

UPHOLSTERY FABRICS AS A DESIGN ELEMENT IN INTERIOR SPACE AND SELECTION CRITERIAS

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Abstract

Interiors are designed an integrity with user-function-space. Spaces created with structural (wall, floor, ceiling, corner) components and qualitative components serve both users and spaces and functions. Furniture especially serve user and function is important component of spaces to specify the style, contribute the created style and especially provide possibility for realizing actions. Furniture is composed of furniture frame and upholstery fabrics, which is the top layer of the upholstery and interact users. Textile products which are used for furniture upholstery are varied according to raw material and surface tissue. This variation affects space and space atmosphere, users in physiological and sensorial aspects and function quality. In this paper s mentioned and examined upholstery fabrics which is used in spaces and selection criterias.

Keywords: Interior Space, Upholstery Fabrics, User, Function, Space.

İÇ MEKANDA BİR TASARIM ÖĞESİ OLARAK DÖŞEMELİK KUMAŞLAR VE SEÇİM ÖLÇÜTLERİ

Özet

İç mekanlar kullanıcı-işlev- mekan bütünlüğü içerisinde tasarlanmaktadır. Yapısal öğeler (duvar-zemin-tavan-köşe) ve niteliksel öğeler (malzeme-renk-doku-ışık-aksesuar-mobilya) ile oluşturulan iç mekanlar hem kullanıcıya hem mekana hem de işleve hizmet etmektedirler. İç mekanın özellikle kullanıcı ve işleve hizmet eden niteliksel öğelerinden mobilyalar mekanın tarzının belirlenmesinde, oluşturulmak istenen tarzın desteklenmesinde özellikle kullanıcının eylemlerini gerçekleştirebilme imkanı sunmasında önemli yer tutmaktadır. Mobilyalar mobilya iskeleti ve kullanıcıyla etkileşimde bulunan döşemenin en üst katmanını oluşturan tekstil ürünlerinden meydana gelmektedir. Mobilya döşemelerinde kullanılan tekstil ürünleri üretim ham maddelerine ve yüzey dokularına göre çeşitlenmektedir. Bu çeşitlilik, mekanı ve mekanda oluşturulmak istenilen atmosferi, kullanıcıyı duyuşsal ve psikolojik yönlerden ve gerçekleştirilmek istenen eylemin niteliğini etkilemektedir. Bu çalışmada iç mekanlarda kullanılan döşemelik tekstil ürünleri çeşitler ve bu ürünlerin seçim ölçütlerine değinilecektir.

Anahtar Kelimeler: İç Mekan, Döşemelik Tekstil Ürünleri, Kullanıcı, İşlev, Mekan

1 Introduction

Textile products are significant design elements in interiors designed within the context of triangular space-user-function construct. It is possible to determine textile, which is considered within the category of materials among the qualitative elements of the space, as upholstery textiles used on furniture, drapery fabrics used in windows solutions and rugs and carpets in floor solutions in interiors. Furniture shapes an important space in interior planning. Furniture could be differentiated based on various utilization properties such as resting, sitting and storage. Especially in the parts that have a contact with the user, upholstery textile products are used. Upholstery textile products consist the uppermost layer where furniture upholstery interacts with the user. Determination of this surface based on selected criteria is important for the comfort and aesthetics of the user and the space.

2 Qualitative Elements of Interior Space

Spatially defined basic elements that we observe as point, line and mass in geometry, correspond to corner, edge, surface and the volumes that these for in interior spaces. Space is formed by structural and qualitative elements. Structural elements of the

space are walls, ceiling, floor and the empty and full areas in the space. Qualitative elements are the material, texture, color, illumination and furniture that provide aesthetic for the structural elements.

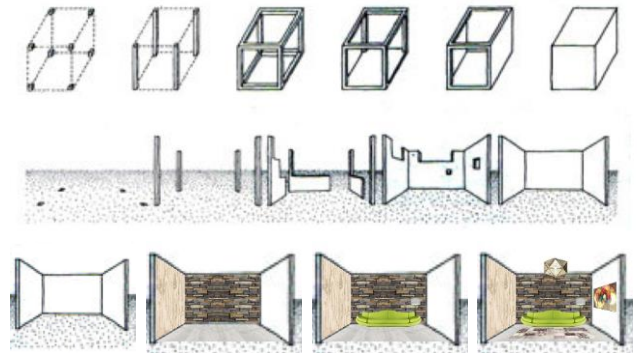


Figure 1. Integration of the Structural and Qualitative elements [7]

Existence of the structural elements in the space form a wholeness together with the qualitative elements that could also be considered as sensual elements [3]. Stressed that elements used in a space such as furniture, color and

illumination enables the spatial experience of the user, in other words, user's visual, tactile and auditory actions and the user establishes the communication with the environment through these elements. Quality of the interior space is determined by the sensual actions of the user such as seeing, hearing and touching. Creating spaces where the user could maximize sensual actions is realized by using qualitative spatial elements such as light, color, texture and material.



Figure 2. Effects of Different Textures to Space [15]

These elements that enable the interaction between the user and the space render the space as a living phenomenon. In spaces where light, color, texture, material, accessories and furniture are not utilized, it is not possible to talk about user-space-function construct and the abovementioned interaction. Colors are perceived as a result of the interaction between light, eyes and the brain. Colors exist in the nature in every form and dimension, while they similarly exist in spaces as light or pigment. Color as light is a dimension provided by illumination. On the other hand, as a pigment, it is an element that is present in material and textures as a tactile and visible dye. In basic taxonomy, colors are divided into primary (yellow - red - blue) and secondary (green - orange - purple) categories. Apart from this classification, colors could be grouped as opposite colors, similar colors, warm and cold colors.



Figure 3. Colour Wheel of Newton [11]

These defined colors could have different impact on human psychology when used along with different elements and in different combinations in a space. Colors could create desired perceptions in the space they are used in. Colors that are inseparable part of the texture and material should be considered as a whole along with all the elements in a space.

Furniture, which are one of the qualitative elements in a space, affect the occupancy / vacancy rate of the space with respect to both the raw material and texture and style. Furniture affect the space through their style, the color and texture used on them, and also the different material used on them. Periodic style of furniture either supports the atmosphere desired in the space or the furniture itself creates this style. Furniture affect the style of the space due to both the material they were manufactured with and the colors and texture of different material used on them. Furniture that play a significant role in

creation of the quality of the space are used for different functions.

2.1 Furniture

Furniture are not only elements that fulfill the needs of the user, but also a significant design element that affect the atmosphere of the space with its upholstery and upholstery fabric. Kilmer and Kilmer stressed that spaces require furniture that could provide the transformation between their architecture and the user [5]. Furniture, while fulfilling the needs of the user, could also affect the user psychologically.



Figure 4. Furniture [12]

Furniture are elements that occupy a certain volume and meet needs in a space such as laying down, resting, sleeping, sitting and storage. "According to several users, furniture transform architectural spaces into usable and personal spaces where human activities could be realized comfortably and appropriately" [9]. Pile attempted to stress that furniture are important design elements in a space and could only become an interior design element when they are designed suitable for the user and their function.

Furniture contains two sections of the frame and upholstery. Furniture frame is the structural system that holds the furniture upright. Frame is generally manufactured with wood, metal and plastic material. Upholstery is the part of the furniture that is in contact with the user and generally produced with soft backfilling material. "Upholstery and upholstery works generally reflects furniture for sitting, resting, laying down and sleeping such as stools, ottomans, chairs, couches, sofas, divans, bed bases, mattresses, beds, etc. The transformation of the chassis called "frame" in furniture into a form on which people could sit on or use for other purposes is what upholstery is about" [10]. Upholstery could also be used to protect the furniture frame.



Figure 5. Upholstery [13]

"Frame is the system that creates the structure of the furniture and holds in upright. Upholstery, on the other hand, is the process of rendering the furniture usable via integration with filling material and different methods" [7]. It is frequently used

in furniture used for resting, laying down and sitting. Furniture upholstery could include more than one layers based on its area of use and its type. However, the uppermost layer of each upholstery is the textile layer. These textile surfaces used in furniture are called upholstery textile products or upholstery linings. These products are superficial products manufactured with substances produced with fibrous raw materials. Textile products are a significant part of the interior material element.

3 Creations of the Textile Products

It is known that clothing is one of the most important needs of humankind, only second to nutrition. Humans used the hides of the animals they hunted for food in early ages for protection and ornamental purposes. In later ages, they started to produce basket-weave shaped surfaces by weaving the wool they obtained from the sheep. Textile products basically consist of fiber. Natural or synthetic fibers are combined in an orderly or disorderly fashion. Natural fibers could be of vegetal, zoological or mineral origins. Some of the artificial fibers are produced from natural fibers, while some other are completely artificial. Properties of the fibers significantly affect the properties of the textile surface that is produced using them. Yarn, which is a textile product with an indefinite length, is produced by spinning these fibers. And yarns are put together with different methods to produce surfaces. The characteristics that yarns gain while being created by spinning affect the characteristic properties of the yarn. Some of these characteristics are the number of the yarn, winding, strength and elasticity. Yarns could also obtain certain visual characteristics due to the properties of the fiber or the method of spinning. Characteristics of the yarn spun affect the characteristics of the textile surfaces.

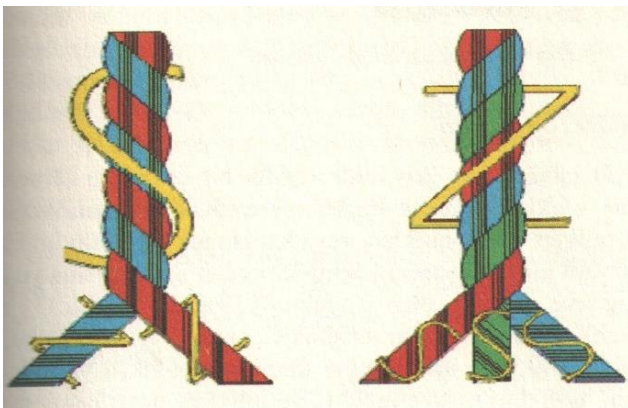


Figure 6. Yarn Spins [4]

Textile surfaces, which are called fabric, are created with three methods. The first method is weaving method, which entails passing at least two groups of yarn from under and above each other forming a right angle. The yarns used in the weaving method are called the woof and the warp. Due to the diversity of weaving techniques, obtained surface is generally durable. The second method is knitting which is conducted by creating a loop with an auxiliary material and holding these loops together. Fabric produced with knitting method is less durable compared to other methods due to the possibility of unfastening. The third method entails creating surfaces with a nonwoven technique where fibers are turned into surfaces with adhesive or binding material. In this method, due to the diversity of available techniques, the fabric could have properties such as flexibility, endurance, different retention and bulkiness characteristics.

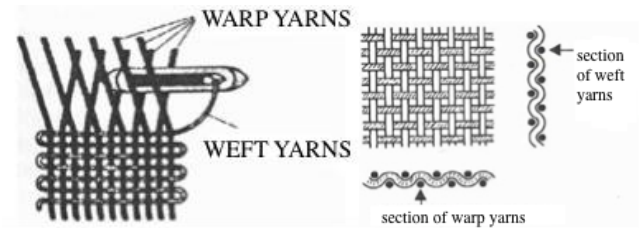


Figure 7. Weaving [8]

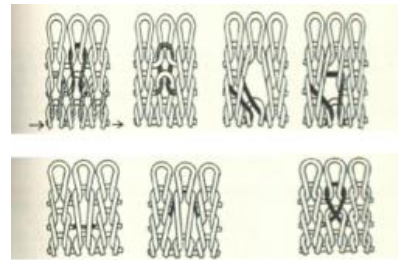


Figure 8. Knitting Models [4]

Certain treatment processes are applied before or after production on textile products of fibers, yarns and surfaces. Preliminary treatment processes are applied to remove foreign material from the fiber or the yarn before transforming them to the product and render them ready for the process. Every process is not applied to every textile product. They are applied based on the desired property and raw material. Second treatment is coloring. Coloring is conducted with dyeing or imprinting methods. The third treatment process is finishing or bare finish, which is conducted so that the product would possess the desired properties. It is applied using two techniques: mechanical and chemical. Mechanical finish process do not pertain and foreign material, while chemical finish entails the use of foreign material.

Reupholsters protect the upholstery below and at the same time provide visual and tactile comfort for the user. Upholstery affect the style of the furniture through their color, texture and designs and at the same time, affect the quality of the space. Especially the final layer of upholstery that is in contact with the user increases the comfort in the space as a result of the touch effect it provides for the user.

4 Upholstery Fabrics and Selection Criteria

Qualitative elements within a space such as material, furniture, color, illumination, texture and accessories define or support the atmosphere within an interior space. Since textile products that are considered within the classification of material affect the user through the four senses of touch, sight, smell and hearing, they are significant interior space material. Textile products are important since they provide the texture and design elements that affect the quality of the space. Almost all material in a space have a pattern or texture. Pattern is an element that affects the user visually, while texture has both visual and tactile effects. Patterns could be considered as important elements within a space since they alter the scale and ratio effect of the space. Geometry, size and especially the colors of the pattern are important for they affect the style of the space. In addition to the pattern of the material utilized in the space, each material has a visible or invisible texture. In addition to affecting the user and the space visually, texture of the material also changes its touch effect. Textile products are significant interior material that contain texture and pattern

and affect the user and the actions desired within the space. In interiors, textile products are used as upholstery fabric on furniture, as carpets and rugs on the floor, as curtains in window solutions and as accessories under the category of other areas of use. Upholstery fabrics that could be frequently observed in the spaces affect the space with their texture and designs.

The uppermost layer of the upholstery process, upholstery textile products are significant elements of determining the style of furniture and the space. They are used to create the style of the space and to support the created style, to facilitate the perception the relationship between space and scale ratio and to provide comfort for the user.

To use upholstery textile products in furniture and spaces, they need to possess certain characteristics. These are:

1. Wear resistance,
2. Resistance against fading,
3. Seam shift resistance, dimensional stability,
4. Ease of care,
5. Firm handle and low drape,
6. Being stain proof,
7. Difficult ignition [6].

In addition to these physical properties, it is expected to exhibit user oriented features such as looks, scale, ratio, comfort and touch. Upholstery fabrics, leather, artificial leather, vinyl and artificial suede material that would reflect these features all possess different characteristics.

Fabrics are textile products that are manufactured by compressing or twisting natural or artificial fibers and then combing the resulting yarns by knitting or one of the weaving techniques. Upholstery fabric is in the category of textile products used in furniture upholstery. Upholstery fabrics are manufactured in two different types: household or contract¹ type. Household fabrics are manufactured for use in spaces where there are limited number of users such as homes. Contract type, on the other hand, is produced for use in public spaces where the user count is dense. Since these fabrics are exposed to more utilization and wear, they are produced with high strength, wear resistance and inflammation resistance.

Since upholstery fabrics are exposed to frequent use in our daily lives, they are expected to be suitable for use, durable, easy to clean, less inflammable, high wear resistant, resistant against fading, unstainable, seam shift resistant, and with a sporous structure. These features are based on using different fibers together, differences in twisting methods of the yarn that would be used for the fabric, or variations in the yarn combination methods. If the desired feature is not available in the fabric despite these different methods, different finishing techniques could be used for this purpose. Due to the diversity of fibers and yarns used in upholstery, fabrics with different colors, designs and textures could be obtained based on the surface formation technique.

Various natural or artificial fibers are used in the production of upholstery fabrics. The most manufactured fabrics are cotton and synthetic fibers due to their high qualitative value. Upholstery fabrics are manufactured nappy or napless based on the effect that is aimed at the space and the user. Naps are napped structures that affect the outlook and touch of the fabric. Upholstery fabrics could be classified based on their nappy or napless structure.



Figure 9. Nappy and Napless Fabrics [14]

Napless fabrics are manufactured with weaving and knitting methods and they lack naps on their surface.

Apart from these fabrics, chenille, which is a cotton fabric that looks like satin is highly preferred. Also, kitoun, denim, drill, flannel, calico fabric and jersey are used as upholstery textile products.

Leather obtained from animal skin could be in different size and thickness based on the animal. Due to its foldable, durable, stainable and shapeable, it is preferred in certain spaces, however, in addition to these properties, it also has certain negative characteristics such as being easily scratched, teared and perforated. Artificial leather, vinyl and artificial suede fabrics are obtained from various polymer compounds. They are preferred as upholstery fabric due to their different characteristics.

These upholstery textile products manufactured with various fibers and polymers are exposed to wear due to dust, moisture, sunlight and use in their environment. To extend the economic life of textile products and to benefit from their features sufficiently, periodical care and knowledge on what to do when they are stained are necessary. The nap found on upholstery fabrics could be cleaned of the dust by a vacuum cleaner. When a solid matter is dropped on the fabric, it should immediately be removed. When a liquid is spilled, it should be absorbed by a paper towel or a dry piece of cloth before it penetrates the fabric. Certain liquid stains could be cleaned with detergents and warm water. Oil based stains should be removed by dry cleaning. If the stain could not be removed with warm water and detergent, the surface should be cleaned with moist kerosene or petroleum. Since artificial leather is composed of various polymer compounds, it could not be cleaned with any detergent. The stains could be removed with a piece of cloth moist with kerosene and petroleum. Upholstery textile care should be regular and necessary intervention should immediately be applied when a sudden stain occurs.

Upholstery textile products are the last layer lining that have the properties of protecting and emphasizing the furniture. They play a significant role in determining the style of the space and supporting the predetermined style. They are able to directly influence the user and the function. Thus, it is important to select suitable upholstery material that suits user taste, the style of the space and design and unity and integrity of the design. Selection of upholstery textile material in interiors should be conducted based on certain fundamental principles. These fundamental principles are investigated under qualitative and physical topics [6]. These principles are physically dimensional and color soundness and consistency, endurance, flammability, based on its effects on the senses, aesthetics, comfort and touch, and based on practical use, care and cost.

¹ Contract textile: Textile products in spaces with high number of users such as hotels and offices [2].

“Use of textile products as furniture upholstery contributes to their comfort and aesthetic value. When an interior space is designed, selection of upholstery textile products consistent and in unison with space-wide design decisions would be a determinant of successful design of space. For this purpose, shape, material and style of the furniture should be considered during the selection of textile products” [1].

The first criterion of upholstery textile selection is the style aimed in the space. To support the style of the space or for the style that is aimed for the space, selection of the upholstery fabric is important. Thus, initially the style of the space should be considered. Following this criterion, basic principles should be considered.

Wear resistance: Furniture are worn away and damaged in time due to use. Since upholstery textile products would wear as well, the fabric is expected to have high wear resistance. Wear resistance varies based on the fiber and yarn used, variations on the method of manufacturing the yarn and combination of the fabric and finishing processes applied on these products. Since wear also would create the problem of pilling on the fabric, upholstery textile products should have high wear resistance. If this property was not created with determined methods, wear resistance should be achieved during the finishing process.

Light fastness: When upholstery fabrics are exposed to high amounts of sunlight during use, their colors could fade or physical deformations could occur on the fabric. “Light fastness against fading, environmental pollution and matting is extremely important for upholstery fabrics” [2]. To prevent the change of color and clarity of the fabric, high light fastness resistance is expected of upholstery textile products.

Seam shift resistance: When the weft and warp yarns on the textile surface are not dense, seam shift problem occurs. This problem results in loosening of the fabric, disintegration of the design, loosening of the yarns and decrease in the endurance in time. Thus, high seam shift resistance is expected of upholstery textile products.

Easy maintenance: Most preferable upholstery fabrics are easy cleaning and maintenance products. Easy cleaning upholstery textile products are the most preferred ones. Upholstery textile products are expected to be suitable for washing or dry cleaning.

Low drape and firm handle: It is expected of upholstery textile products to keep the form that they take on the furniture constant throughout their economic lives. This characteristic directly affects dimensional consistency of the textile product. Low drape is the ability of a textile product to keep its form, firm handle is a characteristic that exhibits the strength of a textile product.

Stain proof property: Textile products are exposed to various dust, dirt and stains based on the use in time. These negative factors shorten the economic life of the textile product. Thus, upholstery textile products are expected to be stain proof. If this is not an inherent property of the textile product, it could be achieved through the finishing process.

Non-flammability: For life safety reasons, materials used in internal environments are expected to be non-flammable or difficult to catch fire. This could be achieved through various finishing processes.

These properties are the characteristics that should functionally be present in upholstery fabrics. In addition to abovementioned properties, upholstery textile products should also possess sensual properties that attract the user such as visual, auditory, tactile and olfactive characteristics.

Table 1. Naples Upholstery Fabrics

Method of Creating Fabric	Fabric
Plain Weave	Homespun, Hopsacking, Tweed, chintz, Duck, Rep, Bengaline, Faille, Ottoman, Shantung
Twill Weave	Plaid, Herringbone
Satin Weave	Antik Saten, Atlas
Crepe Weave	
Dobby Weave	
Patterned	Patterned
Jacquard Weave	Damask, Brocade, Matelas, Lisere, Brokatel, Goblen
Triaxial Weave	
Knitting	

Table 2. Nappy Upholstery Fabric

Method of Creating Fabric	Fabric
Weave	Velvet, Velour, Frieze, Corduroy, Velveteen, Grospoint
Knitting	
Taffeta	

5 Conclusion

As a result of integration of structural and qualitative elements that form the interior space, which is based on geometry, habitable quality interior spaces are created. Among these qualitative elements, textile products classified under material provide services for the user in visual, aesthetic, tactile, olfactory and functional dimensions. Furniture that cover a significant portion of interiors are another qualitative element and most of the textile products are used as upholstery textile products on furniture. Upholstery textile products are selected based on two different sets of criteria of physical and qualitative with reference to the protection of the product itself and the services they provide for the user.

Table 3. Upholstery Fabric Selection Criterias

PHYSICAL CRITERIAS	QUALITATIVE CRITERIAS
Wear Resistance	Aesthetic
Light Fastness	Touch
Seam Shift Resistance	Comfortable
Stain Proof Property	Scale
Difficult ignition	Smelling
Low Drape and Firm Handle	Acoustic
Easy Maintenance	
Static Electrification	
Resistance to insects and moths	

Physical criteria are necessary to extend the economic life of the upholstery textile product and to keep its functional performance at the maximum level. These criteria are wear resistance, light fastness, seam shift resistance, non-flammability, stain proof property, low drape and firm handle, easy maintenance, static electrification, resistance against pests. These properties could be provided intrinsically in the

fabric during production through the raw material and manufacturing method of the yarn and textile surface, however, it is not possible to provide all these properties in every fabric. The latter are provided for the missing properties through different mechanical or chemical finishing processes.

Qualitative criteria aim to provide an environment for the user to conduct actions comfortably. These properties are visual quality (aesthetics), touch (texture), comfort, scale, smell and acoustics. These criteria are determined based on the personal traits of the individual who would utilize the space. Furthermore, the taste and demands of the user are the other important criteria that would determine the design.

In addition, based on the space analysis, suitable fiber, yarn and fabric should be selected and required dyeing and finishing processes should be conducted. Since geographical and climate conditions of the space would change the use of the textile products in the space, selecting upholstery textile products that are suitable for the climate and season of the space are among the basic conditions of a comfortable atmosphere.

Selecting upholstery fabric based on the two significant complements of a space, the user and function is an important design stage for both comfortable movements of the user and productive utilization of the space.

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