

SYNTHETIC TRACK SURFACES

Introduction

There is a range of synthetic surfacing products provided by a number of manufacturers in Australia and elsewhere. The cost of the synthetic products varies markedly as does the performance and life of the products.

In all cases the form of base construction below the surfacing will be similar and will be determined by the site conditions rather than the type of surfacing except that if the synthetic surfacing is permeable then the asphalt below must also be permeable.

The two principal subdivisions of synthetic surface type are those systems that are produced in-situ and those that are manufactured in the factory and delivered in rolls to the site for sticking to the base.

In-situ Systems

These systems which were usually used in Australia in the past and can be subdivided into three principal types:

- a) Full polyurethane/rubber
- b) Sandwich
- c) Resin bound rubber crumb with sprayed on surface

In all cases it is essential to control the compatibility, quality and proportions of the raw materials used in the production of the surfacing.

Full Polyurethane/Rubber

This surface is impermeable to water.

The polyurethane material is produced on site in a proportioning machine which intimately mixes together in the correct proportions two components one a liquid pigmented polyol and the other an isocyanate.

There are then two alternatives for mixing and laying the polyurethane. The first method has chopped EPDM rubber crumb added to the above mix to produce a viscous liquid compound. The mixture is then spread on the track base using a paving machine to the required thickness using screeding bars laser controlled.

The second method has the mixed polyurethane resin applied to the asphalt base to a thickness of about 4mm and high-grade EPDM rubber granules sprinkled or blown onto the polyurethane while it is still fully liquid. After curing the excess crumb is removed and another layer is applied in the same manner as the initial layer. After curing of this second layer, a third and final layer of polyurethane resin is applied.

In both methods the final surface has a granular texture created by sprinkling or spraying with a spray gun elastic highly ultra violet resistant coloured EPDM rubber granules onto the fully liquid polyurethane.

Following curing the excess surfacing granules are removed.

Sandwich

The two-layer surface produced on site is impermeable to water. The base layer 8 or 9 mm thick consists of black SBR rubber granules that are bound together with polyurethane and installed using a paving machine.

After curing the open textured base is grouted with very fine rubber crumb, then the top surface 4 or 5 mm thick is produced on site by intimately mixing two components, one a liquid polyol and the other an isocyanate, in the correct proportions.

Sprinkling elastic ultra violet resistant coloured EPDM rubber granules onto the fully liquid polyurethane produces the final granular surface.

After curing the excess surfacing granules are removed.

The surface thus produced is similar in appearance and performance to that produced by the full polyurethane surface.

Resin Bound Rubber Crumb with Sprayed on Surface

This two-layered surface is produced on site.

The base layer consists of black SBR rubber granules bound with one component moisture curing polyurethane resin installed using a paving machine.

After curing the surface layer consisting of coloured polyurethane with coloured fine coloured fine EPDM rubber granules added to the mix is sprayed on the base layer to give the finished surface traction and slip resistance.

The surface is ultra violet resistant and porous.

Note

EPDM is ethylene propylene-diene-monomer synthetic rubber
SBR is styrene-butadiene rubber

Prefabricated sheet

The polychloroprenicrubber sheets, produced in the factory under controlled conditions, processed by calendaring followed by curing and rolling, have mineral fillers, stabilising agents and coloured pigments incorporated. The sheets have an embossed or textured finish to give traction and slip resistance.

The sheets are supplied in rolls to the specified thickness for bonding to the track asphalt base with adhesive.

COMPARISON OF PREFABRICATED AND IN-SITU SURFACES

Prefabricated Sheet

Advantages

Disadvantages

- * Properties and thickness can be guaranteed
- * Proven high quality surface used at Olympic Games and World Championships
- * Can be lifted and relaid elsewhere with perhaps some damage to the sheet

- * More expensive than comparable in-situ products
- * The base asphalt needs to be very accurately laid to avoid water ponding
- * High degree of skill and accuracy required in laying
- * Depends on good bond between the sheet and the base
- * More joints which can open and let in water

In-situ Surfaces

Advantages

- * Full polyurethane tracks used at many major international championships
- * More experience in Australia with this type of installation
- * Cheaper than prefabricated sheet
- * Better able to accommodate slight imperfections in the asphalt base

Disadvantages

- * More susceptible to delays due to wet weather
- * There is some evidence that some of these surfaces can harden with ageing.

COMPARISON OF IN-SITU SURFACES

Full polyurethane/Rubber

Advantages

- * Largely free of joints and should adhere well
- * Longest life
- * Best competition surface

Disadvantages

- * Most costly
- * Slightly lower force reduction figures ie harder close to IAAF lower limit

Sandwich

Advantages

Disadvantages

* Less expensive than full polyurethane

* Slightly softer than full polyurethane

* Feels the same as full polyurethane/rubber

* High wear areas require full polyurethane/rubber

* More difficult and expensive to repair

* Less durable than full polyurethane/rubber

Resin Bound Rubber Crumb Sprayed on Surface

Advantages

* Cheapest

* As porous does not pond water

* Less susceptible to poor weather delays during installation

Disadvantages

* Least durable

* Asphalt must also be porous

* Not a top competition surface

* High wear areas require full polyurethane/rubber

Comparison of Single and Multi-layers

Single Layer

Advantages

- * Better and more accurate mixing of ingredients
- * Installation quicker as it is one operation
- * Better quality control over manual installation

Disadvantages

- * More machinery can increase cost slightly
- * More surface joints which have appearance and water ingress problems

Multi-layers

Advantages

- * Less surface joints
- * Better able to take account of surface imperfections in the surface underneath

Disadvantages

- * If hand laid the mix proportions are more susceptible to variation
- * More prone to wet weather delay

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June, 2000

