

DEVELOPMENT OF A SYNTHETIC SPORTS SURFACE FOR AN ATHLETIC TRACK


LIBRARY
UNIVERSITY OF MORATUWA
MORATUWA

A DISSERTATION PRESENTED TO
THE POLYMER TECHNOLOGY DIVISION, UNIVERSITY OF MORATUWA

 UniverSRI LANKA Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

678 "87"
678.06:796.023

IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE AWARD OF
THE MASTER OF SCIENCE DEGREE IN POLYMER TECHNOLOGY

University of Moratuwa

78520

78520
LAKMAL SIRIWARDENE

APRIL 1987

UM Thesis
78520

SYNOPSIS

A synthetic sports surface is a multi-layer structure which has become very popular as a substitute for natural grass. This research project was meant to study the feasibility of developing a natural rubber base top covering for an athletic track for Sri Lanka's tropical environment. Here, the scrap rubber crumbs were used as the aggregate which is bound by natural rubber latex and cement. The latter was used to help in drying the surface quickly and also to impart greater hardness.

Two types of rubber crumbs, namely tyre crumbs and microcellular crumbs with two types of latex recipes were used to prepare the samples. One latex formulation is about 60 per cent cheaper than the other. Together with the above variation the main emphasis was to determine the most suitable type of crumb and its particle size range which resulted in a surface having properties comparable with those of reference samples meant to be used as athletic tracks.



The standard tests to evaluate the track performance are stipulated in DIN 18035 Part 6. However, these tests demand a set of specialized apparatus. These were not available and were not possible to turn out locally within the time frame of the project. Thus an attempt was made to compare the results of the test samples with those of the reference samples by carrying out a set of short term standard tests commonly available. These short term tests showed that the proposed formulations give comparable results with the selected reference samples.



ACKNOWLEDGMENT

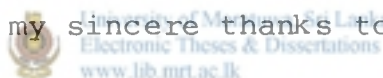
Firstly, I wish to thank the Management of the Sri Lanka Standards Institution for sponsoring me for the M.Sc.course in Polymer Technology which enabled me to carry out this research project.

I wish to express my sincere thanks to the supervisor of this project, Dr Kamal Fernando, Senior Lecturer, Polymer Technology Division for his guidance and assistance given to me throughout this project.

My thanks are due also to Dr (Mrs) L Sivagurunathan, Head, Polymer Technology Division and Prof. Willie Mendis, Vice Chancellor, University of Moratuwa for their encouragement and assistance given in this project.

The literature survey of this project would have been incomplete if not for the guidance from Dr L P Mendis of CISIR.

I wish to express my sincere thanks to him.



I wish to thank the staff of the Polymer Technology Division, University of Moratuwa, who are too numerous to mention individually, for their co-operation extended to me during this project.

My thanks are due also to the staff at the Sugathadasa Stadium and to the numerous other Organizations who helped to make this project a success.

Finally, I wish to thank the staff of the Consultancy and Training Division at the Sri Lanka Standards Institution for the support given to me in compiling this report and especially to Miss B Indra Sarojini for doing an excellent job of typing within such a short time.

C O N T E N T S

	page
SYNOPSIS	i
ACKNOWLEDGEMENT	ii
Chapter 1	INTRODUCTION 1
Chapter 2	SYNTHETIC TOP COVERING OF A SPORTS SURFACE 5
Chapter 3	PREPARATION OF SAMPLES 22
Chapter 4	METHODS OF TEST 28
Chapter 5	TEST RESULTS AND DISCUSSION 33
Chapter 6	SUGGESTIONS FOR FURTHER WORK 45
	LIST OF REFERENCES 46
Appendix	COST ESTIMATE OF RAW MATERIALS REQUIRED TO PREPARE THE TOP COVERING OF A SPORTS SURFACE 47