

## Fabric Burn Test

Use your intuition! Although the information is presented in a flow chart, you do not have to follow the flow. Consider ALL of the contributing factors, including physical appearance of the fabric, when making the ID (ie. linen wrinkles very easily when crushed, far more than cotton; that once helped me to differentiate between mercerized cotton and linen).

If you're having trouble, try burning known samples of fabric to compare, washing the fabric to remove sizing, or consider whether you may have a fabric blend.

## Glossary of Fibre Burn Test Chart Terms

**Self-Extinguishing** - Burns, but goes out soon after the source of flame is removed.

**Does not self-extinguish** - Continues to burn/support a flame long after the source of flame is removed, sometimes until the entire sample is incinerated.

**Melts** - Pulls away from the source of flame and forms a bead.

**Chars** - Fibres darken, but do not form a hard, uncrushable bead.

**Odour of burning.../Smells like...** - The odour released while the sample is burning or the smell of the ashes after the sample has been burned. Be careful when considering this, as fumes can be hazardous.

**Bead** - Ball-like shape

## Safety

Be sure to work over a flameproof surface such as a glass or metal dish/tray for your burn tests. Tie loose hair back, and use tweezers to hold the samples. Keep a container of water nearby.

Use caution when testing - some fibres can produce hazardous fumes. Test a small sample of fabric or fibre to reduce the chance of exposure to a large amount of toxic fumes, and work in a well-ventilated area. Synthetics and chemically-treated natural fibres are more likely to produce hazardous fumes than natural fabrics - perhaps knowing that a fabric is synthetic is enough for your purposes? I have listed the fume hazards where known, but the tables may not reflect all possible hazards.

## Identifying Blends

Fabrics that are made of a blend of fibres can give confusing results. This can make it impossible to identify the fabric, but here are some tips to help make the ID:

- Use fibres of only one colour at a time, and test separately
- Pull the fabric sample apart and test the warp and weft fibres separately
- A single thread may be a blend of two different fibres. This can be very obvious, if part of the thread is shiny and part is dull, for instance, or can be very subtle. If the above separation techniques do not work, consider untwisting a few individual threads and testing the divided thread pieces. This is by far the most difficult identification to make, as your sample size will likely be very small.

<b>Fibre Type</b>	<b>Self-Extinguish?</b>	<b>How it Burns</b>	<b>Odour of burning...</b>	<b>Ash/Bead</b>	<b>Other Characteristics</b>
<b>Linen</b>	no, but once put out, no smouldering or glowing	Chars, can be difficult to ignite, yellow-to-orange steady flame, burns more slowly than cotton, extinguishes by blowing on it, bulk fibre "flash" burns, loose fibre burns rapidly	grass, paper, or leaves	soft, grey ash, possibly "lacy"	Cellulose fibre from flax seed
<b>Jute</b>	no, but once put out, no smouldering or glowing	Chars, doesn't shrink from flame, similar to hemp or linen	grass, leaves, or paper	soft, grey ash, possibly "lacy"	Cellulose fibre
<b>Hemp</b>	no, but once put out, no smouldering or glowing	Chars, ignites rapidly on contact, bright flame, similar to jute or linen	grass, leaves, or wood	soft, grey ash, possibly "lacy"	Cellulose fibre, no fume hazard
<b>Cotton or Ramie</b>	no, ember continues to glow, and slowly burn/ smoke after flame gone	Chars, ignites as the flame nears, yellow-to-orange steady flame, burns rapidly, smoke is grey or white	paper, leaves, or wood	soft, grey, fine ash, easily crushed, small amount	Cellulose fibre
<b>Rayon</b>	no, ember glows when flame is gone, possibly longer than cotton	Chars, may flare when ignited, fast, orange flame, may shrink up and become tighter as it burns	paper, leaves, or wood	soft, grey ash. Almost no ash. May leave a bead if fabric finish applied.	Manufactured cellulose fibre from cotton or wood pulp, mild fume hazard
<b>Mercerized Cotton/ Linen</b>	no	Chars, similar to cotton or linen	paper, leaves, or wood	soft, black ash	Chemically-treated natural cellulose fibre
<b>Bamboo</b>	no	Chars, orange, steady flame, blue at base, slow burn	paper or wood	soft, black ash	Cellulose fibre from bamboo
<b>Silk</b>	yes, burns with difficulty, sputters	Chars, curls away from the flame, sputters	hair, feathers, charred meat, or teeth	dark grey to black, hollow, soft bead that breaks into a gritty powder	Protein fibre from the silkworm, little to no smoke, which is non-hazardous
<b>Weighted Silk</b>	yes	Melts then chars, shrinks from the flame	hair, feathers	Open, lace-like ash that resembles the structure of the original sample	Protein fibre which has been chemically treated - possibly hazardous.
<b>Wool, Mohair, Alpaca, Cashmere, Camel, etc.</b>	yes, supports flame with difficulty	Melts, then chars, harder to ignite than silk, shrinks/curly from the flame, orange flame, burns slowly, sizzles	hair, feathers, or teeth	Irregular, dark, brittle ash that can be crushed into a gritty powder	Fur and hair of animals, can create dark smoke, moderate fume
<b>Acetate, Triacetate</b>	no, can flare up after flame is removed	Melts away from/ahead of flame, burns quickly, sizzles, drips dangerously, carrying flames with the drips	vinegar or paper	hard, brittle, irregular, black, uncrushable bead/ash	Manufactured protein fibre, black smoke, hazardous fume

Fibre Type	Self-Extinguish?	How it Burns	Smells like...	Ash/Bead	Other Characteristics
<b>Modacrylic, Polyacrylic</b>	yes, but continues melting after flame is removed	Melts then burns, flares at match-touch, shrinks from flame, burns rapidly, hot sputtering, drips dangerously, may produce black smoke	sharp, acrid chemicals, fishy, burning meat	hard, black, irregular bead	Man-made from natural gas and petroleum products, fume hazard
<b>Vinyon</b>	yes	Chars more than burns	sweet, fruity chemicals	hard, black, irregular bead	Man-made
<b>Polyester</b>	yes, but not always; after flame removed, burns slowly and may produce soot	Melts, then burns, quick-burning, may flare, shrinks away from flame, orange, sputtery flame, drip danger, black smoke	sweet, faint, fruity chemicals; like burning pine tar	hard, black, round bead starts cream-coloured and then darkens	Man-made from coal, air, water, and petroleum, fume hazard
<b>Nylon/ Polyamide</b>	yes, when flame is gone, supports combustion with difficulty	Melts, flame has blue base and orange tip, sizzles, burns quickly; when flame is gone, burns slowly and melts, dripping dangerously	celery or plastic	Hard, cream-coloured bead darkens to grey/brown	Man-made from petroleum, no smoke, but fumes are very hazardous
<b>Olefin</b>	yes, but can continue to burn	Melts, then burns, shrinks away from flame	asphalt or paraffin	hard, tan bead, or same colour as fibre	Man-made, black smoke
<b>Spandex</b>	no	Melts, does not shrink from flame, can drip dangerously	chemical, rubber	soft, black ash	Man-made
<b>Acrylic (orlon, acrilon)</b>	no	Melts and burns very slowly	meat	hard, black, irregular bead	Man-made, no smoke
<b>Acrylic (zefran, zefkrome)</b>	no	Melts and burns very slowly	turmeric	soft, black, irregular ash	Man-made, no smoke
<b>Glass/ Fibreglass, Asbestos, Metal</b>	n/a	Doesn't burn	n/a	n/a	

Chart references:

<http://www.ditzypriprints.com/dpburnchart.html>

[http://www.fiber-images.com/Free Things/Reference Charts/free reference charts fiber content guide.html](http://www.fiber-images.com/Free_Things/Reference_Charts/free_reference_charts_fiber_content_guide.html)

<http://www.fabricmartfabrics.com/Burn-Test-Chart.html>

<http://www.griffindyeworks.com/site2/wp-content/uploads/2012/11/burn-test.pdf>

*Fibre class notes from Cleveland Institute of Art, 1992, original source unknown*

## Other Fabric Characteristics

(Adapted from handout provided by Fabric Gallery, in Williamston, MI)

Characteristic	Silk	Wool	Cotton	Linen	Polyester	Nylon
<b>Durability</b>	Good	Excellent	Good	Good	Good	Fair
<b>Cost</b>	Med-High	Med-High	Low-Med	Med	Med	Med
<b>Resiliency (Wrinkle Resistance)</b>	Fair-Good	Good	Fair	Fair, but improves with washing	Good	Fair
<b>Insulative Quality</b>	Good	Excellent	Fair	Fair	Fair	Fair
<b>Affinity for Dye</b>	Excellent	Good	Good	Good	Fair	Good
<b>Breathability</b>	Excellent	Excellent	Excellent	Excellent	Poor	Good
<b>Versatility of Weaves Avail.</b>	Good	Very Good	Good	Good	Fair	Fair
<b>Static Resistance</b>	Good	Excellent	Good	Excellent	Poor	Fair
<b>Care</b>	Dry Clean or Hand Wash (painted and metallic silks cannot be washed)	Usually Dry Clean	Washable	Dry-clean, machine wash, or steam	Easy Care - Washable	Most Dry Clean - Some Washable
<b>Absorbency</b>	Good	Very Good	Good	Good-Very Good	Poor	Good
<b>Other Notes</b>	Types include noil, organza, chiffon, Chinese, metallic, painted, and more.	Comes in everything from light and see-through (tropical weight) to thick and heavy.		Finest linen has even-diameter threads with no slubs, though slubs do not compromise integrity.		