

How to Distinguish Quickly Cotton from Linen

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Someone with much experience and practice can differentiate from linen materials by the feel and appearance of the goods, but it is not advisable to rely on such rule of thumb methods especially when mixtures are dealt with.

It is a well known fact that both linen and cotton are vegetable fibers; their basic material being cellulose. Linen originates from a stem (bast) fiber, whereas cotton is a seed fiber. The latter is recognized under the microscope by its cylindrical, flattened tube, which is twisted partially, if not in its entire length. The cross-section of the fiber is elliptical or reniform; the tube is covered with a thin membrane. The length of the cotton fiber is not over 2 1/8 inches. As a seed fiber it is quite soft and somewhat elastic.

Linen on the other hand is a stem (bast) fiber and found between the bark and woody portion of the flax stem. It cannot be isolated completely into single fibers, hence much unsplit fiber is often found in linen yarns. The fiber appears cylindrical under the microscope. The hollow portion is very narrow and in its length small knots are found. It is by far not as soft as cotton.

Testing for Water Absorption

In the testing of fine batistes, table linen and such fabrics the sample can be moistened readily. The procedure for this test is to moisten the finger in clear water and press it against the goods and observe how quickly the goods absorb it. Linen absorbs water much more quickly than cotton, and if it is linen alone, will penetrate to both sides in a very short time. If cotton is present it requires a considerably longer time for the water to penetrate through the fabric.

Other Characteristic Differences

The linen yarn exhibits less fiber ends exuding from the surface of the yarn than the cotton yarn, for which reason pure linen goods as compared to cotton of the same character feel much smoother and cooler. The weight of pure linen goods is heavier than the same cotton goods, although cotton goods can be finished with a gloss and made heavier by filling and finishing. For this reason it is always advisable to rid the particular sample under test from all finishing materials by boiling off or desizing. This will also permit the investigator to note more readily the unevenness of the linen yarn over that of a cotton yarn, because the wet treatment will cause the yarns to regain their original roundness to a certain extent which the mangle destroyed.

Relative Strength Differences

It is often advisable, if the above tests do not suffice, to remove a few warp and filling yarns from the fabric and test them for strength and untwist them. For this purpose a yarn is held between the thumb and forefinger of both hands, one quarter of an inch apart, and then the yarn is pulled quickly apart, if it is cotton. Linen yarn will break only with difficulty or not at all, because linen yarn is made of longer fibers than the cotton yarn. By holding the yarn in a similar manner and untwisting the same, the cotton yarn will come apart much easier than the linen yarn. One will also note that linen fibers are longer, somewhat glossier and less straightened than the shorter and more curly cotton fibers.

Transparency Test

After removal of the finish in the test sample and dry-

ing it, it is moistened with oil. Superfluous oil is squeezed out and the fabric laid between blotting paper. Linen cloth becomes more transparent than cotton cloth. If the linen cloth is laid on a dark background, the linen cloth will appear darker than the cotton fabric. If held against the light the reverse condition exists, i.e. the linen cloth appears lighter than the cotton fabric.

Dyeing and Chemical Tests

In this test the white samples are first freed from finishing materials in the usual manner and then dyed

with Methylene Blue and washed off with water. This will cause the linen to color darker than cotton. Another good test is to treat the samples with an alcoholic solution of fuchsia, rinse it good with water and then steep it in a concentrated ammonia solution for about 3 minutes. This will cause the linen to dye a rose color whereas the cotton stays white. Linen in a solution of copper oxide will show a blue coloring whereas cotton will turn to a pearl cream color. Part-linen goods usually consist of cotton warp and linen filling and it is seldom that such goods are woven any other way.