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FAUX leather: An eco-friendly innovation

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ABSTRACT

The present era consumers are fashion conscious. They demand updated and up style look for themselves. Consumers are now more conscious of what they buy, about the style, visual appearance, etc. They not only look at the functions of the product but also the aesthetics according to the current fashion. The use of faux leather instead of natural leather can cater the demand of fashion products as well as will also take care of their environmental, economic and religious concerns of the consumers.

Keywords: *Faux-leather, Direct coating, Transfer coating, PVC, PU, Pleather, Naugahyde, Vegan*

1. LEATHER HISTORY

Leather tanning is one of the oldest human activities where skins obtained from hunting and livestock breeding were used for clothing and tents. These skins became stiff at low temperatures and rotted when the heat was applied. Various attempts were made to render them more flexible and stronger by rubbing in animal fats. Working with leather is dated back to 1550 BC in Ancient Egypt. As shown in Figure 1, on the left is soaking the hide in a large jar; on the right is stretching and kneading a skin on a trestle to soften it. At the center bottom is shown cutting a skin with a knife. At the top right is the completed skin of an animal [1].

Figure 1: Working with Leather [1]

2. SHORTCOMINGS OF LEATHER

Natural leather has few shortcomings in its functions and also in the manufacturing process of end products. It is very difficult to launder leather because of poor resistance to watermarks after laundering. Leather has weak resistance to mildew formation. Hence, the end products require frequent maintenance treatments. Its natural origin makes it unsuitable for the mass production system, as it is very difficult to obtain consistent quality. Also, deliberate animal killing is associated with natural leather. It is of major concern due to decreasing population of these animals. Animal skin is turned into finished leather through the use of dangerous mineral salts, formaldehyde, coal-tar derivatives, cyanide-based oils and dyes, chrome, and other toxins. People who work in and live near tanneries die of cancer caused by exposure to toxic chemicals used to process and dye of leather [2].

3. FAUX LEATHER

Faux leather, artificial leather or fake leather is a synthetic material used for clothing, furniture, and even in cars. Faux is a French word that means fake, or not real. Faux leather is used when the use of real leather is too expensive or unsuitable or even unethical. Faux leather was created in the early years of the twentieth century, but it was very rigid and had an unpleasant smell. The major problem of past faux leather was that it was not breathable. This meant that wearing faux leather would leave a nasty smell and a nasty feeling. In the sixties a company called DuPont invented a new way of manufacturing faux leather, by added tiny holes in faux leather, with the use of a new technique [3] For many people, the thought of wearing animal skin is just unacceptable, that is

why there are many brands that specialize in making faux leather clothing and accessories. Real leather is costly as compared to faux leather and more difficult to work than faux leather [4].
There are several different types of artificial leather materials available today, used for clothing and furniture products and other items. Artificial leather has become increasingly popular because of its appearance and flexibility, and also because of the positive effect on the environment. As more individuals shop for alternative leather products, fewer animals are killed each year, and less pollution is generated from the processing of those animals.

3.1 Requirements for Faux Leather

- Should maintain its texture and appearance for a long time
- Should be porous and breathable
- Should not degrade and should be crack-proof and crease resistant
- Should have good strength and good mechanical properties
- Should have good elasticity and stretch to optimum level as per product requirement
- Should be soft and easily cut, sewn and glued together
- Should have uniform properties in all directions good
- Should be resistant to color fading
- Should be washable and dry-cleanable

3.2 Production Process of Faux Leather

In the manufacturing of most of the conventional type faux leather, staple fibers from 1.5 - 5.5 denier fineness are used to compose the basic sheet layer, one surface of which is coated with resin using several processes. Some of the common ones include direct coating process, transfer coating process, and wet process.

3.2.1 Direct Coating Process

In this process the plastisol is directly coated with woven cotton, acrylic, viscous, or any other blends can be used as base fabric before passing through the oven and then embossed. The end product made from this process has limited use in industries such as the bag and luggage industry.

3.2.2 Transfer Coating Process

In this process, the coating is done on a release paper and then the film is released and laminated onto the fabric. The mainly knitted fabric is used as base fabric. The end product of this process is used in several industries such as upholstery, shoes, bags, etc.

3.2.3 Wet Processor Coagulation

This process is used for producing polyurethane cloth. The fabric is dipped into a bath of PU, which is then impregnated into the fabric. Compared to PVC, PU leather cloth is more flexible with a higher tensile, tearing, and bursting strength. Due to this, PU leather cloth has an advantage when used in making products with high stress-tolerance like shoes and luggage bags. Split leather is also made using this process [5].

3.3 Types of Faux Leather

PVC-based faux leather focuses on flexibility, this is the major benefit of using PVC-based leather, and it looks like real leather. The PVC-based leather is not breathable, that is why it is not used for clothing and it is more focused on surface decoration, like car seats and furniture [6]. Polyurethane is made by coating materials like cotton or wool with a polymer-based substance and then treating it to resemble real leather, this gives flexibility and breathability as compared to real leather, and thus, it is more used for clothing and for intimate products. Among PVC and PU faux leather, PU is more tough and flexible [7].

3.3.1 Pleather

Pleather is a low-cost material that is commonly used to make artificial leather garments. Pleather is made from plastic materials and is lighter in weight compared to genuine leather products. Two common types of pleather are polyurethane (PU) and polyvinyl chloride (PVC). Pleather products can be bought in an array of colors because the dyeing process does not damage the materials.

Figure 2: Pleather: PVC Based (on left), PU Based (on the right) [7]

3.3.2 Naugahyde

Naugahyde is vinyl coated; characteristics are similar to a genuine leather hide. It is used mainly for furniture coverings, as well as waterproof seat covers, clothes, and toys. Naugahyde artificial leather has a soft texture and genuine appearance of real leather.

Figure 3: Naugahyde [8]

3.3.3 Vegan Leather

Vegan leather is popular artificial leather, but although vegan leather is considered animal-friendly, the manufacturing of some of the materials used may not be considered environmentally friendly. The different types of materials used to make vegan leathers are, Birko-Flor (made out of acrylic and polyamide), Kydex, (an acrylic and PVC alloy), Lorica (micro-fibers blend) PVC and Vegetan. Vegan leather is used to make garments, shoes, and accessories.

Figure 4: Vegan Leather [8]

3.4 Advantages of Faux Leather to Real Leather

- Economical– Faux leather is typically more affordable than real leather.
- Durability – Faux leather is very durable and is long lasting. It can withstand scratches and scrapes that would spoil genuine leather. It is not prone to crack or peel like leather. It does not fade as easily in ultra-violet (UV) light and is stain resistant.
- Low Maintenance – Faux leather materials can be wiped clean with a rag and warm water. Unlike genuine leather, it does not retain moisture, so faux leather items will not crack. Some of the new performance faux leathers can remove ink, liquid and food stains with only a dry cloth.
- Realistic Quality – Faux leather has been modified and improved with variations in grain, color and textures to reflect a visual appearance with a realistic leather quality.
- Consistent Appearance – Faux leather will provide a uniform look since all the pieces come from the same stock.
- Fashion - Faux leathers can also be printed providing an enormous variety of textures and patterns. In addition, because faux leather is a synthetic material, it can be dyed in a rainbow of colors. This fashion-forward approach allows for more freedom when decorating residential or commercial interiors.
- Easy to Work with – Faux leather is easier to cut and sew than real leather. In addition, needle marks are usually less noticeable and threads blend with the faux leather material more seamlessly.

3.5 Disadvantages of Faux Leather Compared to Real Leather

- Faux Leather does have some disadvantages when compared to real leather.
- Faux leather does not stretch, breathe or wear like leather.
- Faux leather does not develop the same lustre and patina over time as leather.

4. CONCLUSION

Leather making is a highly specialized and time-consuming process. The tanning chemical contains pollutants like salt, lime sludge, sulphides, and acids. Workers in tanneries suffer from skin diseases and respiratory illness caused by the chemicals used in tanning process to make leather. In spite of its conformity by consumers, leather has its own shortcomings such as difficulty in the laundering process because of the poor resistance to watermarks and mildew formation.

In order to overcome the above shortcomings inherent to leather various types of faux leather have been introduced in the leather product industry. Faux leather, artificial leather or fake leather is a synthetic material used for clothing, furniture, and even in cars

upholstery. The popularity of faux leather increased with time as it was available in different colors. Even people living in hot climates could also enjoy wearing faux leather garments as it allows the skin to breathe, unlike leather. Two common types of faux leather are polyurethane (PU) and polyvinyl chloride (PVC). PVC leather is a type of faux leather that is made by covering a base of natural or synthetic material with vinyl, made from polyvinyl chloride (PVC) and plasticizers. PU leather is made by covering a backing fabric such as cotton, polyester or with a layer of polyurethane. Faux leather is easier to cut and sew, and needle marks are less noticeable on it. One can use faux leather for a variety of projects, from making clothing to covering headboard because it is easy to work with.

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