

DETAILED DESCRIPTION OF THE INVENTION

The present invention provides novel untwisted wrapped yarns for Saxony carpets, upholstery and other applications, carpets manufactured therefrom and the method of their manufacture. The yarns of the invention comprise untwisted wrapped singles yarns having a core strand and a wrapper yarn. The core strand is comprised of untwisted bulked continuous filament yarn or a sliver of a natural or synthetic fiber. The wrapper yarn is comprised of a base synthetic fiber and a heat-activated binder fiber with a melting point substantially below that of the base synthetic fiber.

The yarn of the invention provides an answer to long-standing needs. It provides improved texture retention, tip definition, bulk and wear resistance, thus providing added value to consumers. It is an untwisted singles yarn and therefore eliminates the slow and expensive steps of twisting of the singles yarn, plying and re-twisting, previously necessary for applications such as Saxony carpets. It is expected to have numerous other applications such as in upholstery fabrics and automotive carpeting.

The yarns of the invention accomplish these results through the use of novel, specific constructions within narrow ranges. The prior art includes many examples of yarn constructions where a heat activated binder material is incorporated in twisted yarn. Also, the co-pending application, Serial No. 08/933,822 filed September 19, 1997, and South African Patent 98/8628 describe a generic wrapped yarn where a heat activated binder material is incorporated in the wrapper yarn. However, there is no prior disclosure or suggestion of an untwisted wrapped singles yarn comprising a base synthetic fiber wrapper yarn containing heat activated binder material. The inclusion of each of these characteristics is essential to the success of the yarns of the invention. Further, there is no prior disclosure or suggestion that Saxony carpets could be made from such an untwisted yarn having tuft definition, tip retention, hand and wear resistance equivalent to or better than carpets of equal pile weight made from multiple plied twist set yarns, and more simply and at lower cost.

Without being held to a particular theory of why the invention works, it is believed that when the yarns of the invention are subjected to a heat setting

operation at a temperature sufficient to melt the heat activated binder fiber in the wrapper yarn, elastic forces stored within the binder fiber are released, pulling and constricting the base synthetic fiber tight about the core strand. When the yarn is cooled, the base synthetic fiber constituent of the wrapper yarn presses on the core strand and is securely attached to the core strand. This radial constraint on the core strand provides the finished singles heatset yarn with a more resilient (stiffer) hand, a tighter more defined yarn structure and significantly greater yarn structure retention compared to a conventional wrapped singles heatset yarn. The untwisted nature of the yarn means there will be no spreading of the filaments due to relaxation of residual torque. The presence of a minor percent of heat activated binder fiber within the core strand is also beneficial.

The core strand of a yarn of the invention is comprised of an untwisted bulked continuous filament yarn or a sliver of a natural or a synthetic origin. A continuous filament yarn may be bulked by any of the well known methods for texturizing or crimping as false twist, stuffer box, edge crimp, gear crimp and others.

In one embodiment the core strand is a sliver of about 0.8 to 6 cotton count. (Cotton count is a term of art defined as the number of skeins of 840 yard length to weigh to one pound total.) Preferably the core strand is a sliver of about 1 to 5 cotton count. More preferably, the core strand is a sliver of about 1 to 3 cotton count.

In another embodiment, the core strand is a bulked continuous filament yarn of about 900 to 6000 denier. Preferably, the core strand is a bulked continuous filament yarn of about 1000 to 5300 denier. More preferably, the core strand is a bulked continuous filament yarn of about 1000 to 3000 denier.

The core strand is comprised of at least one textile fiber member selected from the group consisting of cotton, wool, polyester (preferably polyethylene terephthalate, polytrimethylene terephthalate), polyolefin (preferably polypropylene), and polyamide (preferably nylon 6, nylon 66). The cotton count or denier of the core strand and the materials of which it is comprised are selected within these ranges to accommodate the requirements of the carpet or upholstery manufacturer.