# Evaluation study of water-based polyurethane composite as a coating for various textile fabrics

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## Abstract:

Nowadays environmental concerns and impending legislation are in favor of non-solvent containing materials and reduction of VO, so In This invention studied the use of polyurethane binder (water-based) as coating film for different types of fabric at different fixation condition with suitable recipes.

**Keywords:** Polyurethane binder, water-based, coating.

## Research background

Using Polyurethane (water-based) to coating a various textile fabrics that adding different properties to fabrics.

## Research objective

Using Polyurethane (water-based) to coating fabrics without organic solvents, harmful to the environment.

Polyurethane considered as one of unique polymers that can achieve special and novel effects when applied as a coating material even in form of water-based, that high adhesion to fabrics and improve a physical properties for fabrics such as tear, tensile, elongation, pilling, abrasion.

## Research importance

Water-based Polyurethane Dispersions make excellent Textile coatings. Suitable grades are inherently flexible, have superior tensile properties, and have excellent abrasion resistance. Waterborne polyurethane dispersions can be used by themselves or in conjunction with acrylic emulsions to reach just the right cost/performance balance for your specific application. All of our waterborne polyurethanes for textile coatings resins can be cross-linked to improve their overall properties for very high performance applications.

## Methodology

Experimental analytical approach

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## Research results

Polyurethane composites were studied as coating material for different types of fabrics 100%Cotton, 50/50% Cotton/Polyester blend, 100%Polyester.

the physical properties for 100%Cotton, 50/50% Cotton/Polyester blend, 100%Polyester without coating were tear strength equal (11.37, 8.90 , 22.55 N) respectively, tensile strength equal (250.86, 237.16 , 558.11 N) respectively, elongation at break equal (16.16, 9.59 , 19.4 %) respectively , pilling grade (2,1, 2-3 ) respectively, loss weight after abrasion equal (15, 30.3 , 10.6 %) respectively, fabric weight equal (148, 90, 110 gm./m2) respectively

The best recipe was 40/60 % PU/Water, the physical properties for 100%Cotton, 50/50% Cotton/Polyester blend, 100%Polyester coating were tear strength equal (16.37, 13.57, 26.15 N) respectively, tensile strength equal (288, 286, 589 N) respectively, elongation at break equal (18.1, 8.5, 23.4%) respectively , pilling grade (4,4, 4-5) respectively, loss weight after abrasion equal (2.5, 3.2, 2.6%) respectively, fabric weight equal (179, 132, 157 gm./m2) respectively and the fixation condition is at 1800C for 30 Sec.

That mean the polyurethane coating improve the physical and fatness properties of various fabrics