

# TRACK SURFACE TYPES

## 1. OVERVIEW

Athletics tracks have come a long way in the last 50 years. What once were facilities made of cinder, shale and stone are now predominantly rubberised surfaces that are laid over a concrete pavement and referred to as "all-weather", meaning they can be used almost immediately after rainfall.

The first fully synthetic athletics track surface – known by the brand name "Tartan™" - was manufactured in the USA by 3M in the late 1960's and was initially developed for the equine industry.



The first recorded use of a Tartan Track surface in England was a long jump competition held at the Norman Green Sports Centre in Solihull on the 16th September 1967. The following year the Tartan™ surface was used by athletes competing in the 1968 Summer Olympics in Mexico City. From this original surface a multitude of similar "rubberised" track surfaces have now been developed by companies all over the world.

In 1989 the IAAF published their Performance Specification for Synthetic Surfaced Athletics Tracks (Outdoor), this came from a recognition that different track surfaces were being manufactured which gave different performances and athletes and event organisers and had begun to notice this. The most common statement was that 'a track was fast or slow', this generally referred to how sprinters performed on the surface, with little or no consideration to comments from longer distance runners until, as manufacturers produced harder and harder surfaces to improve times for sprinters, some longer distance runners started complaining of leg pain after races. The IAAF took this on board and after a process of assessing various test methods and synthetic surfaces published a set of specifications and testing protocols for synthetic track surfaces.



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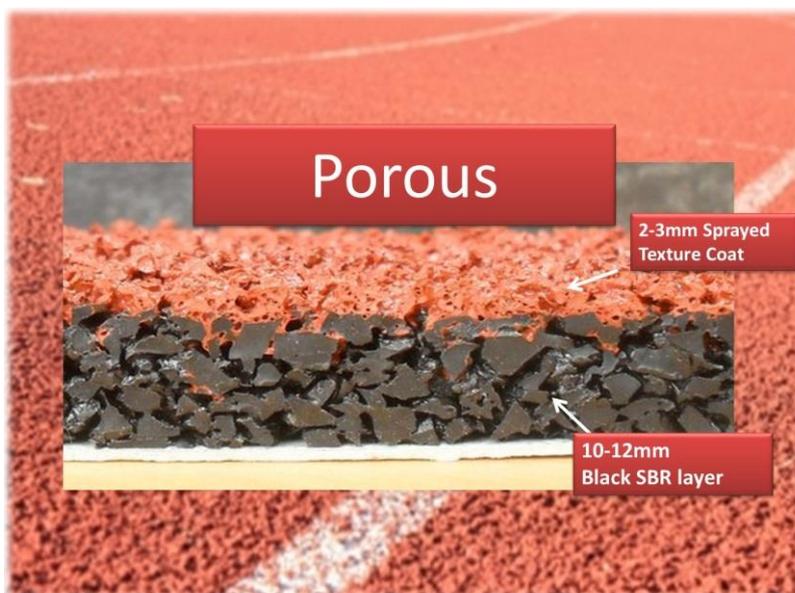
Today, there are many different types of synthetic track surface available. However, they all fall into two distinct categories: porous and non-porous.

**Porous** - Porous track surfaces are designed so that water will flow through the surface to the pavement below while allowing moisture to escape. In most cases the track will incorporate a porous asphalt sub base for the water to continue to rapidly move to a drainage system installed in an aggregate base.

**Non-porous** - Non porous track surfaces are designed so that water does not penetrate the surface. Water is removed by slope and by gravitational flow to a surface drain system. It is vital to the success of a non-porous surface that adequate drainage and base aggregate design eliminate water from beneath the surface. Note: In the UK there are currently three main types of non-porous system: solid, sandwich (hybrid) and prefabricated.

## 2. POROUS TRACKS

The most common synthetic track surface in the UK is a porous system. Porous systems provide a cost effective solution to facility providers who wants to install a track facility for training and low level local competitions and the softer surface characteristics of porous surfaces make it an ideal solution for schools and community athletics clubs.



The system is made up of two layers: a sub base made up of black rubber granules bound with polyurethane resin, and a spray finish of coloured EPDM (rubber) granules and pigmented polyurethane.

The downside of porous track systems is that they tend to be less hard wearing than their non-porous counterparts and require a more intensive maintenance and repair regime.



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## Common issues with porous tracks:



## Key points:

- The most popular synthetic track system; ideal for schools and community tracks
- Excellent energy reduction properties
- Economical system providing a cost effective solution
- Will take up to 50,000 athlete user hours per year
- Professional clean every 3years
- Re-mark every 7years
- Surface respray after 7-10 years dependent on use. Note: May need minor repairs/resurfacing to areas of heavy wear during this period

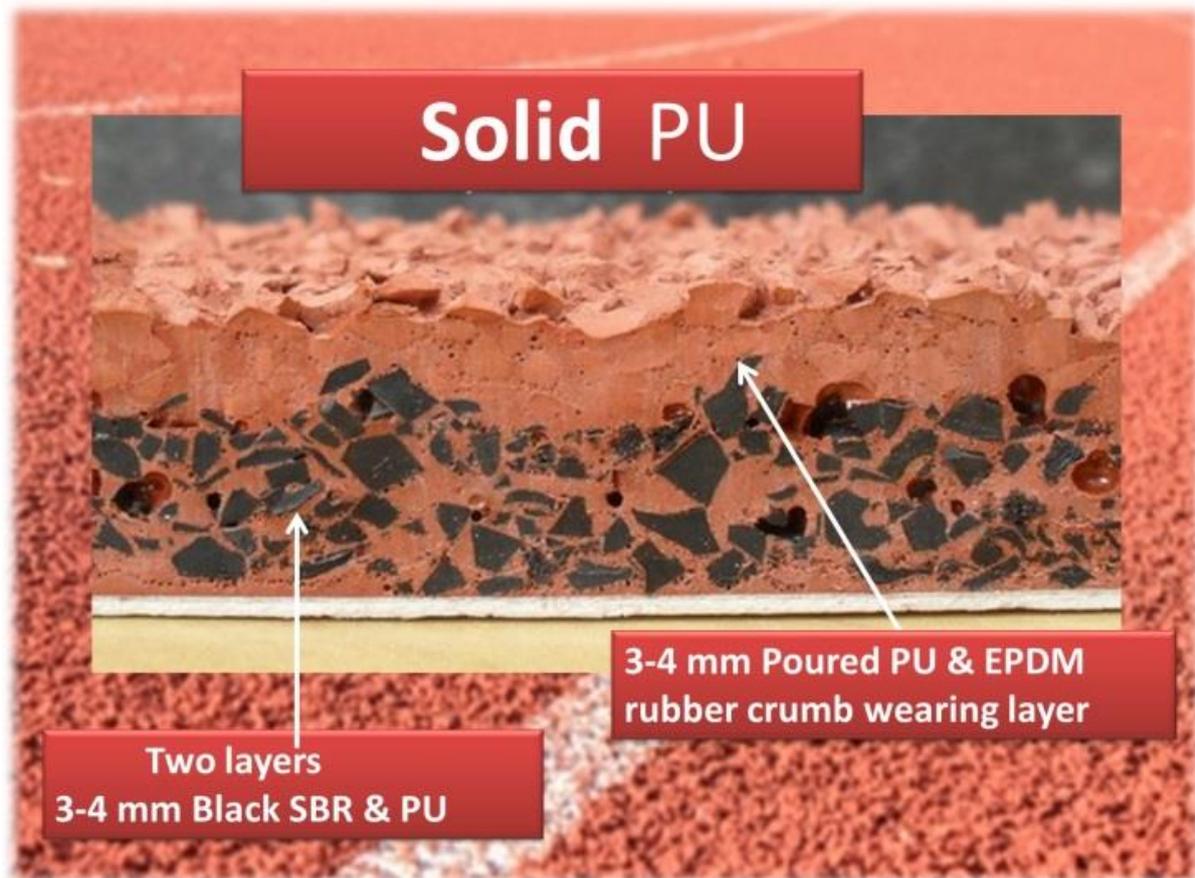


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### 3 SOLID SYSTEM (NON POROUS)



Non porous "solid" systems are designed for high level competition, high intensity use facilities and have the harder surface consistency preferred by elite level athletes.

Solid systems have a non porous full depth construction made up of two layers: A base polyurethane flood coat layer impregnated with rubber granules and a final flood layer of polyurethane topped with an EPDM (rubber) surface dressing. As this type of surface is impermeable to water it relies on a fall in the track to a perimeter drain to keep the running surface free of surface water. This method of track construction produces excellent finish levels and is recognised as a first class surface suitable for international standard athletics.

The installation of solid track systems is relatively costly when compared to porous and sandwich systems. However, the payoff is that the surface is much more durable and requires a less onerous maintenance regime. That said, sub-standard installations, excessive/inappropriate use and a lack of a maintenance regime can lead to some of the problems highlighted below:



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## Common issues with solid systems



### Key points:

- High performance system designed to meet the highest standards of international competition
- Up to 150,000 athlete user hours per year
- Highly spike resistant surface
- More expensive than porous and sandwich systems
- Less inclined to develop moss as water runs off and spores can't establish themselves as easily
- Professional clean every 3years
- Re-mark every 7years
- Surface re-topping after 7-10 years dependent on use. Note: May need minor repairs/resurfacing to areas of heavy wear during this period

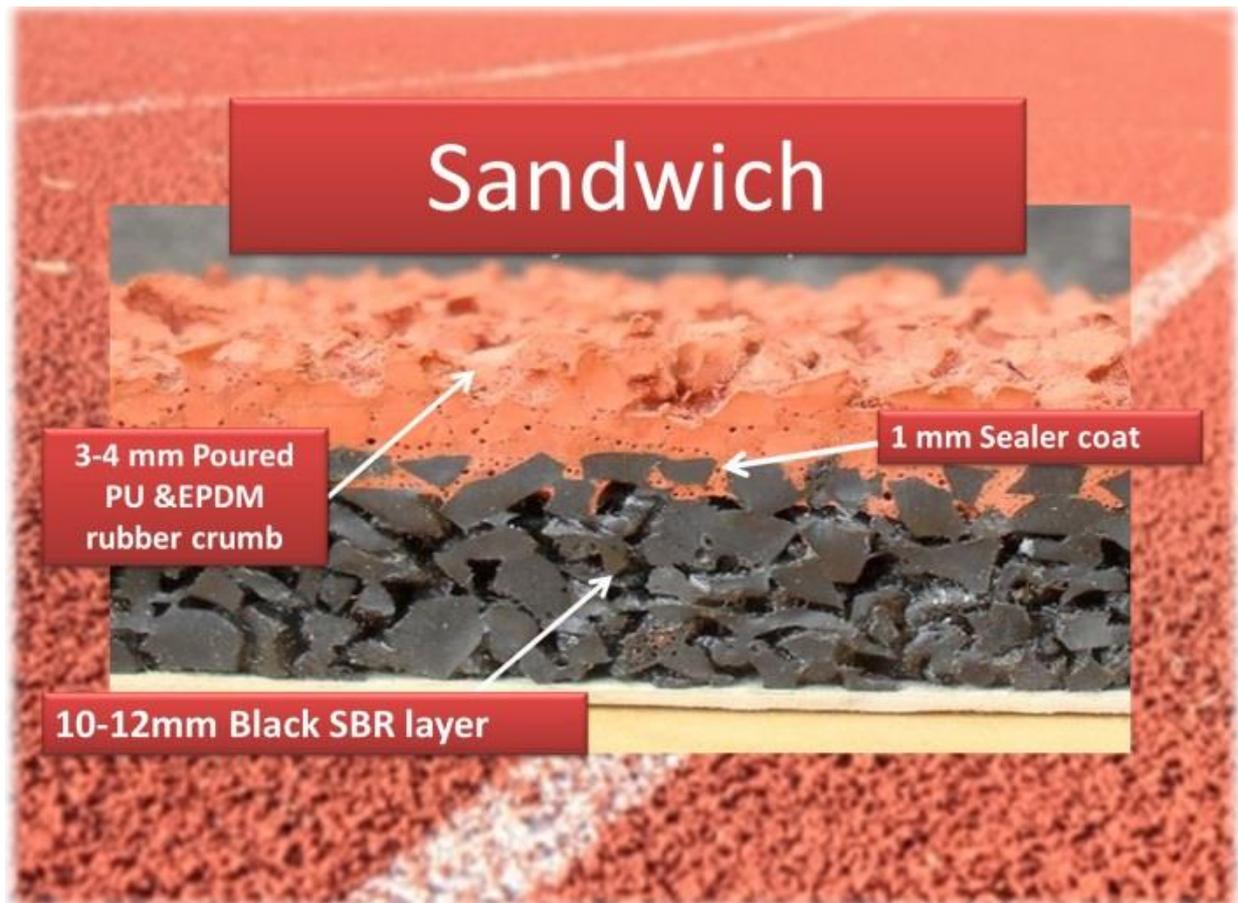


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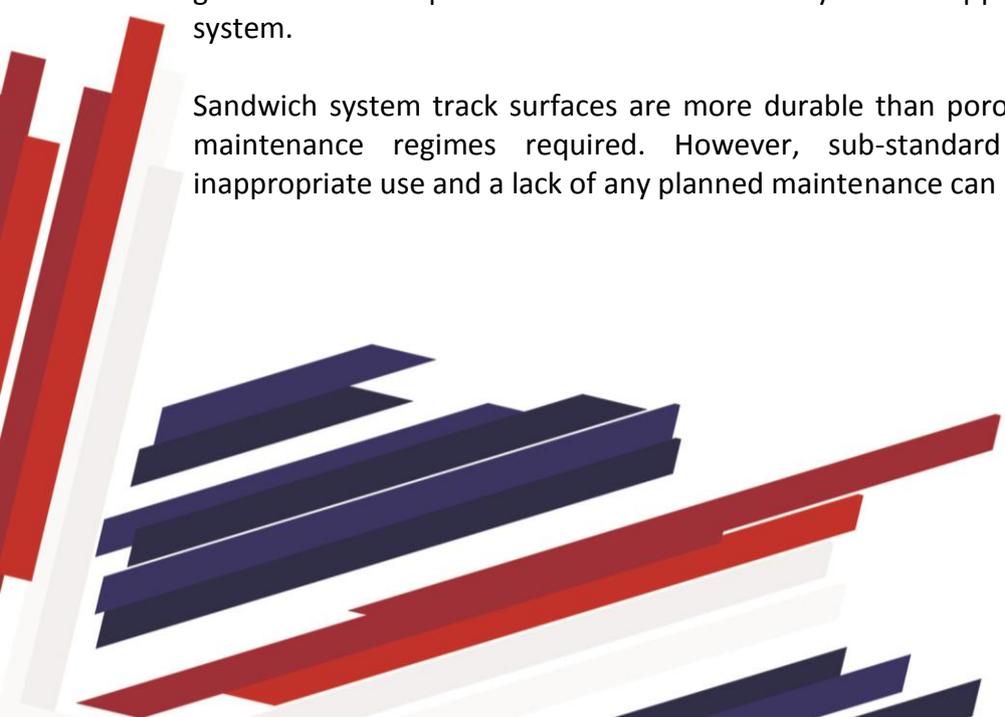
#### 4 SANDWICH OR "HYBRID" SYSTEM (NON POROUS)



Often referred to as a 'sandwich' system, this hybrid system provides a non-porous elite level surface at a competitive price. This surface is constructed in two layers: A base layer made up of black rubber granules bound with polyurethane resin and a polyurethane flood coat combined with an EPDM surface dressing. As this type of surface is impermeable to water it relies on a fall in the track to a perimeter drain to keep the running surface free of surface water.

Sandwich systems have the advantage of combining the less expensive black rubber granules used in porous tracks with the full synthetic topping of a more expensive solid system.

Sandwich system track surfaces are more durable than porous systems with less onerous maintenance regimes required. However, sub-standard installations, excessive or inappropriate use and a lack of any planned maintenance can lead to problems:



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## Common issues



## Key points

- Top quality track surface suitable for international athletics at a competitive price
- Offers many of the properties of the solid system at a reduced cost
- More expensive to install than porous systems due to additional process
- Up to 100,000 athlete user hours per year
- Less inclined to develop moss as water runs off and spores can't establish themselves as easily
- Professional clean every 3years
- Re-mark every 7years
- Surface re-topping after 7-10 years dependent on use. Note: May need minor repairs/resurfacing to areas of heavy wear during this period

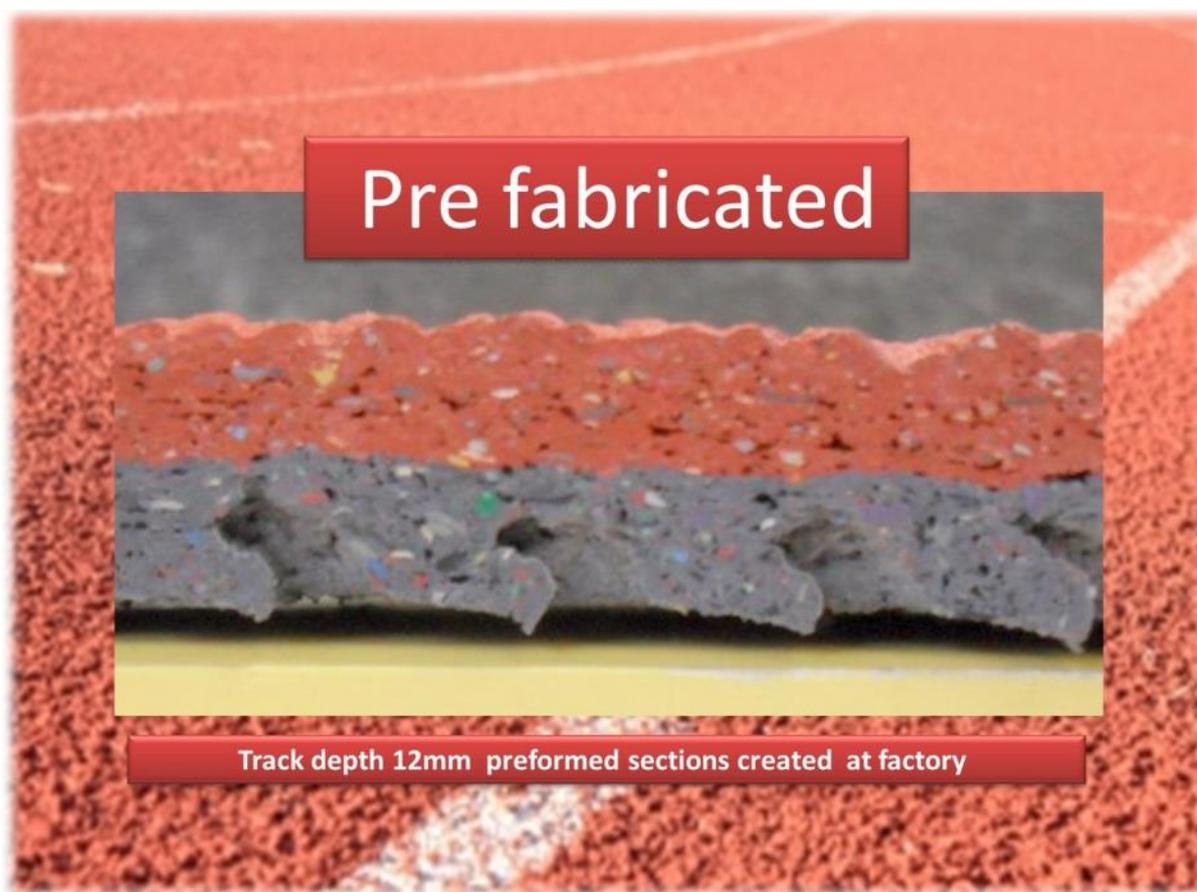


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## 5 PREFABRICATED SYSTEM (NON POROUS)



Prefabricated track systems are designed for all levels of training and competition at high intensity use facilities and they are the preferred track surface for wheelchair athletes and is extensively used at Major Track & Field Championships (a prefabricated track surface was used at the London 2012 Olympic and Paralympic Games). Whilst they are more expensive to install than other track systems they tend to be much harder wearing and require less maintenance and remedial repairs.

Unlike porous, solid and sandwich systems which are all laid "in-situ", prefabricated surfaces are sections of rubber matting manufactured in a controlled factory environment which helps to ensure even thickness and controlled performance characteristics. There are two main types of construction: solid sheets and sheets with a voided backing that improves shock absorption.

Supplied in rolls 1.22m wide x 30m long, the mat is adhered to a base macadam to provide a non-porous system. Like solid and sandwich systems this type of surface is also impermeable to water and relies on crossfall to slot drains to keep the running surface free of surface water. This method of track construction produces excellent finish levels to exacting standards and is recognised as a elite level surface suitable for international athletics events.



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Prefabricated tracks tend to be more long lasting and have lower maintenance costs than polymeric surfaces and retain their performance characteristics throughout the life of the material. There are also environmental benefits in that prefabricated systems can be removed and recycled.

**Key points:**

- High performance Olympic standard system designed to meet the highest standards of international competition
- More expensive than porous, sandwich and solid track systems
- Highly durable and able to withstand heavy usage
- Maintenance friendly: No resurfacing or re-coating required
- Non slip, easy to manoeuvre wheelchairs and walkers
- Environmentally friendly and recyclable
- Less inclined to develop moss as water runs off and spores can't establish themselves as easily
- Professional clean every 3years
- Re-mark every 7years
- Resurface 10-15years dependent on use. Note: May need minor repairs to areas of heavy wear during this period



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