

Effects of pH on Felting of Superfine Merino Wool

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We all know that the main ingredients for felting are agitation, lubrication (in the form of a soap), water and heat. Each of these ingredients plays a significant part in the felting process. The ways in which we use these ingredients will vary depending on the type of wool being felted. In this article I will be focusing on the effect the lubricant (soap) has on felting making when using Superfine Merino (meaning wool between 17.6 and 18.5 microns).

The surface of a wool fibre (the cuticle) is relatively difficult to wet-out, even after it has been scoured (de-greased) because of the waxy, hydrocarbon coating that is chemically bound to the surface of each cuticle scale. These scales overlap on the surface of the wool fibre like tiles on a roof. One reason to use soap during feltmaking is that it allows water to penetrate through this waxy coating. When water penetrates into the fibre it swells the cuticle scales; thereby facilitating easier felting. Water also acts to make the fibres more elastic which in turn causes wool to stretch and recover forming a tighter and tighter mass. Soap is also used as a lubricant which facilitates the scaly fibres to slide over one another more easily, thus helping to create an entangled mass more easily.

It has been proven that fibres only migrate in the direction of their root ends (called Directional Frictional Effect). Although changes in soap pH do not significantly affect the Directional Frictional properties of wool (Lindberg), a soap's pH was found to influence felting rate by changing the elastic properties of the fibre (Speakman). The ease of a fibre's extensibility was found to be at a minimum in the pH range of 4-8, which corresponds to low felting rates. When the pH was either low (acids) or high (alkaline) increased fibre extensibility was found and also the felting rate. (Rippon)

However, just because felt can be made faster at both a higher pH and a lower pH doesn't mean that is the best choice when using Superfine Merino. "For example, the higher the pH or temperature of the solution the greater is the degree of yellowing of wool while problems with colour bleeding and damage are then more likely." (Feldtman).

It has been my experience as a feltmaker that by using soap with a pH lower than 7 or higher than pH 9 can forever alter the handle of your superfine merino. Yes, it can speed up the process, but at a price!

Note that detergents are made by adding builders to soap (ie to enhance whiteness, etc...). These builders also tend to increase the pH of a product; therefore, I tend to steer away from using detergents. Also, some products that are specifically made for the washing of Woolens can be formulated to actually retard shrinkage, so beware they are not a good choice for a feltmaker. As for using Vinegar as a final rinse, it is my belief that this practice arose because of the use of harsh soaps with high pH values. Vinegar is an acid and would neutralized the excess alkalinity, leaving the wool with a more neutral pH. However, "just giving an acid rinse after is not always so simple; unless you know what's happening you may leave the goods with a harsh hand (scratchy)" (Beaudet). Especially when using Superfine Merino!

My recommendation is to treat your Superfine Merino with respect and use a gentle Dishwashing Liquid with a pH between 7-9. Google on Material Data Sheet (or Safety Data Sheet) using the exact product name and check out the pH of the soap you are thinking of using. In general start by using 1ml of soap to 1 liter of room temperature water for the Rolling (Hardening) process, and then my practice is to change to a bar of Olive Oil Soap for the Fulling aspects. Beware that some of the old favourites like Lux Flakes and Ivory all have a pH greater than 9.

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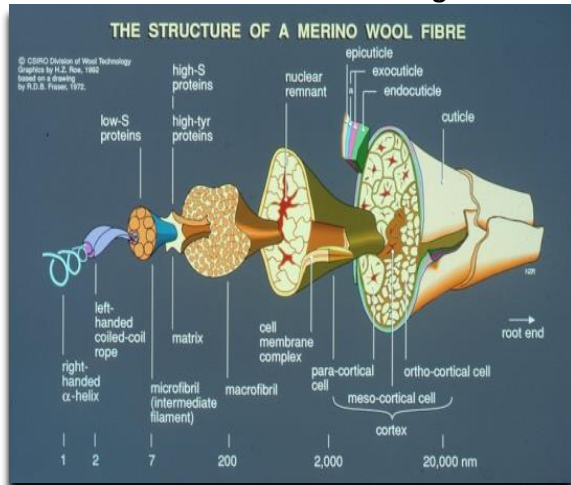
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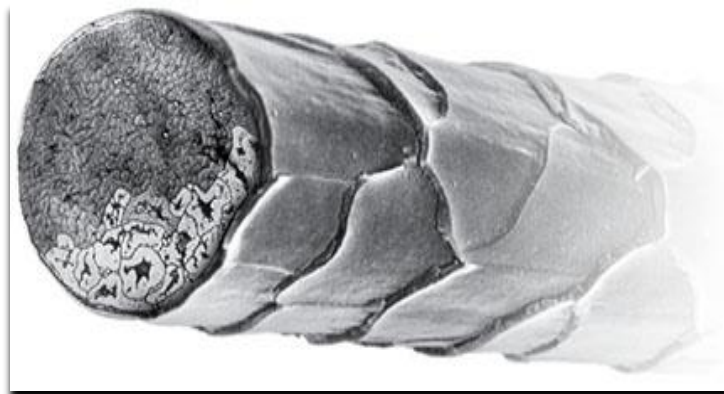
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Entanglement of wool fibres during felting



Electron Microscope of Single Wool Fibre



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Nancy Ballesteros has passionately been working with textiles most of her life. As a child she learned to sew and then was introduced to spinning, felting and dyeing while studying Vet. Medicine at university. Textiles ultimately took over as her life's passion, and in 1987 she hatched an international textile fibre business called Treetops Colour Harmonies. Here she creates and hand-dyes unique colour palettes onto wool, silk fibres and fabrics. After moving to Australia in 1990, she immersed herself in the science of wool and attended Wool Classing courses. She has now been designing colours and felting for over 30 years. She has taught in Australia, New Zealand, Europe and the USA, mostly concentrating on unravelling the mysteries of Nuno felting using Silk and superfine Merino.

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