

# The preparation and physical properties of UHMWPE/C wraps yarn

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## Summary

UHMWPE/C wraps yarn is composed of ultra-high molecular weight polyethylene (UHMWPE) filament and cotton yarn. UHMWPE filament which adopts Holland DSM Dyneema company product SK65 was treated as core filament and cotton yarn which is made in Taiwan factory was treated as sheath yarn was fabricated by hollow spindle machine. The physical properties of UHMWPE/C wraps yarn were investigated through experiments of tensile load, tensile strain, tensile tenacity, yarn count, evenness, hairiness, neps and twist angle, while properties of tensile load, tensile strain and tensile tenacity were tested by tensile testing machine, yarn count would be experimented by accurate balance, oven and calculation of formula, for yarn qualities of evenness (U%), hairiness and neps were measured by uster testing instrument and the properties of twisting angle was taken by optical microscope, scanning electronic microscope cooperates with Pierce theory operation. Afterward, the cotton yarn count and the degree of twist number were chose as the experiment's parameters in this study. The region of cotton yarn count was from 20'S to 50 'S and degree of twist number was from 700TPM to1000TPM (turn per meter). The results of UHMWPE/C wraps yarn are shown that the properties of yarns' count (denier) and twist angle of UHMWPE/C wraps yarn were increased with the decrease of cotton yarn count and increase of degree of twist number; the properties of tensile load, hairiness of \* UHMWPE/C wraps yarn were also increased with the decrease of cotton yarn count and the increase of degree of

twist number. Oppositely, the properties of tensile tenacity and U% were decreased with the decrease of cotton yarn count and the increase of degree of twist number; although the properties of tensile extension and tensile strain of UHMWPE/C wraps yarn had not a trend by affection of cotton yarn count and degree of twist number, the both of tensile extension and tensile strain of UHMWPE/C wraps yarn were increased more significantly than original UHMWPE filaments'. Summary, the properties of UHMWPE filament is improved by it wrap cotton yarn behind have: 1. ameliorated dyeing of yarn which would promote color changeable 2. Tensile extension of yarn can be increased from 3.5% to 12~17% 3. Roughness on the surface of yarn is increased which would improve to weaving.

**Key word: UHMWPE, wrap cover yarn, tenacity, yarn count, U%.**

