

A comparative study of the lamination process on cardboard in litho-offset printing

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Abstract:

Lamination is one of the most important surface treatments used to improve the physical properties of printed products. Cardboard is widely used in the printing and packaging industries, which calls for improving its print quality to increase its efficiency and commercial appeal. This study aims to examine the effect of lamination (cold and hot lamination) on the quality of printing on cardboard, while also examining some of the problems that may arise during the lamination process. This will contribute to improving the production process and extending the shelf life of printed products. The term "lamination" is used in many ways in the final stage of a printed product. In this study, we discuss lamination as the process of applying a transparent polymer film to cardboard after printing using heat or pressure to protect the final product and enhance its appearance. This film also protects the final product from moisture, scratches, and corrosion, while also providing it with a unique appearance.

Research Problem: Some problems arise during the application of lamination (sulphonation) to folded paper after the printing process is completed.

Research Objective: The research aims to study the effect of lamination (cold and hot sulphonation) on the printed product, while clarifying some of the problems that may arise during the lamination process on cardboard after printing—so that the operator can avoid recurrence of such problems during the production process.

Research Importance: Clarifying the effect of lamination (cold and hot sulphonation) on the printed product, as well as focusing on monitoring problems that may arise during the application of the polymer film to cardboard and ways to resolve them.

Research Hypothesis: If the lamination process is controlled and errors that may arise during the production process are identified, this will reduce the amount of waste and machine downtime during production—while achieving added value to the product.

Spatial Limits: The research problem was studied and the applied study was conducted at the Perfect Pack Printing Press in 6th of October City.

Research Methodology: The researcher adopted a descriptive and analytical approach to fully fulfill the research requirements.

Results: The study showed that cold sulfonation is characterized by lower energy consumption compared to hot sulfonation, making it more suitable from an economic and environmental perspective, as well as from a worker's health perspective. Cold sulfonation does not lose the physical properties of the material (the heat-sensitive printed product) compared to hot sulfonation, thus reducing the chances of damage or deformation of the printed product. Hot sulfonation achieves higher efficiency and durability for the final product compared to cold sulfonation (as the heat in hot sulfonation achieves rapid fusion and homogeneity). Hot sulfonation adds brightness to printed inks compared to cold sulfonation. Recommendations: Hot sulfonation is preferred for prints requiring high quality and ink stability, especially for products with high market value. Cold sulfonation is preferred for heat-sensitive materials. Cold sulfonation is preferred to preserve economic value and environmental emissions. Problems that may arise during finishing processes should be studied to identify the causes and arrive at a solution in the shortest possible time.

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