



Metric Felt Company

Wool Felt Products and Industrial Textile Conversion Manufacturing

FELT ROLLERS, SEAMLESS SLEEVES, AND BELTS

Rollers perform many functions. The applications available for seamless felt sleeves and belts are equally as varied. Wool felt is suitable as a roll covering material if: (a) the rollers are to absorb fluids, compress or uniformly moisten a surface, (b) tacky materials are not to adhere to the roller outer surface, (c) a roller is to have an elastic outer surface, such as conveyer rollers for sensitive articles or as sound absorption measure, or (d) the coefficient of friction of the wool felt is important for the function of the roller.

There are a number of possibilities for the manufacture of a roller with a felt outer surface.

WOUND ROLLERS FOR DRY MEDIA OPERATION

A cylindrical roller core is spirally wound and bounded with a felt strip. The felt thickness and hardness are determined in relation to the limits of the roller diameter. This type of winding is not suitable for wet application, because the felt strips shrink with the effect of water. The effect of the gap at the joint of every felt strip, which is already problematic in many applications, would only be accentuated by the shrinking effect.

COMPOSITE DISC ROLLERS FOR LARGE FELT THICKNESS UP TO 800mm (31.5")

Felt discs of 30 (1.18") to 50mm (1.97") thickness are placed adjacent to each other on a roller core which is usually of square section, the discs are then compressed together by suitable screw arrangements on the roller ends. The composite disc roller makes possible the use of the greatest felt thickness, this is because individual discs of up to 800mm (31.5") outside diameter can be produced. A higher felt hardness of up to approximately 60 is also possible. A slight deformation of the individual rollers can occur when pressing the discs on to the core. It is for this reason, that before a composite disc roller is put into service it requires to be circumferentially ground so as to obtain a perfect circular form and exact rotational concentricity.

Following long service periods and with high loadings, and as a result of uneven wear caused in relation to the materials which are processed, the joints between the individual felt discs can lead to marking of the work piece.

SEAMLESS FELT ROLLER COVERS

This type of felt roller cover is the most reliable, because the markings at the joint points as already described do not occur. Seamless roller covers are made from 100 wool fibers, which, under the effects of moisture, heat, friction and pressure combine to form a compact structure without the action of a bonding agent. The originally loosely compacted, soft material crepe is run against a roller and is thus made into felt. The process of compaction is continued by a calendering process until the required material density is achieved. Quite naturally, the felt reduces in circumference, length and thickness in direct proportion to its increase in density. For felt sleeves which are to be fitted to rollers, the diameter which is achieved during calendering is made smaller than the core diameter of the roller on to which the sleeve is to be fitted. While in a wet condition, the calendered felt is stressed to a diameter which is larger than the roller core diameter. The felt is dried in warm air in this stressed condition. Following successful drying, the felt then retains the stressed diameter. The sleeve will only reduce by a process of stress relief to the calendered diameter if it comes into contact with water. Finally, the felt is freed from all internally protruding fibers by singeing, and externally by circumferential grinding. The thickness and external surface are leveled, and the felt is then smooth cut on all corners.

HANDLING AND FITTING

Before fitting to the roller core, the prestressed seamless felt sleeve must be kept completely dry, at best sealed in an air tight foil. Depending upon the length of storage, normal air moisture will cause a slow but measurable shrinkage of the diameter. Depending upon the subsequent service loading of the felt covered roller, a decision has to be taken as to whether or not the felt sleeve is only to be shrunk on to the roller core or is to be bonded at the same time. Bonding is always recommended, where, as a result of high line contact pressure acting on the roller in conjunction with a high calendering effect, the danger of twisting of the felt sleeve must be taken into consideration. This is even more applicable to rollers which work in a dry environment than it is for those which work under conditions of continual contact with water.