

UNIVERSITI TEKNOLOGI MARA

**DURABLE PRESS FINISH WITH QUALITY
REFERENCE FOR COTTON, VISCOSE RAYON
AND THEIR BLENDS WITH POLYESTER**

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Thesis submitted in fulfillment of the requirements
for the degree of
Doctor of Philosophy

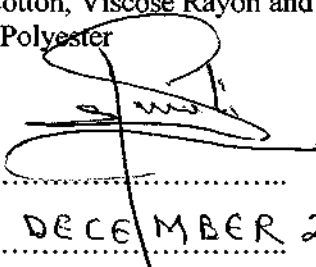
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ABSTRACT

In the preliminary study of Durable Press finish, ten new formulations of DP1 to DP10 were applied on light weight cotton fabric, by the pad-dry-cure method in the laboratory. The finishing solution consisted of Durable Press agent containing the alkyl modified dihydroxy ethylene urea/melamine formaldehyde derivative, magnesium chloride, acetic acid and two softeners of functional polysiloxane active groups. The fabric was impregnated into the solution, padded and dried at 135°C for 30 minutes. Then it was cured at 140°C for five minutes. The finished fabric was tested and analyzed statistically for weight, wrinkle recovery angle (WRA), appearance, stiffness, drapability, abrasion resistance, breaking strength and tearing strength to decide on four formulations for trial run in the manufacturing process at the textile mill. The selected formulations with good Durable Press performances were DP7, DP8, DP9 and DP10. These formulations were applied on four fabrics of light and medium weight cotton and polyester/cotton (65/35) after dyeing. At the mill, the formulations and application method of DP7, DP8, DP9 and DP10, were the same as in the preliminary study, with an additional process of compressive shrinkage after curing. The finished fabrics were analyzed to decide on ONE optimum formulation of Durable Press finish, which was then applied on four other fabrics of light and medium weight viscose rayon and polyester/viscose rayon (65/35). This ONE formulation was DP10, and it now becomes the Durable Press formulation for all eight fabrics.

The DP10 was formulated with vat dye in the single bath process of combined dyeing and finishing of DPV1 to DPV8 in the laboratory. From these eight formulations, three were selected for trial run in the textile mill, on eight fabrics to decide one optimum formulation. The three selected formulations were DPV6, DPV7 and DPV8, and from these, the optimum ONE was DPV8.

A quality measurement of Durable Press Reference (DPR), a novelty of this research was developed using the properties of wrinkle resistance and draping quality of all finished fabrics. It is a formula to calculate objectively the Durable Press performances of fabrics. The DPR for the eight fabrics is 3.39 to 7.53, differently for each fabric of different fiber content.

DP10 and DPV8 fabrics resist flaming, have good color appearance and fastness, dimensionally stable and are durable to repeated home launderings. The formaldehyde released from fabrics complies with the OSHA health requirement, except for the viscose rayon fabrics. Durable Press finishes of DP10 and DPV8, overall have enhanced FAST evaluation of fabrics, with warning statements for tailoring noted for each fabric.

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