

Stretch Aesthetics In Contemporary Fashion Design*

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현대 패션디자인에 나타난 스트레치의 미(美)연구

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국문요약

텍스타일의 발전에 있어서 진보적 기술혁신은 합성섬유의 잠재력을 높이는데 큰 촉매 역할을 해왔는데 그 중 가장 두드러지게 성공적인 분야는 바로 스트레치 직물 분야이다. 스트레치는 그 자체의 다양한 종류와 변화무쌍한 특성과 함께 스포츠웨어, 캐주얼웨어 뿐 아니라 최근에는 정장류, 남성복에 이르기까지 그 사용범위와 미적 표현이 크게 증가되고 다양해 졌다. 스트레치의 미는 기능적이고 편안하면서도 직물자체의 유동적인 특성과 함께 인체와 더불어 표출되는 시각적 이미지가 현대미에 새로운 개념을 더하고 있다는 데에 그 가치가 있다. 본 연구목적은 현대 패션디자인에 표현되어진 스트레치의 미적 개념과 가치가 무엇인가를 발견하는데 있다. 특히, 섬유과학기술의 진보로 인한 스트레치 직물의 다양함과 그에 대한 디자이너들의 패션철학과 디자인의 다양한 변화를 강조하고, 나아가 다음 세기를 위한 보다 나은 디자인의 방향을 제시해 보고자한다.

연구결과는 다음과 같다. 1. 스트레치의 가장 두드러지는 현대적 미는 편안함과 기능성에 있다. 특히, 스트레치 직물 자체가 더욱 가벼워지고 강해지면서 현대생활과 미래생활에서 가장 크게 중시되고 있는 comfortable & functional의 이상적인 개념을 충족시켜 주고 있다. 2. 스트레치 직물의 유동적(flexible) 특징에서 대표적으로 나타난 스타일은 바디수트(body suit)인데, 이것은 스트레치 자체의 신축성이 기본적으로 인체곡선 위에서 표현되어진 것으로서 거의 비슷한 스타일의 uniformity 현상을 낳게 되었고, 또한 인체선의 드러남으로 인해 'healthy'이미지 추구라는 현대미의 새로운 개념을 가져왔다. 3. 더욱 정교해진 스트레치는 결국 transparent look을 낳았고, 또한 비치는 직물들을 겹쳐입는 layering 현상을 가져왔는데, 이것은 현대적 순수미와 여성미가 시각각적 이미지로 표현되어진 것이라 할 수 있다. 4. 스트레치가 되므로서 생기는 긴장은 다른 디자인 요소들에 대해서는 극히 단순한 것을 요구하면서 결국 simplicity를 동반하게 되었다. 5. 스트레치는 디자인 구성 요소들의 보다 작은(적은) 개념을 낳았는데 즉, 더욱 좁아진 형과 작아

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진 사이즈, 얹어지거나 줄어든 다트와 구성선, 그리고 그에 따라 줄어든 공정과 낮아진 가격이다. 이 개념은 현대미의 minimalism의 한 현상으로 해석되어지며, 스트레치 직물은 여기에 가장 부합되는 소재가 되었다. 6. 스트레치의 시각적 이미지는 그 자체가 'easy', 'free'느낌과 함께 보편적(universal)이면서 미래적(futuristic)이다. 이상으로 볼 때, 미래의 패션은, 보다 진보적인 섬유과학발전에 힘입어 21세기의 새로운 환경에 잘 적응 할 수 있는 합리적이면서도 미적 가치가 내포된, 인간에게 보다 친숙한 디자인으로 전개되리라 라고 생각되어진다.

Key Word : stretch, aesthetic, technical textiles, comfortable, functional
(스트레치, 미, 기술이 가해진, 편안한, 기능적인)

I. Introduction

"Traditional stripes are renewed with the use of stretch, matte shine combinations and innovative yarn blends."¹⁾ "A signature corset look in metaloplastic stretch...and metallic shower coat with an automotive lustre gave a whole new meaning to glitterati"²⁾ "A portrait of modern femininity projected toward the future...The surfaces of fine, sheer gold and silver cloth reflect light like stretches of water..."³⁾ These were all examples of fashion trend descriptions from the worldwide fashion and textile magazines. A remarkable development of technical textiles and its emphasis have influenced fashion designs, constructions and production techniques. Textile innovation has occurred at the major part of not only fashion but also other visual arts and design fields with new concepts of aesthetics.⁴⁾

As the next millennium approaches, we have moved forward a cyber-electronic age with its environments. The world has become easily accessible, because of modern travel, communications, transportation and the computer. We have already entered this new era where the value of comfort and freedom gains in importance in preparing the new environment.⁵⁾ Fashion has always been a reflection of the times and highly sensitive to changes in attitude, displaying its relation to technology, morals, customs, values, and the social structure in which it is worn.⁶⁾ Modern technological innovations have enhanced and accelerated the rise of synthetic fabrics and have expanded new markets for the textile industry, providing designers with the latest in sophisticated textiles.⁷⁾ Fashion today has been taking its lead from technology and has shown the designers' work with the cutting edge of

1) International Textiles : Information and Inspiration, No. 773, Grange Press, London , May 1996, p.60.

2) Ibid., No. 793, May 1998, p.49.

3) Collezioni : Pret-A-Porter, S/S 1999, No. 67, Nov. 1998.

4) Tapio Periainen, Soul in Design, Kirjayhtyma, Helsinki, 1990, p.24.

5) Textile Horizons, Vol.16, No.1, World Textile Publication Ltd., Bradford, Feb-Mar 1996, p.18.

6) Marilyn J. Horn and Lois M. Gure, The Second skin, Houghton Mifflin Co., Boston, 1981, p.333.

7) Sarah E. Braddock and Marei O'mahony, Techno Textiles, Thames and Hudson, New York, 1993, p.7.

fabric development.

The most successful part of technical textiles is the inherent versatility of the properties of stretch. Stretch fabrics by elastane yarns⁸⁾ as well as other new elastic fibers have expanded their potential to encompass the whole of the textile industry since their introduction into the pantyhose and swimwear markets. Innovative stretch products today by advanced technological developments have evolved to fit, or to be flexible to, all types of clothing and other technical requirements, bringing in new dimensions and added value with a new modern aesthetic.

"Aesthetic" generally refers to a quality of an object and a state of being.⁹⁾ The aesthetic response to fashion is generally connected to what people evaluate as excellent and important about a particular style.¹⁰⁾ The aesthetic qualities of fashion lie in the impressions of the materials, which show on their surface texture symbolic meanings.¹¹⁾ The aesthetic value of contemporary fashion has been specifically concerned with the stretch aesthetics that have their own values of beauty and function, offering various modern concepts.

The purpose of this study was to find the aesthetics of stretching properties on contemporary fashion design with their astonishingly varied performance. The specific objectives of this research were:

1. To examine the increasing versatility and

serviceability of synthetic stretch fabric and its design development.

2. To consider the changing quality of fashion designs in advanced technical textiles in relation to the new environment in the next millennium.

Primarily books related to contemporary fashion and textiles have been examined. Journal articles, edited books and magazines related to the arts, aesthetics, environments, predictions of the future, and fashion and textile trends have also been examined. Mainly photos and some real samples were used for design analysis, and the Internet was used for textile technology information from companies like Du Pont. Fashion and textile shows in New York and visits to textile companies were helpful for understanding the variety of stretch.

The period of the study focused on the 1990s, when synthetic stretch fabrics were rapidly developed and accepted in their own right.

First of all, the development of synthetic textiles and stretch fabric was examined in order to understand the essence of synthetics and stretch, with their unique features and types; and the fashion designs using stretch fabrics were analyzed with their designer's philosophies, focusing mainly on their aesthetics. More details of stretch aesthetics were examined, and then the better designs from advanced technology for the next era were suggested.

8) Textile Horizons, Vol.16, No.1, op., cit., p.18.

9) Ann M. Fiore, Patricia A. Kimle and Josephine M. Moreno, Aesthetics: A Comparison of the State of the Art Outside and the Inside Field of Textiles and Clothing, Clothing and Textiles Research Journal, Vol. 14, No. 1, 1996, p. 30.

10) Marilyn R. Delong, The Way We Look: Dress and Aesthetics, Fairchild Publications, New York, 1998, p.23.

11) Ann M. Fiore and Patricia A. Kimle, Understanding Aesthetics, Fairchild Publications, New York, 1997, p.171.

II. Development of Synthetic Textiles and Stretch Fabric

Technical textiles are basically made from synthetic fiber. The term "synthetic" covers only the noncellulosic fibers. Synthetic fibers are made from the carbon atom of oil or coal. In the textile industry, synthetic indicates all "chemically produced fibers as man-made or manufactured fiber"¹²⁾ and most synthetic fibers relate to polyester, which is the most usual synthetic fiber now being made in at least 55 different countries, including Korea.

Since the first chemical fiber, nylon, was introduced by Du Pont in 1939, large textile companies such as BASF (*Badische Anilin und Soda Fabrik*), Courtaulds Fibers, Inc., Hoechst-Celanese and Zeneca (formerly ICI) have spurred more and more research and development of new varieties of fibers with new techniques.¹³⁾ Synthetics have been used more and more in blends, with other man-made fibers or with natural fibers like cotton, wool and linen, to achieve totally unpredictable and miraculous creativity. Stretch, wash and wear, permanent press and fabric-to-fabric bonding rapidly followed; and non-wovens such as plastic, vinyl and artificial leathers were also made. As development in synthetic textiles continued, futuristic designers

like André Courrèges, Paco Rabanne and Pierre Cardin, in the 1960s and 70s began to use the latest products of scientific ingenuity.

The advanced technology of synthetic fabrics entered in during the 1980s. With the advent of microfibers¹⁴⁾ in the late '80s, modern fiber technology in innovative textiles swiftly developed in the 1990s—"The New Age."¹⁵⁾ During the 1990s, as a result of the modern communications media, the electronics industry, high-tech manufacturing, cable TV, shopping by computer, computer-aided design and the Internet, people of all lifestyles feel easier, faster, and more comfortable. With this modernized consciousness in mind, the use of technological fabrics with their special qualities and aesthetics has been internationally widespread in every fashion category, especially since the middle of the '90s. These incredibly versatile products have today become the most advanced and uncompromisingly modern aspects of fashion.¹⁶⁾

The '90s have brought modern products whose outstanding features are that they are lighter, smaller, stronger, labor-saving and lower in cost,¹⁷⁾ and thus more concerned with spiritual values such as simplicity, purity and comfort. This has influenced designers to bring a relaxed look of freedom.

12) Gin S. Firings, *Fashion: From Concept to Consumer*, Prentice Hall, New Jersey, 1996, p.105.

13) Rosalie Salomon, *Fashion Design for Moderns*, Fairchild Publications, New York, 1976, p.85.

14) Chloë Colchester, *The New Textiles: Trend and Traditions*, Rizzoli, New York, 1991, p.26.

Extremely fine yarns of one denier or less, which is 60 times finer than a human hair.

15) Miriam Moss, *Fashion Designer*, Crestwood House, New York, 1991, p.28.

16) Chloë Colchester, op., cit., p.24.

17) Tom Forester edited, *The Materials Revolution*, The MIT Press, Massachusetts, 1988, p.119.

III. Synthetic Stretch Types

The stretching is done in various ways : generally by incorporating a synthetic elastic yarn like Lycra : naturally, by using elastane, a yarn with its own elastic quality : by using both natural and synthetic rubber : and by knitting, which has its own elastic quality. Besides, there are various finishing techniques for stretching, like pleating, smoking, pop-corn shaping, etc... Many of the recent stretch fabrics are made from blends, which are a mixture of elastic yarn or fiber and other synthetic or natural yarns or fibers. They have different qualities of stretch, according to which kind of yarn or fibers are blended and what percentage is blended. In this paper, only the synthetic types related to stretch were examined.

Here, polyamide and polyester, among the synthetic fiber group, will be briefly described because they are fibers related mainly to stretch fabric or major blended fibers with elastic. Microfiber, a new synthetic fiber, will be included, to illustrate a very finely sheered stretch fabric. Elastane, rubber, Neoprene, Lycra and Latex, all of which have the quality of stretch, will be examined.

Polyamide, developed by Du Pont in 1938, was the first successful synthetic fiber. It is a very strong, durable fiber, and "resists wear and tear."¹⁸⁾ Polyamide is mixed very well with both synthetic and natural fibers and improves the performance of blended fabric(Figure 1). It has been used not only for hosiery, lingerie, clothing and interior textiles, but also for tents and

parachutes.



Figure 1. Stretch Polyamide Textile, Koji Hamai, Mar.1995 Techno Textiles, p.126.

Polyester was invented by J.R. Whinfield and J.T. Dickson in the 1940s and was first called Terylene by Imperial Chemical Industries(ICI).¹⁹⁾ Polyester is also lightweight, durable, and strong, even when wet. It has a smooth drapery quality, which creates the contemporary look and feel, and is naturally elastic, resilient, crease-resistant, and moth-resistant. Polyester is also wonderfully blended with other fibers or coated(Figure 2). Polyester fabric is easy care, quick drying and



Figure 2. Plastic-coated polyester Dress, Vivienne Westwood, 1988 The New Textiles

18) Sarah E. Braddock and Marie O'Mahony, op., cit., pp.13-14.

19) Ibid., p.13.

very soft, like human skin. The most recent interest in polyester focuses on microfilament fiber, which is thermoplastic. It would be expected to take permanent pleating and heat-molding.

Microfibers have been considered as wonderful synthetic yarns specifically engineered in the world's most advanced laboratories²⁰⁾ because of a wide range of aesthetics and revolutionary performance characteristics with versatile function. They are used mainly not only in woven textiles but also in knitted fabrics, which make the fabric lightweight, strong, soft and sheer with crease-resistance, machine washable and temperature and water-resistant, showing fluid qualities. Many of the most successful combinations of microfiber are blended with traditional fibers,²¹⁾ and they are very fine, comfortable and soft, like silk. The recent microfiber trend is to blend it with stretch yarns to create a body-conscious style that is one of the most popular looks today (Figure 3).



Figure 3. Microfiber Dresses, Feb 1999
 'NXY' Co., Catalogue for S/S 2000
 'Style & Industry' Fashion Show in NY

Since its introduction in 1965, stretch from elastane has remarkably increased its diverse qualities in technical textile production. Besides the main categories of stretch clothing, such as pantyhose, socks and knitted fabric, the revolution of elastane occurred for all types of textiles and moved rapidly into sportswear, children's wear, men's wear, and activewear like ski pants and swimwear, and at one time, "it was predicted that 90% of all apparel would have some stretch properties."²²⁾

The diffusion of stretch has been generalized in the world with its important quality in today's textile trends. Elastane especially became the common catalyst for bringing extra fit when the body's shape was emphasized, or for giving extra fluidity when draping was important, with lightweight, strong, soft, and comfortable fabric. The increasing demand of sophisticated stretch fabric has led the elastane manufacturers to research and seek novel technical solutions and its whole supply "has shared with the consumer the undoubted benefits of added value and excitement of novelty in style, form and functionality."²³⁾ In the past, the cost of ultra-fine elastanes of better quality was very high; but now modern technology innovation has developed a cost-effective product combining elastane with a rigid fiber.²⁴⁾

The more advanced 'flexible' stretching is where both natural and synthetic rubber come into their own. "Natural rubber comes from the

20) Sarah E. Braddock and Marie O'Mahony, op., cit., p.6.

21) Marilyn J. Horn and Lois M. Gure, op., cit., p.401.

22) Rosalie Salomon, op., cit., p.85.

23) Textile Horizons, Vol. 16, No. 1, op., cit., p.18.

24) Ibid., p.18.

tree *Hevea Brasiliensis*, but synthetic rubber is now more commonly used." Synthetic rubber can be blended with a variety of other materials to create new aesthetic, texture and performance of fabric(Figure 4).



Figure 4. Pearlized Rubber Dress, Abe Hamilton, 1996
International Textiles, No.763, p.74.

Neoprene is combined with rubber and knitted synthetics, and provide unusual fabrics for wet-suits and other sportswear. The warmth and softness of stretch knit makes fabrics that are more ideal for wearing and that feel better on the body.

Latex is a blended synthetic of viscose liquid and rubber particles. The result is fabric that can be molded into many configurations. The use of Latex and Neoprene provide a novel twist to tailoring and corsetry and offers a glimpse of possible future fashion²⁶⁾(Figure 5).

Lycra is a fiber made from synthetic rubber and considered as one of the most successful achievements in the development of textile tech-



Figure 5 a. Pink "Scuba" Neoprene Knit Dress,
Donna Karan, 1994, FIT Museum
b. Transparent Latex as a Second Skin
Stephen Fuller, F/W 1995/96, Techno Textiles

nology. Many stretch fabrics today contain Lycra and other natural elastic yarns. Lycra has been extensively developed for sportswear, underwear, leisurewear and activewear, since its first invention by Du Pont in the 1960s for lingerie. Lycra has an excellent stretch quality and combines well with all types of fibers, both natural and synthetic, making it lightweight, strong, porous, quick-drying and crease-resistant.

Lycra has given ordinary clothing the qualities of mobility, functionality and comfort with urban fitness, and it has presented an easy solution to problems of industrial tailoring²⁷⁾:for instance, chiffon blended Lycra stretch no longer requiring ironing(Figure 6). At the same time, the stretching has changed garment construction, eliminating the need for the opening, the dart, and seams, saving labor and lowering the price. More and more designers have experienced the benefits

25) Sarah E. Braddock and Marie O'mahony, op., cit., p.24.

26) International Textiles, No. 754, June 1994, op., cit., p.78.

27) Chloë Colchester, op., cit., p.24.

and beauty of Lycra, including its easy handling and soft, comfortable appearance and its remarkably successful performance. Lycra today, influenced by stretch power, has shown in unstructured or loosely tailored garments for both women and men with appealing new lifestyle concepts. Even for more formal suits, the fabrics with a small percentage of Lycra present give to a garment the important stretch aesthetic.



Figure 6. Lycra and Chiffon Mix,
Georgina Godley, 1990 *The New Textiles*

For knitwear, the main manufacturers such as Du Pont and Wykes have researched a 'wool stretch.'²⁸⁾ which is a blend of wool and Lycra. It is an example of exploiting advantages of both fibers of knitted and woven constructions, adding stretch qualities to both the warp and weft. There are many different kinds of blends of them, such as wool and cashmere lightened with a touch of Lycra. These technically wool fabrics with elasticity and tensile strength have been improved by advanced technology, combining unique resilience, performance and tailorability with

superb drape and soft-handling qualities. People now wear the tailored suit that stretches with pure wools, which means that it doesn't crease and it has long-lasting properties.

Tactel, by Du Pont, is another synthetic possessing the best qualities in recent blends, often with microfiber. It keeps the body warm through its composition of microscopic polyester fiber and includes body-shaping fabric quality, which combines lightness with stretch.²⁹⁾ It offers many opportunities for much softer and more comfortable fabrics with different aesthetics, showing better performance qualities than ever before (Figure 7). Tactel micro achieved the biggest impact, resulting in delicate, fine-touch products with slinky appearance and weightless feel. Tactel continues to increase in popularity with modern consumers who demand excitement and innovation in fabric. It is sure that the Tactel value of a highly fluid and sensuous touch has



Figure 7. Tactel and Lycra Blend,
M & S Slip, 1994, *Collezioni*, No.52

28) *Textile Horizons*, Vol

29) *International Textiles*, No. 771, March 1996, op., cit.

inspired the message of the futuristic³⁰⁾ with the feeling of freedom and function.

Stretch fabrics, from about the middle of the '90s, have shown a pearized transparent layer that skins across the body. It has been usually embedded in rubber, latex, or sequins. More recent development has added a glittering lustre, to which stretch fabrics included a shiny or metallic surface by adding metallic yarns or finishing with metallic coating effects. Vogue (Figure 8) in July 1994, described that "Nineties rocket girls leave the launch pad in the shiny and sleek-in second skins of rippling lame and liquid Lycra. The future looks perfect..."³¹⁾ This sparkling look with stretch quality gives a new value about artificials of '90s' technology and substance to the future vision of both artist and



Figure 8. PVC and Metallic Lycra, 1994
Vogue: British, No.9, Vol.160, p.79.

scientist.³²⁾ It is noteworthy that of great emphasis in designer collections for 1999 and 2000 is the lightweight sheer metallic stretch fabric, symbolizing the future look.

Finally, it is predicted that the stretch approach with any different kind of yarn or fiber or finishing treatment will be continually developed to react to new lifestyles and to inspire the new aesthetics, which involve flexibility, mobility and variety.³³⁾

IV. Fashion Designs and Designers

Fashion designers, as we move toward the next century, have realized that the future of fashion centers on fiber technology³⁴⁾ and recognize that the selection of the right fabrics for their collection is very important. Many fashion designers already turned to new technical materials in the early '90s, and in recent times, most designers have their own textile design team or textile company and designer specifically joined with them who make their unique fabrics by their own theme.³⁵⁾

Especially the innovative products and the use of synthetic stretch fabrics that have blended the natural and synthetic fibers with different finishing effects have presented the wonderful performance of fashion designs, offering many opportunities for modern aesthetics. This aspect

30) International Textiles, No. 773, May 1996, op., cit., p.50.

31) Vogue: British, No. 9, Vol. 160, July 1994, p.79.

32) —, In Black & White: Dress from the 1920s to Today, Wexner Center for the Arts, The Ohio S. University, 1992, p.49.

33) International Textiles, No. 788, Nov. 1997, op., cit., p.66.

34) Sarah E. Braddock and Marie O'mahony, op., cit., p.100.

35) Ibid., pp.105-115.

has occurred in all types of fashion categories of not only lingerie and activewear, but also casual wear and eveningwear, and in all kinds of design levels from couture collections to general ready-to-wear markets. For instance, S/S for '99 in the Milan collection emphasized that "nylon, neoprene and microfibre are deal any time of day,"³⁶⁾ and lots of designs from S/S 2000 ?Style & Industry?, one of the general fashion shows in New York, have shown stretch styles(Figure 9). The preference for stretch fabric has been a priority in the contemporary collections of the worldwide fashion designers. Here, the representative designers with their designs will be examined.

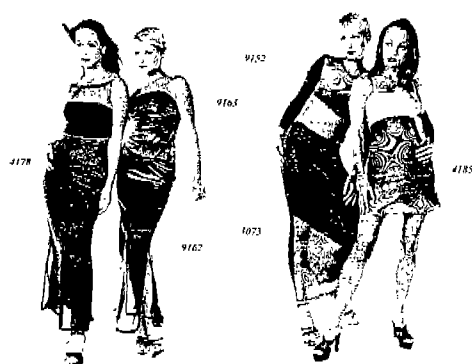


Figure 9. From 'NXY' Company Catalogue for S/S 2000
"Style & Industry, Fashion Show in New York

Donna Karan, one of the most famous American designers, believed that "technology is the future of fashion"³⁷⁾ and has preferred new synthetics. A textile design team has created many unique and unusual technical fabrics including Lycra and cashmere mixture or

shimmering metallic. Donna Karan has often used stretch properties for emphasizing the flexible of design³⁸⁾ which made the woman's body alive with sensuality and created flattering silhouettes, including reflectives and high-performance (Figure 10). One of her dress designs (Figure 5a) shows a neon pink "scuba" neoprene knit.



Figure 10. a. Donna Karan, 1997, Collezioni: Donna, No.59
b. Metallic Dress, Donna Karan
Fashion Show, S/S 1999, p.385.

Tierry Muglar has impressively shown the unlimited possibility of design using stretch "flexibility" with mainly rubberized sheen(Figure 11). Design focusing on materials like rubber, molded plastic and vinyl is called 'Industrial Revolution' by Women's Wear Daily: "The industrial materials one reserved for...scuba, gear, and surgical gloves have now made it to the runways."³⁹⁾ He created simple form and structure and added defined shape to the body expressing the image of techno-city⁴⁰⁾ or a robot of the New

36) Collezioni:Pret-A-Porter, Spring & Summer 1999, No. 67, Nov. 1998

37) Sarah E. Braddock and Marie O'mahony, op., cit., p.100.

38) , Donna Karan, The Vendome Press, New York, 1998, p. Forward.

39) Valerie Steele, Fifty Years of Fashion, Yale University Press, New Haven, 1997, p.158.

40) Kennedy Fraser, The Fashionable Mind: Reflections on Fashion, Nonpareil Book, Boston, 1982, pp.304-305.



Figure 11. Thierry Mugler Designs

- a. Stretch Sequin Body Suit
Thierry Mugler, p.11.
- b. Rubberized Sheen Dress, 1997
Collezioni: Donna, No. 57.
- c. Stretch Vinyl Body Suit,
Thierry Mugler, p.139.

World. As he said in an interview that, "Fashion will change dramatically in the coming years. One will find it less and less important to be 'fashionable'... Fashion will be more human, closer to the needs of the people in terms of their well being and well feeling, not well showing"⁴¹⁾, the point of his designs were the overwhelming body consciousness as a second skin with "less" image.

Issey Miyake, one of the most creative designers with dramatic materials, has continually showed all new fabrics with new technology since his great "pleats" innovation in 1992. He designed simple dresses with sensuality of the fabric

accomplishing its femininity with his imagination. Issey Miyake considered "the body as a reed and a neutral flexible thing"⁴²⁾ and designed the body conscious style for the future, which naturally required the stretch quality of fabric and achieved a garment that is more comfortable, and easier, giving above all a sense of freedom(Figure 12). His graphic style of designs has always presented the visual aspect to the wearer with unique feel, and "the fabrics themselves are sparkly modern, keenly pointed toward the next century."⁴³⁾ His attitude for the future would be strongly influenced by the manipulation of new fabric.

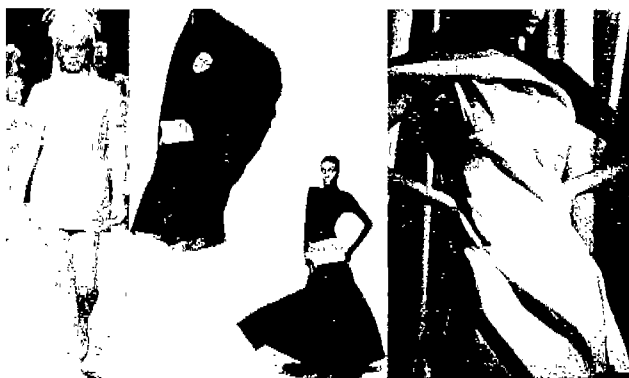


Figure 12. Issey Miyake Designs

- a. Stretch Crochet Body Suit
worn Underneath
Techno Textiles, p.115.
- b. Blend of Knit and Lycra
Issey Miyake: East meets West
p.138.
- c. Plastic-Coated Polyester Dress
with Rubber Stretch,
Issey Miyake, p.65.

41) Lucille Khornak, Fashion 2001, A Studio Book: The Viking Press, New York, 1992, p.7.

42) Marie-André Jouve, Issey Miyake, Universe Publishing, New York, 1997, p.16.

43) Ibid., p.3.

Hanae Mori has also been considering the blended fabrics of natural fabric and synthetic fiber. She already said that the next century would be more simple and practical than today, and light and stretch fabric would be described.⁴⁴⁾ Stretch blends of Latex and lace with transparency, for example, have shown in her design collection during the last few years(Figure 13).



Figure 13. a. Hanae Mori, 1998, Collezioni, Pret-A-Porter, No.65.

b. Stretch Lace and Velvet Dress,
Hanae Mori, 1997, Collezioni, No.60

Even **Giorgio Armany**, famed for his fine, clean line with wool cashmeres, has recently often included synthetic fabrics. His recent collections have often shown the blended knit with stretching(Figure 14). Specifically, this kind of transparent knit became even more attractive, slipping over the body. It seemed to be a reflection of his philosophy that fashion in the future would be free from any restrictions.⁴⁵⁾ The

transparent sheer look with stretched fluid materials made the skin color to become visible and body shape was gently revealed. This visible inside aspect is a part of modern aesthetics of contemporary art, including architecture.⁴⁶⁾



Figure 14. Blended Knit with Stretch,
Giorgio Armany, Collezioni, No.61

Geoffrey Beene has also enjoyed using inventive and unusual synthetic fabrics, especially stretch, and creating cleanly cut lines that reveal the body.⁴⁷⁾ His concern with designing is always about pleasure for 'sheer'.⁴⁸⁾ His sophisticated evening dresses of(Figure 15) show that the body consciousness with a revealing and sheer look is achieved by the delicate cutting with stretch fabric.

Gianni Versace, one of the most ingenious designers, also liked to use advanced materials, including synthetic stretch fabrics, which were

44) Lucille Khornak, op., cit., p.39.

45) Ibid., p.63.

46) Mark Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture*, The MIT Press, Massachusetts, 1995, p.25.

47) Dilys E. Blum and H. Kristina Haugland, *Best Dressed*, Philadelphia Museum of Art, 1997, p.72.

48) Brenda Cullerton, *Geoffrey Beene*, Harry N. Abrams, Inc., Publishers, 1995, p.106.



Figure 15. Delicate Cuttings with Stretch Fabrics, Geoffrey Beene, a/ b/ c. Geoffrey Beene.

surprisingly diverse. His favorite stretches were the blends, such as Devoré⁴⁹⁾ velvet, latex and lace, sequins and chiffon, nylon jersey, tulle, supplemental meshes, and stretch vinyl, which all included the flexible quality. These fabrics have achieved his design concept of super sex image.⁵⁰⁾ He has continually tried to show off the woman's body without any false modesty, using his unique fabrics sometimes as a transparent look or sometimes as body-tight styles (Figure 16). Transparent looks, especially, created another modern

aesthetic of design detail which was layering. This layering style using sheer stretch fabrics also has been seen often in most other designers' collections; and it is the right aspect to collaborate with the transparent aesthetic of today. Gianni Versace is estimated as a creator of "a dialogue between the resources of the past and the possibilities of the future."⁵¹⁾ He actually took traditional materials of fashion and pushed them toward his unlimited recreation.

Designs by **Krizia (Mariuccia Mandelli)** have



Figure 16. Gianni Versace Designs

- a. Stretch Vinyl Dress, 1994-95, Gianni Versace, No.27.
- b. Transparent Look by Stretch, 1996, Collezzionni, No. 51
- c. Nylon Stretch Jersey Body Suit, S/S 1994, Gianni Versace, p.144.

49) Sarah E. Braddock and Marie O'mahony, op., cit., p.176.

A technique by which a fabric is eaten away by chemicals, producing a fragile fabric with both semi-transparent and opaque areas

50) Richard Martin, Gianni Versace, The Metropolitan Museum of Art, New York, 1997, p.13.-305

51) Anna Gramiccia, Versace Signatures, Leonardo de Luca Editori, Rome, 1992, p.192.

always talked about "free." She has enjoyed using stretch fabric because, she thought, stretch gave women the freedom to choose from a range of directions.⁵²⁾ Her collections for 2000 showed the simple slip dresses made from sequin stretch with a fluid and free look (Figure 17). She predicted in an interview that "for the year 2001, simplicity, comfort, and functionality in styles (elastic for complete freedom of movement)..."⁵³⁾ Krizia sportswear has come into great demand worldwide with its flexible quality.



Figure 17. Sequin Stretch Dresses, Krizia,
a/b. Fashion Show, S/S 1999, p.385.

Some designers have predicted the fashion of the future, based on an architectural design concept, which usually emphasized the materials. **Paco Rabanne**, who already used advanced materials like plastic and aluminum in the 1960s, has continually used new materials like shell pearl, freely emitting metallic light. He also emphasized

the flexible materials of stretching with his vision of freedom for future fashion. He explained that, "...the clothes of the future will be premolded, bound, or welded? no longer will they be sewn. Sewing is a bondage... the clothes of tomorrow will be free..."⁵⁴⁾ His designs (Figure 18) showed stretch silver metallic fabrics which were involved in the futuristic images. Especially, the blue body suit of one piece perfectly showed the achievement of his fashion philosophy that "clothing must be universal, not created for a specific woman."⁵⁵⁾ Actually, the body-conscious suit style has been in fashion worldwide. It seemed that his advanced designs with challenging materials have been arranged into contemporary fashion.



Figure 18. a. Metallic Stretch Body Suit
Paco Rabanne, Fashion 2001, p.26
b. Metallic Dress, Paco Rabanne,
1999 Collezioni: Haute Couture, No. 69

Gianfranco Frerre, trained as an architect, thought that the fashion of the new era depended

52) Lucille Khornak, *op. cit.*, p.39.

53) *Ibid.*, p.39.

54) *Ibid.*, p.7.

55) *Ibid.*, p.8.

on simulating new materials with innovative technology, and the fabrics would be durable. He believed that comfort would be first and it would be accomplished by flexible material. He said in an interview that "...the line of clothing will be straight and geometric, and the body will be narrower, and that comfort will be one of the essential factors in determining future trends."⁵⁶⁾ His recent designs have shown very comfortable and functional styles using stretch sheer fabric (Figure 19). These transparent looks were also shown in the other designs of Giorgio Armani, Geoffrey Beane and Gianni Versace, and it was one of the extreme expressions of the contemporary aesthetic. He considered these designs by stretching as an architecture which was supported



Figure 19. Gianfranco Ferré Designs
 a. Transparent Looks, 1997
 Collezione: Pret-A-Porter, No.61.
 b. Body Suit by Sheer Metallic, 1998
 Collizioni, No.65

by tensile structure in textile architecture.⁵⁷⁾ The simple and transparent dresses are just fine today, day and night.

André Courrèges, a designer who has continually pursued architectural futuristic beauty, preferred to choose stretch fabric for the future fashion which would be body tights in one piece as a second skin in all its purity, allowing it to move in total freedom. He thought that future life would be explained "by functional needs, an evolution of customs and a new contribution of fabrics and their use."⁵⁸⁾ He continually explained that "Warm, yet ventilated, stretchable in all directions, adaptable to all body forms and to all movement, Mesh (knitted fabric) allows one to live casually and acts as a 'second skin.'"⁵⁹⁾ His designs (Figure 20) presented body tights made of stretch fabric, and one of them showed the tensile of stretching like the tensile structure of archi-



Figure 20. a. Ribbed Knit Body Suit worn Underneath,
 André Courrèges, Fashion 2001, p.31.
 b. Tensile Structure of Stretching,
 André Courrèges, Mode & Art, p.19.

56) Lucille Khornak, op., cit., p.16.

57) ———, *Intimate Architecture: Contemporary Clothing Design*, Hayden Gallery, Massachusetts Institute of Technology, 1982.

58) Lucille Khornak, op., cit., p.16.

59) Ibid., p.16.

ture.⁶⁰⁾ With this design, he emphasized the minimalism with evolution of lingerie feminine.⁶¹⁾

Many of the other fashion designers as well as those designers mentioned above have searched, predicted and presented their designs by imagining the future trend for inspiration. A pronounced emphasis of most of them has been on the lines for body consciousness. It has become the ultimate in modern clothing,⁶²⁾ and stretch fabrics have perfectly served that with womanly curves of skin-tight shape. Another generalized feature of fashion detail by stretch fabric was that most of them fastened with characteristic zips which were naturally preferred for stretchy fabrics.

V. Aesthetics

Aesthetics always supremely reflects the significant impact of the culture of the times. The aesthetics of 1990s' fashion has been concerned with the spiritual state of expecting the next millennium as well as technical advances: the most important concept is comfort, freedom, purity and simplicity.⁶³⁾ Technology has led fashion to be truly modern.⁶⁴⁾ Technical textiles have increasingly been incorporated into second skin dresses and other innovative fashion looks for the new era, and the stretch quality of

the fabric has been most effective in achieving the modern concept of aesthetic.

Comfortable & Functional -The unique aesthetic of stretch was mentioned by Interfiliere Conference of Fabric Laboratory in 1996, supported by major fibre producers, Du Pont, Bayer and Nylstar. It presented four key concepts with other technical textiles and technology: comfort, beauty, health and protection of self and the environment.⁶⁵⁾ Those aesthetic concepts satisfy today's customer's demands and manufacturer's needs. Especially 'comfort' has finally become a fashionable commodity⁶⁶⁾ and the comfortable beauty of stretch fabric, as examined in fashion designs above, has led designers to bring more relaxed and more free image of look with modern function. The demands for a much softer, stronger and lighter fabric in one's garment have made the creation of more innovative fabric such as Tactel; and when Tactel micro combines with Lycra, a superior ultra-fine garment is offered to the consumer, supporting a much more comfortable and friendly feeling with beauty and function.

Flexibility, Body Consciousness & Uniformity -The key to the new advances in technology is the fineness of the fiber which makes it flexible.⁶⁷⁾ The flexible image with inflatable and disposable structure has been completely accomplished by

60) Horst Berger, *Light Structures/ Structure of Light*, Birkhauser, Basel, 1996, p.35.

61) —, *Mode & Art 1960-1990*, Societe des Expositions du Palais des Beaux-Arts, 1995, p.24.

62) Kate Mulvey and Melissa Richards, *Decades of Beauty*, Reed Consumer Books Limited, New York, 1998 p.185.

63) Miriam Moss, op., cit., p.28.

64) Valerie Steele, op., cit., p.161.

65) *International Textiles*, No. 771, Mar. 1996, op., cit.

66) Kate Mulvey and Melissa Richards, op., cit., p.185.

67) Sarah E. Braddock and Marie O'mahony, op., cit., pp.24-25.

stretching.⁶⁸⁾ Stretch flexibility, either adhering to the body or moving fluidly around the body, has always contributed to body consciousness with freedom of movement. Especially, the body-tight style has been at the heart of contemporary fashion from the beginning of the 1980s, and its aspect has shown at most of the designer collections during the 1990s, as an almost same look, a body suit style. This uniformity of body suit has had a significant impact on modern fashion,⁶⁹⁾ and stretch fabric has been enough material to emphasize human body lines with its own function. In this view, it could be said that the uniformity aspect⁷⁰⁾ of contemporary designs has come from fabric quality, particularly the stretching. Kawakubo, a Japanese fashion designer, said about this, "The machines that make fabric are more and more making uniform. ..."⁷¹⁾ Lucille Khornak, in the book *Fashion 2001?*, also described that "we will be forced to wear uniforms..."⁷²⁾ Actually, as observed in the fashion designers above, most designers have presented body contour styles, which were almost the same looks using different stretch fabrics.

Healthy - Extremely emphasized body consciousness has made people change the concept of the ideal body, which is increasingly muscular as well as thin and young.⁷³⁾ Body fitness styles were

originally inspired by sports looks like aerobics, running and jogging suits and leggings⁷⁴⁾ which were made from technically strong stretch fabric such as waterproof nylon and thermal fleece. Both men and women today have tended to overwhelmingly prefer to wear muscular body suits of stretch fabric, and this aspect has provoked the reaction of the 'healthy' new modern image. The new 'healthy' aesthetic, with its emphasis on strength, including the strong image of stretch fabrics, became the new cultural value and continued to be fascinated with technological innovation.

Futuristic & Universal - Stretch fabric's performance of a body-conscious style with free comfort was futuristic and universal. Vestito Antineutrato, a men's wear designer, insisted that "...futuristic clothing should be aggressive, augmenting the flexibility of the body."⁷⁵⁾ The Collezioni for A/W 98 also said that "The future is already here. Traditional fabrics make way for innovative ones...Flesh-toned latex is the most popular fabric among the designers: it's supple, comfortable..."⁷⁶⁾ Actually, a body-conscious style using stretch fabric has recently been worn in all over the world, and many designers have focused out the stretch body suit as a second skin in prediction of future fashion (Figures 11, 12, 16,

68) Charles Jencks, *Architecture 2000*, Praeger Publishers, New York, 1971, p.88

69) Valerie Steele, op., cit., p.121.

70) Deborah Fausch, *Architecture in Fashion*, Princeton Architecture Press, 1994, p.222.

71) Valerie Steele, op., cit., p.128.

72) Lucille Khornak, op., cit., p.6.

73) Valerie Steele, op. cit., p.124.

74) Ibid., p.124.

75) *International Textiles*, No. 750, Feb. 1994, op., cit., p.78.

76) *Collezioni: Donna, Pret-A-Porter S/S*, No. 62, Dec 97/Jan 98, p.148.

18, 19b, 20). In addition, (Figure 21) Natasha, an American designer, in her prediction of future fashion, showed the extremely accentuated stretch bodyline with metallic transparency. She has been excited with stretch fabrics like stretch vinyl and believed that the stretch which plays on the body curves was the vision for the future, with blue color, expressing the feeling of the space creature.⁷⁷⁾ The added metallic quality on stretch fabric, either by metallic yarn or coating finish, enhanced the futuristic image, with highly tactile surface techniques. The strong message of the futuristic on the metallic surface should require the simplest design line, and the body contours could be the final and the best of the simplest one.

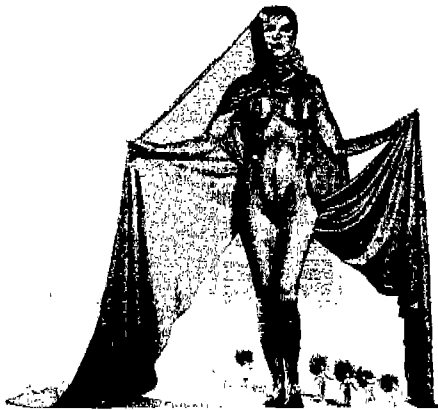


Figure 21. Shimmering Metallic Body Suit
Natasha, Fashion 2001, p.31.

Transparency & Modern Purity -The transparent look, with lightweight stretch fabric that covered the skin, has provided the special optical effects with more modern concerns of aesthetics⁷⁸⁾

(Figure 5b, 9, 10a, 11b, 13a, 14, 15, 16b, 19). This advanced aesthetic has been simultaneously explored by textile designers and researchers and beautifully expressed in contemporary designs by sheer fabrics, including fine stretches.⁷⁹⁾ Khornak explained "...because of this newly visualized energy, the transparent will become apparent." Konrad Wachsman also noted about general contemporary designs that "I could imagine that there will no longer be anything but transparent. . .The new structure will be characterized by surfaces without weight. Lightness will more than ever dominate."⁸⁰⁾ Lighter, stronger sheer stretch fabrics, such as shimmering gauze, organza and nylon mixture and embroidered hosiery mesh have finally achieved the modern image of a transparent look with new vision and sensuality, which involves the purity of cool, crisp and plain. Modern purity has usually shown itself in the color white, but at the same time the transparent effect shows purity through flesh tones, revealed primarily through the use of sheer stretch fabrics.

Layering & Modern Femininity - The sensuality of the transparent effect by sheer fabrics has created another modern design aesthetic which is layering fashion detail. This ethereal layering styles working in collaboration with lightweight stretch, mainly by voiles, fine knits, rubber and Lycra, were fitted to the body contours for the contemporary look (Figures 9, 11b, 16b). The layering aesthetic has been seen in most fashion designers collections. The designs

77) Lucille Khornak, op., cit., p.16.

78) Chloe Colchester, op. cit., p.38.

79) Lucille Khornak, op., cit., p.6.

80) _____, *Intimate Architecture; Contemporary Clothing*, op., cit., p.74.

(Figure 22) enhanced their creations with crystal, metallic stretch fabrics for layering. It seemed to be a natural aspect that too finely transparent fabric pieces required the addition of another fabric or garment to put it over. The successful performance of the layering aesthetic from a sober, sophisticated stretch fabric was interpreted as modern femininity⁸¹⁾ with innovative elegance, which articulated the modernity that contemporary fashion must capture.



Figure 22. Layered Looks, 1997

Collezioni: Donna, No. 62.

Simplicity - The tasteful layering by soft sheer fabric has been accomplished by a simple design line. The strong power of simplicity of contemporary fashion design should result from the prevalence of technical stretch fabric. This simplified beauty could be described by the general principle of design aesthetic that, "When

the material is interesting, only one simple artistic insight or vision is needed... Simplified beauty, its expression and comprehension, is the result of profound and long maturation."⁸²⁾ In this, it seemed that the stretch quality required only the simplicity that had an 'easy' and 'free' feeling⁸³⁾ because the stretching itself had an unlimited possibility of flexibility.

"Less" & Minimalism-The quality of stretch fabric has brought the modern "less" aesthetic⁸⁴⁾ and it changed structure: the body shape became narrower: the sizes became smaller: the dart, seam and opening became less or disappeared. In addition, stretch fabric is recently less weighty, lighter, and lighter yet stronger. This aspect has presented in almost all modern products with less visibility, including hi-tech items and other design fields, and it was totally due to the technology development. Bill Tice's prediction for the future of fashion was very interesting: "In the future, the cost of clothing may be lower, owing to the advancement of technology. We will not need seamstresses: garments will be fused together. As technology grows, we will move with it."⁸⁵⁾ Jean-Paul Gaiter, who believed that the most dramatic change would be the development of new fabrics like rubber latex, also mentioned that, "the sewing machine will no longer exist... seamless and without opening, the 'second skin' body suit will serve as a basic uniform."⁸⁶⁾ Indeed,

81) Ingeborg M. O'Sickey, *Barbie Magazine and the Aesthetic*, On Fashion, Rutgers University Press, New Jersey, 1994, p.24.

82) Tapro Priainen, op., cit., p.74.

83) Valerie Steele, op., cit., p.133.

84) Deborah Frausch, op., cit., p.368.

85) Lucille Khornak, op., cit., p.8.

86) Ibid., p.62.

the minimized body consciousness style without supporting any details has recently been worn by both men and women(Figure 23). The "less" aesthetic is finally interpreted in today's minimalism.⁸⁷⁾ The extremely simplified minimal visual line achieved the maximal impact of the theme with perfect function and beauty and still comfort, and its accomplishment was made by a dramatically exploited stretch fabric. The metallic stretch fabrics themselves(Figure 23) were enough to show up the futuristic imagine of design concept, with nothing.



Figure 23. a. Metallic Stretch Vest, 1996
Mark Eisen, *Techno Textiles*, p. 91.
b. Metallic Stretch Dress,
Todd Oldham 1997, Todd Oldham

VI. Conclusion And Vision Of The Future

As examined above, fashion modernity centers

on innovative fabric effect, and stretch fabric is the ultimate in modern fashion.

Aesthetic values in contemporary fashion have especially concerned themselves with stretch aesthetics, which has expressed not only cultural value but also technical advances. The modern aesthetics of stretch fabric have revolutionized fashion design and inspired designers to have more advanced design views:and many designers have preferred stretch fabric for its modern design beauty and for its future image of fashion.

The innovative stretches of today, with better qualities of lightness, softness and strength, have become the common fabric for all types of fashion categories, to bring extra fit or to give extra flexible fluidity to the body line, as a second skin. At the same time, the undoubted benefits of more advanced stretch qualities by new technology have made ordinary clothing functional and industrial tailoring comfortable in an easy solution to some problems with machine-washable, quick-drying fabrics that no longer requires ironing. The performance of stretch fabric, with easy handling and inherent attractiveness, has created the advanced image of looks in contemporary fashion and has been most effective in achieving the modern concept of aesthetics:comfort, function, flexibility, uniformity, healthiness, modern purity, modern femininity, simplicity and minimalism, which are totally universal and futuristic with "easy" and "free" feelings.

The goal is still quality. The stretch aesthetic

87) ———, *Art of this century: The Guggenheim Museum and Its Collection*, Guggenheim Museum Publications, New York, 1993.

88) Subhash Anand, *The Quality of Life in the Next Millennium: Textile Horizons*, Vol. 18, No. 2, June 1998, p.5.

89) Alex Pentland, *W2000: Redefining Style*, W, Fairchild, New York, Mar. 1999.

ends up caught somewhere between the demands of beauty of fashion and of realistic modern function life, and it is successfully negotiated by modern technology.

The key to the features in contemporary fashion lies in textiles and techniques. Then, what is next? Future fashion will be continually influenced by more advanced technology for interest and inspiration in a new environment. It will be more often dependent upon technical textiles than ever before, to interpret the changing fashion and consumer requirements.⁸⁸⁾ Everyone will live one life through the globalization in the world, and the innovative fabrics will encourage more intimate interaction.⁸⁹⁾ There is no doubt that the technical textiles, for protection of both human life and the environment, can be expected to be an integral part of future life and better fashion.

Stretch fabric, specifically for complete freedom of future life, will reach fashion maturity and have a distinct identity of preparing for the new environment, bringing a new aesthetic in the humanizing of high technology and its advantages. Body temperature-controlled fabric blended with Lycra and anti-bacterial fabric blended with Tactel, for instance, could possibly be produced and may enable the adjustment of a balance between fabric performance and aesthetics. With this view in mind, fashion designs in the future could be suggested as environmentally friendly designs, combining the practical with the conceptual in an aesthetic value, that will be more comfortable and more functional, with protective safety materials to fit the new environment.

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