

# ANALYSIS OF THE CONTEMPORARY PROBLEM OF GARMENT SIZES

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## Abstract

Problems of size and proportion of body shape intrigued man since the dawn of history. For centuries, tried to find the dependencies, which are clearly and accurately described the size and proportions of various parts of the human body for example in relation to its growth. These issues are currently dealt with by using anthropometric techniques. According to the received data, tables of human dimensions have been created as a source for designing various items including clothing. Contemporary clothing market is international, so clothing purchased in the country may be produced in a different country or even on another continent. Currently most countries have their own classification systems of sizes. This introduces large distortions and prevents the customer purchase the right product. This publication presents the genesis of the phenomenon of differences in the way of determination size clothing and investigations of compare classification systems existing in different countries and attempt to create a universal system of garment sizes codifications.

**Key word:** clothing size, anthropometric measurements, tables of body dimensional.

## 1. Introduction.

Analysing the contemporary clothing market can be seen very adverse phenomena which is "diversity of dimensional sizes". This diversity has led to total chaos in the clothing sizes which mean that the size is not equal to the size. The result is a situation in which there is no possibility of purchasing clothing without first trying on. From the garment, moreover as with other products related with anthropometric measurements, is required to define some dimensional data, determining the size. Meanwhile, clothing from different manufacturers, having the same size's symbol, varies considerably in dimensions. This forces the costumer to pick up a few pieces of the same product to the fitting room, mostly in smaller, medium and larger size in order to appropriately fitting. Purchase without first trying of clothes, on the basis of the so-called "symbol size" represents a lottery in which the chance of success is fifty - fifty - "succeed or not". This problem affects almost all assortments of clothing, both in the branded stores as well as hypermarkets. Even within the same store where clothing is branded the same brand, there are differences in size. This is not only domestic market problem, but embraces practically to the entire world market.

This paper presents the genesis of the phenomenon of differences in the way of determination clothing size on the basis of examples tables size from different apparel companies as well as investigations of compare classification systems existing in different countries.

## 2. Analysis of changes in the dimensions of human figures and their genesis.

In order to illustrate the causes of contemporary chaos in sizes we should go back in the history and track issues related to changes in the structure of the human body occurring over the past decades and look at the techniques and frequency of anthropometric research.

Almost to the twentieth century in force a rule that says that the human silhouette is proportionate and strictly determined. Force many canons of beauty, expressed by different modules [1,2]. All these theories disqualified achievements of the twentieth century, when was demonstrated the great diversity and variability of the human species. This thesis confirmed the cyclic anthropometric investigations conducted on the large scale around the world. Among the most important include:

1. Anthropometric measurements in the U.S.[3,4].

In 1937 the U.S. began the first large-scale women's body measurements ever recorded, for the purpose of creating a sizing system which the entire industry could follow. During 1939-40, about 15,000 American women participated in a national survey conducted. The results of the study were published in 1941 in USDA Miscellaneous Publication 454, "Women's Measurements for Garment and Pattern Construction". From 1949 until 1952, work continued in order to develop standards. The resulting commercial standard was distributed by National Bureau of Standards to the industry for comment in 1953, formally accepted by the industry in 1957, and published as Commercial Standard (CS)215-58 in 1958. In September 1971, the recommendation in CS215-58 was updated and republished with the new designation Voluntary Product Standard.

2. Anthropometric measurements in the Europe [5].

In Europe in the twentieth century also began anthropometric study on large scale. In Poland, these study included the collective total of 180 thousand people and covered the years from 1921 to 77. The last one took place in the 1976/77. The obtained data were the source of the current Polish tables of clothing sizes issued first by Research & Development Centre for the Clothing (1982) and then republished by Institute of Knitting Techniques and Technologies "Tricotextil" (1997).

Comparable research has been conducted in the Czech Republic. It included 400 thousand people, and the results were collected for the design of footwear and clothing. Measurements in the UK and the Netherlands were performed on slightly smaller populations.

The obtained data were excellent source of information used by a wide variety of scientific and industrial fields. There were also an indispensable base for the design and construction of clothing. Unfortunately, due to excessive costs and social – political – economic maelstrom most of these studies have been abandoned.

Meanwhile according to available publications [6,7] changes in the shapes and proportion of modern humans' silhouettes in comparison to those of the prior 30 years are strong and visible. Ordinary people not only grew up during those years, but also changed the proportions of their bodies, making the problems of properly fitting clothes. The contemporary population of people has put on weight an average of about 3 kg and has grown by 10-20 cm. Feet lengthened by an average of 20 millimeters, male buttocks decreased, but the trunk is rounded off, and the woman's breasts have enlarged and moved lower. Women also have longer legs and more clearly marked waist, but they are more rounded in the hips (on average by about 10cm) [6,7].

Accelerated development of the modern human mostly affected by external factors, e.g. [7]:

**A. improve living conditions** - better nutrition during infancy and childhood (in Poland especially for infants and children, born after 1985 – began era of baby food products with vitamins and the "essential" other nutrients). Some scientists argue that the acceleration process starts already during fetal and lasts until the end of puberty and the concerns genetic changes. The trends of these changes may be the result of the introduction on a massive scale into the body of pregnant women, children and youth undesirable substances such as pathogens in vaccines, which may have links with growth regulators, high protein diet that includes animal growth hormones used in farming and the increasing use of hormonal substances.

**B. physical activity** - there are two extreme attitudes:

static model of life - a small motor activity, characterized by people who prefer sitting position, spending most of their free time watching TV or working on computer, using means of transport (car, tram, bus) - weakly muscular silhouette with a visible overweight and excess body fat;

active model of life - popular and fashionable becomes active recreation and sport, more young people and adults enjoy of classes in gyms and fitness clubs, swimming in the pools, and so on - it promotes improved muscular body and the silhouette is slim and athletic;

**C. better medical care** - level of development of medicine access to specialized research equipment, accurate and quick diagnosis and proper conduct of the rehabilitation and action on prevention of disease, strongly improved in comparison to the mid-twentieth.

In view of continuous volatility dimensional characteristics of the human, existing tables of sizes have become unavailable and require significant correction or complete change.

### 3. Materials and methodology.

Since the purpose of this publication is analysis the modernly existing systems of clothing sizes and attempt to submit their interconnection, as well as to confront with the tables used by various manufacturers and retailers of clothing, material research are:

- standards for garment sizes obligatory in selected countries: UE, UK, US;
- systems of codification of garment sizes from selected countries: UE, Poland, Germany, Scandinavia, UK, France, Spain and Portugal, US, Italy Japan;
- industry tables of clothing sizes from selected eight companies.

Investigation methodology includes:

1. comparative analysis of major assumption data of standards clothing size issues obligatory in the selected countries;
2. official interrelationship of garment systems codification of sizes from selected countries;
3. comparative analysis of industrial tables with clothing sizes and anthropometric dimensions from selected clothing and retailers companies.

### 4. Investigation results and discussion.

#### 4.1 Clothing size standards.

There are many different systems of clothing measurement around the world. Among the most important ones can be:

European clothing sizes standard [8,9]

The European Union has produced a standard EN 13402 "Size designation of clothes" for labelling clothes sizes intended to replace existing standards in the member countries. It is based on body-dimensions, the metric system (SI), data from new anthropometric studies of the European population performed in the late 1990s and similar existing international standards (ISO 3635). This standard consists of four parts: terms, definitions and body measurement procedure; primary and secondary dimensions; measurements and intervals; coding system. This standard, in force in some European countries including Poland (PL-EN 13402), combines the dependency code letter not with the known size, but the values dimension of the chest (men) or bust (women) girth (tab. 1) and next with other measurement for example with height (tab.2).

This approach is not functional, and certainly not a simple, because the purpose of comparison and finding a correlation requires knowledge of the range of values of various measurements ranges in each system size and therefore is not yet in common use.

Table 1 Letter code for women's clothing according to standard EN 13402-3 "Size designation of clothes. Measurements and intervals "[8]

<b>Bust</b>	← 68	72	76	80	84	88	92	96	100	104	110	116	122	128	134	140 →
<b>Letter code</b>	←XXS		XS		S		M		L		XL		XXL		XXXL→	
<b>Range</b>	66÷74		74÷82		82÷90		90÷98		98÷106		107÷119		119÷131		131÷143	

Table.2 Selected measurements of women - height according to standard EN 13402-3 "Size designation of clothes. Measurements and intervals " [8]

Height with interval 4 cm									
Symbol	← 156	160	164	168	172	176	180	184	188 →
Height	154 -158	158 -162	162 -166	166 -170	170 -174	174 -178	178 -182	182 -186	186 -190
Height with interval 8 cm									
Height	-	156 -164	-	164 -172	-	172 -180	-	180 -188	-

United Kingdom clothing sizes standard [10]. The United Kingdom has an existing standard for women's clothing published by British Standards Institute in 1982 – standard BS 3666:1982. This standard is traditionally indicated by numbers for sizes from 8 to 32 quoted in centimeters (tab.3)

Table.3 Sizes as given by the British Standard BS 3666:1982 [10]

Size	Hips				Bust				Size	Hips				Bust			
	from		to		from		to			from		to		from		to	
	cm	in	cm	in	cm	in	cm	in		cm	in	cm	in	cm	in	cm	in
<b>8</b>	83	32.7	87	34.3	78	30.7	82	32.3	<b>22</b>	115	45.3	119	46.9	110	43.3	114	44.9
<b>10</b>	87	34.3	91	35.8	82	32.3	86	33.9	<b>24</b>	120	47.2	124	48.8	115	45.3	119	46.9
<b>12</b>	91	35.8	95	37.4	86	33.9	90	35.4	<b>26</b>	125	49.2	129	50.8	120	47.2	124	48.8
<b>14</b>	95	37.4	99	39.0	90	35.4	94	37.0	<b>28</b>	130	51.2	134	52.8	125	49.2	129	50.8
<b>16</b>	100	39.4	104	40.9	95	37.4	99	39.0	<b>30</b>	135	53.1	139	54.7	130	51.2	134	52.8
<b>18</b>	105	41.3	109	42.9	100	39.4	104	40.9	<b>32</b>	140	55.1	144	56.7	135	53.1	139	54.7
<b>20</b>	110	43.3	114	44.9	105	41.3	109	42.9									

This standard however is rarely used by manufacturers as it defines sizes in terms of hip and bust measurements only within a limited range. And, unfortunately, there is no requirement for manufacturers or stores to use the British Standard resulting in a range of size indications for the same size of garment from different sellers. A new standard BS-EN 13402 is intended to replace this system with one in which actual measurements are used, however this is not yet in common use.

US clothing sizes standard [8]. US standard clothing sizes were developed from statistical data in the 1940-50s. It is similar in concept to the EN 13402 European clothing size standard, however now the most common is standards known as US catalog sizes. Catalogs have departed from the US standard sizes since approximately the 1980s. Companies now may provide the measurements for their sizes, which may vary even among different styles of the same type of garment. According to these catalogs, women's sizes are divided into various types, depending on the overall height and the relative bust and waistlines heights (tab.4).

Table.4 US Catalog Women's Sizes [8]

Women's sizes							
5'5"-5'6" (165-168 cm) tall, average bust, average back							
Dimension/Size	38	40	42	44	46	48	50
<b>Bust</b>	42	44	46	48	50	52	54
<b>Waist</b>	35	37	39	41½	44	46½	49
<b>Hip</b>	44	46	48	50	52	54	56
<b>Back-waist length</b>	17¼	17⅜	17½	17⅝	17¾	17⅞	18
Women's Petite (Half sizes)							
5'2"-5'3" (157,5-160 cm) tall, lower bust, shorter back							

Dimension/Size	10½	12½	14½	16½	18½	20½	22½	24½
<b>Bust</b>	33	35	37	39	41	43	45	47
<b>Waist</b>	27	29	31	33	35	37½	40	42½
<b>Hip</b>	35	37	39	41	43	45½	48	50½
<b>Back-waist length</b>	15	15¼	15½	15¾	15⅞	16	16⅞	16¼

Unfortunately, as in the previously discussed issues of both the US clothing sizes standard and the US catalog sizes has become outdated. Both American men and women with the passage of time were becoming heavier and their silhouettes had changed significantly.

#### 4.2 Clothing size converter [11,12].

In view of the widespread globalization, including the garment industry there is a need to find a relationship between different systems of garment sizes, used in various countries around the world. Only a properly defined and the corresponding correlation makes possibly to commercial transactions between companies from different countries and provides correct relationship imports - exports. Converter sizes would give the ability to translate a symbol ad - hoc from one system to another according to the encoded size clothing. Theoretically, between these systems of clothing sizes can be found a relationship (tab.5), but this is just the conventional relationship, and so far has not standardized. Finding a connection is not simple and straightforward because between these systems are fairly significant differences. They arise not only from the use of different versus of the units, but there are different philosophies in some areas, especially in children's sizes. For children's clothing, Europeans go by height rather than age. Meanwhile, the UK system uses only age to define size. Such thinking is not always correct because the children of the same age can have different height.

Table 5 Converter of clothing sizes systems [11,12]

COUNTRY	SIZE													
	Women's clothing													
International Sizes	XS		S		M		L		XL		XXL		XXXL	
<b>Europe, Poland, Germany, Scandinavia</b>	32	34	36	38	40	42	44	46	48	50	52	54	56	58
<b>UK</b>	-	6	8	10	12	14	16	18	20	22	24	-	-	-
<b>France, Spain and Portugal</b>	34	36	38	40	42	42	46	-	-	-	-	-	-	-
<b>US</b>	-	4	6	8	10	12	14	16	18	20	22	-	-	-
<b>Italy</b>	38	40	42	44	46	48	50	-	-	-	-	-	-	-
<b>Japan</b>	7	9	11	13	15	17	19	21	23	-	-	-	-	-
COUNTRY	SIZE													
	Men's clothing													
International Sizes	XS		S		M		L		XL		XXL		XXXL	
<b>Europe, Poland, Germany, Scandinavia</b>	40	42	43	44	46	48	50	52	54	56	58	60	62	64
<b>UK</b>	-	32	34	36	38	40	42	44	46	48	50	52	-	-
<b>US</b>	-	32	34	36	38	40	42	44	46	48	50	52	-	-

#### 4.3 Industry tables of clothing sizes.

In connection with the undeniable need to use anthropometric dimensions in the design and construction of clothing and as a result of outdated standards clothing sizes, the companies, wishing to operate in the market have forced to create their own issues, so-called industry tables. The creation of the tables were based on different sources of domestic and foreign, based on their own experience and through cooperation with customers.

Commonly used systems of sizes should define the size of the garment by specification one or more dimensions of the body for which it was sewn clothing. These designations are

meaningful, regardless of origin country and clothing destination, but in practice there is a lot of discrepancies, as shown by comparative data from a random table sizes offered by various clothing companies, traditional and internet shops and mail order houses (tab.6)

Table 6 Compare the dimensions of the various industry tables of clothing sizes from of the exemplary companies [13].

Firm	XS			S		M		L		XL			XXL	
	30	32	34	36	38	40	42	44	46	48	50	52	54	56
<b>Firm</b>	<b>Height</b>													
Nopex	-	158		162		164		170		172			188	
P.Sarafiiis	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Koral	169	172	175	178	181	184	186	188	190	190	190	-	-	-
BDF Boutique	-	-	160	162	164	166	169	172	174	176	178	180	-	-
Necerman/ Bonprix/ Quelle	For all girths are used heights: Extra Small:<157cm; Small:(157-164cm); Normal: (165-172cm); High:>172cm													
VEGA	-	-	152 158	158 164	158 164 M	158 164 L	164 170 XL	104 106 XXL	-	-	-	-	-	-
<b>Firm</b>	<b>Bust girth</b>													
Nopex	74 - 81			82 - 89		90 - 96		97 - 106		107 - 116			117-128	
P.Sarafii	-	75 79	80 82	83 86	87 90	91 94	95 98	99 102	103 106	107 111	112 117	118 123	124 129	130 135
Koral	84	88	92	96	100	104	108	112	116	120	124	-	-	-
BDF Boutique	-	-	78 81	82 85	86 89	90 93	94 97	98 101	102 106	107 112	113 118	119 124	-	-
Necerman/ Bonprix/ Quelle	-	74 77	78 81	82 85	86 89	90 93	94 97	98 102	103 107	108 113	114 119	120 125	126 131	132 137
VEGA	-	-	78 81	82 85	86 89 M	90 93 L	94 97 XL	98 102 XXL	-	-	-	-	-	-
<b>Firm</b>	<b>Hip girth</b>													
Nopex	84 -91			92 - 98		99 - 104		105 - 112		113 - 124			125 - 134	
P.Sarafiiis		84 87	88 91	92 94	95 98	99 102	103 106	107 111	111 114	115 119	120 124	125 129	130 135	136 141
Koral	82	86	90	94	98	102	106	110	114	120	120	-	-	-
BDF Boutique	-	86 89	90 92	93 96	97 99	100 103	104 106	107 111	112 116	117 122	123 127	-	-	-
Necerman/ Bonprix/ Quelle	-	84 87	88 87	92 95	96 98	99 101	102 104	105 108	109 112	113 116	117 121	122 126	127 132	133 138
VEGA	-	-	86 89	90 92	93 96 M	97 99 L	100 103 XL	104 106 XXL	-	-	-	-	-	-

According to obtained data from between the basic dimensions defining the size, i.e. height, bust girth, and hip girth, within the same group of size there are differences values of dimensional for individual companies. Sometimes the differences are small but in extreme cases, that difference for example: for height is up to 18cm, for bust - 20cm and for hip - 16cm. Such differences in basic dimensions give rise to a completely different dependences of anthropometric profiles that describe the silhouettes. It provide to the design an entirely different clothing pattern, and ultimately to creation garments developed for the size of different dimensions and proportions. In addition, not every company producing or selling clothing understand exactly in the same way the code size (gray highlight in the table 6). The

diversity of industry table size of clothing used in particular in the garment industry, introduces confusion and chaos in the sizes of the market and makes big problems with the selection of the correct size when buying clothes. Customers of the same symbol of size get products which are significantly different dimensions. With data from the standards and from industry tables created a veritable hodgepodge collection of very useless data practically not to use.

Currently, preferably to the dimensions of the modern user are adapted cars - more than 90% of production takes into account changes in height and body proportion.

The tables provided by manufacturers of clothing and in the standards is one thing, but the real dimensions of the clothing is another. Not generally, it can be observed that the practice of sizes conducted by different companies cannot always be compatible with what shall state in their tables. This contains particularly of commercial networks, cooperating with a large number of subcontractors, each of which manufactures clothes according to their own measurements. As a result, a customer browsing clothing branded by the same manufacturer company (the same trademark), can meet with the products labelled by the same code size, but with completely different dimensions, or vice versa, clothes of the same or similar dimensions can be labelled in a completely different code.

#### **4.3.1. Vanity sizing** [14,15,16].

Quite new and very interesting phenomenon, which appeared in recent years are the vanity sizing, also known as size inflation. It is used to refer to the phenomenon of ready-to-wear clothing of the same nominal size becoming larger over time. It is the marketing policy of some producers of clothing, which consists of intentional suppression numbering garments in order to satisfying the psychological needs of their customers. Vanity sizes usually occurs in places where clothing sizes are not standardized, are more frequently in women's apparel than in men's and more concern smaller, cheaper firms than more expensive brands. Many commentators have suggested that "vanity sizing", as its name suggests, is designed to satisfy clients' wishes to appear thin and feel better about himself. Customer try on clothes in size, which previously wore, suddenly learns that he is too big for him, and that it now fits on it a size smaller. Being positively surprised, with a much better well-being will make a purchase and return to buy another clothing. The arguments of the type that this is a mystification and that the label lies here are not important - what counts is the fact that apparently is a leaner and shapely. Such actions are understandable by both the customer and the manufacturer, but they are causes additional turbulence in the field of sizes. Now, actually nothing is known - which size is really actually, resulting from anthropometric measurements, and which is the downside, designed to "tickle our vanity"?

## **5. Conclusion.**

According to the above analysis the problem of contemporary clothing sizes exists and is different substrates. Currently, the chaos of sizes is so big that both manufacturers and customers are unable to control over it. Actually on the current level, no one can expect that in the near term standards for the measurements will be the same for all European Union countries as well as in world. In addition to dimensional variations occurring in different populations, leading to a situation that nominally the same size clothing will mean something different in Spain, Great Britain, Sweden or Poland there is the phenomenon of various interpreting standard sizes and creating industrial clothing size by the individual company. This diversity of data introduces confusion in the clothing sizes of the market and creates big problems with the selection of the correct size by customers. Taking into account also sociological and psychological aspect of vanity sizes, current data are veritable hodgepodge collection of very useless information practically not to use. The only sensible solution seems

to be revisits anthropometric measurements on a very large global scale using modern techniques such as e.g. 3D Scanning and the wider international collaboration of researchers, manufacturers or retailers, to create the appropriate correlation of body measurements, which formed the basis for action in order to sizes unify in United Europe and then worldwide. Only in this way there is a chance to create a database of current anthropometric measurements, giving rise to obtain high quality uniform, unambiguous and unanimous systems for codes of products sizes, including garments.

## 6. References.

1. Malinowski A., Bozilow W. *“Fundamentals of anthropometrics. Methods, techniques, standards”* Scientific Publishing PWN, Warsaw, 1997, p. 7-16.
2. Cogill. B *“Anthropometric indicators measurement guide”*, Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C., 2003.
3. Sencer. F *“A history of American physical anthropology, 1930-1980”*, American Association of Physical Anthropologists , Academic Press, 1982 – 495
4. *“Standardization of women’s clothing”*, Available from [www.museum.nist.gov/exhibits/apparel/role.htm](http://www.museum.nist.gov/exhibits/apparel/role.htm), (10.06.2010)
5. Milicerowa. H. *“Polish photos anthropometric I to IV”* Published by Institute of Anthropology, Polish Academy of Sciences, Wroclaw, 1982
6. Kozłowski. T. *“The evolution of modern humans”*, Available from [www.biol.uni.torun.pl/~kozlow/antrop/ewol.htm](http://www.biol.uni.torun.pl/~kozlow/antrop/ewol.htm), (10.03.2010)
7. Kucharczak. P *“We are growing like a weed”* Available from <http://nauka.wiara.pl/doc/469229> (15.03.2010)
8. EN 13402 *“European Clothing Size Standards. Definition for the Clothing Industry”* presented by Apparel Search, Available from [www.apparelsearch.com/definitions/miscellaneous/EN13402\\_European\\_Clothing\\_Size\\_Standard.htm](http://www.apparelsearch.com/definitions/miscellaneous/EN13402_European_Clothing_Size_Standard.htm), (20.04.2010)
9. PN-EN 13402 *“Size designation of clothing”* (03.2002)
10. British Standard 3666 : 1982, *“Size Designation of Women’s Wear”* Available from [www.tradingstandards.gov.uk/towerhamlets/size.htm](http://www.tradingstandards.gov.uk/towerhamlets/size.htm) (24.04.2010)
11. *“Clothing size conversion”*, Genuine Luxury Outlet, Available from [http://www.genuineluxuryoutlet.com/guides/ebay\\_clothing\\_size\\_conversion\\_chart.pdf](http://www.genuineluxuryoutlet.com/guides/ebay_clothing_size_conversion_chart.pdf) (10.05.2010)
12. Martin J. *“Clothing Sizes and Size Conversions in Europe”*, Available from [http://goeurope.about.com/cs/shopping/l/bl\\_clothes\\_size.htm](http://goeurope.about.com/cs/shopping/l/bl_clothes_size.htm) (10.05.2010)
13. Source industrial tables of clothing sizes (03.03.2010), Available from:
  - [www.bonprix.pl/bp/sizing\\_her.htm](http://www.bonprix.pl/bp/sizing_her.htm)
  - [www.neckermann.com.pl/](http://www.neckermann.com.pl/)
  - [www.quelle.pl](http://www.quelle.pl)
  - [www.nopex.com.pl/tabela\\_rozmiarow.html](http://www.nopex.com.pl/tabela_rozmiarow.html)
  - [www.public.sarafis.pl/images/rozmiary\\_odziezy.htm](http://www.public.sarafis.pl/images/rozmiary_odziezy.htm)
  - [www.koral.bielsko.pl/pl/rozmiary\\_tabele/id\\_2449.html](http://www.koral.bielsko.pl/pl/rozmiary_tabele/id_2449.html)
  - [www.bd-fashion.com/Rozmiary-cinfo-pol-5.html](http://www.bd-fashion.com/Rozmiary-cinfo-pol-5.html)
  - [www.vega.czest.pl/tabela.html](http://www.vega.czest.pl/tabela.html)
14. Kinley T. R *“Study questions the sizing methods in women's apparel”*, News service, University of North Texas, Denton, December 16, 2003
15. Schrobsdorff S. *“Faith-based sizing”*, Newsweek, October 18, 2006
16. Kinley, T. R *“Clothing Size Variation in Women’s Pants”*, Clothing and Textiles Research Journal, Published in Association ITAA 21(1), 19-31 Citrus Heights, USA 2003