

Sizing of the Toweling Fabric Yarns

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There are two beams in the loom when towel weaving technique is considered. One of these beams is the upper beam, also called as pile beam, which forms the pile yarns of the towel and the other is the lower beam, also called as the ground beam, which forms the ground knitting of the towel. These beams, which are woven in the same loom, are sized separately after being unwound. Thus the sizing of the two beams is achieved at the optimum level without any problem and the start of the weaving process with two separate beams are quite important. Otherwise, it will not be possible to create a healthy weaving surface. Generally the two beams have different yarn numbers and types, so the sizing recipes are prepared after the features are taken into consideration and sizing materials suitable for the demanded quality should be opted.

Pile beams spin faster approximately at the rate of one-six (1:6) during the weaving process when compared to ground beams. This is because ground yarns form a tighter structure by knitting like cloth fabrics when forming the towel, but pile yarns both join in the ground knitting and form the pile yarns of the towel. Thus, pile yarns have less difficulty in forming the knitting of the towel since they curl. Towel production is collected under two titles. One of these is the production of bathrobes. During the production of bathrobes, classic towel knitting is used during the whole process of weaving. The other is the production of towels. As well as

classic towel knitting, both pile yarns and ground yarns are included in knitting especially for borders during towel production. Many kinds of formed and designed towel and bathrobe designs and patterns have started to be manufactured today. At the same time, a lot of raw materials and yarns made out of these are used in the production of towels. So, it is quite important for these beams to be sized. It is also important to use the qualified sizing materials, which could respond to all the versatility.

With the factors we have mentioned roughly above, pile yarns are exposed to friction at a lower rate when compared to ground yarns during the weaving process. That is why they require sizing less than others. However, the sizing to be made should be durable against the

friction power of the border parts of the towels especially during the weaving of towels and towels with wide border, because during the border production, pile yarns and ground yarns will enter into the knitting at every insertion of the weft and form a close surface. Pile yarns are consisted of single plied yarns. But it can be consisted of two plied yarns, as well. Generally, pile warps are drawn at the direct warp beamer whether they are colored, repeated or raw. But there are cases in which they are drawn at sectional warping machines when the repeat is wide and the number of yarn bobbins is not enough. Generally the cotton yarns NE 16/1 and NE 20/1 are used as pile yarns during the production of towels. The use of carded or combed yarns change in terms of the quality of the towel or bathrobe. They are woven with 12 w/cm closeness at the loom. If the pile yarns are woven to be a bathrobe, less sizing is needed since borders are not necessary for bathrobe production. However, special patterns and designs should be evaluated and then recipes should be adjusted accordingly. In the companies, which have their own sizing machines, planners and weaving preparation office should always be consulted about these matters, because the recipes that are applied to all types of production cause problems. Since every firm has different working conditions, the warps drawn with prepared recipes should be monitored in the weaving room and adjusted at the optimum level. If the pile yarns are two-ply, sizing



Figure 1

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process is not needed but if it is taken from direct warp beamer it would be appropriate to place the warp in sizing solution for a short while and supply with an anti-static wax. This will prevent the yarns from spinning in the pile beam at low closeness and forming pile draw by attaching to each other. During the weaving of pile yarns, it is important to get them to the lamella. So, it is important to weave drafts at the sizing card to create a smooth beam surface. Weaving drafts is required to place the repeat and the wires on the card when process is carried at colored and direct warp beamers.

Warping process of the pile yarns is quite important. Pile towels should be at the same tension to carry out a healthy towel production. Yarns, in which there are tension differences between pile yarns cause pile draws and warp fractures and after the finishing processes at dyehouses they tend to lie on a different side and cause marks and breaches through the whole roll of yarn. It is the same for ground yarns, as well. That is why, during the warping process, all the bobbins should be controlled before mounting on the creel and when corrupted winding, different numbers, yarns twisted in a different way are noticed, they should be prevented from blending in the warp. Also, tension calibrations of the warping machine should be carried out frequently and it should be made sure that there is no difference between the front bobbin and the back bobbin. During the operation, the dirt coming from inside the bobbin and dust, which accumulates in the break drums should be monitored and cleaned when necessary because in such cases, the yarn becomes deformed with hairiness and the tension changes.

While preparing the recipes of pile yarns, the condition of the sizing machine and the weaving room should be taken into account and the recipes should be standardized accordingly. The important element to weave a good towel on the loom and make the surface as smooth as demanded, is to make sure that pile yarns are as loose as possible and ground yarns are as tight as possible. This will enable the pile yarns to be formed on the surface we want and ground yarns to be uniform and tightly bound so that they will not break apart. Piles should be flexible and durable to be able to form a smooth curl and lie at the same side and create a smooth towel surface. Moreover, the fibers that are broken from the yarn axis should not attach the ground yarns and create

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errors. These demanded features can only be possible with fully synthetic sizing materials. Fully synthetic sizing materials decrease the amount of litter, prevent the fibers from accumulating between the lamellas and in the harness wires and thus prevent warp fractures and pile draws. The most important difference between fully synthetic sizing materials and starch based sizing



Figure 2

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materials is the softness. Starches based sizing materials become much harder and take away the flexibility of the yarn. Sometimes this hardness cause problems in forming the curls and prevent them from being at the demanded height and structure. Pile formation can be observed in the shapes below (See pic.1)

Production at different pile heights is carried out with the new generation looms. Yarn elasticity and flexibility is important especially for this kind of production and errors, which could happen during the formation of the shortest and longest piles, should be prevented. One of these errors is observed when the curl of the longest pile twists and enters into the ground knitting and becomes shorter than the demanded

height and thus causes errors called pediculous on the other side of the towel. (See pic.2)

Since bathrobes and towels are products that get in touch with the human skin directly, there should not be a sizing waste left on them. Fully synthetic sizing materials are used less in towels than their starch based kind and are cleared from the surface of the towels only with hot water and so; they are much more preferred in towel production due to the easiness and lower costs. The leftovers from after the use of synthetic sizing can be preserved in the relaxation boilers for a long time without any deterioration and thus, the losses caused by sizing process can be prevented.

Pile yarns that are formed in smooth curls provide an advantage to the to-



Figure 3

uché of the towel after the process in dye houses. The surface appearance and the touch of the towel affect the customers, who will purchase it, as well.

During the weaving process and when the woven rolls of yarns are formed, piles formed with yarns, which are sized with the starch based materials, are intertwined because they are stiff and hard. Even when these towels or fabrics to be bathrobes are decatized, unfortunately the problem is the same. These rolls or decatized rolls create pile draws by pulling each other during the re-opening for the finishing process in dyehouses. But with yarns, which are sized with fully synthetic sizing materials, this problem and the effort do not go to waste. (See pic.3) Another key element to be considered while pile warps are

drawn is that the warp piles should be softer than standard towels and bathrobes if the surface to be woven is going to be velvet. The reason for this is that when the fabrics of towels and bathrobes are shaved after woven, the piles are cut and the hard piles are torn by the razor. When it is too soft, the piles lie completely down and a healthy shaving is not possible. That is why, a recipe that is a little softer than the normal pile sizing, should be fixed. As we have mentioned above, one of the key points of weaving a towel is to make sure that the ground warps are as tight as possible. Also, the friction resistance of the ground warps should be high. Generally Ne 20/2 double-layered yarn is used as a ground yarn for towel production. Some establishments do not size ground yarns. However, this situation is valid for establishments, which

weave at low speeds and produce bathrobes. Ground warps enter into the knitting constantly like cloth weaving, do locking with the weft yarns, so; let pile yarns form piles and create towel surface when the card strikes. At that moment, they touch both to each other and to pile yarns. Also, they touch the dents of the card. Thus, they should have high elasticity, durability and friction resistance.

That is why, when they are sized with fully synthetic sizing materials, they can resist all the external influences. The sizing film on these yarns, which are under high tension, should adapt to the tension and should not be torn. Fully synthetic sizing materials, which have higher film elasticity when compared to starch based sizing materials, are preferred. Towel manufacturers have been using the single-layered yarns in the ground beams in recent years in order to reduce the costs. In this case, fully synthetic sizing materials are recommended because the only sizing materials to fit the conditions we have mentioned above are the fully synthetic ones. The lino size line of the synthetic sizing materials are used in small amounts in towels and they have lower costs when compared to starch based sizing materials and so; it is possible to save 20% in sizing costs. Nowadays, optimization in every stage of the textile production is necessary.

The studies are conducted in terms of quality, but the ruthless competition makes cost research is as much important as the quality. At this point, we hope that the points we have mentioned above can cast a light on the studies that are carried out by establishments, which manufacture towels. We believe that the establishments, which optimize their production process and are open to innovation, will always win.

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