



Mechanical and Thermal Behaviors of First Choice, Second Choice and Recycled P-Aramid Fibers

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ABSTRACT

The paper reports cutting, abrasion, fire and thermal behavior of different para-aramide fibers. Different qualities of p-aramid fibers were evaluated: first choice fibers (Kevlar®), second choice fibers and recycled fibers. Despite of a very different cost, some properties (cutting and thermal behavior) remain very close and do not depend on the quality of the fibers. In the other hand, the different processes, to produce those fibers, make some difference in terms of behavior, which can cause damage, especially for protective clothing.

Keywords. *Aramid, recycled-aramid, protective clothing, cutting, abrasion, flame retardant.*

I- Introduction.

The market of protective clothing is growing in many fields such as flame and heat-resistant clothes, cut-resistant-gloves, bullet-resistant vest... Textile used in individual protection has brought lightness, flexibility and durability, and is an ideal compromise between comfort and protection. In addition to protection, comfort is one of the most important features for such garments

because without basic comfort, people dare to take off the clothing and so, risk is increased.

High performance fibers have been developed to provide properties such as high operating temperature, heat resistance, flame retardancy chemical resistance and tensile strength (1) (2). P-aramide fibers are the first high performance fibers launched on the market. They were discovered in the 1970s,

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