

Artificial Clay



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Introduction

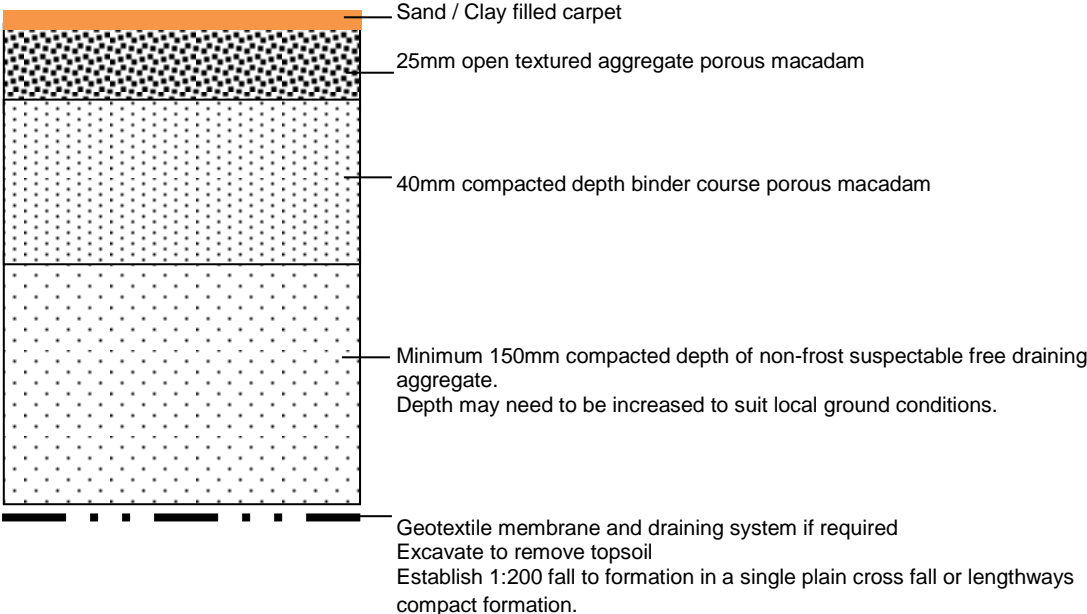
The demand for Artificial Clay surfaces within the United Kingdom continues to rise, which has led to an increased number of Artificial Clay products becoming available within the UK Market. The products available comprise a tufted polypropylene or polyethylene synthetic carpet that is filled with an aggregate to provide a playing surface that allows slide and, depending on the infill type used, also replicate the ball pace and spin characteristics of traditional European Clay.

The benefit of most Artificial Clay products are that whilst providing similar characteristics to traditional clay courts, the surfaces allow opportunities for winter play and a reduced level of maintenance compared to traditional clay surfaces. Products using coated or heat treated sand infill do not require irrigation systems and can be used throughout the year. Products incorporating traditional red clay infill (brick dust) do require watering; to keep the surface in the best possible condition; courts with these products are commonly designed with inbuilt sprinkler systems that can be controlled automatically by computers, thus reducing the need for extensive levels of work by ground-staff.

What is it made of?

Where-as sand filled synthetic turf products are designed so the synthetic turf carpets are filled to within 1mm-3m of the top of the carpet pile, artificial clay products are overfilled with infill to allow the sliding capabilities that are experienced on a clay surface. The aggregate fillings used by these products vary, some products are actually filled with crushed brick dust (traditional European Clay) whilst others are filled with a coated or heat treated coloured rounded sands.

Minimum Design Requirements



Carpets are produced in a range of widths, usually between 4.0m or 5.0m and courts are now often supplied in kits to maximise the number of integral line markings.

How does it perform for the player?

Playing Characteristics	
Ball Surface	
Speed of Court:	Slow – Medium (surfaces with brick dust infills being slower than those with sand infills)
Height of Ball Bounce:	Medium
Trueness of Bounce	Almost consistent – providing infill levels are maintained
Ball Spin	

Topspin	Yes
Slice	Yes

Player Surface	
Footing:	Sliding
Traction:	Non Slip
Shock Absorption:	Medium-Soft

Important considerations when choosing and installing Artificial Clay.

As there are many different designs of carpet and an even greater number of manufacturers of artificial clay it is important that when considering which clay to choose that information regarding the products performance and durability is sought. This can be requested in a specification for the works, so that all the information is provided by contractors at the time the works are tendered or investigation into the type of surface can be undertaken before tendering. The two important factors are that the surface has an ITF (International Tennis Federation) court pace rating certificate and that the surface has been tested to *and meets the requirements detailed in EN 15330 for a surface primarily used for tennis. These requirements should be written into the scope of works for the works.*

The quality of the infill (especially when selecting heat treated and coated sands) is fundamental to the long-term performance and appearance of the surface. Poor quality coated sands can abrade quickly and the resulting dust and debris can result in hardening of the surface and a significant reduction in water permeability rates; resulting in surface flooding. It is therefore recommended that sands of proven quality are used and that they satisfy the following criteria:

Infill	Colour	Terracotta / brick red
	Particle grading (BS EN 933 - Part 1)	0.2mm – 1.0mm and within \pm 20% of manufacturers specification
	Particle shape (BSEN 14955)	Sub-round or round
	Colour retention over five years	> Grey scale 3
	Resistance to friability (NF-P 18-576)	< 30
	Water permeability (BSEN 12616)	> 500mm/h

The court should incorporate an upstand of at least 50mm in height to the perimeter edging when built from new. For existing courts a wooden kick board may be incorporated to the base of the perimeter fencing in order to prevent the clay infill from spilling over the edge of the court block.

Irrigation Systems.

The versions of artificial clay tennis courts that use traditional clay (crushed brick dust) normally require some form of irrigation or watering system to keep the clay immobile. This may be achieved by either an irrigation or watering system or hand watering by hose pipe.

Irrigation systems are preferable for multiple court installations as they can be automated to water the courts at the optimum times of the day (minimising water loss through evaporation and player downtime). Irrigation systems normally comprise pop up sports sprinklers located around the perimeter of the court, away from the actual playing surface. The sprinklers are almost completely hidden underground with only the top disc of the sprinkler visible when it is not operating. Once under pressure, the sprinkler rises out of the ground and waters in a pre set arc. Heavy duty pipework brings the pressurised water to each sprinkle. This means a water storage tank and pump unit are required to operate the system; these will often require planning consent. The design of an irrigation system needs to be undertaken by a specialist that understands the precise needs of the tennis and the artificial clay surfaces.

Whilst hand watering is a far cheaper option; the limitations of time and inconsistencies in water application can be disruptive to play and the playing experience. Hand watering is possibly suitable for single courts or at clubs where members are used to undertaking some court preparation / maintenance prior to play. If hand watering is to be used it is essential that the water supply to the courts has an adequate pressure and flow rate; if in doubt seek specialist advice. As hand watering is not automated it often uses more water and can increase operational costs, a significant factor as water costs escalate. In times of water restrictions, experience suggests a system based on hand watering may be less likely to win an exception from any hose pipe ban, than a sprinkler system.

Player Testing

It can be a difficult task to compare the quality and performance of the many different products currently available on the market. Prospective purchasers must rely largely on their own inspection and play testing of different courts, although this can also be difficult when comparing examples of surfaces of varying age and condition. Buyers should be particularly careful when play-testing older, well-worn installations of artificial surfaces, as the performance of courts can change significantly from when they were new.

Most court contractors act as agents for different manufacturers' products, and it is important to ensure that surfaces inspected are the same as those offered, as products may vary whilst still having the same trade name.

Installation

The quality of the installation works is fundamental to the success of the facility. Installing tennis surfaces outdoors in the British climatic can be problematical and it is strongly recommended that a specialist consultant or engineer is appointed to oversee the works. Once the installation is completed it is also recommended consideration be given to having it independently tested to verify the courts have the anticipated court pace rating. If desired such testing can be expanded to allow the courts to be formally certified under the International Tennis Federation's Court Recognition Scheme.

How do I look after it?

The maintenance procedures are designed to ensure:

- Infill levels are maintained at the contractors specified depth and are uniform across the whole court area, including run-backs and side-runs
- The playing surface is kept scrupulously clean, to preserve its playing characteristics
- That the carpet pile remains supported to prevent flattening leading to inconsistency in ball rebound and poor drainage.
- That the free drainage of surface water is maintained throughout the life of the court.
- That the tennis court should look attractive and well kept at all times.

These objectives are achieved by:

- Drag matting the surface after every game, as you would on a clay or shale court
- Shovelling up the excess build up of dressing at the outer perimeter or net line and re-distributing to the main playing area
- Regularly sweeping leaves and other detritus from the surface
- If required apply prophylactic treatments of moss killer and/or algaecide.

Drag matting

To ensure true and consistent playing characteristics the infill levels need to be maintained at the surface manufacturer's specified depth across the whole court. Failure to do this will result in areas that allow slide and areas that do not, which can be hazardous to players, and also result in inconsistent ball characteristics.

In order to achieve this, after each session of usage the court surface should be dragged both horizontally and laterally with a drag mat by hand. Drag mats usually comprise of a 6.5 x 5 foot PVC fabric net which is attached to either a wooden or aluminium rail. The mat allows the clay surface to be smoothed by the rail and then evenly distributed by the net. With a width of 6.5 feet, the front PVC mat smooths the unevenness and slide traces, while the back net smooths the covering of the court. Should any low spots appear, these should be immediately filled and smoothed out.



Example of a Drag Matt

More robust drag matting or brushing to prevent the compaction of the infill can be undertaken can be undertaken using a mat pulled behind a mini-tractor. This would be undertaken on a weekly basis.

Keeping the Surface Clean

Leaves, tree flowers, pine needles, and other detritus should not be allowed to remain on the surface for any length of time. If this happens they rapidly decay forming a drainage-inhibiting skin within the surface, and providing a growing medium for algae and moss.

A wide soft broom or a rubber-tined rake is ideal for removing vegetable matter and other rubbish. Better still a mechanical leaf sweeper or garden vacuum cleaner will greatly speed-up the operation. The equipment should be well maintained and carefully operated to avoid contamination of or physical damage to the surface.

Brushing

Although a necessary requirement in the maintenance of Artificial Grass courts, brushing is not always seen to be necessary on Artificial Clay surfaces as the infill should always be above the carpet and act as a protecting layer. However if brushing is recommended in the manufacturers operation and maintenance manual, then places to play should follow this guidance.

Moss and Algae

In certain situations and in some seasons algae or moss can become established on the court surface. Since prevention is very much more effective than cure, it is important to treat the court with a good proprietary moss killer and algaecide at least once a year.

Moss is not usually found on that part of the surface that is heavily used, and it may not be essential to treat these areas although it is still a wise precaution to do so. Particular attention should however be paid to those perimeter and other areas that are not heavily used, especially if they are shaded by walls or buildings or overhung by trees. Any good proprietary product is satisfactory provided it is not oil-based. The manufacturers instructions should be closely followed. Some installers can supply specially formulated moss killers.

Where moss has become established, repeated applications of moss killer may be needed until the moss can be brushed and cleared away. In the case of very severe infestation, the installer should be consulted. High pressure cleaning equipment is now available but its use is a skilled process.

It should be emphasised that moss is only a serious problem if it is allowed to become established. An annual prophylactic application of moss-killer is an easy way of preventing this. Regular brushing and use of the court renders moss an even less likely problem.

Play Lines

Your court will normally be supplied with permanently in-laid playing lines. However, if additional lines are required chalk lines can be applied for temporary additional lines but these tend to leave a lasting powder spread in the area of the line. Permanent lines require no special attention.

Weeds

No matter how much care is taken, weeds may occasionally appear on the surface usually as a result of wind blown seeds. Small numbers of weeds can be removed by hand without damaging the surface. Localised areas of weed seedling infestation can be treated with domestic weed-killers without causing damage to the surface of your court. Oil based weed-killers should not be used.

Snow and Ice

Snow and ice are not harmful provided the courts are not used and can be permitted to melt through. Snow should not be removed manually as this will always result in some of the infill material being removed and the need to replace with new material. Rock salt and chemical de-icing agents should not be used.

If heavy rain falls immediately after a very cold spell, the court may become flooded for a few hours. This is because the infill beneath is still frozen. Do not worry; the ice will soon melt and the surface will then drain normally.

Footwear and General Court Care

Make sure that suitable footwear is used i.e. tennis shoes or plimsolls.

It is strongly recommended that your court is a "NO SMOKING" area. A dropped cigarette will melt the fibres down to the surface leaving an unsightly mark. Chewing gum should be banned too.

Maintenance Schedule

Daily

Immediately after play

- Drag mat the courts after every match / coaching session.
- Remove any debris or detritus

At the end of the day's play

- Make sure the gate is shut

Weekly

- Clear leaves and rubbish etc. from the court
- Deal with any new weeds, moss or algae
- Check sand / clay infill levels

Periodically – at least every six months

- Check for moss and algae growth, etc., and remedy as appropriate
- Apply grease to the winding gear
- Check all carpet and line joints and repair any that are failing before they become a safety concern

Annually

- Treat court with moss-killer/algaecide
- Call in installer if any aspect is causing significant concern

Rejuvenation

The majority of the artificial clay surfaces are designed so that the top of the playing surface is mobile, so that the players can slide. Regular dragging of the surface ensures that the surface remains mobile. As the court ages, the layers under the top surface / carpet will begin to compact, which will in turn lead to the base of the infill compacting. Therefore it could be beneficial for places to play to look at rejuvenating the sub-base and the infill after around 5-6 years of usage in order to allow the court to achieve optimum performance.

Note:

These are minimum recommendations. Cleaning and court inspections can always be done more frequently. Common sense and careful observation should prevail. If any serious doubt exists about the effectiveness of the maintenance regime or the condition of the court(s), call in the installer immediately. It is better to be safe than sorry.

Frequently Asked Questions.

Do Artificial Clay courts need much maintenance?

It is essential to keep the clay evenly distributed and free from dirt and debris. This is achieved through regular dragging of the courts after play and coaching sessions. The courts should be monitored on a daily basis to ensure that the optimum playing characteristics are provided at all times and the lifespan of the court is maximised.

Our courts are not draining properly, what is the cause?

Bad drainage is usually a sign that an ageing court has a build up of moss, dirt and debris contaminating the infill and causing it to compact. Compaction effectively blocks water from permeating through the carpet and results in ponding. If the problem is severe the contaminated infill can be replaced with new sand / clay. There are two methods using either high power water pressure or compressed air. Vacuuming using compressed air is the most effective because the surface remains dry, allowing immediate and complete re-sanding. The water pressure method needs to be carried out in two stages. Once the infill is removed the carpet must be allowed to dry out before the new infill is installed. If the carpet is wet the infill will not flow evenly into the carpet pile. There is also the risk of some contamination being washed to the bottom of the carpet and causing a problem in the future.

Both of these methods are available through contractors but they are expensive and the choice of companies offering the dry version is limited. The only effective way of avoiding contamination is to follow the recommended maintenance guidelines.

When is the best time to drag the courts?

The best time to drag the courts is when they are dry.

What is the method of replacement?

The artificial clay carpet is removed in its entirety and replaced with a new surface and new clay infill.

In order to ensure adequate drainage for the life of the new artificial clay carpet the macadam base of the court may need to be pierced and back filled before resurfacing. With medium and particularly short pile carpets there is a possibility of the pierced holes causing small depressions in the playing surface. This can distort the bounce of the ball after it has made

contact and is therefore unacceptable. To ensure the holes do not become a problem it is strongly recommended that the pierced macadam surface is overlaid with a new macadam layer. Overlaying also has the advantage of ensuring the surface regularity of the macadam base for the carpet is to the highest possible standards – giving the best possible ball consistency. A new layer of macadam with raised kerbs will cost approximately £5000 per court excluding VAT.

Life cycle costs

Table 1 shows the total cumulative **budget** un-inflated, over a life cycle period of 12 years. It shows the initial construction cost and the subsequent maintenance, repair and renovation costs incurred during the court life cycle.

Table 1.

Year	Court Construction	Moss and weed killer	Rotary brushing	Remove and replace turf	Replace fence/gates	Minor repairs
1	£34,000 00					
2		£150.00	£350.00			£100.00
3		£150.00	£350.00			
4		£150.00	£350.00			£100.00
5		£150.00	£350.00			
6		£150.00	£350.00			£100.00
7		£150.00	£350.00			
8		£150.00	£350.00			£100.00
9				£12,500.00		
10		£150.00	£350.00			£100.00
11		£150.00	£350.00			
12		£150.00	£350.00		£3,800.00	£100.00
Total Construction Cost	£34,000					
Total Running Cost		£1500.00	£3500.00	£11,000.00	£2,500.00	£600.00

New Artificial Clay Court- £40-42,000 per court.

Notes:

Figures are based on the average cost of a new court in a block of three. For more than one court costs should be calculated on a pro-rata basis.

Figures exclude VAT, inflation and overheads (e.g. fees)

Figures are subject to regional variation

What is a sinking fund?

A sinking fund is created by putting aside each year an amount in cash that will cover the full cost at the time of replacement of an asset such as a tennis court.

As the cost to you of this replacement is in the future, you will need to save the amount of money that you will spend at that future date, not the cost at today's date.

This means that it is not possible to take the cost of replacement at today's prices and divide it by the number of years until replacement is due. A more complex sum, but one which is standard practice, is involved. This sum takes into account compound interest to the replacement date and can make the amount you need to save appear quite high.

The logic is that present membership fees should cover the deterioration of the courts caused by the present members so that the funds for replacement are automatically available when the courts have to be renewed.

Sinking fund requirements

Table 2. shows the amount of money to be invested each year to cover the cost of removing and replacing the turf.

Year	1	2	3	4	5	6	7	8	9	10
Annual Contribution	£1,800	£1,800	£1,800	£1,800	£1,800	£1,800	£1,800	£1,800	£1,800	£1,800
Balance Brought Forward		£1,800	£3,690	£5,675	£7,758	£9,946	£12,243	£14,656	£17,188	£19,848
Interest @ 5%		£90	£185	£284	£388	£497	£612	£733	£859	£992
Expenditure										£22,640
Accumulated Fund	£1,800	£3,690	£5,675	£7,758	£9,946	£12,243	£14,656	£17,188	£19,848	0

The combined rate of 5% for interest & inflation has been taken into account in these figures.

Budget costs are exclusive of VAT

Terminology:

Future changes in the terminology to be included in the European Asphalt Standards:

The term “asphalt” is the internationally accepted technical name for “macadam” which has been used throughout this document as it is more commonly known within the UK.

The term ‘base course’ as it is most commonly known and used in this document will in future be called ‘binder course’.

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