INVESTIGATING THE COMPETITIVENESS
OF NATURAL RUBBER LATEX-FILMS
AS A POTENTIAL SUBSTITUTE
FOR COMMON THIN-FILM PLASTIC PACKAGING
MATERIALS

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November 2010

(This thesis was composed as the final dissertation of the M.Sc. in Polymer technology)
Declaration

Hereby I wish to declare that this research thesis is prepared from my own research work, of which a part or whole has not been submitted for any other academic qualification, or at any other institution. Information derived from published or unpublished work carried out by others has been acknowledged, cited or referred in the text.

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Acknowledgement

It is with heartfelt thankfulness to remember the incomparable level of support, supervision, and guidance provided by my supervisor, Dr. Jagath Premachandra, at the Department of Chemical and Process Engineering, University of Moratuwa, throughout this research project. The continuous advices and corrections he made, has been an enormous strength in making this achievement.

The invaluable support and courage I received from Dr. Shantha Walpalage, is also remembered with heartfelt gratitude. The direction he has shown, has navigated me through the research to make a highly successful outcome.

It is unforgettable to recollect the invaluable direction I received from Dr. Shantha Amarasinghe, Prof. Ajith De Alwis, Dr. Mrs Shantha Egodage, and all the staff members of the Department of Chemical And Process Engineering at the University of Moratuwa, in shaping my research to comply with the highest standards.

I am obliged for the continuous corporation and assistance extended to me, by Dr. Lakshman Nethsighe, at Dipped Products Plc, Pannipitiya, Sri Lanka, who introduced me to the polymer industry and motivated me towards innovative thinking which fuelled me in designing this research.

Finally, I am proud to recall the continuous support and encouragement given by my beloved wife, Ranmuthumalie, and my Uncle Mr. Lionel De Silva, towards overcoming various hardships and making this accomplishment.

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November 2010
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Investigating the competitiveness of natural rubber latex films, as a potential substitute for common thin-film-plastic packaging materials.

Abstract

This report is based on an Industrial research, performed as an initiative effort, to introduce dip-coated Natural Rubber (NR) latex films, to compete with some common thin-film, flexible, plastic, packaging materials. While identifying some of the most sensitive global issues associated with such plastic packaging materials, Natural rubber latex was qualified in terms of many of its unique properties, essentially being a renewable resource. Sample production and testing were carried out at an industrial research and development facility where a comparative analysis was made to establish relative mechanical performance of rubber against Polyvinylchloride (PVC), Polypropylene (PP), and Polyethylene (PE) films. It was shown that the natural rubber films being produced exhibited comparable performance levels in terms of tensile strength and resistance against abrasion, while the films over-performed the tested thermoplastic films with respect to percentage elongation at break, resistance against abrasion, tear, blade-cut, and puncture, including resistance against macro-level water and air leakage. Accordingly, it was suggested that Natural rubber (NR) films having a minimum thickness of 0.3 mm, possessed potential prospects as a competitor for the selected categories of Polyethylene, Polypropylene, and Polyvinylchloride films, having a thickness range of 0.04mm to 0.11mm, in terms of mechanical performance criteria being considered.