CHAPTER 6

6. SUGGESTIONS FOR FURTHER WORK

6.1 Within the time frame of this research project, it was not possible to prepare a sufficient number of samples under the same conditions to get conclusive results. It is therefore suggested that a large number of samples should be prepared, making note of the factors that effect the reproducibility of test results. Once these factors are resolved, samples should be prepared to determine the;

(a) effect of using microcellular crumbs Vs. tyre crumbs

(b) effect of different particle size distributions within each type of crumb.

(c) effect of proportion of latex:cement:crumbs

(d) effect of pre-vulcanized latex

6.2 Samples that has a potential to be used as an athletic track from the above study should be prepard incorporating a uv stabilizer and subjected to accelarated artificial weathering tests as mentioned in 2.2.1.5. A test track should also be laid and tested for the performance requirements specified in 2.2.1 to asses the suitability as an athletic track and also the variation of properties from place to place.

6.3 A problem faced with tyre crumbs available is the oblong shape of the crumb which is a disadvantage as an aggregate for a sports surface. There is no control over the shape of the crumb because it is the form in which crumbs are obtained from the tyre re-building industry as buffing dust. An attempt should be made to modify the tyre crumbs to suit as an aggregate by shredding to obtain regular size crumbs or to device a method to shred discarded tyres to obtain the required shape.

6.4 The method used to compress the formulation in a mould in order to obtain a more compacted sample was not satisfactory as latex being a liquid oozed out from the mould when compressed. A method should be studied to overcome this problem.

LIST OF REFERENCES

1. G. Tipp and V.J. Watson, Polymeric surfaces for sports and recreation, Applied Science Publishers

2. Anon , Hop,skip and jump, Rubber Developments 1974,27 pp 52 -53

3. DIN 18035 Part 6 :1978 Sports grounds -Synthetic surfacing - Requirements, test, maintenance.

4. Same as Reference 1, p.11

5. Same as Reference 1, p.13

6. Same as Reference 1, pp 22-23,83

7. Anon, sports surfaces, NR Technology 1975 , 6(2) p.39

8. K.O. Calvert, Polymer latices and their applications p.250 Applied Science Publishers

9. A.D.T. Gorton and T.D. Pendle, Recent advances in natural rubber latex concentrate, European Rubber Journal 1974, 156 (12) p.34

10. Same as Reference 1, p.21
11. Same as Reference 1, p.12
12. Same as Reference 1, p.27
13. Same as Reference 1, p.14
14. DIN 51963 : Testing of organic floor coverings (except textile floor coverings); abrasion test (20-cycle method)

15. ASTM D 1076:1980 Specification for rubber-concentrated, Ammonia preserved, creamed and centrifuged natural latex.

16. BS 12 : 1978 Specification for portland cement

17 DIN 53516:1977 Testing of Rubber and Elastomers -Determination of abrasion resistance.

APPENDIX

Cost estimate of raw materials required to prepare the top covering of a sports surface

Item	Quantity in the the formulation	Cost of material per kg (Rs)	Approximate cost per kg of ready to use material (Rs)	Quantity of material required to prepare 1m² sample of 13 mm thickness (note 1) (kg)	Approximate cost of material reqd. to prepare 1m² sample of 13 mm thickness (Rs)
Compounded latex					
60% Centrifuged latex	166.7	17.50	17.50	5.557	97.00
Vulcastab LW - 25% solution	16.0	16.00	4.00	0.533	2.00
Sulfur - 50% dispersion	3.0	8.75	5.00	0.100	0.50
ZDC - 50% dispersion	3.0	82.50	45.00	0.100	4,50
ZMBT - 50% dispersion	3.0	100.00	50.00	0.100	5.00
ZnO - 50% dispersion	2.0	50.00	25.00	0.067	1.50
Nonox SP - 50% emulsion	4.0	62.50	40.00	0.133	5.50
Thiourea (dry)	1.0	3900.00	3900.00	0.033	129.00
Glycine - 20% solution	15.0	1030.00	206.00	0.500	103.00
Methyl cellulose - 2.5% soln.	5.0	400.00	10.00	0.167	1.50
Casien _ 10% solution	20.0	275.00	30.00	0.667	20.00
Distilled water	4.0	-	-	-	-
Pigment	Negligible	-	-	-	-
Rubber crumbs	175	1.00	1.00	5.833	6.00
Cement	150	2.50	2.50	5.000	12.50
					388.00

Approximate cost of raw materials required to prepare 1m² of the sample (13 mm thickness) as per Recipe A = Rs 388.00

Approximate cost of raw materials required to prepare 1m² of the sample (13 mm thickness) as per recipe B = Rs 156.00

Note 1: The quantities required are based on past experience in preparing testsamples