Study on the Stress Relaxation Behaviors of Air-Jet Spun Yarns

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Air-jet spun yarns consist of core fibers and sheath fibers wrapped them.

And to compare tensile strength of air-jet spun yarns to that of ring spun yarns, the case of air-jet spun yarns was lower than that of ring spun yarns about 15%.

While the parameters effected on the yarn formation mechanism of air-jet spun yarns are spinning speed, nozzle pressure, distance between air-jet nozzles etc..

Hence, the constitutive eq. was applied to examine the stress relaxation behaviors as a field of physical property investigation of air-jet spun yarns with spinning speed, yarn count(Ne), twist angle, blending ratio etc..

From the experimental results, it was known that the initial relax ation stress of ring spun yarns were larger than those of air-jet spun yarns but the slopes of stress relaxation of air-jet spun yarns were lager than those of ring spun yarns.

And the initial relaxation stress were decreased with yarn count(Ne) and increased with twist angle for air-jet spun yarns.

Finally, the relaxation rates r_f, r_b, of air-jet spun yarns were larger than those of ring spun yarns for the reason that the relaxation of air-jet spun yarns proceeded rapidly by the restoration force of wrapping fibers.