BREMER WOLL-KÄMMEREI AG

The Product of Bremer Woll-Kämmerei: Wool Top

The word "top" stems from the Old High German word "Zopf" meaning a tuft of hair. In the wool industry it designates a continuous strand of the longer wool fibres after straightening and separating from the shorter fibres by combing. In pre-industrial days the wool actually was pulled through a comb by hand. The short fibres and the tufts of wool known as "naps" were held back by the teeth of the comb as so-called "noil". The purpose of combing was in those days exactly the same as today: to prepare the wool for the spinning of fine, uniform yarns known as worsted yarns. In those days, depending on the quality of the wool, a wool comber managed to produce between half a kilogramme and two kilogrammes of top in a 12-hour working day.

One of today's high-performance combing machines produces more than 30 kilogrammes per hour. Whole batteries of such machines are arranged into combing lines and operated and monitored together with the additional aggregates (carding machines, preparatory gilling and finisher drawing frames) in an 8-hour shift by only six operatives.

So remember:

Wool top is a clean, uniform sliver of parallel wool fibres which - freed of short fibres and fibre entanglements - goes as a semi-product to be processed further in a worsted spinning mill.

Why is wool combed?

Well, to begin with wool does not always have to be combed. Yarn made from uncombed wool is known as woollen yarn. As the short fibres have not been removed from the wool, woollen yarn has innumerable fibre ends sticking out of it. In the woven fabric this makes for fluffy, mossy or bristly surface.

Well-known quality names for fabrics made from woollen yarn are flannel, loden, melton and tweed.

Combed wool, on the other hand, makes it possible to produce yarn of a different character. As the short fibres have been removed, the long, parallel fibres can be spun into a uniform, smooth and thus high-quality yarn, namely worsted yarn. Furthermore, worsted yarns can be spun much finer than woollen yarns since fewer fibres are required in the yarn cross-section. Woven and knitted fabrics made of worsted yarns are characterised by clear, uniform surfaces.

Textiles made of combed wool open up the whole diversity of what the fashion world can offer: from elegant to rustic, from formal to casual, from cosily warm for cold days to "cool" for spring and summer.

The Production Process: Raw Wool Becomes Top

Raw Wool

BWK mainly processes the wool of the merino sheep, which is especially fine, features a strong crimp and is used for high-quality outerwear. The wool comes predominantly from countries in the southern hemisphere: Australian, New Zealand, South Africa and South America. After being shipped to the ports of Hamburg and Bremerhaven, the wool is delivered to BWK by rail or lorry.

Preparation

In the preparation area, the bales of raw wool are put together into lots. Bale openers loosen up the compressed wool, which is then blown through pipes into the wool scouring mill.

Wool Scouring

The wool is scoured, i. e. washed, in order to remove perspiration salts, grease, sand, earth and dirt from the raw wool. Using soda and washing agents, these substances are gently washed out of the wool while subjecting the wool to minimum mechanical stress.

In a further process, wool wax is gained from the wool scouring water. This wax is used for cosmetic and technical purposes.

The scoured and dried wool is again transported through pipes by blowers to the carding and combing systems.

Carding

The scoured wool still contains some vegetable matter such as burrs, plant seeds and grass. These are removed mechanically from the wool on the carding machines. These machines consist of a complicated system of several large and small rollers covered with needles, some rotating in the same direction while others rotate against each other. These pick up the wool flocks and split them down to the individual fibres. What then forms on the last roller is a fine wool web which is drawn off like a veil and for the first time put into sliver form (carded sliver).

Preparatory Gilling

The machine aggregates following carding, namely the gilling frames, have the task of putting several carded slivers together, mixing them and drawing them out. In this way the fibres are drawn parallel to each other and the sliver is rendered more uniform.

Combing

Wool consists of fibres of different lengths. However, as only the long fibres are used to produce worsted yarn, the short fibres have to be removed from the wool.

This is done on the combing machines. The carded slivers, which have now been gilled several times, are carefully pulled apart and one end of the sliver is held in a nipper jaw. Then a circular comb runs through the free tuft of fibres and combs out all the fibres that are not being held by the nipper jaw. After this, the ends of the tuft are again laid on top of each other and moved a few centimetres further forward. This process is carried out several hundred times a minute. The result is

the wool top, which consists only of long wool fibres lying parallel to each other.

The combed-out short fibres are known as "noil". This is used in woollen spinning and in the felt industry.

Gilling and Finishing, Packing

The gilling passages after the combing machines again mix and equalise the wool tops. These are wound into 10-kilogramme bobbins or pressed to form bumps and tied up with string. On the packing press, 56 such bobbins and bumps are packed into a bale. The wool top is then ready for dispatch to the worsted spinning mills.

Environmental Protection

Scouring wool needs a lot of water so that large amounts of waste water are produced. This contains the substances washed out of the raw wool such as sand and earth, grease, perspiration salts, other organic constituents and substances with which the sheep have to be treated to protect them from troublesome pests.

Through high research and investment input and in collaboration with university institutions, with the engineering company Lurgi and with the Federal Environmental Agency, we have managed to solve the problem of cleaning the waste water. The process consists of a combination of a biological water treatment plant and an evaporation and incineration plant.

What is special about this process is the way the wool scouring water is treated by evaporation and incineration.

The scouring water is heated to turn it into steam and separated into an energy-rich concentrate. The steam condenses into water that can be re-used in the production process and which we use for wool scouring. The concentrate produced by evaporation is incinerated at 1200°C; this destroys all the organic constituents and harmful substances. The energy released is converted into steam and electricity for the combing plant.

Our waste water cleaning system therefore works with water recycling and energy recovery. Furthermore, the amount of sludge collected in our biological water treatment plant is reduced by 75% and fresh water is saved. The Federal Environmental Agency rated our process as trend-setting for identical and similar problem cases and provided financial assistance for the investment involved.

Also in future, we at BWK will resolutely continue to advance the level of resources-thrifty environmental technology. In all fields.

In order not to jeopardise the good reputation of wool as a natural product, all efforts are justified to make sure that, from its production via all processing stages and through to the ultimate consumer, we can in future continue to award wool the best possible certificate for environmental friendliness.

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