



The game's underfoot

As an international business sector, synthetic sports surfaces are a multi-billion dollar activity based on the application of any one of a number of artificial substitutes for naturally occurring substances. Using a wide variety of products, ranging from re-worked timber to sand to polymers to recycled auto tyres, the companies concerned have collectively made it possible for children and adults alike to participate safely in every form of sporting endeavour that requires an enclosed playing area.

In July 2002 the city of Manchester in the United Kingdom played host to the 17th Commonwealth Games. As a series of athletic events, as a spectacle, as a triumph of organisation the Games were a resounding success. True, there were some problems with the weather. It rained on the opening day and on the closure – and on several days in-between – but, thanks to the prior efforts of the synthetic surface industry, very little disruption was sustained.

But that was back in July. The main stadium has metamorphosed into a soccer ground – the new home for Manchester City Football Club. The athletics track, 'the best ever' according to the competitors, has been lifted in sections and transferred to a sports stadium in Birmingham some 80 miles to the south. The turf from the centre of the oval has also been transferred to another sports centre in the Belle Vue district of Manchester to form the basis of new soccer pitches. Belle Vue is also home to one of the continuations of the Games, the field hockey pitches housed in the area's eponymous Leisure Centre.

Part of the outcome of a £3 million Sport England-funded redevelopment, the two hockey pitches were surfaced with AstroTurf System 5 synthetic turf supplied by Southwest Recreational Industries Inc., based in Leander, Texas. In turn the pitches are part of the new English Institute of Sport network, wherein the Belle Vue venue is now a Regional Performance Centre for both hockey and badminton.

AstroTurf is probably one of the most recognised brand names outside the industry proper – possibly becoming generic as time

passes – and the System 5 version is described by Southwest as 'the 'world's most popular hockey surface, designed to preserve its "wet" characteristics without excess watering'.

The Belle Vue fields were constructed from nylon 6.6 fibres, which are said to provide a softer and less abrasive surface with improvements in playing dynamics, player comfort, ease of maintenance, and dependability. Because of its hydrophilic nature, the lower segment of durable open cell foam pad adds cushioning and water containment to the surfaces to maintain wet conditions longer and requires less water usage overall.

Science challenging nature

Whatever the type of surface undertaken, and this will be governed by its intended use, the aim is to achieve a balance of relative cost, playing performance and longevity. The outer level may be a performance polymer over an under layer of rubber, or pure rubber in either sheet or poured format, or synthetic turf consisting of polymer tufts locked into a base layer, or tiles bonded to a substrate, or processed timber. In all instances it can be said that science challenges nature by producing a surface engineered to performance parameters established by the requirements of the activity.

Grass is by far the most popular replication, which is hardly surprising when one considers the number of sports that rely on the subtle mix of impact transfer, shock absorption, 'slide' and texture that constitutes the real thing. Begging the fact that there are major differences in construction techniques and the chemical engineering used by different manufacturers, synthetic turf consists of a polymer base (usually a geo-textile) into which is locked longish polymer tufts – the most common being nylon 6.6 or polyethylene. Infill consisting of either rubber crumb (often from recycled tyres) or sand is applied, leaving 0.5 inch or so of fibrillated fibre on the surface. That is a very simplified explanation and the variations on the theme are almost endless.

It is the intended usage that determines the methods used to lay these highly engineered



sports surfaces into place. For example, a ball game requiring fast rebound and equally fast player reaction could conceivably take place on a carpet-style surface laid over an asphalt base. Where the likelihood is that of greater inter-player contact and the potential for 'carpet burns', then perhaps the base would be a deep layer of compacted sand over limestone chippings. Golf putting surfaces, of the type marketed by Synthetic Turf International of Florida, perform best over a fully compacted 5-inch layer of crushed limestone. For the manufacturers the challenge can be said to lie in blending the two perspectives of technology and infrastructure into a state-of-the-art product that the players can use in complete safety over and over again.

Although AstroTurf is considered by some to be the classic of its type, a growing acceptance by serious athletes and an increase in general sports participation has led to a substantial growth in synthetic surface installations in the USA and Europe in recent months and this has opened an opportunity for corresponding growth among companies such as Montreal-based specialist Fieldturf International Inc. which has just recorded a total of seven FIFA licence recommendations for its high profile soccer pitch installations. In 1999, Fieldturf began mass-producing a new surface where the composition imitated the real thing more closely, with an improved resistance to wear and tear. The longer, grasslike fibres give it a more natural look and feel, while the infill that forms the base is loosely packed around the blades of "grass", providing – it is said – a softer cushion than real soil.

Fieldturf's patented surface system gives a moderately shaggier look to the finished product. That is possibly because it attempts to emulate real grass as closely as possible in the placing of the hybrid polyethylene/polypropylene tufting that is secured to a geo-textile base before the addition of the infill mix of ground rubber (obtained from recycled sports footwear) and graded silica sand. The result, says Fieldturf, is softer, more resilient and less likely to cause twisting injuries than the basic 'carpet over blacktop' approach.

The product doesn't grow, but the market does

Almost 200 synthetic fields will be laid in the U.S. alone this year, compared with fewer than 50 in 1999. Public schools and parks in Europe and the U.S. now use synthetic surfaces, as do top European soccer teams such as Manchester United FC, FC Barcelona, Ipswich Town FC, Glasgow Rangers, SV Werder Bremen, Middlesbrough FC, Aston Villa FC, Blackburn Rovers FC and FC Lokomotiv.

More than 20 U.S. companies are competing for synthetic-turf contracts, in contrast to only a handful three years ago. They are actively seeking to build internationally, while others based outside the American continent, such as Australia's Balsam Pacific and Germany's Tarkett

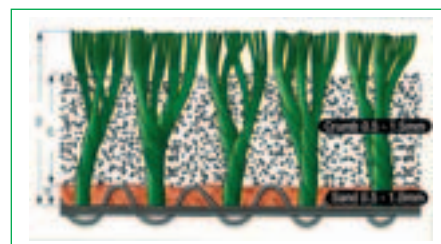
Sommer, are going to the U.S. looking for business.

Although professional stadia receive more attention, the real volume is possibly in recreational fields. With more girls as well as boys playing sports throughout any one year, and with limited available land where new fields can be built, communities and schools must get more use from the fields they have, and they can do so by installing artificial turf.

Edel International is a Dutch company that owes its existence to a carpet-manufacturing group founded in 1918. Edel Grass products in the 21st century use appropriate technology and materials to produce a range of synthetic turf surfaces that it suggests are almost indistinguishable from the natural growth. The supporting framework of the turf comprises a polypropylene primary backing that is reinforced with a secondary backing of glass fibre for dimensional stability. Added to this is a curled reinforcing yarn, which Edel describes as a bouclé matting, that strengthens a 0.5 inch layer of sand infill, and by its weight gives the artificial grass added stability. On top of the sand is an infill layer of crumb rubber that surrounds and stabilises the Thiolon LSR fibres, leaving just 0.5 inch protruding at the playing surface. The last process is to mechanically fibrillate these fibres into a fine layer that covers the rubber and provides the visual appearance of true grass.

Variations on the Edel Grass theme, usually in the fibre weight and the amount of infill, appear to justify the company's claim to have a product range that validates all-year-round use of surfaces for soccer, tennis, hockey, crown green bowling, golf, baseball or rugby.

It follows that a potential problem for surface manufacturers and installers is that of UV degradation when their products are laid out of



Edel's synthetic grass product introduces an extra yarn for base reinforcement.



A classic putting green by Synthetic Turf International.



doors. Australian textile group Tapex Pty Limited is based in Sydney – and could therefore claim with some justification to know something about the subject. Its synthetic grass yarns range is UV stabilised and guaranteed for up to seven years against degradation – as well as being produced in five shades of green and a variety of other common colours.

Typically the yarns can be polypropylene, polyethylene or a co-polymer with levels of fibrillation to suit customers' requirements. Yarns are twisted to aid in processing by the tufting companies. The amount of twist can be varied but is typically 32 or 41 twist per metre. The direction of the twist can also be varied between "Z" and "S" although "Z" twist is said to be the most common.

As an aid in processing, Tapex lubricates the synthetic grass yarns with diluted organic oil that does not affect the finished sports surface.

Many sports are 'roll conscious' in that a moving ball must not receive any imparted bias from the running surface – hockey and bowls are games in example. Tapex produces a KdK (knit de-knit) yarn expressly for these applications that is manufactured by taking a standard synthetic sports yarn and putting it through a secondary process. First the yarn is knitted into a sock form. Then this sock is heat set and finally de-knitted back into a cone for the tufting company to use. This process causes the yarn to gain a "curl" and when tufted the finished surface will have the yarn curling over at random rather than standing proud.

Half and half

Even with the general increase in interest in synthetic surfaces and the prevalence of weather conditions that justify the expense, there are still many authorities that prefer the vagaries of playing on natural grass. Two interesting technologies cater for this sector: the Motz Group of Newtown, Ohio, and Hummer Turfgrass Systems Inc. from Lancaster, Pennsylvania, offer individual variations on the home-grown theme that combine synthetics with nature to produce turf that is lush enough to satisfy the most demanding of green keepers.

The Motz TS-II is a hybrid turf product that uses a spatially sympathetic tufting programme based on a bio-degradable matrix so that natural grass can grow upwards through the gaps and the roots become entwined in the matrix of synthetic tufts and backing. They grow through the plastic mesh and into the foundation material below. The leaf blades rise above the tops of the synthetic tufts, creating a fully natural grass surface. If the turf canopy is worn away, the sand-filled synthetic matrix continues to provide a consistent, sure-footed playing area. Motz says that plant roots, crowns, rhizomes and stolons growing within the stabilised zone above the backings are shielded from wear damage, extending the field's playability and accelerating turf recuperation following rigorous use.

Grasstiles is the aptly descriptive name given to

the Hummer products that use recycled carpet fibres from DuPont's Carpet Reclamation programme as a major component in the growing mixture used to fill 7 feet square trays. These are then seeded, turfed or sprig-planted to produce a 100% natural grass playing surface that Hummer says can take a real beating. The tiles in the trays are replaceable, can be rotated and are instantly playable. The company maintains that the 2-inch thick Grasstiles are ideal for lowlight conditions in stadiums, areas of heavy traffic and the rapid repair when the halfway line disappears.

Sheet and tile

Where polymers have proved their value in grass substitution, the applications are primarily out of doors – although there are situations where faux grass has a major part to play in aiding the transfer of some sports into an indoor arena. International bowling is a prime example.

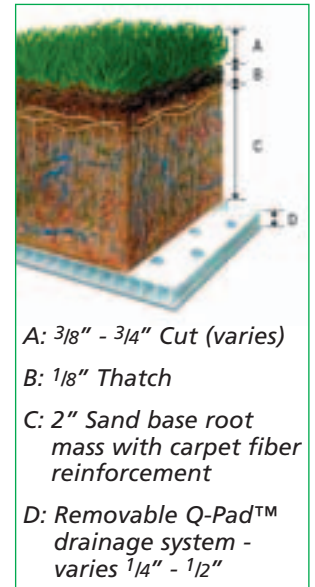
In general terms however it is more often that indoor synthetic surfaces are in sheet or tile format, with appropriately textured faces to match the playing requirements of the activity in mind. The manufacturer Prestige Enterprise International, of Cincinnati, quotes its Play Turf/Play Gym as a multi-purpose sports surface suitable for volleyball, handball, badminton, basketball, soccer and tennis. As the name suggests it is two systems in one; a self-levelling, 4mm polyvinyl chloride rollout with two embossed variations to provide ball rebound or match the ball control required in tennis. Prestige quotes the self-levelling nature of Play Turf/Play Gym as an aid to cutting the time and costs of laying – just 24 hours to renovate a court or fit out a gym.

The same company also produces interlocking, reinforced polypropylene tiles for basketball and volleyball courts. Only 250mm square, the tiles have five injection points as an aid to maintaining a lifelong level surface. The thick heavy gauge surface structure is virtually indestructible and the tight connections produce the effect of a virtually seamless floor. Prestige says they are perfect for skating, inline hockey, ball games and gymnastics.

French-based Gerflor ranks as the third largest synthetic flooring manufacturer in the world. Its sports flooring line includes permanent indoor flooring products such as Taraflex Sport Plus, Taraflex Sport M, Taraflex Sport 3D, Taraflex Sport Performance, and Bateco protective floor covering.

The Taraflex synthetic floor is designed to combine shock absorption and a range of safety features without compromising performance. The multi-layered product is said to provide safety and resilience through a laminating process that combines a 100% pure vinyl wear layer with reinforced glass fibre and a patented closed-cell foam backing. The laminated construction provides shock absorption to reduce stress on the skeletal structure and help fight fatigue. 🗨️

Derryck Draper



A: 3/8" - 3/4" Cut (varies)

B: 1/8" Thatch

C: 2" Sand base root mass with carpet fiber reinforcement

D: Removable Q-Pad™ drainage system - varies 1/4" - 1/2"

The content for a standard Hammer Grasstile.