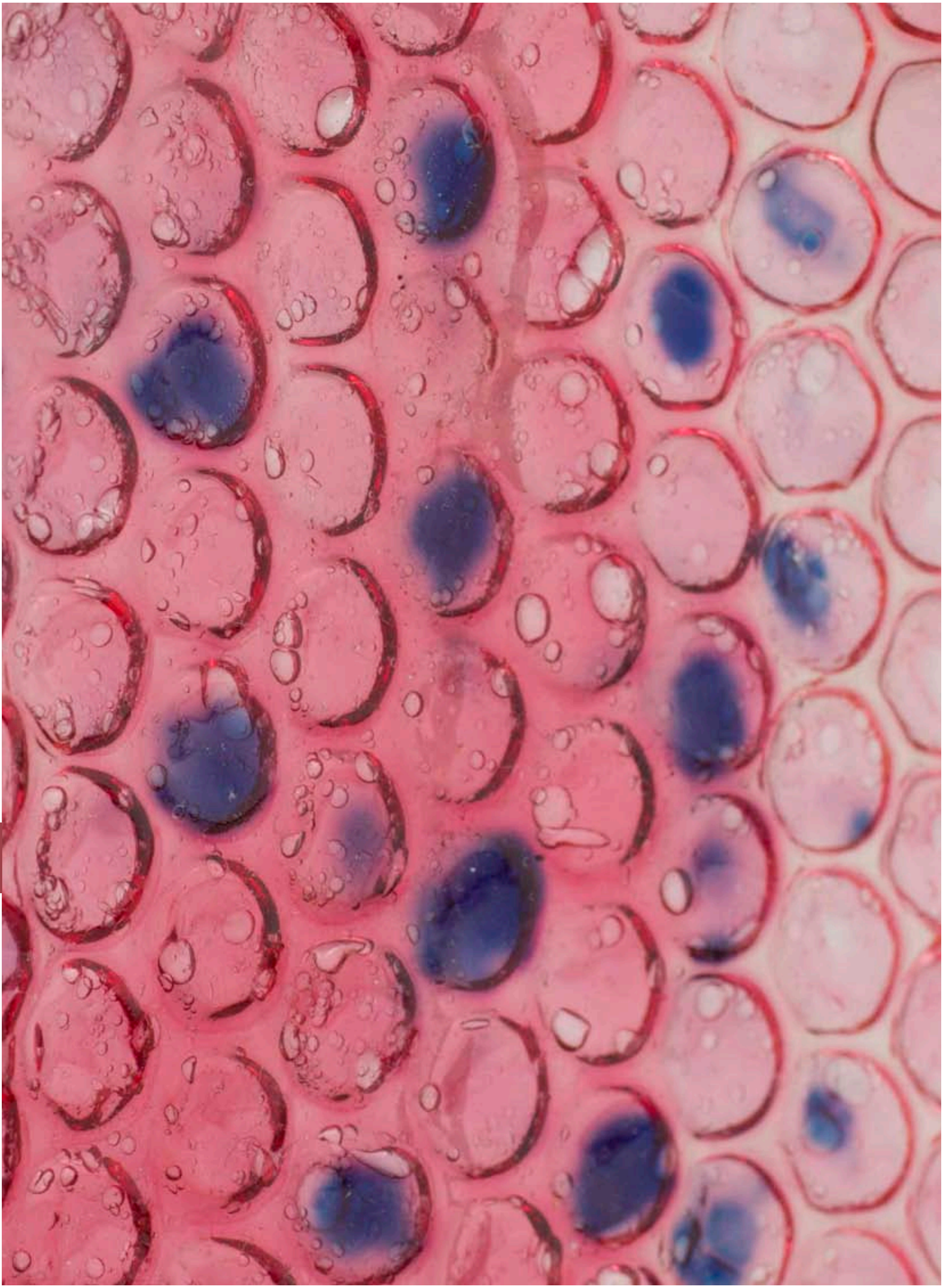


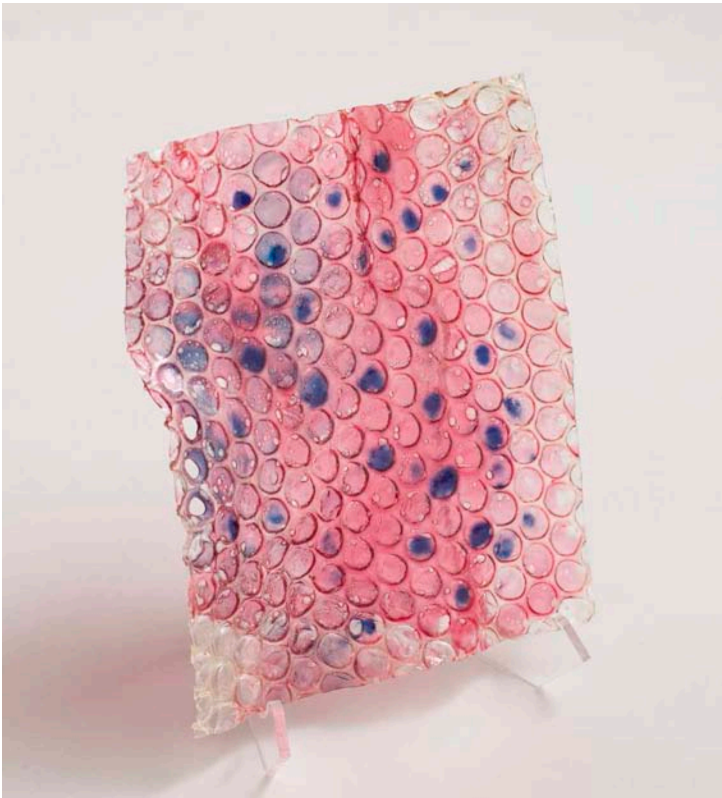
All samples:

Materials:
Water, gelatine, glycerol, food colouring

Size: 9 x 12 cm

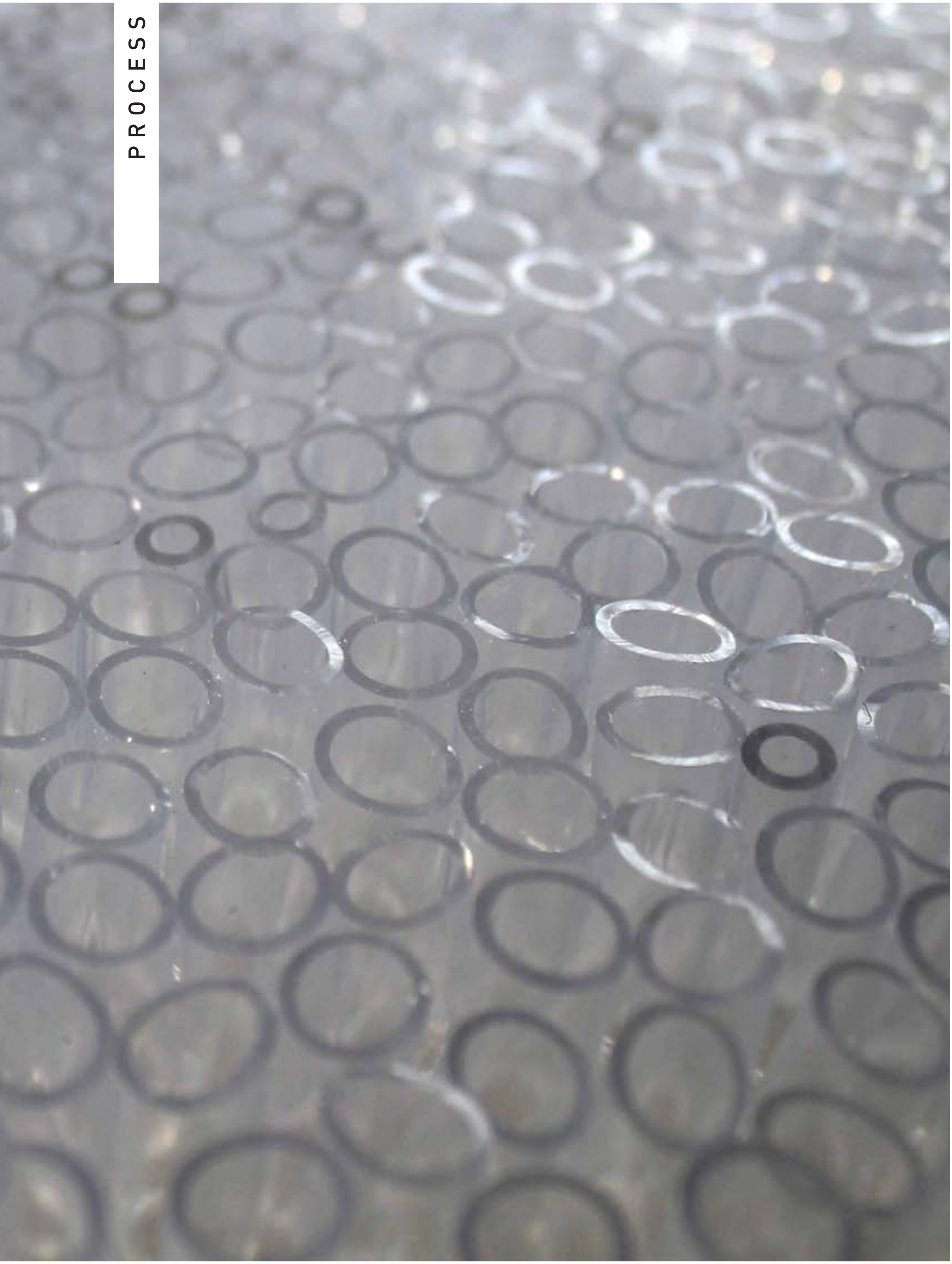




Materials:

Water, gelatine, glycerol, food colouring

Size: 12 x 15 cm

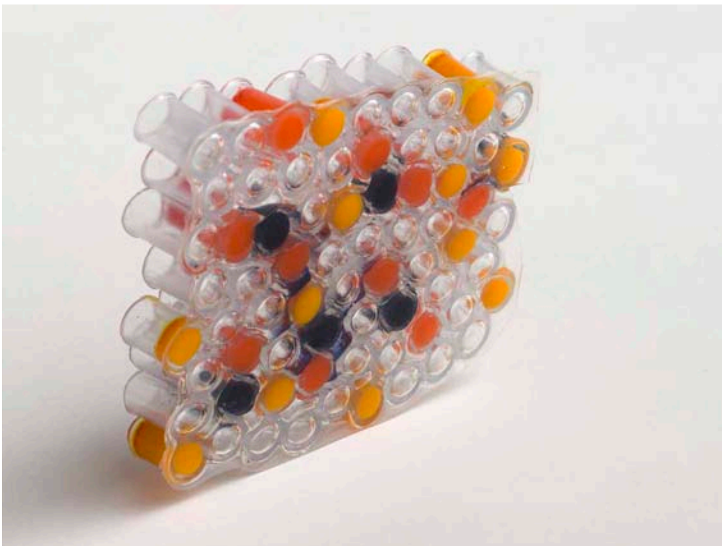


The process used and explored pigment containing cells and methods to combine them with different materials. To create cell structures, tests with PVC and acrylic tubes were made. Tubes were placed ontop of the resin or glued onto the PVC sheet. To create cells containing liquid, acrylic tubes were used, which compared to PVC tubes were more stable providing a stronger structure. The use of thermochromic pigments inside the cells allows a change of colour in response to heat.

Test with creating cell structure by connecting pieces of PVC tubes using resin

Test with pigment filled and both sides closed cell structure

Test with thermochromic colour inside the cells



Materials:

Resin, PVC tubes

Size: 20 x 20 cm

Materials:

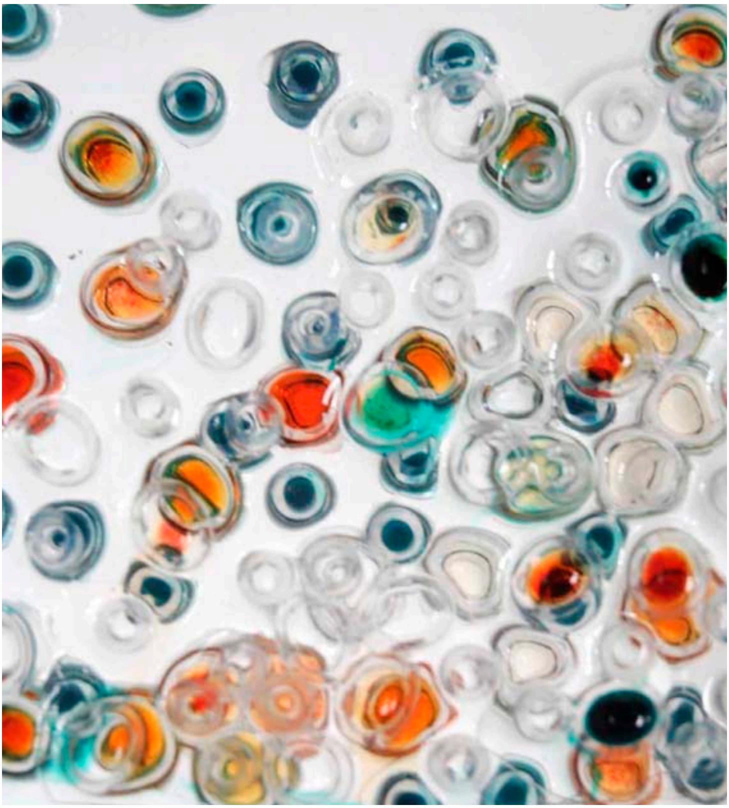
Resin, PVC tubes, pigment

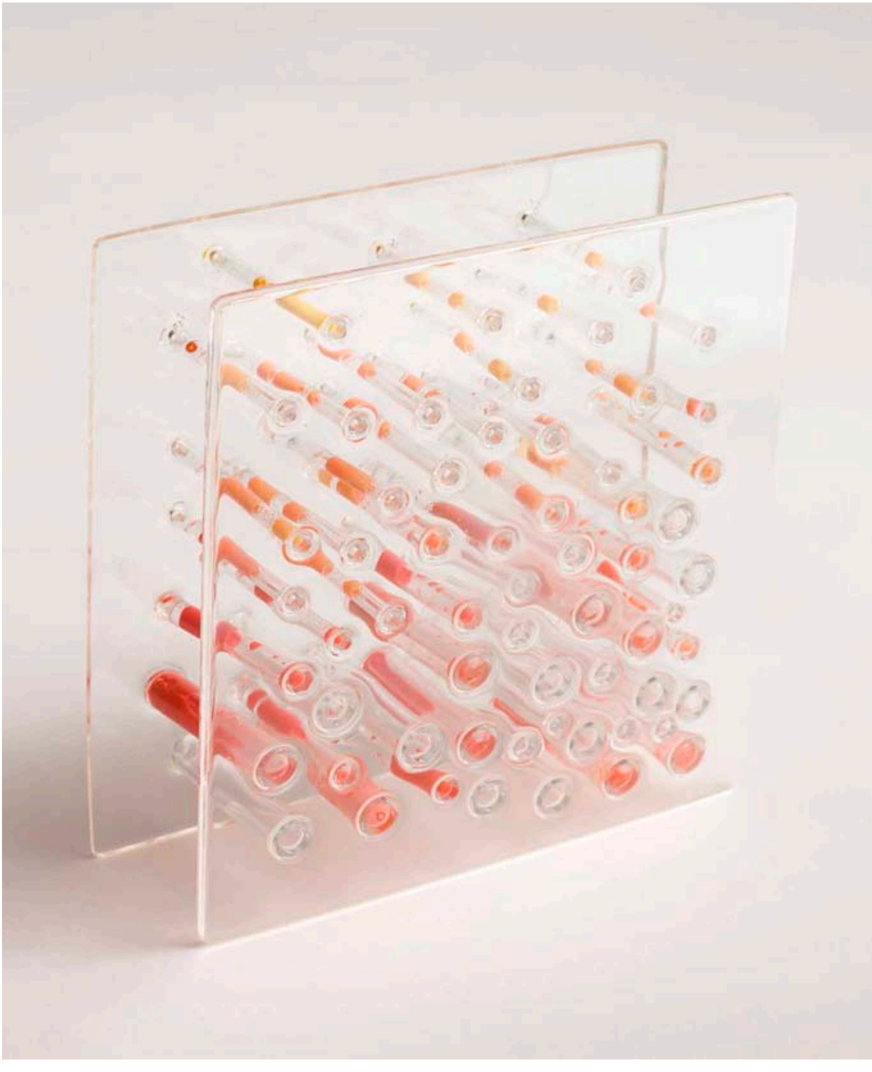
Size: 20 x 20 cm

Materials:

Resin, PVC tubes, pigment

Size: 18 x 20 cm





Materials:

Resin, acrylic tubes, thermochromic pigment, oil

Size: 20 x 20 cm

Materials:

PVC, acrylic tubes, thermochromic colour, oil, ink

Size: 30 x 40 cm

Materials:

Resin, PVC tubes, pigment

Size:

30 x 40 cm

DANKE

PROF. DR. ZANE BERZINA

ANDREAS KALLFELZ

PAULA VAN BRUMMELEN

JULIA WOLF

VERONIKA AUMANN

STEFAN MARIA ROTHER

HAWKE GIHM

OLIVER HURDMAN

IMPRESSUM

LIINA LEO

THE ACT OF SEEING

PHOTOS

LIINA LEO & STEFAN MARIA ROTHER

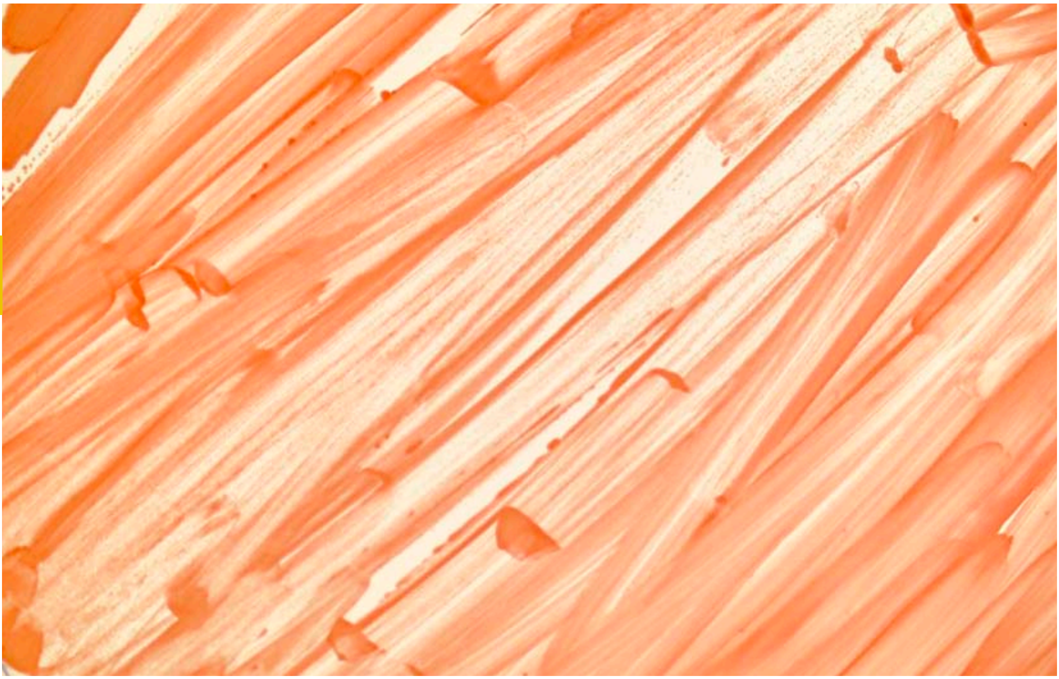
TEXTS

LIINA LEO & ANDREAS KALLFELZ

SUSPICIOUS GROWTH

a matter of bacteria

JACK RANDOL



Anicka Yi

"Life is Cheap"
2016

Artist Anicka Yi uses bacteria as a material for creating art.

SUSPICIOUS GROWTH

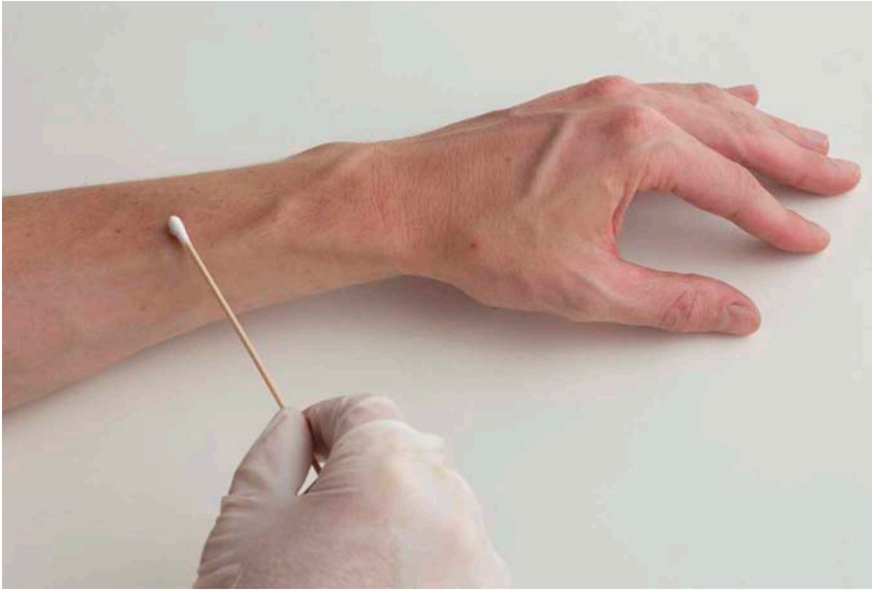
A MATTER OF BACTERIA

In 19th century rural Austria women would carry a slice of apple in their armpit while dancing and at the end of the night would offer it to a man of their choice who would then eat the apple if he was intrigued by its scent. But what makes the scent of each person's sweat unique and seductive? Sweat itself is entirely odorless; it's the living bacteria it contains which create body odor. This story creates a connection between individuals by breaking taboos that exist around body odor.

Philosopher Georges Bataille insists that between all beings is a "gulf of discontinuity" meaning humans exist on separate wavelengths. No matter what we do as individuals one is always born alone and will also die alone. He suggests that eroticism lies where we can find continuity between individuals. This happens when the perception of an individual self is broken down; when the matter of our own existence is called into question the continuity becomes visible. From a scientific perspective, the above story calls into question the matter of human bacteria.

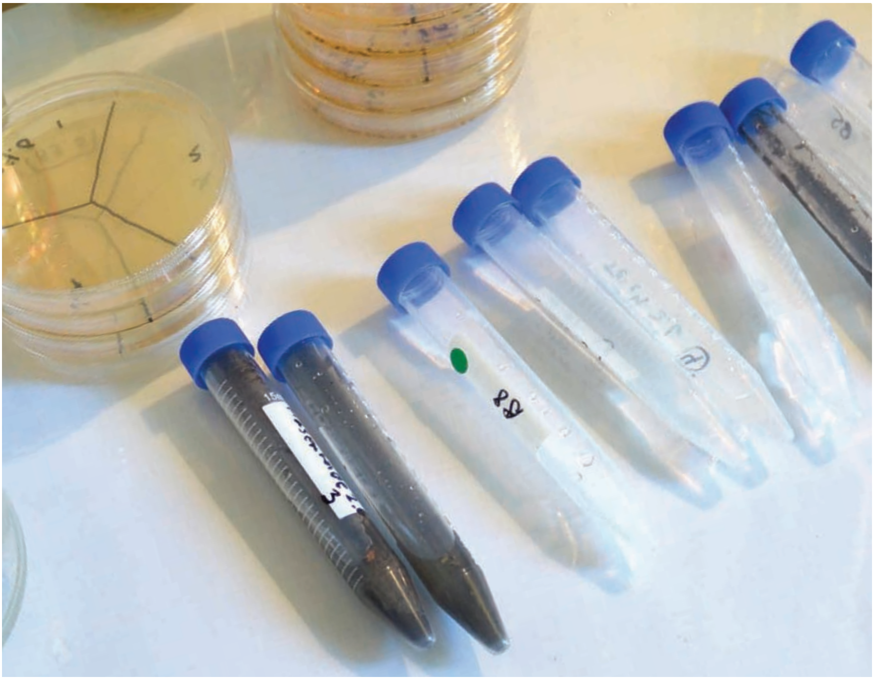
The bacteria in a single human body weigh almost two kilograms. Most serve a beneficial function but they incite fear more often than desire. Thoughts deviate quickly toward dangerous pathogens, illness and decay although we are always in contact with these little critters. The only sterile environment we have ever inhabited was inside the womb. Our first contact with bacteria happens as we pass through the birth canal like an imprint that helps inform the identity of a child from its immune system to its digestion and odor. As we go through life this microbial body changes and is affected by the places we go, people we see and things we eat. There is a fluid exchange of bacteria between our surroundings and us. By manipulating the growth of the bacteria into something aesthetic can we transgress our own fear of these imperceptible creatures and turn them into something desirable?

A simple swab from skin, the subway or cell phone can all reveal different colors and growth patterns when streaked across a petri dish. This project uses real situations, people and surroundings as sources for bacteria, which are grown, tested and redesigned as a kind of living color palette. Can this reclaiming of the bacteria on our bodies and surroundings enable us to say, “I am a host, and I am proud”?

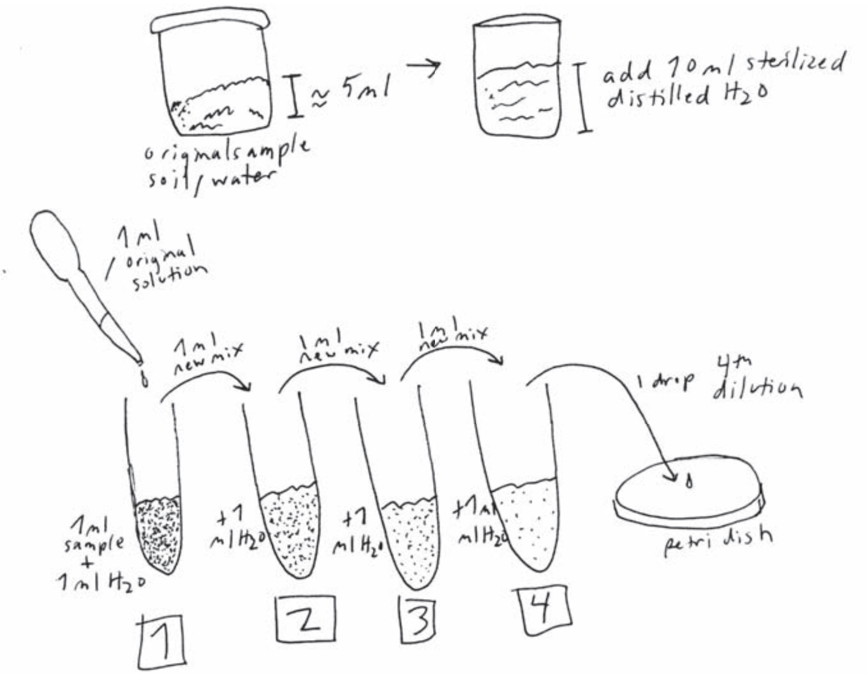


GROWING BACTERIA

In order to grow bacteria, a sample must be taken and spread across a nutrient base media. Samples can be collected by swiping a sterile cotton swab across any surface. To grow bacteria found in soil or water dilutions must be prepared in order to reduce the amount of bacteria in the sample. Too much bacteria in a singular sample will cause overcrowding in the petri dish and singular kinds of bacteria will be difficult to isolate. Dilutions are created by adding sterile distilled water to the sample. Different levels of dilution are usually tested to ensure healthy growth of only a few bacterias. A small droplet of the dilution is spread across a solid nutrient base media made of proteins like tryptone and peptone, yeast extract and agar agar.

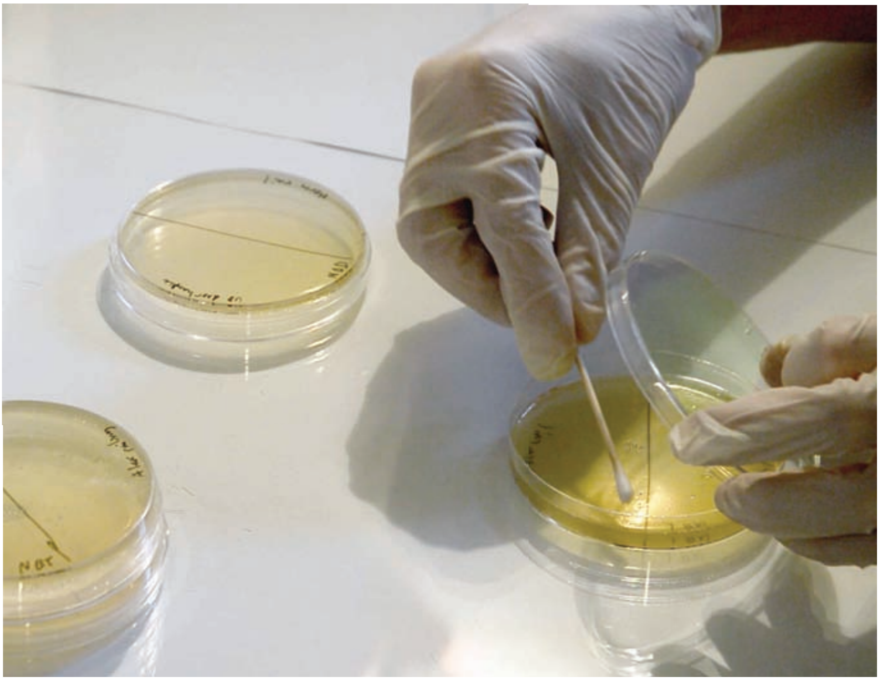


Soil and Water Samples



Serial Dilutions

About five millilters of soil or water is collected and then diluted via the process illustrated here.

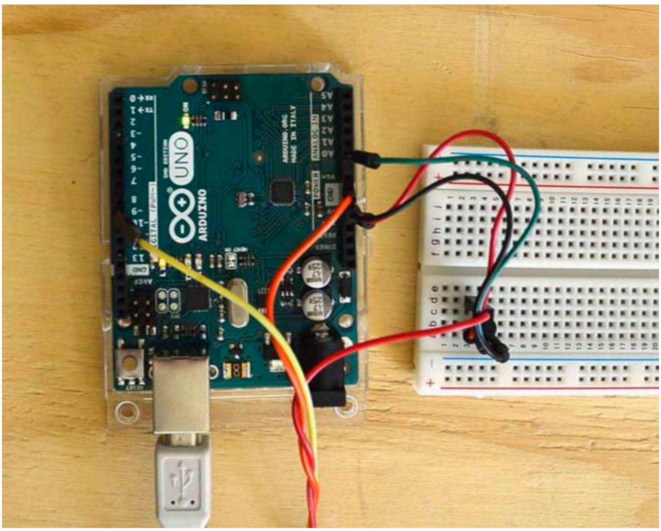


Inoculation

Above, a droplet of one of the serial dilutions is placed onto the nutrient base media. Below, a swab taken directly from a surface is streaked across the nutrient base media.

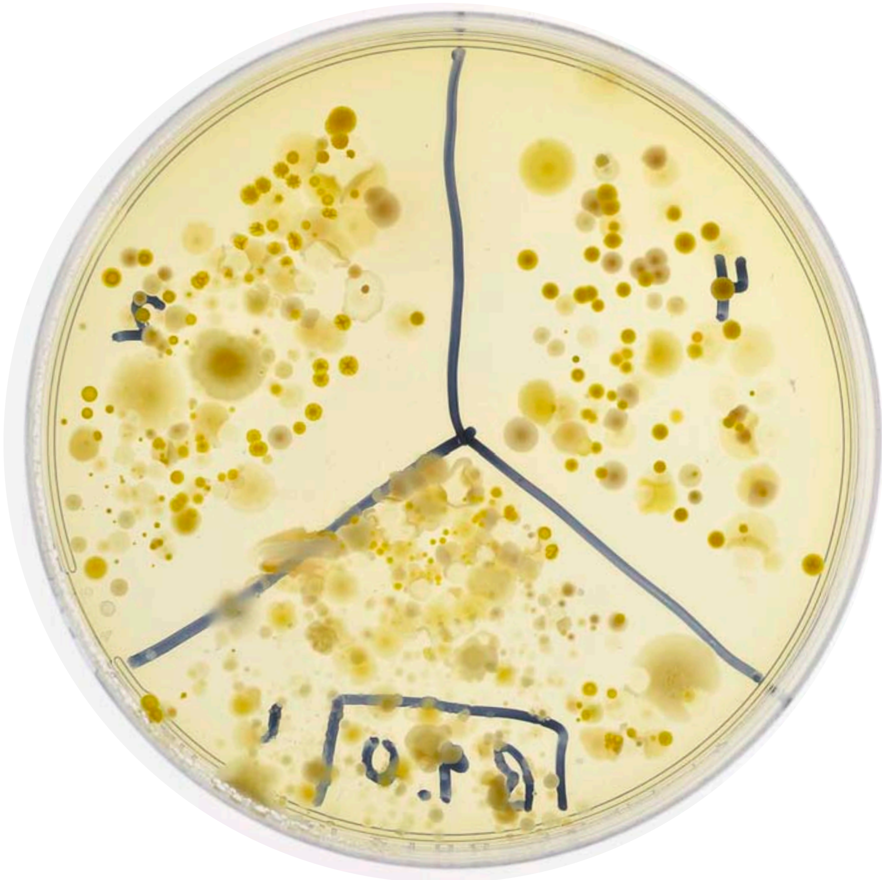
Incubation

Bacteria need a warm and generally dark climate to grow in. Prepared petri dishes are placed into this incubator which has a 40 watt light bulb to regulate heat.



Temperature Regulation

The light bulb is connected to this Arduino which is programmed to regulate the temperature by switching the light bulb on and off. The incubator is kept at 26 degrees celsius.



Bacteria from Wannsee

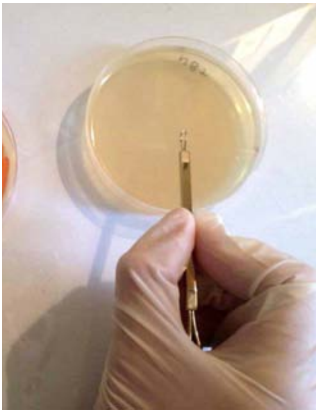
Here is the inital growth from a sample of water from Wannsee. Four dilutions were made of the water and 3 were tested here. The dish is divided into three parts, each for a different dilution. Dilution 4, in the upper right corner grew the best.

Bacteria from Skin

Here is a sample from a singular swab of skin after two weeks. The individual bacteria have reproduced and vary in color, texture and growth pattern.

ISOLATING INDIVIDUAL BACTERIA

From one sample many different kinds of bacteria will grow. In order to test a single kind of bacteria it needs to be isolated and multiplied or regrown on a new petri dish. Using a small sterile tool a bit of the single kind of bacteria are picked up and spread across a new petri dish. The bacteria don't travel much on the media, they generally grow in a small lumps.

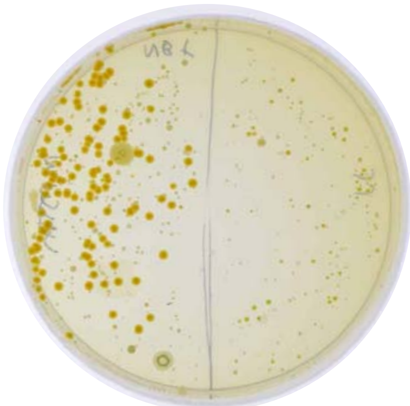


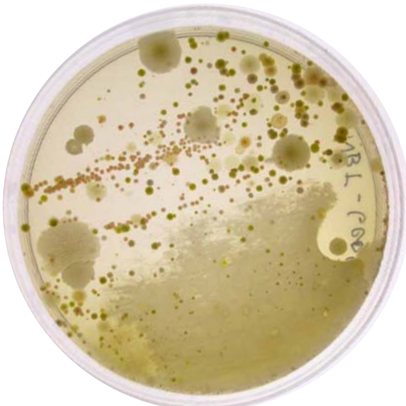
Innoculation Loop

A very small bit of bacteria are picked up with this metal tool and spread across a new petri dish where they can grow and multiply.

Color Isolations

Three singular bacteria were isolated from the soil and water samples. Clockwise from the upper right samples come from water near the ferry at Wannsee, soil from Wannsee and water from the Spree.

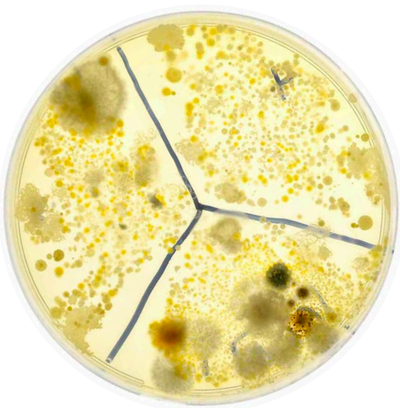




Initial Tests

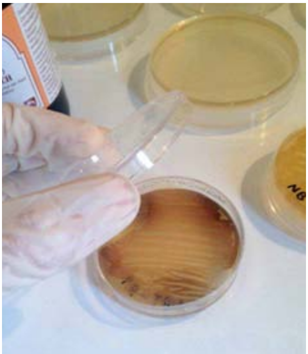
Samples from soil and water around Berlin were taken and examined for different colored bacterial growth.

Pictured on the left page are samples from human skin, sweat and objects that people interact with.




Becky Sui Zhen
MUSICIAN
Color: Pink
Sample: Sweat


Moritzplatz
BERLIN
Media: Tryptone
Color: Orange
Sample: Puddle Water



Material Prints

Fabric is pressed onto the bacteria to make a print, which is then dried and ironed to kill and press the bacteria.

Controlling Bacterial Growth

While making color isolations of bacteria, an antibacterial solution was tested to see how the bacterial growth can be controlled.

Experiments in Clockwise order

Droplets of solution

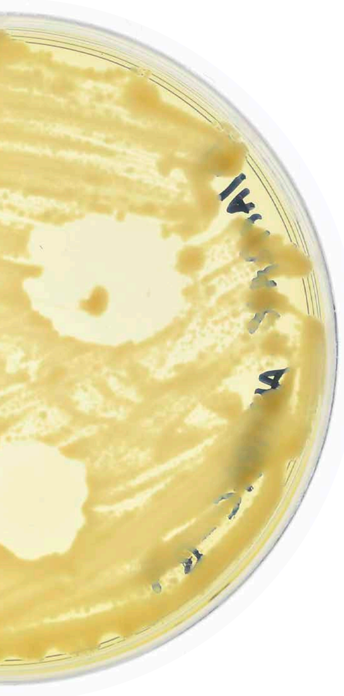
Stamp of number 9

Cotton swab of B

Stamp of number 9

Stamp of number 17

(the stamp forms of 17 were left on the media during growth)



Bacterial Drawing

Bacteria painted onto the nutrient base media and then grown with the resulting prints on textile.

BACTERIAL GROWTH

Photographed over a period of 73 hours, the first image was taken just after a very small amount of a singular bacteria was taken and spread across the nutrient base media into a pattern. The last image was taken 73 hours and 35 minutes later.

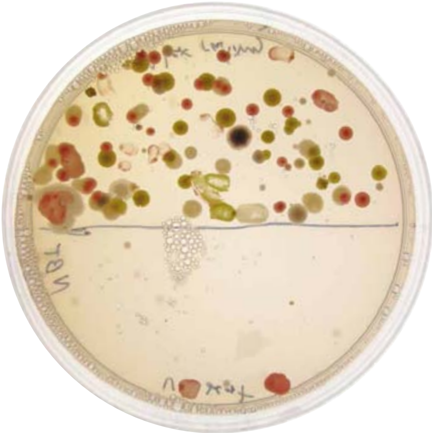
"**Between one being and another**, there is a gulf, a discontinuity. This gulf exists, for instance, between you, listening to me, speaking to you. We are attempting to communicate, but no communication between us can abolish our fundamental difference. If you die, it is not my death. You and I are discontinuous beings." - Georges Bataille "Eroticism"

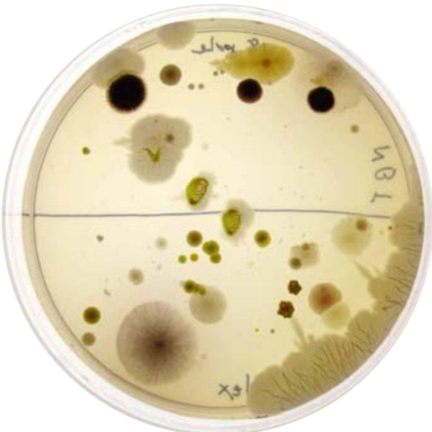
This quote is a starting point from which Georges Bataille goes on to suggest that eroticism lies where we can find continuity between discontinuous individuals. This happens when the perception of an individual self is broken down. When the matter of our own existence is called into question the continuity becomes visible. The human body itself is made up of between one and three kilos of bacteria, the actual number of bacterial cells in body outweigh the human ones. Our bodies are less human than we think. As one goes through life these bacterial colonies are affected by everything we come into contact with.

In order to examine what kind of colors can be found in our surroundings, five situations were analyzed. Bacterias were collected in the form of swabs and samples from soil and water. Samples were grown in petri dishes and examined for colored growth. Singular bacterias were isolated to create a living color palette. Isolated colors were drawn into letter forms and grown into the beginning of the above quote. Five words were made from five different situations.

Water sample grown
from Teufelssee

On the way to university I collected samples from the U-Bahn of things I touched. The railing of the stairwell at Hermann-platz, the door handle of the U8 subway, a seat at Alexander-platz all were swiped with a cotton swab. A lot of mold resulted in the petri dishes, but also yellow, orange, beige and plenty of pink bacterias.



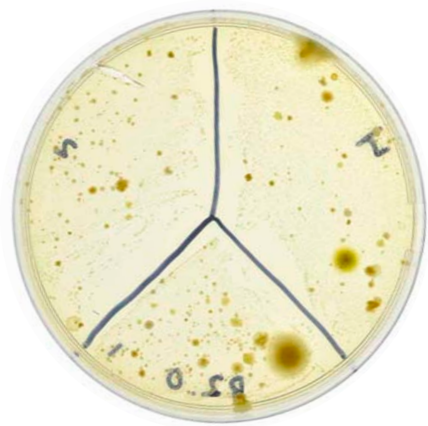


Initial growths from top to bottom	**Color Isolations from top to bottom**
Hermannplatz Railing/U8 Train Door Handle	Hermannplatz Railing (both)
Alexanderplatz Railing/Different railing from Alexanderplatz	U8 Train Door Handle (both)
U8 Pole inside Train	

Becky was staying with my roommate while on tour with her band from Australia. One morning I found them boxing in Imogen's room. They offered to donate some of their sweat for this project. We scraped a bit of sweat from their skin and placed it onto petri dishes. From Becky's sample we found pink bacterias and some little beige ones as well. Imogen's samples produced more yellow colors. Isolations were made from the pink and yellow bacteria.

Initial growths from sweat (left) with color isolations (right). Imogen's bacteria are on top, Becky's are on the bottom.

Bogdan and I went to the canal to have a beer in the evening. I wanted to document the bacteria where all these people collect and sit together. I took a cotton swab of a few areas on our bodies, water from the canal and his e-cigarette. In Bogdan's petri dish were yellow bacterias and orange from his e-cigarette. From the canal water there was too much mold to isolate any singular bacteria but some yellow spots formed at the beginning of its growth.



Initial growths top to bottom

Bogdan's Skin and E-cigarette, Canal Water, Jack's Skin

Color Isolations

Bogdan's skin/ E-cigarette, Jack's Skin/Canal Water

Georgey was visiting Berlin for the weekend and we took a trip to Grunewald. We biked to Teufelssee to swim and after I took a swab of Georgey's arm. I also collected some dirt from where we were lying, lake water and soil from a field. Georgey's petri dish had pink, yellow and orange bacteria. From the lake water were some darker brown colors and beige. Similar bacteria appeared in the lake water and from Georgeys skin that seemed to overtake a large part of the petri dish.

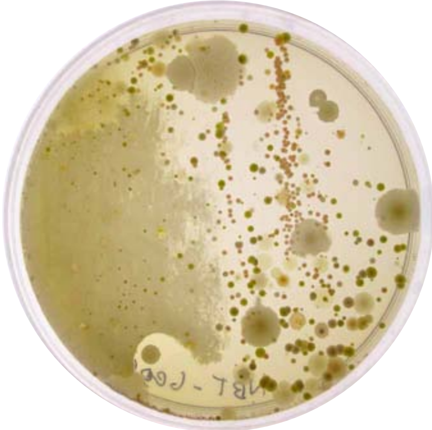
Initial growths

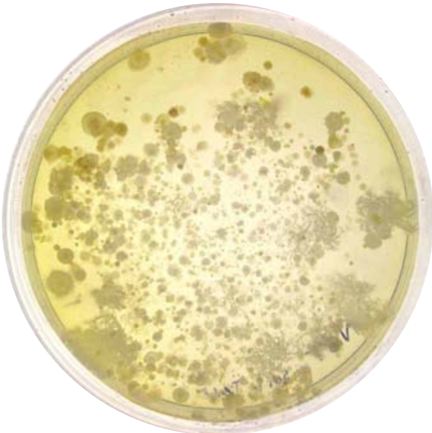
clockwise from top left of opposite page

Water from Teufelssee
Soil from Teufelssee
Soil from Grunewald
Swab from Georgey

Color Isolations (last two petri dishes

Swab from Georgey
Soil from Grunewald





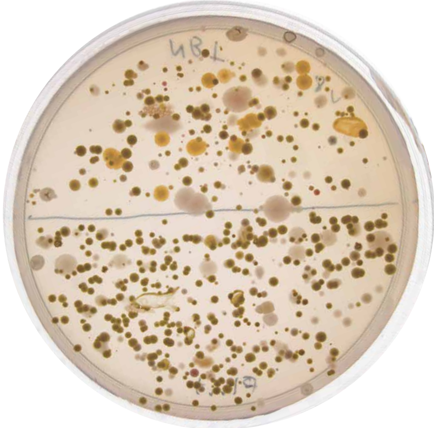
I was working late one night but decided to meet friends at a club afterwards to see a friend's band play. When I arrived at 2 am I had missed my friends show but still managed to catch my friends. The picture above was taken just before Tommy fell off this pole and hurt his wrist. I took a swab from his injury and from where I was sitting on a bench watching. Later we went for pizza and I took a sample also from the table and a plant next to us.

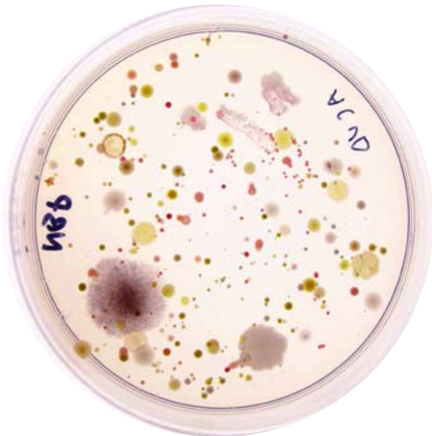
Initial growths from top to bottom

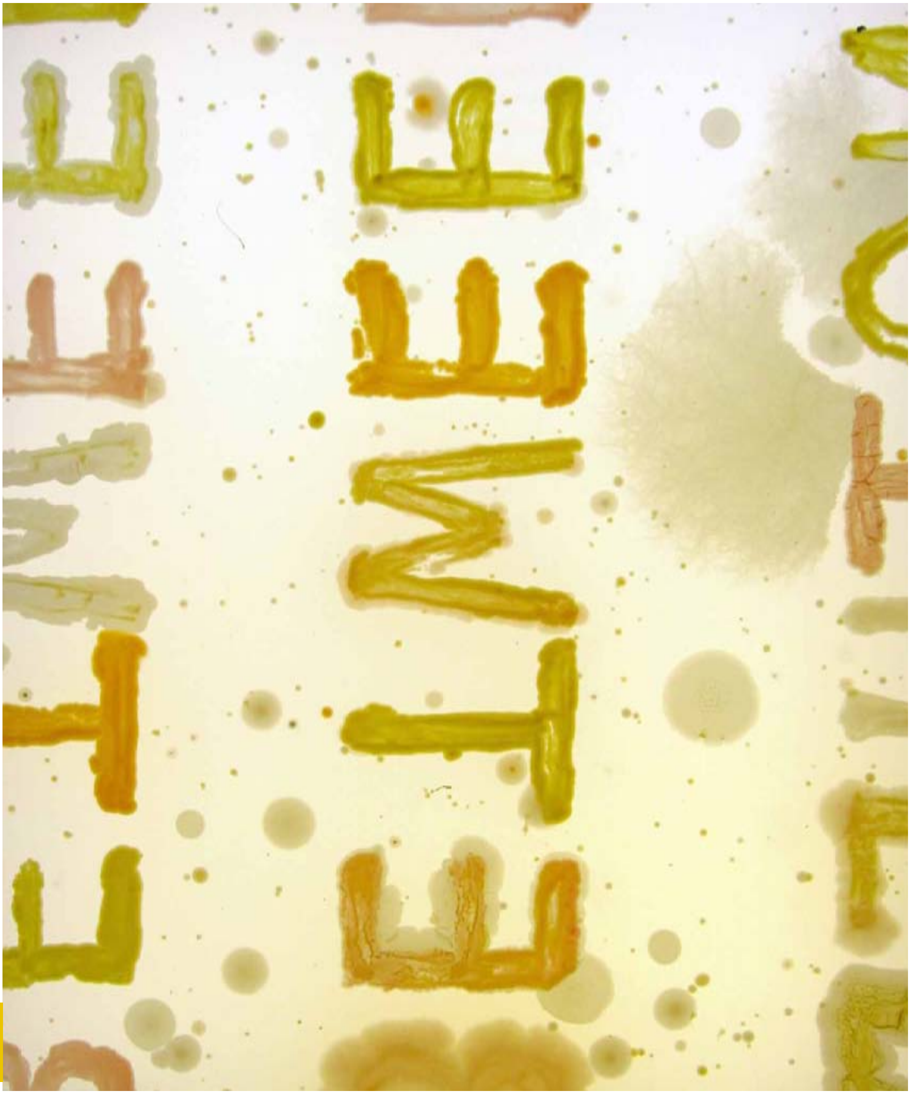
Tommy's Wrist
Bench at ACUD
Bar at ACUD/Train Ride Home
Pizza Restaurant Table/Plant

Color Isolations from top to bottom

Tommy's Wrist/Bench at ACUD/Train Ride Home
Tommy's Wrist/Bar at ACUD







Letter Forms

From the color isolations that were created from each situation a word was drawn. Each letter uses one color or kind of bacteria.


BETWEEN
ONE
BE


AND
ING
ANOTHER

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THANK YOU

PROF DR ZANE BERZINA

DR FLAVIA BARRAGAN

ANDREAS KALLFELZ

STEFAN MARIA ROTHER

AND THANK YOU TO EVERYONE WHO
GLADLY DONATED THEIR BACTERIA

IMPRESSUM

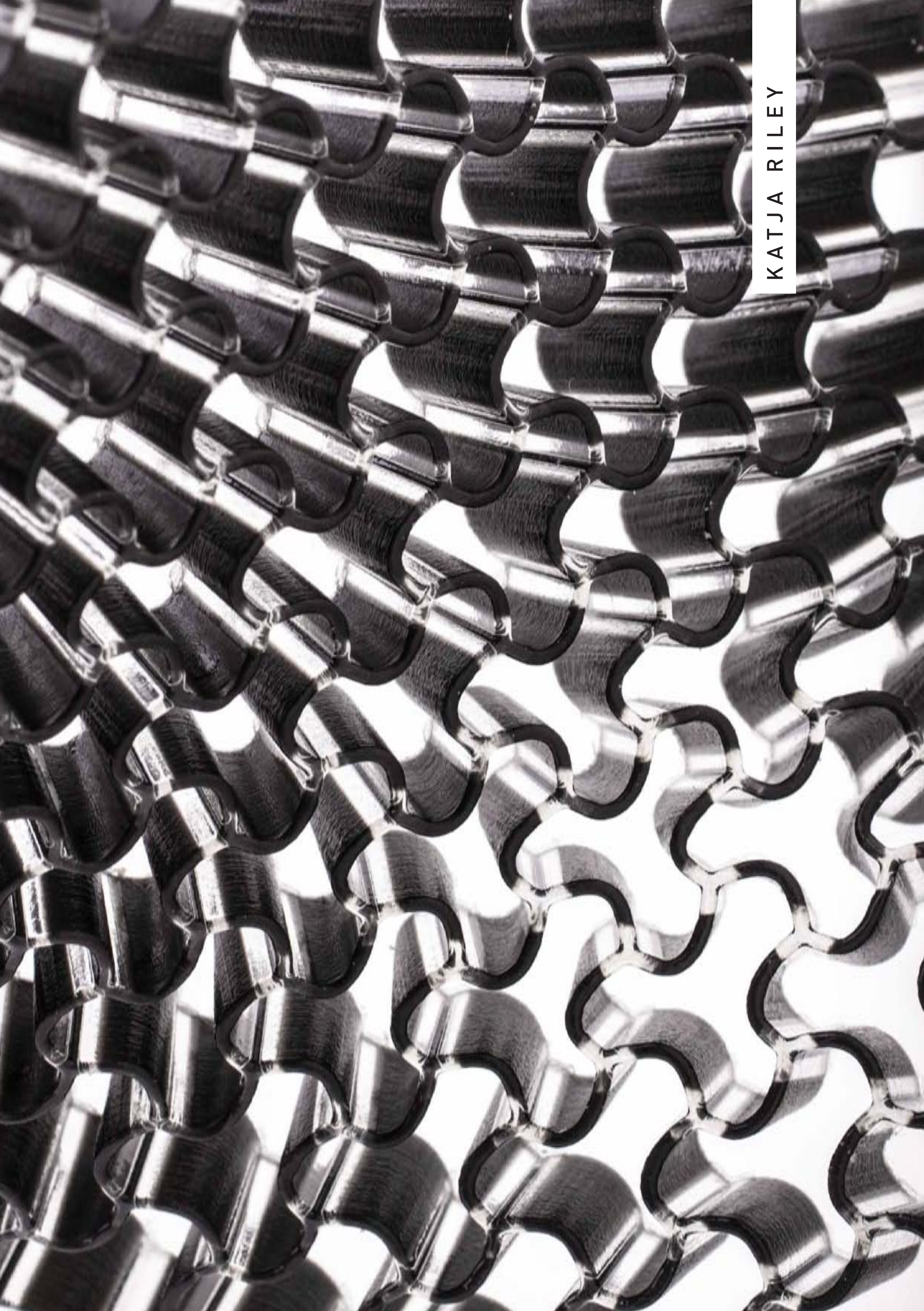
JACK RANDOL
SUSPICIOUS GROWTH

PHOTOS
JACK RANDOL
STEFAN MARIA ROTHER

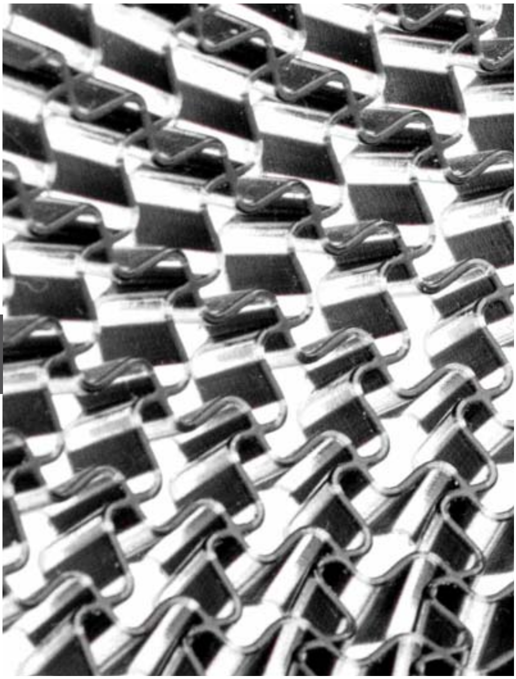
TEXTS
JACK RANDOL AND ANDREAS KALLFELZ

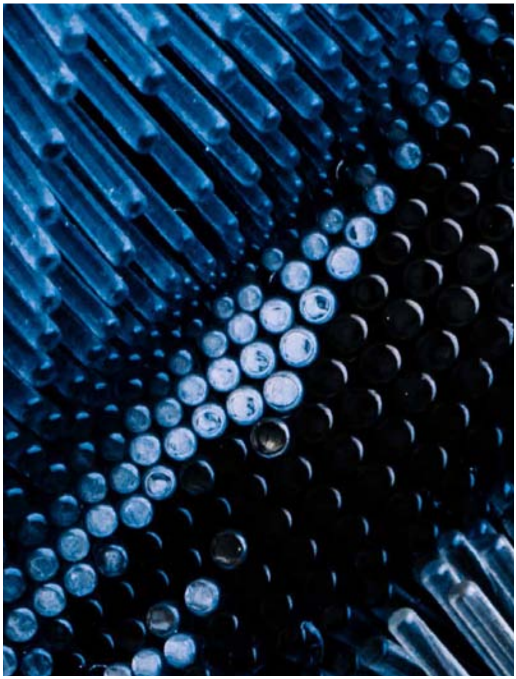
MIXED MATTERS

multi-material 3d-printed structures



KATJA RILEY





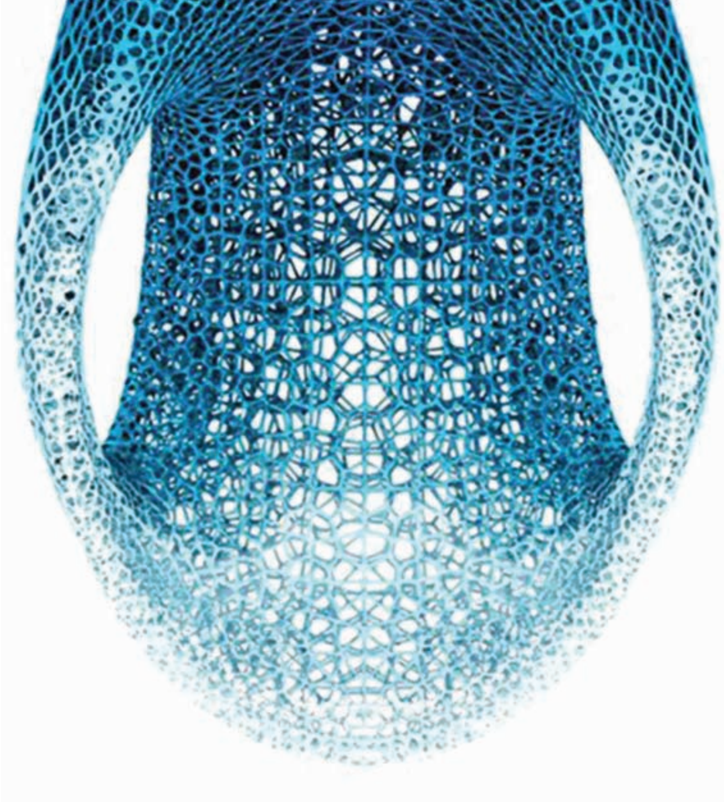
multi-material 3D printing

enables designers to create highly detailed structures with varying color, transparency, elasticity and texture - in one single print

right side:
Durotaxis Chair by Alvin Huang
source:
www.dezeen.com

left side:
3D-printed object
source:
www.monolith.zone

MULTI-MATERIAL 3D PRNTING



MIXED MATTERS

MULTI-MATERIAL 3D PRINTED TEXTILES AND SURFACES

Multi-material 3D printing incorporates a wide range of material properties to vary translucency, rigidity, thermal resistance and color in one single print. Acknowledging that material is the fundamental part of each design solution this work aims to examine the future potential of 3D printing for material design. It is clear that this technology has fundamentally affected the designers' relationship towards materials and their processing, at the same time enabling them to create shapes and material combinations not possible otherwise.

Similar to inkjet printing, PolyJet printing simultaneously processes up to 8 different polymers such as digital ABS, simulated Polypropylene, resin and rubber with an accuracy down to 0.1 millimeters. Highly detailed structures can be combined with freely distributed material properties.

CONCEPT

In this work the possibilities of multi-material 3D-printing is explored in the context of 3D textiles and surfaces. The goal is to tailor specific material behavior by means of geometry, pattern design and material combinations. Generative form-finding techniques based on parametric design software were applied, resulting in two series of samples. By printing, testing and iterating the influence of material distribution on material behavior was studied.

Objet260 Connex multi-material 3D printer from Stratasys

picture source: http://www.cimetrixsolutions.com/files/

materials

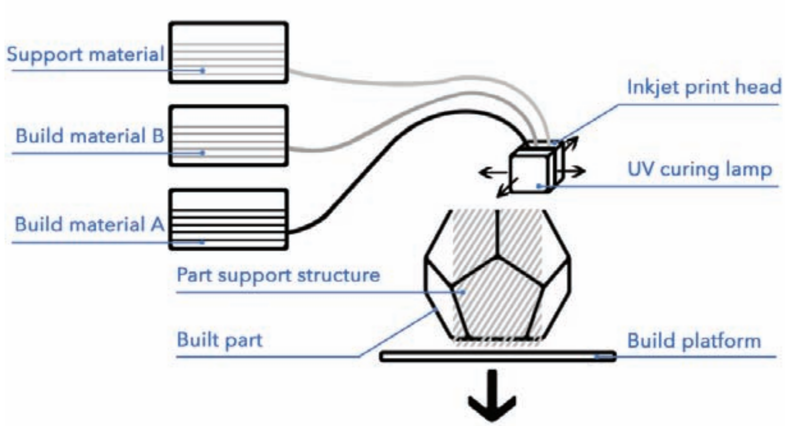
Material properties range from rubber to rigid, transparent to opaque, neutral to vibrantly colored and standard to biocompatible.

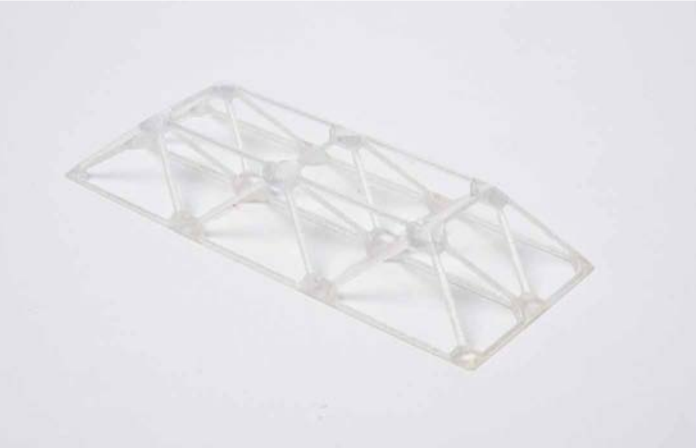
picture source: http://global72.stratasys.com/~/media/Image-Gallery/

Polyjet technology

similar to inkjet printing, PolyJet 3D Printers jet layers of curable liquid photopolymer onto a build tray

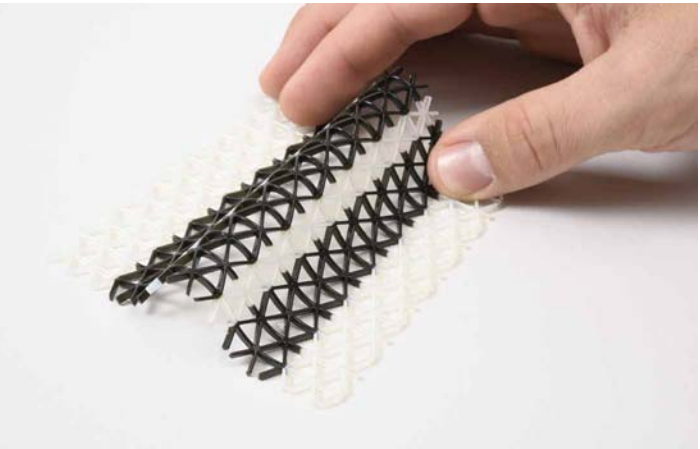
picture source: http://technology-applied.com/wp-content/uploads/2016/10/opis-technologii_polyjet.png

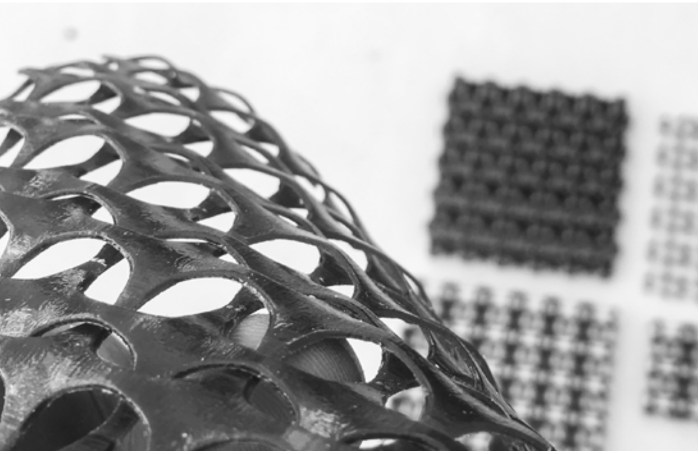


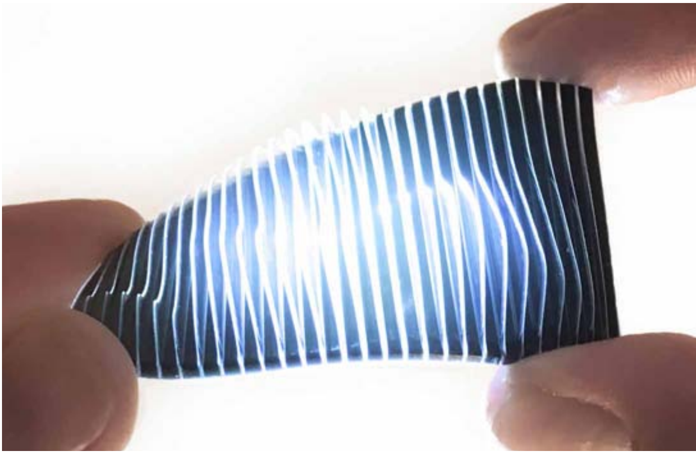


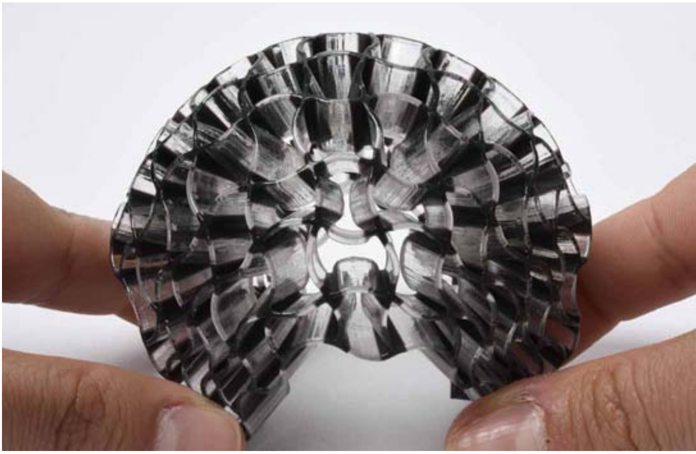
testing material
strength, elasticity,
distances, hard-soft
combinations,
auxetic structures,
weaves, grids, 3D
structures, fine detail
printing

materials used:
Agilus black (soft)
Vero clear (rigid)
Vero white (rigid)





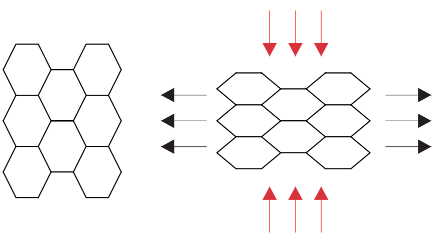




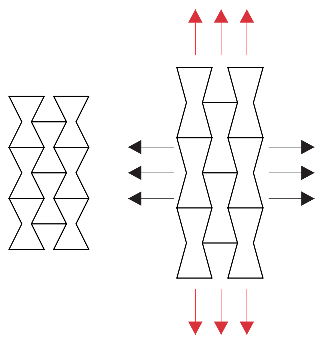
MATERIAL STUDY 1:

AUXETIC STRUCTURES

Auxetics are metamaterials with unusual mechanical properties: they have a so-called "negative Poisson's ratio", which means that when stretched they expand perpendicular to the direction of the applied force. This behavior is not dependent primarily on material composition but rather on the internal architecture. Here, selected auxetic geometries were researched and tested through iterative design processes. By adding the component of multi-material design, auxetic behavior can be increased by controlling cellular stiffness and contact pressure distribution. As a result of these findings cellular structures with varying material properties were developed, suggesting high potential for various, particularly body-related, applications.

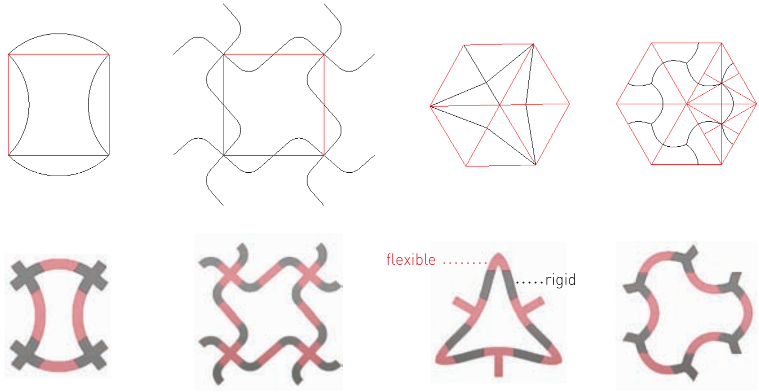


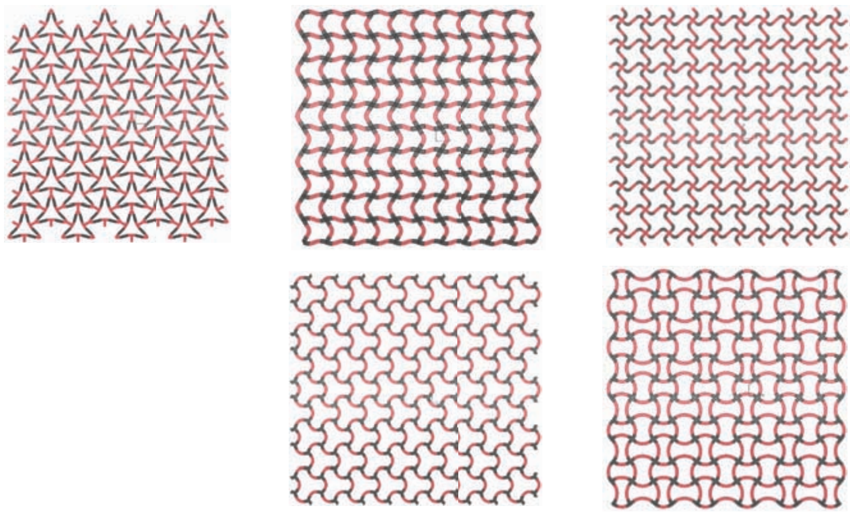
conventional materials

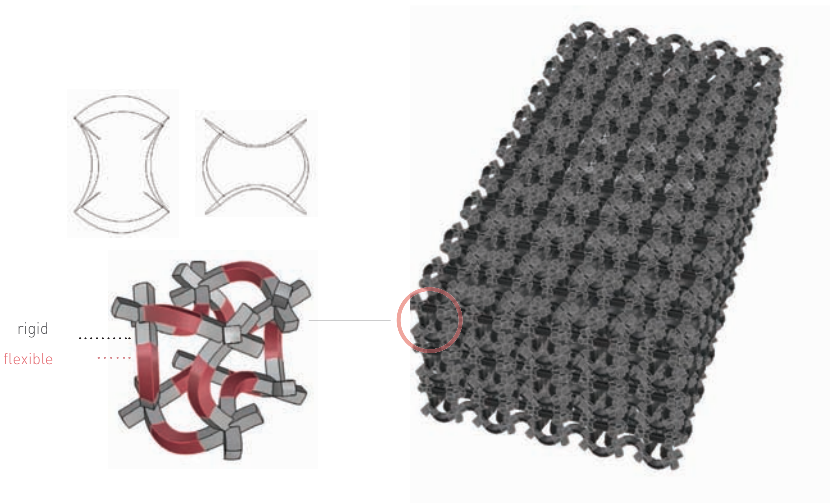


auxetic materials

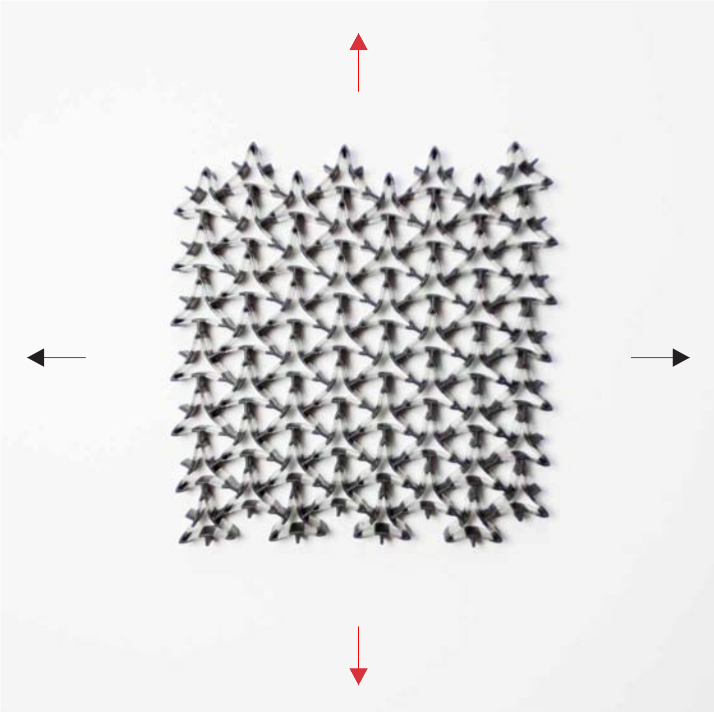
PROCESS

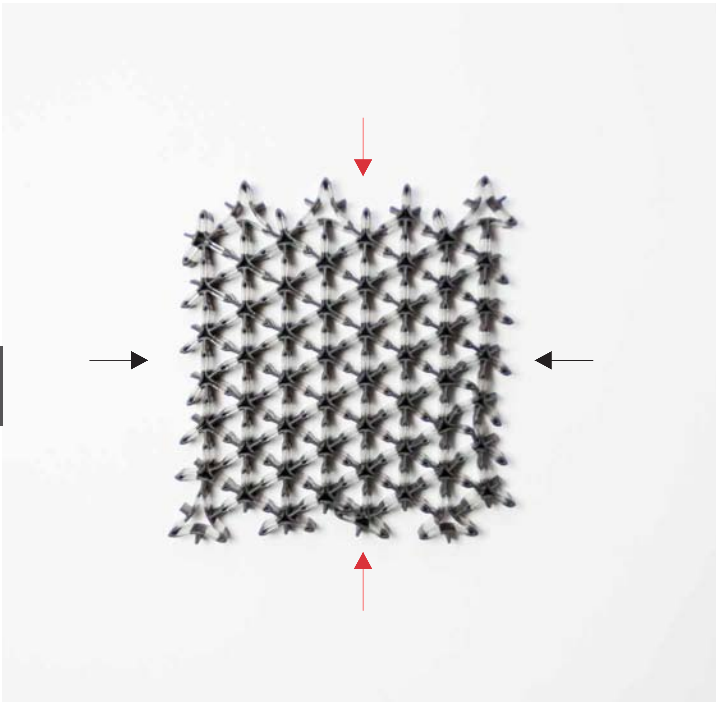






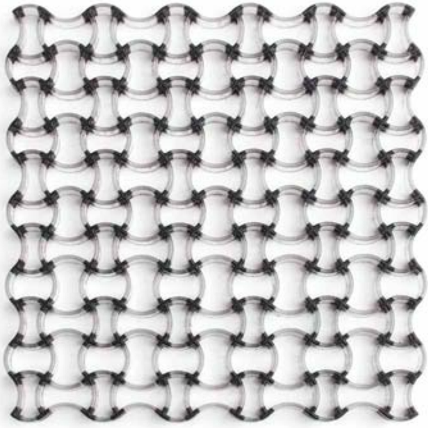
patterns created
based on research of
auxetic geometry

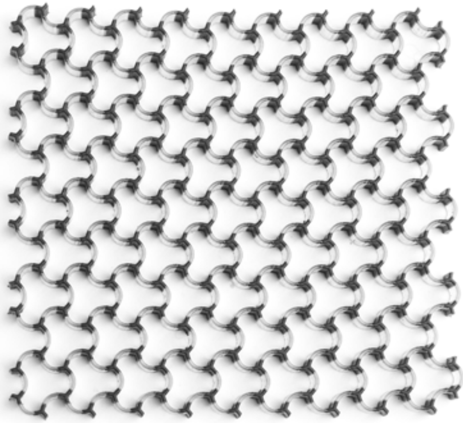


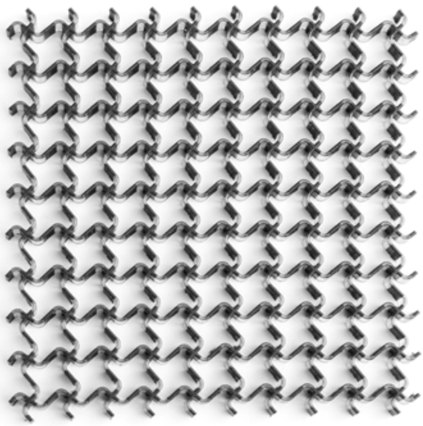


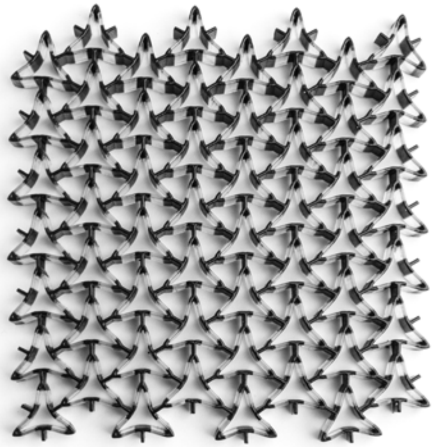
left
structure showing auxetic behavior due to flexible hinges and rigid walls,
printed with Vero clear (rigid) and Agilus black (soft)

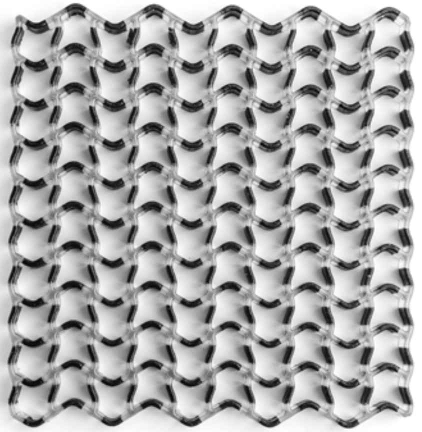
right
printed samples of identified auxetic geometries,
size: 10 x 10 cm

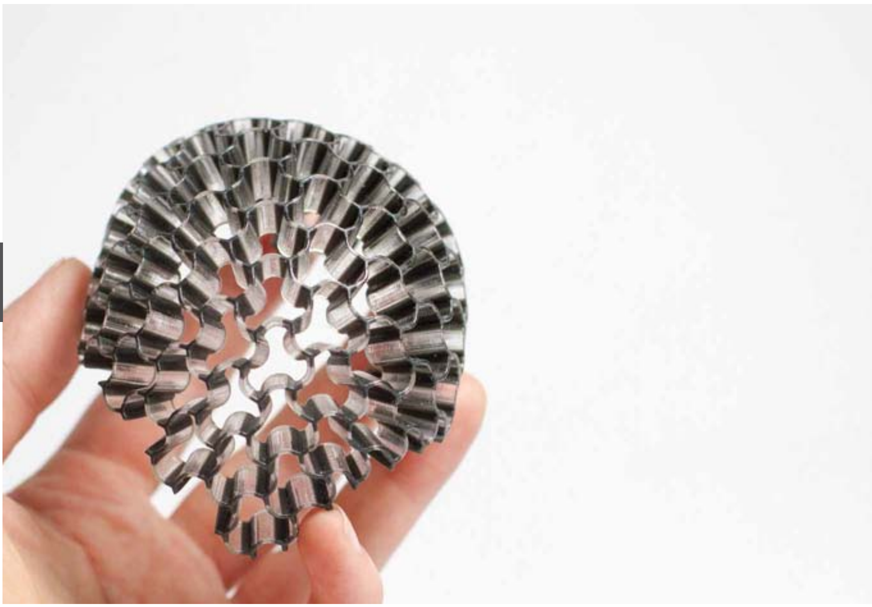






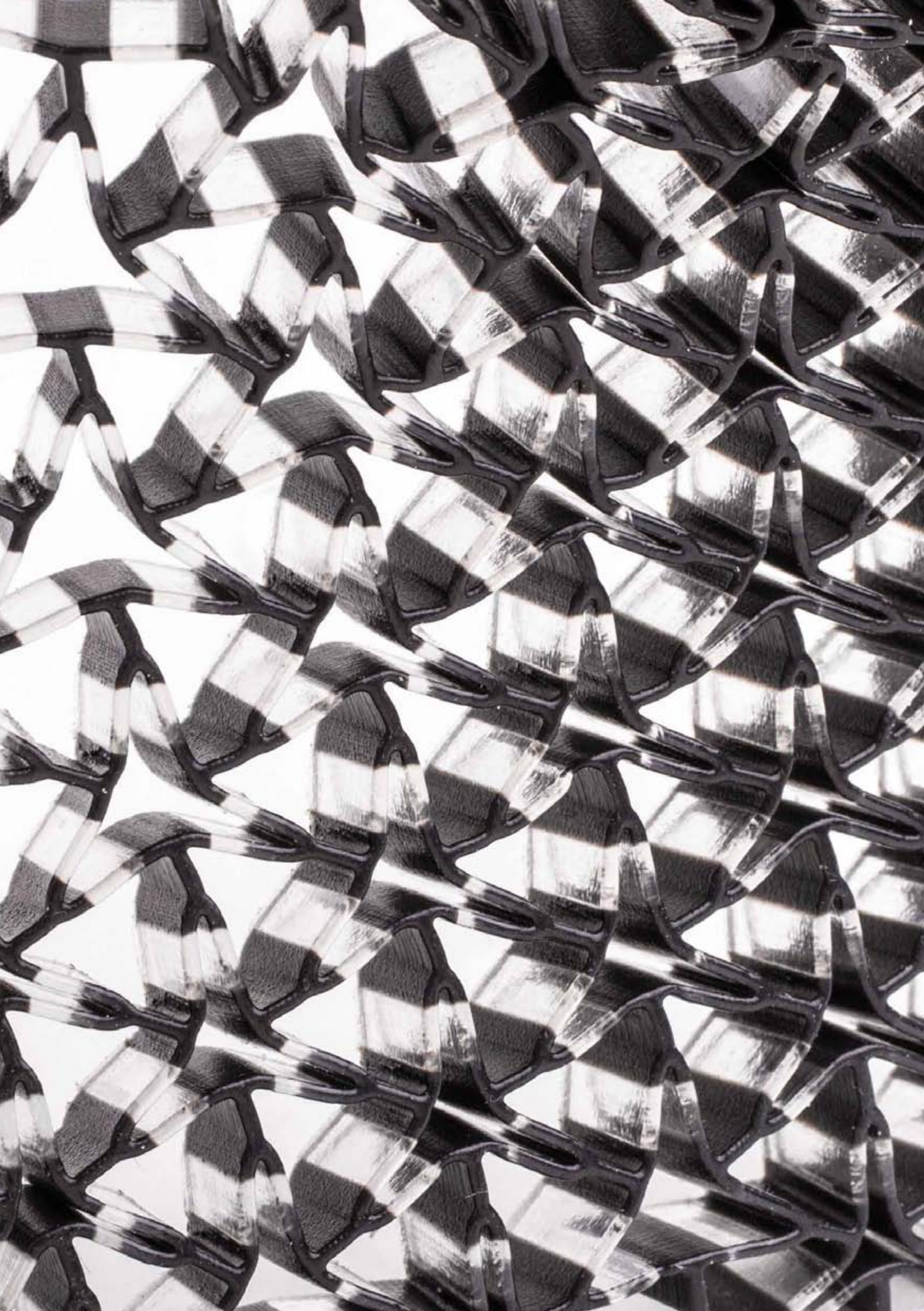


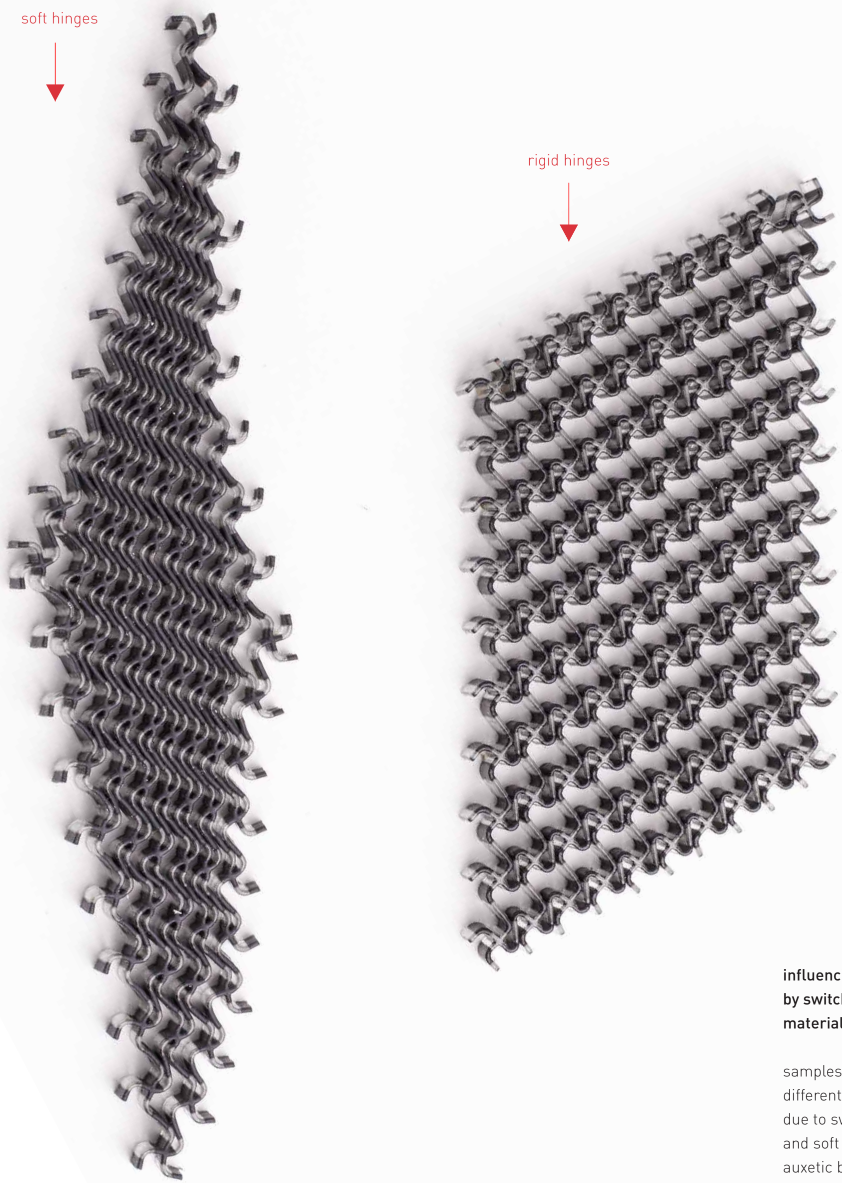




left
flexibility by combining rigid and soft materials

right
Objet Polyjet printing technology produces seamless material transitions

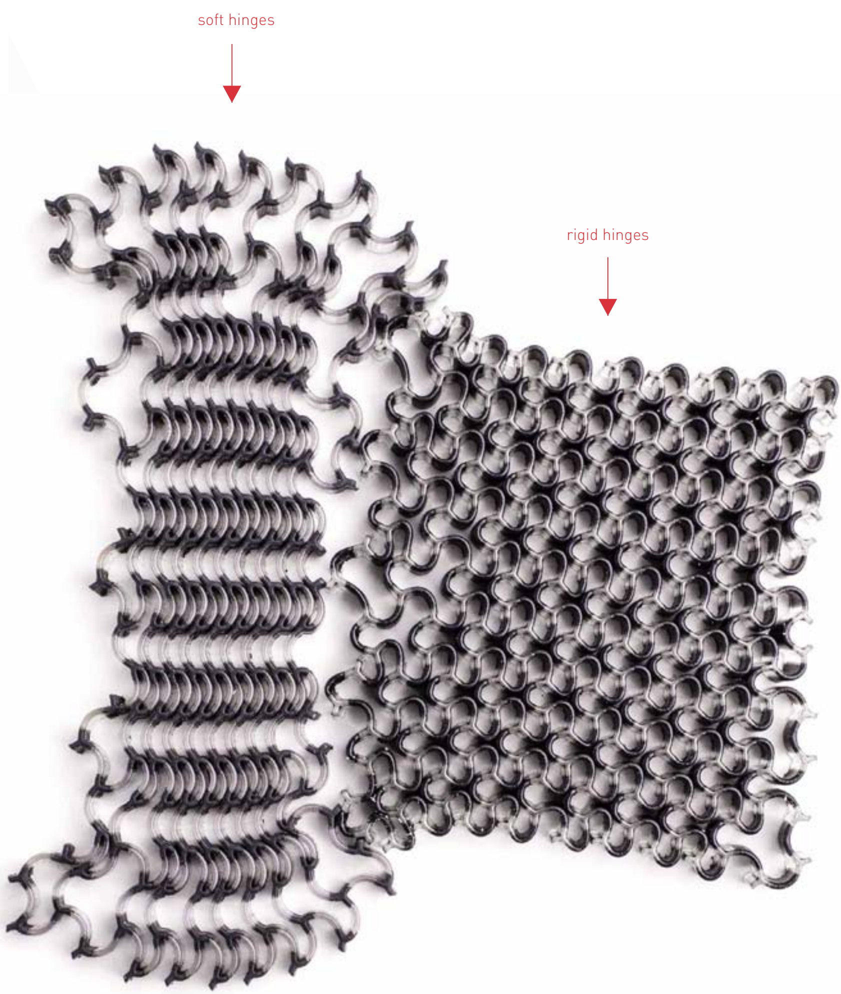




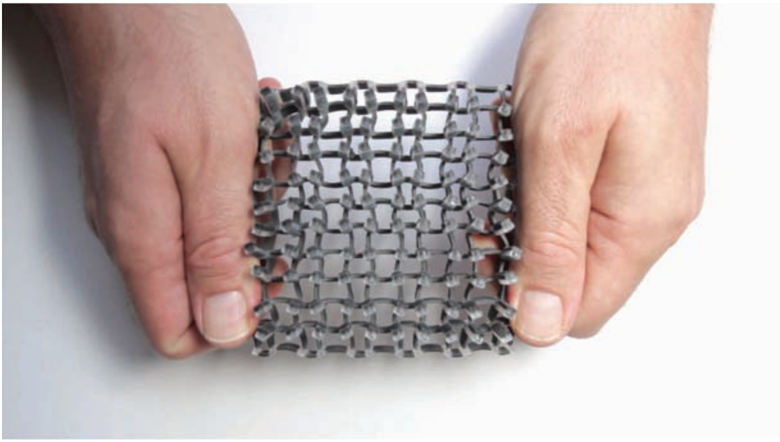
influencing behavior by switching material properties

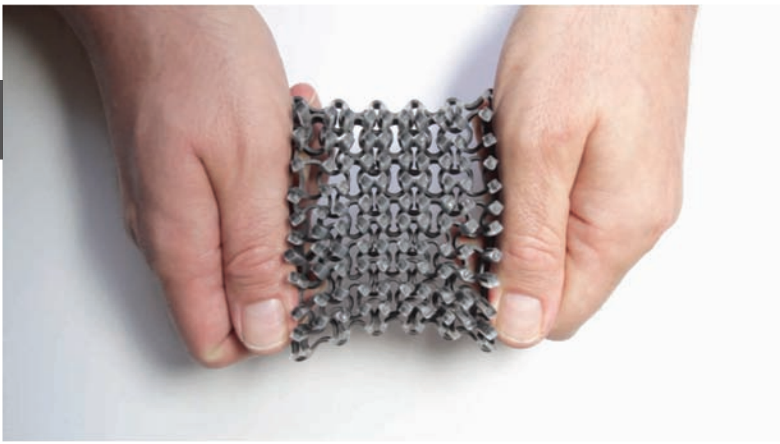
samples showing different behavior due to switch of rigid and soft materials, auxetic behavior with rigid hinges and soft connections (right samples shown in left and right image)

materials:
Vero clear (rigid)
Agilus black (soft)


soft hinges
rigid hinges

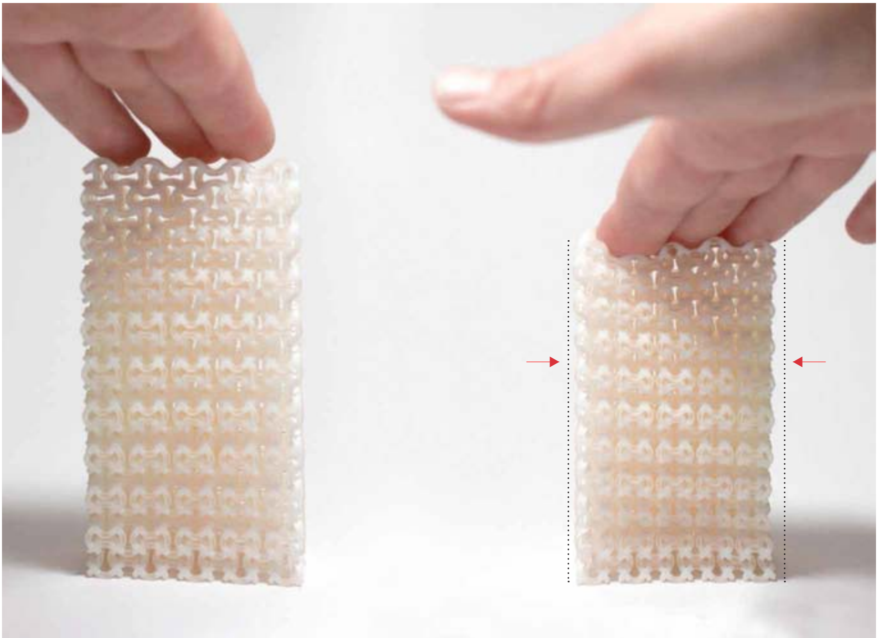
AUXETIC 3D STRUCTURES

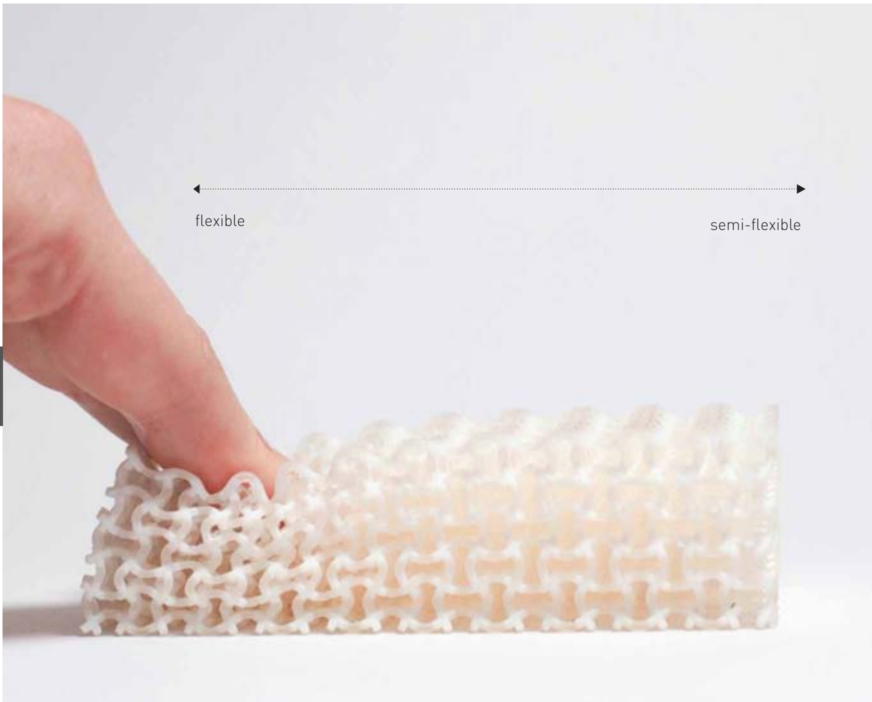




left
auxetic textile used as a carrier of rods, expanding and compressing the structure causes the rods to rotate

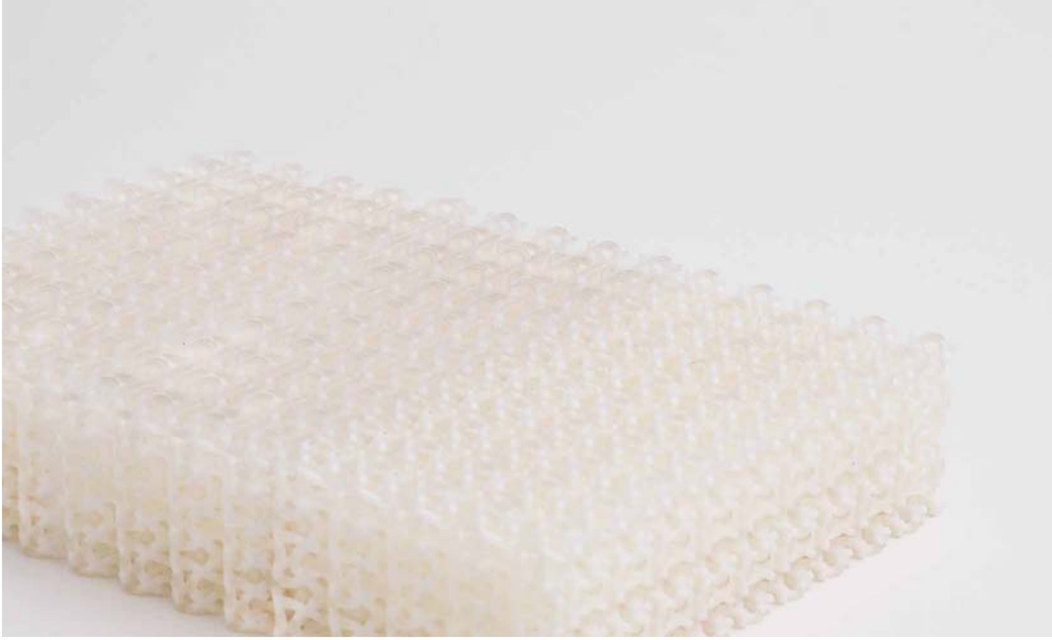
right
3-dimensional grid structures with auxetic geometry; printed with 1, 2 and 3 mm material thickness





cellular fabrics
3-dimensional auxetic structure with stiffness distribution

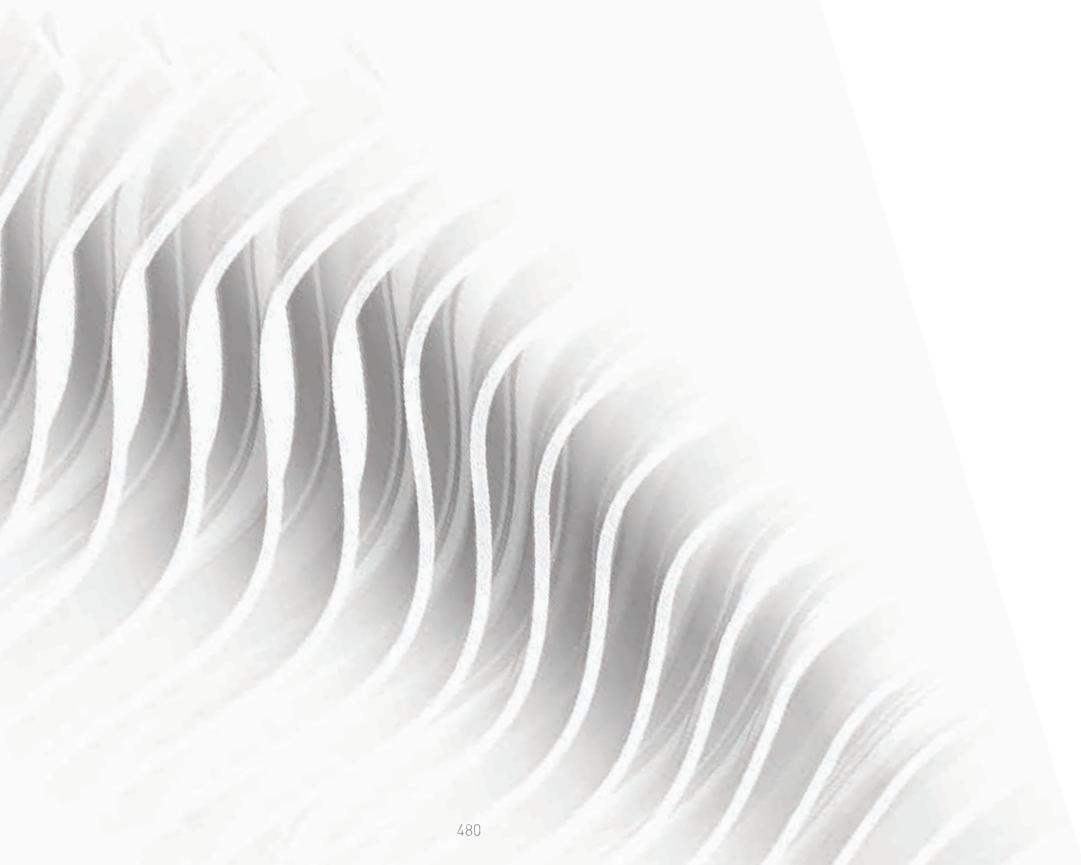
the foam was printed with Agilus clear (soft) and Vero white (rigid) as well as 4 different mixture ratios of these 2 materials - creating a total of 6 different material stiffness qualities



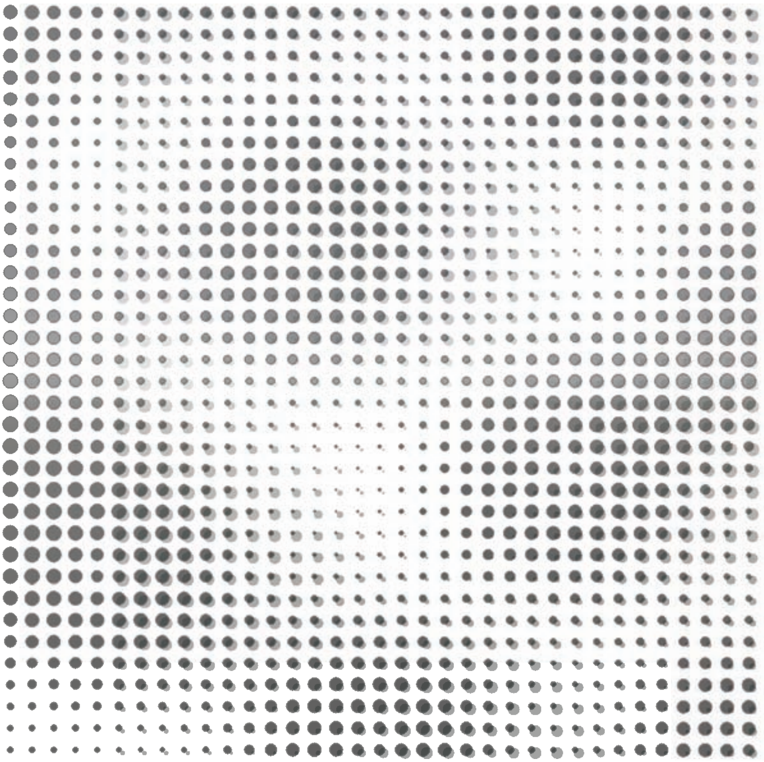
MATERIAL STUDY 2:

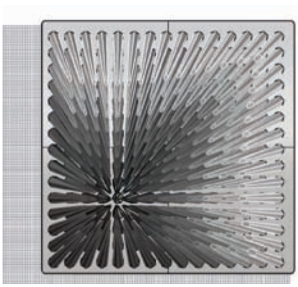
3-DIMENSIONAL SURFACES

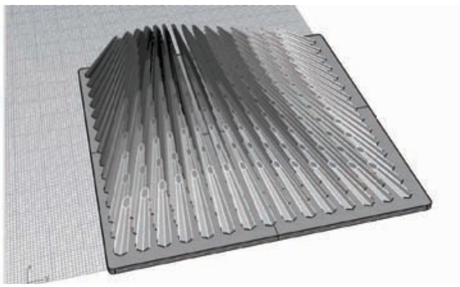
Natural structures were abstracted into simplified geometric shapes. The original inspiration is materialized by moving and manipulating the objects and discovering their organic behavior. This effect was realized by varying the level of translucency as well as hard-soft material combinations. The connecting link between all surfaces is the use of Vero Clear, a stiff transparent photopolymer with optical qualities. In different ways the light guiding properties of the material are shown.

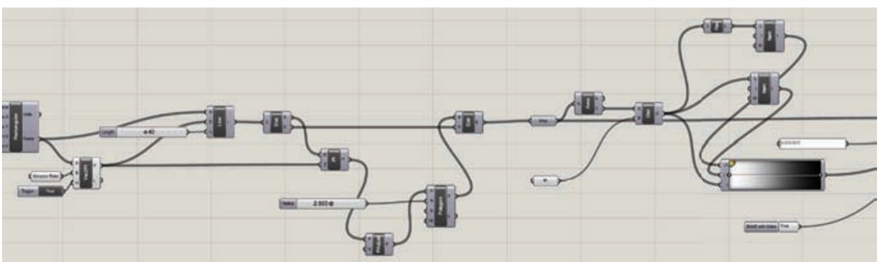


PROCESS





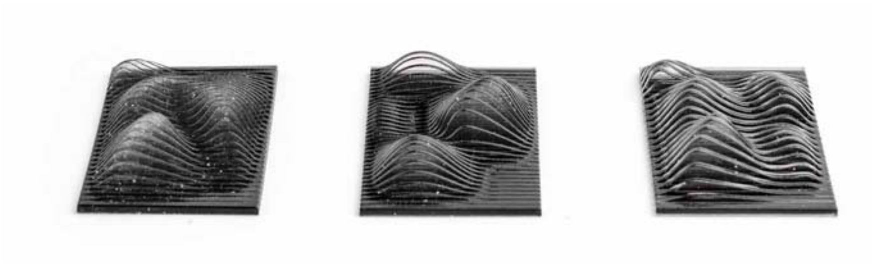


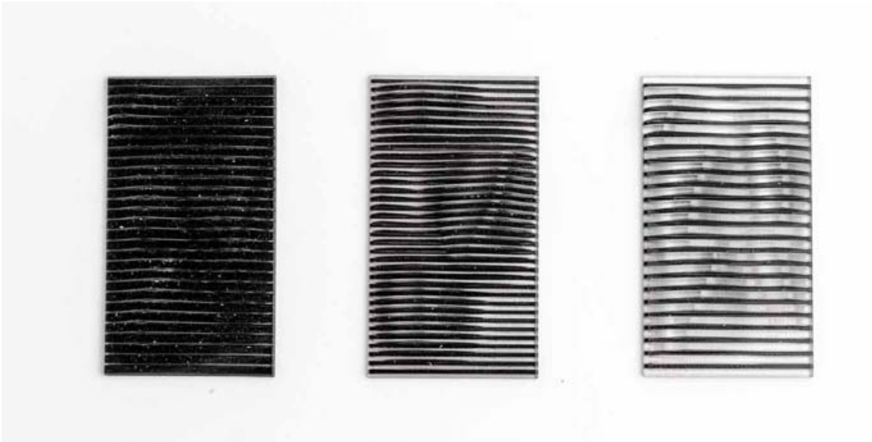


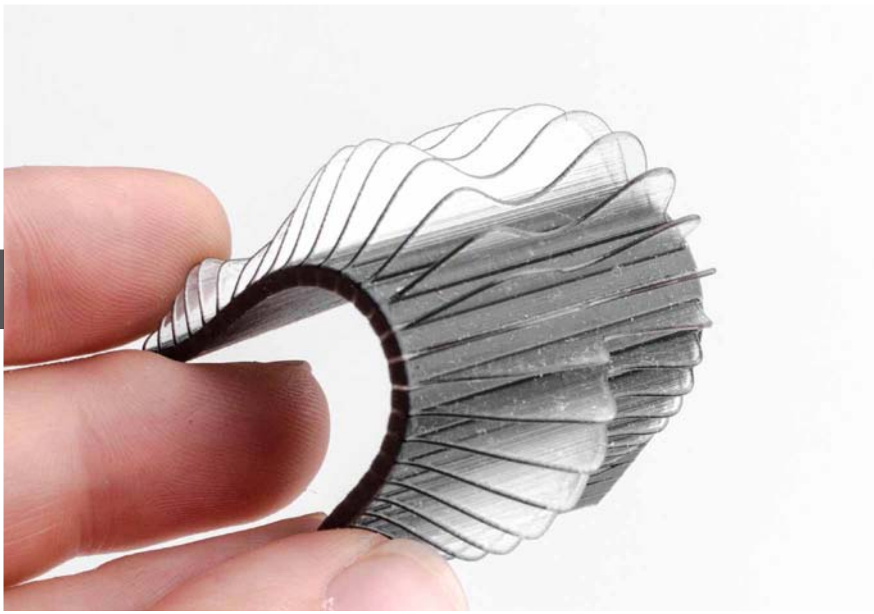
Rhino / Grasshopper modeling

flexible surface with material gradient

printed in matte finish with Agilus clear (soft), Agilus black (soft), Vero clear (rigid) and different mixture ratios of these materials, creating a total of 8 different material properties

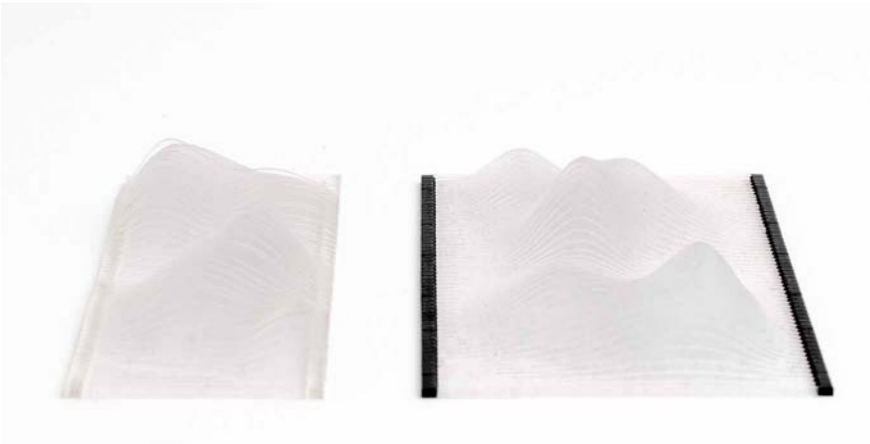


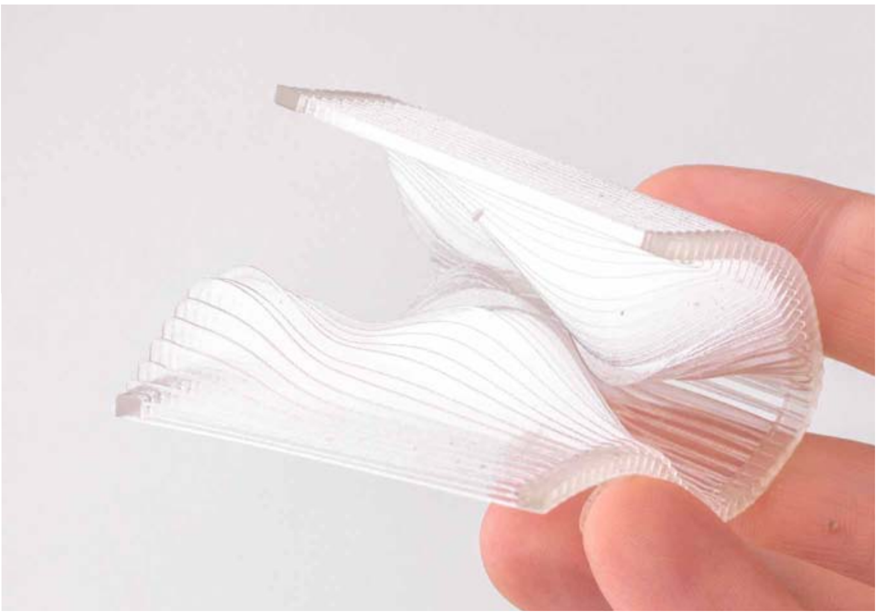




waves 1

models printed with parametrically designed waves (Vero clear) held by soft material for movement (Agilus black),
size: 4 x 7 cm
thickness: 0.5 mm, 1 mm, 2 mm





waves 2

models printed with parametrically designed waves (Vero clear) held only at the edges by soft material (Agilus black and clear), sizes: 5x12 cm, 8x12 cm thickness: 0.5 mm

3-DIMENSIONAL SURFACES

combining soft materials

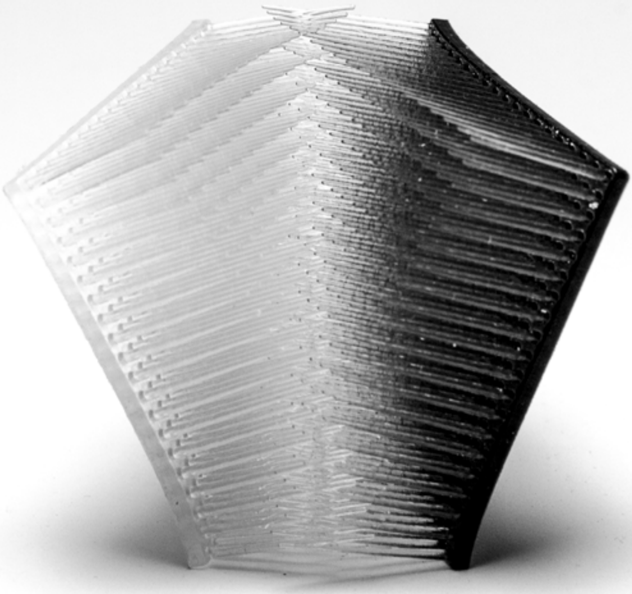
model printed with
2 flexible materials,
size: 5 x 5 cm

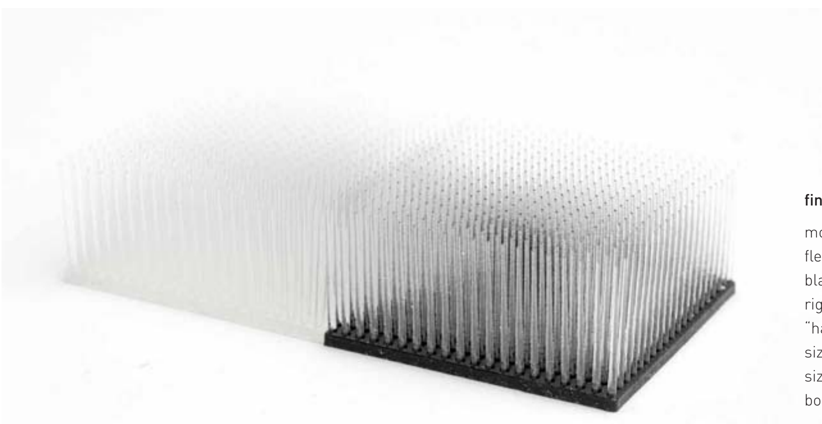
materials
Agilus clear
Agilus black

3-DIMENSIONAL SURFACES

flexibility gradient model showing different levels of expansion

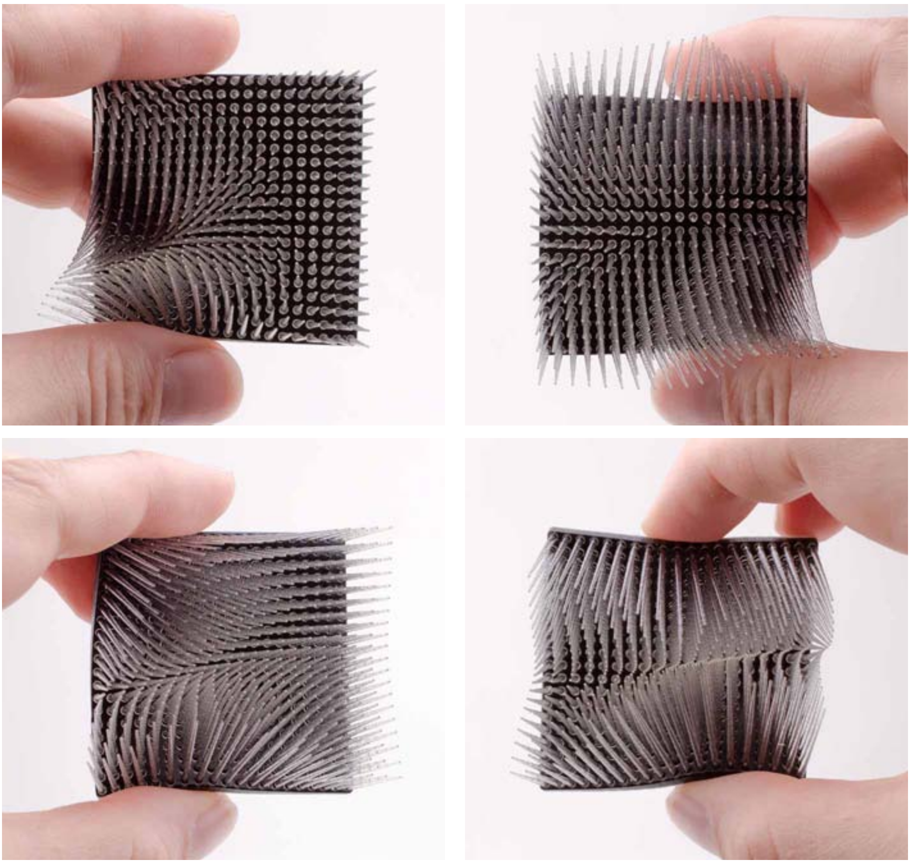
the structure was printed with Agilus clear (soft), Agilus black (soft) and Vero clear (rigid) at different mixture ratios - creating a total of 10 different material qualities. by distributing varying levels of softness the model can expand more or less in different areas,
size: 12 x 20 cm

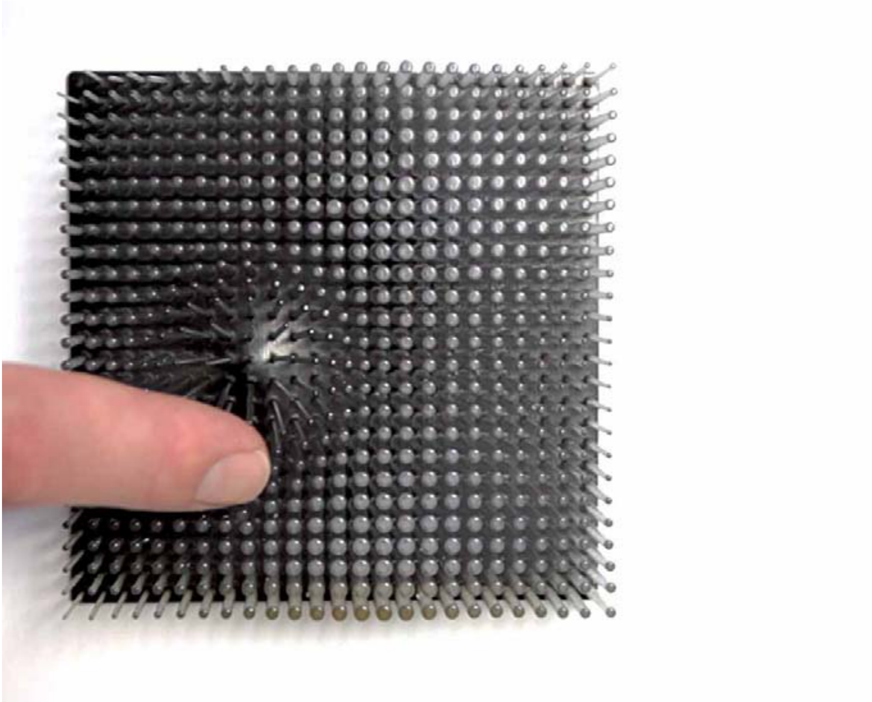


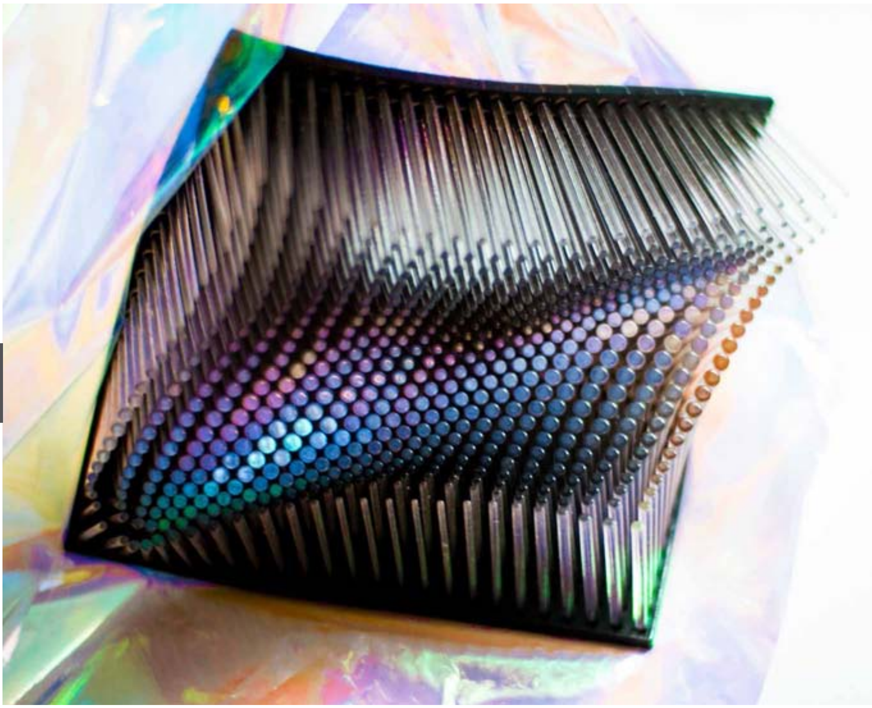


fine details

models printed with flexible base (Agilus black and clear) and rigid transparent "hairs" (Vero clear); size: 5 x 5 cm
size of hairs: 1.5 mm bottom, 0.3 mm top



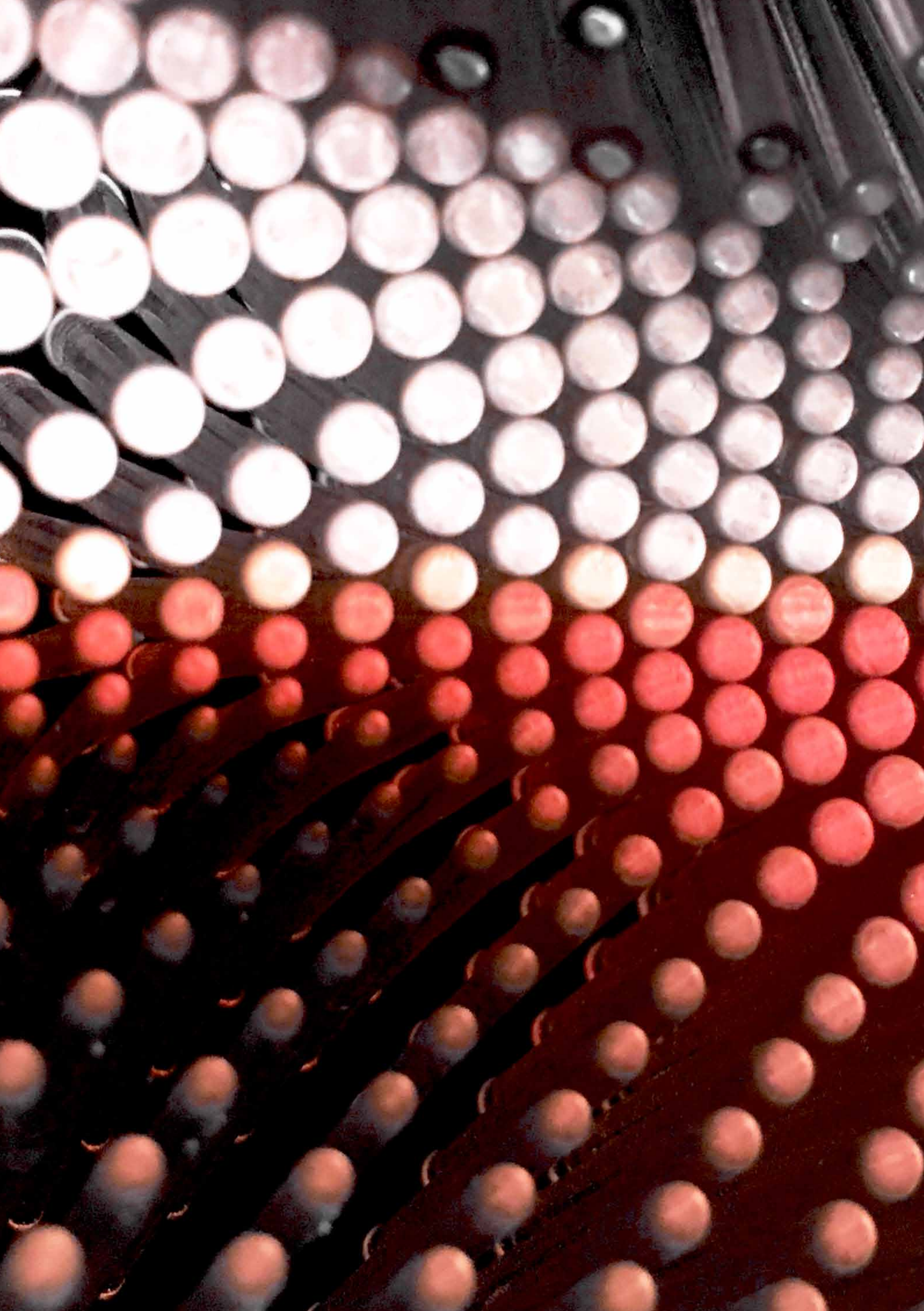


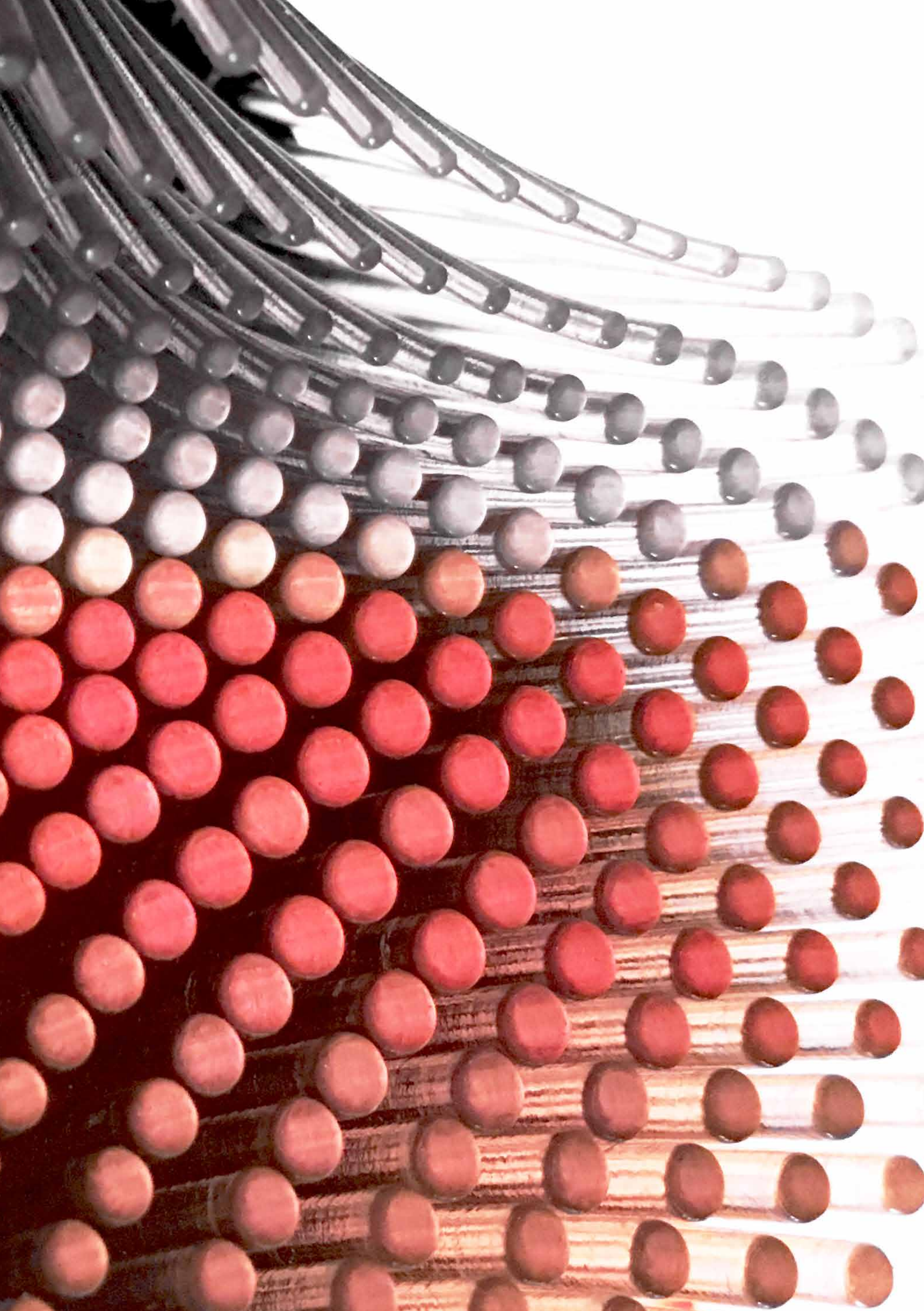


model printed with flexible base (Agilus black) and rigid transparent rods (Vero clear)

top
organic movement due to flexible base

bottom
showing light guiding properties of Vero clear





ACKNOWLEDGEMENTS

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PROF. BARBARA SCHMIDT

AGATA KYCIA

ANDREAS KALLFELZ

SEBASTIAN REICHEL

JÖRG HUGO

BJÖRN BERNT

VERONIKA AUMANN

JULIA WOLF

PAULA VAN BRUMMELEN

IMPRESSUM

KATJA RILEY
MIXED MATTERS

PHOTOS
PROCESS: KATJA RILEY
EXPERIMENTS: KATJA RILEY, PAOLA VIDAL, ALISSA WOLTER
RESULTS: KATJA RILEY

TEXTS
KATJA RILEY, ANDREAS KALLFELZ

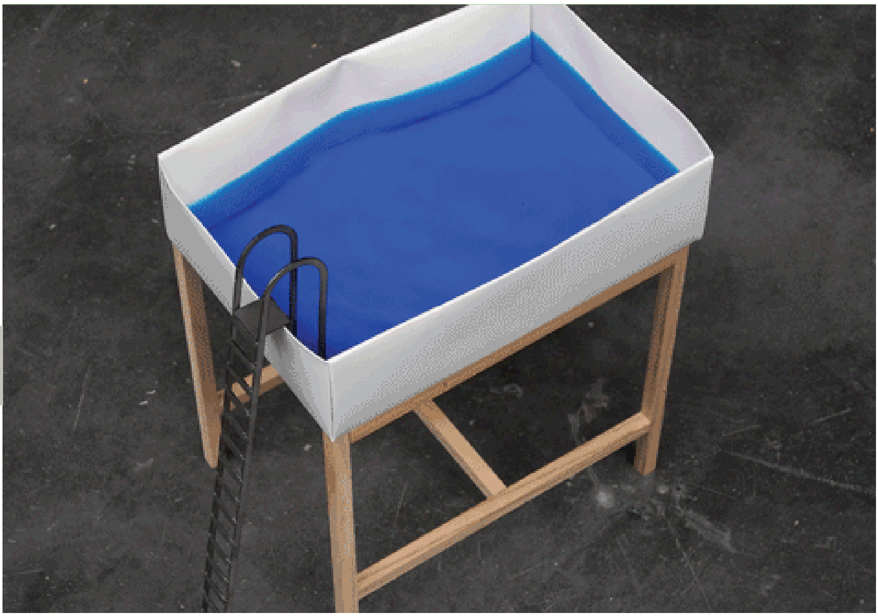
IMMATERIAL

challenging material qualities

ALICE CHAMBERLAINE

Tony Cragg: A Rare Catogary Of Objects, at the Yorkshire Sculpture Park.

Piece shown is sculpted out of aluminuim and spray painted white to appear like plastic.



Materials:

Top left:
Concrete Canvas

Source:

http://inhabitat.com/concrete-cloth-flexible-material-makes-durable-disaster-shelters/

Bottom left:
Stone Paper

Source:
http://www.burg-halle.de/make/tag/stone-paper/
Bottom Right: Flexible wood, Dakta.

Source:
http://dukta.com/en/

The project concept was largely influenced by a visit to Burg Giebigstein and their materials library. A selection of materials; concrete canvas, stone paper and flexible wood, all provided great interest, as all three mediums either defy their traditional and conventional properties or add to them. Concrete can now be easily moulded and sculpted into an array of different forms. Stone paper provides added strength and is water resistant. Additionally, flexible wood clearly allows for movement and flexibility, much unlike their traditional forms and selves.

IMMATERIAL

Synonyms: irrelevant, unimportant, inconsequential, insignificant, of no matter/moment, of little account, beside the point, not to the point, neither here nor there, inapposite, not pertinent, not germane, superficial.

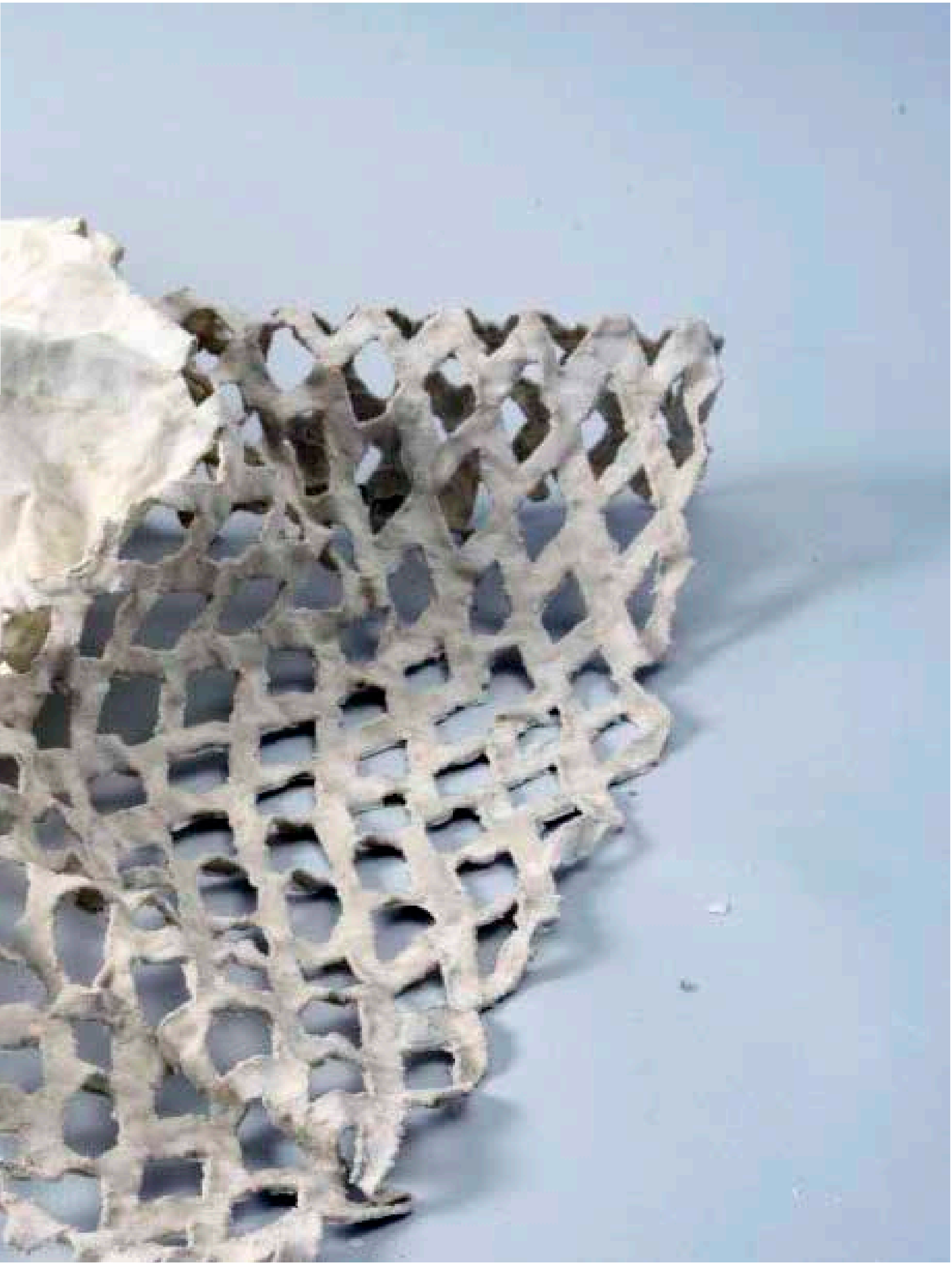
Our understanding of materials is largely dependent on aesthetic perception. We learn from experience the properties of a material through visual clues as to whether it might be for example, hard, soft, rough, smooth, lightweight or heavy.

This project involved the manipulation of materials to explore and challenge their aesthetic, tactility, structure and shape. Through an investigation of contrasts I combine materials with opposing qualities altering traditional perceptions of material characteristics. The experiments push for new possibilities for existing materials in terms of a new aesthetic or/and structure.

The project takes on familiar, everyday materials such as foam, wire, concrete, in an attempt to alter and challenge their traditional characteristics and qualities. For example making a rigid material flexible and appear soft, extending or limiting the inherent properties of the material. Adopting techniques that are visually blatant in the way they have been manipulated that might present a new context for their application.

Contrast in a broad sense is central to the concept. Firstly in terms of the material and mediums that were combined together, marrying two opposing states such as solid and liquid or soft and hard. For instance, a metal wire structure that is unyielding and sharp with liquid latex that provides a soft, elastic surface Materials that are traditionally not contextually associated together, e.g. foam and concrete. Thus it was aimed to create ideas and objects that in a sense both contrast and contradict their original form and use. Fundamentally changing the context of the material now that it is equipped with contradictory properties. Fabric that once would have been used as a furnishing or wearable textile could now pose as a structural facade with its new rigid form.

Experimentation and manipulation of these materials here also meant a conscious subversion of their physical and perceptible properties. Still, in some cases, in spite of limited traditional use and practicality the results provide a possibility for alternative applications.

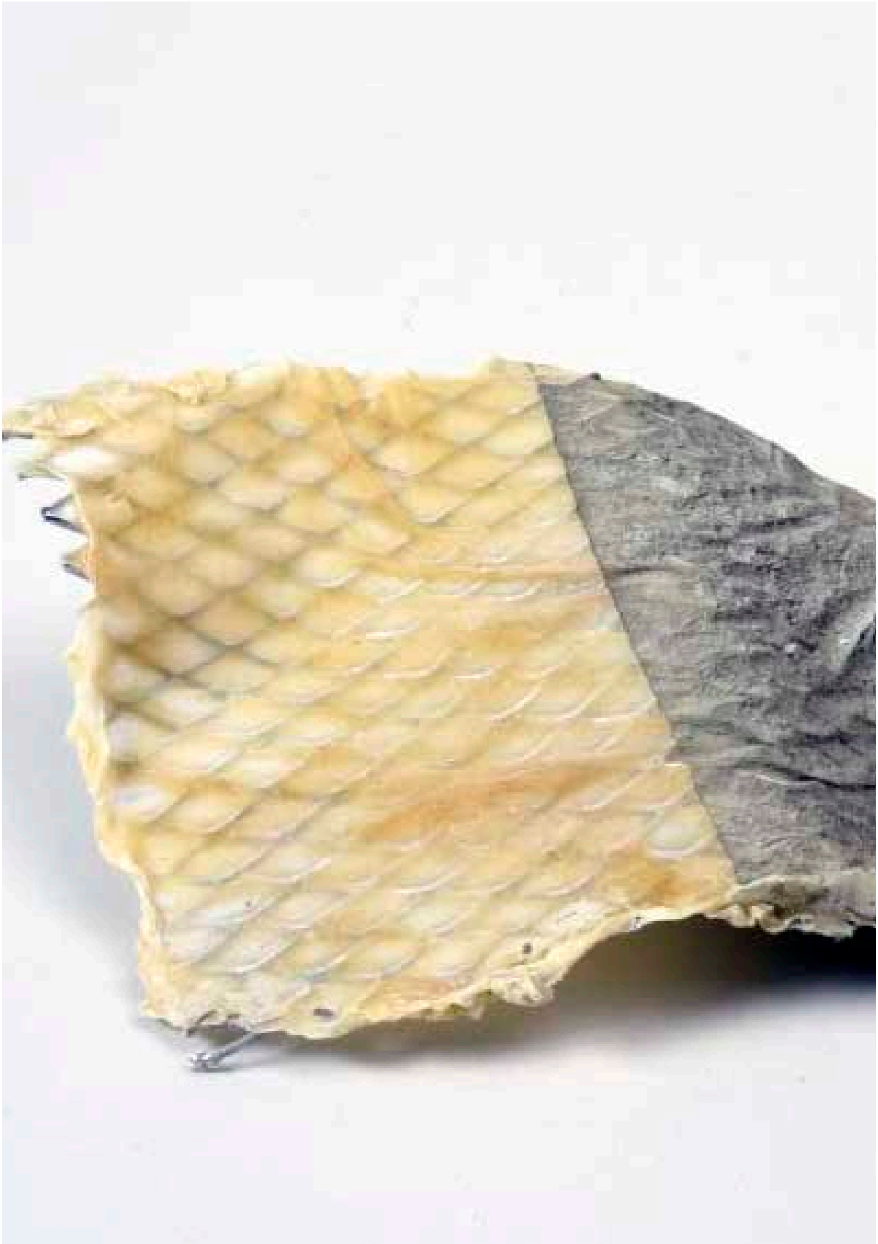


The project began with the exploration of materials and mediums and methods to combine them. Experimenting with very basic, every day known materials such as wire, foam, clay and fabric. The initial experimentation began with manipulating the surface of materials, in terms of their tactility and appearance, using mediums such as liquid latex, concrete and plaster.

Contrasts became a focal point of the project, combining mediums that have opposing states such as liquid and solid or soft and hard and materials that are not usually contextually associated together. Also contrasts in terms of the material outcome, creating new properties that maybe contradict or contrast their traditional ones and in some cases making the original properties redundant.

Wire mesh combined with liquid latex and shaped.

Previous page: Cotton cut with scalpel then dipped in plaster and shaped.

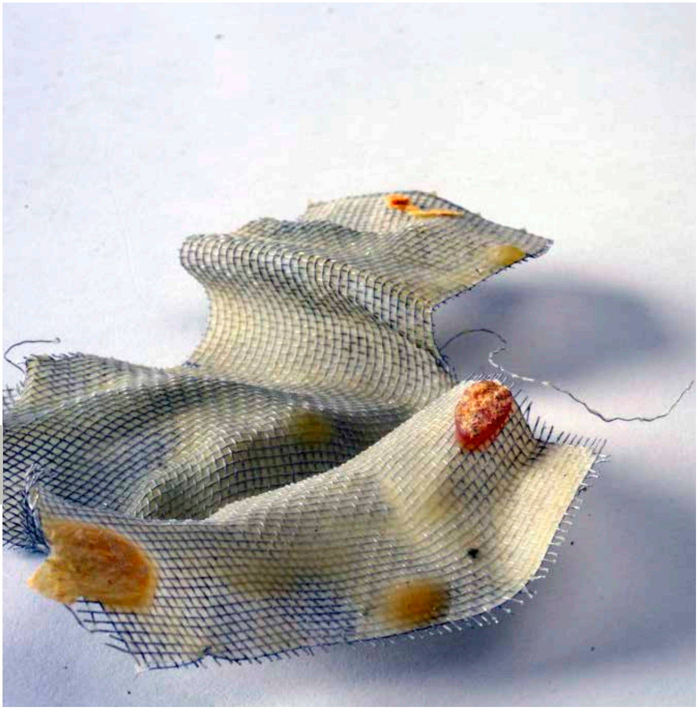


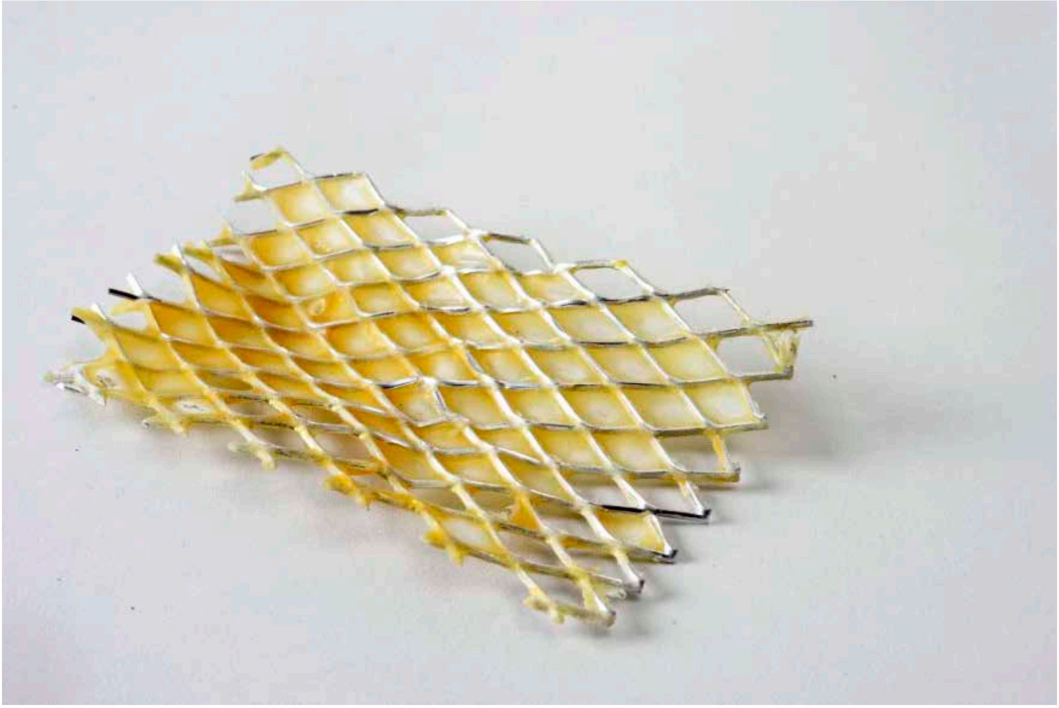
Large wire fencing
combined with liquid
latex and later dip-
ped into concrete.

Materials

Materials used in experiementation period:

Wire mess/ fencing
Liquid latex
Fimo clay
Concrete
Plaster
Felt 2 mm
Foam 15 mm



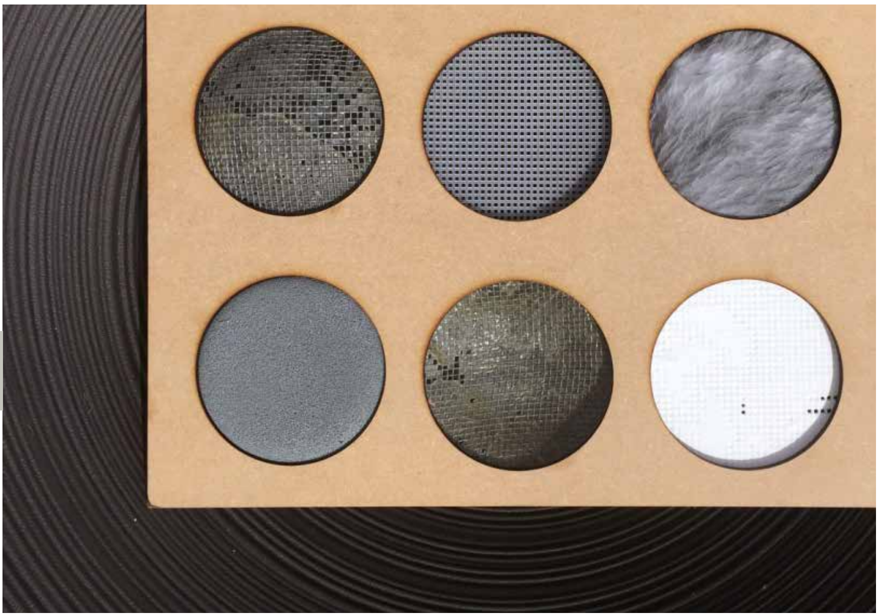


EXPERIMENTATION

Materials

Materials used in experiementation period:

Wire mess/ fencing
Liquid latex
Fimo clay
Concrete
Plaster
Felt 2 mm
Foam 15 mm



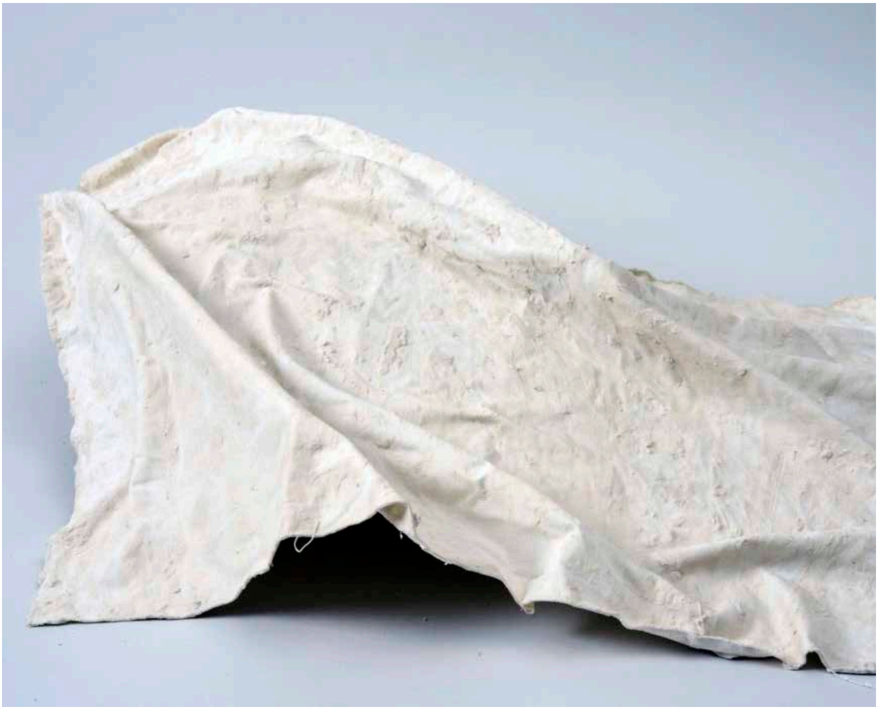
Materials:

MDF 5 mm
Wire mesh
Latex
Foam
Spray paint
Plaster
Faux fur

Further experimentation led to an idea of exploring hidden experiences, manipulating material properties without altering their appearance or aesthetic. In the hope that our initial presumptions and expectations of a material would be contradicted by the actual physical reality of it. For instance making a material that was once flexible, firm and unyielding, providing an unexpected experience. However, after some tests and experiments the project steered its way back to more blatant and literal ways of exploring manipulation and contrasts.

Textiles;

cotton and foam combined with plaster.



The processes used and explored during the project were largely material and medium based. Using mediums such as concrete, plaster and liquid latex and then dipping, painting and coating materials with these mediums.

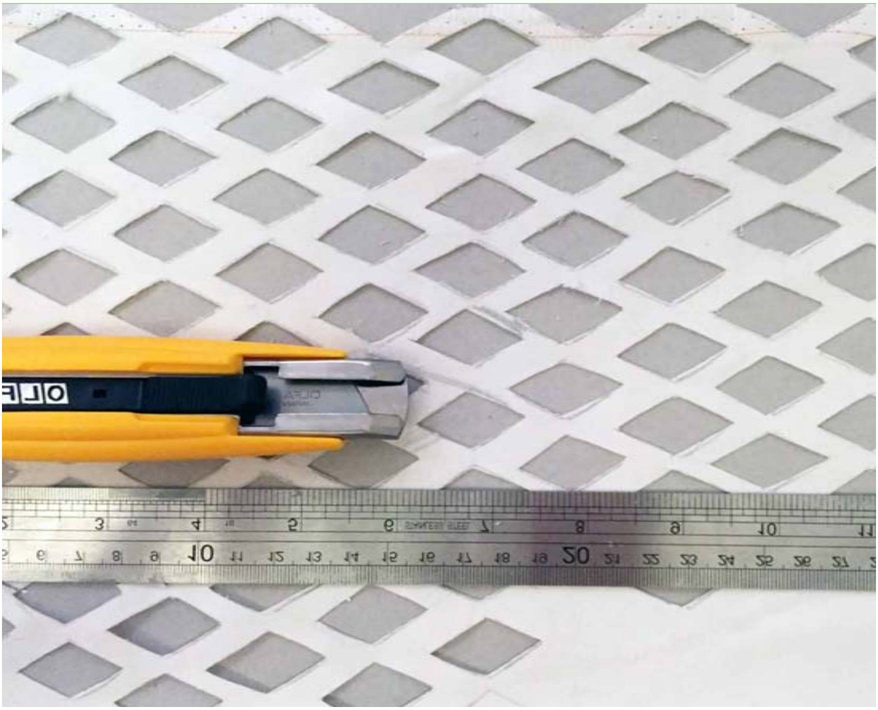
Therefore, the project relied mostly upon material and medium experiments, exploring how they combined and reacted together. Later experiments and outcome samples exploited the use of the laser cutter, enabling more purposeful design qualities and elements.

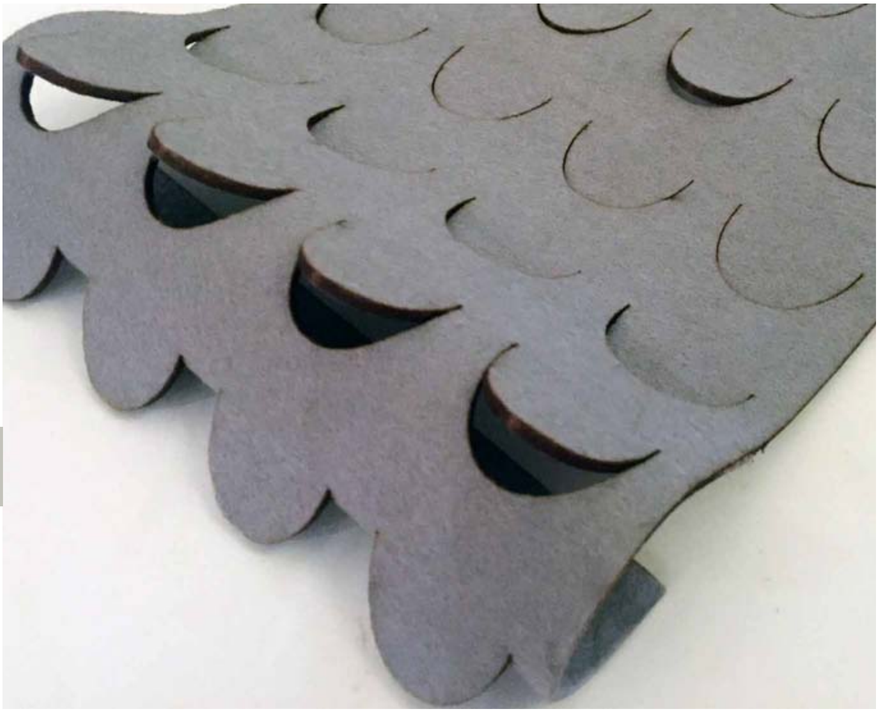
Laser Test:

2 mm felt laser cut and then partly dipped into plaster.

Material and medium Experiments:

5 mm Foam and 1 mm latex sheet dipped into concrete.





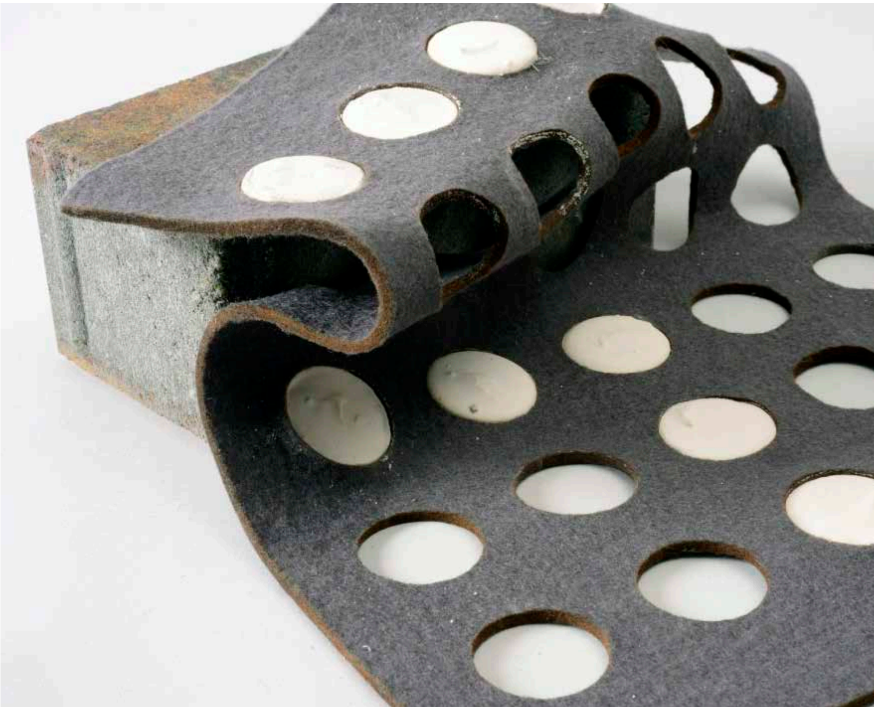
Processes:

Top:
Cotton cut with scalpel.

Bottom:
2 mm felt laser cut

Fabric coated in plaster

OUTCOME

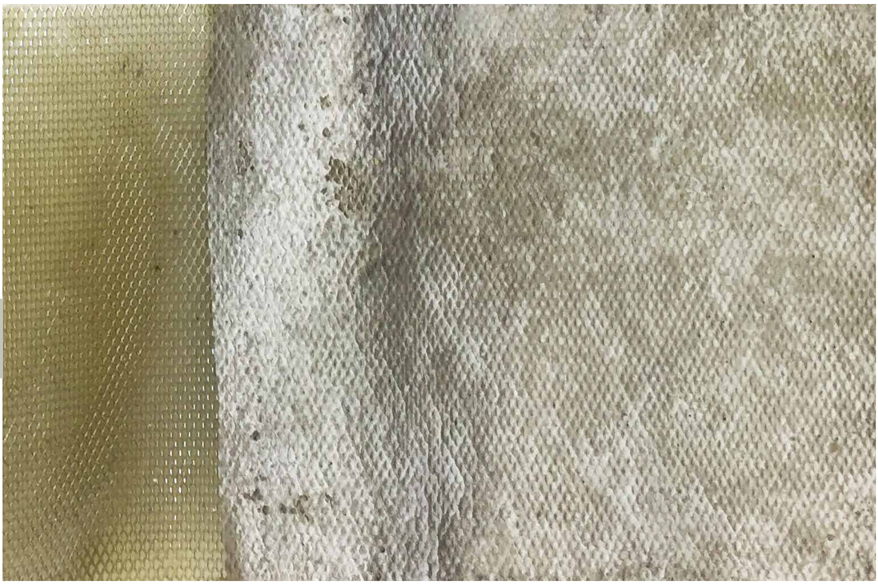


Top:
2 mm felt laser cut with selected areas filled with plaster.

Bottom:
Interior laser cut felt circles set in plaster block.

Felt strips coated in plaster and woven together.

The outcome entails a collection of material samples which all inevitably focus of the concept of contrast and incorporate contradictory elements and properties. Some samples provide interactive qualities, due to their new tactility or limitations in terms of their original properties. For instance, the combination of wire and latex is something that must be felt and experienced as the latex provides a new tactile quality to the wire. In spite of these limitations, new properties and qualities have been formed, therefore providing the possibility for alternative applications. The concepts present opportunities to rethink our perception of materials in how we interact with them and how they might be repurposed. Expanding or restricting their physical, aesthetic and tactile properties presents a new palette for designers and architects to explore through scale, structure, and contextual application

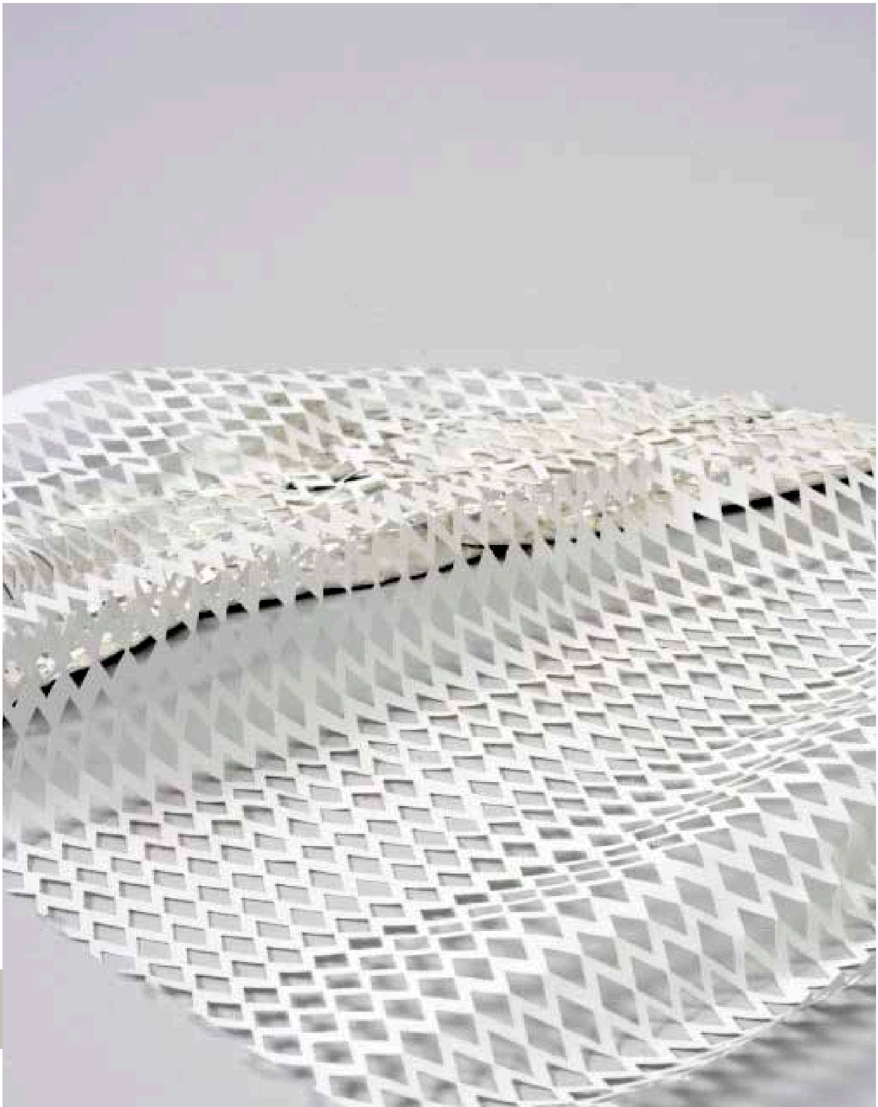


Wire mesh coated in liquid latex, then dipped in concrete.

Sensorik

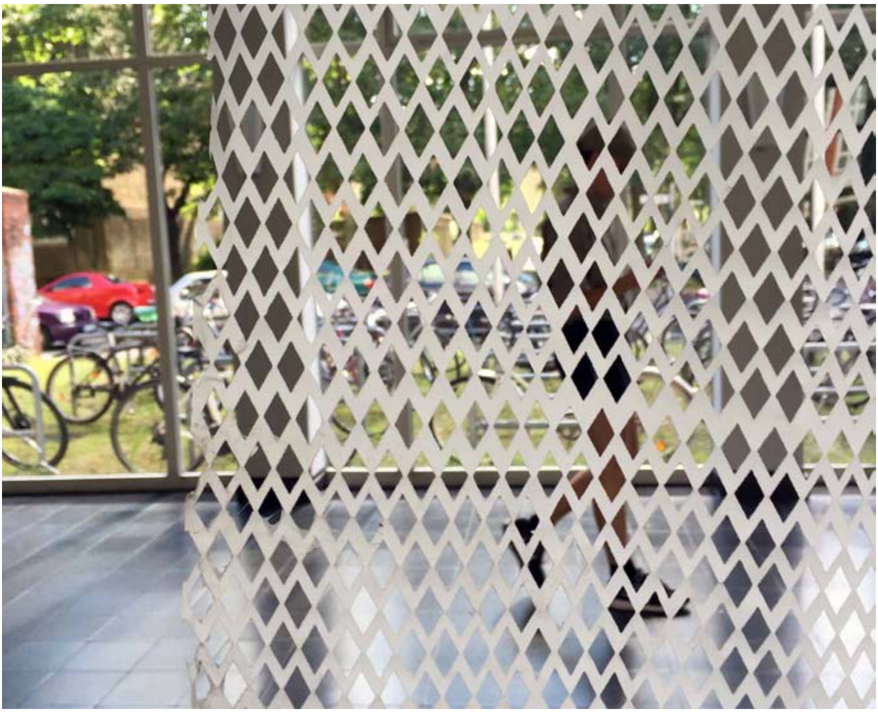
Top:
5 mm foam dipped mostly in concrete, then partially dipped in plaster

Bottom:
Close up of sample



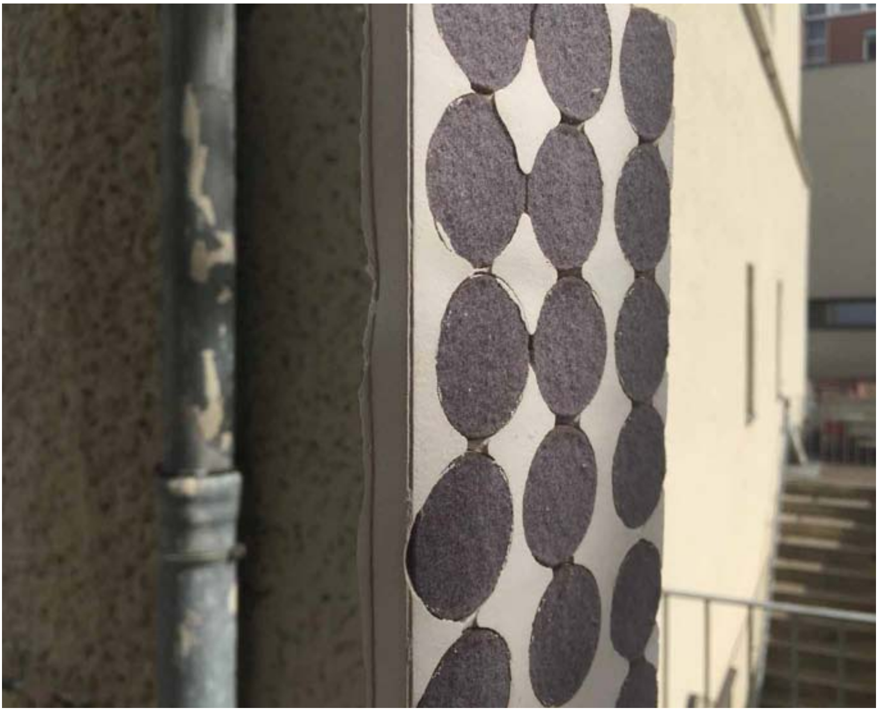
Stone paper, 2 mm, laser cut in a wire inspired formation with fimo clay pushed through in selected areas.

OUTCOME



A possible application for this sample. Working in an interior setting as a room divider.

Stitched metal fencing
Possible context as a room divider or decoration.



Top:
Woven felt and plaster acting as a temporary wall or divider.

Bottom:
Felt circles in plaster block, concept for wall decoration or facade.

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JULIA WOLF

IMPRESSUM

ALICE CHAMBERLAIN
IMMATERIAL

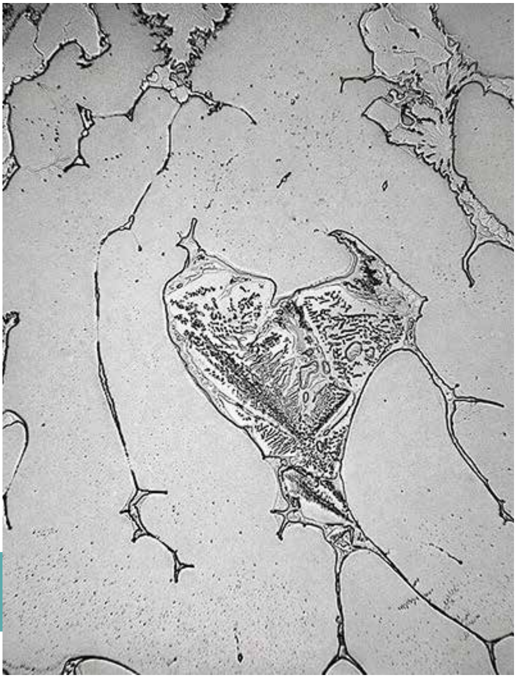
PHOTOS
PROZESS: ALICE CHAMBERLAIN
EXPERIMENTE: ALICE CHAMBERLAIN
ERGEBNIS: ALICE CHAMBERLAIN

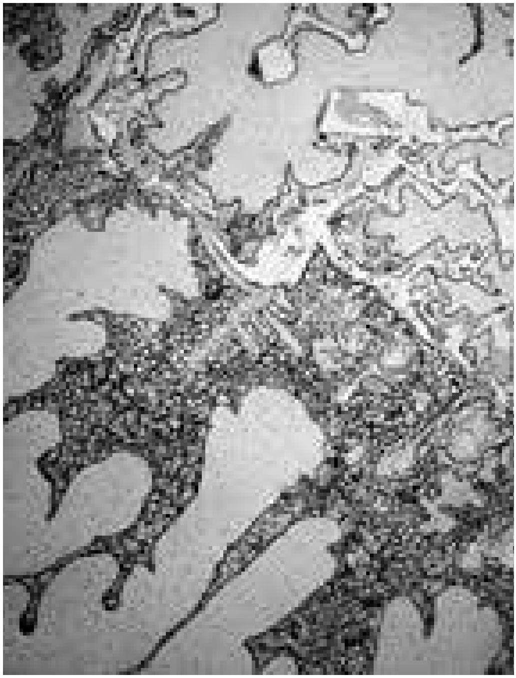
TEXTS
ALICE CHAMBERLAIN & ANDREAS KALLFELZ

L'ÉMOI

Stoff Emotion

CONSTANCE VIDALAIN





L'ÉMOI

Das Projekt 'L'émoi' befasst sich mit der Verknüpfung tradioneller Techniken wie der Stickerei mit moderneren Techniken wie der Thermochromie. Die Rolle und der Platz des Körpers werden ebenfalls behandelt und thematisiert sowie die Präsenz und Abwesenheit von Emotionen und Empfindungen.

Stickerei und Thermochromie interagieren beide mit dem Körper und den Sinnen des Protagonisten. Durch die Thermochromie verändert sich in Abhängigkeit von Körpertemperatur und Umgebung die Farbe auf dem Stoff. Die Stickerei wird dadurch bei Temperaturschwankungen für das menschliche Auge maskiert oder aufgedeckt. Die Emotionen können so je nachdem vor der Außenwelt verborgen werden.

Ziel ist es, eine intime Beziehung bzw. Interaktion zwischen dem Stoff und dem Betrachter zu etablieren und zu kreieren. Der Betrachter hat

durch seine Handlung (z.B. Berührung oder Atem) einen direkten Einfluss auf den Stoff und seine Färbung.
Dieser Vorgang ist eine Art Dialog zwischen Protagonist und Stoff.

Die Muster basieren auf der Arbeit «Topography of Tears» von Rose-Lynn Fisher. Durch ein Mikroskop hat sie mehr als 100 verschiedene Tränen fotografiert. Alle Tränen unterscheiden sich von den anderen je nach Emotionszustand.

Auf den Stoff übertragen, visualisieren sie Emotionen und Empfindungen, die im ersten Augenblick nicht erkennbar sind. Das Material fungiert als Grundlage der verschiedenen Emotionen, die durch die Muster zur Geltung kommen und eine Reaktion bei den Betrachtern auslösen.

Jede Emotion hat auch ihre eigene Temperatur, z.B. kühlt der Körper ab, wenn man traurig ist. Die Temperaturschwankungen des Körpers sind in diesem Stoff direkt integriert.

Als Thermochromie bezeichnet man die Eigenschaft bestimmter Substanzen, bei Erwärmung die Farbe zu ändern. Dieser Vorgang ist reversibel, d.h. nach dem Abkühlen nehmen sie wieder ihre ursprüngliche Farbe an. Grund für diese Farbveränderungen sind Änderungen in der Kristallstruktur. Bekannt ist dieses Verhalten unter anderem bei den anorganischen Verbindungen Rutil und Zinkoxid, die ihre Farbe bei starkem Erhitzen von weiss nach gelb ändern.




top left:

Air

A form of wind reactive ink that changes colour upon contact with the air around us. Intended to reveal the otherwise unseen turbulence surrounding the human as it goes about its environment.

Quelle: http://seetheunseen.co.uk/collection-archive/air/

bottom left:

Kooroshnia's flu masks are printed with thermochromic ink that responds to the body temperature of their wearer.

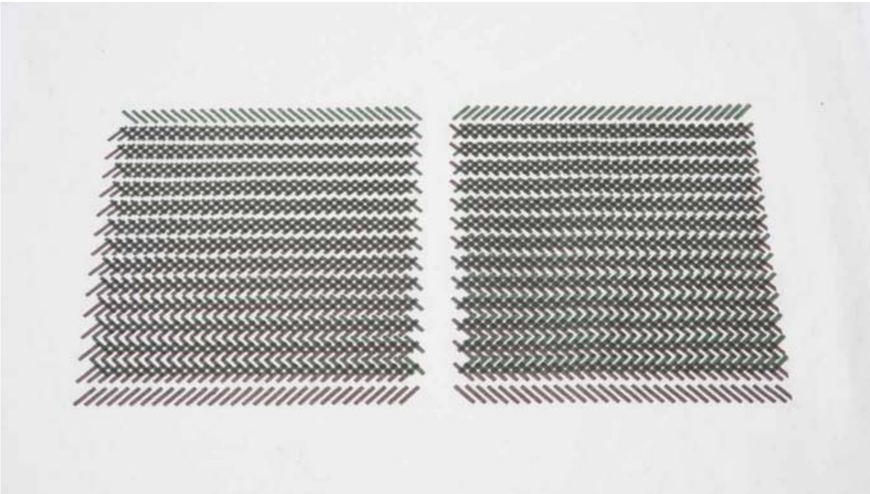
top right:

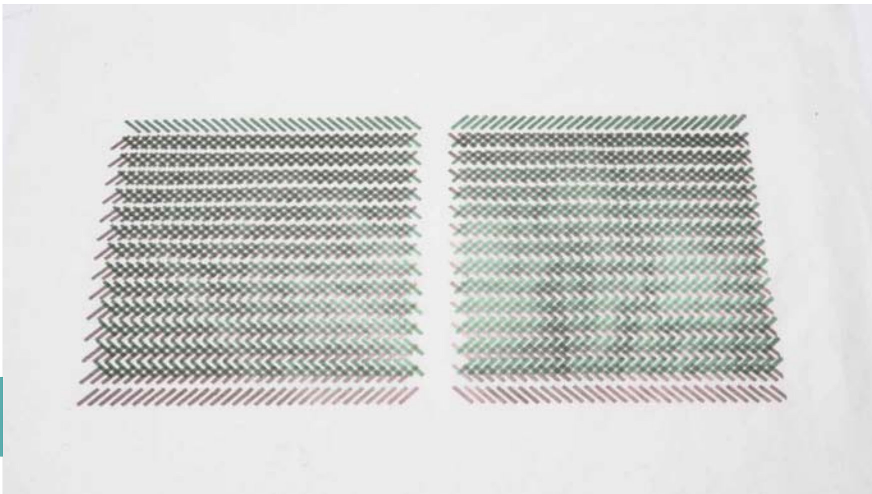
This table made by Jay Watson Design is one on which you're guaranteed to leave fingerprints. Made of solid oak painted with thermochromic paint, its surface temporarily changes color when heat is applied.

bottom right:
LIE - Bed Sheets, J.MAYER.H

Temperature Sensitive Data-Protection Pattern Print on Cotton

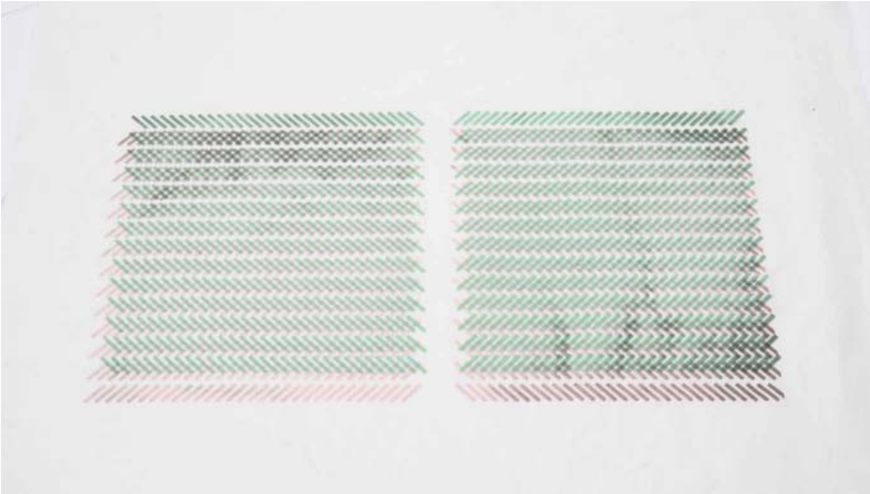
In meiner Experimentierreihe habe ich die Aspekte von Thermochromie durch unterschiedliche Materialien und Formen der Siebdrucktechnik und der Färbung untersucht, um somit ihre Anwendungspotenziale zu definieren. Die Verbindungen zwischen Farbänderung und Temperatur wurden ebenfalls berücksichtigt und erforscht.

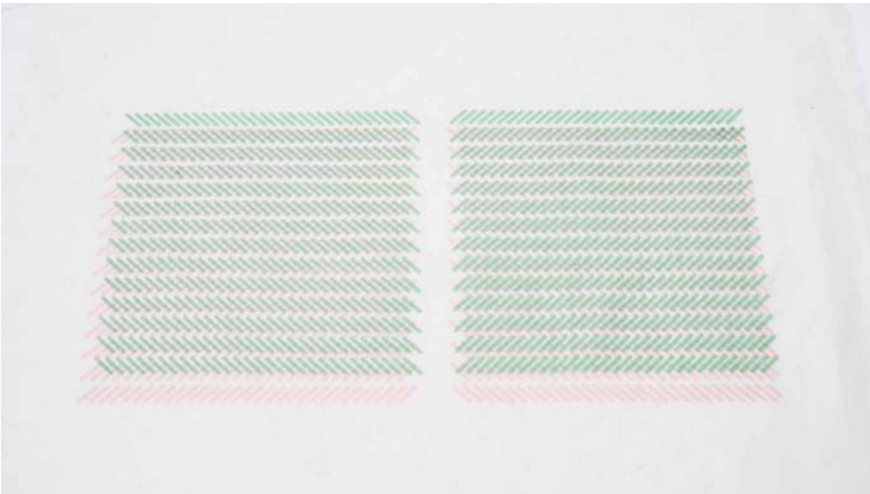




Erprobung

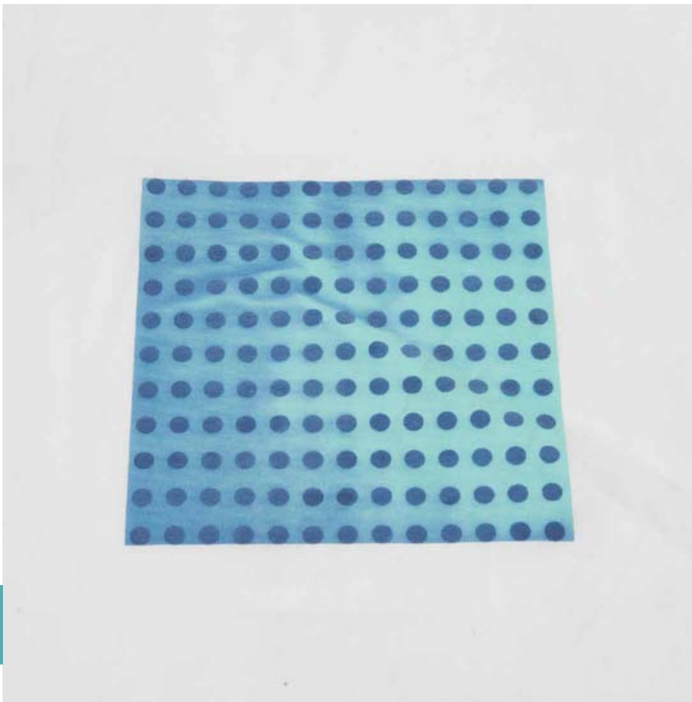
zwei verschiedene thermochrome Muster, die sich bei unterschiedlichen Temperaturen veändern

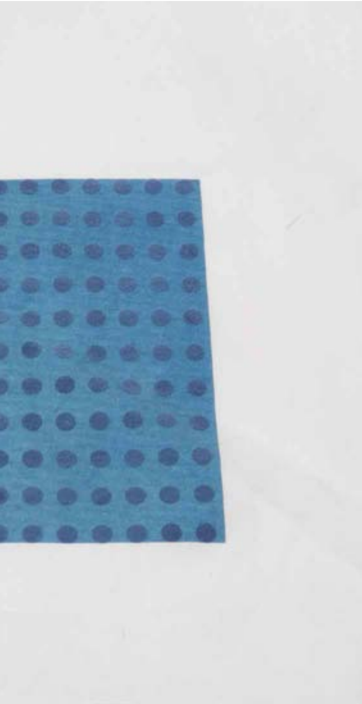
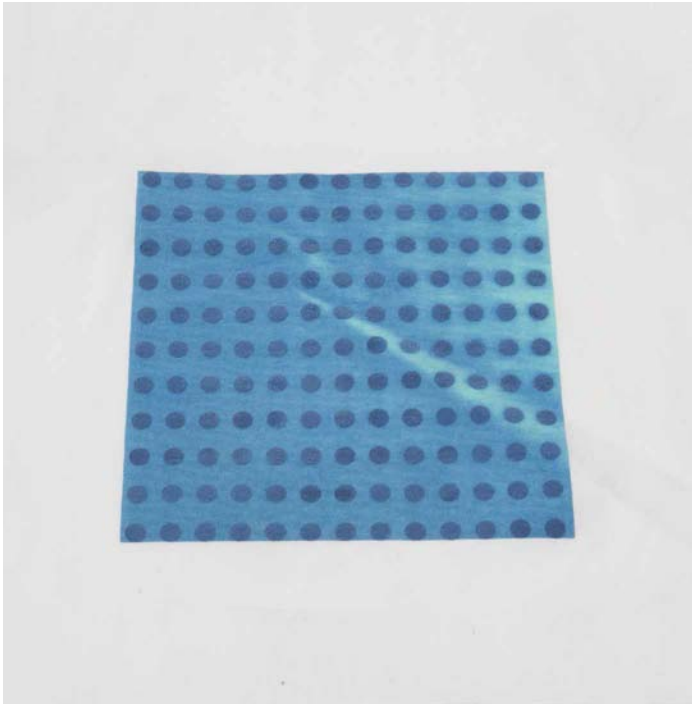


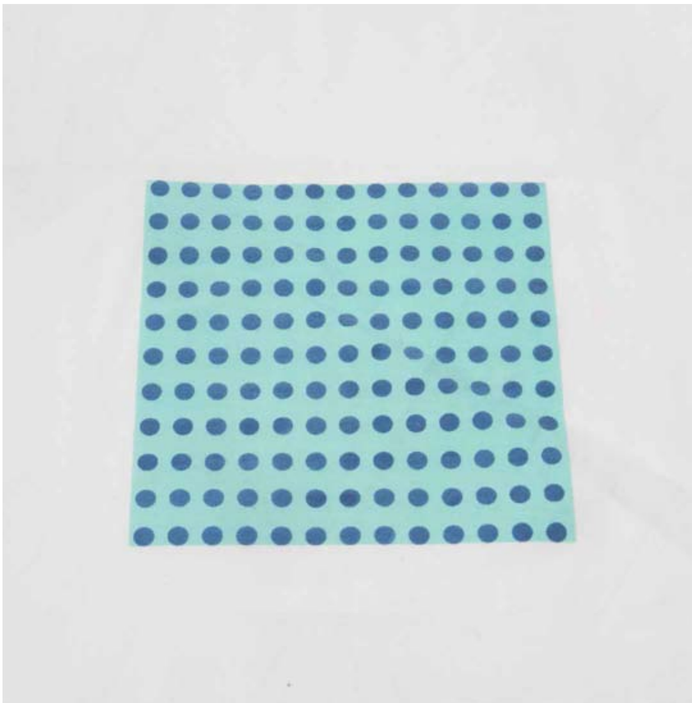


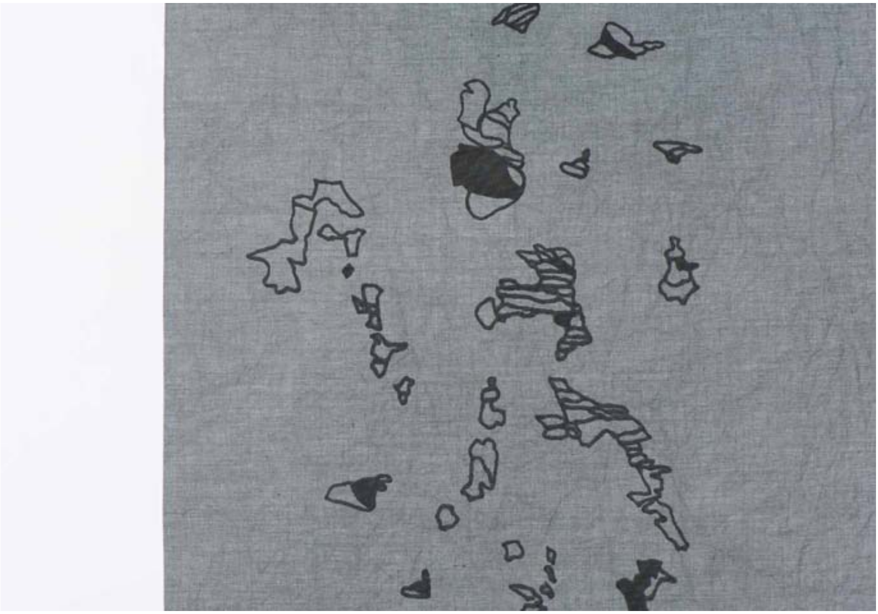
Erprobung

zwei verschiedene thermochrome Muster mit Flock- und Farbdruck, die sich bei unterschiedlichen Temperaturen veändern



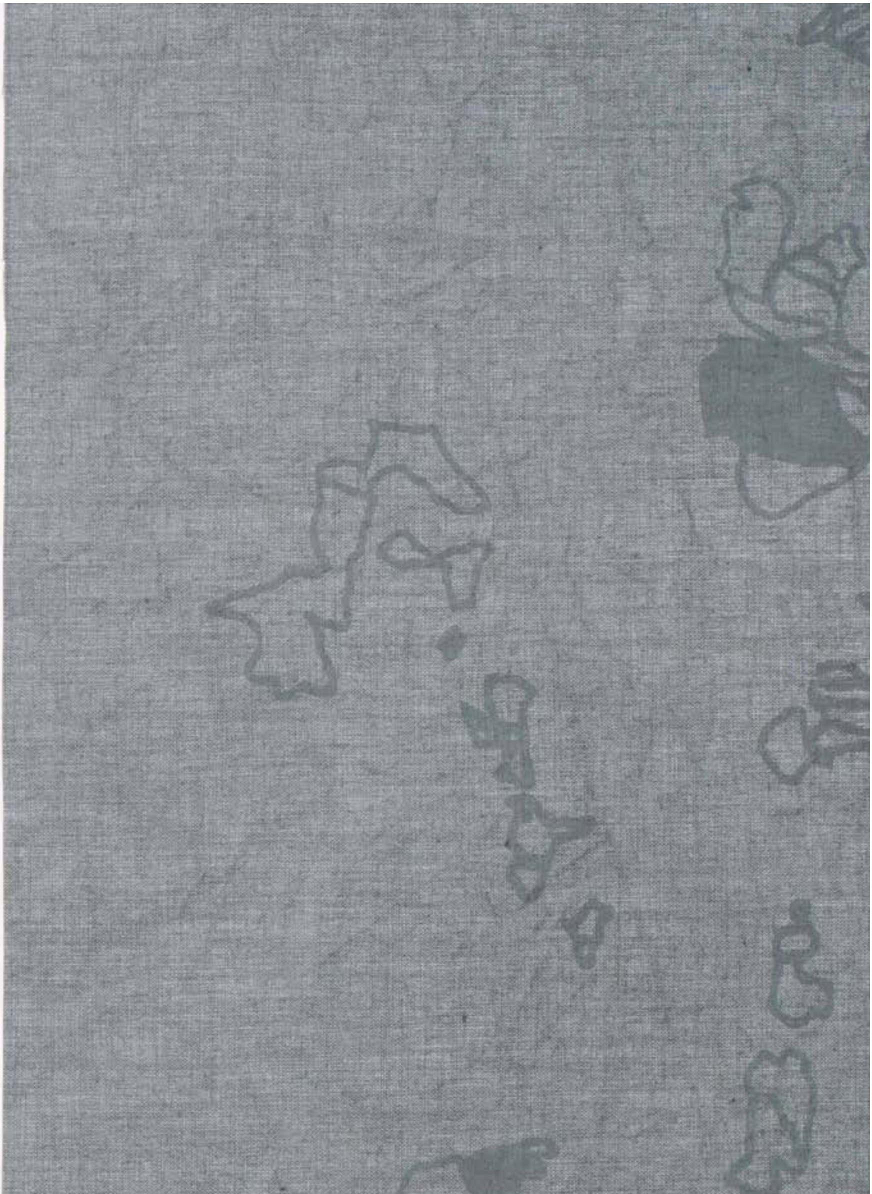




Erprobung

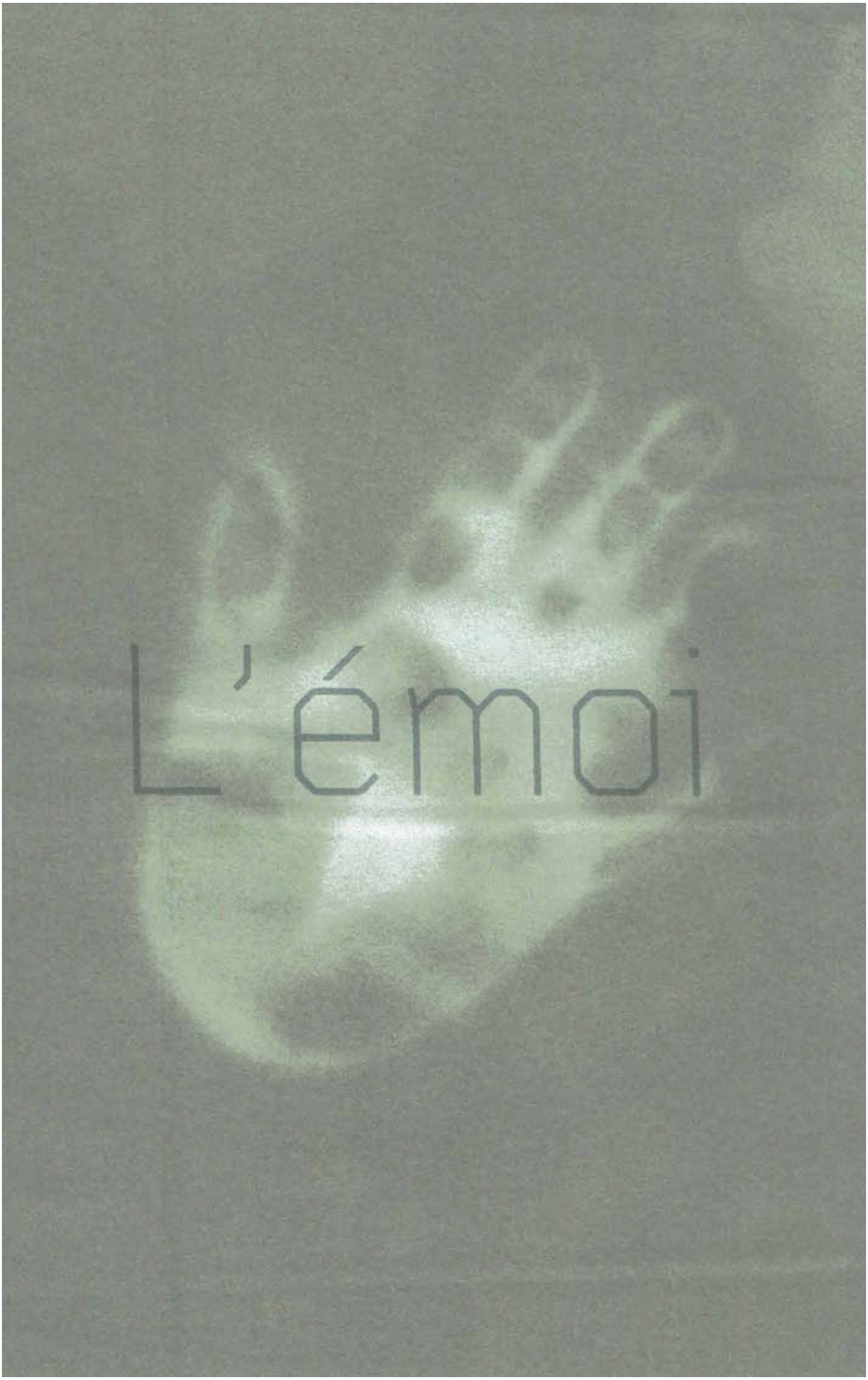
Thermo-

chromiemuster
in Siebdruck bei
unterschiedlicher
Temperatur



Stickerei mit gefärbten thermochromen Fäden auf Baumwolle

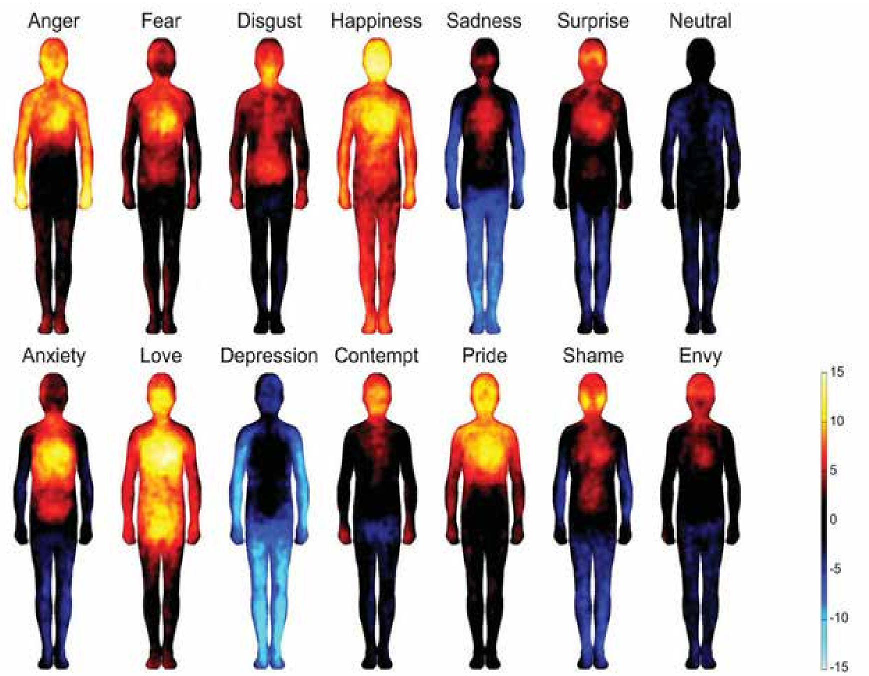
Stickerei mit gefärbten thermo-chromie Fäden auf Baumwolle



Thermochromie
auf Papier

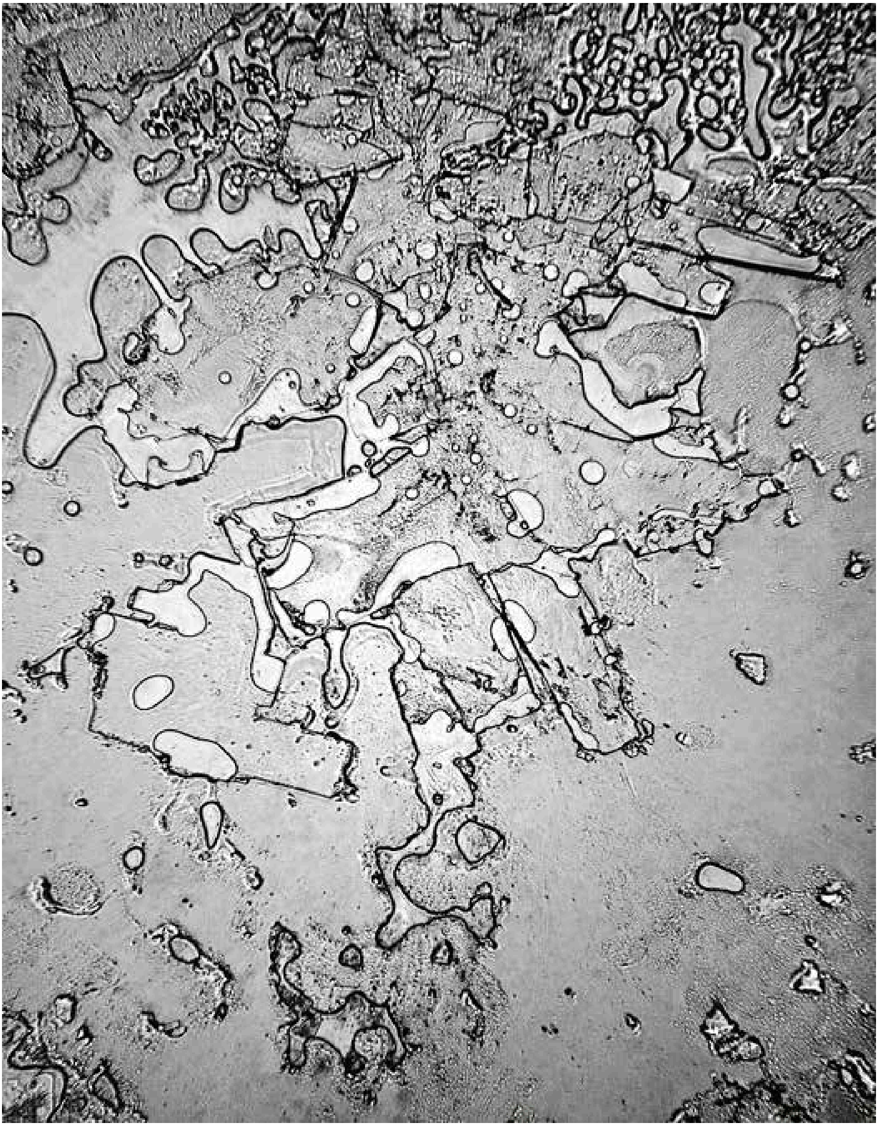
Die Muster sind von der Arbeit «Topography of Tears» von Rose-Lynn Fisher inspiriert. In ihrer Arbeit hat sie durch ein Mikroskop mehr als 100 verschiedene Tränen fotografiert. Alle Tränen unterscheiden sich von den anderen je nach Emotionszustand.

Jede Emotion hat auch ihre eigene Temperatur, z.B. wenn man traurig ist oder niedergeschlagen, kühlt der Körper ab. Die Temperaturschwankungen des Köpers sind in diesem Projekt direkt integriert.



Temperaturschwankungen des Köpers

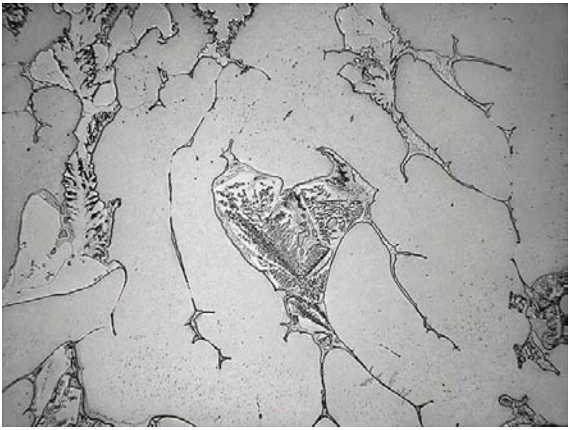
Quelle: https://www.sciencesetavenir.fr/sante/les-zones-du-corps-humains-qui-reagissent-aux-emotions_26881



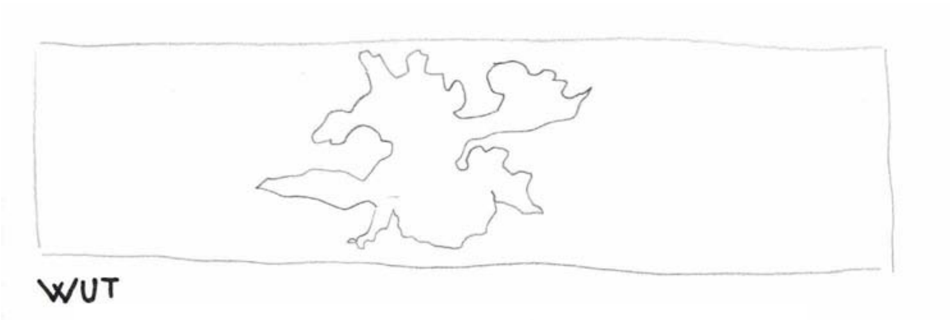
“Topography of Tears”, Rose-Lynn Fisher

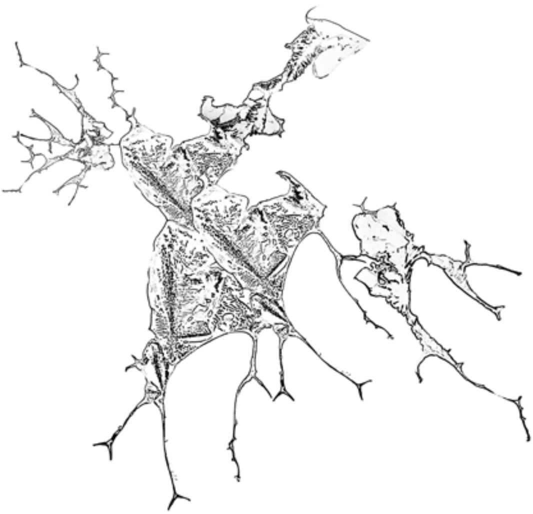
Quelle: http://rose-lynnfisher.com/tears.html

ANGER



PROZESS



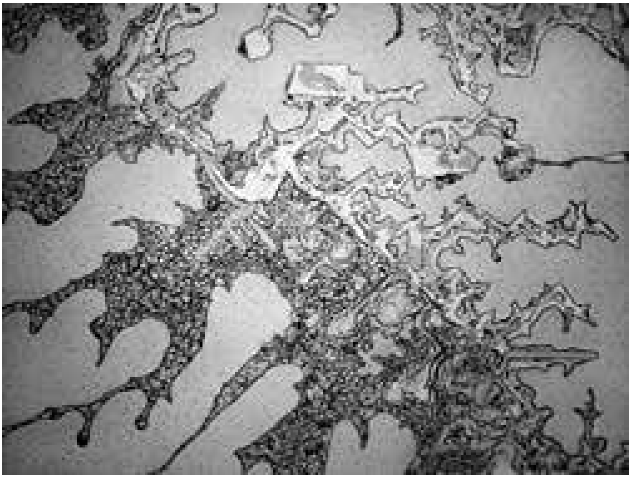


Prozess 1

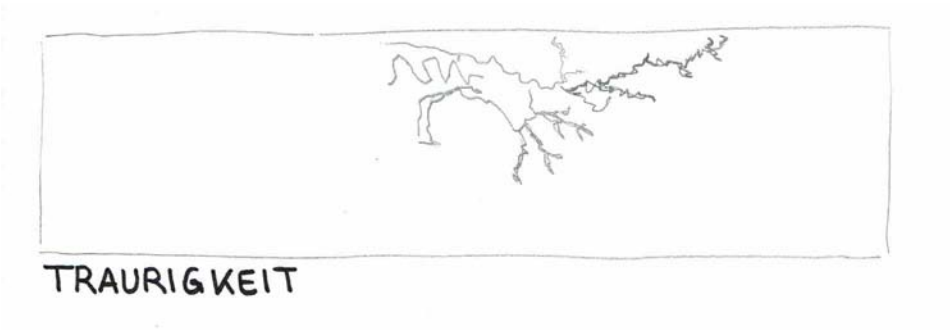
Ich habe hier Wut-tränen bearbeitet. Das Muster ist in der Mitte des Stoffs plaziert.

Siebdruck und
Stickerei auf
Nesselstoff

SADNESS



PROZESS

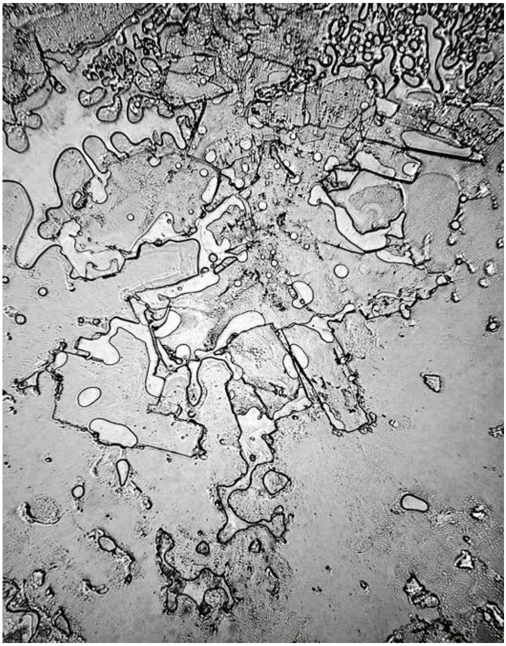


Prozess 2

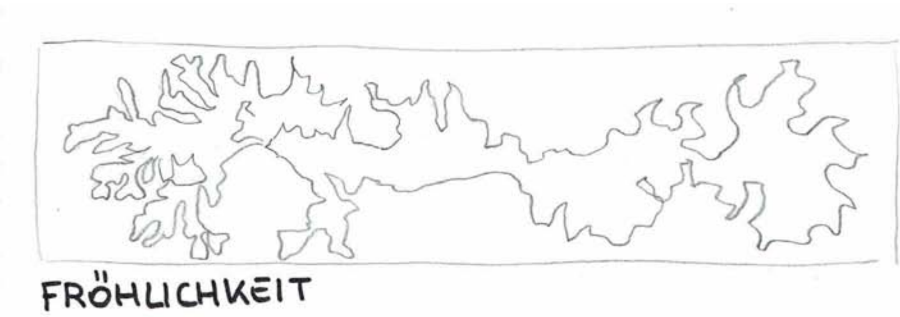
Ich habe hier Traurigkeitstränen bearbeitet. Das Muster ist in der Mitte des Stoffs plaziert.

Siebdruck und
Stickerei auf
Nesselstoff

HAPPINESS



PROZESS



Prozess 3

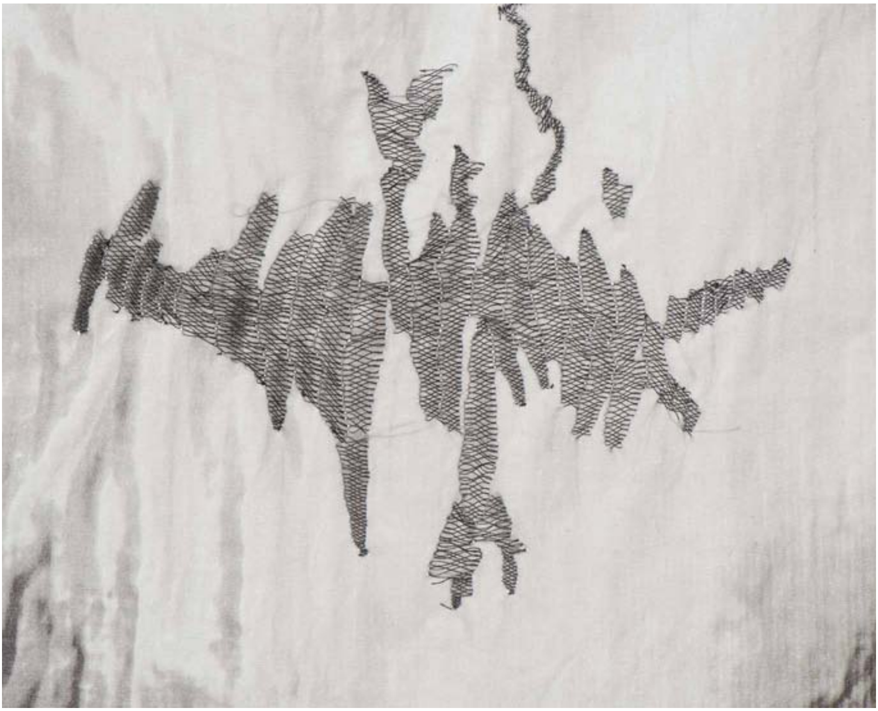
Ich habe hier Fröhlichkeitstränen bearbeitet. Das Muster dehnt sich über die gesamte Länge des Stoffes aus.

Siebdruck und
Stickerei auf
Nesselstoff

Duras sagte über Tränen «Tränen sind Kummer die den Körper durchdringen»

Das gestickte Muster ist im Stoff zunächst unsichtbar und in der thermochromen Farbe versteckt. Erst mit der Körperwärme kommt es zum Vorschein.

ERGEBNIS



ein schwarzer,
thermochromer
Siebdruck, der
über den ganzen
Stoff geht, mit
Stickmuster

ALLÉGRESSE

Das Gefühl der Freude gewinnt und durchströmt den ganzen Körper.

Wärme verbreitet sich, und die Freude wird sichtbar.

Das Muster bedeckt den ganzen Stoff. Die Farbe des Musters ist offen

sichbar und verschwindet durch die Köperhitze.

Thermochromie

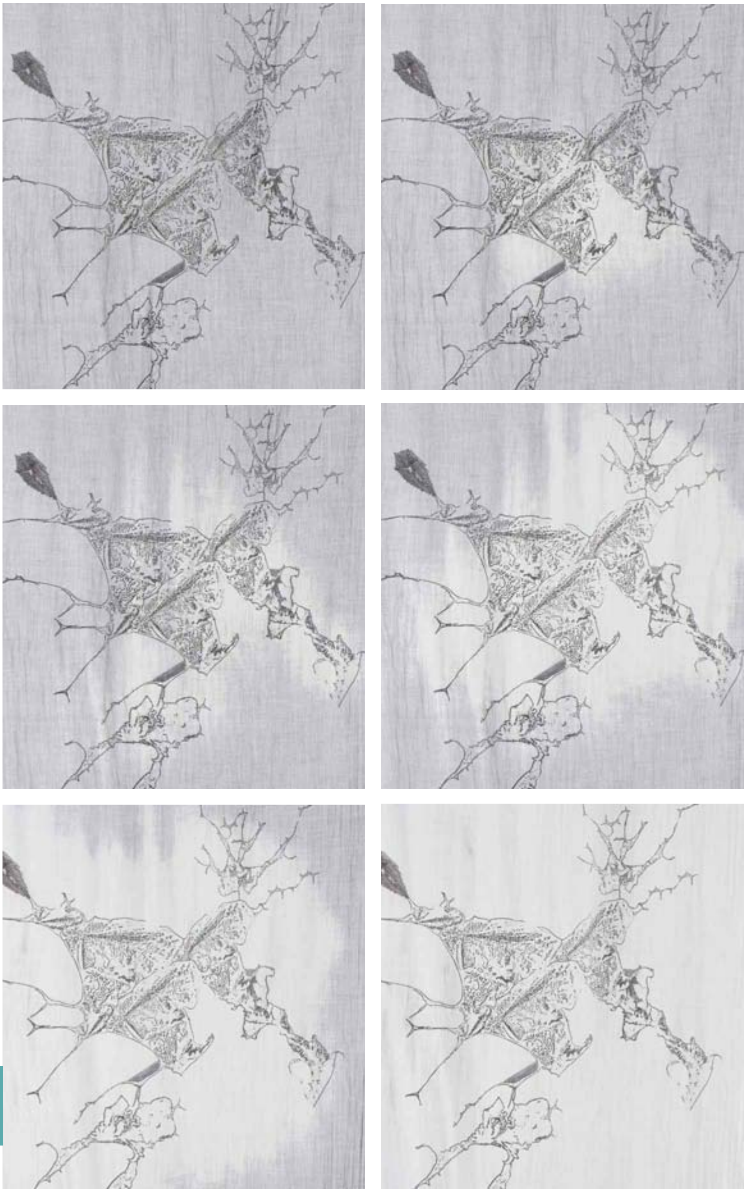
Siebdruck Muster mit thermochromer Farbe und ungefärbten Stickgarn

FURIE

Die Wut explodiert innerhalb des Körpers, der sich verkrampft.

Das Muster ist zentral plaziert, um die „Wut-Explosion" darzustellen.

Das Motiv ist versteckt und wird durch die Theromchromie sichtbar.



Temperaturzustände eines farbigen thermochromen Stoffs mit Siebdruck- und Stickerei-Muster

DANKE

JULIA WOLF

PAULA VAN BRUMMELEN

LOUISE DRUBIGNY

VERONIKA AUMANN

PROF. DR. ZANE BERZINA

ANDREAS KALLFELZ

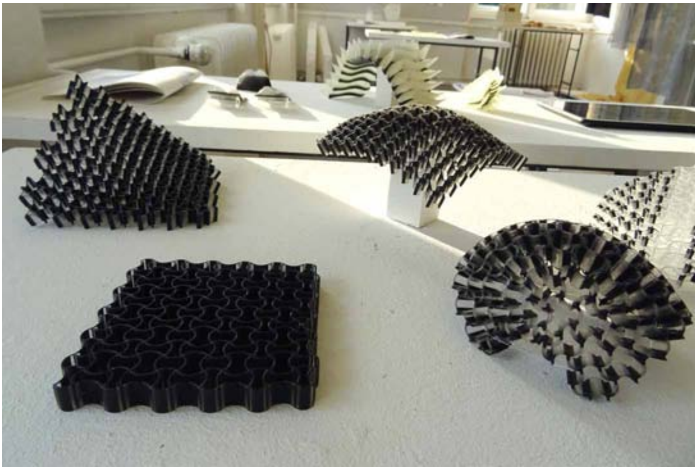
STEFAN MARIA ROTHER

IMPRESSUM

CONSTANCE VIDALAIN
L'ÉMOI

PHOTOS
PROZESS: CONSTANCE VIDALAIN
EXPERIMENTE: CONSTANCE VIDALAIN
ERGEBNIS: CONSTANCE VIDALAIN & STEFAN MARIA ROTHER
MODEL: LIINA LEO

TEXTS
CONSTANCE VIDALAIN & ANDREAS KALLFELZ



oben:

Arbeiten von Lena Ganswindt

mitte:

Arbeiten von Katja Riley

unten:

Arbeiten von Philippa Lorenzen

Arbeiten von
Liina Leo

Arbeiten von
Junshen Wu

Arbeiten von
Suzan Camlik

Arbeiten von
Constance
Vidalain

IMPRESSUM

AS A MATTER OF FACT...

PROF. DR. ZANE BERZINA

SOMMERSEMESTER 2017

HERAUSGEBER

PROF. DR. ZANE BERZINA

WEISSENSEE KUNSTHOCHSCHULE BERLIN

TEXTE

PROF. DR. ZANE BERZINA, DIE STUDIERENDEN, ANDREAS KALLFELZ

LAYOUT

VERONIKA AUMANN, LENA GANSWINDT

DRUCK

BOOK ON DEMAND BERLIN

BINDUNG

BOOK ON DEMAND BERLIN

BERLIN, IM AUGUST 2017

weißensee kunsthochschule berlin