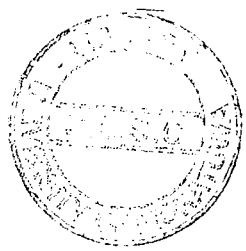
STUDY OF FLOW PROPERTIES OF NYLON 6 RECYCLED MATERIAL IN RECIPROCATING INJECTION MOLDING MACHINE

by

D. B. Yapa



THIS THESIS WAS SUBMITTED TO THE DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING OF THE UNIVERSITY OF MORATUWA IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MSc. IN POLYMER TECHNOLOGY

Department of Chemical and Process Engineering
University of Moratuwa
Sri Lanka

February, 2003.

ACKNOWLEDGEMENTS

I acknowledge with gratitude the Managing Director and the general Manager of Lanka Fastener Limited in giving me the opportunity to carry out this project in our production facility at Katunayake.

I am grateful to Mr. Mevan Pieris and Dr. Mrs. Olga Gunapala, my supervisor and co-supervisor respectively who very generously spared their precious time and provided necessary guidance and assistance to carryout the research.

I am also extend my gratitude and thanks for the encouragement given by Mr. Subramanium and Dr. Santha Walpolage.

Further, I wish to sincerely thank Mr. Chandana Katugahage of Industrial Technology Institute, Mr. J. M. M. Jayaweera and his subordinates of Lanka Fastener Limited for providing me with all necessary assistance in carrying out this project.

ABSTRACT

Many of the industries use nylons mainly for engineering applications for several reasons. Basically nylon provide a combination of toughness, rigidity and lubrication free performance of products, which leads to mechanical uses. Some of the initial properties of nylons may change in the process of mechanical and thermal recycling. The flow properties of extrusion grade recycled nylon 6 were observed with a torque measuring mixer and a reciprocating screw injection moulding machine. Low Density Polyethylene and Zinc-stearate were used separately as lubricants. The plasticating behaviour was observed by increasing mixer temperature in a torque measuring mixer and recorded as torque versus time. The resultant stock temperature variation of above process was also recorded graphically. The flow of recycled nylon 6 through reciprocating screw injection moulding machine was discussed. The effect of polyethylene (1% maximum) incorporated recycled nylon 6, to the quality of specific product was compared against the pure recycled nylon 6.

CONTENTS

List of Figures

List of Tables