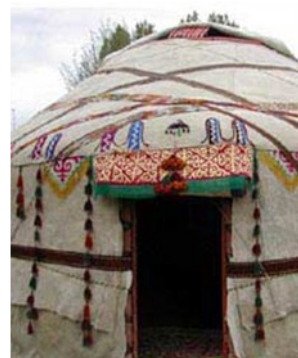


Technical Bulletin

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What is Felt, and why has it been one of the most popular textiles for over 5000 years and what is the connection with Lewis Carroll's Alice in Wonderland?

Felt is a non woven textile. It is made by compressing and matting fibres together until they connect to form a sturdy fabric. (see page 3 for after care for felt and Lewis Carroll)
Felt has been used in many cultures as a material for clothing, footwear, rugs and even tents. The distinctive yurt was traditionally made from felt. Felt can be made of natural fibres such as wool or animal fur, or from synthetic fibres such as petroleum-based acrylic or acrylonitrile or wood pulp-based rayon. Felting is the natural characteristic of most animal fur to entangle and form matts. Wool is particularly well suited to felt and is superior to synthetic fibres. Characteristics include an inherent durability and resilience as the crimp or bend in the fibres gives it a natural elasticity.



Felt is man-made, a fabric created originally from natural fibres. Most created fabrics these days are generally woven; however, felt differs in this sense. So, what is felt exactly? A Felted fabric is created from fibres being compressed and matted, often pressed together using heat, moisture and a *lot* of pressure. It can take a large amount of work, but the result is a very dense fabric consisting of permanently interlocked fibres. Felt is a textile material that is produced by matting, condensing and pressing fibres together.

What is Felt Made From?

Felt was traditionally composed of wool or other natural raw materials, which generally produces the highest quality and softest fabric. Wool also mats very easily, making it ideal for this fuzzy fabric. However, adding synthetic fibres into the mix (such as polyester or acrylic) can improve the product depending on its intended use. Adding a percentage of synthetic fibres can increase felts durability for certain crafts or industrial use, and can also increase pliability. A common fibre sometimes added to wool is rayon, which when added removes the prickly feeling that pure wool can often have against the skin. Meaning that a synthetic mix is the best of both worlds!

How is Felt Made?

As mentioned, the process of creating felt can be pretty labour intensive, involving various steps of blending the fibres, matting the material, shrinking and steam-pressing. However, the most straightforward method is simply to apply heat and moisture which causes the mix of fibres to merge and blend together. You can even do this yourself at home to any wool or knitted products – pop it in the washing machine for a process known as ‘felting’ or ‘fulling’ – the same thing that happens when you accidentally shrink that woollen jumper!

Felt Origins

Wool felt is one of the oldest known textiles. The location of its origin is debated, with many cultures having their own origin legends for the process. However, it is thought to have been created over 5000 years ago in Asia. The method is still practised by Nomadic peoples in Asia to make tents, rugs and clothing, including traditional yurts (seen above) and more tourist oriented items such as decorative slippers. One commonly told origin story is that during the Middle Ages, men lined their sandals with wool for comfort. Over time, the fibres in the wool became interlocked and felted as a result of the moisture, warmth and recurring pressure from being walked on.

Types of Felt There are a few types of felt readily available to work with, alongside needlefelt which is used in our industry for press clothing and covering ironing rollers in a laundry (calender).



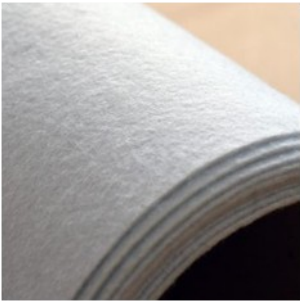
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Pressed felt

This is the oldest form of felt (or fabric at all) that is known to man, it even predates knitting and weaving techniques. It's the most common type, which uses wool fibres or a blend of wool and synthetic fibres which are compressed using heat and moisture, causing the fabrics to interlock. It can be cheap to make, and can also be made in a range of thicknesses which achieve a high density.

Needled Felt



In the case of needed felt, a blend of wool and synthetic fibres, or 100% wool, are again interlocked but this time by a machine rather than naturally. Machines that contain thousands of needles interlock the fibres to produce this softer, less dense type of felt fabric which is often used for heated rollers and press covers in our business.

Woven Felt

To make woven felt, wool or a wool blend is directly woven into a cloth and then moisture and pressure are applied. This makes the fibres naturally interlock, as with pressed felt. This incredibly durable fabric is ideal for musical instruments and door seals, and has a much lower maximum thickness than needed or pressed felt.

What is Felt Used For?

So, what is felt used for? Felt has a huge range of uses, depending on the type you're using and the quality of the wool. Wool has different textures ranging from silky to coarse, which ultimately effects the felt you create with it. Felt has an incredibly unique texture and qualities, and can be made from a wide range of materials which is quite unusual in a fabric. Needed felt is very soft, whereas wool blends are light and breathable but still keep you toasty during the winter months; making them perfect for knitwear. Pure wool felt is a natural insulator and very resilient to wear and tear, as well as being strong and able to absorb moisture. This means it can be used for home furnishings as well as decorative items.

Synthetic felts are manufactured using man-made fibres that do not bond together naturally. To construct the felt they can be needed together, or fused using chemical impregnations and heat. They are usually measured in grammes per square metre.

Unlike woollen felts where density, hardness and thickness are all inter-related to tensile strength, synthetic felts owe their hardness and strength to fibre type, impregnations and finish. Therefore if a very strong, thin felt is required, or pore rates are critical to the micron, as in precision filtration, synthetics will offer an advantage over wool. However, synthetics cannot match wool's performance in compressibility, elasticity, absorption and abrasion, but they can be harder wearing, and in applications where either could be considered they can offer a price advantage. Blends are available to provide a combination of both types of fibre where application demands. Singeing of some fibre types can be carried out to reduce pilling. (bobbles on the surface)

Heat Setting – fibres can have a tendency to shrink in length when substantially heated. To minimise this effect they need to be heat stabilised. This can be achieved by exposing the material to a temperature above that expected in the application. This process helps the material to relax and results in a fabric that will have minimal shrinkage at the required operating temperature.

Advantages and Disadvantages of Felt Fabrics

Advantages

Durable
Warm but lightweight
Doesn't fray
Easy to cut and work with
Available in wide range of colours and thicknesses
Generally inexpensive
Versatile



Wool Felt is highly resilient, retaining its strength and unique properties for decades. Wool Felt is flame retardant and self-extinguishing. Synthetic Felt and Wool Blend Felt can be treated for flame resistance. Wool felt is a renewable and environmentally friendly resource.

Disadvantages

Not particularly supple
Minimal elasticity
Coarse texture
Potential to shrink
Can pill or fuzz over time

Moths. Like other woollen materials, clothing made from felt is susceptible to moth damage. When felt is worn close to the body, the wool absorbs sweat and moisture, which are the primary water sources for moths. As the pests feed on the clothing, they create holes in the fabric, which can ruin the garment.

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Care for Felt:

Unfortunately, wool felt is not something you can pop into the washing machine. Dry cleaning is typically recommended, though you can try hand washing with a detergent such as Woolite. Since colours can bleed, if your garment includes more than one colour of felt, you should try spot cleaning first.

Spotting and Stain Removal – Susceptible to damage from mechanical action

Dry Cleaning: Dry cleanable in all solvents on a gentle process.

Machine Washing: Felt is not machine washable

Professional Wet cleaning: Clean with care on a gentle process.

Finishing: Steam Press and vacuum to set. Avoid direct pressure on seams to prevent glazing.

Hand wash separately in warm water with a small amount of dissolved, gentle pure soap, shampoo or wool wash. When washing gently massage the item – do not wash vigorously or it will felt more and shrink in size. A dash of acetic acid in the final rinse water is helpful.

Carroting can be seen in the Hatter's Museum in Stockport, Cheshire.



Invented in the mid 17th century and used until the mid-20th centuries, a process called "carroting" was used in the manufacture of good quality felt for making men's hats. Beaver, rabbit or hare skins were treated with a dilute solution of the mercury compound mercuric nitrate.

The skins were dried in an oven where the thin fur at the sides turned orange, the colour of carrots. Pelts were stretched over a bar in a cutting machine, and the skin was sliced off in thin shreds, with the fleece coming away entirely.

The fur was then blown onto a cone-shaped colander and then treated with hot water to consolidate it. The cone then peeled off and passed through wet rollers to cause the fur to felt. These 'hoods' were then dyed and blocked to make hats.

The toxic solutions from the carrot and the vapours it produced resulted in widespread cases of mercury poisoning among hatters. This may be the origin of the phrase "mad as a hatter" which was used to humorous effect by Lewis Carroll in the chapter "A Mad Tea Party" of the novel Alice in Wonderland.