



CHAPTER 1 INTRODUCTION

1.1 Synthetic running track

Nowadays, Thai people are interested in athletic sports. An important factor for the development of sports is a standard stadium with running track. However, most of athletic fields in Thailand had natural running track which are ruined quickly or need much maintenance. Moreover, it may be the cause of fatigue and injury to athletes. This problem can be overcome by using the synthetic polymer as running track. The synthetic polymer which is the key for solving this problem is polyurethane. The benefits of polyurethane are relieved muscular fatigue and offer the opportunity to reduce injury of the athletes when compared with natural running field. Another advantageous characteristic of this synthetic polymer running track are long life expectancy under various conditions, resistance to light and oxidation-included damage, low maintenance and good weather resistance that they are not subjected to environmental effects.

Polyurethane is formed by the reaction between alcohol with two or more reactive hydroxyl groups per molecule (diol or polyols) and isocyanates that have more than one reactive isocyanate group per molecule (diisocyanate or polyisocyanate). This type of polymerization is called addition polymerization. All polyurethane is based on exothermic reaction of diisocyanate or polyisocyanates with polyols molecules. However, using of polyurethane as synthetic running track has disadvantage on expensive cost and lack of surface roughness that is desired for running surface. This problem can be overcome by improve surface wherein a liquid urethane is formulated and mixed with granular particles of rubber and urethane to provide a resilient running surface which

reduces runner fatigue and injury due to impact forces on the runner's body and joints. The cost of polyurethane running track can be reduced by adding local cheap filler waste material (granule particles of tire) as granular rubber in filled-polyurethane which provides attractive characteristics in improvement of synthetic paving surfaces. Thus the present work is carried out in line with this principle.

1.2 Statement of the problem

Due to high cost of polyols and isocyanate, polyurethane material is expensive. Consequently, to build a synthetic running track needs high investment cost. This is the obstacle for every province to have their own standard sport stadium. This problem can be solved by development of an economic running track.

1.3 Objective of this work

The principle aim of this study was to develop a low-cost paving material for a running track. In detail, studying would include the following study.

1. Determine a suitable composition for polyurethane
2. Determine fillers to be used in filled-polyurethane and the quantity of the fillers.
3. Determine the steps of producing paving surface and the operating conditions.

1.4 The scope of this work

The raw materials to be investigated will be mainly local-manufactured or easily obtainable in local market.