

FABRIC ANALYSIS.

(Continued from November issue.)

Ascertaining Weight per Yard and Counts of Yarn.

This subject is best explained by means of practical examples.

Worsted Flaid Dress Goods. (54 inches wide.)

Ascertain from information thus far given, *Texture* and *Color Arrangement* for warp and filling; the same to be:

Texture: 63 warp-threads and 77 picks per inch.

Warp Dressed: 16 ends White

16 " Brown

32 ends, repeat.

Filling Arrangement: 20 picks White

20 " Brown

40 picks, repeat.

After having thus ascertained texture and color arrangement for warp and filling, trim your sample to the largest regular dimensions.

In our example the same to be 3½ inches wide (cut to length of filling) and 2 inches long (cut to length of warp) or 7½ square inches of fabric.

We now weigh this sample and find its weight to be 9.1 grains.

Always trim sample given accurately to its largest possible dimensions; the larger the sample, the more accurate your calculations will be. Be sure to use a reliable pair of scales for your work.

ASCERTAIN WEIGHT OF FABRIC FOR ONE YARD.

This, like all textile calculations is solved by means of proportion, based upon facts previously obtained, as well as that there are (36 × 54 =) 1944 square inches of cloth in one yard of goods under consideration.

$$\frac{7\frac{1}{2}}{1944} \times 9.1 = 3230 \text{ grains, weight of sample for one yard.}$$

This, divided by 437.5 (number of grains in one oz.) gives us the weight of the fabric as 5.302 oz.

Answer: The fabric in question weighs 5.3 oz., or practically 5½ oz. per yard, including selvage, and which before was not taken into consideration.

ASCERTAIN COUNTS OF YARN USED.

For this purpose liberate carefully warp and filling in the sample, keeping each separate; also keep the different kinds of yarns in each system of threads separate from each other. Weigh each kind of yarn most carefully, also keep track of any refuse fibres liberated from the sample while separating warp from filling. For this reason do the separating on a large sheet of paper so you can clearly see this refuse and if necessary allow for it in your calculations.

Proceeding in this manner we find:

White Warp: 114 ends, 2" long = 228"; to weigh 2.5 grains.

Brown Warp: 125 ends, 2" long = 250"; to weigh 2.74 grains.

White Filling: 74 picks, 3½" long = 262½"; to weigh 1.91 grains.

Brown Filling: 77 picks, 3½" long = 270½"; to weigh 1.95 grains.

Having obtained a given length of each yarn used in the construction of the fabric, also its respective weight, the count of each yarn is readily obtained by proportion, remembering that there are 7000 grains in one yard, and that the standard of the yarn we deal with in our example is 560 yards to the hank of worsted yarn.

White Warp: 228 inches weigh 2.5 grains; ascertain count of yarn.

$$228 : 2.5 :: x : 7000$$

228 × 7000 ÷ 2.5 = 638,400 inches of yarn will balance 1 lb., or what is the same, ascertain weight per yard = 2 Last.

$$638,400 \div 36 = 17,733.33 \text{ yards.}$$

$$17,733.33 \div 560 \text{ (worsted standard)} = 31.66.$$

Answer: 31.66, or practically 32's single or 2/64's (two ply) worsted is the count of the yarn in the finished sample.

After thus ascertaining the count of the yarn in the finished sample, experience has to guide us as to its count in the spun state, taking into consideration any take-up in weaving, loss in weight of cloth in scouring, loss of weight by shearing, singeing, brushing, etc. In our example these items are next to nil, since the sample submitted deals with a very clean yarn from the start and a loosely interlacing weave and texture, balancing any possible take-up in weaving by the life in the

yarn; in other words, yards dressed to equal yards woven and finished, 2/64's worsted, on the heavy side, being the count of the white warp yarn.

Brown Warp: 250 inches weigh 2.74 grains, ascertain count of yarn.

$$250 : 2.74 :: x : 7000$$

$$250 \times 7000 \div 2.74 = 638686.13$$

$$638686.13 \div 36 \div 560 = 31.68$$

Answer: 31.68, or practically 32's single or 2/64's (two ply) worsted (being the same count as its mate, the white warp) is the count of the brown warp yarn to use, to be spun on the heavy side.

White Filling: 282½ inches weigh 1.91 grains, ascertain count of yarn.

$$282\frac{1}{2} : 1.91 :: x : 7000, \text{ and}$$

$$282\frac{1}{2} \times 7000 \div 1.91 = 1033965.97$$

$$1033965.97 \div 36 \div 560 = 51.28$$

Answer: 51.28, or practically 52's single, or 2/100's (two ply) worsted is the count of the yarn to use.

Brown Filling: 293⅞ inches weigh 1.95 grains, ascertain count of yarn.

$$293\frac{7}{8} : 1.95 :: x : 7000, \text{ and}$$

$$293\frac{7}{8} \times 7000 \div 1.95 = 1053813.89$$

$$1053813.89 \div 36 \div 560 = 52.27$$

Answer: 52.27, or practically 52's single, or 2/100's (two ply) worsted, is the count of the yarn to use.

Woolen Cheviot Suiting. (56 inches wide.)

Ascertain *Texture* and *Color Arrangement* for warp and filling; the same to be:

Texture: 20 warp-threads and 15 picks per inch.

Warp Dressed: 1 end Mix

1 " Black

2 ends, repeat.

Filling: All Mix.

Sample trimmed to 3½ inches square, i. e., 12.25 square inches weighs 61.72 grains.

ASCERTAIN WEIGHT OF FABRIC FOR ONE YARD.

$$36 \times 56 = 2016 \text{ square inches in one yard of fabric.}$$

$$12.25 : 61.72 :: 2016 : x$$

$$x = 10157.34 \text{ grains and}$$

$$10157.34 \div 437.5 = 23.21$$

Answer: Sample in question weighs 23.2, or practically 23¼ ounces per yard, exclusive of any selvage.

ASCERTAINING COUNTS OF YARN USED.

Wool Standard, *Run* System, is 1600 yards to 1 run.

Mix Warp: 34 ends, 3½" long = 119"; weigh 14.36 grains.

Black Warp: 35 ends, 3½" long = 122.5"; weigh 17.4 grains.

Filling: 55 picks, 3½" long = 192.5"; weigh 30.37 grains.

Mix Warp: 119 : 14.36 : : x : 7000

$$x = 58,008 \text{ inches} \div 36 = 1611 \text{ yards, and}$$

$$1611 \div 1600 = 1.+$$

Answer: 1 run woolen yarn is the count of the yarn in the finished sample, to which add loss in finishing (scouring). also consider a take-up of 10 per cent in weaving. The first item will call for a heavier spun yarn, the latter will somewhat counteract this, with the result that a 1 run yarn, spun on the heavy side, i. e., leaning towards a ¾ run will be the count desired.

Black Warp: 122.5 : 17.4 : : x : 7000

$$x \div 36 = 1368 \text{ yards, and}$$

$$1368 \div 1600 = \text{practically } \frac{3}{4} \text{ run is the count. Ans.}$$

Filling: 192.5 : 30.37 : : x : 7000

$$x \div 36 = 1,232 \text{ yards, and}$$

$$1,232 \div 1600 = \text{practically a } \frac{3}{4} \text{ run yarn in the finished fabric.}$$

Laying the fabric 74 inches in the loom will in this instance more than counteract loss in scouring, hence the count of yarn to spin is

$$54 : \frac{3}{4} : : 74 : x = 1.2$$

$$\text{less loss in scouring (20\%)} = 0.2$$

$$1.0 \text{ run. Ans.}$$

To find Number of Yards of Cloth to the pound, Avoirdupois.

Cut from the cloth a piece two inches square. The weight of this multiplied by the width of the cloth gives a product which divided into 778 gives the number of yards to the pound.

Example: Suppose we have a piece of cloth 27 inches wide, from which a piece two inches square is cut, weighing 20 grains, then

$$778 \div (27 \times 20) = 1.44 \text{ yards to the pound.}$$

Another Example: Suppose the cloth is 30 inches wide and weighs 10 grains, then

$$778 \div (30 \times 10) = 2.59 \text{ yards to the pound.}$$