

# Upcycling Used Garments to Recreate Sustainable Fashion Designs Treated by Soil Release Finishing

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**Abstract**—Upcycled garments can have that independent appeal. No matter whom the designer is or what styling options designers choose, these upcycled fashion garments and accessories are by nature one-of-a kind. Finishing of textile fabric is carried out to increase attractiveness and/or serviceability of the fabric. Different finishing treatments are available to get various effects, which add value to the basic textile material, which can be better solutions for sustainable fashion.

The sustainable fashion was achieved to a certain extent by using available materials to its ultimate usage, using waste material, recycling of the products, planning second life for the fashion product, slowing down the fashion etc. The main idea to do so is to develop more sustainable and responsible designs. This paper is not just about recycled clothes but about fashion, recycling, upcycling, adding value and uniqueness by the resulting one-of-a-kind design available for women to purchase in any retail store.

Create nine designs using waste garments treated by soil release finishing agent as a source of sustainable fashionable designs.

**Keywords**—sustainable fashion – soil release finishing – Upcycling.

## I. INTRODUCTION

The current movement to capture throwaway clothing and remake it into a different fashionable, wearable piece of clothing with greater value is called upcycling. Although some authors have called it a trend, others consider it a movement that is here to stay. In the book Fashion and Sustainability upcycling defined as “adding value through thoughtful reclamation”.[1] Murray describes it as “not merely conserving the resources that went into the production of particular materials, but adding to the value

embodied in them by the application of knowledge in the course of their recirculation”.[2]

So, if one can add value – economic, intellectual, emotional, material – to a product through the process of reuse, it can be called ‘upcycled’. The forward to the book, Upcycle, speaks of upcycling in general terms: “The goal of the upcycle is a delightfully diverse, safe, healthy, and just world with clean air, water, soil, and power - economically, equitable, ecologically, and elegantly enjoyed”.[3] If clothing is a necessity, fashion is a luxury - hopefully to be elegantly enjoyed. The elegance in recycling comes from skillful upcycling, not the “hippie” pieced fashions from the 60’s, but beautifully designed fashion.[1]

Upcycled garments can have that independent appeal. No matter who the designer is or what styling options designers choose, these upcycled fashion garments and accessories are by nature one-of-a kind. Older generational groups may find that same one and only appeal as they are familiar with exclusivity and custom clothing, including tailored goods. There is some familiarity with upcycled fashion concepts across the board, but the vintage, bohemian styles of the past will not necessarily find the same appeal in consumer groups who want currency in their apparel. This is a new twist because upcycling textiles is really fashion design with a cause, and it has yet to find its market.[4] Garment finishing is one of the finishing methods applied on garment, with the use of new technologies and equipment enables to obtain the desired results. [5]

The field of apparel and textile finishing is very broad. Globalization has added competition at the highest level. Making an apparel product more sustainable, fashionable and customer focused by increasing its both aesthetics and functional properties is the way to make the apparel products more demandable in the market.[6]

### **1.1. Soil release Finish:**

Soil-release finishes on textiles facilitate the removal of soils during laundering under common household conditions. Fabrics treated with soil-release finishes are particularly suited to active wear and leisure wear.[7,8] The soil release activity of finish should last for 20-50 home launderings and they should be stable to abrasion.[9, 10]

A soil release finish does not prevent soil from entering the fabric but it simply allows it to leave faster. It removes soil from the fabric and transfers it to the detergent; it protects the fiber from attack by soiling matter; it prevents redeposition of soil which has been dissolved or dispersed and lastly it prevents dust from being attracted and held by electrical charges on the fabric surface. Soils can be defined as unwanted substances at the wrong place.[11,12]

### **1.2. Silicone softeners:**

Provide very high softness, special unique hand, high lubricity, good sew ability elastic resilience, crease recovery, abrasion resistance and tear strength. They show good temperature stability and durability, with a high degree of permanence for those products that form cross linked films and a range of properties from hydrophobic to hydrophilic.[13,14,15]

Set against following background the driving forces for change in finishing of fabric have been considered to be the need for competitive strategy that utilizes:

- Chemical compatibility to provide one-shot multifunctional finishes.
- Cost reduction through process integration and minimizing the consumption of all utilities.
- More environmentally friendly and application method.
- Cost reduction through minimization of effluent treatment cost.
- Improve process control, monitoring and automation.
- Greater innovation in chemical finishes.
- Quick response through right-first-time, right-on – time, right-every-time finishing [16, 17].

In this way, it should be possible for finishing department to satisfy the aesthetic and functional performance demands of customers. Finishing of textile fabric is carried out to increase attractiveness and/or serviceability of the fabric. Different finishing treatments are available to get various effects, which add value to the basic textile material. The domestic readymade garment sector is booming, and garment processing has emerged as one of the important production routes towards meeting quick changing demands of the fashion market.[18]

The paper aim is not just about recycled clothes but about fashion it is about recycling and upcycling to add value and uniqueness by the resulting one-of-a-kind design available for women to purchase in any retail store. Create designs using waste garments treated by soil release finishing agent as a source of sustainable fashionable designs.

## **II. EXPERIMENTAL WORK**

### **2.1. Materials:**

Different used garments cotton 100 % and cotton blends. Decorative threads, beads.

### **2.2. Chemicals:**

STRUKSILON 8450 a conventional modified nonionic silicone (macro emulsion) kindly provided by Dahab Trade, New Maadi, Cairo distrusted from Schill + Seilacher "Struktol" GmbH, Hamburg, Germany.

### **2.3. Methods:**

The fabric was weighted and padded through two dips and two nips in the solution containing STRUKSILON 8450 factors studied were (1- 3.5% o.w.f) at pH (3-8) and pick up (50- 100 %), then drying at (90 -130°C) for (1- 3 min.) cured at (100 - 140°C) for (1- 3 min.). The fabrics then washed with 2 g/l nonionic detergent at 60°C for 15 min. rinsed with hot then with tap water, and air dried.

### **2.4. Soil release testing:**

For soiling release testing the fabric were tested according to AATCC 130.[19]

#### **2.4.1. Objective Evaluation of Soil Release in Fabrics:**

The standard procedure for evaluating the soil release property of a fabric is described in AATCC test method 130 – 2010, and it essentially involves the steps of placing the stain on the fabric, laundering the stained fabric in a prescribed manner, and rating the residual stain on the fabric on a scale from 5 to 1. The grades are based on a set of standard stain release replicas (provided by the AATCC). [19]



Fig.1: AATCC Stain Release Replica showing a series of graduated stains from grades one through five. Where grade 5 denotes absence of a stain (excellent stain release).

#### **2.5. The Evaluation of Wettability:**

Determination of resistance to surface wetting (spray test) of fabrics was measured according to ISO 4920-1981.[9]

**III.RESULTS AND PRODUCTS ANALYSIS**

**3.1. Design (1):**



Before After

Fig.2:Design (1) Upcycled by HebaAllah H. Fathy.

**Materials:** Beige cotton blouse, Batik orange printing fabric.

**Recreation:** Cut upper part of tubular blouse from neck to armhole, cut four rectangle in the lower part,gathering printing fabric and sewing it in rectangle cut straight line,using upper part which cutting from blouse to make upper part of skirt consist from yoke waistband and pocket which cutting from half neck to end of shoulder.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface:

**3.2. Design (2):**



Before After

Fig.3: Design (2) Upcycled by HebaAllah H. Fathy.

**Materials:** Burgundy satin cotton fabric, white printing cotton fabric, white cotton fabric, and Burgundy plain cotton fabric.

**Recreation:** Cut two rectangle from white printing fabric 28x18cm for center part of back and front, cut two strips 22x4 cm for bag side from burgundy plain fabric, cut two rectangle strip for top 28x6 for top part and 9x28 for bottom part from burgundy satin cotton fabric, stitch all

strips by crochet, cut three strips from white printing fabric to make flowers for decorative, sew interfacing from white fabric and cut strip from burgundy satin cotton fabric and sew it two make bag hand.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface

**3.3. Design (3):**



Before After

Fig.4: Design (3) Upcycled by HebaAllah H. Fathy.

**Materials:** Gray cotton shirt, pink cotton blouse and pink lace strips.

**Recreation:** Cut curved line of lower part of shirt in straight line and sew it with upper part of blouse,decorative the front of the dress with lace strip, sew lace on collar and finished arm hole by diagonal stripe from pink cotton blouse.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

**3.4. Design (4):**



Before After

Fig.5: Design (4) Upcycled by Aya S. Mahmoud.

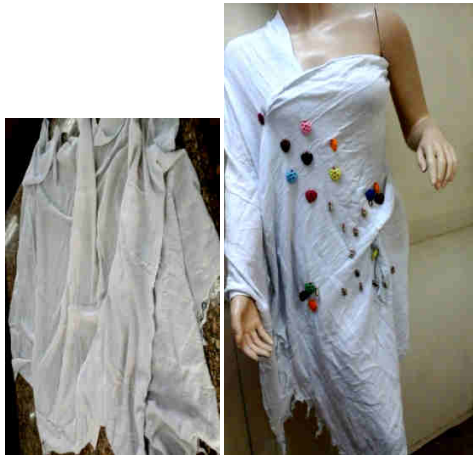
**Materials:**Black skirt, colored strip, white flowers and pink harts.

**Recreation:**-Up the skirt on a bust, put a colored strip under bust, make a heart shape and fill it with fiber, put a short colored on a different places.

**Treatment with STRUKSILON 8450**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

**3.5. Design (5):**



Before After

Fig.6: Design (5) Upcycled by Aya S. Mahmoud.

**Materials:** Grey scarf and colored beads.

**Recreation:** Made a flower shape with beads, made a button and button hole, turn the scarf around one shoulder.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

**3.6. Design (6):**



Before After

Fig.7: Design (6) Upcycled by Aya S. Mahmoud.

**Materials:** Pink skirt, grey coins, and colored threads.

**Recreation:** Cut a hem line strip and put it parallel crosswise, hanging the coins from hip line with a different lengths, and bend the hem line.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

**3.7. Design(7):**



Before After

Fig.8: Design (7) Upcycled by Sarah M. Sharaf.

**Material:**Beige Cotton short, red zipper, red satin strips, and brown braids leather.

**Recreation:** First install the zipper on the left side of short and in pocket in back by hand stitch. Secondly rounded the braids leather around zipper edge by stitch. Finally, manual embroidery by satin strips on right side

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

**3.8. Design (8):**



Before After

Fig.9: Design (8) Upcycled by Sarah M. Sharaf.

**Material:** Light blue Shirt, dark blue lace strips and embroider thread.

**Recreation:** Cut sleeves, collar and yoke. Fold edge of cut line in sleeves and stitch strip lace on edge of cut lines by embroider thread. Put part of lace on pocket.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

### 3.9. Design(9):



Before



After

Fig.10: Design (9) Upcycled by Sarah M. Sharaf.

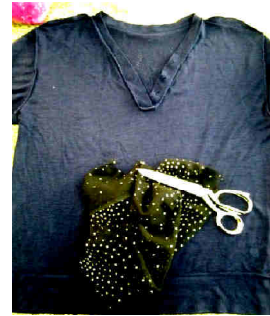
**Material:** Brown T-shirt, dark blue Scraps and pink embroidery thread.

**Recreation:** Determination by draw line new cut then cut it. Make pocket and square from scrapes and install with decorate by embroidery threads. Embroidered word (Sarah) by pink thread. The edge decorated with stitch machine.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

### 3.10. Design (10):



Before



After

Fig.11: Design (10) Upcycled by Student Sarah M. Sharaf.

**Material:** Dark blue T-shirt and black satin.

**Recreation:** Cut sleeves, hem line and neck line with opposite V line. Decorated edge of neck line and sleeves by satin. Bend hem and cut line by machine stitch.

**Treatment with STRUKSILON 8450.**

**Result:** Grade (5) in soil release test and in wettability test recorded ISO(1): complete wetting of whole upper surface.

## IV. CONCLUSION

Few innovative thoughts applied by the students in design development to attain sustainable fashion were; by adding added value to the design, finishing with Eco friendly soil release agent giving second life of the product, reusing material, able to make allied business.

This understanding of sustainable design philosophy was able to develop important designer skills amongst the students which otherwise were never taken into consideration. This teaching experiment resulted in:

- Enabled logical understanding of the design for design students.
- Made the students understand sustainable design philosophy to comply with the principles of economic, social, and ecological sustainability.

- Developed Intuitive approach towards the extended life of a product in order to use resources to its optimum level.
- It enhances an ability to understand and apply long term fashion trends, endurance for classics.
- Develops ability to think design with a sense of responsibility.
- Extend the endurance of the material used beyond the product's short life (trend).
- It was able to build an intuitive approach towards the extended life of a product thus driving momentum for slow fashion.
- Sustainable fashion philosophy enables designers to create unconventional and innovative designs against an obsolete fashion product.

After analyzing, it can be concluded that the design of a product can be done keeping environmental concerns into consideration. A thorough research about long term fashion trends is important in designing the extended life cycle of the product. A designer can incorporate simple and convenient methods to transform a product for the best usage resulting in reduction of environmental hazards in a considerable way.

In today's scenario with global focus on sustainability, extending a fashionable product's life beyond the recognized horizon will certainly have a positive impact. Including the aspect of sustainability in teaching itself gives students a wider perspective to think design in a more respective manner and to become sensitive and sensible towards environment while designing.

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