

# The Burn Test

## Becky Earley

**Short Description:** A Simple Technique for Identifying Fibre Types

**Audience and Space:** Design students and 'upcyclers'

**Duration:** 2 Hours

**What happens?:** It's important to understand how textiles behave when you're selecting a garment for potential recycling or upcycling. For this workshop select a monomaterial garment. The label may tell you all you need to know. There are times, however, when the fibre content is a mystery. One way to test fibre content is to burn the fabric – and watch it carefully as it reacts to the heat, burns, melts, cools, and emits a smell and leaves an ash of varying textures.

In this workshop you can find out how to burn swatches for three common fabric types: silk, wool and polyester. We've also added an identification notes sheet for different fibres.

**Test Procedures:** Select a small sample of at least six to eight yarns about 4 inches long, and twist them together into about a 1/8 inch in diameter bundle. Hold one end of the bundle with tweezers or two coins. A sheet of aluminum foil about 10 to 12 inches square can be used as a protected working area. If the sample ignites it can be dropped on the foil without damage. Either a candle or match can be used to provide the flame.

**Equipment Needed:** You will need to create your own testing kit of a disposable lighter, tweezers, and a tin foil container.

**Pre Workshop Questions:**  
Can you gather a range of fabrics for testing?

**Post Workshop Questions:**  
What fabric types did you have?

**Feedback:** Please feedback to the TED team, [ted@chelsea.arts.ac.uk](mailto:ted@chelsea.arts.ac.uk)

# Identification Notes

**More information:** The burn test is a somewhat subjective, but simple, test based on the knowledge of how particular fibres burn. In the burn test, the following characteristics are noted:

- Do the fibre melt and/or burn?
- Do the fibers shrink from the flame?
- What type of odor do the fumes have?
- What is the characteristic s of any smoke?
- What does the residue of the burned fibers look like?

**Limitations:** The characteristics observed during the burning test can be affected by several things. If the fabric /yarn contains blends of fibers, identification of individual fibers can be difficult. Two or three different kinds of fibers burned together in one yarn may also be difficult to distinguish. Finishes used on the fabric can also change the observed characteristics.

**Caution:** Some fibers are slow in igniting, but then burn quickly. Others can burn hot and produce a painful burn if caution is not maintained.. Care also must be exercised so that your hair is kept out of the flame.

**To end:** Inhale and hold the breath comfortably in for 10 – 30 seconds

## Natural fibres:

**Cotton:** Burns, but does not melt. It has the odor of burning paper, leaves, or wood. The residue is a fine, feathery, gray ash.

**Hemp:** Same as cotton

**Linen:** Same as cotton

**Ramie:** Same as cotton

**Rayon:** Same as cotton

**Silk:** Burns, but does not melt. It shrinks from the flame. It has the odor of charred meat. The residue is a black, hollow irregular bead that can be easily to a gritty black powder. It is self-extinguishing, i.e., it

burns itself out.

**Wool, and other Protein Fibers:** Burns, but does not melt. It shrinks from the flame. It has a strong odor of burning hair. The residue is a black, hollow irregular bead that can be easily crushed into a gritty black powder. It is self-extinguishing, i.e., it burns itself out.

## Manufactured fibres:

Most manufactured fibers both burn and melt, and also tend to shrink away from the flame. Other identifying characteristics include:

**Acetate:** Has an odor similar to burning paper and vinegar. It's residue is a hard, dark, solid bead.

**Acrylic:** Has a fishy odor. The residue is a hard irregularly-shaped bead. It also gives off a black smoke when burned

**Nylon:** Has an odor likened to celery. It's residue is initially a hard, cream-colored bead that becomes darker.

**Olefin/Polyolefin:** Has a chemical type odor. The residue id a hard, tan-colored bead. The flames creates black smoke.

**Polyester:** Has a somewhat sweet chemical odor. The residue is initially a hard cream-colored bead that becomes darker. Flames gives off black smoke.

**Spandex:** It burns and melts, but does not shrink from the flame. It has a chemical type odor. Its residue is a soft black ash

## Sources Online:

[http://www.pacificfabrics.com/media/uploads/2011/03/17/files/The\\_Burn\\_Test\\_to\\_Identify\\_Textile\\_Fibers.pdf](http://www.pacificfabrics.com/media/uploads/2011/03/17/files/The_Burn_Test_to_Identify_Textile_Fibers.pdf)

<http://www.dharmatrading.com/home/the-fire-test.html>

<http://textilelearner.blogspot.co.uk/2011/08/burning-test-of-textile-fiber.html>

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Identification Notes from <http://www.fabriclink.com/university/burntest.cfm>