

What is a Size Chart?

By Elizabeth White, [TC]²

In the apparel industry, there are many conventions used to streamline and standardize processes for efficiency. For product development processes, one of the most useful conventions is a size chart. Have you ever wondered what makes up a size chart and how the chart can be used? Did you know that many common charts used in production are derived from size charts?

General Components of a Size Chart

A size chart is a table of data showing points of measurement, usually listed down the left side, and size labels, usually listed across the top of the table, with corresponding measurement values for each point of measurement and size label combination. An example of a size chart is included in the next section.

The header for the table may denote the primary use of the table, such as for a target market and a particular product type like Women's Tops. Other tables may be for more general use and only denote the target market, such as Missy. The definitions of these target markets and product types vary for individual companies. In some cases, the company may have target market measurement data that has been analyzed and sorted into measurement and size label combinations by market coverage goals. The resulting group of sizes is known as a size range. Product types may be general in nature, such as for tops, or more specific, such as woven tops or knit bottoms.

Size labels are chosen for different reasons. For instance, some size labels are chosen because they represent actual measurements of the body using that size label, such as a waist measurement of 32 for pants. Other size labels are chosen to indicate a relationship within the size range, such as S (for Small), M (for Medium), and L (for Large). Usually, the size label order is arranged from smallest size on the left to largest size on the right.

The individual points of measurement, also known as POM, are relevant measurements chosen to match the chart's application. For example, if the chart is to be used for the size range for a specific line of apparel, key body measurements would be chosen to define the sizes that fit within the range. However, the application may also cause the number of measurements in a given size chart to vary. For a retail website, the size chart may be used for size prediction, showing only a few key measurements to help customers choose an appropriate size. If the chart will be used for pattern grading, more measurements would be required to control different pattern piece contours and markings. In all cases, an additional document, known as a measurement manual, is needed to define how the measurements are obtained. The manual includes both written descriptions and graphics illustrating the measurement

methods. If alternative measurement methods are used for some applications, explanations are included on when to use the alternative methods. An example would be a waist measurement taken at the natural waist position for a tailored pant versus one taken a certain dimension below the natural waist for a jean.

Normally, one unit of measurement is used for the entire size chart. However, in sourcing production between countries where different units may be used, the chart may have two sections with each POM expressed in two different units. This is also true for some standard ASTM size charts, such as [D5586 - 10 Standard Tables of Body Measurements for Women Aged 55 and Older \(All Figure Types\)](#). However, caution should be exercised when working with converted units as rounding usually occurs with use of any system. For example, 9.52 mm is equivalent to 3/8", but 10 mm is more likely used for a typical measurement unless there is an extremely tight tolerance for fit.

Example

An example of a size chart used in the past for women's apparel in the US is the withdrawn "NBS Voluntary Product Standard [PS 42-70](#) Body Measurements for the Sizing of Women's Patterns and Apparel," partially reproduced in this graphic:

TABLE 4. Misses¹

Size	6	8	10	12	14	16	18	20	22
GIRTH MEASUREMENTS (inches)									
Bust -----	31½	32½	33½	35	36½	38	40	42	44
Waist -----	22½	23½	24½	26	27½	29	31	33	35
Hip -----	33½	34½	35½	37	38½	40	42	44	46
Mid neck -----	13½	13%	13%	14	14%	14%	15¼	15%	16%
Armscye -----	13%	14¼	14%	15¼	15%	16½	17¼	18	18%
Abdominal extension (high hip) -----	29%	30%	31%	33¼	34%	36%	38%	40%	42%
Sitting spread -----	33½	34½	35½	37	38½	40	42	44	46
Thigh, maximum -----	18%	19½	20¼	21¼	22¼	23¼	24½	25%	27
Thigh, mid -----	17	17½	18	18%	19½	20¼	21¼	22¼	23¼
Knee -----	12	12%	12%	13¼	13%	14¼	14%	15¼	15%
Calf -----	11½	11%	12¼	12%	13¼	13%	14¼	14%	15¼
Ankle -----	8%	8%	8%	8%	9%	9%	9%	9%	10%
Upper arm -----	9%	9%	10½	10½	10%	11¼	11%	12%	13%
Elbow -----	9¼	9%	9½	9%	10	10¼	10%	11	11%
Wrist -----	5¼	5%	5½	5%	5%	5%	6	6½	6¼
Vertical trunk -----	55½	57	58½	60	61½	63	64½	66	67½
ARC MEASUREMENTS (inches)									
Bust, front -----	17%	18½	19¼	20¼	21¼	22¼	23%	25	26%
Waist, front -----	11%	12¼	13¼	14	14%	15¼	17	18¼	19¼
Abdominal, front (high hip) -----	15%	16½	17½	18	18%	19%	21	22¼	23½
Hip, back -----	16%	17¼	17%	18¼	18%	19½	20¼	21	21%
VERTICAL MEASUREMENTS (inches)									
Stature (total height) -----	62½	63	63½	64	64½	65	65½	66	66½
Cervicale height -----	53½	54	54½	55	55½	56	56½	57	57½
Waist height -----	38%	39%	39½	39%	40¼	40%	41	41%	41%
Abdominal extension height (high hip) -----	35%	36	36¼	36½	36%	37	37¼	37½	37%
Hip height -----	31½	31%	31%	31%	32	32%	32¼	32%	32½
Crotch height -----	28%	28½	28%	28%	28%	29	29%	29¼	29%
Knee height -----	16%	17	17%	17¼	17%	17½	17%	17%	17%
Ankle height -----	2%	2%	2%	2%	2%	2%	2%	2%	2%
WIDTH AND LENGTH MEASUREMENTS (inches)									
Cross-back width -----	12	12¼	12½	12%	13¼	13%	14¼	14%	15½
Cross-chest width -----	11%	12	12%	12%	12%	12%	13¼	13%	14

Notice that the header for this size chart is Misses, a target market category that is defined in Appendix A of the document. The size range includes sizes from 6 to 22, with the same POM used for all seven size charts in the document. The header of the chart refers to a footnote on converting the units of measurement used for the document from inches and pounds to centimeters and kilograms.

Standards document agreements made by different groups, either within companies or between companies or industries. Standards usually include definitions of commonly used terms to avoid confusion. [ASTM](#) and [ISO](#) are examples of standards organizations that publish current voluntary apparel sizing standards. These standard sizing systems define both measurement terms and methods that apply to the covered size ranges with their respective size labels and measurement values.

Size ranges are groups of size labels differentiated from other groups by common traits. Traits may include body shape, age, and gender, such as infants or boys. PS 42-70 includes the size ranges Junior Petite, Juniors, Misses Petite, Misses, Misses Talls, Women’s, and Half Sizes. The standard measurement method for each POM of every size range is illustrated and defined in the beginning of the document.

Organization of a Size Chart

Size charts are often organized in particular ways to facilitate practical use. Characteristics, order, and application drive the organization of the chart components.

Primary Measurements and Size Breaks

The most important measurements for the size chart are usually listed first and may be called primary measurements. Many size charts may also show these measurements with the same rate of change, also called grading. For example, in the PS 42-70 Misses chart, the Bust, Waist, and Hip measurements for one size differ by the same amount when compared to the next size. Size 12 Bust measurement (35) minus Size 10 Bust measurement (33.5) equals 1.5”. The same result of 1.5” also occurs when subtracting size 10 Waist (24.5) from size 12 Waist (26) and size 10 Hip (35.5) from Size 12 Hip (37).

TABLE 4. Misses¹

Size	6	8	10	12	14	16	18	20	22
GIRTH MEASUREMENTS (inches)									
Bust	31½	32½	33½	35	36½	38	40	42	44
Waist	22½	23½	24½	26	27½	29	31	33	35
Hip	33½	34½	35½	37	38½	40	42	44	46

The rate of change is not the same between all pairs of sizes in the chart, but these three measurements maintain the same rate in moving from one size to the next. Notice that the rate of change between the first three sizes (6 to 8 to 10) is one inch. The next rate is 1.5 inches between the middle group of sizes (10 to

12 to 14 to 16). And the final rate is 2 inches between the last four sizes (16 to 18 to 20 to 22). This set of standard rates is often used for missy and women's sizing in the US. Rate of change between sizes is commonly called grading and these grade amounts are used in determining how individual pattern pieces should be modified for different sizes within a size range.

Rate changes in a measurement are called size breaks because of the break in the rate of change in size. In this example, the size breaks occur at sizes 10 and 16. Notice that the difference between the measurements of size 8 and size 10 is different from the difference between the measurements of size 12 and size 10. This is also true for the differences between measurements in sizes 14, 16, and 18.

For some measurements, there is a constant rate of change without any size breaks. An example in this chart is the wrist measurement which changes at the rate of 1/8" for every size from 6 to 22.

TABLE 4. Misses¹

Size	6	8	10	12	14	16	18	20	22
GIRTH MEASUREMENTS (inches)									
Wrist -----	5¼	5½	5½	5¾	5¾	5¾	6	6½	6½

The rate of change, or grade, is dependent on the source of measurement values. In some cases, actual body measurements are obtained from a group of subjects. Statistical analysis of the measurements determines the grade amounts. Results may show that the bust, waist, and hip measurements do not change at the same rate between sizes as commonly presumed. However, when measurements are derived from standard sources using conventional grading and size breaks, the same grade and size changes will continue to be evident in the derived charts.

Body measurements may originate with manual or automatic measurement surveys by a retailer or organization, such as [TC]². Background on sizing surveys may be found in the article "[Sizing Up Garment Fit Issues](#)" from Techexchange.com. Because of the investment required to plan, measure, and analyze data from a survey, results are often considered proprietary and may be sold as opposed to distributed freely. A recent size survey of adults in the US was conducted by [TC]², known as [SizeUSA](#). Data from this survey is available for sale by demographic groups, such as age, gender, and ethnicity.

In cases where finished garment measurements are listed in a size chart, the application and name of the chart are different from the original body measurement size chart. This derived chart is often called a finished garment specification. Some measurements may be based on style features and are graded by proportion to primary garment measurements or other style features. These measurements would not necessarily follow actual body measurement grade amounts but may be proportional to those amounts. Examples would

include pocket, cuff, and trim locations and dimensions. A pocket may be placed in a particular location on the garment near a body landmark. That landmark's grade amounts may dictate the pocket's grading. If the pocket is placed on the front chest near the center front of a shirt, the pocket location will be graded to appear in the same location on all sizes, using proportions of the chest level and width grades in relation to the center front. Pocket dimensions may also change so that the pocket size appears proportional to the shirt size for all sizes in the size range.

POM Order and Quantity

Other measurements in the size chart may be listed in groups or by some predetermined order. The PS 42-70 measurements are grouped by measurement types, such as girth, arc, and vertical. If the chart will be used for grading a particular product type, such as pants, almost all the measurements will be from the lower body. Very few, if any, upper body measurements will be included in the chart. Individual companies may have determined a standard POM order so that charts can be automatically generated from a PDM or PLM system. Each POM may also have a numeric code so that the order can be preserved no matter which measurements are chosen for a chart.

Size Labels and Ranges

Both size labels and ranges vary by market and product types. Traditionally, fitted, or tailored, clothing is sized with numeric size labels. As mentioned earlier, numeric size labels are often associated with body measurements. Chest, waist, inseam, and bust are some of the variables often associated with size labels. Age may also be associated with numeric size labels, as in infants clothing sized by number of months – 6 months, 9 months, etc.

For less fitted clothing, alpha sizing is common. SML is often used, but the naming convention can be expanded to XS (for Extra Small) and XL (Extra Large). For commodity garments, such as sweatpants, sweatshirts, and t-shirts, there may be numeric extensions for XS and XL, such as 2XS or 5XL. If there are several size ranges for a brand, size labels may also include a letter denoting the size range, such as 14P, where the P stands for Petite.

Applications

Size charts are used for many types of applications and as the basis for other similar charts. The most basic use for a size chart with body measurements is to define the range of sizes for clothing lines. This helps to achieve fit consistency across a size range and multiple product lines by standardizing sizing increments.

These same measurements are used to develop grade rules for all clothing within the size range. Since not all measurements required for grading are body measurements, the POM list is revised to include the necessary additional

measurements. These revised charts may become standard product grading charts.

As clothing is being produced, in process garment measurements are needed to check quality at different process steps. These charts may be labeled as particular in process specifications, such as an after wash spec. Tolerance levels are calculated and added to each POM affected by process variations in the derived chart. Not all measurements are required in these process specifications so the POM list may be different for each in process spec.

Final garment measurements will also be developed from this size chart for use as finished garment specifications. Tolerance levels and POM will be revised to reflect projected production outcomes. If the original body measurement size chart has been consistently used as the basis for developing and producing garments, the brand owner will reduce product returns for inconsistent fit within the size range.

Elizabeth White assists and instructs companies in the use of product development tools through [TC]² seminars and consulting services. Size charts and their derivations are integral topics within the Pattern Development, Grading for Fit, and How to Build a Tech Pack seminars.

April 2011