



Design Your Essence


New possibilities for natural garment dyeing

Thesis by Sara Calzana, 915241
Supervisor: Maria Grazia Soldati

Master's Degree in Design for the Fashion System
A.A. 2019/2020
Politecnico di Milano - Department of Design

*To my grandfather, a skilled
craftsman and painter, who taught
me the value of small things and the
beauty of being creative.*

Index

00  **Introduction**

0.0 About the project _____ 7


01  **Benetton Case History**

1.1 Attractive yellow:
About the brand _____ 14

1.2 Innovative red:
Garment Dyeing _____ 17

1.3 Committed Green:
Benetton Group and
Sustainability _____ 20

1.4 United Color of People:
Brand Identity _____ 25

02  **Colors Design, emotions and perception**

2.1 Stories: Origins, symbols
and sensations _____ 30

2.2 Color theories _____ 32

2.3 Design and color _____ 37

2.4 Solid color: industrial vs
natural garment dyeing _____ 40

2.5 Chromophobia and pure
white _____ 43

03  **Textile industry a Pollution Issue**

3.1 Water footprint in the
textile industry _____ 48

3.2 Clothes to landfill _____ 54

3.3 Low Cost Mania _____ 56

3.4 The Slow Fashion
Model _____ 60

3.5 Circular economy _____ 63


04  **Shopping Triggers**
The reason why we buy

4.1 Ideas move the world _____ 68

4.2 The role of emotions _____ 71

4.3 The future is Green _____ 73

4.4 Culture, Tradition &
Handicraft _____ 76


05  **Dyeing Between chemicals and natural process**

5.1 Modern Chemistry _____ 80

 Primaries Colors
 Rainbow of Colors
 Dyeing Methods
 Dye characteristics

5.2 Return to the Origins _____ 92

 Natural dyes
 Natural fabrics
 Preparation of the fibers
 for dyeing
 The importance of the
 water
 Mordants
 Slow Textile and Slow
 Movement

06  **D.Y.E Design Your Essence**

6.1 The Project _____ 107

 Abstract; Moodboard; Concept;
 Target and Silhouette

6.2 Capsule Collection _____ 116

 Overview and Fabrics

6.3 Color Palette _____ 114

 Natural Colors; New possibility
 for natural garment dyeing;
 Natural Dyes; The Recipe;
 Dyeing: experimental phase;
 Lab Dip and Color Capsule

6.4 Visual Identity _____ 174

 The Logotype
 Label and Packaging
 "Thank You" Letter
 Concept Store

6.5 Brand Communication _____ 182

 Shooting
 Off-line communication
 On-line communication
 Conscious Community

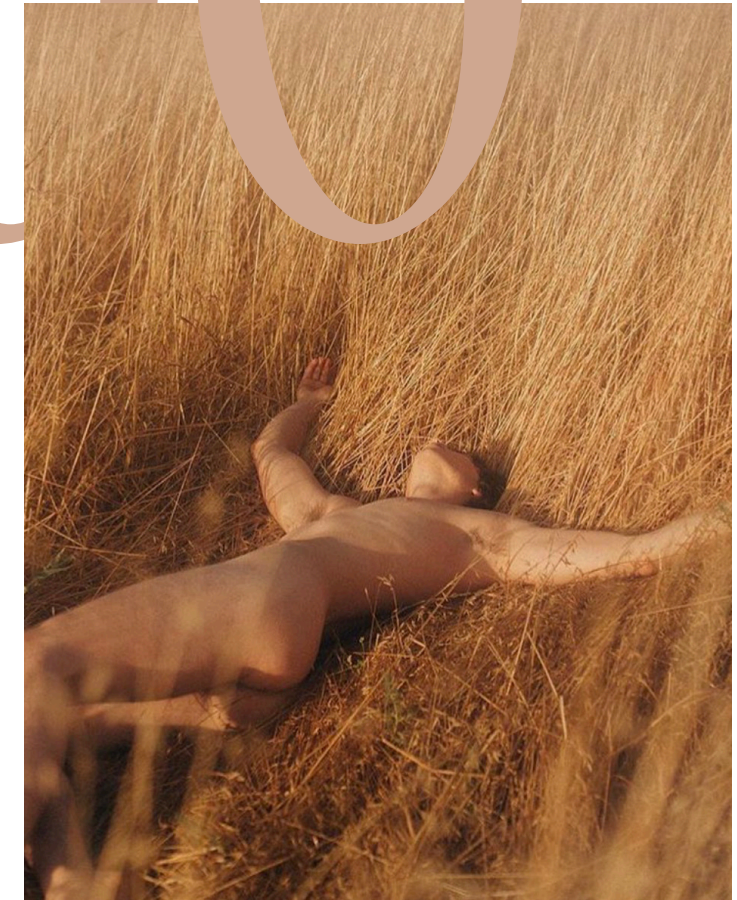
6.6 Brand Management _____ 214

 Positioning Map
 Pricing Range
 Business Model
 Calendar
 Services

Conclusion _____ 224

Acknowledgements _____ 226

Bibliography _____ 228

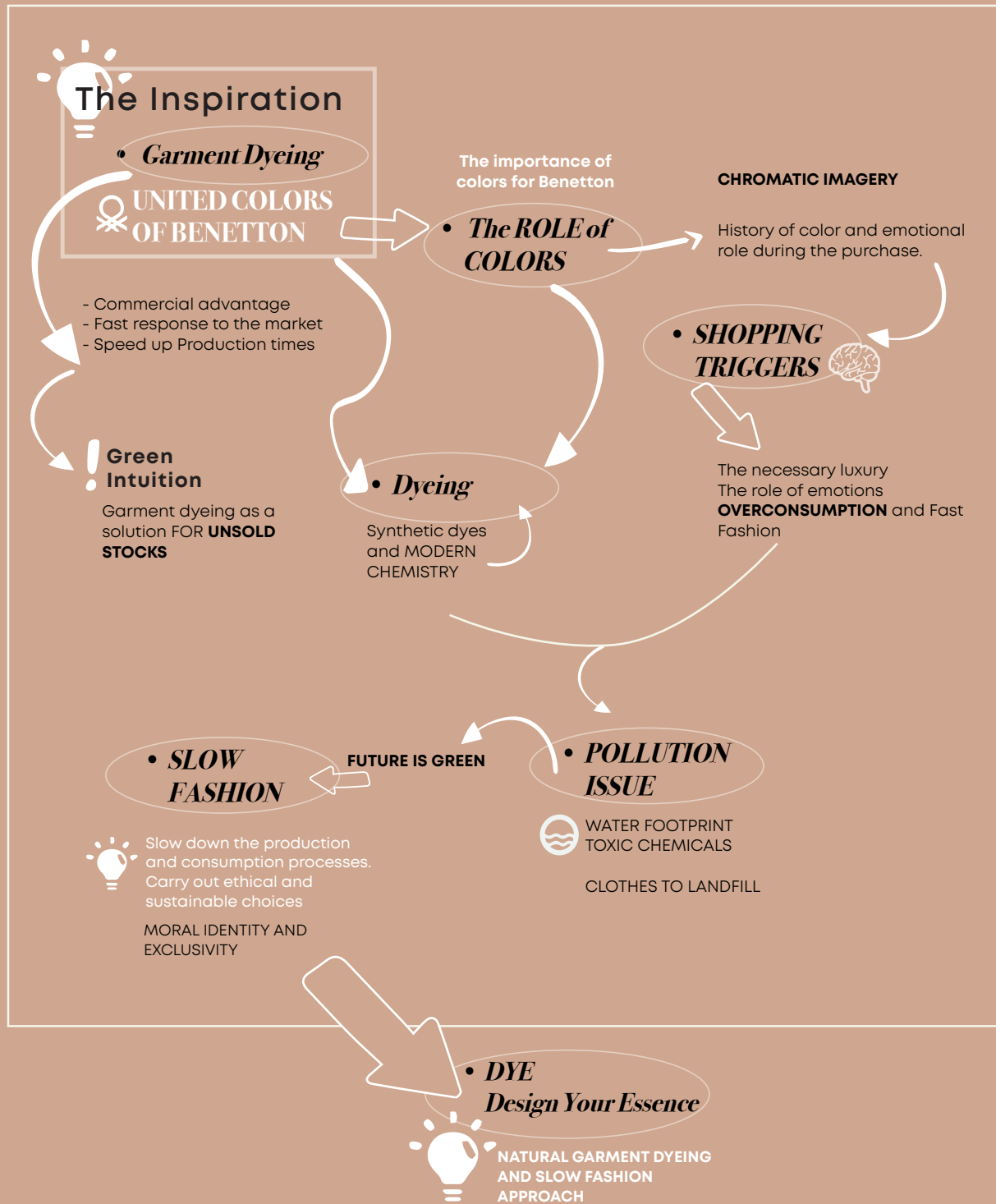


Introduction

Reading notes:

In this thesis, all translations from texts or articles written in Italian have been translated by the author.

COVER IMAGE: (FIG. 1) via @michaeloliverlove



NEAR: (FIG. 2) Concept Map for the development of the project

0.0

Introduction:

About the Project

Design Your Essence Design is a project that comes from a simple intuition: garment dyeing, but natural. The challenge is to make garment dyeing of a fashion product after the purchase phase as an act of personalization. A slow approach is adopted for the development of the project, following the fundamental concepts of *Slow Fashion and Slow Textile*.

The inspiration for this project is linked to *United Color of Benetton*, which has been analyzed and used as a starting point. Luciano Benetton in the 1960s senses that to speed up production times he would have to dye the sweaters, already made up, just before delivering them to the stores. This new process led the brand to have a unique, fast and always up-to-date products. In this way, even if it is a standardized offer (they only have few models of sweaters), they are making it unique and modern through the use of color. The company was the first to offer the same garment in 30 different colors that today have become more than 50. From this we can deduce the enormous importance and role that color plays in the decision-making phase of the purchase. It is precisely to color and its emotional strength as a trigger of impulsive and momentary shopping that I have decided to dedicate a chapter to it to fully explore it (Gallucci, 2016).

The fashion system has been trying to tackle the problem of pollution for several years, being in second place as the most polluting sector in the world. Speaking of fashion pollution, three main causes are identified: *water footprint, carbon footprint and overconsumption*. The first two aspects are related to the production and disposal processes, while overconsumption is linked to a new production model born in the 70s: fast fashion. It is a very fast model which has an attractive production, because

it offers very current and low-cost solutions. The main problem consists in the excessive and very polluting production which is followed by an impulsive purchase dictated by momentary trends making us forget the value of the object and the impact it will have on the environment. We have wardrobes that overflow with purchased items, worn only once and then no longer used. In fact, 2/3 of our annual purchases end up in landfills and some fabrics are very difficult to dispose of (Shirvanimoghaddam et. Al., 2020). *That's enough!* This whole mechanism must change and slow down. In this way we could enjoy higher quality products that reflect an ethical, environmental and social commitment, allowing us to appreciate and recognize their value even over time. That is a boost to go back in time, rediscovering the added value of craftsmanship and ancient traditions, just like natural dyeing: a practice in risk of disappearing because of the advent of modern chemistry.

The future is green, this is now clear (Turinetti, 2018). The modern consumer is ready to move towards a more conscious purchase that satisfies his *moral identity* (Legere, A., Kang, J., 2020). Today a project must be sustainable both to be more ecological but also to be more competitive.

The first chapters of this thesis perform the function of Desk Research, that is to gather information on the various aspects that I have included in the project: garment dyeing, dyeing processes, dyes, stories and theories of color, impulsive buying and environmental problems deriving from fashion companies. DYE, *Design Your Essence* is a new solution to address some of these issues. The project is based on the definition of a careful and aware contemporary brand.

The collection consists of a capsule collection with a few standardized but contemporary items, made with natural fabrics. The proposal in the store is neutral in both color and gender. Genderless and total white garments create a universal language by presenting the item of clothing in its purest and most raw form. In the store it is possible to buy the garment and possibly also the capsule of natural extract to dye it with a minimum, almost zero, environmental impact. The selection of colors will be the exclusivity of the season, creating a unique color palette for each season. Color is the *time factor* and it is also able to update the garment and make it attractive as Mr. Benetton claims (Leodi & Volli, 2012). By going to dye the product at a later time, the problems relating to unsold stocks are also solved. In fact, the same garment proposed the previous season, but with a different color, can generate new interest in the consumer.

Fashion is artistic expression, culture and creativity like any other form of art. My artistic background led me to welcome the importance and essence of colors and the expressive capacity that they know how to create. With this project I hope to generate curiosity and interest in the new modern consumers and give them an entire palette of colors to allow them to express themselves while respecting the environment. *Design Your Essence is a conscious individualism.*

“

Call it 'Eco Fashion' if you like, but I think it's just common sense.

”

Livia Firth



Benetton
Case History

COVER IMAGE: (FIG.3) via Iside Benetton, *Nudi*.

1.1 Attractive Yellow:

About the Brand

Benetton's passion for color is clear to everyone today. For this reason, within this thesis I wanted to dedicate a whole chapter to the color that will be treated later. Certainly color is an aspect of fundamental importance that characterizes and distinguishes the brand. The interest in color for Luciano Benetton borns from "a yellow knitted stitch" (Benetton, n.d-d).

His sister, Giuliana, gives him a yellow wool sweater made by her. Obviously today we are used to see sweaters of all colors, but at that time the sweaters were dark or neutral. Wearing the yellow sweater, he realized that he was attracting the attention of other people. Luciano immediately senses that it is **the yellow color that draws attention** to himself. So, he decides to buy, with all their savings, a knitting machine and begins to lay the foundations for a small family business made up of Giuliana as a seamstress, Gilberto as an accountant, Carlo was in charge of production, while Luciano was in charge of the commercial aspect. It was 1955.

Très Jolie is the name of the first collection which is sold by a local haberdashery. It was made up of «twenty crewneck, turtleneck or V-neck shirts in bright colors ranging from yellow to blue and green» (Benetton, n.d-d). They are colors that no one would dare to produce, much less to showcase them. Fashion of the time was predominated by neutral colors and this new proposed offer could never meet a demand. Benetton, however, realizes that the **consumer does not know he needs a colored sweater until he sees it.**

The result was surprising: the haberdashery began to sell at a rate of 20 sweaters a week and to have a huge success that would become planetary soon.

In 1958 Luciano dedicates himself completely to his company with his three brothers. At the end of the sixties the company took the name of "Maglificio di Ponzano Veneto of the Benetton snc

brothers". The logo is made up of a green knitted stitch that recalls the human figure (Leodi & Volli, 2012).

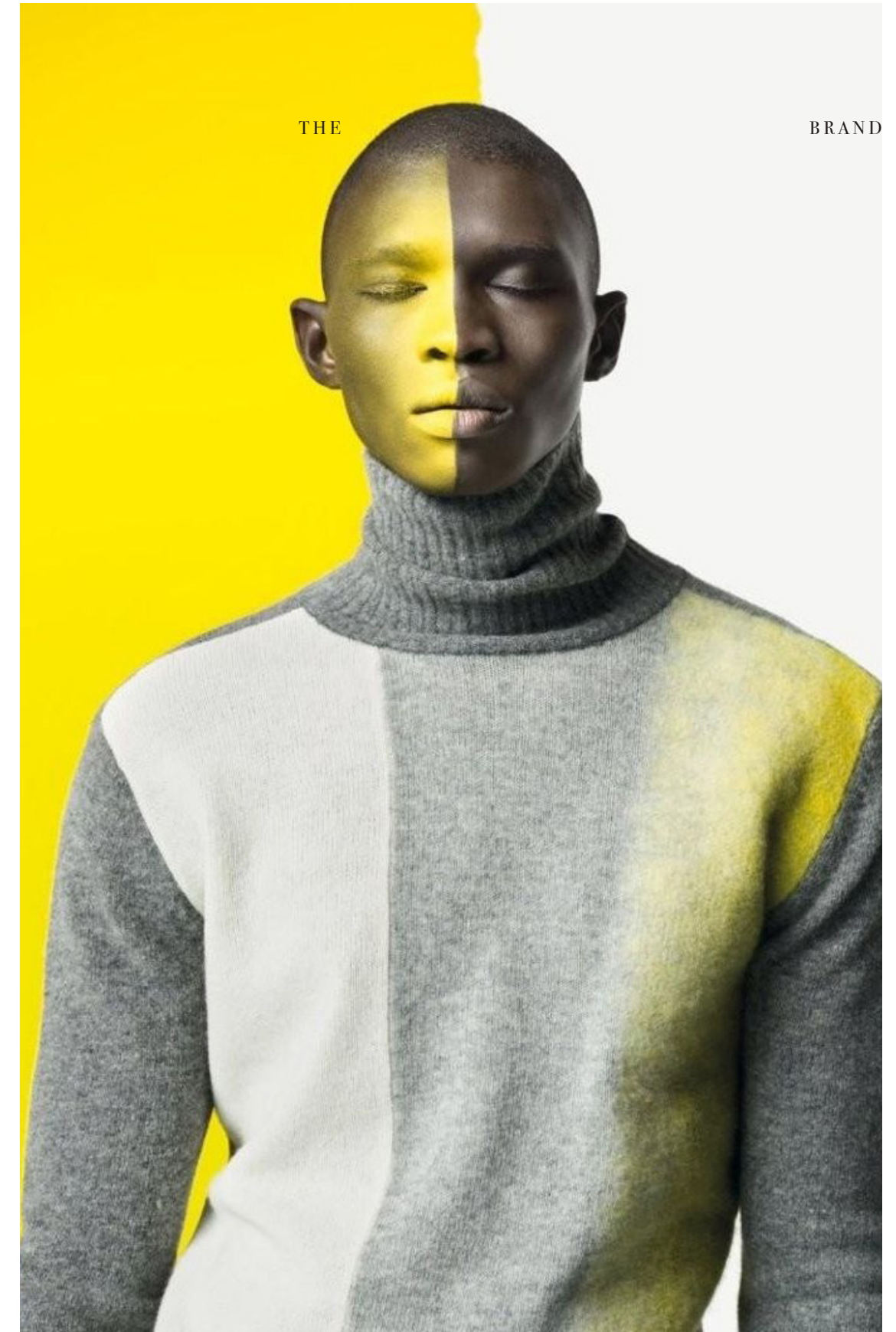
Today Benetton Group has a network of around 5000 stores and is known in all ways thanks to its full and bright colors. The head office is located in Ponzano (Veneto). Villa Minelli is the beating heart of the Benetton Group (United Color of Benetton and Sisley) since the mid-1980s. Fabrica, on the other hand, is the research center on traditional and experimental communication of the company. Since the early years, the company has always had at heart its territory rich in history, culture, know-how and traditions. For this reason, the Benetton empire was born from small specialized factories in Veneto. A project that we can define as cutting edge for the sixties, as it was an industrial project founded on social and territorial reasons, such as the opening of the Treviso sports center, the Ponzano kindergarten and the Benetton Foundation (Leodi & Volli, 2012). Even today, certain "delicate" processes and iconic symbol of tradition are carried out on site, while most of the production has been decentralized in Eastern Europe and in the Mediterranean basin.

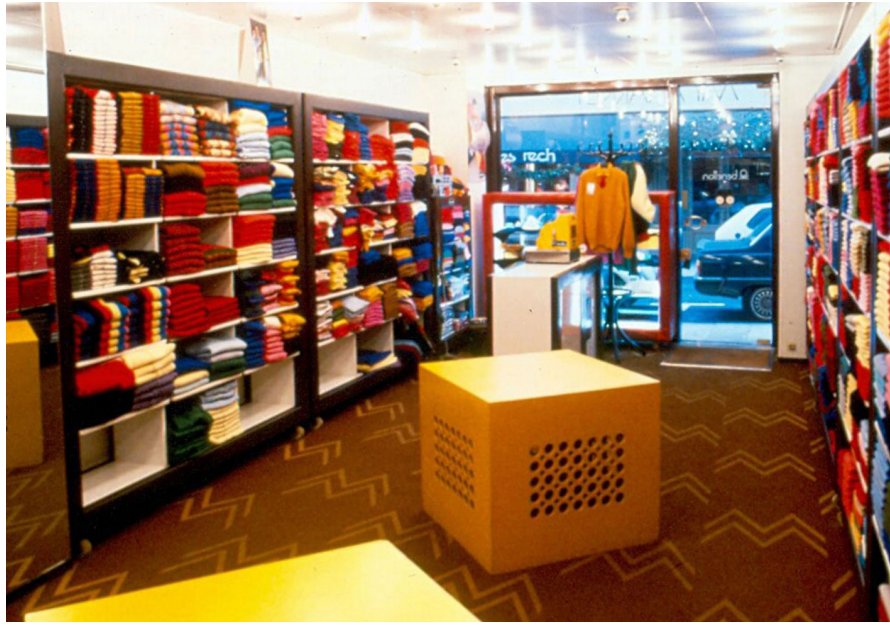
As far as stores are concerned, Benetton immediately decided to adopt the strategy of **single-brand stores**, an unusual and not widespread choice for the sixties. The first shop was opened in Belluno in 1965 and followed by Padua and Cortina. A choice of cities is also linked to Veneto and its territories. They have been strategically selected as cultural, tourist and university cities.

The first stores were called "*My Market*" and they were without a counter. It was an open spaces full of high shelves displaying colorful sweaters.

In the shop windows classic sweaters were displayed with simple shapes but available in **thirty different colors.**

IN THIS PAGE: (FIG. 4) *United Colors of Benetton Autumn Winter Menswear Campaign*, model Fernando Cabral, via fanshare.com





An offer that Luciano Benetton himself defines as «absolutely unique on the market» (interview with L. Benetton in Leodi & Volli, 2012: 47).

United Color of Benetton is synonymous with **identity, innovation and color** and is capable of offering a quality product at democratic prices.

The group's collections range from casual to sportswear for men, women and kids. Benetton's identity is also linked to a **strong idea of multiculturalism** that will be narrated in the advertising campaigns.

The interest in this extraordinarily current topic stems from Luciano Benetton's mind during the 1960 Olympics that took place in Rome. All those flags, all those colors and different nationalities give rise to the desire to be present as a brand in all countries of the world as a **sign of openness to the world and to cultural, ideological and religious barriers**.

In terms of style, this cultural commitment becomes clearly visible through the original and colorful proposal of the brand synonymous with cultural mix.

According to Luciano Benetton, the future of the company can be summed up in one word: innovation (Leodi & Volli, 2012). Innovation because it is a company that has always been in step with the times and capable of satisfying the wishes of a society that is always in transformation.

The brand has a lot of charm for me: from the use to the innovation of color, from the value of Toscani's photographic images for advertising campaigns to the magazine founded in 91 "Colors", from the commitment to organize artistic events in the Foundation to the choice of the characters with whom the brand has collaborated.

Since 2018 the new creative director of the United Colors of Benetton brand has been *Jean-Charles de Castelbajac*, a charismatic 360 ° artist who has collaborated with major fashion brands. When the news was still fresh, Castelbajac said: «United Colors of Benetton and I have always been united by a similar DNA: the passion for knitwear and the love for pop and the rainbow» (Salto, 2018) .

ABOVE: (FIG. 5) *First My Market Shop in Belluno*, via Inside Benetton;
ON THE LEFT: (FIG. 6) *Garment Dyeing Machine*, via Inside Benetton



1.2 Innovative Red: *Garment Dyeing*

Before the 1970s, a colored sweater was the result of the interweaving of colored yarns. This means that if a certain color did not make the product sell well in a season Benetton, like many other brands, had to reckon with the unsold stock. For this reason, during these years Benetton decided to adopt a **new entrepreneurial strategy** that radically changed the brand's business: **garment dyed**. It all stems from an intuition by Luciano Benetton after a trip to Scotland, home of renowned knitting factories. In order to put his idea into practice, however, he needs help and decides to contact the dyer Ado Montana. He asked Ado if it was possible to **color the sweaters after making them**. Together they experimented with dyes on wool for months, until they obtained the right and balanced combination. The main problems they encountered were color uniformity and its fastness, but they were able to solve them. This new discovery allowed the brand to **produce raw yarn shirts and color them later based on customer demand**. The result is a **huge commercial advantage** that also entails a fast and always current response to the market. It meant buying huge quantities of raw yarn and then having the certainty of using it, as the color was given to the garment at a later date: a very intelligent commercial strategy. At the beginning, these are garments whose production is standardized and where **color plays the main role**.

In summary, the garment dyed is nothing more than the dyeing of a packaged garment. Luciano Benetton tells in "Benetton, l'impresa della visione" of how the company was able to accumulate huge quantities of finished product, but not colored, to then dye it at the last moment and distribute it in the store. «This process was an absolute novelty» says Benetton, «it allowed us to be first on the market with the most focused offer. In a week we could produce 100,000 jerseys of the same color: we were unreachable»



(interview with L. Benetton in Leodi & Volli, 2012: 47).

To date, the company's color chart contains more than 50 colors plus the mélange for knitted garments.

Garment dyeing is carried out with the same dyes that are used to dye fibers, yarns and fabrics; while the machines are different. The machines that dye the garment resemble special washing machines that allow you to adjust and control the dyeing process. On an industrial level, as Mr. Luciano tells us, they were «oval basins, with a shovel that did not touch the garment but sent the water forward, so the meshes made the rounds and the colors were absorbed uniformly» (interview with L. Benetton in Leodi & Volli, 2012: 67).

After dyeing, finishing treatments can be carried out, for example stone wash or further washing.

One of the reasons that can push a fashion company towards the choice of garment dyeing is certainly a motivation relating to the timing of production.

For Benetton, **color is the time factor**. The three colors of the sweaters displayed in shop windows for a few weeks made that color fashionable and a few weeks later that color changed. Color is optimism and has the power to affect the customer's mood, for this reason it has always been a strong point and of great importance for the brand (Leodi & Volli, 2012). The color, as we will see in the chapter reserved for him, plays a very important role as regards the decisive moment of a choice of a garment, making this moment impulsive and emotional. In fact, thanks to its color, a product can become necessary and rewarding.

Maybe time is not the only reason today. Warehouses are full of unsold products and dyeing based on market demand can also help solve this problem and give it an ethical and sustainable aspect.

1.3 Committed Green:

Benetton Group and Sustainability

Benetton Group, according to the *Fashion Transparency Index 2020*, is the **first Italian fashion brand regarding transparency** (Benetton, n.d-b). The brand occupies the first place for two years thanks to the work done to disseminate clear and credible information and all the work done on the environmental and social level. The company achieved an overall score of 55% which places it in the **top ten of the best brands on a global scale** as regards transparency. Just four years ago that score was 17% and the brand has worked hard to achieve this goal in a short time. In particular, this ranking rewards the company's commitment to **mapping the entire supply chain**.

Starting in 2013, the Benetton group is one of the brands that participated with Greenpeace in the *Detox program* (Chapter 2.1 Water footprint in the textile industry). The program consists of the commitment adopted by companies to achieve the almost total elimination of dangerous chemicals in the fashion sector. In this way, the company can also guarantee the consumer's health and safety. In 2016 and 2018 Benetton is among the leaders of the *Detox campaign* according to data reported by "Destination Zero: seven years of Detoxing the clothing industry". To achieve this goal in the same year, the brand joined the **Zero Discharge of Hazardous Chemicals** (ZDHC) group. By adopting the *precautionary principle* throughout the company supply chain, Benetton continues to make enormous progress in the elimination of chemicals that can be dangerous for the environment or for people, thanks to the RSL **Restricted Substances List**.

Since 2013 Benetton Group and its suppliers are required to use only APEO free chemical formulations and eliminate the use of all PFCs, or better known as perfluorocarbons, which are synthetic compounds dangerous for the environment, with which jackets can be made anti-rain (Benetton Group, nd).

Ethoxylated alkylphenol (APEO), on the other hand, is a dangerous substance for the environment and aquatic organisms.

In 2017, to increase its commitment to the environment, the Benetton group joined the **Sustainable Apparel Coalition** (SAC) which from that year began to collaborate with the ZDHC. **The company is one of the most avant-garde in terms of environmental and social sustainability.**

Fresh water, as we will see in the following chapters, is a fundamental element for a textile company, but which if used without care can cause serious environmental damage. Benetton Group has compiled a list of countries that are most involved in the dyeing and washing processes, **Wet Process List** (Benetton Group, n.d). These countries represent an important supply chain for the company and must comply with the ethical and environmental standards imposed by it. On the benettogroup.com website you can consult all the results relating to water analysis. According to the company, it is very important that the consumer can easily find the data that demonstrate the great environmental work and the transparency with which they are doing it.

The choice of suppliers relies on the quality of the products and on the local manufacturing. Also in this case, the collaboration between foreign countries and the company is carried out in compliance with social, ethical and environmental rights.

The attention to the environment of a company must start from within: employees and offices. Small ecological attentions applied inside the offices can make the difference, such as separate waste collection and energy savings. Only by educating the brand we can think of going to educate and pass on the message to its consumers.

The Green Campus project meant that the company refused the use of plastic, introducing computable glass glasses and customized water bottles for all employees in its place. **Green** is not only the color of the United Color of Benetton brand, but it is also its **philosophy and its design spirit**. Environmental protection turns out to be a real mission of the company.

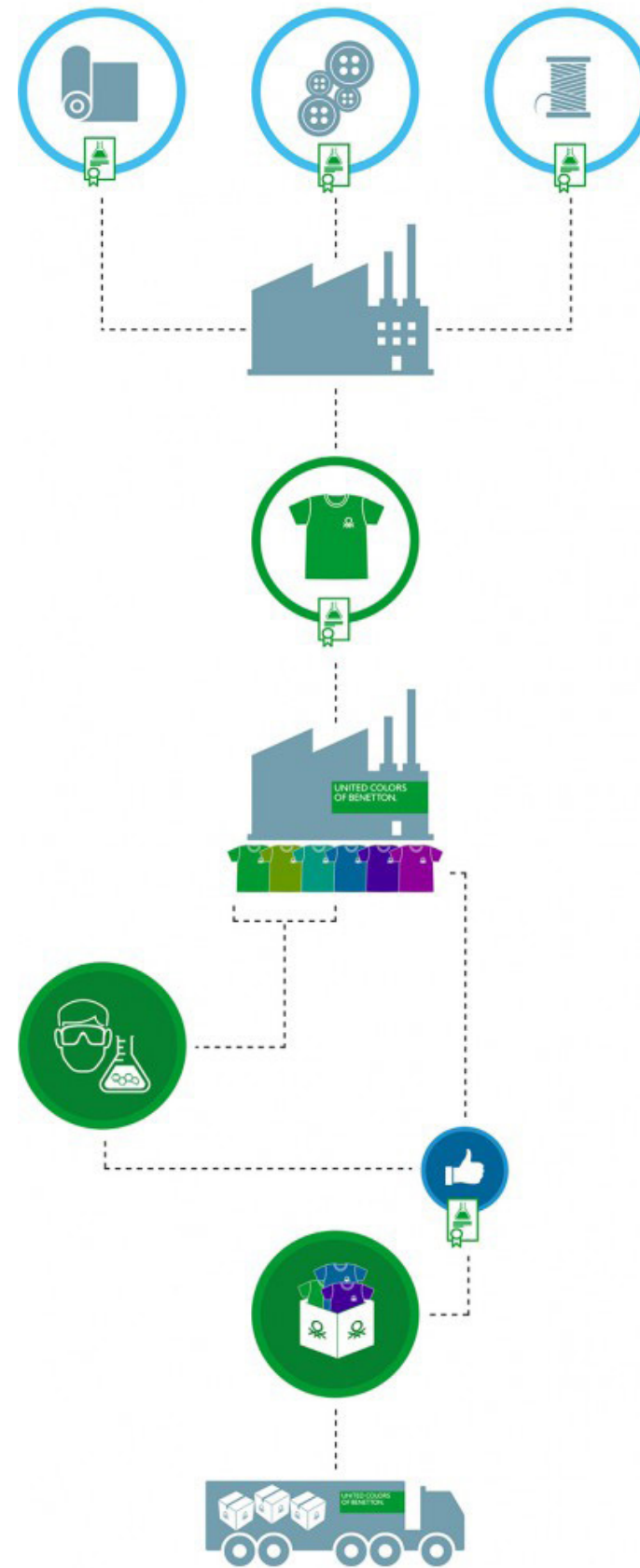
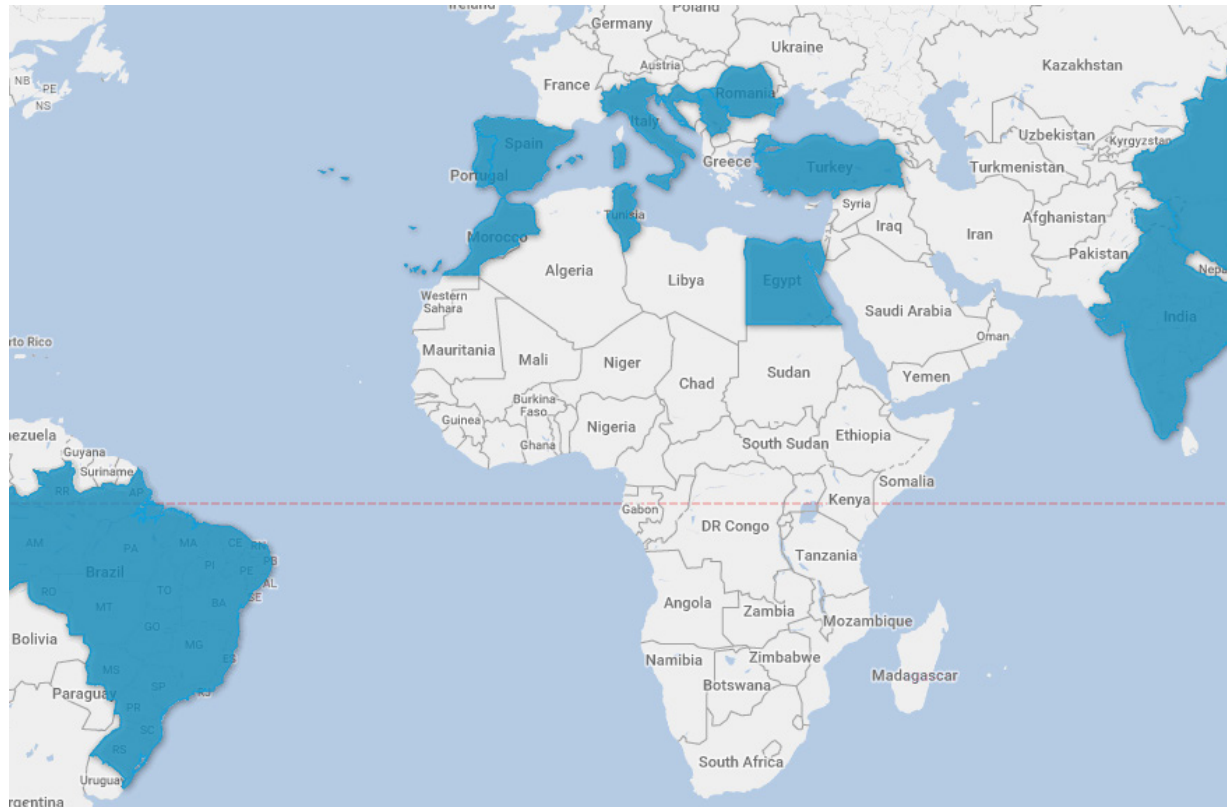
Another interesting initiative, which the brand supports, is the **Benetton Forest**. It is located in Kenya and is made up of over a thousand trees planted by Benetton in collaboration with Treedom (Benetton, n.d-c). Social commitment is a mission that the brand has always pursued, and now it is also starting to turn to the planet. As for the quality of the yarns and materials, they are always basic elements of the Benetton brand. The aim is to create garments that last over time. The company launches the slogan "Wear.Care.Repair" and publishes a guide on garment maintenance. It contains video tutorials on how to repair and care for clothes by extending their life cycle. In our "disposable", even a small initiative for the care of the garment can help create a more attentive and aware consumer and help decrease the ecological footprint of the Benetton brand.

IN THIS PAGE: (FIG. 8) Image of a forest in Kenya, via @treedom_trees

FIG. 9: Industrial complex of Casrette, photo by Antonia Mulas, via Benetton Group.



FIG. 10: Benetton Wet Process Lisi, image via Benetton Group.



Green is not only the color of the United Color of Benetton brand, but it is also its philosophy and its design spirit.

NEAR: (FIG.11) *Product Screening Methodology*, via benettongroup.com

FIG. 12: *All the Colors of the Worlds*, ph. Oliviero Toscani, image via Inside Benetton.



1.4 United Colors of People.

Brand Identity

Social issues and solidarity are two other important issues for the brand. The company and its suppliers undertake to follow ethical and social codes.

Since the 1980s campaigns, brand communication has carried out a very strong and impactful communication work linked to these issues. A “universal” communication capable of breaking down the boundaries generated by diversity, by the color of the skin and by the crude situations of contemporary society. The brand’s advertising campaigns are the result of the extraordinary work of the photographer Oliviero Toscani. Some of these shots, we can say that they have become real iconic images that represent the brand and its values.

Oliviero Toscani’s work for Benetton begin with advertising campaigns made in the studio, on a white background, where color and cheerfulness are the protagonists. This style was soon abandoned to follow the desire to make the brand more international and to accompany the numerous new store openings around the world. From now on we have the most famous photographer’s campaigns dealing with social and current issues, such as “**All the colors of the world**” from 1984. Color is once again the protagonist and is also highlighted by the different colors of the models’ skins. The result of the advertising campaign fluctuates between important and critical acknowledgments. “All the colors of the world” embraces social issues that for the first time are also deal with in the fashion sector: **diversity, globalization, human heterogeneity and provocation.**

Benetton decides to continue with this kind of works and launches other controversial campaigns based on the encounter and confrontation of the subjects: «A Russian boy and an American girl who embrace each other. A Palestinian boy and an Arab boy holding a globe together. A Native American and a young punk

with very similar hair» (Benetton, n.d-f). This advertising campaign represents a fundamental turning point for the brand image and its future campaigns. “All the colors of the world” turns into **United Colors of Benetton**. It is the first time that a communication of a fashion brand that promotes a global anti-racist struggle. After this campaign, portraits of different ethnic groups follow each other representing a humanity that makes friends and recognizes itself in a Benetton item of clothing: «[...] the sweater thus becomes the glue for the difference in race, language, religion» (Toscani quoted in Pagnucco Salvemini, 2002).

Toscani’s work for the brand has always paid attention to commitment and social denunciation through news stories and themes such as death, AIDS, racism or sex (Pagnucco Salvemini, 2002). Benetton’s fashion photography and advertising campaigns are not just advertisement but art and information. The great reputation of the brand allows Toscani to untie the advertising campaigns from the product itself, thus creating images capable of intriguing us and questioning us on current issues. The consumer will be pushed to the final purchase of the garment as a sign of

emancipation (Pagnucco Salvemini, 2002). This way of communicating is often the subject of scandals, probably because the harsh reality is difficult to accept. It has been repeatedly explained to the various newspapers that cited the photographer’s shots for the brand that the photographs were never conceived with the intention of being offensive, but simply to make us open our eyes to the harsh reality of the contemporary world. The collaboration with the photographer ended in the 2000s.

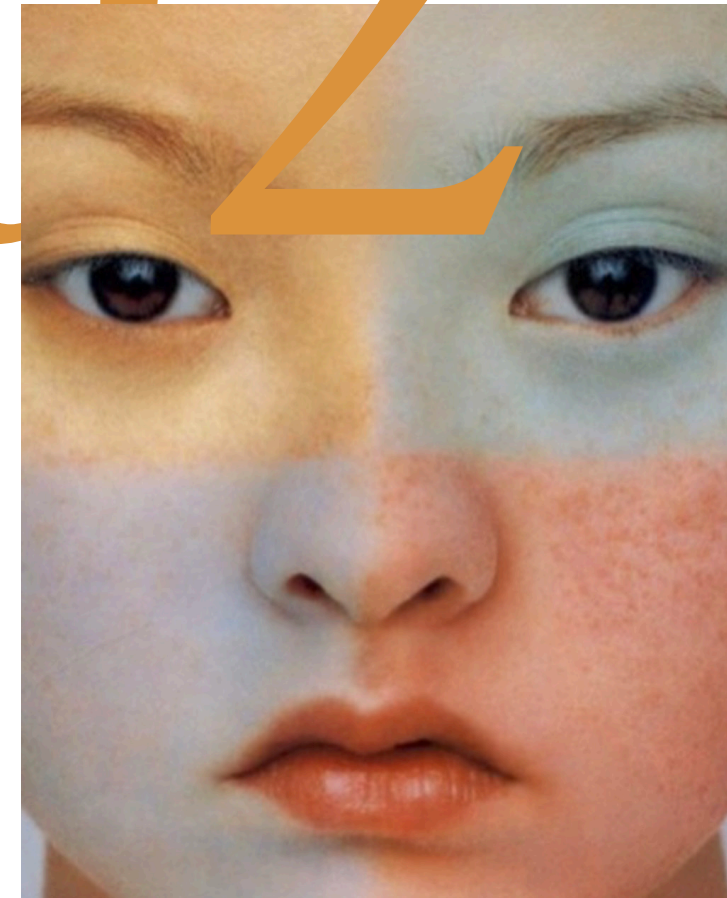
To date, all company communication is managed by Fabrica, the creative heart of the brand. United Color of Benetton in recent years, through important collaborations with well-known European museums, has decided to devote itself to more sophisticated communication to stay in the cultural debate.



FIG. 13: Benetton Campaigns, images via Benetton Group, Inside Benetton & Benetton/Toscani, Storia di una avventura, 1984-2000.

Oliviero Toscani was born in Milan in 1942. His passion for photography was transmitted to him by his father, a news photographer for the “Corriere della Sera”. At six he was given his first camera and his father often took him to work with him. In 1957, when he was only a few years old, a shot by Oliviero was published and went around the world: it was the photo of Benito Mussolini’s body. In 1961 he attended the School of Applied Arts in Zurich and immediately developed a strong interest in committed photography. His work presents «irreverent, derisive, irreverent genes» and wants to offer a different point of view through the shock generated by the image (Pagnucco Salvemini, 2002: 10). After his studies, Toscani travels continuously between large cities: New York, Paris, London and Milan. Here He starts working for “Vogue” and for “Elle”. His interest, however, is more directed to the ghettos of the big apple and to the conditions of the blacks of America, a reportage work that is not appreciated by the director of “Condè Nast”. In 1965 Oliviero starts working with the Benetton company with the aim to create international communication for the brand that is opening stores all over the world.

02



Colors

*Design, Emotions and
Perception.*

COVER IMAGE: (FIG. 14) *Ellen Von Unwerth* for i-D September '98, via @coloro_



ON THE RIGHT: (FIG. 15) *Lascaux IV international centre for cave art*, image © boegly
ON THE LEFT: (FIG. 16) *Jomon figurines and fragments*, Japan 2500-1500 BC., via @mudimakes

2.1 Stories.

Origins, Symbols and Sensations

The origins of natural color and synthetic pigments will be briefly exposed in this part since they are also studied in the following chapters concerning the dye part.

Color in antiquity was a very precious material that was put in crisis with the advent of modern chemistry.

The first colors the man used are ground dusts: easy to find and use. The earthy colors give us today the charm of the ancient cave paintings in the caves. This color is also suitable for coloring ancient clay artifacts.

While for the coloring of paper, food and fabrics, the extracted juices of the plants were used: such as madder, saffron or dyer's woad. The natural blue color is extracted from the woad plant.

In the past, the color was linked to the territory and to certain geographical areas. The limited availability and distant provenance made color a precious material. In fact, in the ancient world, each color had its price based on the country of import and its preciousness.

Today, however, colors are synthetic products obtained through chemical reactions in the laboratory. The main

advantages of color chemistry is the fact that a wide range of synthetic colors can be obtained without going to distant places.

In the past color was a precious and expensive item.

In medieval and Byzantine paintings gems were considered alive and with particular powers: «chalcedony keeps melancholy away; the opal can unleash uncontrollable energies in the hands of the uncultivated; jasper protects against epilepsy» (Falcinelli, 2017: 70).

Color in the medieval era is also a manifestation of the theological mysteries and the use of gold in particular served to symbolize God, who is metaphor for light. The blue obtained from lapis lazuli powder was the most expensive in the fifteenth century, in fact it was used to paint the mantle of the Virgin Mary, transferring symbolic meanings and hierarchical and theological distinctions to the art work. Throughout the history of art up to the present day, The Virgin Mary has always been depicted in a blue cloak. This example shows how the chromatic past history continues to influence modern habits, creating strong associations between color and meanings in our mind. However, limiting color to universal

meanings would be a big mistake thus rejecting the importance of cultural and social relativism.

Color in modern society, on the other hand, is interpreted through the taste and sensitivity of the consumer. When we buy a colorful design object, we actually buy the feeling that object arouses in us. Today color is a precious element of visual language, in fact sensations and emotions can depend on it.

«For more than thirty-five millennia colors have been obtained from three natural kingdoms. From the mineral kingdom the ground dust, coal and stones extracted from the ground; from the animal one, clams and insects to be squeezed; from the vegetable one, all the plants whose juices revealed dyeing powers» (Falcinelli, 2017: 46)



2.2

Color theories.*Color as an accident of our psyche*

Aristotle is the first to hypothesize color as a dynamic relationship between light and dark. Aristotle concludes his discourse on color by stating that «color is an accident, that is, something added to things, which belongs to an object in a casual way without being part of its essence» (Falcinelli, 2017: 74). With the advent of the great revolution of the twentieth century we will understand that color is an accident of our psyche. This theory is the one closest to recounting the relationship between modern society and color.

We must wait till the 17th century when color was analyzed and regularized by scientific theories.

Color is light. This is the conclusion obtained with **Isaac Newton's** experiment of natural decomposition of light in 1666. This light is a radiant energy capable of propagating «waves that hit objects and are reflected on their surface and then be captured by our eyes» (Macetti and Pinotti, 2014: 74). Through this experiment Newton demonstrates «that color is something that is inside the light and not on things» (Falcinelli, 2017: 82).

«According to modern science, light is a type of electromagnetic radiation composed of waves capable of arousing sensations in our nervous system» (Falcinelli, 2017: 82).

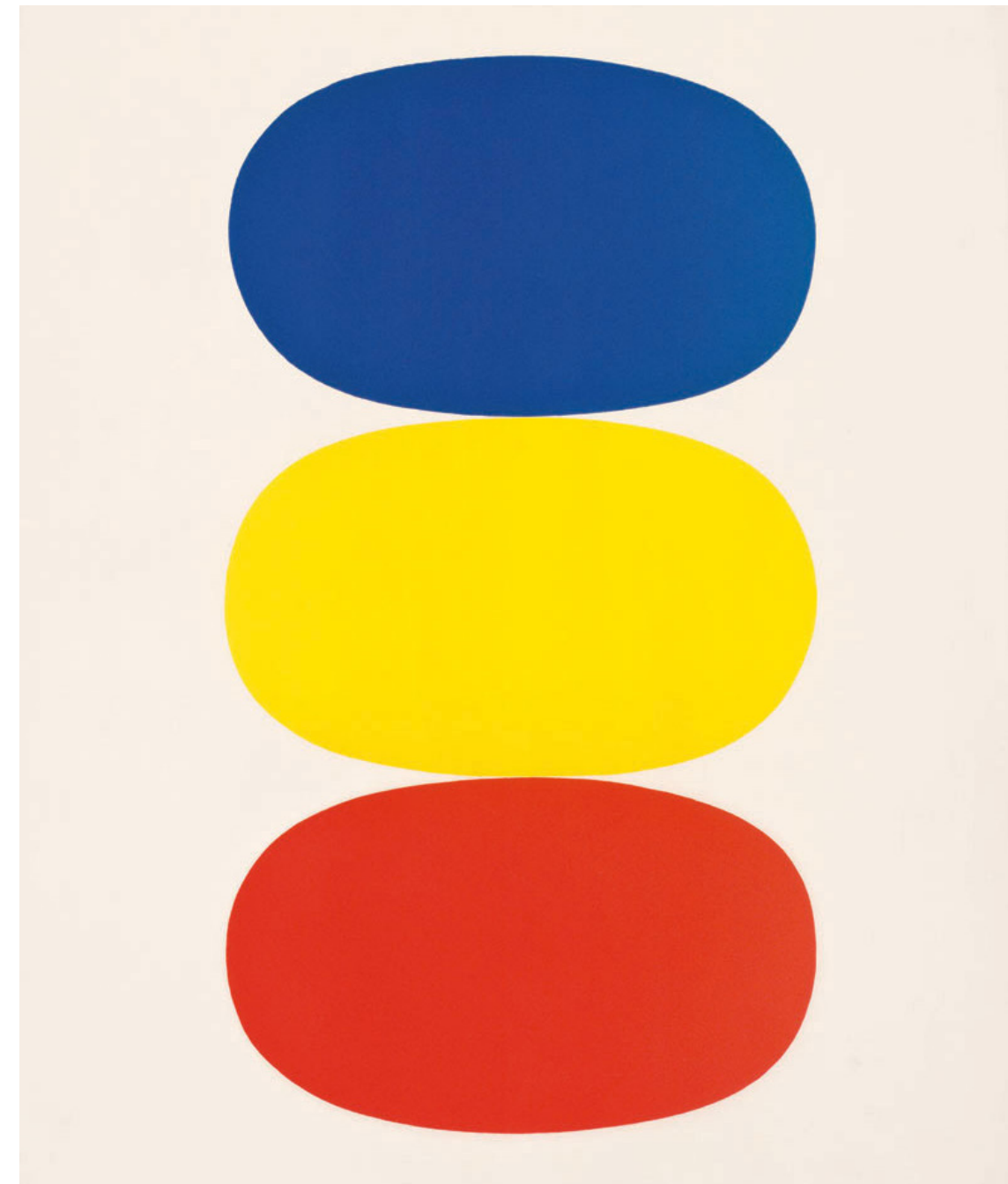
The visible spectrum is the section of radiant energy that the human eye is able to perceive. It is a bright segment that shows the colors in an orderly sequence, such as the colors of the rainbow. It is the first time in history that colors such as black and white do not appear on the color list. This is because science recognizes black and white only as forms of light and dark.

Carrying on with the experiment, Newton discovers that rays from different prism can overlap. In this way we obtain compound hues, colors not present in the rainbow; then Newton draws a circular graph of the representation of colors. With this graph,

relationships are established between colors: «each hue has its opposite on the other side of the circle which turns out to be the most distant not only geometrically but also on the perceptual level» (Falcinelli, 2017: 86).

If Newton investigated color as light, a century after instead **Goethe** focuses on the phenomenal aspect of color, a modern concept of perceiving color. One of his greatest discoveries on the perceptual level are the posthumous images which are «tints aroused in the observer and not of something that exists in reality, suggesting that the mind can produce color even in the absence of external stimuli» (Falcinelli, 2017: 89). The experiment is based on the fixed observation of a color, for example red, on a neutral background for a few seconds. Then if we move our gaze on a neutral wall we will see the same image that we were previously observing of its opposite color, sea green. For Goethe each color therefore has its complement which it establishes a relationship of *elective affinity* with, that is a relationship of attraction and detachment. These ideas lay the foundation «of psychology and perception of colors: the proof that senses do not limit themselves to measuring the world but provide the brain with tools with which to build what we see» (Falcinelli, 2017: 91).

After that, following Goethe's thoughts, **Chevreul** understands that the sight of one color close to another is not linked to its tint but to the eye of the observer capable of creating a psychological complement. A color may appear warmer or colder due to the tint it has nearby. This contrast is called *simultaneous* and is very successful among twentieth century painters. **Delacroix** offers us purple shade and pinkish complexions. This combination of color is also received with great enthusiasm by impressionist painters.



IN THIS PAGE:
(FIG. 17)
*Minimal and Color
Master*, artwork by
Ellsworth Kelly



EMOTIONS

AND

PERCEPTION

The fact was not to paint things as they appear but as our psyche processes them. This is the basis of all future visual communication.

The study concerning the relationship of harmony between certain colors was carried out by **Johannes Itten** who taught color theory at the Bauhaus, 1919. He is the first scholar to investigate the balance between colors and to do so he analyzed the relationships between colors, proposing a new model. At the center of this model are the three primary colors that generate the secondary and tertiary hues. Analyzing the relationship of the colors belonging to the external circle, he identifies some fundamental chromatic contrasts.

After that he builds another model, always in the form of a circle, where the six main shades are represented in quantities «inversely proportional to the quantity of light that the shades reflect» (Falcinelli, 2017: 173). If there is a luminous value for each tint we will achieve harmony only through the balance obtained by these proportions.

In conclusion, Itten shows that «a harmonious composition is one in which the mixture of hue, brightness and saturation values produces a neutral gray» (Falcinelli, 2017: 176).

However, the idea that there is a harmony between colors a priori is false. We can speak of **sensitivity in the combination of colors and its historical and cultural influence**. Color tells stories, but they are not universal. In a given period there may be a color we prefer or a pleasant combination of hues dictated by the fashion system.

Itten is also the first to lay the foundations of concept as **Color Analysis (Armocromia)**, that is the association of chromatic choices with the physical traits and character traits.

For example, Itten suggests that «blondes with blue eyes would lean towards bright colors besides Brunette for the dark colors» (Falcinelli, 2017: 183).



2.3

Design and colors.

Colors as expectations, emotions and archetype.

We begin to deal with this chapter color after color, to analyze the **relationship between color-shape, color-archetype and color-emotion**. We will address the topic related to the archetype starting from the *industrial yellow* (Falcinelli, 2017).

If we think of the yellow color, many images come to mind in our head. Among these images there is also a small industrial product known for its coloring: the wooden pencil painted in yellow nail varnish. It appears for the first time at the Chicago Exposition in 1893. Probably the reason for its painting was an attempt to hide the imperfections of the cheap wood that is still used today. This is a surface design intervention as an embellishment of the pencil. This event led color to be both an idea, but also an expectation.

To support this thesis, market surveys were conducted and two new pencils were proposed: one yellow and one green. For the public the yellow pencil wrote better than the green one, in fact the green one was made of hard wood and difficult to sharpen. The two pencils were identical except for the difference in the paint.

It is not a coincidence that «two thirds of the pencils produced and sold on the planet are yellow», because **the yellow pencil is the idea of the pencil** (Falcinelli, 2017: 7). The pencils of the emoticons are also yellow: on the various social networks the draw of the pencil changes slightly, but never its color.

The yellow pencil is an archetype, a mental model, used to compare all the other pencils (Falcinelli, 2017).

From these examples we begin to understand what is a **chromatic imaginary**: the deposition of a certain color associated with a specific object in our collective memory.

Color can also reflect a role and occupy a certain position within a system. For example the colorful Smarties thanks to their colors we can understand its positioning and recipients: children.

A significant turning point between color and design takes place with Apple's iMac in 1999. What attracts the attention of the consumer are the new colors of the electronic object. The role of the **iMac** is to differentiate itself from office computers, **interpreting the role of the personal computer intended for free time**. The PCs of the time were only gray, white and black and their design was strictly geometric to symbolize the efficiency and seriousness of the electronic product. With the advent of the internet, the computer, as well as the mobile phone later, becomes extensions of our personality and identity through numerous social networks. The iMac with its colors inaugurates the beginning of a **new era where style is the new vision of the world**.

Thanks to its colors, this object finds enormous success in creative environments: designers, stylists, writers and architects use Mac.

As for the fashion sector, the color palette of our wardrobe is almost completely emotional and dictated by the trends of the moment. The fashion system in fact for each season elects trendy colors. These studied colors (**color forecasts**) influence not only catwalks of fashion shows, but also design, architecture and all the rest. Garments of the trend color lead us to the **purchase guided by a momentary enthusiasm linked to the trend factor** and often, once the season is over, we no longer wear it.

Through our way of dressing we try to **represent an identity**, sometimes fictitious, which however allows us to become part of a fashionable community, through the consumption of things.

These concepts seem so common to us today, but it has not always been so.

Only in 1793 freedom of clothing was promulgated. Before the clothes were closely related to the role and the social class. In the seventeenth century, for the first time in history, the dress reflects

We first perceive the chromed identity of an object related to its function.



ON THE LEFT:(FIG.19) *Yellow Work/Handtools Of A Craftsman Arranged*, image by Audrey Shtecinjo
IN THIS PAGE:(FIG.20) *Picture of first Apple's iMac, 1999*

the personality and expresses the sensitivity to the taste of the customer. In the 19th century, however, a new concept was born that would change the world of fashion: **seasonality**. «The current concept of seasonality was introduced in the mid-nineteenth century with the aim of offering different clothes and styles for each season, proposing the best dress to change over time and seasons» (Conti and Fiorani, 2017: 16). The colors at the time, in addition to reflecting the changing seasons, also marked the hours of the day: for example dress colored by pastel shades of pink, blue and mauve were destined for the morning.

Today any color is accepted if chosen by famous characters who have the **authority to dictate the taste**. In this case the **color** is design and **becomes a model that is replicated in series by the masses**. We dress in a certain way or in a certain color because we saw it on someone else through a proposal from the mass media. Imitation is the basis of our current behavior and the industrial process (Falcinelli, 2017). For example, yellow is usually a color intended for sports or leisure clothing, but actually it acquired a new concept of royalty if worn by Queen Elizabeth or the former first lady Michelle Obama.

The **colors in the fashion system** are studied through color forecasts, but are also analyzed and evaluated according to which color worked and which did not within a collection, proposing the winning solutions that will then be copied from the fast fashion and mass market.

In this regard I would like to mention a famous scene from the film *The Devil Wears Prada*. Miranda Priestley, editor of a New York fashion magazine gives a life lesson to her intern Andrea, who believes she has nothing to do with the fashion world and is amazed and laughs at the meticulous assessments they make in the office for the color of a belt.

The authoritativeness expressed by a color within the fashion system is subject to future imitation to try to achieve the same success.

In conclusion, color has the power to give design objects a strong seductive power.

IN THIS PAGES: (FIG. 21) Kenzo, image via @coloro_



«Oh, of course I understand: you think this has nothing to do with you. You open your closet and choose, I don't know, that felted blue sweater for example, because you want to shout to the world that you take yourself too seriously to care what you put on yourself, but what you don't know is that that sweater is not simply blue, it is not turquoise, it is not lapis, it is actually cerulean, and you are also cheerfully unaware of the fact that in 2002 Oscar de la Renta created a collection of cerulean skirts and then it was Yves Saint Laurent if I am not mistaken to propose military jackets cerulean color. And then the cerulean quickly appeared in the collections of eight different stylists. After that, he gradually arrived in the department stores and finally infiltrated some tragic casual corner, where you evidently caught him in the basket of occasions. However that blue represents millions of dollars and countless jobs, and we are at the limit of the comedian when I think you are convinced that you have made a choice out of fashion proposals so in fact you are wearing a sweater that has been selected for you by people here ... in the middle of a pile of stuff»

The Devil Wears Prada. Dir. David Frankel. Perf. Meryl Streep, Anne Hathaway, Emily Blunt. 20th Century Studios, 2006.

2.4

Solid color*Industrial vs. natural garment dyeing*

In the section “Ideas move the world” the element of speed emerged as an important value. Thanks to industrialization, **immediacy has overtaken the slow human rhythm.**

In this period synthetic pigments were discovered and the plain colors were born. This gives all its products a **uniform surface appearance.** The solid color is an industrial language that makes the color homogeneous and immediate, but above all, it is able to produce a mass-produced product which will look the same as the other. To make identical products, the industry had to simplify the shapes and finishes of the objects. Solid color is not simply a choice, but is «one of the inevitable consequences of serial production» (Falcinelli, 2017: 24). The modern objects that surround us have for the most part a solid color. Even in the case of prints, which seem external to this concept, in reality we are able to recognize a constant and orderly repetition within the pattern.

Solid color is the new virtue of modernity where it is the homogeneous color that governs our lives.

«Industrialization has transformed solid color from an exceptional event into everyday life, to the point of making it the criterion on the basis of which we define everything else» (Falcinelli, 2017: 24). Nowadays an object is beautiful if it is plain.

This immense **standardization** of color has led us over time to an **abstraction of the color itself** through a normalized evaluation, for example, of the Pantone samples. In this samples collection we can find all the possible colors with which to compare a uniformly colored square with the things of the world. **Solid color, standardization and regularity are the new forms of control of modern society.**

The great success of modern colors is essentially due to the beauty of uniformity, capable of transmitting an ideal dimension

of things to our mind. On the other hand, however, our eyes look for **dirt and imperfection**, elements that make the **color alive and human.** Before industrialization, almost every artisan creation was a **unique piece** characterized by **non-plain colors**, an object full of small chromatic variations that required a slow and careful observation to appreciate its essence.

«The taste for uneven color is a constant quality in the artifacts of the past» (Falcinelli, 2017: 19). The modern customer is now ready to appreciate the dynamic effects of **artisan color** far from modern uniformity. For this reason, the thesis project will take an industrial, fast and immediate dyeing method and slow it down bringing it back in time. In this way the final garment will have greater complexity in the color that will make it unique. Obviously in this case the choice of natural coloring also rely on a question of sustainable element which is of fundamental importance for future design. Just as in a classic painting, color is a material capable of penetrating the canvas, so natural dyes will also penetrate the fiber and merge with it.

The solid color and the artisan color are two distant languages and choices. Solid color is a mass language, it is immediate and flat colors are appreciated at a glance. It is logical that for more than 95% of modern products we need solid colors, standardization and mass-produced products for a fast consumer, but this project wants to make people appreciate the more natural, refined and intimate side of green-design. A new contact with nature with the **ancient traditions of craftsmanship, transforming them into a modern and current key.** True, the modern consumer prefers solid colors, but it is also true that consumption is moving towards a more conscious purchase. It is on this concept that we want to force and lay the foundations for the design of the thesis project.

ON THE LEFT:(FIG. 22) *Lido Swimwear Campaign* shot at La Muralla Roja, via pinterest
ON THE RIGHT:(FIG. 23) *Coral wind*, via flickr





2.5

Chromo- phobia and pure white

Cleanliness and safe

There is no color like white, according to countless market surveys, capable of better telling the concept of cleanliness and hygiene.

I believe that the proposal to design thesis garments with natural organic whitish or neutral colored fabrics represents a very important concept for the consumer of 2020: **sterilization**. In a society conditioned by the threat of Covid-19, the concepts of cleanliness, hygiene and sterile are revolutionizing our habits, finding a **reassuring aspect in the white color**. As we have seen in previous chapters, color tells its stories and meanings for the society of a given historical period and the meaning is not universal.

As far as concerned clothing the modern society prefers white, neutral and black colors, thus generating a concept of **chromophobia on the perceptual level**. This relationship of color and non-color is reflected in everyday life. To go to the office the consumer prefers a dark suit capable of expressing seriousness and authority.

Achromatism for modern society is something measured, **moral and elegant** (Falcinelli, 2017).

In the contemporary world, the white color

is synonymous with classicism that refers to the aesthetics of Greek and Roman art. By the way the fact that the ancient statuary is white is a somewhat modern concept. In fact, these works were brightly colored in antiquity, but time has erased the pigments from their surface. The neoclassical generation, who discovered these sculptures, preferred to recognize an idealized this imaginary of the white color due to the **purity of naked marble**. The success of the white color in the mid-eighteenth century is probably due to its opposition to the world of industrialization and new synthetic dyes.

Two centuries later, the concepts of the designer and architect Adolf Loos and his condemnation of color and ornamentation reinforce this concept of modern classicism and simplicity. Loos offers a more minimalist and modernist idea of seeing things by enhancing their essentiality.

It is not that modern society does not like colors, on the contrary colors are very popular, but not as far as clothing is concerned. Even the scholar and lover of color Goethe says that «refined people have a natural disinterest in bright colors» (Falcinelli, 2017: 310).

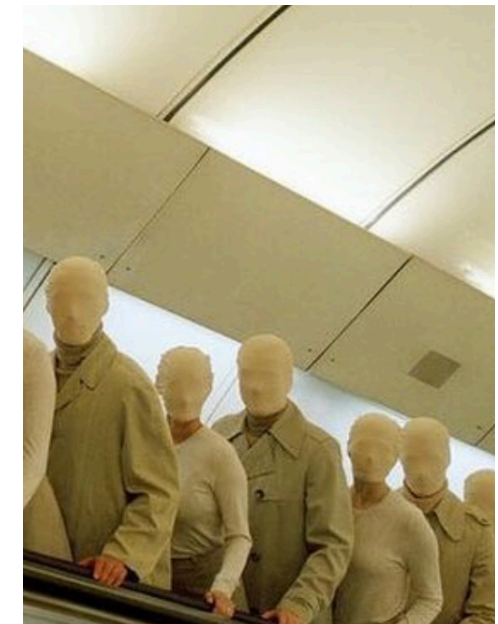
Chromatic minimalism is perhaps one of the most current trends in the world of fashion: «black is indispensable. And love for white is law», thus transforming our clothing into a sort of uniform for the modern man (Falcinelli, 2017: 310).

White color is also the pure essence of the work of the Antwerp designer *Martin Margiela*. The poetic and stylistic choice of a total white visual communication is dictated by the desire to communicate: **purity and harmony**. Entering its showrooms the customer is overwhelmed by the white color that is everywhere and changes according to the surfaces and raw materials involved. White could also represent the absence of the identity of the designer: «for years the Belgian designer has chosen to deny himself, to erase his figure, perhaps to bring out his nameless label, stopped by only four white points, rightly visible: they had to be cut quickly, to remove even the sign that somehow would have led to its creator, this at least the intent of the origins » (Frisa, 2009).

In fact, the name Martin Margiela represents a collective name characterized however by a strong creative and artistic identity.

White is an iconic color even when the brand is founded. In 1988 the Belgian designer chose a single dress-code for all the staff: the *blouse blanche* uniform.

Achromatism for modern society is something measured, moral and elegant (Falcinelli, 2017).



IN THIS PAGE: (FIG.25) Image by [@micha_l_pudelka](#) for Prague National Theatre, via [maggieontherocks.com](#)

03



Textile Industry a
Pollution Issue

COVER IMAGE:(FIG.26) via @fash_rev

3.1 Water footprint

in the textile industry

Pollution can be seen as a critical issue in the fashion industry. I want to focus in particular on water pollution and waste because it is one of the aspects that will influence the thesis project. In fact the use of natural dyeing will have a very low impact on the global water footprint considering that classic dyeing process in the **fashion industry** belong to the «top three water-consuming processes and contribute about **90% of the total water footprint**» (Aivazidou & Tsolakis, 2019: 83).

Freshwater is an essential water resource, but 70% of the global water use is used for agriculture and 22% it is used by industrial sectors, such as fashion. The use of this resource is assumed to grow to 400% in about thirty years and that nearly half of the global population will face serious water scarcity problems (Aivazidou & Tsolakis, 2019).

For a deeper analysis we need to introduce a new concept of **water footprint (WF)** «as a key performance indicator of the total freshwater volume consumed and polluted directly or indirectly across a product's end-to-end supply chain» (Aivazidou & Tsolakis, 2019: 77). In order to better understand this concept, water footprint has been dividing due to its impact on sustainability in three different categories: green, blue and gray WF. Green WF is related to the consumption of rain water in agriculture, blue WF is the water used for commodities while the gray WF refers to the freshwater that industry need to add to the toxic water in the process of production (Aivazidou & Tsolakis, 2019).

According to what the United Nation estimated so far, fashion industry «is responsible for 10% of global greenhouse-gas emission and 20% of water waste» (Humes, 2019: 279).

The environmental impact of a household's clothing in a year is the same of the amount of water needed to fill 1000 bathtubs and

the carbon emissions can be compared to an average modern car driving for 6000 miles (Shirvanimoghaddam et. al., 2020).

Unfortunately, water is a very important element in this sector. The use of this basic necessity good starts with the irrigation of cotton plantations, for example, up to numerous washes, scrapes and dyes where, in addition to using tons of water, you often end up polluting it with toxic chemicals.

Up to 37% of clothes production is made by cotton. Cotton might be consider a sustainable fiber, because we perceive it as a natural one. That is actually more complicated than that. Cotton's cultivations, actually consume a huge quantity of water and in many cases cotton farming regions are facing problems such as water scarcity (Aivazidou & Tsolakis, 2019). It is shocking to know that «for production of 1.0 kg of cotton, there is a need for approximately 7000 to 29,000 L of water. More specifically, for making a **cotton T-shirt, 2700 L of water** and a large amount of toxic chemicals are used which affects soil, water, ecosystem and people's health» (Shirvanimoghaddam et. al., 2020: 2-3). Another interesting data, according to Levi Strauss, is the freshwater used in the process of making a pair of Jeans which is more than 3700 L. In order to face this problem, fashion sector is moving towards **water-saving strategy** across all the supply chain and manufacturing process.

As we seen before, «significant volumes of water throughout all processing operations, such as dyeing, bleaching or/and washing» are used in the fashion industry (Aivazidou & Tsolakis, 2019: 78). Fashion sector takes part in freshwater pollution also because of chemicals used to process fabrics. That is why a new sustainable opportunity in the fashion industry could be the production of **water-friendly textile or dye**.

The toxic chemicals used generated another big global



IN THIS PAGE:
(FIG.27) *Citarum River (Indonesia)*, artwork posted on @fash_rev

(FIG.28) Concept map about the *impact of the textile industry on freshwater resources*, created by the author.



environmental challenges for the fashion industry is to reduce, up to almost total elimination, of **micro-plastic and micro-textile waste** that go to pollute the ocean. A serious consequence derives from this sad fact is that fishes might end up swallowing these micro-waste and this can also damage our food chain.

In this regard, I would like to include a 2017 study, which appears in the *Journal of Cleaner Production* n° 149 and concerns the fundamental role of NGOs in negatively influencing consumer behavior regarding company's unethical practices (Grappi et. al., 2017). The role of the NGOs by publishing the campaign is to develop more sustainable and responsible business and promote a more ethical consumption. In this article the “**Detox**” campaign by Greenpeace in 2011 has been analyzed. The focus of the attention goes to highlighting the negative reaction of consumers regarding brands that were accused by this campaign. The aim of the *Detox* campaign was to reduce toxic chemicals in the manufacturing process and final products of the fashion brands (Grappi et. al., 2017). Another similar campaign by Greenpeace was the “**Dirty Laundry**” in 2011. It blamed textile and fashion company in China to pollute the water with the discharge of hazardous chemicals (Grappi et. al., 2017).

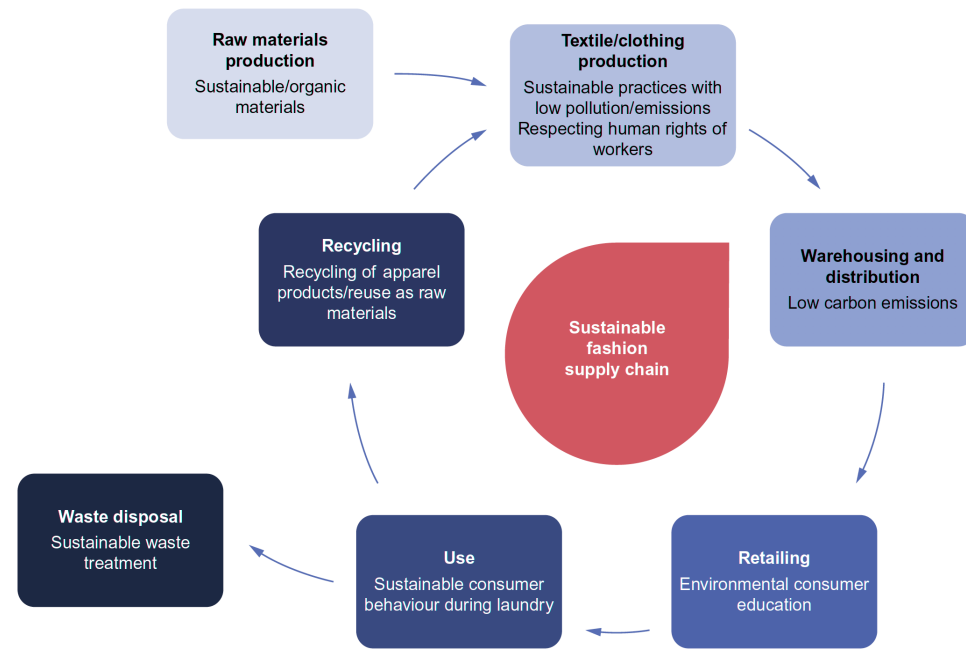
In China, there are still industrial areas that do not care about water pollution. That is why dirty water is dumped directly into rivers. This neglect made the *Jian* river, for example, change color: it become red. (Cline, 2018).

The use of toxic substances in dyeing processes is not only an environmental problem. Indeed it leads to skin problems and irritation on consumer skin due to the use of toxic substances. This campaign was followed by another one, only one year later. The “**Cleaning up the Fashion Industry**” is a campaign which denounce many polluting Chinese factories (Grappi et. al., 2017).

All these campaigns were followed by events, environmental protests and flash mobs with the aim of denouncing the brands and making the customer aware. In fact, the started to less willing to purchase from them.

As an effect generated by these numerous campaigns, was some of the brands were convinced to reduce carbon footprint and eliminate toxic chemicals into water by 2020. To date, these are some of the most sustainable luxury fashion brands: Stella McCartney, Gucci, Burberry, Prada and Dior. We also need to include Patagonia, Reformation, Nanushka, Mara Hoffman, Espirit, Nike, Uniqlo and some of the biggest fast fashion brands, such as Zara, H&M and Asos, with their sustainable collections and sustainability programs.

By the way it is clear the one of the future and present biggest challenges of the fashion sector is to generally **improve their corporate social responsibility agendas**, because the modern consumer has change is attitude. In fact consumers «are willing to pay a premium for an eco-friendly high quality fashion product» (Aivazidou & Tsolakis, 2019: 78). **The new consumer has rise its environmental awareness and its social consciousness** throughout all the fashion industry. In fact by now he will pay more attention in the purchasing phase, looking for this two important aspects.



ON THE TOP (FIG.29): a woman collects a sample of red polluted water flowing from a sewer into the Jian River in Luoyang, north China's Henan province, via newsweek.com; ON THE BOTTOM (FIG.30) *Sustainable fashion supply chain framework*, via (Aivazidou & Tsolakis, 2019)

The role of dyes in the water footprint.

The dyeing processes of modern industries are one of the main causes of the climate crisis of these days. Just to dye fabrics worldwide, the textile sector uses enormous quantities of water ranging from «six to nine trillion liters per year» (Cole, 2019). In addition to having to deal with the problem of water waste, modern dyes are predominantly chemical and require complicated and expensive filtration processes to clean the water from chemicals that are harmful to the health of the environment and man.

For this reason most of water used in the textile sector for dyeing fabrics, equal to approximately **3/4 of the total volume, becomes non-drinkable waste water**. This waste water is made up of dyes, alkalis, heavy metals, and various chemicals (Cole, 2019). Some of these substances, which are used in China and India, cannot be used in dyeing processes here in Europe. This is the cause of various debates on the issue of importing fabrics from these countries. Without these filtering processes, waste water is discharged into rivers and lakes causing serious damage to the ecosystem (Chen et al., 2020). Bleaching, dyeing and mercerization are just some of the textile processes that produce significant amounts of alkaline

wastewater that **alkalize the receiving water bodies if water filtration is not performed** (Chen et al., 2020).

A very innovative project, which aims to solve this environmental problem, is the work of the biodesigner *Natsai Audrey Chieza* (founder of *Faber Future*). Through the use of microorganisms, the designer has revolutionized our concept of dyeing. There is a microbe who produces pigment capable of dyeing fabrics. The colors change from blue to pink depending on the pH of where the bacterium grew. This technique «consumes 500 times less water than standard dyeing processes and completely eliminates harmful chemicals» (Cole, 2019).

This environmental crisis has pushed new artisans to go in search of centuries-old techniques. *Porfirio Gutiérrez*, Mexican textile artist, is writing a book that talks about ancient natural dyeing techniques that were handed down exclusively orally.

In any case, the idyllic desire to bring natural dyeing on a large scale, according to *Jess Cole* in an article on *Vogue Italia*, seems to be a distant future. These dyes are difficult to find and have higher costs

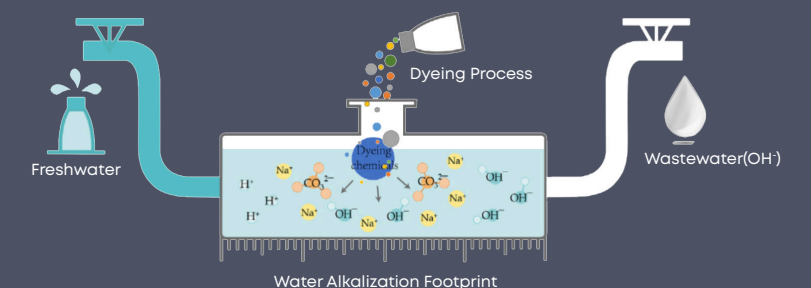


than synthetic ones. For this reason there would be a sharp increase in costs in mass production.

I personally am more positive on this point. In my opinion, small industries can begin to emerge and make their mission from natural dyeing. Before 1800, natural dyeing was the only possible solution. Preciously colored and fine fabrics were imported from faraway India, France and Turkey. If this scenario was possible more than 300 years ago, I don't see why it couldn't be in 2020.

Certainly natural colors cannot have the same timing as synthetic dyes. The solution lies in having confidence in

slower production processes that are based on Slow Movement and in going to interest a conscious and committed consumer. **Natural dyes are not for mass consumption but for intimate, artistic, individual garments and for the expression of one's personality.**



3.2 Clothes to landfill

Global tide of used and discarded goods

The fashion industry, which it also include fast fashion, is guilty of a serious environmental, health, social and economical concern (Shirvanimoghaddam et. al., 2020).

In addition to taking care of the processes of manufacturing of a product, we also should take into consideration **how we dispose it**. That's because the average of global annual consumption of textiles has doubled for each person and touched the huge number of **100 million tonnes of textile consumption** (Shirvanimoghaddam et. al., 2020). Of all this production, more than two thirds of the textile products end up submerging landfills all over the world and a small part of which is then burned while only about 15% is recycled (Shirvanimoghaddam et. al., 2020). So basically one of the biggest problems is the huge global tide of used and discarded goods, which not only involve fashion products but also furniture, kitchenware, shoes, decor and technological items (Humes, 2019). According to Adam Minter, a journalist who writes about environmental problems, the modern consumer is driven by **overconsumption**. This is a mass behavior that makes us to buy and store more goods than we actually need. In

general the majority of consumers, prefer new clothes and accept the poor quality of product if it is inexpensive. This behavior only increase the amount of clothes that will be thrown away after few months.

«According to the recent industrial reports, \$400 Billion worth of clothing is wasted every year and an average Australian purchases **27 kg of new textiles** each year of which **23 kg is discarded** into landfill» (Shirvanimoghaddam et. al., 2020: 2).

This numbers are so much bigger in North America. They are reaching up to an average of 37 kg (about 64 items of clothing) per user each year.

Two thirds of the garments that end up in landfills are made of man-made fibers, and this aspect complicates things. In fact, it takes 200 years to breakdown a polyester suit. By the way there is another problem linked with petrochemicals and synthetic fibers. Those kind of fibers have increased carbon dioxide (CO₂) emissions.

In order to build a great sustainable fashion company you should take in consideration multiple aspects, which could be: local sourcing and production, produce avoiding toxic elements and using renewable energies, adopt an ethical manufacturing and take care of social



responsibility, support long life product through circular economy.

As Aivazidou and Tsolakis (2019) point out in their article sustainability is leading several emerging trends.

Since in the apparel industry clothing consumption and environmental footprint are rising and becoming unacceptable, fashion brands should act sustainable following some steps: «(1) setting sustainable responsibility standards in cotton production and garment design, (2) using nontoxic and sustainable materials, (3) establishing reuse and recycling programs, (4) offering garment repair services, (5) using organic cotton, (6) investing in new fibers, (7) educating consumers about clothing-care practices,

and (8) consulting suppliers over labor and environmental issues» (Aivazidou & Tsolakis, 2019: 85).

From the article “Death by waste: Fashion and textile circular economy case” on *Science of the Total Environment* it is clear that the huge and global volume of textile waste can be fight through **textile reuse and recycling**. This aspect will positively influenced the reduction of waste into landfill, but not only.

Through the application of **circular economy**, in fact, you can also reduce «the production of virgin materials and energy consumption as well as producing a smaller environmental footprint» (Shirvanimoghaddam et. al., 2020: 2)



People discard an average of 23kg of textile every year.

IN THIS PAGE: (FIG. 3.3) Image via textile.systematism

3.3

Low Cost Mania*Fast Fashion and Overconsumption*

Low cost is a particular consumption model that has become worldwide and had great success in Italy. The first application of this consumption model dates back to more than forty years ago with the first flights of *Virgin Atlantic Airways*, but over time this model has become part of our purchasing habits.

To date, in fact, there is no commodity sector that does not use this type of strategy: flight companies (*Ryanair*), furniture stores (*Ikea*), sports shops (*Decathlon*), cars (*Fiat Panda*) and finally all the big giants of fast fashion (*Zara*, *H&M*, *Mango* ..). The undisputed protagonist of this form of consumption is the middle class and young people.

Before the advent of low cost «there was a highly pyramidal pricing structure. Above, a small amount of products sold at a high price but also with a high perceived value. In the middle a large quantity of medium products, with prices and perceived value of an equally average level. Finally, below, many products with even lower price and perceived value levels. The relationship between price and value therefore also represented an orientation tool for consumers: a higher price corresponded to a higher perceived value and vice versa» (Rizzo, 2010: VIII). The new low cost model breaks this relationship between price and perceived value for the first time. You can spend little and have products and services that correspond and satisfy the needs of the new consumer. It is a fascinating and engaging model. The low cost allows you to build your personal identity, offers numerous choices, always updated, which are not very demanding from an economic point of view. The contemporary consumer is free, and no longer buys out of necessity, but out of personal satisfaction.

We can summarize the behavior of the modern consumer by outlining it into two categories. The low cost led to a buying behavior called *trading-down*. In this case, the consumer is pushed to buy products with

IN THIS PAGES (FIG. 3.4) *Enduring Love*, by Craig McDean for British Vogue February 2019.



“We live in an era where the superfluous is our only need”

Oscar Wild, Aphorism.

particularly advantageous prices as long as the quality-price ratio is acceptable.

At the same time we are witnessing a consumer who instead is willing to pay, only to buy certain brands, a significant difference in price compared to his low cost variant. This type of approach is called *trading-up*. This kind brands are able to offer the customer a series of services related to the purchase of the product, leveraging emotional power. In this case, in fact, the price justifies the expense of the product thanks to the value that that brand has for us and for society.

The contemporary customer is able to swing freely and consciously between these two apparently very different buying behaviors. It performs «purchase deeds for an intimate satisfaction» (Rizzo, 2010: 21). Usually this hypothetical consumer buys designer luxury accessories to access the elite world of the brand and the rest of his purchases are made by the fast fashion giants.

This is because the range of cheap fashion products still have good performances for the price offered. The problem usually in these cases is reflected in the conditions of the workers, the quality of the raw materials used and the production processes.

Two great inventions of the last twenty years have favored the development of low cost: outlets and fast fashion. The outlets allow you to buy renowned brands at reduced prices while the success of fast fashion is due to the ability of the companies to offer customers a wardrobe in line with current trends which everyone can afford it. It is the beginning of the **democratic fashion era**. However, these inventions on consumption and purchase methods are not enough for the modern consumer who wants a more varied and prolonged shopping experience. The concept of shopping is amplified and becomes entertainment. Shopping centers were born in Italy in 1970: «a sort of Disneyland of shopping where you don't just go to buy at affordable prices but to have lunch, to see a movie to chat and walk in large and clean pedestrian areas without the hindrance of cars» (Rizzo, 2010: 50). The sociologist Gegeorge Ritzer in his essay Religion of consumption, compares the purchasing process to a sort of religious cult, where the customer is in a condition of pilgrimage to the shopping cathedrals (Rizzo: 2010).

Fast fashion, as we have already analyzed in previous chapters, generates a huge problem for the fashion industry. «How is it possible that a garment costs less than a sandwich?» (Li Edelkort quoted in Biserni, 2019). The final fashion product is the result of various production operations and its final cost should reflect all these steps. Instead the fast fashion chains are able to offer the product to the market for a couple of euros.

Most consumers interpret the lowest price as the right price. The new paradigm is that of *cheap-chic*: the cost is minimal for the consumer, but it is high for our planet (Cline, 2018). The first fast fashion company is Zara. The Spanish brand is able to design a garment and display it in all its retails in just two weeks. Speed,

trendy products and low prices are the ingredients that conquer the fast fashion consumer. All this rush of producing and buying is also increasing the price of fibers. The demand for cotton, for example, far exceeds the offer.

The cost is minimal for the consumer, but it is high for our planet. To address this problem, the United Nations has proposed 17 **Sustainable Development Goals** (SDGs) to be adopted by 2030 (Biserni, 2019). The general objective is to make a positive impact on the environment but also on the human one. Some of these points are: reducing poverty, guaranteeing health conditions, promoting sustainable agriculture, guaranteeing sustainable management of clean and sustainable water and energy, promoting sustainable growth, safeguarding the oceans and protecting the ecosystem. The consumer also plays an important role, in fact greater information and transparency about the products must be guaranteed.



IN THIS PAGE: (FIG. 35) *Extinction Rebellion Is Protesting London Fashion Week With "Die Ins" and a Funeral*, Photography by Immo Klink on Vogue Runway

3.4 The Slow Fashion Model.

A way to improve our moral identity and self-esteem.

As we have seen in the previous chapter clothing consumption is reaching dimensions never seen before. It is therefore understandable that this fact raises concern on the environmental issue and human well-being.

Now a days one of the favorite business models is the fast fashion in which the garment is quickly bought, worn and thrown away. In fact, within their stores the products are continuously replaced to keep up with the trend and consumers needs. Consequently **three quarters of our purchases end up in landfills.**

Another problem related to the world of fast fashion is that workers often do their jobs in unsafe situations. One of the biggest accidents dates back to 2013, where more than 1100 Bangladeshi employees lost their lives because Rana Plaza collapsed.

The choice, which led many companies to move production to the East, was dictated by the advantage of a low-cost workforce. «Bangladesh» for example, «requires factories to pay workers only \$ 43 a month» (Cline, 2018: 57).

In order to face such environmental and social issue the slow fashion model has been create. It is define as «a holistic philosophy that seeks to change modes of production and consumption» (Legere, A., Kang, J., 2020: 1). It focuses not only on raw materials but **it tries to slowing down all the processes:** production and consumption. The slow fashion model it is based on the slow movement. As for the slow movement, the goal of slow fashion is to «merge the hedonic aspects of fashion consumption with a commitment to the fair treatment of garment workers and taking better care of the environment» (Legere, A., Kang, J., 2020: 2).

There are five main aspect that make slow fashion a big player in the sustainability issue: **Equity, Localism, Authenticity, Exclusivity and Functionality.** From this pillars we can understand that the

purchase moment is driven by the desire of having something exclusive, sustainable and made by high quality.

It is clear that this new model stands as a possible alternative to the current fast fashion one. Despite the slow fashion model might be extremely challenging to adopt, we need take into consideration that «the demand for sustainable made products is higher than ever, as consumers become more educated and enjoy more immediate access to information» (Legere, A., Kang, J., 2020: 1). In the article “The role of self-concept in shaping sustainable consumption: A model of slow fashion” by Alisha Legere and Jiyun Kang, it is explained how they tested and truly believe that customers are driven by their will to **improve their self-image through the purchase of sustainable products.** They were able to examine and prove the central role of self-concept as a motivator in decision making for slow fashion and behavioral intentions (Legere, A., Kang, J., 2020). In fact fashion has always been a symbolic reflection of personality, feelings and attitude. Through sustainable fashion the **consumer could reflex its moral identity, self-esteem and benefits.**

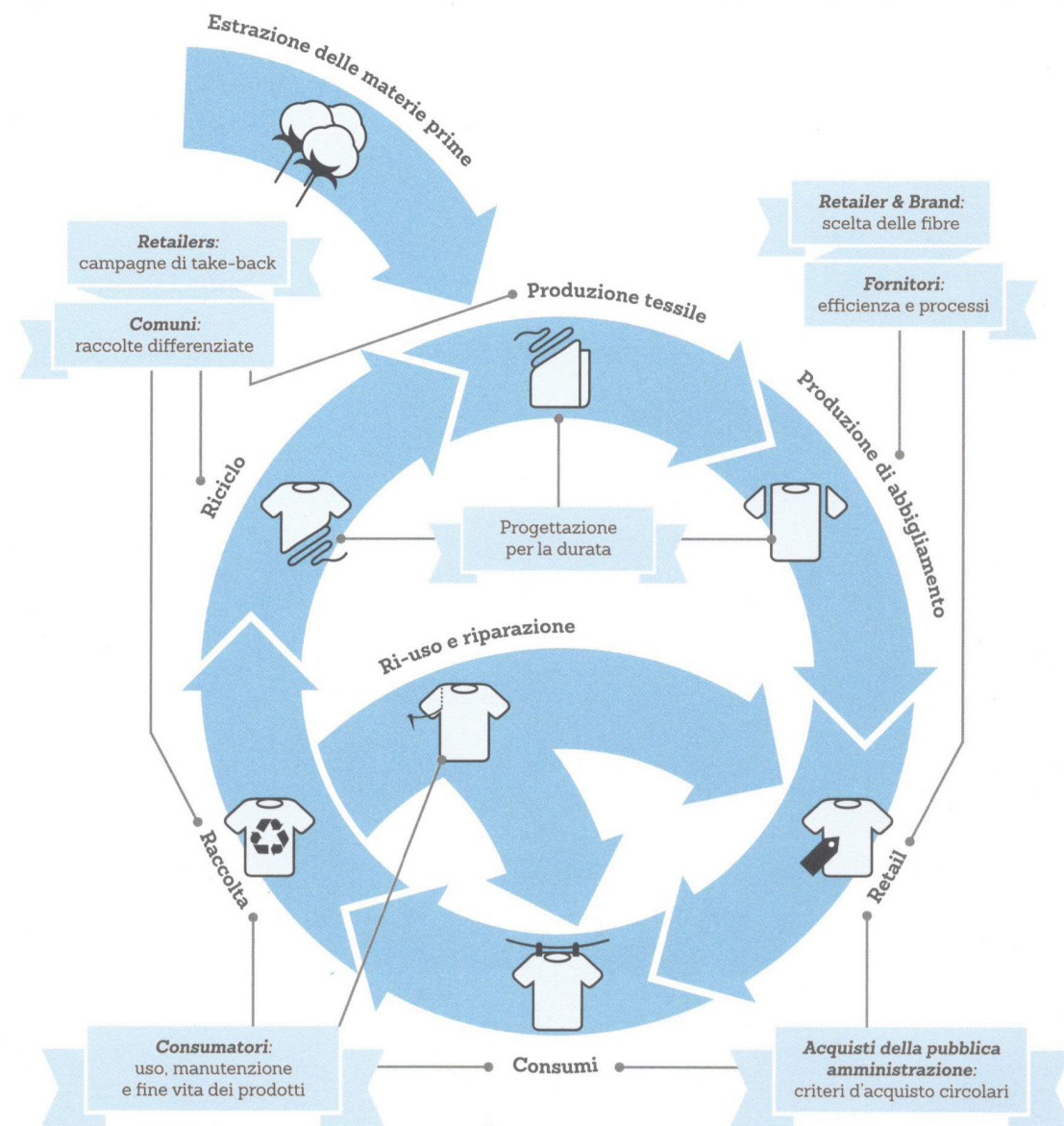
To sum up the slow fashion model describes the moral identity of the consumer and his behavior in the purchase of sustainable products. This process implies a strong awareness on the environmental issue and sees the benefits of self-improvement through the purchase and use of these products.

Moreover this model will take into account the **quality over quantity** unlike the fast fashion model. In fact clothing is designing with the intention of durability. In order to support this aspect the fashion sector should rise its initiative of free repair services, second hands, re-creation and garment recycling. All of this aspects are deeper explained in the chapter below.



The five pillars of slow fashion: «**EQUITY** considers the understanding and care consumers have of fair labor practices when buying clothes; **LOCALISM** stresses the value of buying domestic products; **AUTHENTICITY** is the appreciation of clothing made by handcrafted and traditional methods; **EXCLUSIVITY** is the value consumers place on rare clothing, and **FUNCTIONALITY** is defined as the concern consumers place on the longevity and versatility of clothing» (Legere, A., Kang, J., 2020: 2).

IN THIS PAGE: (FIG. 36) Tencel™ x Refibra™ in Closed Denim collection



IN THIS PAGE: (FIG. 37) Map of the circular approach to sustainability in the fashion sector according to the European clothing action plan (ECAP), via (Ricchetti, 2017: 27)

3.5 Circular Economy

As a new solution for the fashion system

Repair our clothing is a revolutionary act. We don't want disposable clothing because we value the people who make it.
(Fashion Revolution's post on their Instagram)

Circular economy and secondhand could be two possible solutions in facing the problem of traditional economy made by manufacturing, use and dispose. In both two cases the aim is to keep the «resources in a loop for as much time as possible, try to maintain their value while in use, and repurpose for generation of new products at the end of utilization» (Shirvanimoghaddam et. al., 2020:1). In addition the circular economy pushes all the fashion sector to adopt **sustainable raw materials, eco friendly manufacturing trying to mitigate water and carbon footprint**. Bio textiles, toxic chemical free, play a central role in the circular economy because it is easier to extend their life cycle or recycle them. Another green option for the fashion system is generated by the **sharing economy**. Many companies are relying on the Internet to create online communities where it is possible to rent clothing or buy them second-hand. According to Minter, so far, we are not able to create a circular economy, which means reduce waste, retain products' values through use, reuse and recycle (Humes, 2019). Actually I have to say that I don't fully agree with this thought. I believe that the whole

fashion system is pushing towards a drastic change as regards the ecological and environmental aspect. In fact, as we will see in the following chapters, the concept of green is becoming more and more an element of fundamental importance for the development and success of all companies. What I would like to underline through these frightening data on pollution is that in this way we cannot continue, or at least we should no longer produce, in this way and that the fashion system should react and improve day by day. To sum up, if you want to be a brand that works for the protection of the environment, aspects such as waste and pollution of water or the overproduction of goods of mediocre quality must be diminished or totally eliminated. For this reason, for the development of the thesis project these aspects were addressed in a positive and green way, trying not to damage the current situation. To support the idea of a green transformation of the fashion industry there is the strong idea that the modern consumer is interested in the way of how a product is made and this is one of the reasons that lead to final consumption. This means that «decisions are driven by moral rationale and pro environmental motivation» (Grappi et. al., 2017: 1164).

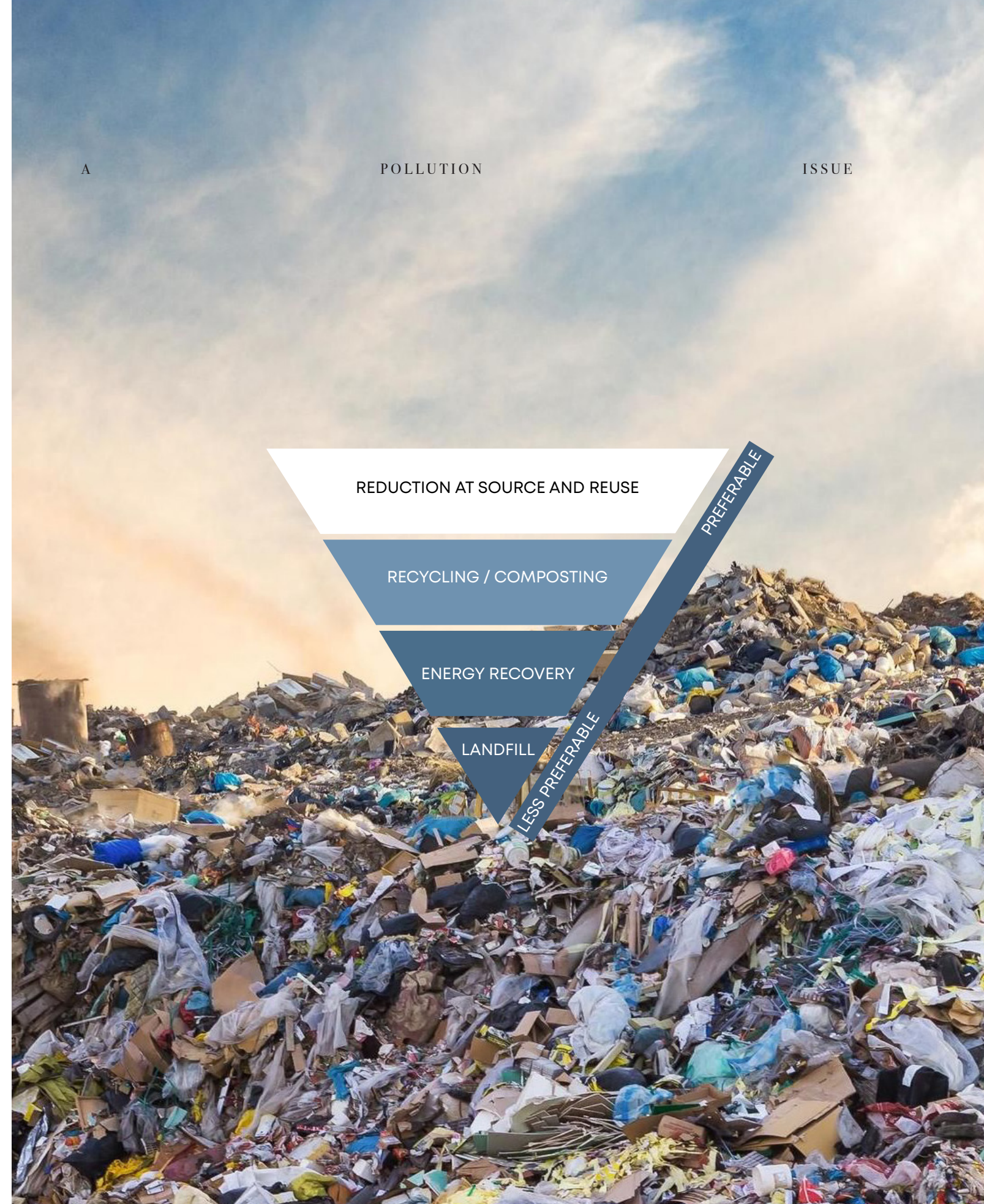
There is a hierarchy in waste management and disposal.

The triangular scheme proposed by the *US Environmental Protection Agency (EPA)* orders non-hazardous waste by placing the preferable solutions for waste management in the upper part, while in the lower part we find the least preferable choices (Ricchetti, 2017).

1. The first option is to **re-design** products starting from the supply chain, from the choice of materials and from the packaging.
2. **Reuse**: Transforming "waste" into a new product. This choice is compatible with the circular economy where we try to extend the life of the product.
3. **Recycling** of materials.
4. **Energy recovery** from non-recyclable waste.
5. **Landfill disposal**. This is the last and worst option. In a future prospect, point 5 must disappear as it is the most harmful to the environment.

The thesis project wants to be designed following the design spirit of point 1: re-design. With this project, in fact, we want to prevent waste. Re-design rely on designing sustainable products that can be disposed of or reused easily and it takes in considera

IN THE OTHER PAGE: (FIG. 38) *Clothes dumped in landfill*, image via independent.co.uk; Waste management hierarchy Graph, via (Ricchetti, 2017: 140)





Shopping Triggers

The reason why we buy

Cover Image: (FIG.39) artwork by Isabel Castillo Guijarro

4.1 Ideas move the world.

The added value

This section of the thesis is dedicated to all those ideas and strategies that today are the basis of a good competitive project in the market. For this reason they constitute a fundamental part of the research for the development of the final project. In fact many of these topics, after analyzing them, have become conceptual pillars on which my project is based.

Most **consumers are attracted and seduced** by new services and products capable of enhancing the intangible and highly emotional aspects.

The *added value* pushes us to buy, for example, the sixth coat for the winter season, when actually we know that probably only one coat would be enough. Isn't it the function of a coat to protect us from the cold? So what is the difference between coat number one, number two, etc.? Answer: aesthetics. The functionality of the coat, however, goes into background. This means it is the **emotional power** linked to design, color, material, packaging, retail and social status that I will get by buying this coat, which has the function of trigger and drives us to purchase. From this point of view we are able to perceive a luxury good as necessary and indispensable (Turinetto, 2018). By perceiving a product as *necessary luxury* we are going to emotionally justify its purchase.

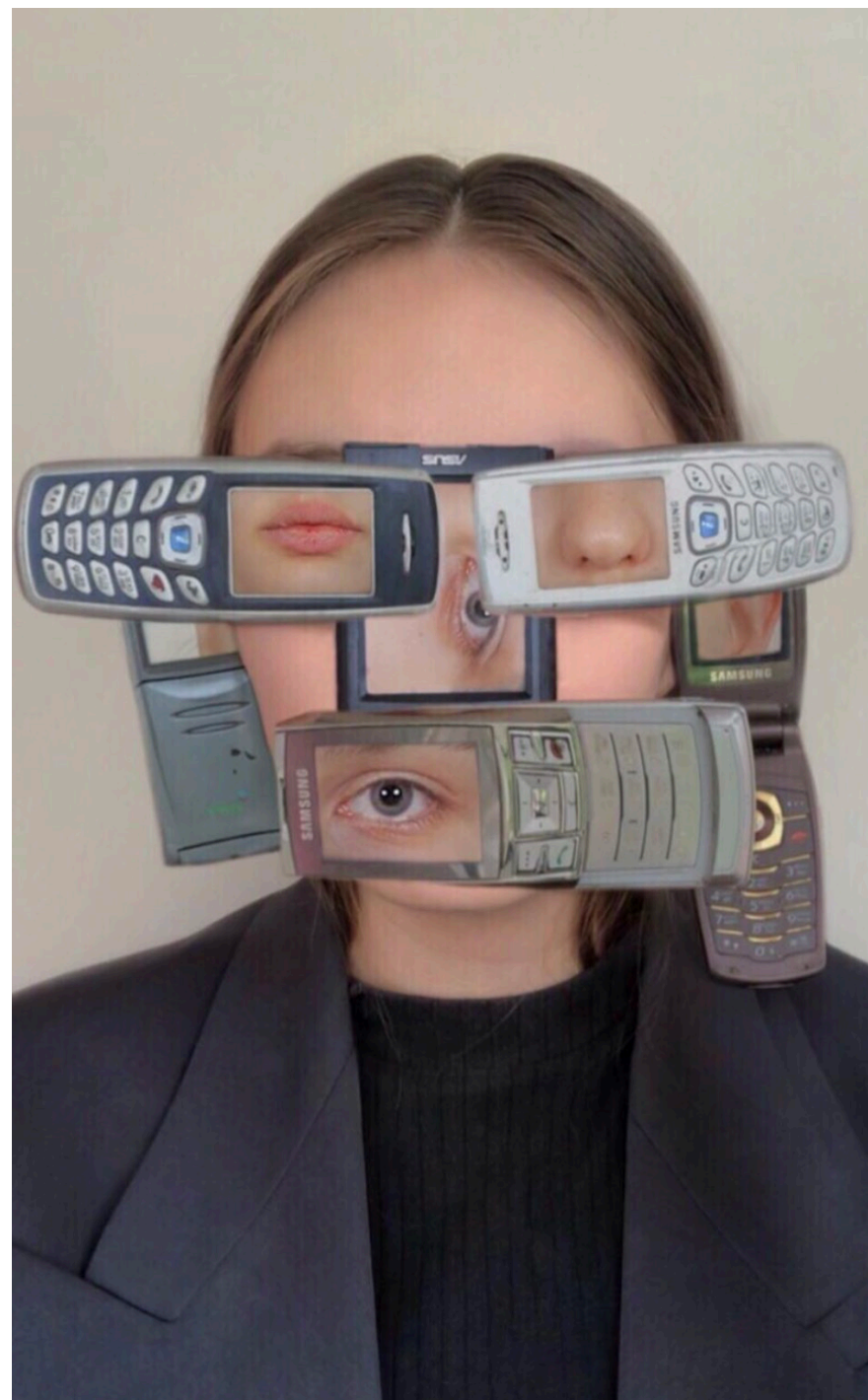
The purchase becomes less and less rational and more emotional. In fact, it is the product that is capable of «generating a memorable consumer experience» that is what the costumer wants. (Turinetto, 2018: 39). Summarizing these concepts we can affirm that the

modern consumer wants «to be stimulated by products that anticipate his desires» (Turinetto, 2018: 77).

The concept of owning more products than what is strictly necessary, helps the fashion sector not to improve its relationship with pollution. In fact it remains the second most polluting sector in the world.

In this chapter we will analyze some of these added values that lead to purchasing for personal satisfaction. The emotionality of a product is an idea that is the basis for proposing a competitive and winning product in today's market. For this reason «even the daily choices for luxury goods become more selective and move towards solid products and services with declared and concrete added value» (Turinetto, 2018: 21). In addition, to attracting us the brand becomes a guarantor of quality, originality and innovation. Modern society evaluates its propensity towards a purchase of one product, rather than another, based on the **added value of the idea behind the project**. This added value can go to involve the uniqueness of the product offer, its **interdisciplinarity** obtained from the transfer of ideas from one sector to another: the so-called “moving ideas” (Turinetto, 2018).

The human being is attracted to **novelty**, therefore to new models and new uses. In terms of technology, for example, we are always looking to grab the latest model, the one just released, which is able to satisfy new needs. This component is able to make the product more attractive and therefore much more competitive.



IN THIS PAGE: (FIG. 40) image via @hamezaruma

Therefore, **innovation and speed** are also two factors capable of differentiating a product. These are expressed aesthetically through **design**. The consumer wants to be surrounded by «objects to admire, touch, exhibit and dispose of, goods whose value embraces an intangible but visible and concrete dimension» (Turinetto, 2018: 14).

Owning a design object can give us a certain status, or a social position within a more or less elite belonging community. Finally, the purchase of the product gives us personal gratification. In fact, these are small or large expenses determined «by a push to want to grant, at the source of other renunciations, new satisfactions» (Turinetto, 2009: 21). This mechanism is governed by the so-called “available resources”. The top of the range and the economic product begin to coexist in our lives: fine French wines and frozen meals can appear on the same table during a normal dinner, as well as a Gucci bag and a pair of H&M Jeans can be the outfit for an evening in Milan.

Time is another fundamental modern value. Free time and time for the person can improve the style and quality of life of the consumer. It is an entity that has a social importance because it cannot be produced or sold, and today it seems that people lack the time nowadays. In fact, time allows us to access the sphere related to personal **well-being**.

Of fundamental importance is the retail sector which assumes a very important function at the time of purchase. The shop itself, with its beautiful showcase,



TRIGGERS.

THE

ROLE

OF

EMOTIONS

takes on an attractive role that convinces you to enter and browse. Once inside we are overwhelmed by a deep intimate satisfaction due to the environment, the service and the product that is offered to us. Marco Turinetta in his book *Idee in movimento*, describes showrooms as «contemporary temples where the cult of the brand is celebrated, capable also through the places, to communicate the authoritativeness of the offer and at the same time be intriguing» (Turinetta 2018: 89).

Even strategies such as those of **product customization** and the **limited series** help to make us perceive the product as indispensable and strictly necessary. Both values are able to modify the product making it unique through surface innovations for example. Usually this is advantageous because they have little impact on the cost and production of the product.

If within a product we are able to recognize one or more added values than the price of the product we consider it justified and correct. In fact, any product «can aspire to be placed in the top of the range, to the point of transforming a desire into something strictly necessary» (Turinetta, 2018: 27).



4.2

The role of emotions

Through Neuromarketing

Emotions, as we saw in the previous chapter, play an important role in the decision-making moment of the purchase. To anticipate them, it is necessary to better understand how the consumer thinks. In this perspective it is very useful to know some notions of neuromarketing.

The purchase process begins with the stimulus, or *trigger*, which is the moment when the consumer comes into contact with the product or service. When the stimulus reaches the consumer's mind he produces an answer.

Stimulus = Answer is the new neuromarketing equation and to make it work you need to focus on triggers (Gallucci, 2016).

The stimuli are able to reach the customers' mind by creating new emotions, new needs and new behaviors. «The key is therefore to create a trigger between the external trigger-stimuli (an advertisement, a claim or a sound) and an internal trigger-reaction» (Gallucci, 2016: 11).

The human brain, just like a machine, has a central decision maker that is activated in the purchasing phase. It involves three structures: the nucleus accumbens, the insula and the prefrontal cortex (Gallucci, 2016). The first structure is in close connection with **dopamine** and therefore plays a decisive role in the processes. It generates emotions and feelings of pleasure that decrease the perception of the risk produced by the insula. Finally, the prefrontal cortex collects sensory information and through rational reasoning leads us to

the final purchase.

The emotional component generated by dopamine is certainly very important and it is for this reason that shopping aims to encourage an emotional purchase. This type of purchase is prompted by forms of communication that act on the brain of the consumer.

The **limited series and daily offers** are an emotionally effective way of communicating. In fact, these techniques try to quickly bypass the rational analysis of the product and the critical ability of the consumer, focusing entirely on the concept of limited and unique product. The driving force behind all decisions is the **pleasure system**. It is activated the moment before the purchase where the consumer evaluates the emotional advantages that he can derive from the product.

To summarize the concept «our unconscious orders on the thrust of emotions, while the conscious mind executes and rationalizes, explaining the actions that derive from unconscious decision-making processes» (Gallucci, 2016: 62).

Gerald Zaltman, a professor at Harvard Business School, attributes 95% of the decision-making power to the seat of the unconscious, leaving only 5% of this power to the rational part.

The image to best represent this imbalance is the iceberg: the visible part above the water consists only of the small tip of the ice mountain.

The role of emotions is also recognized in the value that the consumer attaches to a specific brand or product.

IN THE OTHER PAGE: (FIG. 41) Unintitled, 1985 (Brain) by Keith Haring.

The brand, thanks to the **activation of the leisure centers**, performs the function of reward for an expensive purchase. In addition, brand loyal customers more actively celebrate the areas relating to pleasure, thus creating an emotional bond with the brand in their unconscious.

The role of emotions is a winning aspect, because it affects the quality not only of purchase but also of the moment. A good purchase excites us, gives us moments of joy that slow down sensations such as stress and fear.

Not only does the unconscious part of the brain guide purchasing decisions but it is also faster. Jhon-Dylan Haynes of the Max Plank Institute for Cognitive and Brain Sciences in Leipzig, has shown that the unconscious part is activated and decides seven seconds before of the rational one.

ON THE RIGHT: (FIG. 42) *Plant-Based Lighting From High Society* by Design Milk;
(FIG. 43) *Enter the void* by Klaartje Lambrechts; (FIG. 44) *Suspended Cocoon*s by
Porky Hefer



4.3 The future is green

Sustainability

Fortunately, added value is not only synonymous of innovation, novelty and speed. Nowadays concepts of sustainability and well-being are becoming two mandatory trends for future production and design. The ethical value in the near future will become fundamental for the acquisition of a new credibility of the company and the brand, and both of them will become ambassadors of deeper and more sensitive values.

The modern customer, in fact, prefers a purchase that tends to involve the ecological aspects and organic products, guided by an innovation capable of embracing ethical, environmental and social responsibility values.

The macro theme for future planning is therefore environmentalism. In this sector, the concept of subtraction and simplification to increase product quality is very important. In fact, the new goals are reducing emissions, reducing waste, reducing harmful substances and reducing the energy used. Design is associated with this green philosophy by proposing natural and eco-friendly materials that dress clean, simple and essential forms: «well-being meets measure» (Turinetti, 2018: 34).

Even in the theme of food regarding well-being, the concept of subtraction is very important. In fact, the product that has low fat, low sugar and little salt is healthier. Also in this case the biological and natural aspect act as driving forces that lead to the final purchase of the product.

The issue of sustainability as added value changes the way in which the values of a project are communicated. We will need new labels that can communicate and inform the customer on the issue of sustainability by declaring bio materials and processes.

Adopting a green-policy in your company does not only concern raw materials, but also the business process, the production



SHOPPING

TRIGGERS.

FUTURE

IS

GREEN

phases, reduction or elimination of packaging, environmental and socially sustainable investments.

In summary «the defense of the environment will create value and become a strategy for activating new businesses: building products that are more environmentally friendly, or that save energy, will in fact lead to general savings, which starting from the production processes will be directly transferred to more qualified» (Turinetto, 2018: 62).

We will end up adopting a green attitude that will make thinner boundaries between wellness and politically correct. Ethical, supportive, environmental and green are the starting points for the mission of the green-strategy because «overall ethical behaviors are then reflected in an emotional appeal, perception of quality and overall positive reputation» which leads us to a final purchase. This green strategy is also advantageous in the business and economic fields, in fact companies capable of producing renewable energy by limiting emissions and novice materials will be the protagonists of future successes.

From this point of view, sustainable products become excellent products and consequently trendy products. We must leave room for innovation that is capable of marrying traditional and ethical concepts by practicing the so-

called Lifestyle of Health and Sustainability (Turinetto, 2018).

Zero carbon footprint economy is the successful dictact, due to the new sensitivity of consumers by proposing: new solutions for transportation, more sustainable buildings, renewable energy and sustainable products. This sensitivity is summarized in the word **SEGOR**, acronymous of *Sustainability, Ethics, Green, Organic and Responsible* (Turinetto, 2009).

New consumers want to improve their lifestyles and find the answer to their desires in the sustainable product that is capable of giving a feeling of well-being.

The biggest challenge is to predict customer needs. For this reason, made-to-order products are increasingly increasing, often adopting a one-to-one customer personalization process. In this way you can have a high quality garment, maybe even hand-sewn, and not only. With made-to-order products, waste and unsold items are radically reduced, producing only what we are ordered to production. Obviously this type of service lengthens the time of purchase, but to its advantage there is the value of the single piece.

ON THE LEFT: (FIG. 45) image by Nikki McClarron, Photographer

4.4

Culture, Tradition & Handicraft

Ancient traditions

In this thesis, sustainability is not the only added value that I would like to use to develop the project.

We have analyzed some values such as time, personalization and the limited series in the previous chapter. Another genuine value caught my attention in the research phase: culture and tradition.

Through the use of the ancient art of natural dyeing, I combine **modern design with an ancient tradition**.

This is because there is a strong need to «express an extraordinary balance between the energy of the contemporary and the solidity of the traditional» (Turinnetto, 2018: 37).

In fact, what we define **socially responsible** can also include a high level of craftsmanship and quality.

There are many artisan knowledge and traditions in risk of disappearing.

Modern society, frenetic and technological, perhaps is unable to learn this **cultural know-how**, but it is certainly able to recognize the value, quality and originality of the artisan products that are regaining great importance.

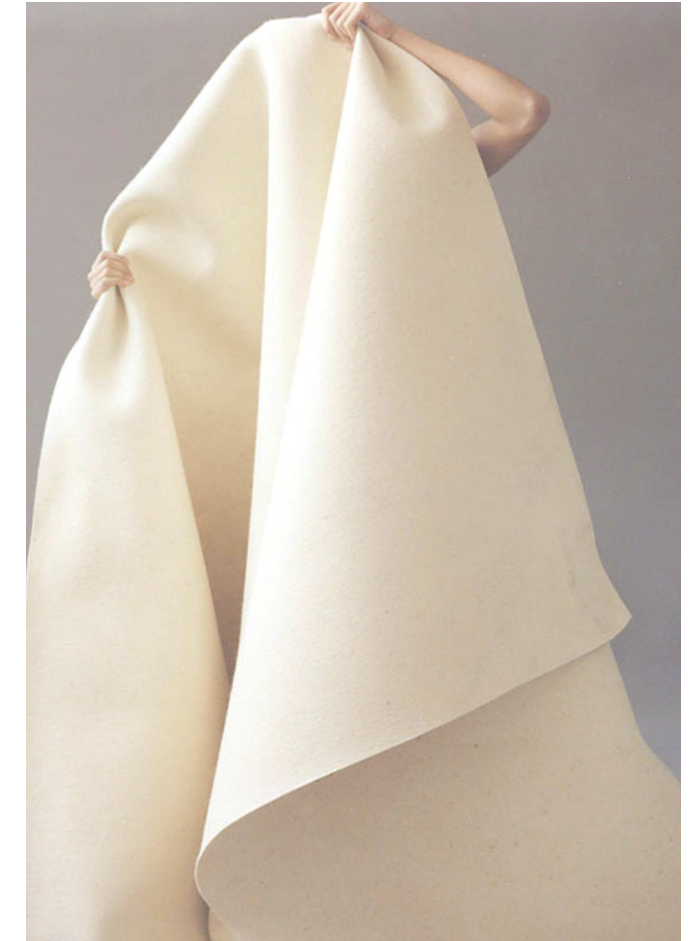
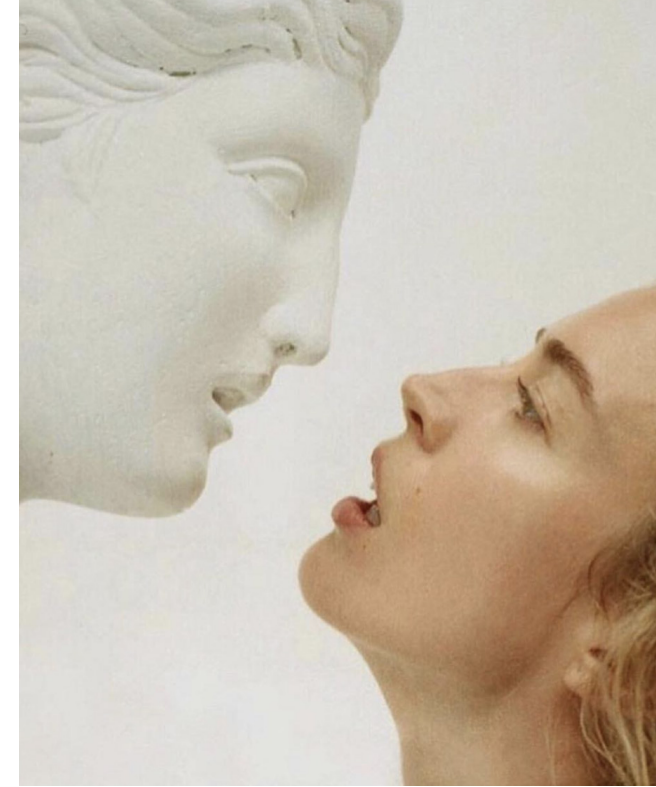
In our country, Italy, ancient knowledge has been combined for years with modern design and taste. The resulting products are a balanced mix of ancient and innovation. Made in Italy it is such an important aspects for luxury goods.

Culture has always had and will always have a decisive aspect on design. For this reason, culture is also an added value that helps us to appreciate and better understand the product and its history.

A contemporary design of particular importance in this respect is maison *Martin Margiela*. For the maison, particular attention is paid to the **world of craftsmanship, handmade, romantic love**

for ruins, the aesthetics of poverty and raw materials, the so called “Artisanal”. In this way of creating and creating products, each garment is unique.

The decadent philosophy, but with a high craftsmanship, of the brand was a source of inspiration for the design of the thesis collection.



ON THE OTHER PAGE:(FIG.46) Raquel Zimmermann photographed by Harley Weir;(FIG.47) *Vase Savoy*, Alvar Aalto; (FIG.48) Image by Michael Oliver Love; (FIG.49) The House, Maison Margiela official web site.

05



Dyeing

*Between chemical and
natural process*

Cover Image:(FIG.50) Easter Eggs, via UnaDonna.it

5.1

Modern Chemistry

Technical aspects of dyeing

Fabrics are subjected several manufacturing processes before obtaining the finished ones ready for the trade. Among all these noble processes, there is an operation that is able to provide textile materials with a special feature: the variation of their color.

Color is an aspect that is able to **modify the economic, artistic and emotional value of these artifacts.**

Until the mid-nineteenth century, dyeing was the art of the dyer who, as a painter, used to create his colors with the shades that natural dyes offered him.

Starting from the fifties of the nineteenth century «dyeing is transformed from art into technique» (Cegarra et al., 1988: 7). Thanks to the evolution of modern chemistry, new possibilities were born. They started working with a vast quantity of coloring materials applicable to natural fibers and later to synthetic ones. The dyers could obtain the colors required by the fashion system with extreme technique and new instruments.

Dyeing is a phenomenon considered to be a chemical-scientific origins, these two aspects act simultaneously in the processes for coloring the fibers.

By analyzing the dyeing process, a dye molecule goes through the following stages.

The first phase is *diffusion* in the dye bath, the molecule inside the liquid phase moves towards the fiber. This phase is followed by *absorption*, that is, the passage from the liquid to the solid phase. Finally, before the *stabilization* of the bonds between the fiber and the dye, there is the *fixation* phase, where the molecule spreads within the fiber. With the stabilization the dyeing process is over (Cegarra et al., 1988).

The birth of **synthetic dyes**, which revolutionized the fashion system in particular, is due to the birth and development of modern chemistry. It was born in 1856 with the discovery of the first synthetic dye which

IN THIS PAGES:(FIG.5.1) Image from
Alessandrini industrial dyeing



“Il colore è lo sforzo della materia per diventare luce”

Color is the effort of matter to turn into light”

Gabriele D’Annunzio, *Opera omnia*

generated a series of syntheses of new chemical products up to the *indanthrene* dye (IDH) in 1910.

IDH dyes marked a turning point in the quality of the colors and in the creation of fantastic prints and dyes. It is a group of organic dyes, very stable to light, atmospheric agents and detergents. All this characteristics were unthinkable to obtain with natural dyes. In fact, they are the maximum expression of the potential of synthetic dyes.

Retracing the phases of the birth of modern chemistry, an event that deserves attention is the discovery of the mauve color.

In the 1800s, malaria was widespread and the remedies still held true to popular beliefs without any type of scientific foundation. In England, with the advent of the industrial revolution and the development of illuminating gas, it consequently led to the production of hard coal and tar. Thanks to these new discoveries, the chemists of the time have been able to make enormous scientific progress.

The first step was taken by the German chemist August Hofmann who managed to isolate naphthalidine, a crystalline alkaloid. He

exposed the idea of adding a water molecule (H_2O) to naphthalene to his students. Thanks to this intuition, chemist William Henry Perkin, a student of August Hofmann, father of chemistry, decided to start from aniline to obtain quinine, a fundamental element for the cure against malaria. The result was a «dark mass repellent which he hastened to remove with a rag» (Giavini, 2010: 39).

Washing away the dirt he realized that the mass melted creating beautiful violet crystals on a purple background. Perkin quickly understood that this event could be a turning point for chemistry, so he threw a piece of silk in the solution and obtained a mauve silk.

The Mauvéine color was the first synthetic dye, so called because it reminded the color of the mallow flower. The English chemist was the first to have the intuition of using the colors obtained from chemical reactions to dye the fabric. At the same time, it was a discovery that helped several sectors of human activity, including medicine.

The mauve is the first synthetic color obtained in laboratory, it is therefore **cheap, normalized and always available**. For these reasons, this color is the first to have a social importance ceasing to be an elitist color and turning into a consumer good, finding strong success and consensus by **mass society**.

The world of dyers was still very close to the ancient recipes that were handed down from generation to generation, for this reason they did not welcome the synthetic dyes. In a short time, the researchers refined their colorant syntheses with increasingly accessible and cheaper processes and raw materials.

Only a year later the chemist Thèophile Grison discovered the method for dyeing wool and silk of green tones starting from the use of blue indigo.

Another interesting discovery occurred in 1876 when Berlin chemist Adolf Johann von Baeyer changed the way of conceiving the chemistry of the time.

In those years, Baeyer's colleagues were busy working on new synthetic dyes, making sure they got closer to natural shades. The Berlin chemist instead sensed the potential of natural dyes. These new dyes could have a chemical composition similar to that of synthetic dyes and this consideration opened the possibility to create new shades in the laboratories. This discovery was called "The colors of the Dawn" (Giavini, 2010).

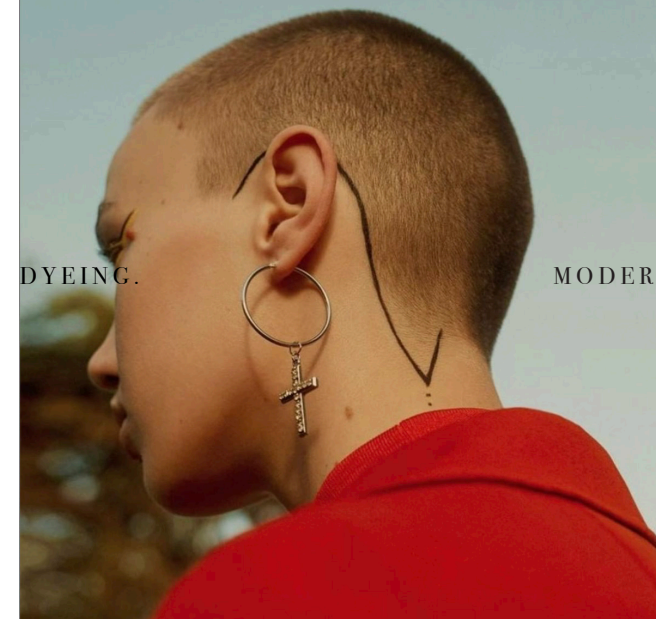
This pinkish color, owes its name, *Eosina*, due to the divinity *Eos* «who preceded the chariot of the Sun at dawn, spreading its path with fragrant roses» (Giavini, 2010: 35). It was a very difficult color to obtain because it was very bright.

Primary colors: Red, Yellow and Blue

In this paragraph we will retrace the steps that led to the discovery of the three synthetic dyes related to primary colors: red, yellow and blue.

In the previous chapters we were able to understand that the transition from natural to artificial dyes occurred thanks to the discoveries carried out by modern chemistry.

RED is an intense and passionate color, whose history and symbolism are linked to different cultures and populations



whose traditions are in risk of disappearing because they are overwhelmed by synthetic dyes.

Turkish red, whose recipe is secret, spread in Europe thanks to Greek and Turkish dyers already in the second half of the eighteenth century. It was a very intense red.

In the early 1900s the red color was obtained from the madder which dyed animal fibers easily but not cotton and linen. The natural dye was fixed with the help of oils, tin salts or aluminum acetates. Then with the discovery of dyes that were also synthesized on cotton fiber, naphthols, many shades of red were created.

In nature, the red color is obtained from «various molluscs *Murex brandaris*, *Murex trunculus* and *Purpura haemastoma*, insects, cochineal *Dactylopius coccus*, and the famous vermilion *Chermes*, the range of plants and herbs containing the active ingredients of the red color is vast» (Giavini, 2010: 49). One of these examples is *Rubia Tinctorum*, or madder, capable of releasing the red color, alizarin.

The synthesis of this organic compound, the alizarin, was the dream of many chemists after the discovery of Perkin's mauve. In 1859 Hoffmann obtained an intense red called "magenta red" from the synthesis of aniline and carbon tetrachloride.

It took another nine years to obtain the official patent of the alizarin synthesis. In 1868 Kalr Graebe and Karl Theodore Liebermann in Berlin, in the Baeyer laboratories, managed to fix the alizarin structure. This discovery was made possible thanks to research on the chemical structure of benzene and the



THE

DYEING.

MODERN



forms of resonance that are today the basis of the most important chemical discoveries.

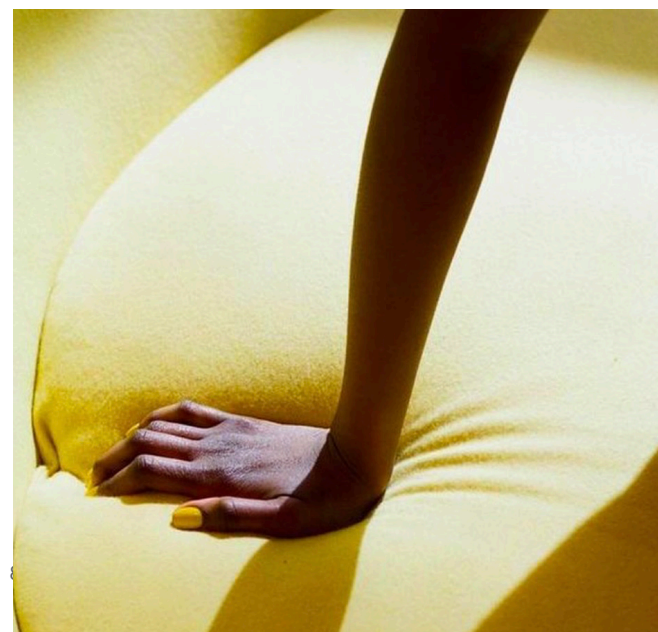
In the second half of the nineteenth century the dye industries moved from France to Switzerland and Germany, two great nations that welcomed the studies of those last years with great interest. They finally obtained **alizarin** from a sulfur-based chemical reaction. The result was amazing: it was possible to notice a **higher color fastness to light and washing** than the mauve color.

However, this great discovery also had dramatic implications. The synthesis of alizarin generated a **strong loss of value of madder plantations**, a source of enormous economic revenues for entire populations of the France. The same problem then happened to India and its natural Indigo crops when the synthetic one was discovered.

Even for workers it was a critical moment, with the advent of new machinery and new mechanical frames, many of them lost their jobs.

In the book "The color of the Dawn", these events are explained with a quote by Franco Brunello: «Failure on one hand, but success in the rest of the world thanks to the lower cost of dyeing - and therefore of fabrics and clothes - , increased the well-being that science brought to the human beings» (Brunello, quoted in Giavini, 2010: 52).

It took several years and many attempts before obtaining a beautiful vivid **YELLOW**, similar to the natural ones. In the book *The color of the Dawn* the yellow color is introduced by a quote: «The green parts of the plants are rich in beta-carotene, whose characteristic yellow-orange color is not perceived because it is covered by chlorophyll. In autumn, when chlorophyll exhausts



its photosynthetic function and disappears, the colors of beta-carotene appear. They are the colors of autumn» (Stradi, quoted in Giavini, 2010: 71).

Despite several experiments carried out from the mid-700s, in 1770 a recipe by Delormois, who was the colorist for the king of France, describes how to obtain a beautiful yellow color with perfect solidity for printing for the first time.

To conclude the trio of primary colors we miss the history of the **BLUE** color.

The Indigo color comes from a black mud that sticks to the foam of the bamboo canes, once it separates from the bamboo, it produces a beautiful blue-purple color. Once the way to dissolve the indigo was discovered, it started a huge creation of the first Indian canvases. In this way great fashion markets and trades were opened to a poor country as India.

The range of possible shades increased thanks to the logwood from Central America and allowed to obtain a blue-blackish also on wool and silk. To compete with the Indian indigo, the American Indigo of the Antilles arrived in the seventeenth century and it was cheaper than the Indian one.

Nature once again surrendered to science when Baeyer, in 1880, managed to synthesize the indigo color, after 15 years of study, using ortho-nitro-cinnamic acid.

As with the red color and madder in France, with the advent of the synthetic indigo, the uses and traditions of different people were overwhelmed by a great crisis that involved India in particular.

«In 1897 India exported 19 tons of natural indigo, which in 1913 would have decreased to around 1000 tons» (Giavini, 2010: 82).

The trauma caused by the synthetic indigo led entire regions to





THE

misery and this crisis was a fundamental element for the historical movement led by Gandhi, protagonist of the struggle for the independence of India.

Another huge discovery was Indantrene Blue R synthesized in the early 1900s, for the first time synthetic colors perfectly imitate natural colors and have much more qualities of resistance and solidity. «The blue of the sky, the beauty of the bluebottle, the charm of the cobalt blue of the alpine lakes, the turquoise of the tropical seas: there were no more secrets for the chemists» (Giavini, 2010: 85).

Rainbow of Colors

Thanks to modern chemistry and the discovery of the three primary colors among **synthetic dyes**, the possibility arises of **obtaining an infinite series of color shades**.

In fact, in the second half of the 1800s, the extraordinary color chemistry was born with the help of tar.

In the following years, the discovery of the mauve color led to a true explosion of rainbow of colors: «1858 *fuchsina* thanks to Francois Verguin; 1859, coral of Persoz; 1860, Lyon Blue (...)» (Giavini, 2010: 95); continuing with methyl violet, alkaline blue and aldehyde green, until in 1863 the “Hofmann violets” that exceeded the quality of Perkin’s mauve.

In 1877 sun yellow and Congo red were the **first substantive or direct dyes** used for cotton. This new type of dyes are capable of dyeing cotton «by immersing the fiber in their aqueous solutions (...). These dyes proved very useful for the low price and the brilliance of the tones» (Giavini, 2010: 98).



DYEING.

MODERN

CHEMISTRY

Synthetic dyes had a great influence on some European problems and changes of the late nineteenth century, «before synthetic dyes, the chromatic richness was reserved for only elites» (Giavini, 2010: 111). Now, on the other hand, also the other less ambient classes could afford printed and dyed clothes with new and bright colors that changed the old and sad popular costumes. As always, even in this case, however, there was a **negative aspect**. Some manufacturers decided to pay **less attention to quality** in order to be able to **afford even lower prices**. This behavior transformed dyes into a sort of poison and they were the cause of various diseases, especially dermatological ones. The victims of these poisonous dyes (made with aniline and arsenic) were the poorest.

Another major change was the **relocation of chemical-textile factories along rivers**, which marked the **beginning of an ecological drama** due to the pollution of European rivers. All these changes also influenced the workers who were faced with the transition from the slow rhythms of hand printing to the more automated ones of the Alsatian machines, called rouleaux. The production speeds and times reached rhythms never thought before and this generated several **traumas on the staff unprepared to work with the new technologies of the industrial revolution**.

In 1891 the chemical-textile industries could boast of 392 shades of synthetic dyes that carried more than 800 commercial names to «inflate the variety of the offer and increase the prestige of manufacturers» (Giavini, 2010: 115).



IN THIS PAGES:(FIG. 61-63)All images via @designmilk, artwork by Bradley Bowers.

Cosmos scarf series is inspired by constellations.

Dyeing Methods

It is possible to differentiate the dyes according to the dyeing method, referring to the mechanisms by which the dye is absorbed and fixed on the fibers.

DIRECT METHODS.

The direct methods are those most used by the textile industries. Acid, basic and direct dyes for cotton, reactive and dispersed dyes belong to this group.

Acid dyes are mainly used for wool and silk. They take their name from the acid solution inside which they dye the protein fibers.

Basic dyes have found greater success on acrylic fibers and more generally on synthetic ones.

Dispersed dyes were created for artificial cellulose fibers, for nylon and especially for polyesters. For example, the rayon acetate fiber is hydrophobic in nature, in fact it has a membrane that obstacle the passage of water. For this reason «the dye bath with the dispersed dyes is prepared by mixing the dye with a dispersing agent, then diluting the mixture with water» (Cegarra et al., 1988: 632)

Direct dyes for cotton are used for natural cellulosic fibers. Direct dyes are soluble in water and are so called «because they dye cellulose without the need for a mordant; they are also called substantive dyestuff because they possess the property of dyeing the fiber without being eliminated by a subsequent washing» (Cegarra et al., 1988: 262).

INDIRECT METHODS.

Typically it is a dye with the use of vat or alkaline dyes. The name “vat”, in Italian “al tino”, derives from the homonymous name with which the container, where the dye reduction was made, was called.

Dyes of this type are classified into two macro groups: indigo derivatives (natural and synthetic) and anthraquinone derivatives (Cegarra et al., 1988). The IDH dyes that we

have analyzed in the chapter “modern chemistry” also belong to this category.

These are dyes that are «insoluble in water but by reduction in an alkaline environment they turn into water-soluble leukoderivatives» (Cegarra et al., 1988: 370). The main method for dyeing with this type of dye is therefore dyeing by reduction.

Although we can identify two different derivation groups, the dyeing method is the same.

This consists in treating the fiber or fabric (usually cellulosic fibers) with a substance, initially colorless, and transforming it into a colored substance with a chemical reaction.

MORDANT METHODS.

These methods are characterized by a dye with a high color fastness. In fact, as we have already seen, they are used to “help” dyes that have poor affinity. In fact it help the dye to fix in the fiber. Etchers are salts of metals such as chromium, copper, aluminum and iron.

DEVELOPMENT METHOD.

This method consists in generating a chemical reaction (conducted at 0 ° C) inside the textile fiber between two reagents. The result of the chemical reaction is the production of a colored substance. They are also called ‘ice’ dyes due to the low temperature of the chemical reaction.

For this method, azo dyes and oxidation dyes are used.

For example, azo dyes are insoluble in water and this leads to excellent color fastness to washing (Cegarra et al., 1988).

One of the most important of the oxidation dyes is aniline black.

SOLVENT METHODS.

For this method are used dyes which are able to dissolve in a chemical solvent and not in water. This method is advantageous for dyeing synthetic fibers with intense colors and quickly. They have a very low environmental impact unlike what you might think. In fact, the solvents are easily recovered and reused during the different processes and are not dispersed in the environment.

Dye characteristics and color fastness

The perceived color is the result of the interaction between the light and the colored object, in this case: the fabric. The reflected color is proportionate to the dye absorbed by the fiber. The color molecule is defined by *chromophores*, which are a particular chemical structure responsible for all the colored things we see.

The dyeing behavior of a good dye does not depend only on the spectral absorption of light, but on many other factors. One of these is called affinity, which implies that first the color must be absorbed by the fiber.

As we will see in this paragraph, it is not enough that the color is absorbed by the fabric, but it must also be firmly fixed and the color must not change. This feature is called color fastness.

To be considered suitable for industrialization, the dyes must have different characteristics. One of the most important characteristics for a dye is that related to its color fastness.

«By **color fastness** of a dye, or a print, we mean the resistance it exhibits when changing or losing its color when it is subjected to the action of a specific agent. This action can generate a degradation of the color and / or the discharge of that color on other fabrics» (Cegarra et al., 1988: 140).

There are several factors that can influence this property. Some of these factors are related to chemical-physical concepts. In fact, the chemical structure is of fundamental importance for the color fastness. Even the state of aggregation, or physical state, can affect. In fact «a dye of the same fiber has a better color fasteners in relation of the dimension of the molecular aggregates of the dye used» (Cegarra et al., 1988: 141).

As we have already mentioned, the color fastness can vary according to the dyed fiber. Some dyes prefer certain fiber families; for



example **natural dyes satisfy the prerequisite of color fastness only on natural fibers**. Another example is that of basic dyes which have good characteristics on acrylic fibers and on cellulose-based ones (Cegarra et al.).

On an industrial level it is not only a question of fiber but also of finishing, for example the mercerization of cotton can modify the absorption capacity of the cotton fiber.

It must be taken into account that dyes can be applied on the fibers with different dyeing processes. Based on the chosen process, we can change the color fastness. For example for synthetic fibers «as in the dyeing of polyester with disperse dyes, the fastnesses can vary depending on whether it is carried out at high temperature or by conveyors» (Cegarra et al., 1988: 142).

The last factor that can involve the color fastness is **the intensity of dyeing**. There is a link between the intensity of the dye bath and the color that can be released from the fiber. In fact, «color fastness is due to the destruction of the color molecules or their elimination. In both cases for a same quantity of dye eliminated from the fiber, exist a proportion which is greater if the initial intensity of the dye is lower» (Cegarra et al., 1988: 142).

From production to the use of our textile product, other factors may affect the color fastness. A first group of industrial factors are: washing, bleaching, mercerization, fulling, etc. Other factors instead affect the color after purchasing the product, which means during its use. In this second group we have: sweat, sun, sea water, rubbing, etc.

To summarize the topic, **in the industrial sector color fastness is a characteristic that the product must absolutely satisfy**. In fact, in order to regularize its production, the final product must respect the international standards and values set by ISO.

5.2

Return to the origins

Cultures and traditions of natural dyes

In a frenetic world driven by innovation, it is difficult to take a break to think. In the previous chapter we covered the history of artificial dyes by analyzing both the negative and positive aspects. Speed, color fastness and brighter colors are the aspects that attract the textile industries to follow this path that offers infinite possibilities of color and finishes.

However, we have also seen the critical aspects generated by these synthetic dyes: water pollution, the production of harmful substances and therefore greater difficulty also in the disposal of the product. Another critical aspect that must be kept in consideration is the repercussion that the industrial revolution and synthetic dyes had on people and workers in the eighteenth and nineteenth centuries. Many populations, in fact, obtained their livelihood from natural dyes as madder for France and indigo for India and America.

This thesis wants to give importance to natural dyes, for their beauty in naturalness.

«The purpose of all biological practices (...) is not only to reduce, and ideally eliminate, the use of toxic chemicals harmful for people, animals, plants and planet, but also to find a way to understand natural processes in order to participate in them rather than hinder them» (Walker quoted by Duerr, 2015: 5) **Natural dyeing is an ancient art.** It is a source of numerous experiments and research by artists and alchemists of the past. When we speak of natural dyeing we speak of recipes, the most common are made up of natural ground powder plus other elements capable of fixing them.

«It all began when a man, probably accidentally, handling red ochre realized that he could leave the imprint of his colored hand on the wall of his cave. Thus was born the first form of painting» (Giavini, 2010: 39). This is an example of the oldest paintings, made on rock. Cave paintings are date back to the beginning of human history thousands of years ago. After that we can find examples regarding the civilization of



IN THIS PAGES:(FIG.65) *Dry cleaners in the center of Fes, photographs of Morocco, via GoogleImmagini.*

ancient Egypt which are examples of a more sophisticated experimental kind of chemistry. This research on art and color essentially involves all ancient civilizations: Greece, Italy and the Far East. The use of color was mainly used for everyday objects such as fabrics, ceramics and decorative elements.

Usually as coloring natural pigments are used: «fruits, leaves, roots, petals and plant extracts: from the Indian Indigo (*Indigo tinctoria*) to the cochineal lacquer (*Coccus cacti*) in Mexico, madder roots (*Rubia tinctoria*), saffron, henna (*Lawsonia and Alkanna tinctoria*), aloe, walnut skins, mallow flowers, some mosses, turmeric powder and other spices, birch leaves or the bark of some trees. But also minerals, some rocks, insects, vegetable and animal oils mixed in elaborate recipes» (Besso, 2003: 6).

The complexity of these bio-colors is due to the fact that the natural color is “alive”. In a purple color we are able to distinguish shades of blue and others of purple within the color itself. These different shades make the color more brilliant.

Sasha Duerr in her book describes **natural dyes** as «ecological alternative to synthetic dyes because they derive from plants which make them a **renewable and biodegradable non-toxic resources**» (Duerr, 2015: 12). Obviously these types of dyes are more easily fixed on natural fibers, both vegetable and animal. The most suitable fabrics are therefore wool, silk, linen and cotton.

Sometimes it is possible to expand the range of colors through the use of a mordant during the dyeing process. The mordant is a substance capable of helping the color to fix itself to the fiber. In this case, since it is still a metallic agent, mordants can contain toxic substances. The best solution is to look for types of mordant that are not harmful to people or the environment.

When using natural vegetable dyes, we can come across some plants that already have the chemical properties necessary to fix the color to the fibers.

Vegetable colors
«have a complexity impossible to obtain with synthetic dyes»

(Duerr, 2015: 12).

Natural fibers and natural dyes, processes and materials

Dyeing with natural dyes requires fabrics that have a high porosity and that of course, as we have already said, that are natural. «The different types of wool are generally the materials which are more versatile because natural dyes have a good grip on the fiber» (Duerr, 2015: 27).

This allows us to obtain a greater variety of dyes, for example, compared to the cotton fibers. Therefore, depending on the fabric, the soaking time and the dyeing bath, the final coloring may change. In some cases it may be necessary to use a mordant to help to fix the color. In order to obtain solid colors, tannin and then alum can be used as pre-mordant and mordant.

The tools which are used for this type of dyeing are simple everyday objects: large pots where you can dip the garment to color it. It is recommended that the dye container is made of stainless steel, because it is a metal that does not change the color of the dye bath. During the procedure, the fabric should be checked to make sure it is changing color or that it is not darkening too much. For this reason, the use of gloves is also recommended, not all natural ingredients only because they are natural this also means that are safe. Indeed some dosages can irritate the skin. An example is the stem of the fruit and leaves of the fig tree which contain a toxic lymph. The fig leaves release a very bright color between yellow and green. Other dyeing elements to which attention must be paid for their toxicity are the peach and plum leaves which contain cyanide and those of rhubarb which instead contain oxalic acid. In general, a precaution to be taken to understand the non-toxicity of a material is to go and see if it is edible.

The vegetable dyeing can also be regenerative. In this case organic and vegetable waste is used. An example of this process is dyeing

with onion skins. Once the fabric is dyed, the skins can become nutritious composting for other plants. In general «**the biological fibers and dyes decompose without releasing further toxic by-products into the ecosystem**» (Duerr, 2015: 27).

Other natural tinctures are instead ephemeral, as in the case of turmeric. These are dye baths which over time tend to lose color. Turmeric, for example, dyes the fabric with a bright yellow hue, then with washing and exposure to the sun it loses solidity and becomes a pale yellow. Despite its low solidity, these types of natural dyes can give excellent temporary results. It is interesting to see how some light natural dyes can also perform the function of protection against certain natural fabrics. For example, a lavender or laurel bath protects fabrics from moths and other insects. This is because these plants are natural repellents and in nature and they perform this function. This protective process is an excellent alternative to the use of naphthalene, used to protect the wool, silk and linen fibers that are vulnerable to attack by insects.

If we want to carry on a discussion that deals with sustainability at 360°, we must not limit ourselves to using natural dyes, but we must start from the production of the fiber with which the fabric is made. For this reason, in addition to using natural materials, it is preferable to use bio and organic ones. In agricultural crops pesticides are often used, in fact, «**150 grams of chemicals** (pesticides and fertilizers) are needed to produce enough cotton for a **single shirt**» (Duerr, 2015: 27). Not to mention the absurdity of some shirts made with biological material and then dyed with toxic dyes. This last step of dyeing prevents the shirt biodegradability. Organic crops follow specific methods for the cultivation of fibers and dye plants, designed to help without damaging the soil in which they grow, workers and more generally the environment.



NEAR: (FIG. 66-67) *The Botanical Feminine*, photoshoot by Anastasia Cheatham, via rosmarinertextile.com.

Another factor that affects the quality of the fibers is organic farming. In organic farming, animals are raised and fed in the absence of pesticides. Precautions also adapt to the meadows where the animals graze, where it is not allowed to exceed the natural capacity that the soil can bear. There is a strong parallel with the rotation that is used in agriculture. In both cases, in fact, we proceed **not to damage the delicate balance of the ecosystem**. Today we are definitely more prepared to welcome the **Slow Living philosophy** and to have a greener approach to our daily lives as well as to fashion. In fact, tracing and verifying sustainable and organic materials is becoming easier. Companies are starting to communicate this bio-organic aspect to their customer with extreme sincerity and transparency through advertising campaigns or simply with labels. Sometimes using technology, this information is also communicated to us via QRCode. By acting responsibly, we are able to do good not only to the environment, but also to our skin.

Dealing with natural dyes, you may get in touch with stories of ancient traditions. To dye naturally we can use different plants, which in the past they were strongly linked to a specific territorial area. Today it is easier to have different plants regardless of the area in which we live. However, **working with native plants can represent historical and cultural advantages, because they are linked to our history** and experts in the area or our grandparents hand down knowledge about these plants. As the California Native Plant Society states, «native plants (...) are the basis of our native ecosystems, or natural communities» (Duerr, 2015: 80).

Following this philosophy, it is therefore important to know the location and seasonality of these dye plants in order to limit the carbon footprint, since, whenever possible, we try to use zero

kilometer plants. This is about the eco-awareness of the territory and the ecological landscape.

To get even more in touch with nature, you can grow these plants yourself or collect them consciously.

In general, «many traditional dyeing plants have been columns of vegetable dyeing process for a long time and are available already packaged at natural dye stores» (Duerr, 2015: 125).

Natural fabrics

To find out what natural and naturally biodegradable fibers, which are essential for the development of the thesis project, I want to dedicate a part of this research to deepen them and create a kind of textual material book. In this part I will look for some of the best raw materials and yarns for the study of an ethical and sustainable project.

Natural fibers are divided into animal and vegetable fibers.

Natural fibers are also called protein fibers and are obtained by shearing the animal's hair following human methods, therefore they are completely sustainable. In addition to their natural characteristics, protein fibers tend to absorb dyes well and require no further treatment. These are two guiding aspects that have fundamental importance for the study of my project.

In general, before dyeing these fibers, it is recommended to leave them immersed in water for a few hours in order to favor the penetration of the color into the fiber.

Among the many natural animal fibers there are:

ALPACA. The alpaca is a South American mammal that resembles a small lama. Its wool is of high quality, in fact it excels in qualities

such as softness, resistance, lightness and warmth. Another feature is that it has great ability to absorb color even in hand dyeing. Alpaca fiber is elastic and does not contain lanolin, so the processes for preparing the fiber for dyeing are shorter.

In recent years also in Italy many small farms have started to breed this camelid, therefore it allows us to have a material with a low carbon footprint.

ANGORA. Angora is a type of wool, also very fine, which comes from the homonymous rabbit. The rabbit is from Turkey and has a very soft, long and white coat.

In fact, the hand of the fiber is very soft, slippery, shiny and silky. It is often used in blends with fine wool, mohair, alpaca or silk to lower the originally high cost. I decided to talk about this animal because angora fiber also lends itself well to dyeing.

CASHMERE. Cashmere comes from cashmere goats, a rare species originating from the altitudes of Central Asia. Its qualities of finesse, warmth, finesse and softness make this fiber particularly expensive. With this protein fiber you can get light, but very warm clothes.

SILK. Usually the silk comes from the cocoon of the mulberry worm which is bred in captivity. There are many other types of silk that are made from different larvae, but the mulberry worm remains the most common. To carry on an ethical concept if I use silk in my project I will try to take into consideration cruelty-free silk and raw tussah. Raw tussah silk is wild, it does not come from farms, but the cocoons are collected in nature. While cruelty-free silk is a sustainable and human option where the larva is not sacrificed for collection. The worm, in fact, before the cocoon is used to spin the

silk becomes larva.

Another aspect to check before purchasing silk is the degumming and bleaching procedures. In some silks these procedures, due to their toxicity, are limited.

SHEEP WOOL. Sheep wool is obtained from the animal's fleece. It «constitutes the most important animal fiber and has been used since ancient times» (Rubertelli et al., 2008: 19).

There are various types of sheep's wool and they can vary in strength, color, hand and weight depending on the sheep from which it comes. It is a fiber that is suitable for dyeing, in fact it is possible to obtain numerous natural colors, because the color binds well to the fiber. This material is easy to work with and find.

As far as it concerns vegetable fibers, called also cellulose fibers, they are part of natural fibers and consequently they are biodegradable and sustainable. Also in this case it is recommended to favor organic vegetable fibers, as they are better products for the ecosystem, but also for people. The most common ones are:

COTTON. Cotton is a plant native to India, Africa and America, which are tropical regions of our planet. Its fiber is obtained from the capsule of the plant. It is the most used natural fiber in the clothing sector. In fact, this fiber is soft, breathable, versatile and cheap. There are several varieties of cotton and organic cotton is preferred since it is harvested according to ethical principles. Another characteristic of cotton is its compatibility with the dye, in fact since it is a natural fiber, it is dyed very easily.

BAMBOO. Bamboo is a cellulose fiber. Its fabric is obtained from the pulp of the bamboo plant. The bamboo plant can be grown

without the use of synthetic chemical fertilizers or pesticides and its rapid growth is able to avoid cases of deforestation. The resulting fabric is similar to hemp, is robust, light and has excellent absorption properties. It is a material, in fact, capable of removing sweat from our skin and is also antibacterial. These last two characteristics make it ideal for sportswear. It is a fairly new fiber in the textile market and is produced with the same processes as viscose fiber.

HEMP. The hemp plant also grows rapidly and does not require the use of pesticides in any way because it does not attract parasites. The fiber is obtained from the stem and it is longer and stronger than the cotton. The fabric has excellent absorbent qualities like bamboo and is able to block the sun's rays in a very effective way, but if it is used in blends the percentage must be higher than 50%.

LINEN. Linen fabric is one of the oldest in the world. It is a particularly fresh, soft and flexible fabric. The cellulose fiber is long and derives from the inner part of the homonymous plant.

THE

DYEING.

RETURN

TO

ORIGINS

Preparation of the fibers for dyeing

Before dyeing fabrics it is necessary to prepare them for this process.

Animal fabrics are pre-treated differently from plant ones. Animal **fabrics must be washed to remove any residues from chemical processes or dirt** that would hinder good dyeing.

For example, wool can often contain *lanolin* which is a substance that could prevent the dye from penetrating the fiber in the correct way. In this case there may be a risk that the fabric will become discolored during the various washes. To wash the fabric it is possible to dip it in cold water with a little neutral pH soap and then rinse it thoroughly.

After this first step, it is better to immerse the fabric again in clean water for at least an hour or one night. This will help the fiber take on the color better. It is important that all changes in water temperature are gradual because a sudden transition from cold to hot can damage natural fibers. For example, silk must be treated at a lower temperature because otherwise it loses shine.

As for animal fibers, also vegetable fibers must be treated and cleaned by simmering them for a few hours in a solution made of water, neutral pH soap and sodium carbonate (usually one teaspoon for every four liters of soapy water). The fabric after purchase may contain bleaches or industrial starches for this reason it needs to be washed thoroughly.

The importance of water

Natural dye depends on water. Dyeing consciously not only means paying attention to natural dyes but also to the soaps with which we prepare the fabric for dyeing, which for consistency, must be **non-toxic biodegradable soaps**. In this way it would not pollute the water and cause environmental damage. To adopt an even more eco-sustainable method, it is also possible to dye using **rainwater**. It is a fresh water suitable for dyeing, in fact it allows to obtain much brighter colors.

We can dye in hot or cold water. Generally four liters of water are used for every one hundred grams of fabric. The important thing is to avoid wasting this vital asset and check that the water completely covers the

fabric. Many vegetable dyes release their color even in cold water, but most release a brighter and deeper color if dyed in hot water, in an infusion similar to tea. In this case we will bring the water containing the dye to a boil, and then we will lower the heat until it simmers (around 82 ° C). This temperature should be kept for at least twenty or thirty minutes to finally obtain the dye bath. Following a more ecological philosophy, it is possible to heat water by exposing it to sunlight, in this way we will save more energy.

Some plants, on the other hand, leave more vivid colors in cold water. For example, madder root in cold water creates red, in hot water brown. In any case, it is always advisable to carry out sampling tests for dyeing before dyeing the garment.

The samples in question at the industrial level are called **Lab Dip**. Color test are necessary even if it is naturally dyed to evaluate the various dye baths and the effect they generate on the fibers.

In any case, after soaking in the dye bath, the fabric must be rinsed thoroughly in cold water and neutral soap and then left to dry.

For the washing and care of natural dyed fabrics it is necessary to treat them as

delicate ones as we could ruin the color with heavy washing or chemicals. The best way is to **wash them by hand in cold water, in this way the color will remain brighter** during the different washes. When we wash the fibers in cold water it is always advisable to use a soap with an ecological neutral pH that does not alter the color properties. This soap is also biodegradable and it does not pollute the water we are using.

All these steps try to be carried out following an ethical line in respect of the protection of our planet. **The goal is to try to decrease the impact that the fashion sector has on pollution, relying on an ancient process, rich in traditions.**

To stay on the subject, sometimes it happens that some fabrics must be bleached before dyeing them. However, it is advisable not to use bleach on fabrics that we have just dyed naturally. As an alternative to bleach, lemon juice can be used as natural bleach. Citric acid is a powerful sterilizer or can be used as a stain remover. However, it should be remembered that lemon juice can remove iron, used as a mordant, from fiber, altering its natural coloring.

ON THE RIGHT: (FIG. 68-70) MSGM FANTASTIC GREEN; first fully-sustainable collection: 100% certified organic cotton, printed with chemical-free biodegradable ink. All images via @msgm.





DYEING.

RETURN

TO

ORIGINS



NEAR: (FIG. 71) Image by Nik Dukic Exclusively for *Fashion Editorials* with Tayla Shaw; (FIG. 72) *Daisy Clementine* by Jordan Zobrist; (FIG. 73) *Summer daydream* via Pinterest.

Mordants

As we have already seen in the previous paragraphs, **mordants helps to fix and increase the color fastness** during the dyeing process.

«The word mordants derives from the Latin word *mordere* and it indicates a chemical behavior that can make the color of a dye more lively, darker or more solid» (Duerr, 2015: 40).

Fortunately, not all natural dyes require a mordant to obtain a bright color. In this way our result will be much more ecological and during the dyeing process we will avoid waisting more time, water and energy.

Aluminum sulfate or alum can be used to obtain bright colors and prevent the fabric from fading over time. Usually the mordants have a chemical or metal origin, therefore they need to be treated with care, wearing gloves and a mask to avoid inhaling the fumes produced during the boiling phase.

Another element that can be used as a mordant is iron. Generally when it is used *ferrous sulphate* as a mordant the color of the dye bath will tend to darken or change the color. In the second case it is said that iron is a natural color modifier, that is, it completely alters the original color (Duerr, 2015).

In nature there are also less harmful mordants which are the vegetable mordants. Also in this case they are used to obtain a wider range of colors. The *tannic acid* is naturally contained in acorns, in walnuts, in the pomegranate peel and in some leaves or bark. It is an excellent mordant to revive the color of the dye.

To save time, water and energy, it is also possible to dye and use the mordant simultaneously. In this way we will extract the dye by adding the mordant in the dye bath before immersing the fabric.

Slow textile and Slow movement

The birth of large industries, as what happened in France along the 19th century with madder roots and the discovery of synthetic red, are often the cause of the loss of ancient recipes about natural dyes that were part of different cultures and traditions. All over the world natural tinctures are part of a long cultural history. Their history is about sustainable procedures which allow us to rediscover the recipes of the past. This means developing new sustainable techniques that are fundamental for the conservation of our planet.

Based on this line of thought, certain areas of some sectors have recently been born with the name Slow. The Slow Food is now widespread internationally.

It was born as a reaction to the speed and superficiality of modern life. Slow Food is the first segment of this cultural movement which, in this specific case, encourages a new type of appreciation of food, combining **pleasure and responsibility**. In fact, the production is based on organic food and the agricultural **traditions of the past, which were not harmful to the environment, producers or consumers**. In a short time the Slow movement was easily applied in other segmentations of the productive sectors.

Two other cultural movements develop in the same philosophy are: Slow Fashion and Slow Textiles. The basis of these two new movements is the perception that mass-produced clothes and fabrics, as well as food, often lack healthy and quality ingredients.

To sum up, the values shared by this movement are: «attention and consideration for the origin of the materials, for those who make them, support for quality and durable goods and responsible

THE

DYEING.

RETURN

TO

ORIGINS

management of the environment» (Duerr, 2015: 139). This type of production often creates an environmental pollution problem. The secret, therefore, is balance, and having love and attention for nature and culture.

The idea of “slowness” does not concern the time needed to achieve something, but it means being aware and responsible for our daily actions. (Duerr, 2015) Indeed in addition to indicating a concept of slowness, the term Slow is also an acronym made up of:

«S = Sustainable - not having an impact
L = Local - not someone else's patch
O = Organic - not mass-produced
W = Whole - not processed» (Slow living, 2020).

An example of Slow Fabric is a fabric made of non-toxic natural fibers and dyed with ecological methods with low environmental impact. This means the whole process from the collection of raw materials to production and dyeing is sustainable. A process of this type allows you to draw «just as nature does, without waste and with incredible beauty» (Duerr, 2015: 17).

With Slow Food and Slow Fashion, a new movement was born: Slow Living. It was capable of including all these concepts of a slowed life. **Slow Living is proposed as a solution to an industrial and modern approach that is a source of environmental pollution.** The solution consists in a more conscious and green approach

to our daily routine and to our lifestyle. This lifestyle includes in particular three human needs that depend in part on plants and are: food, clothing and home. **Our needs are linked to each other by sustainability and our cultures and traditions.**

Sasha Duerr, founder of several non-profit associations for educational projects on natural dyeing, believes that «working with a biodiversity of fibers and dyes with natural ingredients is a very important step in finding long-term sustainability for our clothes and fabrics» (Duerr, 2015: 19). In order to carry out a project that respects the environment, it must be remembered that dye plants must be collected responsibly according to the seasons, without destroying the ecosystem where we go to collect them. Another particular attention goes to the importance of using a large biodiversity of fibers and dyes, «because plants and animals take different resources from the ecosystem, in addition to returning different vital resources» (Duerr, 2015: 27).

ON THE RIGHT: (FIG.74) *Life in Color* by Jacques Henri Lartigue; (FIG.75) Image via juliedumasrose on Pinterest; (FIG.76) Image via Lia Calderari on Pinterest; (FIG.77) Elle Fanning by Benny Horne on *Poster Magazine* (MAY 2018) via Fashion Editorials; (FIG.78) Image by Sarah Ching by sarahchingphotography.com.



06



DYE
Design your essence

COVER IMAGE: (FIG. 79) *Blowing in the wind* via Pinterest.



DYE is natural
DYE is tradition
DYE is craftsmanship
DYE is colors
DYE is ancient recipe
DYE respects the environment
DYE is made for our future
DYE is “slow” made
DYE is free expression
DYE is a natural homecoming

DYE is natural
DYE is tradition
DYE is craftsmanship
DYE is colors
DYE is ancient recipe
DYE respects the environment
DYE is made for our future
DYE is “slow” made
DYE is free expression
DYE is a natural homecoming

DESIGN

YOUR

ESSENCE

Abstract

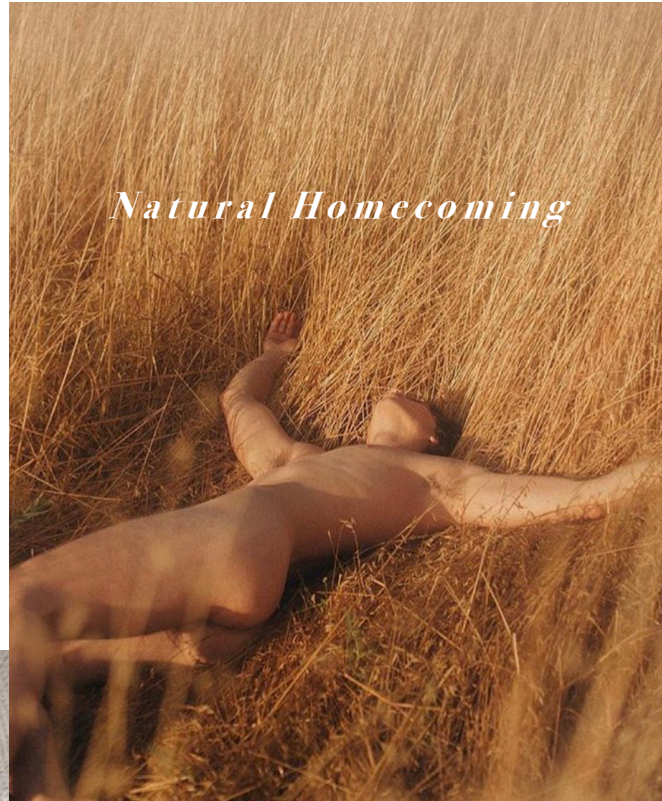
Design Your Essence

Dye, Design Your Essence, is a project based on **natural garment dyeing**. The dyeing is carried out only after the purchase phase of the item of clothing which appears in its purest and most natural form in the store. The range of colors is made up of a limited edition of coloring capsules. Those capsules are selected focusing on seasonality and current trends. The garment dyeing is made by the consumer as an **act of personalization**, transforming the garment into something **unique**.

Before industrialization, each handcrafted creation was a unique piece: the color was not standardized as was the manufacturing phase of the object.

The product was the result of great **craftsmanship and know-how**.

In this project I wanted to combine the ancient traditions related to natural dyeing with a proposal of a contemporary brand and its products made with natural fabrics. The design philosophy lays all its foundations in sustainability: from the choice of materials and dyes to its packaging; from the supply chain to the prototyping phase; from the rediscovery of ancient values and traditions to our future and the life cycle of the product itself.



IN THE OTHER PAGE: on the top left, (FIG. 8.1) *Rock: Solid* for the Lake Magazine via @michaeloverlove; on the top right, (FIG. 8.2) *Falling* by @alexstoddard; in the middle, (FIG. 8.3) *Organic Cotton* via Pinterest; on the bottom left, (FIG. 8.4) photo by the brand *Alighieri* via alighieri.co.uk; on the bottom right, (FIG. 8.5) photo by Nikki McClarron via A Tiny Space.

Moodboard

Natural Homecoming

In this moodboard I wanted to recreate the atmosphere of a *Natural Homecoming*. The images tell an **intimate and delicate return to nature and ancient traditions**. The human figure, blending with extreme lightness into the landscape, wants to emphasize a **new relationship between man and the environment**: a relationship of **harmony and balance**.

“Do not forget that the earth delights in feeling your bare feet and the winds intensely desire to play with your hair”

(dal “Profeta”, Kahlil Gibran)

IN THE OTHER PAGE: on the top, (FIG. 86) *Forti di sera* via Pinterest.ph; on the top left, (FIG. 87) image from Staffonly Studio; on the bottom left, (FIG. 88) *Denim on Denim* via Tomboy; on the bottom right, (FIG. 89) photo by Carolyne Rapp.

Concept

Workwear & Genderless

The project concept is based on the naturalness of the fashion product. This project has been developed following the rules of the **Slow Fashion**. For this reason, the clothing items are made of natural, organic or recycled fabrics.

An important concept is that the garment is **designed to last over time** (*durability*) and this feature is satisfied only by a **high quality manufacture**.

Garment dyeing is conceived as an act of **personalization** by the consumer. *Design Your Essence* is a way to express and create our personality through the use of color.

The capsules of natural extract allow to obtain a **natural and ecological dye** that will have no impact on the water footprint. In the research part I have repeatedly stressed the sustainability factor as an added value. *The future is green* and the new consumer is interested in a more sustainable offer.

To make the capsule collection more current, but also universal, I oriented myself towards a sporty, captivating and genderless aesthetic.

The genderless aspect is very important for the project. The DYE client must not identify with an ideal target, but must reflect a *moral identity* and responsibility.

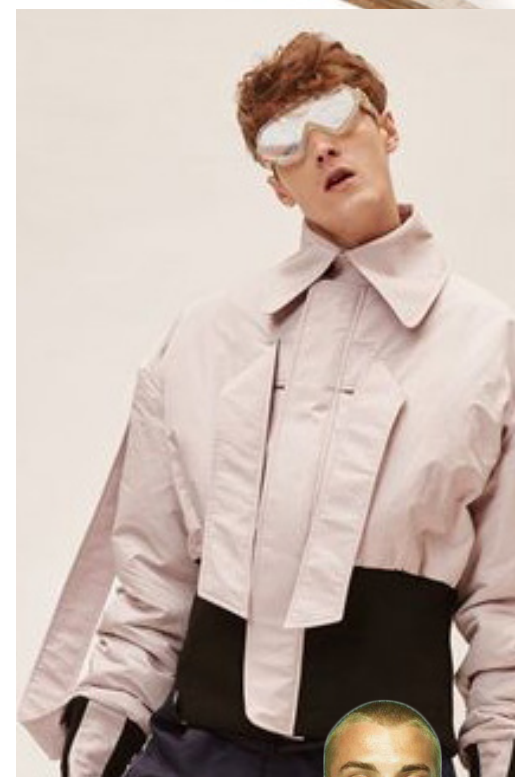
The customer chooses DYE because he has become aware of the brand mission.

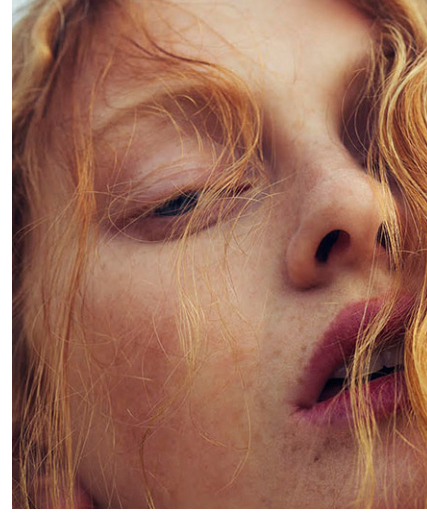
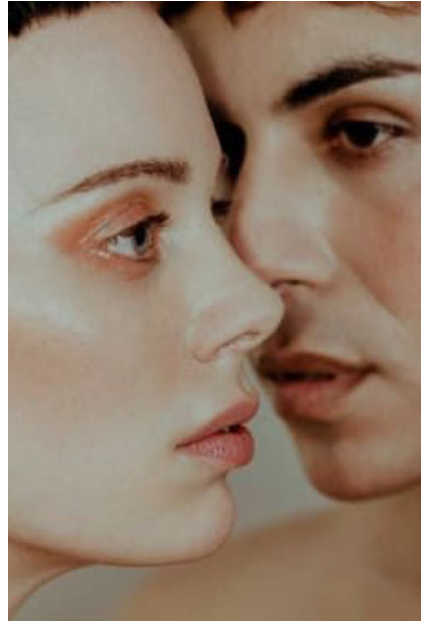
I like to think of fashion as a reflection of the times we are living in. Nowadays I feel a urge of sustainability and inclusiveness.

In recent years the boundaries between menswear and womenwear have been melting, mixing and weaving.

For this reason we speak of *genderless, unisex, a-gender and gender-fluid*. If I had taken as a reference a design linked to gender identity it would have been limiting for the development of a *conscious community* which is something really important for the project if we look at the social aspects.

RAW FABRICS
NATURAL DYEING
GENDERLESS AESTHETIC
CRAFTSMANSHIP





NEAR: (FIG. 90) *Golden showers*, immagine via @michaelolive; (FIG. 91) *Unisex Body*, via domino.com; (FIG. 92-96) *Beina du Toit* via atmyspace.com; (FIG.97) immagine di Morgan Hill Morphy via atmyspace.com.

Target

A Conscious Community

In the near future **ethical value** will become fundamental for the acquisition of a new credibility of the company and the brand, and both will become ambassadors of deeper and more sensitive values. The modern customer, in fact, prefers a purchase that tends to touch the ecological and organic world, guided by an innovation capable of embracing ethical, environmental and social responsibility values (from “The future is Green”, chapter 4.3).

The choice of designing genderless garments is justified by the desire to reach the greatest number of consumers. It is a universal language that wants to interest a **conscious consumer** belonging to a ***Conscious Community***.

Creating a community for a brand is of fundamental importance because it is as if it created a huge container of shared values between the brand and its customers. In the community, these shared values allow the consumers to recognize themselves within a specific community as a **symbol of belonging**.

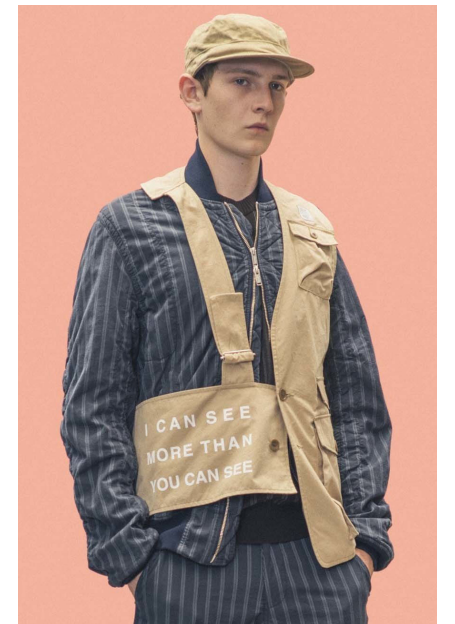
The modern consumer is interested in sustainability because the purchase of an ethical product satisfies his **moral identity** (Legere, A., Kang, J., 2020).

Silhouette

Workwear and Multi pockets

The shapes, the silhouette and the design of the garments are inspired by work uniform, creating a fusion between streetwear and workwear. In fact, the collection includes overalls and work white coats, shirts, jackets, trousers and other garments that reflect this world and its craftsmanship. The idea is therefore to translate some **classic craftsman clothing and combine them with streetwear**. The concept of multi pockets covers a fundamental aspect for workwear-inspired clothing, namely the functionality of containing work tools. In fact, in the collection there are several items or accessories with pockets.

In the chapter relating to natural dyes, we cannot avoid talking about the Blue color and the Blue Jeans worn by workers in Genoese construction sites. To distinguish the two main social classes, *blue-collar* and *white-collar* workers, a reference was made to an aspect related to clothing. The unskilled workers were called Blu Collars; White Collars were the workers with office duties. This is another simple but fundamental example of collective color identity linked to the communicative power of color. In this thesis to replace the iconic blue color we have Bruno Hematin.



FROM LEFT TO RIGHT: (FIG. 98) *Go Vest_ Workwea*, via Pinterest; (FIG. 99) *'Atlas' Organic Black Denim*, via Lucy & Yak; (FIG. 100) *Urban Outfitters Champions*, via British Vogue; (FIG. 101) *Undercover Spring 2017 Menswear Fashion Show*.



IDYIE

Design Your Essence SS21



a Natural Homecoming



IDYIE

Design Your Essence SS21

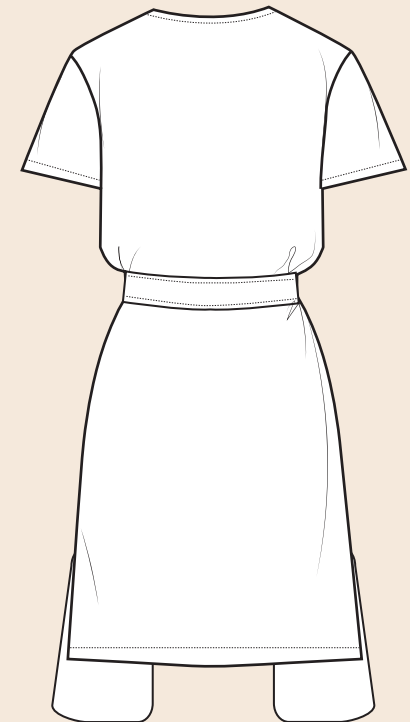
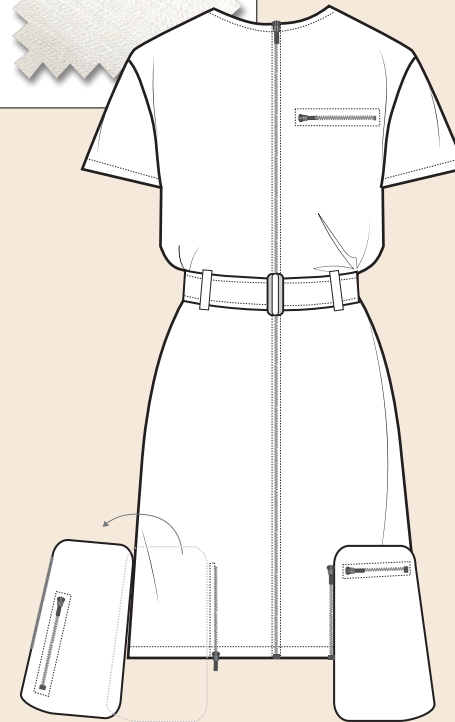


a Natural Homecoming

DYE
Outfit 01_ Cargo Dress



DYE
SS21#01



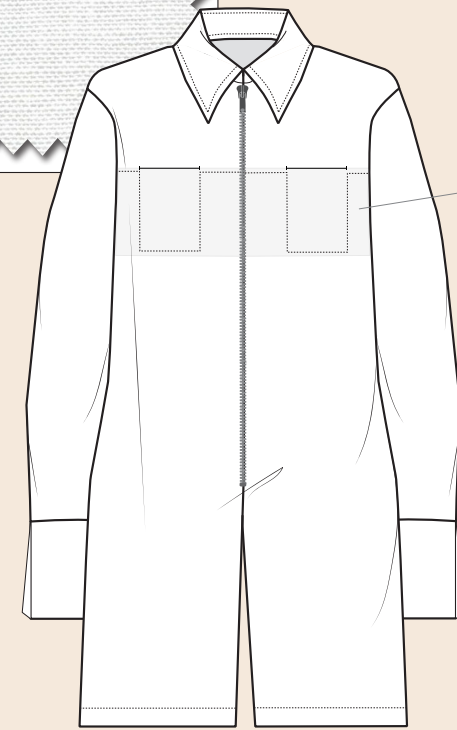
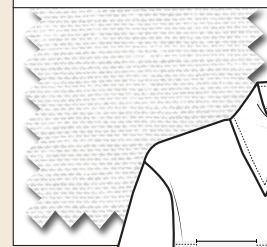
* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 02_ Workwear Jumpsuit

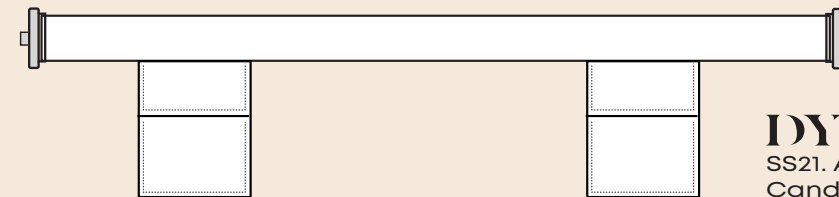
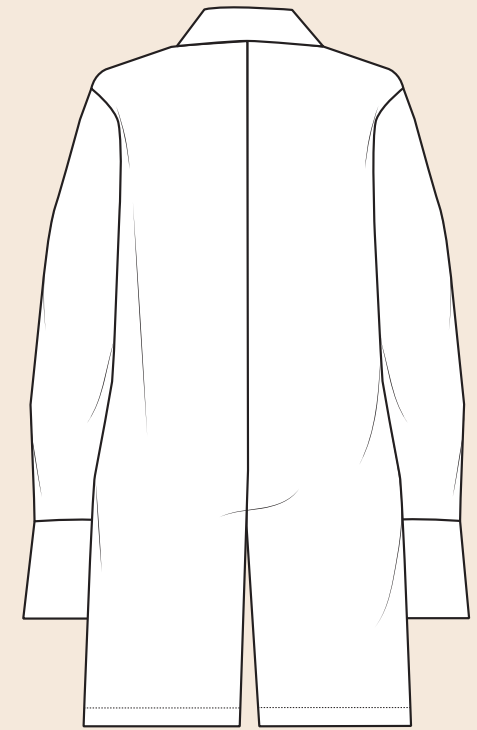


Organic Linen - Predatex
 100% LI
 Class A

DYE
 SS21#02



Welt pocket
 obtained from
 fabric fold. It
 highlights the
 naturalness and
 transparency of
 the fabric.



DYE
 SS21. A#01
 Candiani Denim

* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 03_ Oversize Shirt and Utility Vest



Crepe - Predatex
 100% SE **Cruelty Free**
 Class F

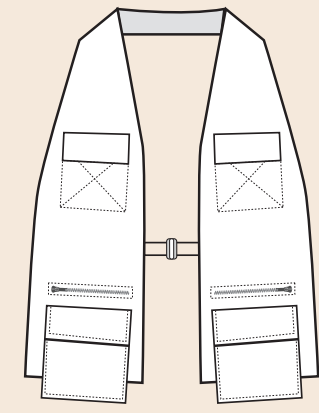
DYE
 SS21#03



Ricamo *DYE*
 realizzato con
 filo in poliestere
 e ricamatrice

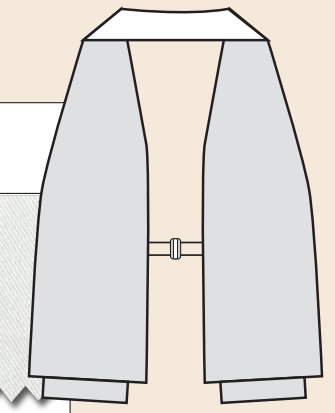
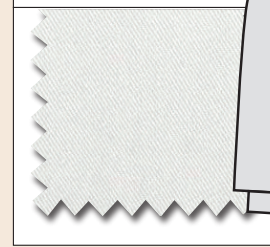


Coulisse laterale
 per arricciatura



DYE
 SS21#04

Candiani DENIM
 RR 55 33-**BCI**
 92%CO+6%EMA+2%EA



* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

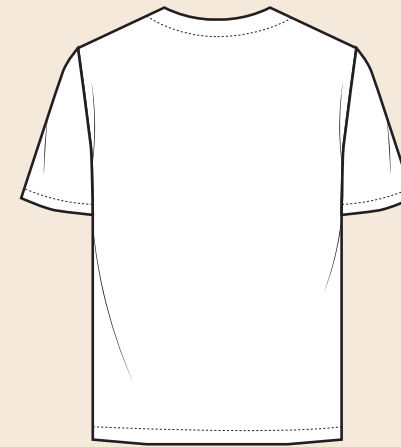
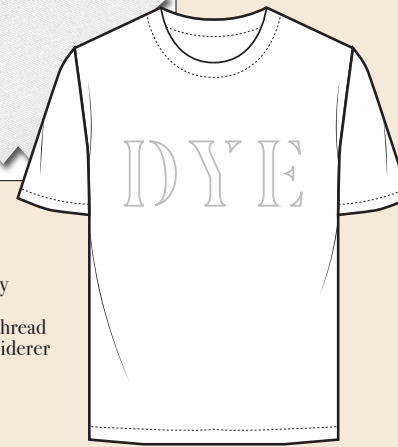
DYE
Outfit 04_ Denim Skirt and DYE T-shirt



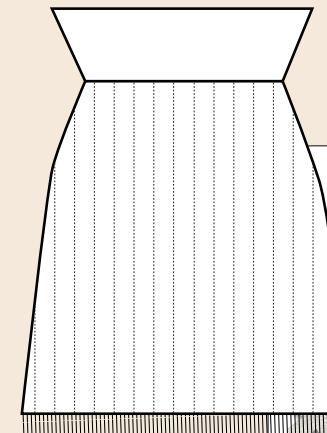
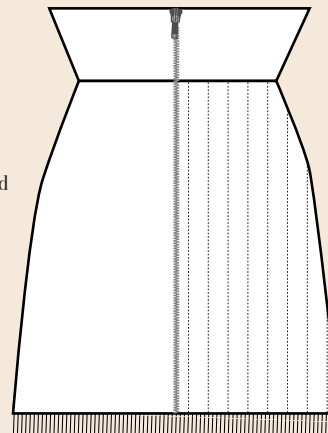
BIO Cotton
 100% CO
 class B

DYE
 SS21#05

DYE
 embroidery
 made with
 polyester thread
 and embroiderer



Pinstripe
 processing:
 seams every
 3 cm with
 polyester thread



Recycled Cotton
 100% CO
 Class A

DYE
 SS21#06



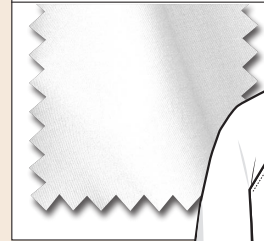
DYE
 SS21. A#02
 Candiani Denim

* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

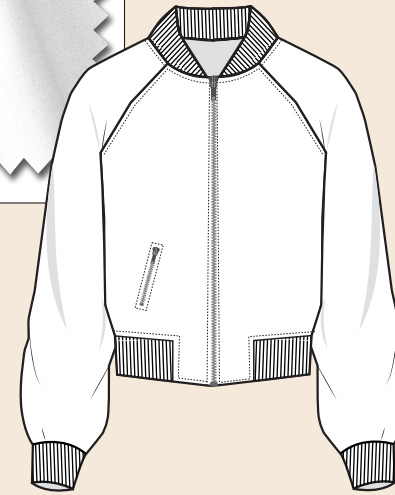
DYE
Outfit 05_ Organic Skirt and Masculine Bomber



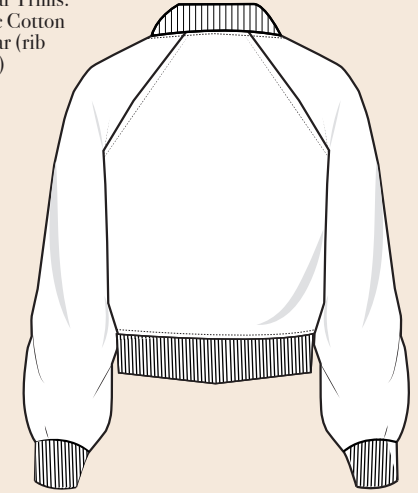
Instinct PLX GZ - Sitip Spa
 86% PL Recycled + 14% EA
 Class A



DYE
 SS21#07



Knitwear Trims:
 Organic Cotton
 Knitwear (rib
 stitches)

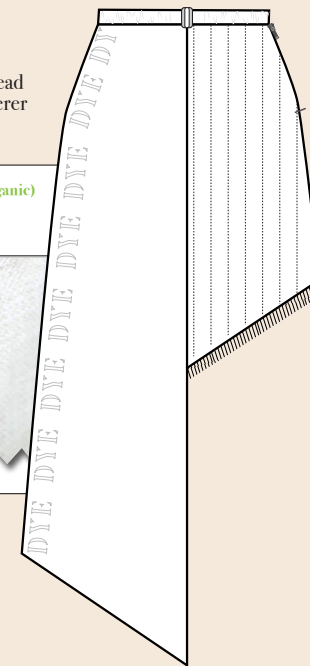


DYE
 embroidery
 made with
 polyester thread
 and embroiderer

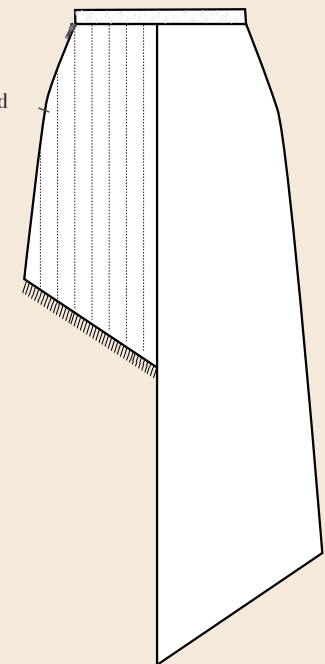
Ancient Hemp (Organic)
 100% CA
 class A



DYE
 SS21#08

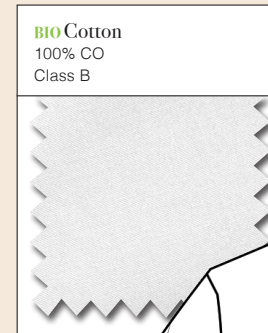


Pinstripe
 processing:
 seams every
 3 cm with
 polyester thread



* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

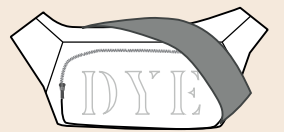
DYE
Outfit 06_ Organic Polo and Cargo Shorts



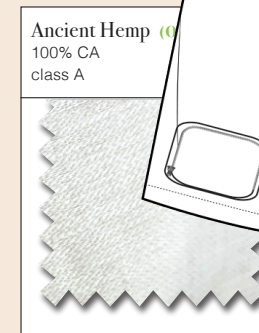
BIO Cotton
 100% CO
 Class B

DYE
 SS21#09

DYE
 embroidery
 made with
 cotton thread.

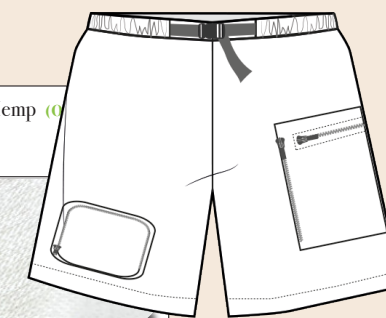


DYE
 SS21. A#03
 Candiani Denim
DYE
 embroidery
 made with
 polyester thread
 and embroiderer



Ancient Hemp (C)
 100% CA
 class A

DYE
 SS21#10



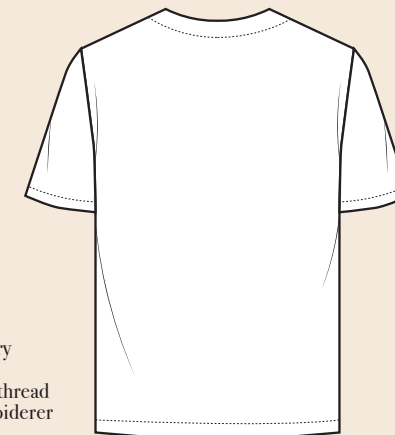
* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 07_ Cargo Pants and DYE T-shirt

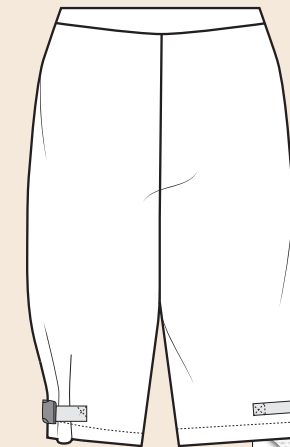
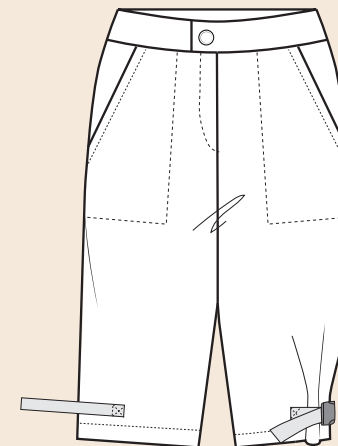


Recycled Cotton
 100% CO
 Class A

DYE
 SS21#11

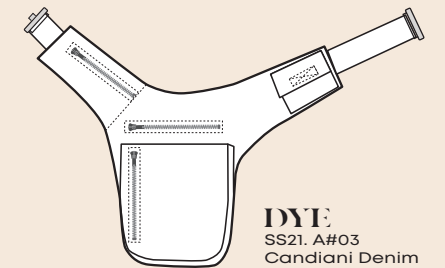
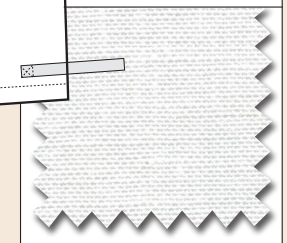


DYE
 embroidery
 made with
 polyester thread
 and embroiderer



Organic Linen - Predatex
 100% LI
 Class A

DYE
 SS21#12



DYE
 SS21, A#03
 Candiani Denim

* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 08_ Sporty Hoody and Natural Trousers



BIO Cotton
 100% CO
 Class B

DYE
 SS21#13



DYE
 SS21#14

Candiani DENIM
 RR 55 33-BCI
 92%CO+6%EMA+2%EA

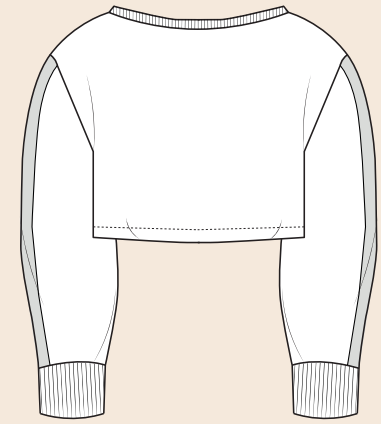
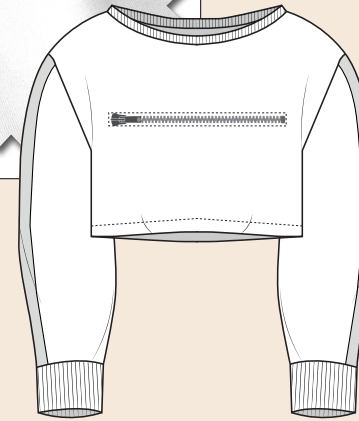
* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 09_ Recycled Cotton Tracksuit

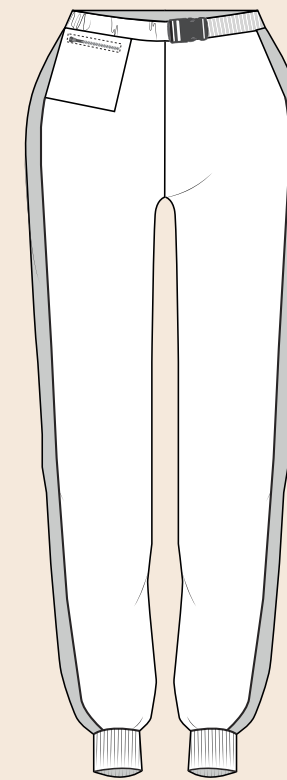


Recycled Cotton
 100% CO
 class A

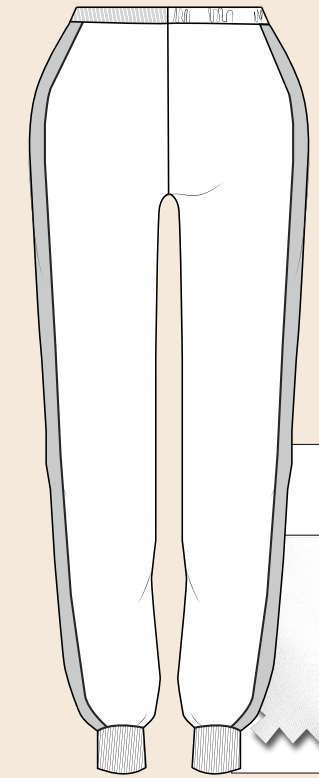
DYE
 SS21#15



Cuffs: Organic Cotton Knitwear (rib stitches)



Side bands made in Instinct PLX GZ 86% PL Recycled

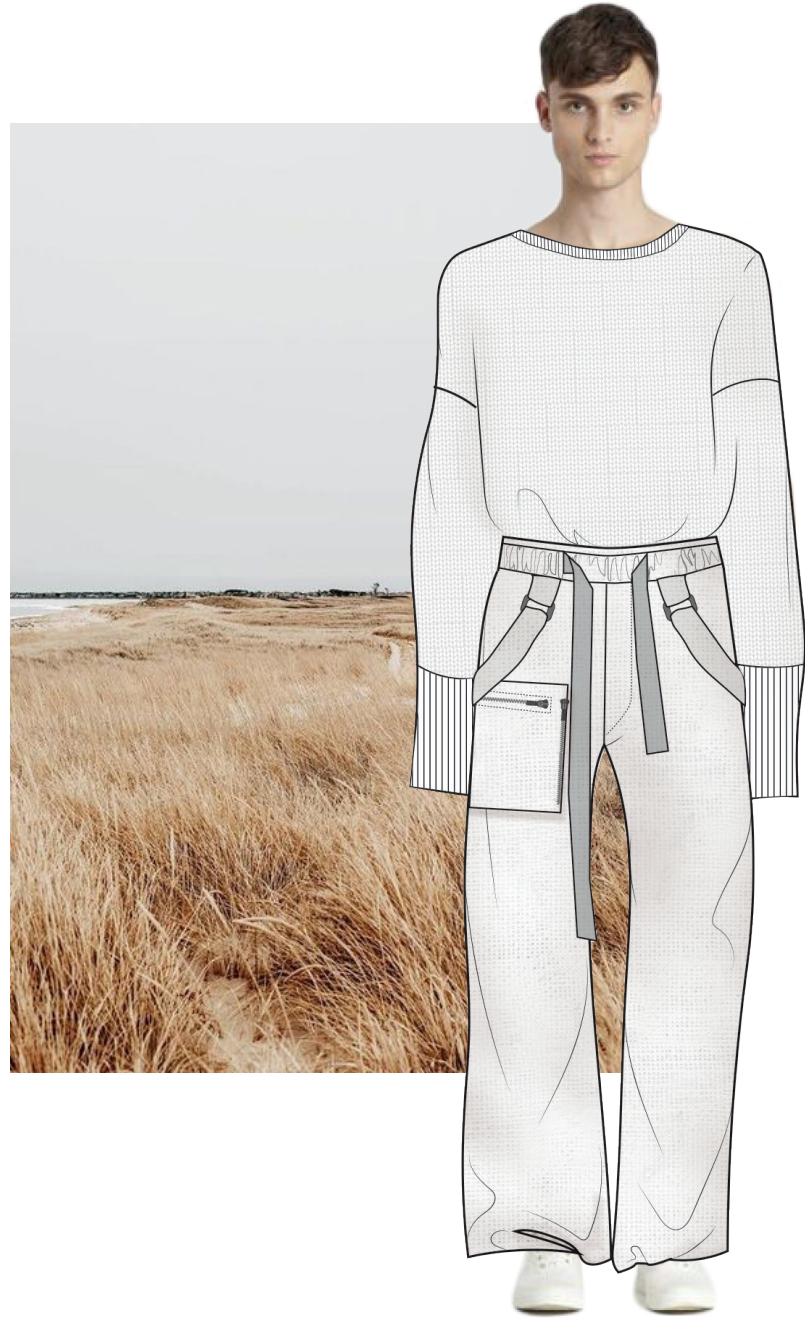


DYE
 SS21#16

Recycled Cotton
 100% CO
 class A

* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

DYE
Outfit 10_ Cotton Sweaters and Jumpsuit

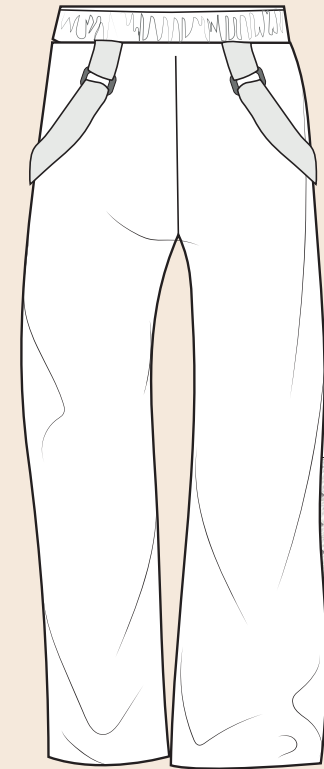
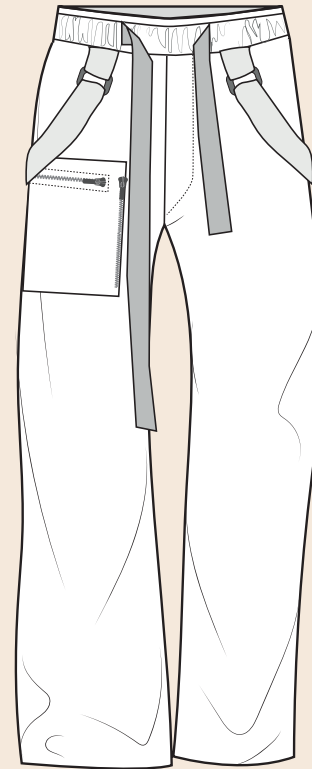
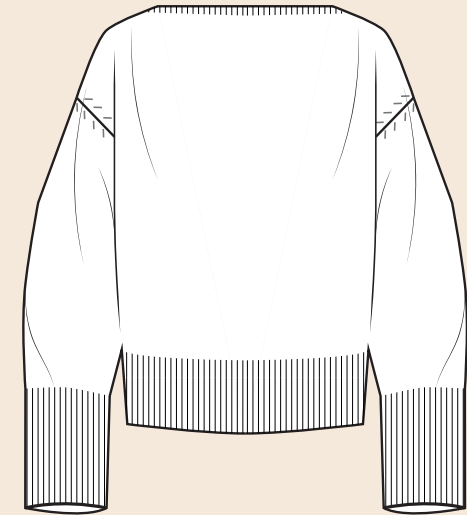
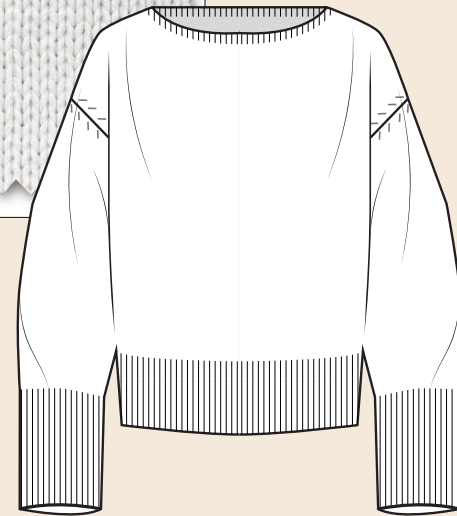


* All accessories, zippers and buckles, are metallic. *Plastic free collection.*

Raw Cotton Thread
100% Bio Cotton
class A

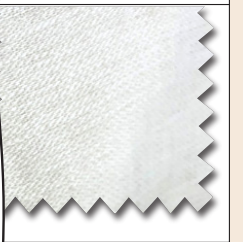


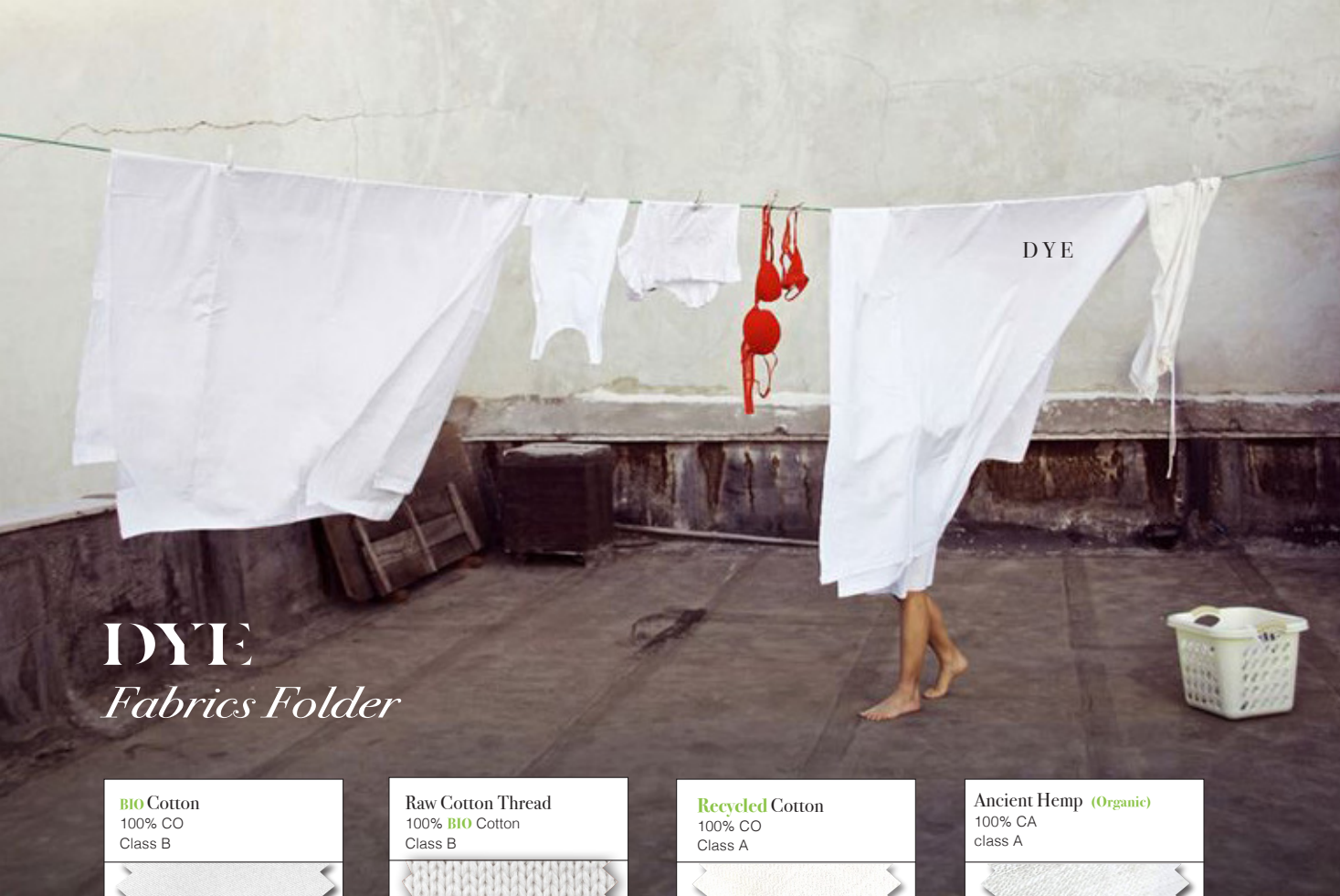
DYE
SS21#17



DYE
SS21#18

Ancient Hemp (Organic)
100% CA
class A





DYE

Fabrics Folder

BIO Cotton 100% CO Class B	Raw Cotton Thread 100% BIO Cotton Class B	Recycled Cotton 100% CO Class A	Ancient Hemp (Organic) 100% CA class A
Organic Linen - Predatex 100% LI Class A	Crepe - Predatex 100% SE Cruelty Free Class F	Candiani DENIM RR 55 33- BCI 92%CO+6%EMA+2%EA	Instinct PLX GZ - Sitip Spa 86% PL Recycled + 14% EA Class A

IN THIS PAGE: (FIG.102) image via *Nauchis*.Tumblr.com

DESIGN

The *Environmental Fiber Benchmark* compares the production processes of the most common natural and artificial yarns, evaluating their impact on the environment. There are six parameters by which yarns are classified: carbon footprint, human toxicity, energy consumption, water footprint and consumption and soil consumption (Richetti, 2017).

After these analyzes, the yarns were divided into classes: class A, more sustainable and class E, less sustainable.

For the development of this project, I oriented myself towards the first two classes of the Environmental Fiber Benchmark in order to **propose sustainable products starting from the choice of raw materials**. For this project some materials such as cotton and silk have been hypothesized as organic, recycled or cruelty free to support the green and conscious design philosophy of the Slow Fashion.

Fibers and Fabrics establish a fundamental aspect for creating sustainable products. Following the sustainable trend, which wants to create fashion for the well-being of people and the planet, I decided to **choose natural materials from companies that rely on sustainability and innovation**.

YOUR

Many of these fabrics, in fact, were given to me by companies that believed in this project (Candiani Denim, Predatex and Sitip). Even if these fabrics do not have Gots or 100% Bio certifications, they are companies that make sustainability one of their main missions.

It is important to underline that regenerated or recycled polyester belongs to class A for the *Environmental Fiber Benchmark*. The polyester that is normally found on the market is considered as plastic because it is composed of polyethylene terephthalate (PET) (Marjorie van Elven, 2018). **Mechanically recycled polyester (rPET)** instead «is obtained by melting down existing plastic and re-spinning it into new polyester fiber» (Marjorie van Elven, 2018). By recycling five plastic bottles we obtain the necessary yarn for a large size t-shirt. In a world where the fight against plastic pollution, I would say it is a nice solution. The thesis was mainly based on natural and organic materials for reasons of sustainability, respect for the environment and for the reason of recycle fibers or dispose them correctly in the future. I decided to insert the recycled polyester jersey because I noticed I was able to dye it with natural pigments, even if

ESSENCE

the fiber is artificial. This fact surprised me very much. The rPET will not be a natural material, but it is a material recycled from common plastic bottles. This aspect makes it sustainable. It is also a fiber suitable for sportswear.

As we have seen in previous chapters, cotton itself is not a sustainable fiber, even if it is a natural fiber. For this reason, when I had to choose the materials I preferred to choose **organic cotton**. The same thing happens for **linen** fiber, it is preferable to use organic linen if you want to include sustainability in your brand mission. The main difference between a natural and an organic fiber lies in the way the fiber is grown and harvested: no pesticides are used for the organic fibers; water used in the irrigation of the fields is limited; the harvest is done by handpick so that a longer fiber is obtained; and even the manufacturing processes are controlled and normalized following sustainable principles.

Silk belongs to Class F, that is why I picked cruelty-free silk, category that does not fit in the table EFB. Cruelty-free silk is a sustainable and human option where the larva is not sacrificed for collection. The

worm, in fact, before the cocoon is used to spin the silk, becomes larva. I don't like the idea of exploiting insects or animals in the fashion industry. This process, in my opinion, changes the classification of silk fiber in the EFB table.

If I had to think of a winter collection for the brand, then I would choose to use recycled wool (Class A).

I like to think that the materials which I use are not only natural but also Bio / Organic. Unfortunately in the phase of realization of the final prototypes this characteristic is not always satisfied. Unfortunately it is still difficult to find natural fabrics with these classifications and certifications on retail. I would like to underline that for me this is a fundamental aspect for the project and moreover it is a question of limitations due to the timing and economic problems that are intrinsic in the thesis project. However, most fabrics have a low environmental impact.

Go to 5.2 "Return to origin" if you want to know more about natural fibers and their characteristics.

**CLASS
A**

Recycled cotton, Mechanically recycled nylon, Mechanically recycled polyester, Recycled wool, Organic Hemp, Organic linen.

**CLASS
B**

Tencel, Organic cotton, Chemically recycled polyester.

**CLASS
C**

Conventional hemp, Ramie, PLA, Conventional linen.

**CLASS
D**

Virgin polyester, Poly-acrylic, Generic modal.

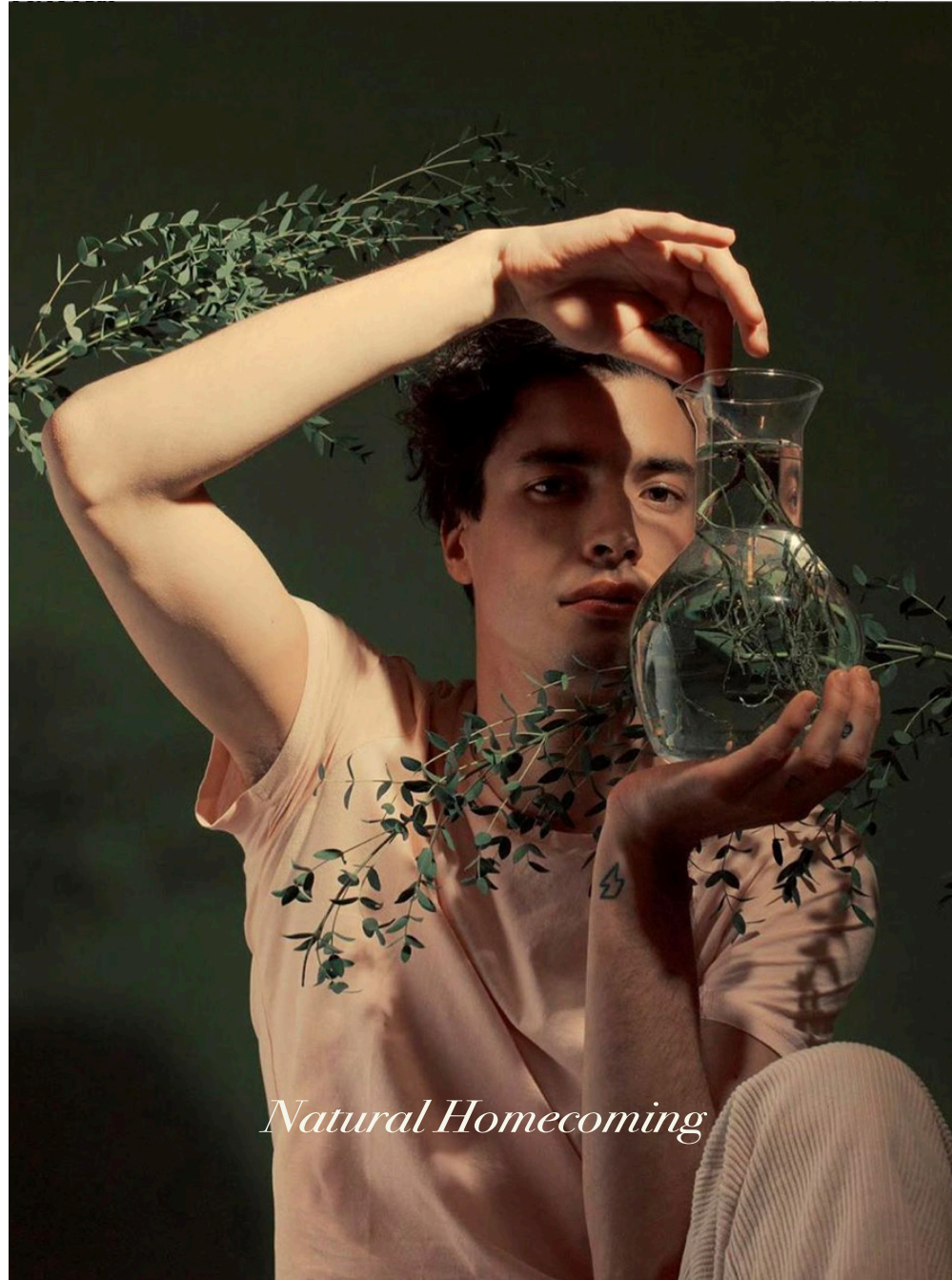
**CLASS
E**

Conventional cotton, Virgin nylon, Cupra, Bamboo viscose, Wool, Generic viscose

**CLASS
F**

Silk, Organic Wool, Leather, Spandex, Acetate, Cashmere wool, Alpaca wool, Mohair wool, Bamboo linen.

TABLE: Info from Environmental Fiber Benchmark, table made by the author.



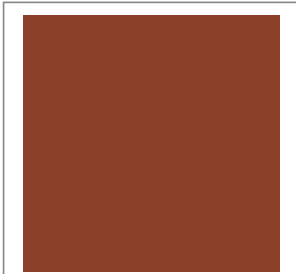
Natural Homecoming

*“The eye must know
how to look to see that
the world is green like
Spring, yellow like
Summer, vermilion like
Autumn and brown like
winter”*

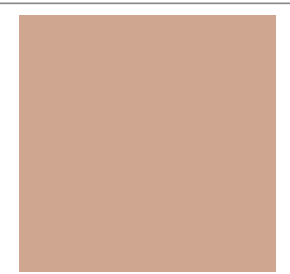
(Vigo & Sibelli, 2007: 8)

Natural Colors

Capsule Collection SS21



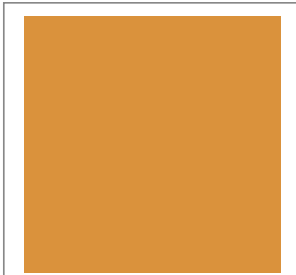
PE21//C01
Brunette Catechu



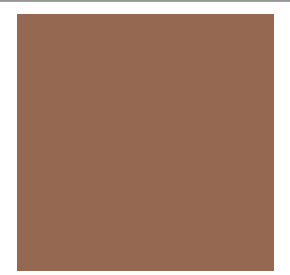
PE21//C02
Reddish Mignonette



PE21//C03
Coffee Blend



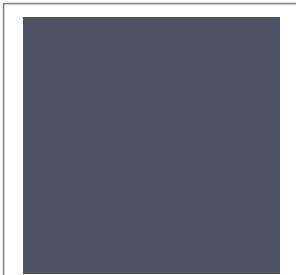
PE21//C04
Spiced Mignonette



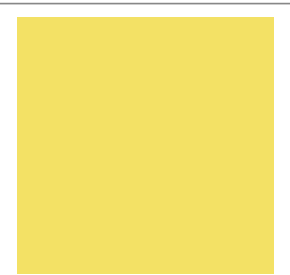
PE21//C05
Black Tea



PE21//C06
Madder



PE21//C07
Hematin Brown



PE21//C08
Mignonette Flower



In ancient times the dyers of the Indio valley in Asia were part of an elite and privileged caste. They were important craftsmen and their work was highly appreciated (Vigo & Sibelli, 2007). The recipes of these skilled dyers were top secret and were passed on to subsequent generations.

In this thesis **natural extracts** are used as dyes for the dye of the garments. With this project I want to enhance the **naturalness of the color** and its low environmental impact: as the dye respects the environment and the precious fresh water resources. Another important aspect of the collection is linked to the **ancient traditions that are disappearing**, such as the natural dyeing methods.

Some natural extracts were kindly provided by the company *F.T.R s.p.a* which is testing them industrially and today they are still in an experimental phase. In this way I can present a **sustainable but innovative and contemporary project, in balance between industry and craftsmanship.**



The **Brunette Catechu** color is an extract obtained from Acacia wood.



Reddish Mignonette is an extract from the plant *Reseda Luteola*. Depending on the extraction concentration, luteolin varies in color from yellow to reddish brown.



Coffee Blend color is obtained from the infusion of finely ground coffee beans.



Black Tea color is obtained by infusing the leaves of the tea plant.



Madder is an extract obtained from the homonymous plant *Rubia tinctorum* L. which belongs to the *Rubiaceae* family.



Spiced Mignonette color comes from the combination of the infusion of *Reseda Luteola* and turmeric.

«*The history of fashion is the history of color*»
(Eiseman & Cutler, 2014:5)

The color is able to give a great visual and emotional impact both to the garment and to the person who wears it. The choice of a garment of a certain color rather than another one is determined by the chromatic trends, the so-called “seasonal color”, and by the emotional impulses that a particular color has on us (Chapter 02 & 04).

Technological innovations and the advent of modern chemistry have made obsolete natural dyes that were used to give color to fabrics and handicrafts.

Synthetic color is fast, offers a thousand opportunities of color shades and is more economical. These are the main reasons that lead synthetic dyes to be the first choice of 20th and 21st century.

With this *Natural Homecoming* color palette, **earthy tones and ancient natural extracts** are re-proposed, including madder which was one of the most important dye before the 9th century, in order to return to the true essence of

natural color.

BROWNTONES:

They represent an intimate relationship between man and the earth and symbolize the environmental movement (Eiseman & Cutler, 2014).

SANDY AND EARTHY COLORS:

Swedish designer *Lars Nilsson* used this color in 2001 to represent a “perfect balance” (Eiseman & Cutler, 2014). It is a natural, sophisticated and humble color. Neutral, natural and casual.

Neutral colors play the role of reference point for the couturiers of the past and the designers of today.

NEUTRAL COLORS:

«People are increasingly sensitive to the nuances and tones of the natural world; there are a million, and there is a million ways to wear them» (Simon Doonan quoted in Eiseman & Cutler, 2014: 94). The light sandy colors are elegant and extremely versatile as they are suitable for

all skin colors. They are fresh and modern colors. As with all neutral tones used for clothing, these are “homologating” colors that represent the modern concept of chromophobia (Chapter 2.5).



Hematin Brown derives from the logwood. It belongs to the *Fabaceae* family, originally from Central America

The color **Mignonette Flower** is an extract from the *Reseda Luteola* plant. Depending on the extraction concentration, luteolin varies in color from yellow to reddish brown.

BLUE INDIGO:

It is a color that has distant origins: a blue thread that has linked cultures and peoples from all over the world since ancient times (Eiseman & Cutler, 2014). A laborious process, which in the past is intertwined with periods of slavery in America and colonization in India, allows us to obtain this precious color. The first Levi's Strauss jeans were dyed with this natural extract until 1890, when it was decided to replace the extract with synthetic dye. To date, most of the dyes of blue ones are obtained with the artificial color. In recent years, small local movements have sprung up trying to bring this ancient tradition back to life: dyeing with natural indigo.

The bluish tones in this thesis have been replaced by another ancient color obtained from the extraction of logwood. Hematin Brown is a gray color tending to purple and blue. It was chosen to visually replace the Blue Jenans color which has always been linked to workwear and casualwear (garments suitable for leisure time).

ATTRACTIVE YELLOW:

The starting point of the project was the brand *United Colors of Benetton*. The Venetian brand would never have been born had it not been for the iconic yellow sweater that his sister made for the young Luciano Benetton. So I couldn't not include it in the first DYE SS21 color palette.



(FIG. 104) Image by Chelsea Jackson, *Color Story: White*.

Natural Dyeing

Ethic and Sustainable

In order to better understand the reasons that led me to choose natural dyes, I recommend going to the previous chapters where we specifically talked about dyeing and sustainability. As we have seen, the **modern consumer is looking for sustainable products**. For this reason, his interest in natural dyes, which do not have a negative impact on the environment, is increasing (Yusuf et al., 2017). This is because «the growing concerns among the communities globally against the use of azo and benzidine synthetic dyes due to their carcinogenic, non-biodegradable nature and hazardous effects on environment and human health, re-established the needs of natural dyes to human society» (Yusuf et al., 2017: 142).

In ancient times the “natural” was the only possible choice and has always dominated artistic expressions since the beginning of human civilization. Color is emotion but it is also the expressiveness and sensitivity of the artist himself. This is the reason why color has always been a faithful companion of man and has always been present in our life. The natural color, unlike industrial

dyes of synthetic origin, is *vibrant*. A perfect solid color cannot be obtained, but it is precisely the **imperfection that makes the product unique, enhancing its naturalness and craftsmanship**.

An ethical product is also expected on the social level. The intention is to bring back the **ancient natural dyeing traditions** in risk of disappearing; a risk that they have already had to face with the advent of modern chemistry.

ON THE LEFT: (FIG. 1.05) *The Art of Natural Dyeing*, image via food54.com



Rock Alum was already used in 2000 BC by the Egyptian civilization which used it as a mordant to prepare the fabric to “embrace” the dye (Vigo & Sibelli, 2007).



The Recipe:

Between natural color and innovation

Step 1: Etching

Weigh the dry fabric. Add the mordant, Rock Alum, about 20% of the weight of the fabric (26% if it is cotton). For washing machine consider 100g of rock alum for every 3-4 liters of water. Before putting it in the washing machine, dissolve the mordant with hot water. Do a wash without prewash then dry the fabric.

Step 2: Dyeing

After the first etching phase the fabric is ready for dyeing. Per 100g of fabric 10g of natural extract (dyeing). The garment dyed in the washing machine will be performed with an approximate ratio of 1kg of fabric in 8 liters of water. If the weight of the fabric is lower, add dye. The machine wash is at 90° without prewash, so as not to disperse the color, before the dyeing phase.

** To dye with an even more sustainable method, I recommend dyeing by hand in a basin with hot water (approximately 90°). Garments in the collection weigh from about 300g to 500g, from 3 to 5 liters of water and from 30 to 50 grams of dye will be needed. **It would be wasteful to use the washing machine to dye just one garment.** Washing machine dyeing only makes sense for dyeing several items. In this way the weight ratio of the fabric, grams of dye and liters of water will be favorable. Otherwise, with hand dyeing you can save even more resources (water and energy).*



Note:

*Natural dyeing
experimental phase*

MIGNONETTE & MADDER

The dyeing is obtained by boiling the dyeing plant at 100 °. Since it is not an extract it is preferable to dye in a basin or in a pot over the fire. To keep the basic dyeing bath add a spoonful of Sodium Bicarbonate. PROS: I get bright, yet natural colors. CONS: dyeing method and 1:1 dye weight-fabric weight ratio.

BRUNETTE HEMATIN

The hematinous brown color if etched with rock alum tends to become a very purplish gray. If not etched, however, a very slightly saturated gray-beige is obtained. PRO: Not being able to use the Indigo color, because the dyeing process requires complicated chemical reactions, the brown hematin is the color I got closest to the blue tones.

SPICED MIGNONETTE

The natural dye obtained with Mignonette Flower is a very light lemon yellow. To intensify the color I decided to take a mixed dye bath:

mignonette+ turmeric powder (for every two liters of water you need 2 tablespoons of turmeric).

PRO: In this way I was able to expand the range of colors. Another experiment was done with reseda + black tea leaves. The color obtained was a very light sand color, which I decided to discard from this season's color palette.

TEA AND COFFEE

If the dyeing is done in a pot, it is advisable to boil the fabric and the dye for two hours.

Every 2 liters of water use coffee of a 4-person mocka.

I chose black tea because it is the darkest and gives a more intense color. One black tea bag is needed for every 250ml of water.

This is a very high ratio, but necessary if you want to get good color intensity.

CONS: dyeing in the pot the color is not homogeneous, while in the washing machine the fact that the basket turns and moves the fabric makes the result better.

EXTRACTS FTR. s.p.a

(Brunette Hematin, Brunette Catechu, Reddish Mignonette)

As these are dye extracts, the concentration of the dye is higher. For this reason we can lower the fabric weight-dye weight ratio, 10g of extract is needed for every 100g of fabric. With these extracts it is possible to dye at 90 ° in the washing machine, obtaining better results: the color is more intense and homogeneous.

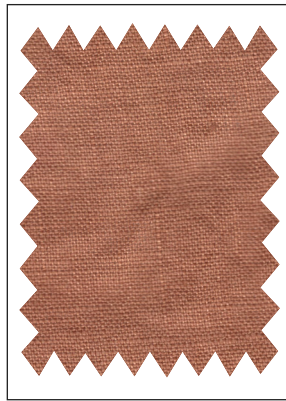
ETCHING

This phase is essential to allow the fabric to prepare to accommodate the colored pigment. Without this first step the color will be faded and will not meet the prerequisites for color fastness.

Lab Dip

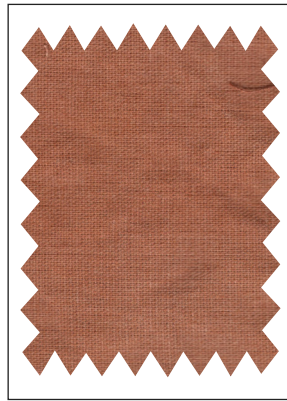
C.01
Brunette Catechu

Organic Linen



Approved.
Beautiful color fastness

Recycled Cotton



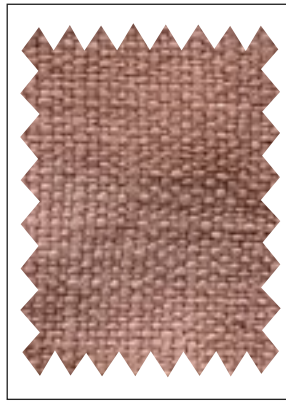
Approved.
Beautiful color fastness

Bio Cotton



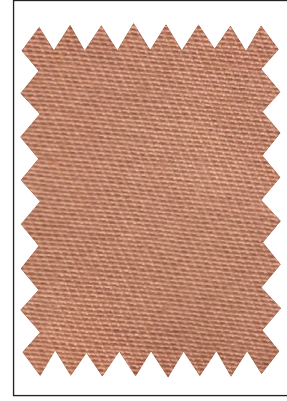
Approved.
Beautiful color fastness

Hemp



Approved.
Beautiful color fastness

Denim



Approved. A little bit less saturated. Fine color fastness

Silk



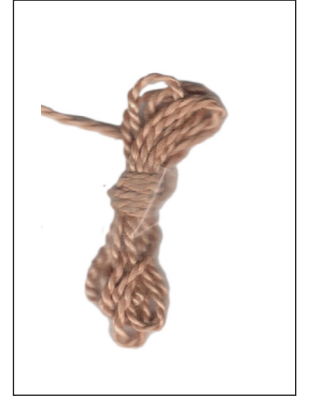
Approved.
Beautiful color fastness

Recycled Polyester



Approved. A little dull.
Fine color fastness

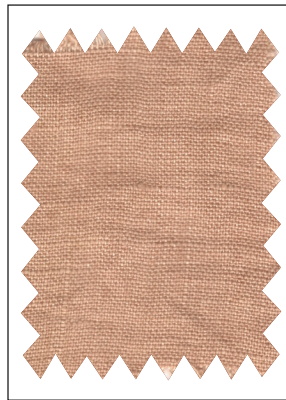
Raw Yarn Cotton



Approved.
Fine color fastness

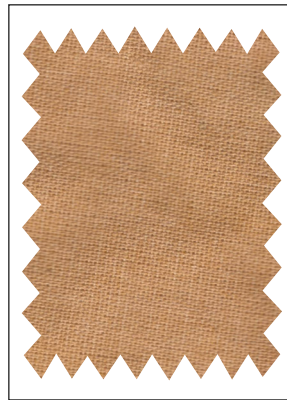
C.02
Reddish Mignonette

Organic Linen



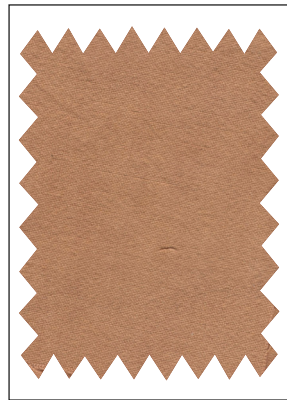
Approved.
Beautiful color fastness

Recycled Cotton



Approved.
Beautiful color fastness

Bio Cotton



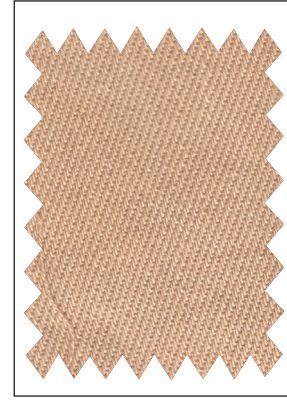
Approved.
Beautiful color fastness

Hemp



Approved.
Beautiful color fastness

Denim



Approved. A little bit less saturated. Fine color fastness

Silk



Approved.
Beautiful color fastness

Recycled Polyester



NOT Approved. It looks like the one of Catechu.

Raw Yarn Cotton



Approved.
Beautiful color fastness

Lab Dip

C.03
Coffee Blend

Organic Linen



Approved.
Fine color fastness.

Recycled Cotton



Approved.
Fine color fastness.

Bio Cotton



Approved.
Fine color fastness.

Hemp



Approved.
Beautiful color fastness.

Denim



Approved.
Fine color fastness.

Silk



Approved.
Beautiful color fastness.

Recycled Polyester



Approved.
Fine color fastness.

Raw Yarn Cotton

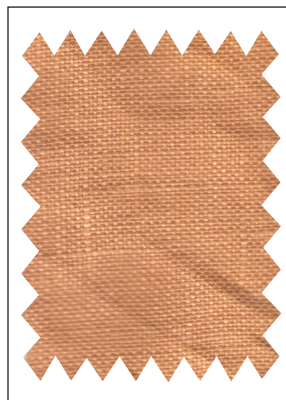


Approved.
Beautiful color fastness.

**It tends to
loose a lot of
dye at the first
wash. Samples in
this table have
been washed.*

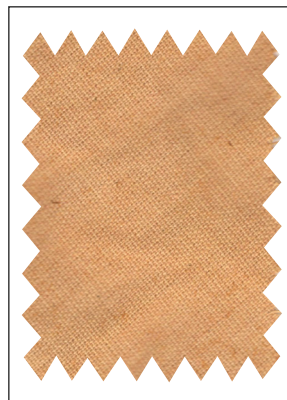
C.04
Spiced Mignonette

Organic Linen



Approved.
Beautiful color fastness

Recycled Cotton



Approved.
Beautiful color fastness

Bio Cotton



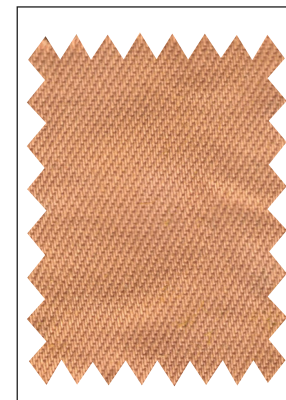
Approved.
Beautiful color fastness

Hemp



Approved.
Beautiful color fastness

Denim



Approved.
Beautiful color fastness

Silk



Approved.
Beautiful color fastness

Recycled Polyester



Approved.
Fine color fastness.

Raw Yarn Cotton

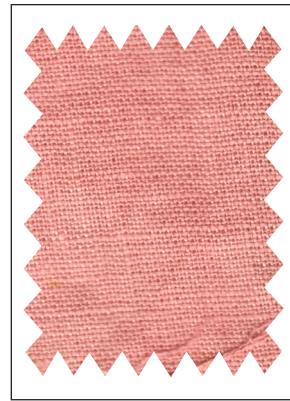


Approved.
Beautiful color fastness

Lab Dip

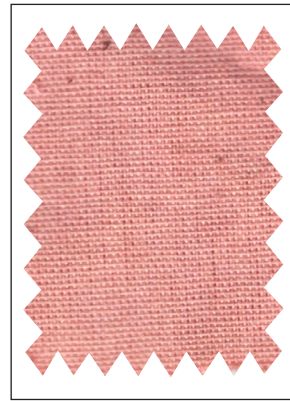
C.05
Madder

Organic Linen



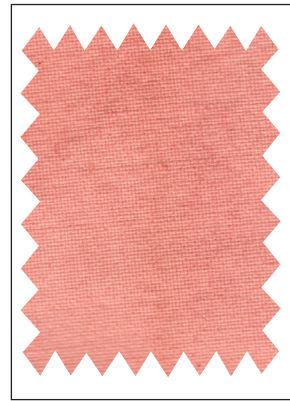
Approved.
Beautiful color fastness

Recycled Cotton



Approved.
Beautiful color fastness

Bio Cotton



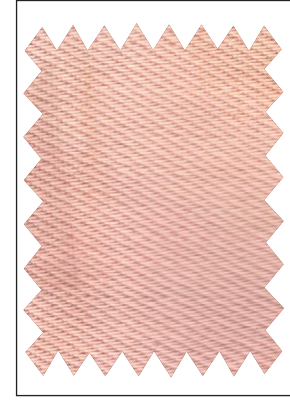
Approved.
Beautiful color fastness

Hemp



Approved.
Beautiful color fastness

Denim



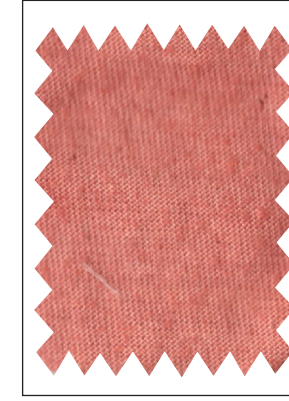
Approved.
Fine color fastness.

Silk



Approved. Very bright.
Fine color fastness.

Recycled Polyester



Approved.
Fine color fastness.

Raw Yarn Cotton



Approved.
Fine color fastness.

C.06
Black Tea

Organic Linen



Approved.
Fine color fastness.

Recycled Cotton



Approved.
Fine color fastness.

Bio Cotton



Approved.
Fine color fastness.

Hemp



Approved. Very bright.
Beautiful color fastness.

Denim



NOT Approved. Unevenly dyed.

Silk



Approved. Very bright.
Beautiful color fastness.

Recycled Polyester



Approved.
Fine color fastness.

Raw Yarn Cotton



Approved.
Fine color fastness.

•It tends to loose a lot of dye at the first wash. Samples in this table have been washed.

Lab Dip

C.07
Hematin Brown

Organic Linen



Approved.
Beautiful color fastness

Recycled Cotton



Approved.
Beautiful color fastness

Bio Cotton



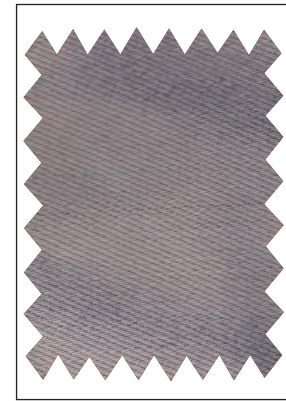
Approved.
Beautiful color fastness

Hemp



Approved.
Beautiful color fastness

Denim



Approved.
Fine color fastness

Silk



Approved.
Beautiful color fastness

Recycled Polyester



Approved. A little bit dull.
Fine color fastness

Raw Yarn Cotton



Approved. A little bit dull.
Fine color fastness

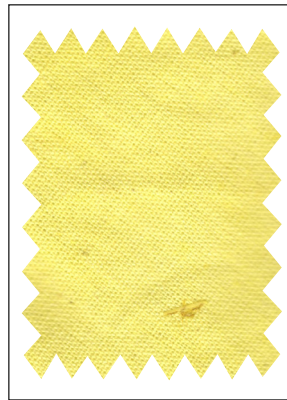
C.08
Mignonette Flower

Organic Linen



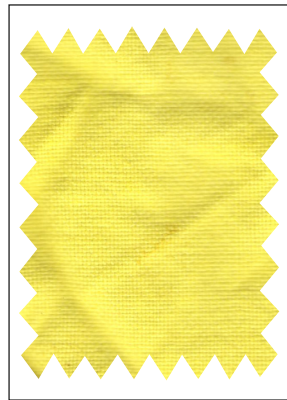
Approved.
Beautiful color fastness

Recycled Cotton



Approved.
Beautiful color fastness

Bio Cotton



Approved.
Beautiful color fastness

Hemp



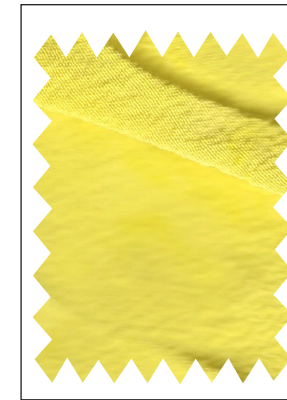
Approved.
Beautiful color fastness

Denim



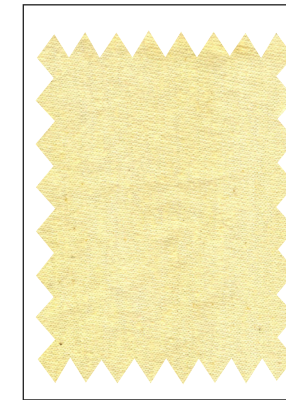
Approved. A little bit dull.
Fine color fastness

Silk



Approved.
Beautiful color fastness

Recycled Polyester



Approved. A little bit dull.
Fine color fastness

Raw Yarn Cotton



Approved.
Beautiful color fastness

Lab Dip **NOT APPROVED**

TEST 01
Hematin Brown with no mordant

Recycled Polyester

Denim

Organic Linen



Too dull and too gray. It looks like a brown color, too different from the real color sample.

The same problem with all the fabric samples, here you have three examples.

TEST 02
Coffee Blend (only powder)

Bio Cotton

Recycled Cotton

Denim



Too dull and too gray. If you avoid real coffee drink to dye the fabric, the result is not satisfactory.

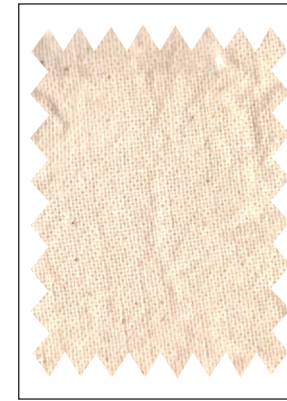
Analyzing the denim fabric, there is a nuance that tends to darken the color. At that point the fabric was treated with an impermeabilizing spray. This option was also discarded because considered not natural.

TEST 03
Onion Peels

Recycled Cotton

Recycled Polyester

Bio Cotton



Too dull and too gray. It looks like a faded color. (Very strange) the color is brighter in the synthetic jersey sample. Not approved.



DESIGN

YOUR

ESSENCE

Blending

For the development of this project I decided to **use in my favor a “weakness” of natural dyes.** To obtain a good result with the dye bath, the dyes must be specific for the fiber that will be dyed. It happens that **synthetic fibers have a weak, almost zero, color fastness if dyed with natural dyes.**

In fact dyes on mixed fibers do not absorb the dye in the same way, this fact generates **difficulties in equalizing the fibers.** It is also possible that there are differences in the absorption of the same fiber, so mixing batches of cotton is not recommended in the industry.

If we analyze the garments made and then dyed, we will notice that the **seams in polyester thread and made with the sewing machine have remained faded, while the hems sewn by hand with cotton thread have become uniform with the color of the garment.**

This is because the natural dye has a greater affinity with the natural fiber which is porous unlike the synthetic one. The same goes for embroidery done with an embroidery machine and for details such as zippers.

Color once again plays a role. In this case it plays the role of **differentiating what is industrial and what is artisanal.**

By coloring the hem by hand, the color gives **importance to craftsmanship** and the natural, highlighting the contrasts with what has been followed in the garment by a more modern and industrial tailoring.

IN THE OTHER PAGE: Original DYE Pictures



DYE

Natural color capsule

SS21

DYE.SS21 Capsule Collection is launched in the concept store as total white garments made of natural fabrics, to maximize the concept of **raw material and purity**.

The consumer can decide to buy a capsule of natural extracts together with the garment. In a second moment he can **dye** the purchased garment as an **act of personalization and reconnection with the ancient traditions** linked to the world of dyers.

Recently, due to the lockdown, a new trend has emerged that has depopulated the web. This trend has also been adopted by some fashion brands in order to involve the consumer in a moment of international crisis (retain costumer). I am referring to the **DIY** phenomenon, *Do It Yourself*. Suddenly on the web there are DIY tutorials of all kinds. In a few weeks we had to find a way to reinvent our everyday life and discover a new type of free time to spend within the walls of our home. This phenomenon of *New Makers* is based on the **sharing of cultural aspects and traditions**.

The selection of colors will be the exclusivity of the season, which means a unique color palette for each season. The one for SS21 wants to be a return to nature: a *Natural Homecoming*. Color is the time factor and it plays a very

important function as regards the concept of trends. In fact, Colors are able to update the garment and make it attractive and competitive on the market. By going to dye the product at a later time, the problems relating to **unsold stocks** are also resolved: the same garment proposed the previous season, but with a different color, can generate new interest in the consumer.

Wearing a color is a way to express yourself, but how do you go on producing colored garments if **today's dyeing methods are a major cause of the climate crisis?** (Cole, 2019). The challenge of the future will be to propose garments dyed with natural pigments.

The sustainability aspect of my thesis is based on experimenting natural extracts that have no impact on the water footprint produced by the fashion system.

NEAR: (FIG. 107) Mockup delle capsule di colore

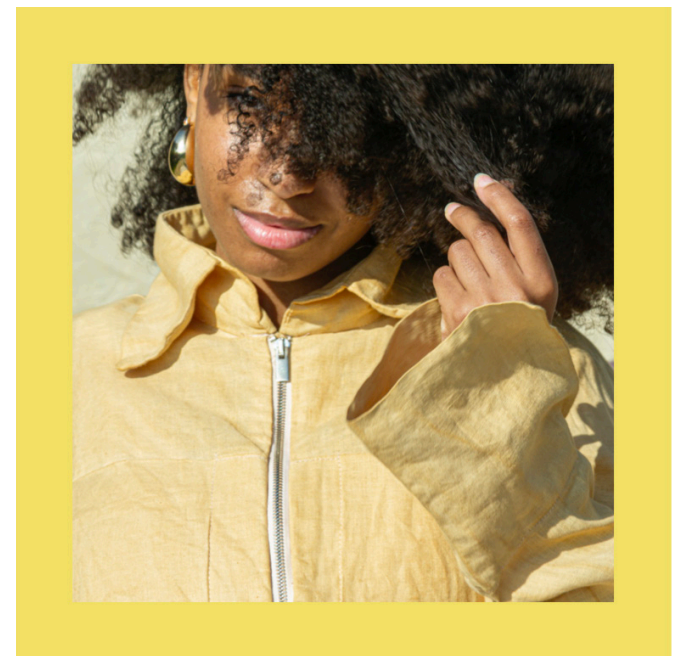
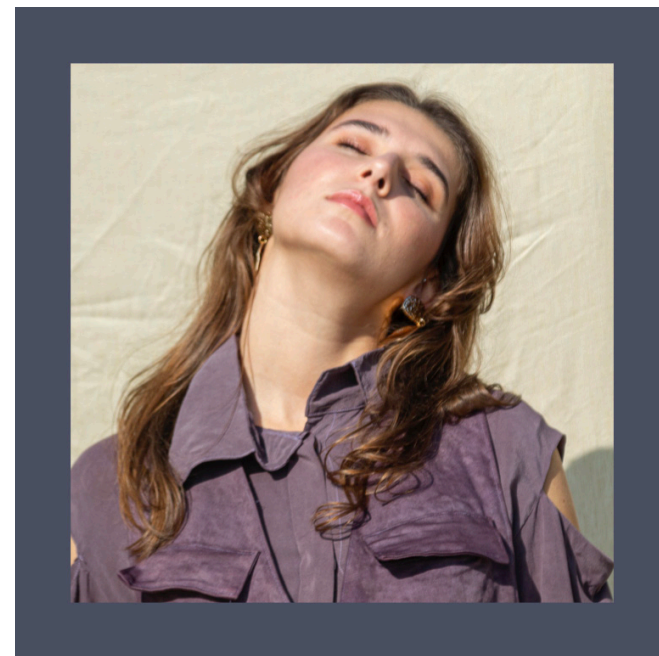
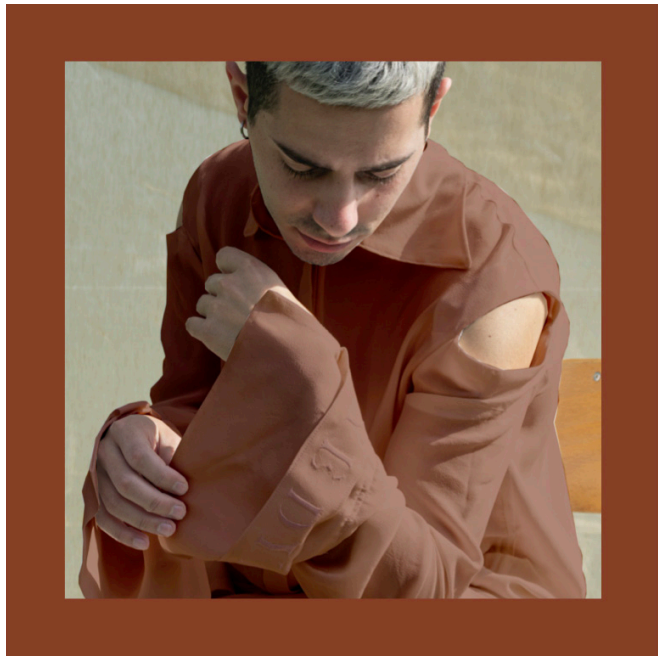


DYE

DESIGN

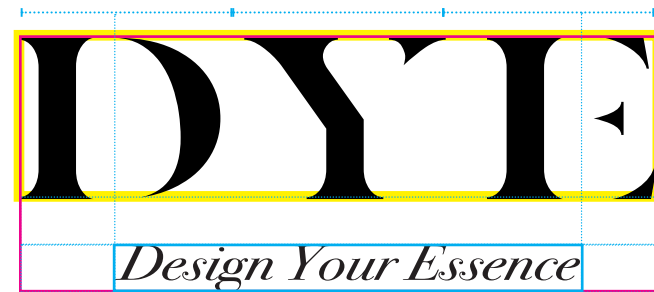
YOUR

ESSENCE



Visual Identity

The Logotype



■ logotype ■ brand mark ■ claim

Font: Quakiez Display, 90pt, 100V/A

Font: Bodoni 72, *Book Italic*, pt19

Dimension: 3,4 x 8,4 cm

Font: Quakiez Display

ABCDEFGHIJK
LMNOPQRSTU
VWXYZ

Font: Bodoni 72, *Book Italic*

*ABCDEFGHIJKL
MNOPQRSTUVW
XYZ*

*abcdefghijklmnop
qrstuvwxyz*



Logotype:
Negative, Positive
& Total White



Meaning:

The name of the brand plays with the dualism of the word which constitutes the brand itself. Dye is the process by which the fabrics are colored, but Dye is also the acronym for *Design Your Essence*.

Within the same name we find **dyeing** and **customization**. These are two fundamental characteristics of the project. The second feature is of particular importance. *Design Your Essence* represents the possibility of a brand that allows you to express your personality by characterizing your garments through the use of color.

Logotype:

Colored Version.

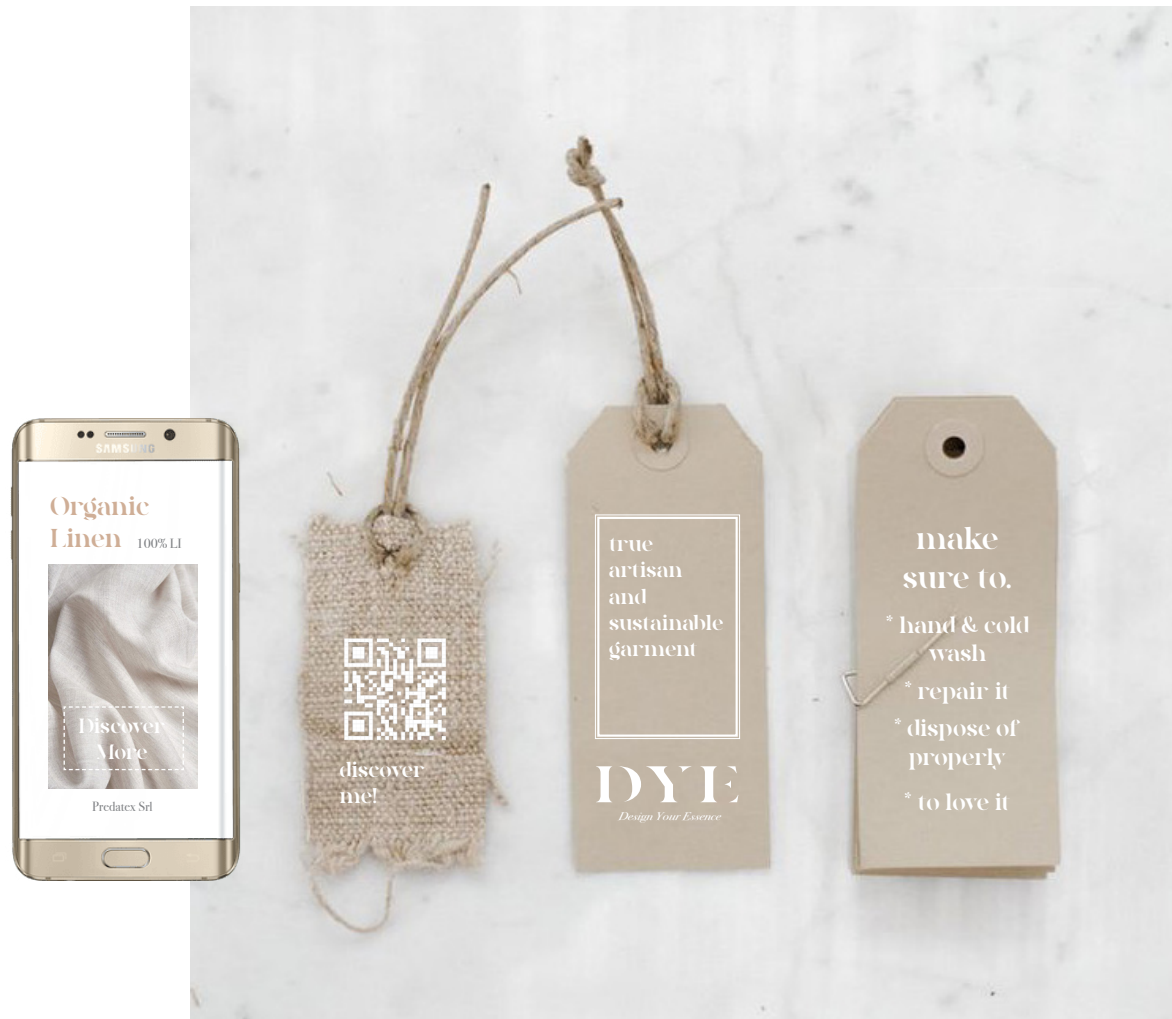
DYE

LABELS

AND

PACKAGINGS

Label and Packaging



The issue of sustainability as added value changes the way in which the values of a project are communicated. We will need new labels that can communicate and inform the customer on the issue of sustainability by declaring bio materials and processes (From *The future is green*, chapter 4.3).

Label is part of the identity of the garment. It serves to inform the consumer about the product: the materials, the origin, the history and its maintenance.

Today it is increasingly important to have a **label capable of easily informing the consumer about the transparency** of the garment's production process. To achieve this purpose, labels have been transformed into smart-tags: RFID tags, QR codes and NFCs that interact directly with smartphones (Richetti, 2017).

The tags for the garments were designed on three pieces. The first is made with the same fabric as the garment. A QRcode is printed

on it which, if scanned, will lead you to discover more information about the fiber and the fabric (transparency).

The second tag bears the brand name and an inscription stating that the garment is ecologically and ethically sustainable (*true artisan and sustainable garment*).

The third tag ensures the correct use of the item purchased: hand and cold wash; repair it if necessary; dispose of properly and love it.

Packaging also plays a fundamental role in the visual identity of a brand. Selecting **packs in organic fabric or recycled paper reinforces the brand's mission**. Through the choice of a sustainable pack, in this case the first reusable as a bag and the second recyclable again, the customer is given attention to the topic of sustainability even in the small details.





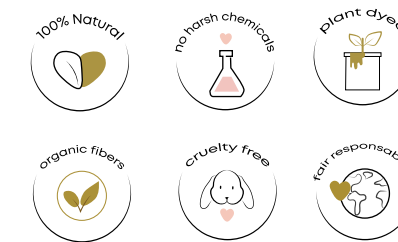
“Thank you” Letter with Dyeing Instructions

We want to thank our customers for their sustainable purchase. It is important that the features of the garment are easy to find and transparent. In the tag you can trace the fabric production chain, while with this *thank you* letter we want to highlight all the main features. In addition, the customer can consult the instructions for *DIY Do It Yourself* dyeing.

Below is the text of the letter:

Thank You, _____ for your purchase .

Your garment is:



Here if you follow the instruction you can dye yourself your garment. While dyeing you will rediscover the ancient art of natural dyeing. Please Enjoy!

DIY Natural Garment Dyeing :

- *Open the capsule containing 50 g of natural extract.*
- *Weigh your dry fabric and heat the water on the stove until it reaches a temperature of 90 °.*
- The ratio you will need to use for dyeing is:*

- 10g of color per 100g of fabric and 1l per 100g of fabric.*
- *Dissolve the extract well in hot water and then dye the fabric.*
- *The dye bath must last at least 30 min and try to keep the temperature constant.*
- Remember to keep the fabric moving in the dye bath to ensure that the color is uniform*
- *Cool it down before rinsing the garment.*
- *You can hand wash in cold water as many times as you like and the color will stay bright.*

** Come back to the shop to discover new colors, and if you want to follow online tutorials on dyeing visit dye.com or come and try our workshops.*

Concept Store

For the store I imagined spaces with warm and natural colors that could tell the concept of the project. It is very important that the store is also in balance with the project design. The design takes inspiration from the images on the opposite page: organic lines and shapes. Raw materials, such as seats covered in linen or hemp fabric, blend with surfaces in warm, almost earthy colors. As this is a concept store, spaces will be limited. The collection will be exhibited in its raw version, the undyed one.

For the choice of color it will be possible to consult the color charts.



Brand Communication

Shooting

Through these photographic shots, I would like to tell the concept of **Natural Homecoming, a return to nature and its most intimate essence.**

The shooting is divided into two parties.

The first photographic series is Total White. In these photos we can appreciate the **naturalness and purity of raw materials:** Organic Linen, Cruelty Free Silk and Recycled Cotton.

The second photographic series focuses on color: a **bright, warm and natural color.**

The transition from total white pictures to colored ones allows us to understand that the garment dyed is an act of personalization of the garment and our intimate expression. White garments can be dyed with multiple capsules of natural dyes that are not toxic or harmful to the environment or to the consumer.

Through this fashion campaign I also wanted to try to build a **harmony between man and nature** (here nature is interpreted by materials and dyes). **Naturalness, harmony and inclusiveness** are the keywords of this shooting.



// TOTAL WHITE



// SS21 COLOR PALETTE

SS21
Oversize Shirt



SS21
Utility Vest



SS21
Organic Jumpsuit



SS21
Cargo Dress













SS21 Color Capsule

**SS21
Brunette Hematin**



**SS21
Mignonette Flower**



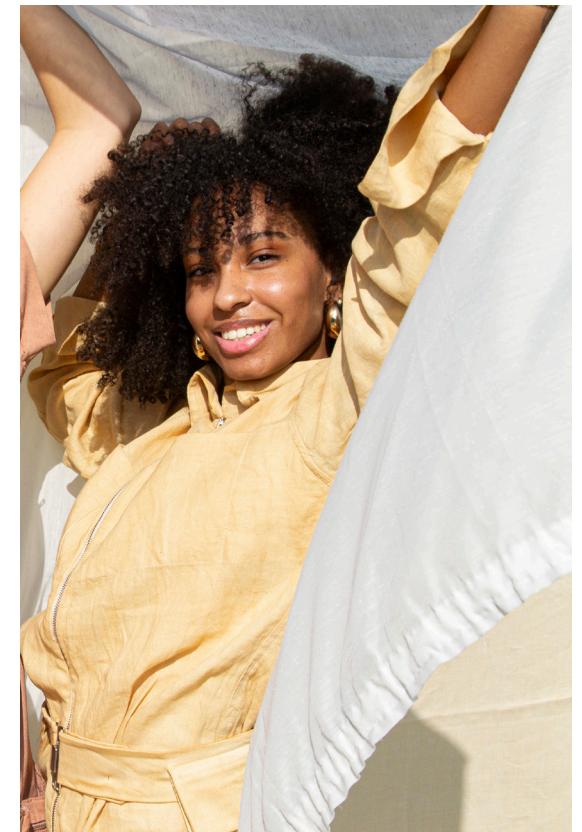
**SS21
Reddish Mignonette**









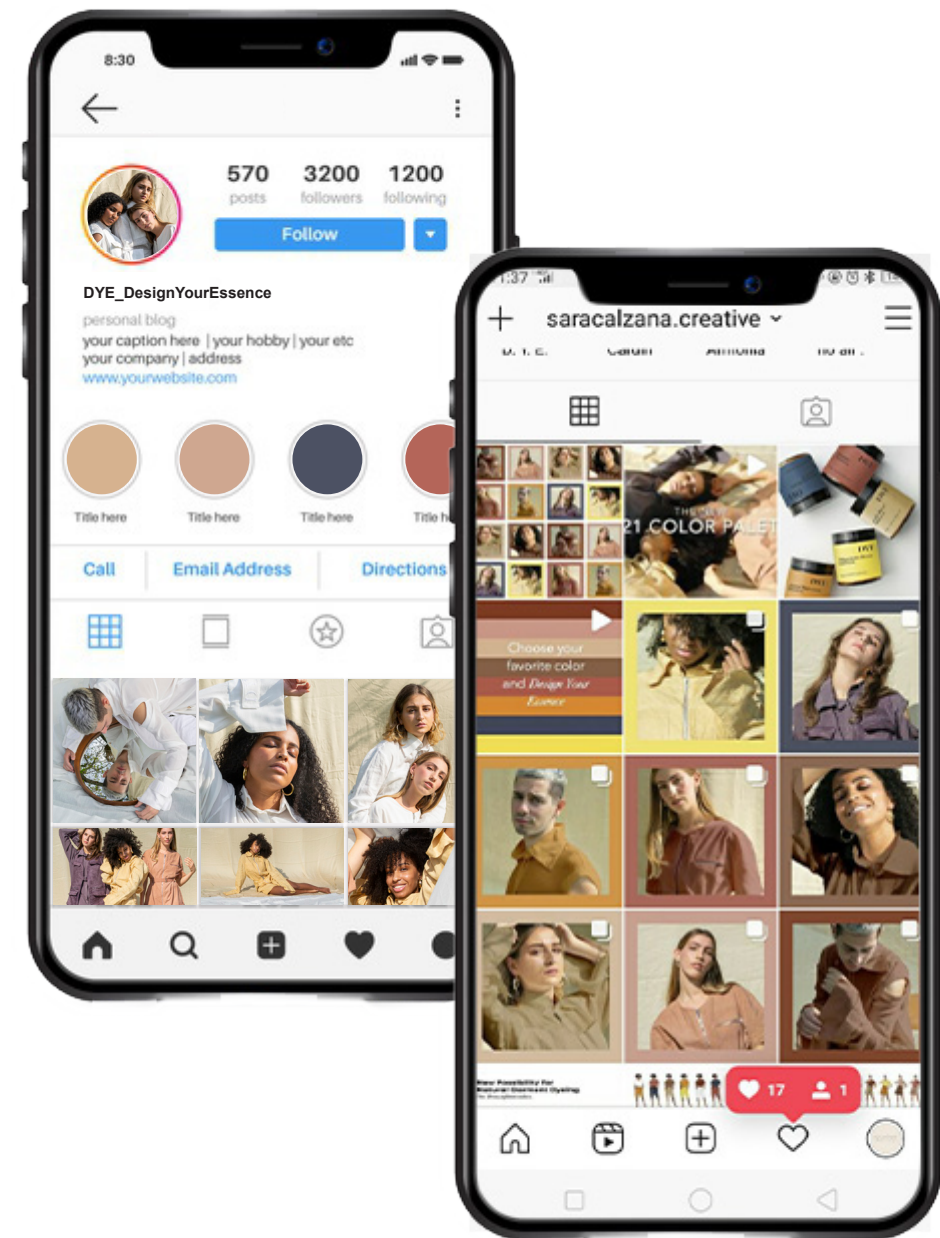
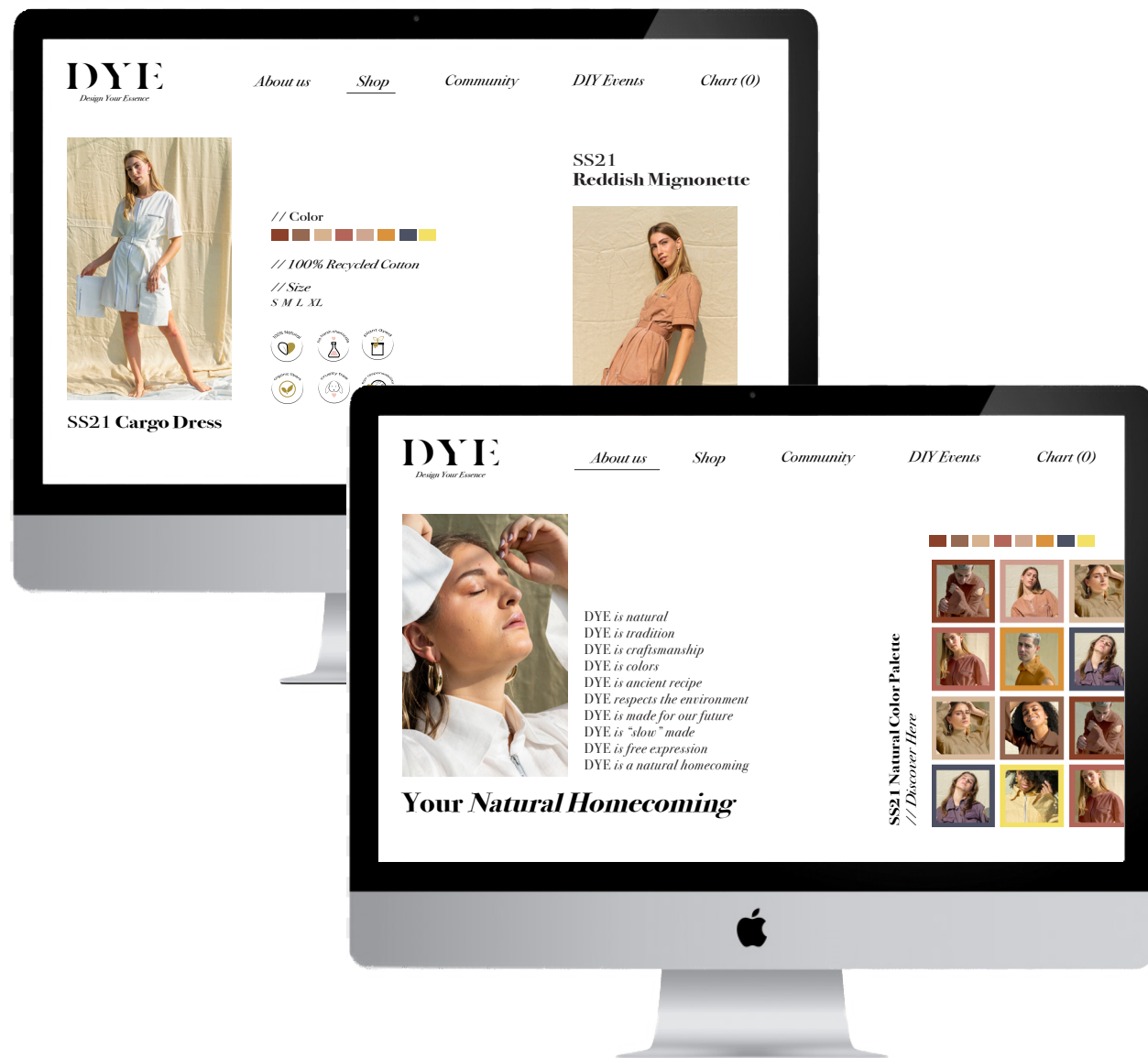




Off-line Communication



Website and Instagram



Conscious community

This design uses a universal language. DYE is sustainable and it is made for our future. These are just some of the linking values of the brand. On Website and on Social Network I want to create a **Conscious Community** for my conscious consumers.

In these platform **the consumer can be part of the brand in an active way:** posting his/her personal experience on the social; chatting with the community about sustainability; find DIY tutorials of garment dyeing; share his/her opinion...

Creating a community for a brand is of fundamental importance because it is as if it created a huge container of shared values between the brand and its customers. In the community, these shared values allow the consumer to recognize themselves within a specific community as a **symbol of belonging.**



Join the Community.



SCAN ME

Brand Management

Positioning Map

The positioning map, on the next page, describes which brands can be considered competitors for my project. Brands with an aesthetic similar to the reference brand (DYE) were selected: genderless, workwear and streetwear. Brands were compared for their sustainability and their price. DYE in this map is placed in a **medium-high price range, but with a high sensitivity to sustainability.**

Sustainable aspects of competitors, personal comparison method:

KOMODO: eco-friendly fashion, premium quality natural fabrics, vegan and cruelty free, safe work space and fair wage, ethically responsible and donations to support our ecosystem.

Y/PROJECT: the “Evergreen Collection” is 100% sustainable, made with ethical and sustainable practices in mind across production, packaging, shipping, branding, materials and trimmings. Use of organic or recycled fabrics and donations to charity.

MSGM: with the collection “Fantastic Green” the brand launches a sustainable capsule: 100% sustainable fabrics, biodegradable ink with no use of chemical agents, packaging and labels made by recycled plastic or polyester,

OUTERKNOW: 90% organic fabrics, plastic fibers are 100% renewed or recycled and fair trade.

TOOGOOD: seasonless, unisex, timeless design, made to last, local supply chain and high manufacture.

TOD’S: artisanal design, savoir faire, “made by humans”, made in Italy, handcraft and ethically responsible.



Pricing Range

Garment	Min price	Max price
Pants & Shorts	150 €	450 €
Shirts and Dresses	200 €	600 €
T-shirt & Polo	40 €	150 €
Jumpsuits	250 €	600 €
Jacket & Vest	150 €	700 €
Accessories	30 €	150 €
Skirts	100 €	350 €
Sweaters	200 €	650 €

This is a price table of the items and their prices. It is based on market research and the potential competitors of DYE. For each item, a range of prices was decided, from minimum to maximum.

This price range it is based on:

raw material, organic or recycled fabrics;

manufacturing (the cost of labor), which must offers fair wages and safe conditions to our craftsmen, tailors and workers;

natural dye, no harmful for water footprint;

logistics costs for transport and storage trying to reduce carbon footprint.

Color	€/100g
Brunette Catechu *	12 €
Reddish Mignonette *	28 €
Coffee Blend	8 €
Spiced Mignonette	35 €
Black Tea	8 €
Madder	10 €
Hematin Brown *	10 €
Mignonette Flower	30 €

* = extract pigment

Please ask to sale assistant to weigh your clothes so you can find out how much color you need. Enjoy the natural dye.

The price of the natural colored pigment varies according to several factors: the quality of the color and the raw material from which it derives; the availability of this raw material on the market and its original location (many extracts from the FTR company come from Brazil, such as the brown walnut that I could not put in a palette).

Some of these prices could be misleading about the final price of the color capsule. It is important to remember that the **ratio of the dye bath varies if we decide to dye with an extract or with the infusion method** starting from dried plants or roots. The natural extract is a concentrated color. Its ratio with the fiber to be dyed is 10g of color per 100g of fiber, while if we dye with dyeing plants, tea or coffee the ratio is greater than 1: 1.

*Business Model*KEY PARTNER 

Long Term Partners:
 - Local or sustainable fabric suppliers
 - Sustainable natural dye

Short Term Partners:
 - Eco-friendly Events

KEY ACTIVITIES 

- Product design
- Creating product perception
- Social media communication
- Transparency
- Local Supplier relationship
- Color palette and trends research

KEY RESOURCES 

- Craftmen, tailors and dyers
- Fabrics partners
- Digital competence, website, and social media
- Fresh water and green energy

VALUE PROPOSITIONS 

- **Ethical Contemporary** workwear /streetwear
- High quality
- Natural and Sustainable materials
- No toxic but 100% natural dye
- Durability and timelessness
- Supporting local suppliers
- **Selectivity:** sense of belongings
- **Heritage:** Cultural and ancient traditions, authenticity, product symbol of culture and craftsmanship.
- **Uniqueness:** color customization

CUSTOMER RELATIONSHIP 

Community belonging
 Customer Engagement
 Responsible consumption
 The brand interacts with the audience with social medias and web site through which it creates the social community.
 DIY workshops and tutorials.

CHANNELS 

Online: DYE official website, social media and Instagram shop.

Offline: DYE concept store and workshops or events where they perform live experiences of design and showcase their products.

CUSTOMER SEGMENTS 

- Age: 25-60 y.o.
- Men and Women (genderless)
- Workwear and Streetwear enthusiast
- Environment conscious
- Design and quality conscious
- Conscious Community
- Moral Identity

COST STRUCTURE 

Fixed Cost: Salary, electricity, rental of spaces, website, maintenance, production.
 Variable costs: materials, delivery cost, advertising, marketing cost (concept store, events), production.

REVENUE STREAMS 

Sales,
 Workshop

This is the **Canvans Business Model** of the brand DYE. It is composed by nine *building blocks* which represent main areas of a business. With this model it is easier to understand how a brand creates, deliver and capture values.

Value proposition runs this model. In this building block tangible and intangible aspects are highlighted and deliver to our customer segmentation through channels. It is important that our customer get satisfaction through the delivery of the value proposition. Our brand offers ethical and sustainable products to a customer which is environment conscious. That creates a fit between customer needs and brand's offer.

Through the development of a community on social media, it is possible to create a strong sense of belonging. DYE customers are linked to each other by ethical and moral values which unite them.

Moral identity guides the brand in the proposal of design and materials, but not only. The moral identity of the consumer drives him to proceed with the purchase and to derive satisfaction from it.

Calendar

This is a calendar that plans the different phases through which the brand will face to obtain the final product confectioned in the store. These are **timelines to be respected if you want to get on the market at the right time.**

Assuming you start thinking about the SS21 summer collection in September 2020, the search for materials and colors will be the starting point.

Since these are precious and timeless garments, **the unsold stock will be integrated into the new collection and proposed with different colors.** In this way unnecessary waste is avoided.

Events or workshops are used as a collection launch experience. In fact there will be one per season. It is an interesting way to involve the customer in the atmosphere of the brand, letting him know the new collection.

TASK	Sept.2020	Oct.2020	Nov. 2020	Dic. 2020	Jan. 2021	Feb. 2021	Mar. 2021	Apr. 2021	May 2021	June 2021	July 2021	Aug. 2021	Sept. 2021
Brief&Planning	COLLECTION SS												
Concept development													
Reuse unsold stocks													
Design & Prototype													
Collection Approval													
Suppliers Management													
Launching the collection on-line platform													
Production													
Delivery to Concept Store								ONCE A MONTH					
Sales Online/Offline													
Events or Workshop										ONCE PER SEASON			
Keep Advertising Brand Value in all the touch points													

Take It Back



We Can
Repair It

SERVICES:

Repair and Dispose

Following the **circular economy** line of thought, according to which the object must be designed in order to lengthen its life cycle, DYE Design Your Essence **offers its customers a garment repair service**. The design philosophy of this service lies in restoring value to the garment by **mending it in an artisanal and unique way**.

Case Study of this idea is the brand Patagonia. Patagonia offer a repairs service to encourage recycling used or unusable garments wherever possible.

If, on the other hand, you want to throw away the items of clothing, you can take them to the concept stores that will take care of the collection of the items and a fair dispose of it. This will make it easier to recycle the different fabrics. This can become a recycling programs able to keep clothes out of landfills.

ON THE LEFT: Image by COS; ON THE RIGHT: Image on [ropedye.com](https://www.ropedye.com); Dries van Noten, *The dye diary*; How to dye fabric, Diy fashion.

DIY Workshops

2020 is an hard year. Fashion is culture and expression of the contemporary world that is undergoing enormous changes in recent months. We have spent a whole lockdown inside our home walls and now we are about to face the second wave. In such a disastrous period, however, we have rediscovered the little daily joys: making homemade pizza, painting, embroidering, sewing, arranging the furniture in the house ... The DIY *Do It Yourself* Movement, even if it has its roots in the past, has exploded on social media in recent months. The fact of **rediscovering the ancient traditions of this land is an engaging experience**. For this reason, we want to **involve the customer in an active way** within the brand, a brand that allows you to design your essence. The modern consumer chooses to do workshops or be in the online community because the experience can be generated by different needs: **need for customization** (you can choose the color), **and identity enhancement** (craftsmanship, empowerment, community seeking, uniqueness).

DIY



Workshop
Mandel Clothes

DIY



Workshop
Natural Dyeing

Conclusion

Be more conscious

The power of fashion should play a fundamental role inspiring ethical and social behavior.

As we have seen in the research (chapters “Future is green”), sustainable products are increasing because consumers start to consider them “cool” (Ricchetti, 2017).

In a post by @id_italy, “What does it mean to look to the future, today?”- June 2019, **the true futurists of 2020 are described as designers who look to the future.** A future known as a world that will need ecological garments. It is a way to respect our planet which is put in crisis by climate change. Now is the time to think about how garments are made because **«the story behind the design must be as beautiful as the design itself»** (Pieters quoted in Ricchetti, 2017: 15).

Dye is a project which wants to tell a fair story, made up of ancient dyeing traditions through the use of natural color. I strongly believe in the quote by *Bruno Pieters*, Fashion Designer.

The project is the story and this must be strong in order to excite the customer.

One of the main goals is to create an eco-sustainable proposal with a low environmental impact.

The future competition will take the sustainability factor into great consideration because I don’t see a future if we don’t start planning it now. For this reason I have chosen to work with natural and organic materials that are the result of a careful research on raw materials. The addition of the words “eco”, “organic” or “sustainable” today can really make a difference for the competitiveness of a brand, but above all for our future.

A fundamental role is played by color. Color is an aspect of design capable of modifying the economic, artistic and emotional value of products, but not only. **A color is able to attract our attention** much more than a shape or volume can. The collection proposal, inspired by workwear, is made up of simple and standardized silhouettes. The garments become unique through the choice of color that is experienced by the customer firsthand as an act of personalization. The role of color is fundamental in the decision-making phase of a purchase.

The thesis project is develops through these basic concepts and finds a solution that is in balance and harmony with today’s environmental situation.

The proposal of the different color palettes for each season, thanks to **color forecasting, is able to anticipate the needs of consumers and their chromatic imagery.** In this way the garments are always contemporary, updated by the color itself. Following the principles of the circular economy, the unsold stock will be re-proposed in following collections, thus extending the life cycle of the garments. It will be the color to give new life to the collection.

Color is therefore synonymous with identity, expression and innovation.

Garment dyeing, just like the United Color Of Benetton brand, involves a fast and update response to the market, limiting unnecessary waste and saving energy and raw materials.

Going deeper with the project, **you can rediscover the ancient values linked to craftsmanship and traditions.** Among these we have the natural dye, which was used to give the fabrics the liveliness and the stories of color in ancient times.

Modern society, the frenetic and technological one, may not be able to learn this cultural know-how, but it is certainly **able to recognize the value, quality and originality of the artisanal products that are regaining great importance.**

The natural extracts, which the collection has been dyed with, not only **respect the environment, but also the health of the consumer** as they are free of any chemical-industrial substance or additive. We have been overwhelmed by the speed and economic advantages of synthetic dyes that we have lost the love for handmade and natural. In a world made up of perfect solid colors of industrial origin, our sensitive eyes go in search of bright color, made up of “dirt” and imperfections: **«the taste for uneven color is a constant quality in the artifacts of the past»** (Falcinelli, 2017: 19). The project aims to raise awareness among the modern consumers and push them to appreciate the dynamic effects of natural color which is very far from modern uniformity.

The **raw achromatism** of the products as they are presented to the customer allows you to instill in him an idea of natural purity and to enhance the shapes of the designed garments. The subsequent dyeing includes the customer within the brand, making him participate actively, giving him a whole series of experiences and personal sensations.

In this phase, two fundamental movements meet for the development of the project: the *Slow Movement* and the *DIY Do*

It Yourself. The first one **attempts to slow down industrial processes by enhancing the desire to have an exclusive, sustainable and high quality product.** The second one is committed to **involving the consumer in a Conscious Community of New Makers** in order to rediscover the beauty of hand-made in the first person.

The future is slow. Companies will have to aspire to a more ecological production, with quality materials and with fewer quantities. The **slow fashion garment is an exclusive product, because it is not produced in large numbers.**

Obviously, such a project is based on the needs of the modern customer and develops around him like a tailored suit. Within the desk research, the fact is highlighted that **the modern customers are guided by the desire to improve their self-image through the purchase of sustainable products** (Legere, A., Kang, J., 2020).

The idyllic desire to bring natural dye to a large scale, according to *Jess Cole* in a 2019 article on *Vogue Italia*, seems to be a distant future. These dyes are difficult to find and have higher costs than synthetic ones; for this reason there would be a sharp

increase in costs in mass production. I am personally more positive on this point. In my opinion, small industries may begin to emerge thanks to natural dyeing.

In any case, before 1800, natural dyeing was the only possible solution; preciously colored and fine fabrics were imported from faraway India, France and Turkey. If this scenario was possible more than 300 years ago, I can’t see why it couldn’t be in 2020. Certainly natural colors cannot have the same timing as synthetic dyes. The solution lies in having confidence in slower production processes, that are based on Slow Movement, and in going to interest a conscious and committed consumer.

Natural dyes are not for mass consumption but for intimate, artistic, individual garments and for the expression of one’s personality.

DYE, Design Your Essence, is the result of a sustainable, clean and essential design. I would dare to define it with a phrase by Professor Turinnetto: **“well-being meets measure”**.

Acknowledgement

Thesis Supervisor.

I would like to start by thanking Professor *Maria Grazia Soldati*, for having accompanied me on this long academic journey and for having always believed in my work. I would like to thank her for the time she has dedicated to me and for her unique advice.

It was a great fortune and honor to assist her for two years in one of her university course. This period was fundamental for my training as a professional designer. I really believe I've grown a lot and I absolutely have to thank her for choosing me and for giving me this chance.

I could not choose a better supervisor because I don't think anyone else knows me as well as her, but also because she has always shared with me her experience and opinion in textile field, a fundamental topic for the development of this thesis.

We have made several attempts, but perhaps in the end we can say we did it. So thank you very much. Without you this thesis would never have existed.

Companies.

For this thesis project I want to thank the companies, and the people within them, who believed in this project by giving me their time, their attention and more. Each of them was of fundamental importance for this thesis. That is why I will proceed to thank them in alphabetical order.

I thank:

Candiani Denim S.p.A that has been collaborating with the Politecnico di Milano for years providing us with high quality denim (Premium quality). The company has always produced its fabrics with an eye towards sustainability and innovation. This corporate vision accompanied me at every stage of the design. The material that the company provided me is a BCI certified White Denim (RR 55 33-92% CO + 6% EMA + 2% EA): better cotton initiative.

FTR SpA, *Forniture Tessili Riunite*, for providing me with samples of natural extract, despite the difficulties we had to face this year. The color extracts formed the basis of my dye research.

In particular, I would like to thank Dr. *Samatha Cortesi*, a dyeing laboratory technician at FTR, for sharing with me her knowledge on dyeing and in particular

on these new natural extracts that are still being tested.

Mr. *Marcello Preda* of the **Predatex SRL**, for kindly helping me in the materials research phase by giving me precious samples of linen, silk and cotton fabrics. With these materials I managed to make the garments of the collection.

Sitip S.p.A, *Industrie Tessili*, for giving me samples of INSTINCT PLX GZ. It is a recycled polyester jersey fabric.

Family & Friends

I absolutely have to thank my family, for always being there. They always believed in me even when I was insecure and fragile.

I thank my boyfriend, *Nicholas*, for supporting me in every single moment of this university path and never leaving me alone. You were always the first to see my projects and you were always ready to give me advice. In my opinion you also deserves a degree in Fashion Design. 😊

I would like to thank my classmates and friends: *Carlotta, Chiara, Elisa, Martina* and *Paola*, for never letting me drown in my anxieties and for sharing these wonderful years with me.

I also thank the Technicians of the Fashion Lab for their patience and for always trying to improve the models and the final prototypes of this thesis. Your advices were invaluable.

I would also like to thank the fantastic guys who took part in the Shooting days: *Barbara, Beatrice, Caterina, Martina, Michela, Riccardo & Viola*.

Bibliography:

Books.

AAVV, (2012), *The Fashion Book*, London, Phaidon Press Limited

Becchetti, L. (2005), *La felicità sostenibile. Economia della responsabilità sociale*, Rome, Donzelli Editore.

Besso, F., (2003), *Colori naturali*, Milan, Fabbri Editori.

Cegarra, J., Puente, P. & Valdeperas, J. (1988), *Tintura delle materie tessili. Fondamenti scientifici e tecniche applicative*, Biella, Paravia-Textilia.

Cline, E.L., (2018), *Siete Pazzi ad indossarlo! La moda a basso costo avvelena noi e il pianeta*, Milan, Piemme.

Conti, G.M., Fiorani, E. (2017), *Oltre l'abito. Iridescentza nella moda contemporanea*, Milan, Libreria di fashionologia.

Duerr, S. (2015). *Tinture Naturali. Colorare i tessuti con le piante e gli ingredienti di ogni giorno*, Nuova edizione, Milan, Terre di Mezzo Editore.

Eiseman, L., Cutler, E.P., (2014) *Pantone Fashion. Un secolo di colori nella moda*, Milan, RCS Libri S.p.a., Rizzoli.

Favero, G., (2005), *Benetton. I colori del successo*, Milano, Egea

Gallucci, F. (2016), *Neuromarketing*, Milan, Egea Editore.

Gandini, C., Turinetti, M. (2009), *Lusso necessario. Alla ricerca del valore per vincere la crisi*, Milan, Lupetti.

Giavini, L. (2010). *Il colore dell'Aurora. La rivoluzione cromatica della chimica moderna*, Busto Arsizio, Nomos Edizioni.

Leodi P., Volli, U., (2012), *Benetton. L'impresa della visione*, Azzano San Paolo (Bg), Bolis Edizioni, Salani Editori.

Palmisano P., Palmisano G., (2008), *Progettare abbigliamento*, Vol. 1, Milan, Hoepli.

Pagnucco Salvemini, L., (2002), *Benetton/Toscani. Storia di una avventura. 1984-2000*, Azzano San Paolo (Bg), Bolis Edizioni.

Reggiani Macchine, (1995) *La stampa tessile*, Bergamo, Reggiani macchine.

Ricchetti, M., (2017), *Neomateriali nell'economia circolare*. Moda. Milan, Edizioni Ambiente

Rinaldi, F. R., (2020) *Fashion industry 2030. Reshaping the future through sustainability and responsible innovation*, Milan, Egea.

Rizzo, G. (2010), *Low cost mania. Moda passeggera, scelta obbligata o nuovo stile di vita*, Milan, Gruppo 24 Ore.

Rubertelli, M., Soldati, M.G. (2008), *Textile design. Prontuario delle fibre, dei filati e dei tessuti*, Milan, Cusl.

Soldati, M. G., Sabbioni, A., (2012), *Tecnologie e innovazione per l'industria tessile*, Milan, Lupetti.

Szkutnicka, B., (2010), *Technical drawing for fashion*, London, Laurence King Publishing with Central Saint Martins College of Art & Design.

Turinetti, M. (2018), *Idee in movimento. Il valore economico dell'innovazione*, Milan, Lupetti.

Vigo, A., Sibelli, F., (2007) *Guida alla tintura naturale*, Chiari (Bs), Nordpress Edizioni srl.

Articles & Editorials.

Aivazidou, E., Tsolakis, N., (2019), Water footprint management in the fashion supply chain: A review of emerging trends and research challenges, *Water in Textiles and Fashion. Consumption, Footprint, and Life Cycle Assessment*, 77-94.

Chen, F., Zhu, J., Yang, Y., Wang, L., (January 2020), Assessing environmental impact of textile production with water alkalization footprint, *Science of the Total Environment*, 719.

Grappi, S., Romani, S., Barbarossa, C., (2017), Fashion without pollution: How consumer evaluate brands after an NGO campaign aimed at reducing toxic chemicals in the fashion industry, *Journal of Cleaner Production*, 149, 1164-1173

Humes, E., (2019), Planetjunk: a journey through discards, *Nature*, 575, 278-279

Legere, A., Kang, J., (2020), The role of self-concept in shaping sustainable consumption: A model of slow fashion, *Journal of Cleaner Production*, 258, on Elsevier.com.

Morello, M., (2020, September), 2021: Odissea nella Moda?, *Vogue Italia*, 840: 104-105.

Shirvanimoghaddam, K., Motamed, B., Ramakrishna, S., Naebe, M., (2020), Death by waste: Fashion and textile circular economy case, *Science of the Total Environment*, 718, 1-10.

Yusuf, M., Shabbir, M., Mohammad, F., (2017), Natural Colorants: Historical, Processing and Sustainable Prospects, *Nat. Prod. Bioprospect*, 7:123-145.

Website.

A brief history of diy, from the shed to the maker movement, (23 April 2020), Science Museum, (last consulted on 7.11.2020)

<https://www.sciencemuseum.org.uk/objects-and-stories/everyday-wonders/brief-history-diy>

Benetton, (n.d-a), *Il tinto in capo*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/expertise/dyed-fabrics/>

Benetton, (n.d-b), *Fashion Transparency Index 2020*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/sostenibilita/fashion-transparency-index-2020/>

Benetton, (n.d-c), *Go Green con Benetton e Treedom*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/sostenibilita/go-green-con-benetton-e-treedom/>

Benetton, (n.d-d), *Un punto a maglia giallo*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/storia/a-yellow-knit-stitch/>

Benetton, (n.d-e), *Wear.Care. Repair*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/expertise/wear-care-repair/>

Benetton, (n.d-f), *Tutti i colori del mondo*, Inside Benetton, (last consulted on 20.6.2020).

<https://inside.benetton.com/it/posts/campagna/tutti-i-colori-del-mondo/>

Benetton Group, (n.d-a), *Il Gruppo*, (last consulted on 20.6.2020).

<http://www.benettongroup.com/ilgruppo>

Benetton Group, (n.d-b), *Sostenibilità*, (last consulted on 20.6.2020).

<http://www.benettongroup.com/sostenibilita/detox/>

Biserni, F., (2018, 3 Maggio), *Quanto inquina la moda: se vestirsi è un problema*, D.Repubblica, (last consulted on 3.6.2020).

https://d.repubblica.it/moda/2018/05/03/news/ambiente_quanto_inquina_la_moda_sostenibilita-3961678/?refresh_ce

Brett, D., (n-d), *Make Do and Mend, 6 men's fashion brands that offer repair services*, Apetogentlemen.com, (last consulted on 2.11.2020)

<https://www.apetogentleman.com/mens-fashion-brands-repair-services/>

Cole, J., (2019, 13 Novembre), *Moda e inquinamento, il problema delle tinture*, Vogue.it, (last consulted on 26.08.2020).

<https://www.vogue.it/moda/article/moda-inquinamento-problema-tinture-soluzioni>

Frisa, M.L., (2009, 13 Gennaio), *Maison Martin Margiela*, Corriere della Sera, (last consulted on 23.5.2020).

<https://living.corriere.it/case/eclettiche/margiela-20113282632/>

I 17 obiettivi di sviluppo sostenibile (blog e notizie), (2015, 1 Ottobre), Save the Children, (last consulted on 20.5.2020).

<https://www.savethechildren.it/blog-notizie/i-17-obiettivi-di-sviluppo-sostenibile>
van Elven, M., (2019, 15 November), *How sustainable is recycledpolyester?*, FashionUnited, (last consulted on 5.10.2020).
<https://fashionunited.uk/news/fashion/how-sustainable-is-recycled-polyester/2018111540000>

Salto, F., (2018, 8 Ottobre), *Jean-Charles de Castelbajac è il nuovo direttore artistico di United Colors of Benetton*, Io Donna, (last consulted on 22.6.2020).

<https://www.iodonna.it/moda/news/2018/10/08/jean-charles-de-castelbajac-nuovo-direttore-artistico-united-colors-of-benetton/>

Wikipedia, (n.d), (2017, 10 Luglio) *Tintura in capo*, (last consulted on 18.6.2020).

https://it.wikipedia.org/wiki/Tintura_in_capo

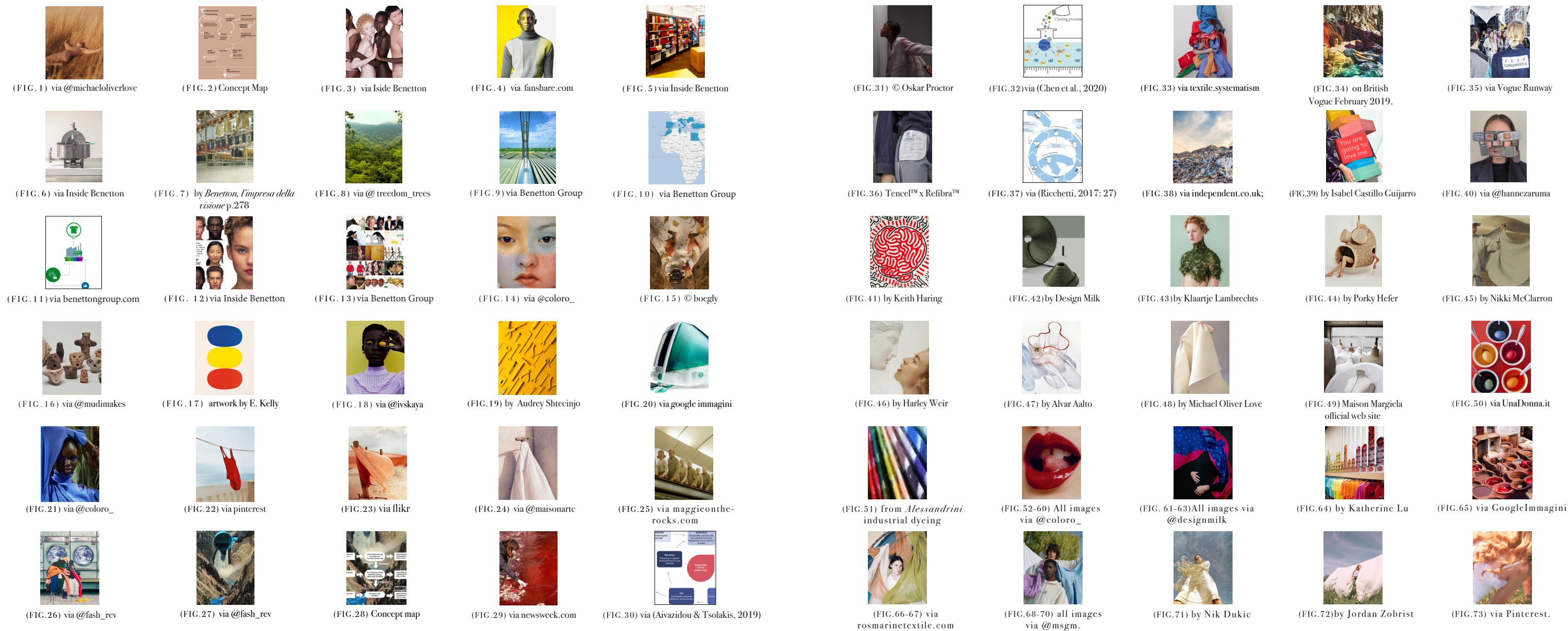
DYE

DESIGN

YOUR

ESSENCE

Images source.

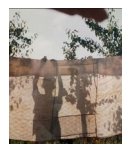


DYE

DESIGN

YOUR

ESSENCE



(FIG. 74) by Jacques Henri Lartigue



(FIG. 75) via juliedumasrose



(FIG. 76) via Pinterest



(FIG. 77) via Fashion Editorials



(FIG. 78) via sarahchingphotography.com



(FIG. 99) via Lucy & Yak



(FIG. 100) via British Vogue



(FIG. 101) via Pinterest



(FIG. 102) via Tumblr.com



(FIG. 103) via @ignaviaexcusatus



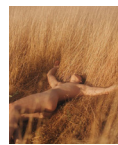
(FIG. 79) via Pinterest



(FIG. 80) via Ignant



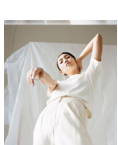
(FIG. 81) via @michaeloliverlove



(FIG. 82) via @alexstoddard



(FIG. 83) via Pinterest



(FIG. 104) by Chelsea Jackson



(FIG. 105) via food54.com



(FIG. 106) via esty.com



(FIG. 108) via M&S Home



(FIG. 109-110) Tingerlily Swimwear Store Sydney



(FIG. 84) via alighieri.co.uk



(FIG. 85) via A Tiny Space



(FIG. 86) via Pinterest.ph



(FIG. 87) from Staffonly Studio



(FIG. 88) via Tomboy



(FIG. 111) Mastani by Design Office



(FIG. 112) Gallery of Forte



(FIG. 113) by P. Resende, P. Kok, R. Teixeira



ALL OTHER IMAGES are original (made or edited by the author)



(FIG. 89) by Carolyne Rapp



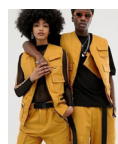
(FIG. 90) via @michaeloliverlove



(FIG. 91) via domino.com



(FIG. 92-97) via atinspace.com



(FIG. 98) via Pinterest

DESIGN

YOUR

ESSENCE

DESIGN

YOUR

ESSENCE