

Renata Salerno-Kochan

Cracow University of Economics  
Department of Industrial Commodity Science  
ul. Sienkiewicza 4, 30-033 Kraków, Poland  
E-mail: salernor@uek.krakow.pl

# Consumer Approach to the Quality and Safety of Textile Products. Part I. Quality of Textile Products from the Point of View of Consumers

## Abstract

*This article analyses the issue of consumer perception of the quality of textile products. The hierarchy of characteristics perceived to be related to the quality of clothes and the relationship between them was examined. The results of the inquiry and analysis of statistical descriptions showed that the aesthetic of a product, the quality of product finishing as well as safety of use and product healthiness have great importance for consumer perception of the quality of textile products. While for clothing products physiological comfort and convenience of use are the most important, for house textiles it is the durability and utility properties. Principal Component Analysis (PCA) method made it possible to establish relationships between parameters and to determine consumer models of textile product quality that consist of 5 principal components in relation to clothing products and 3 components in the case of house textiles. In accordance with the analysis, it was observed that, in general, consumers identify the quality of textile products with marketing and economic features, regardless of the kind and designation of textiles, although their role is not strong. Other factors are differentiated by product designation and consumer gender.*

**Key words:** quality structure, clothes, house textiles, consumer's perception.

and Parasuraram and others define quality as meeting or exceeding customer expectations. Deming underlined the subjective and commercial value of quality. He claims that satisfying customers is not sufficient to be in the "game" (competition)- delighting customers (exceeding customer expectations) is where the competitive advantage can be found [1].

Taking into account the currently applied quality definition according to Standard ISO 9000, the "degree to which a set of inherent characteristics fulfils requirements" [3], the consumer approach, however indirectly, is present, as well. By assuming that the quality of product is verified on the market, both consumer requirements should be fulfilled above all, and characteristics that in the consumers' opinion describe product quality should be known.

Considering the consumer approach to product quality, it should be remembered that their expectations, needs and wants are changeable as well as their product quality perception. Continuous development in many areas of human life influences individuals and their attitude towards product quality. The great advance of technology, chemistry and many other branches connected with producers battling for new markets cause various modifications, the creation of new products and product features, as well as new consumer wants. It is strongly visible in the textile industry, where there are many

innovations connected with applying new kinds of fibres, materials, finishes, electronic elements, technologies of production, etc. It should be added that along with positive changes related to technological and economic development, the aspirations of producers have led to unexpected results and could cause a conflict between consumer and producer expectations. To avoid such problems, it is necessary to follow the behavior of consumers, as well as recognise and analyse their expectations and requirements.

The aims of this paper are the following:

- presentation of survey results related to consumer perception of textile quality,
- to recognise the consumer structure of clothes and house textile quality with respect to the age and gender of the group in question,
- to analyse relationships between the parameters perceived to be responsible for textile product quality,
- to determine models of consumer quality for textile products.

Investigating this subject seems to be more justified due to the fact that the number of publications related to consumer behaviour towards textile purchasing and their approach to textile product quality is limited. Even, though these questions have been the consideration of some publications [e.g. 4 - 7], they did not take into account recent trends in consumer behaviour on the Polish market.

## ■ Introduction

It is obvious that the quality of a product is understood and defined in somewhat different ways. There is a variety of perspectives that can be taken into consideration while defining quality. According to Garvin, whose theory is the most popular, there are five approaches to defining quality: product-, manufacturing-, consumer-, cost- or transcendent based [1]. All of them are well-grounded and have many supporters; but the consumer perspective that comes closest to universality seems to be the most interesting and worthy of attention. It is usually underlined that customer expectations are often represented as dimensions of quality. Besides, this approach is reflected in the definitions of many experts. Juran, for example, defined quality as "fitness for use", Feigenbaum as "best for certain customer conditions", or that "quality is the customer's perception of what quality is, not what a company thinks it is" [2],

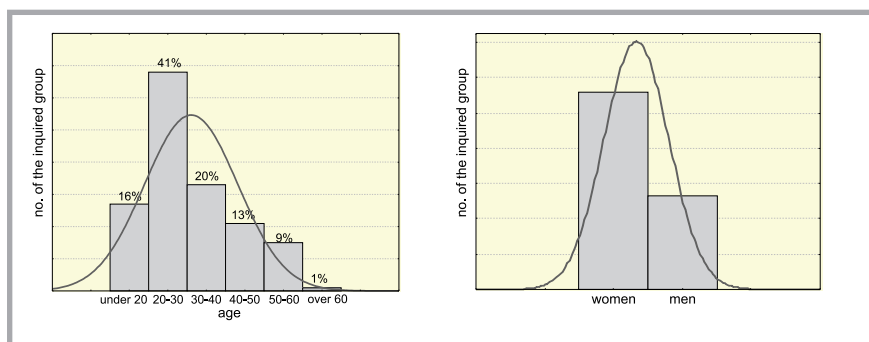
## Scope and methodology of the study

A survey related to consumer perception of the parameters defining the quality of textile products was performed in 2006. It was mainly carried out in Małopolska region (about 66%). 242 of respondents from 19 to 65 years of age took part in the poll. Women constituted the majority of those inquired (almost 68%). Men very often refused to participate in the survey, explaining that they were not specialists in this field. Furthermore, younger people (under 30) more willingly took part in the inquiry, so they also constituted a significant part (about 57%) of the respondents (**Figure 1**). By assuming that younger people and women are those groups of consumers that more often buy clothes than others (it is rather obvious), the structure of respondents obtained seems to be representative of the population enough to carry out the analysis to resolve the above-mentioned aims.

The subject-matter of this study was to recognize the role of the parameters responsible for the quality of clothing and house textile products from the consumer's point of view. The choice of house textiles as an object of the analysis arose due to the lack of studies related to the consumer structure for the quality of these products, the steady increase in consumer interest in them, and the large share they have in fiber production (approx. 27% of world fibre production is used for house textiles [8]). In the case of clothes, they belong to essential products of everyday use, so consumer perception of their quality is especially interesting.

The people participating in the research studies were asked to grade 17 characteristics perceived to be related to the quality of textile products by using the 7-level Likert scale [6, 9]. The characteristics proposed were chosen on the basis of commodity science and marketing literature, and they considered both the product features and attributes related to purchase motivations [5, 9 - 12].

Additionally, two characteristics: safety of use and product healthiness were examined to find out how consumers perceive them as features that constitute the quality of a product. More detailed findings on this issue will be presented in the second part of this article.



**Figure 1.** Structure of the surveyed group.

The characteristics used in the questionnaire referred to an individual feature or a set of them. The purpose of such an approach was to investigate which characteristics are better recognizable and understandable to respondents in relation to clothing and house textile quality.

## Data analysis methods

The data gathered by polling were processed by statistical analysis. In the first stage the main descriptive statistical parameters were determined: arithmetic mean, standard uncertainty (corresponding to standard deviation) and medians for the estimations obtained. These parameters were used to rank the characteristics under investigation according to their significance in the perception of the quality of clothing products. Special attention was paid to medians, which are the most appropriate indices from the measuring theory point of view. They indicate a medium value among the ordered response categories, i.e. the value above and below of which there is 50% of answers [13].

Internal relationships occurring within the data set obtained were examined by using Principal Component Analysis (PCA), which enables orthogonal segments of textile product quality to be determined. Before starting the factor analysis procedure, the justification for the PCA analysis was checked. For this reason a correlation matrix was built for variables under consideration, and all relations between them were investigated. It was assumed that empirical variables are correlated with each other when correlation coefficients are greater than 0.3, and each variable is highly correlated with another one. The number of principal components was determined from Kaiser criterion (eigenvalue  $\geq 1$ ). To enable new variables to be named, factor loadings were determined to express the

degree of factor saturation for a variable which corresponded to the correlation coefficient for an original variable with other factors for uncorrelated factors. Afterwards, varimax orthogonal rotation was carried out to minimise the number of variables necessary for explaining the given factor, thus simplifying the interpretation of factors [13, 14]. The computation was made by using a Statistica 7.1 software package

## Results and analysis

### Determining a hierarchy for the parameters of textile product quality

To improve the understanding of how customers perceive the quality of clothing and house textile products, a separate analysis was made for females and males as well as for people below and above 30 years of age. The consumer models of clothes and house textile quality created on the basis of the data obtained are shown in **Figures 2 & 3** (see page 10).

It was found that the means of analysed characteristics describing the quality of clothes was in the range of  $4.03 \div 6.28$  for the entire group under investigation,  $4.11 \div 6.48$  for females,  $3.67 \div 6.07$  for males,  $3.95 \div 6.31$  for people below 30 years of age, and  $4.17 \div 6.23$  for people above the age of 30.

As is shown in **Figure 2** (see page 10), the main approach of consumers to attributes related to the quality of clothes is similar for all the populations. Those questioned indicated that the aesthetic appearance of the product, the physiological comfort and convenience of use (ergonomics) of clothing products as well as the quality of finishing are the most important features, in general. The aesthetic appearance of a product plays an important role primarily for women and people below 30 years old, whereas men consider

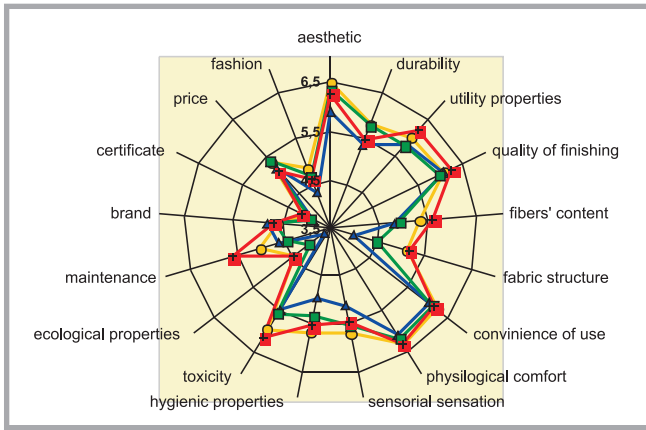


Figure 2. Consumer model of clothing quality.

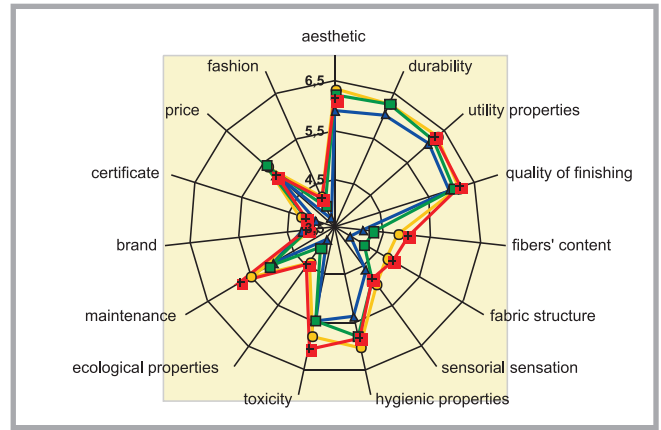


Figure 3. Consumer model of house textile quality.

this feature as the least important one in comparison with the others. Physiological comfort and convenience of use are important mainly for older consumers, usually men, whereas toxicity was graded highly by respondents over 30 years old, particularly women. On the basis of the data gathered, one can conclude that marketing characteristics (product brand, fashion, certificates) and ecological properties (e.g. environmental impact, waste disposal) play a considerably smaller role for all the populations investigated. These observations seem to be a little surprising both in relation to marketing characteristics, primarily in the case of brand estimations by younger people (4.6), who are rather perceived as a group that are interested in this area (the majority of advertisements related to clothes are directed at young consumers) and ecological properties (3.67 ÷ 4.46), or the presence of a certificate testifying the good quality or ecology of the product (3.88 ÷ 4.17).

The relatively weak estimations of the last two characteristics (especially by men and younger people), in comparison with others, seem to be a very alarming observation and may testify that there is a necessity to educate consumers about these issues.

In the case of house textiles, the range of arithmetic means for the parameters analysed was similar to that describing the quality of clothes. It was approximated within 4.02 ÷ 6.21 for all the population. However, there are some important differences in the grading of particular parameters related to the quality of clothing and house textile products. As can be gathered from the data presented in Figure 3 regarding quality perception of house textiles, consumers attach special significance to utility properties (responsible for fulfilling the functions they are designed for) and product durability, i.e., parameters which were not so

important for clothes (Figure 2). On the other hand, consumers also attach great importance to aesthetic appearance, toxicity (consumers over 30) and quality of finishing, whereas, in most cases, women graded these parameters more highly in comparison to the other populations analysed. In the opinion of consumers, fashion, product brand (estimated higher in the case of clothing products) and the presence of a quality or other certificate of environmental impact have the least influence on the quality of house textiles, which were graded very low in relation to clothing products.

As the results showed, the safety of use and healthiness of a product are very important constituents of textile product quality, both in relation to clothes and to house textiles. These features have a stronger meaning than toxicity for example, and they were more highly estimated. It should also be added that in the case

Table 1. Structure of clothing product parameters related to quality according to the values of medians for grades made by respondents of different gender.

The level Of importance	Quality characteristics according to			
	Respondents from 19 to 30 years of age	Respondents over 30 years of age	Male	Female
Level 1. The most important features ( $\bar{X} = 7$ )	physiological comfort,	physiological comfort, aesthetics of product, utility properties, quality of finishing, convenience of use, toxicity of product, (safety, healthiness)	physiological comfort, toxicity of product	physiological comfort, aesthetics of product, convenience of use, quality of finishing, toxicity of product, (safety, healthiness)
Level 2. Very important features ( $\bar{X} = 6$ )	aesthetics of product, durability, utility properties, quality of finishing, convenience of use, sensorial sensation (handle), hygienic properties, toxicity, price, (safety, healthiness)	durability, kind and fiber content, sensorial sensation (handle), hygienic properties, manner of maintenance	aesthetics of product, convenience of use, quality of finishing, utility properties, (safety, healthiness),	utility properties, durability, hygienic properties, sensorial sensation (handle), kind of fiber and content, manner of maintenance
Level 3. Important features ( $\bar{X} = 5.5/ 5$ )	kind of fiber and content, kind and structure of fabrics, manner of maintenance, brand, fashion	kind and structure of fabrics, environmental impact, brand, presence of quality or other certificate, price, fashion,	durability, hygienic properties, sensorial sensation (handle), kind of fiber and content, manner of maintenance, fashion, price, brand,	kind and structure of fabrics, brand, fashion, price, environmental impact, presence of quality or other certificate,
Level 4. Barely important features ( $\bar{X} = 4/3.5$ )	environmental impact, presence of quality or other certificate	-	kind and structure of fabrics, environmental impact, presence of quality or other certificate	-

of clothing products, the healthiness attribute (estimated at 6.14) has a stronger position than safety of use (5.90). However, in the case of house textiles, safety of use is graded more highly (6.12) than healthiness (5.82). It can also be observed that older consumers, especially women, seem to be more exacting in this matter in comparison with others.

The analysis of medians computed from the grades obtained for individual characteristics provides interesting information concerning the structure of product quality. Apart from ranking selected characteristics by their significance in product quality assessment, it is also possible to group them. An example related to clothing products is shown in *Table 1*.

*Table 1* indicates differences in the structure of clothing product quality depending on the gender and age of the respondents. Younger people – up to 30 years old and also males, to a greater extent, differentiate quality attributes. Analysis of the values of medians allows the four categories of quality attributes to be determined for these populations. While the first parameter group – the most important respondent group (up to 30) - classified physiological comfort only, males graded both physiological comfort and product toxicity (in the case of other populations, this category included even 8 parameters). The populations also differ from each other in the selection of parameters of low importance – LEVEL 4, which includes primarily ecological properties (manufacturing harmfulness, utilisation problems) as well as the presence of quality certificates and other product distinguishing marks.

### Relationship between parameters related to the quality of textile products

Principal Component Analysis (PCA) allowed to simplify the structure of the attributes analysed and to set independent factors that explain the maximum variances in each data set. Due to the stated differences in perceiving textile quality by females and males, the PCA analysis was performed separately for every gender, clothing and house textile. An example of detailed results from the PCA analysis performed for data related to clothing products and female population (that constituted the majority of those questioned) is presented in *Table 2*, while for the other analyses performed, there is only discussion.

According to the data obtained from the female population, five principal orthogonal components that constitute a consumer model of clothing product quality were obtained. They explain almost 63% of the variance. Principal factor 1, responsible for almost 15% of the variance, represents two features whose factor loadings exceeded 0.7. They are related to material structure and composition of clothes, i.e. “kind of fiber content” and “kind and structure of fabric”. This factor created by respondents may illustrate the appropriate knowledge about textiles that helps them in making choices and decisions about purchasing clothing products. This principal component is proposed to be named the material factor. Principal factor 2, explaining almost 12% of the variance, is correlated with the “fashion” and “brand of product”, i.e. the marketing attributes that mainly result from media and community influence on individuals, or associating the quality of a product with a particular brand (the products of some famous producers are identified with high quality) or fashion house. These attributes have appeared quite recently on the Polish clothing market [15] and, as previous analysis of parameters showed (*Figure 2*), consumers do not attach great importance to them. Considering their role in consumer perception of product quality, principal component 2 can be called the marketing factor. Principal factor 3 is responsible for the largest percent (about 19%) of variance. It represents two variables, namely “physi-

ological comfort” and “toxicity”. These original features are worthy of attention because they characterise the influence of clothes on the user’s health and frame of mind, therefore they should be considered as the most important factor in the quality assessment of clothing products. It may be named the health factor. Principal factor 4, responsible for 7% of the variance, is correlated with one original attribute only, i.e. “product price”, which makes it possible to be called the economic factor. However, in the consumer’s opinion this factor is rather weakly connected with product quality (*Figure 2*); it has to be stated that it is of great importance during the moment of product purchasing, especially among consumers with lower income or older ones who are perceived as price-sensitive consumers [5]. Principal factor 5 explains 9% of the variance and represents one variable: “aesthetic appearance of product”, whose factor loading exceeded 0.7. This factor reflects emotions that accompany consumers during the purchase or wearing of clothes. Probably, as previous analysis showed, this factor is considered as the main decisive impulse connected with product appearance. The author proposes to will it the emotional factor.

For the male population, 5 principal orthogonal components constitute the consumer model of clothing product quality, although their structure is somehow different from those presented for the female population. Three principal compo-

*Table 2. Principal Component Analysis (PCA) for attributes related to the quality of clothing products estimated by women. Values of factor loadings.*

Attributes	Principal factor 1	Principal factor 2	Principal factor 3	Principal factor 4	Principal factor 5
Aesthetics of product	0,0508	0,0644	0,1195	0,0169	<b>0,8591</b>
Durability	-0,0407	-0,1191	0,6433	0,3712	0,0511
Utility properties	0,1023	0,0488	0,5117	-0,0609	0,4274
Quality of finishing	0,0472	0,1757	0,6618	-0,1176	0,3632
Kind of fiber	<b>0,7282</b>	0,1185	0,3097	-0,1242	-0,0318
Kind and structure of fabric	<b>0,8199</b>	0,1544	-0,0027	0,0749	0,0806
Convenience of use	0,5890	-0,2471	0,3976	0,1331	0,1261
Physiological comfort	0,3388	0,0431	<b>0,7170</b>	-0,0035	0,0744
Sensorial sensation	0,3359	0,2262	0,1980	0,1947	0,5877
Hygienic properties	0,2844	0,0676	0,6311	0,0850	0,2397
Toxicity	0,2714	0,3332	<b>0,7060</b>	0,0228	-0,1394
Ecological properties	0,5077	0,0691	0,1781	0,0462	0,2008
Manner of maintenance	0,3736	0,2799	0,5492	-0,0778	0,1517
Brand of product	0,0910	<b>0,7757</b>	0,1400	-0,1960	0,1412
Presence of certificate	0,4330	0,6034	0,2451	-0,1672	0,0385
Price	0,0629	-0,0002	0,0516	<b>0,9135</b>	0,0624
Fashion	-0,0318	<b>0,7922</b>	0,0048	0,2930	0,1010
Eigenvalues	<b>5.40</b>	<b>1.67</b>	<b>1.37</b>	<b>1.16</b>	<b>1.02</b>
% of variances	<b>14.98</b>	<b>11.74</b>	<b>19.10</b>	<b>7.26</b>	<b>9.44</b>

nents are very similar, i.e.: the marketing factor, which is responsible for 13% of the variance and is correlated with such original variables as product brand, fashion and certificate; the economic factor, explaining 9% and correlated with price; and the material factor (9% of the variance), which represents the kind and content of fibres. The other two are the factor that explains almost 13% of the variances of variables and represents convenience of use, physiological comfort and hygienic properties (it may be called the comfort factor), and the factor correlated with the manner of maintenance and environmental impact, which can be called the external factor.

PCA analysis related to house textiles made it possible to set 3 principal components for both the female and male populations. Their structure is very similar regardless of gender, and reveals that consumers identify the quality of house textiles mainly from marketing features correlated with such original variables as the certificate and fashion, explaining about 15% or 17% of the variance, from the durability of the product (15% or 16% variances of variables) and the economic factor (price), explaining about 8% of the variance.

## Summary

On the basis of the data received and statistical analysis, the hierarchy and relationships between parameters perceived to be related to clothes and house textile quality were established. As the research showed, the consumer approach to product quality is differentiated by gender and age, as well as depending on the kind of textile product. In general the most important features which, in the consumer's opinion, constitute the quality of textiles are the aesthetic of the product, quality of finishing and parameters responsible for the safety of use and healthiness of the product, while ecological properties connected with environmental impact as well as marketing features, namely fashion and presence of quality or other certificates, barely play an important role.

The PCA analysis allowed to establish models of quality structure for textiles from the consumer point of view. These models consist of 5 principal factors for clothing products and of 3 principal factors for house textiles. Two of them, namely marketing and economic factors,

are common for both kinds of textile products analysed regardless of the age and gender of those questioned. However, as the hierarchy analysis showed, consumers hardly ascribe an important role to them in comparison with other factors. The rest of the principal components are mainly related to functions that products perform, which are differentiated by gender.

## References

1. Garvin D.; *What Does Product Quality Really Mean*, Sloan Management Review 26(1): 1984, pp. 25-43.
2. Feigenbaum A.V.; *Total Quality Control, Revised*, McGraw-Hill Companies; 3<sup>rd</sup> edition, New York 1991.
3. PN-EN ISO 9000:2006 *Systemy zarządzania jakością – Podstawy i terminologia*.
4. Eckman M.; *Attractiveness of Men's Suits: The Effect of Aesthetic Attributes and Consumer Characteristics*, Clothing Textiles Research Journal, 15 (4), 1997, pp. 193-202.
5. Humel D., Završnik B., Prodnik J., *Shopping Patterns of Older Consumers in Slovenian Clothes Market*, Fibres & Textiles in Eastern Europe, vol. 14, No 2 (56), 2006, pp. 8-12.
6. Schulz H.G., Cardello A.V., Winterhalter C.; *Perceptions of Fiber and Fabric Uses and the Factors Contributing to Military Clothing Comfort and Satisfaction*, Text. Res. J., 75, (3), 2005, pp. 223-232.
7. Salerno-Kochan R.; *The Role of Health Properties in Quality Assessment of Textile Products. Consumers' poll*, in: *Proceedings of the 8th International Commodity Science Conference (IGWT)*, Poznań, 28.08 – 4.09. 2005. pp. 837-842.
8. *Wiadomości ze świata, Przegląd Włókieniczny*, 2000, nr 10, p. 28.
9. Churchill G. A.; *Badania marketingowe. Podstawy metodologiczne*, PWN, Warszawa 2002.
10. *Wyróżniki użytkowe dóbr konsumpcyjnych* (eds. by Szymczak J.), Akademia Ekonomiczna, Kraków 1992.
11. *Towaroznawstwo przemysłowe* (eds. by Nalepa W.), PWE, Warszawa 1986.
12. Kotler P.; *Marketing*, Rebis, Poznań 2005.
13. Sagan A.; *Przykłady stosowania podstawowych technik analitycznych i graficznych*, [www.statsoft.pl/czytelnia/marketing/wprowmarketing.html](http://www.statsoft.pl/czytelnia/marketing/wprowmarketing.html).
14. Sokołowski A., Sagan A.; *Przykłady stosowania analizy danych w marketingu i badaniu opinii publicznej*, [www.statsoft.pl/czytelnia/marketing/wprowmarketing.html](http://www.statsoft.pl/czytelnia/marketing/wprowmarketing.html).
15. Malinowska-Olszowy M.; *Brand Strategy in the Clothing and Textile Market*, Fibres & Textiles in Eastern Europe, 13, 1 (49), 2005, pp. 8-12.

Received 09.02.2007 Reviewed 1.11.2007



## Institute of Biopolymers and Chemical Fibres

*FIBRES &  
TEXTILES  
in Eastern  
Europe  
reaches all  
corners of the  
world!  
It pays to  
advertise your  
products  
and services in  
our magazine!  
We'll gladly  
assist you in  
placing your  
ads.*

### FIBRES & TEXTILES in Eastern Europe

ul. Skłodowskiej-Curie 19/27  
90-570 Łódź, Poland

Tel.: (48-42) 638-03-00  
637-65-10

Fax: (48-42) 637-65-01

e-mail:

[ibwch@ibwch.lodz.pl](mailto:ibwch@ibwch.lodz.pl)

[infor@ibwch.lodz.pl](mailto:infor@ibwch.lodz.pl)

Internet:

<http://www.fibtex.lodz.pl>