

ligaTurf



GUIDELINES FOR THE
**CARE AND
MAINTENANCE**
OF YOUR FOOTBALL AND
RUGBY FIELDS

MAINTENANCE MANUAL

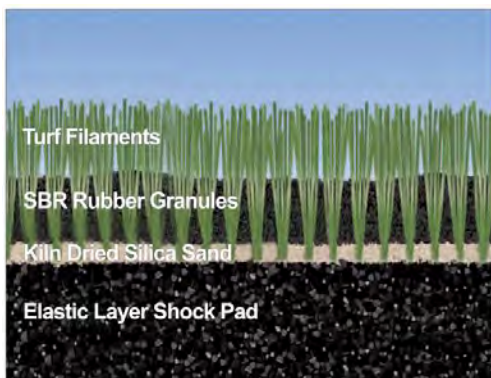
LigaTurf® Football Turf Systems Comprised of Synthetic Turf with Sand and Rubber Infill

Aim and scope

These maintenance instructions are aimed at turf users and the maintenance personnel to provide guidelines for the correct maintenance of the football turf.

1. LigaTurf® Football Turf Systems

Modern football turf systems are already very close to the ideal type of natural turf. LigaTurf® football turf systems with in-situ elastic layer always show the same design. It consists of an elastic layer comprised of rubber granules bound with polyurethane in an in-situ installation. Above this layer sits the artificial turf, which includes sand (stabilising) infill and rubber (performance) infill.



LigaTurf Low Slide



LigaTurf Mono Tex

LigaTurf® systems are monofilaments which have single, straight turf fibres which are not texturised. There are also texturised artificial turf types which do not have straight fibres but texturised (crimped) fibres.

LigaTurf® Artificial Turf without an Elastic Layer Shock Pad

Some LigaTurf® systems do not have an in-situ elastic layer. The infill material in this type of turf is more inclined to shift and displace. Therefore more maintenance work is required than for LigaTurf® football systems with an elastic layer shock pad.

2. Distinction between Maintenance Works

In general it is possible to draw a distinction between three levels of intensity of maintenance work:

- Chapter 3:** General inspection and service work
- Chapter 4:** Maintenance work for turf and infill/granulate material (system)
- Chapter 5:** Special care and maintenance work

These maintenance instructions also contain a description of the maintenance equipment which APT recommends for the maintenance of LigaTurf® football Turf systems. For further information please contact APT.

3. General Inspection and Service Work

We recommend that the general inspection and service work should be carried out every day. The more frequently this maintenance and inspection work is carried out, the simpler the system-related maintenance work will be.

Remove surface dirt regularly

Remove leaves, pine needles, paper etc. straight away. The surface dirt can be removed with a leaf blower or an adapted brushing machine.

Regular maintenance of the edge zones and the surrounds

Remove leaves, pine needles, soil, etc. to ensure that any natural grass, moss and weeds cannot become established in these areas.

Existing pitch growth must be removed by mechanical means

Pull out or spray using high water pressure. Do not use aggressive cleaning nozzles. *(Important: Remember to refill the turf with sand and rubber granules after cleaning).*

Sharp objects

Stones, shards of glass, metal pins etc. must be removed immediately.

Oil and fuel

Oil and fuels must be absorbed as soon as possible with sand or saw dust and then removed. APT advises that infill material be replaced in a radius of 20cm around the affected area to prevent any reactions between the substance and the fibre filament and carpet backing. If residual oils are present on the surface, a mild detergent may be used to clean. The area should be thoroughly rinsed after cleaning.

Chewing gum / gluing agents

Chewing gum can best be removed after it has been frozen.

Contamination from bird droppings, etc.

This type of contamination must be removed as soon as possible and it may also be necessary to remove the sand and rubber granules from the immediate vicinity.

Check the lines and seams

Lines must be checked on a continuous basis to ensure that they are correctly affixed so that even if they peel slightly this problem can be dealt with quickly and easily. The appropriate equipment for this purpose (adhesive and seam tape) can be purchased from APT.

Check rubber and sand infill levels

The entire turf area must be checked at regular intervals to ensure that the sand and rubber infill is at the correct level. If any areas are found where the rubber or sand is low, the material should be refilled straight away.

Check the penalty spots

The areas around the penalty spots must also be checked at regular intervals because they are subject to heavy stress from shooting and goalkeeper training which often results in the sand and rubber infill being displaced. If this is the case the sand and rubber must be refilled to the specified levels.

If major touch-up work or gluing work is required, contact our experts as soon as possible to prevent further damage and possibility even accidents.



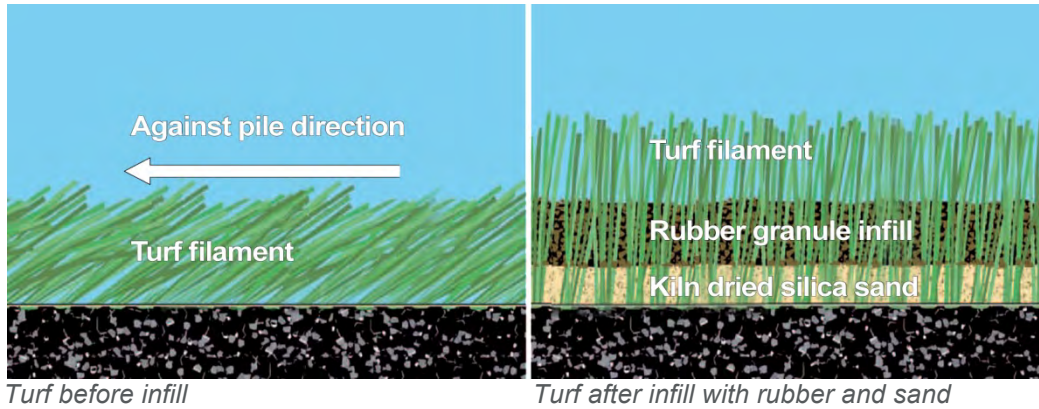
!Attention!

We recommend that you do not use any chemicals for general maintenance work (for example to remove natural turf growth). The wide range of products available and their chemical composition means that APT cannot guarantee that they will not damage the turf fibres.

Any residues that may be left in the rubber and sand infill may be harmful to the health of users and players. It is not possible to guarantee that the chemicals will not damage the environment when they are washed out of the turf.

4. System Related Service Work for Turf and Rubber Infill

The artificial turf fibres always have a certain alignment and never stand up straight by themselves without sand and infill. Even after filling this direction effect is still visible.



As a result of use, this alignment means that the turf filament increasingly lays down in one direction (also know as the pile direction or production direction). During maintenance of the fibres it is necessary to brush against the pile direction in order to brush the fibres upright.



!Attention!

Newly installed systems require time to “settle in”.

The time the system needs to “settle in” may take 6-12 weeks depending on the intensity of usage, infill, turf type and weather.

4.1 System Related Service Work for Turf and Rubber Infill

4.1.1 Installation in the same direction



Rolls of turf installed in the same direction



There is no difference between the rolls in these turf pitches because the fibres all point in the same direction.

4.1.2 Installation in the opposite direction



Rolls of turf installed in opposite directions



Some installations are installed in opposite directions. The turf fibres of two neighbouring rolls points in opposite directions. The effect is easily visible (lawn mowing effect) and can reduce servicing times (see section 4.2).

4.2 Turf filament maintenance

Continuous maintenance ensures that the turf fibres remain upright and do not lie flat.

4.2.1 Maintenance using a fixed plastic brush

The fixed plastic brush on a purpose built brushing unit is the most effective piece of maintenance equipment for an artificial football turf.



Purpose built brushing machine

It is important to ensure that the brush is adjusted correctly and that the unit travels in the right direction during maintenance.



!Attention!

Another point to be kept in mind during maintenance is the vertical pressure exerted by the maintenance machines. Equipment should be adjusted so that the turf rolls do not become corrugated and the rolls displaced by the maintenance work. In this respect special attention must be paid when maintaining around lined areas.

4.2.2 Maintenance intensity

Maintenance with a brush should be carried out at least two times per week if the turf is used intensively for matches and training (5-6 hours per day, multiple teams) or at least once per week if it is not used very much (3-4 hours per day). It is recommended that in advance of tournament days to arrange a brushing session, to ensure the optimum playing conditions.

The frequency of maintenance and maintenance cycle for all types of turf depending on usage are set out in the appended maintenance schedule.

Turf with rolls installed in the same direction



Direction the rolls have been installed.

Direction of travel for maintenance to ensure the fibres are standing upright.

Marking the direction of travel by installing signs in appropriate areas for maintenance personnel to reference is recommended.

Turf with rolls installed in the opposite direction



Direction the rolls have been installed in.



Direction of travel for maintenance to ensure the fibres stand upright.

If the rolls have been installed in opposite directions, the driving distances can be reduced because it is possible to travel to the end of the pitch on the next strip.

Travel direction for opposite installation in detail



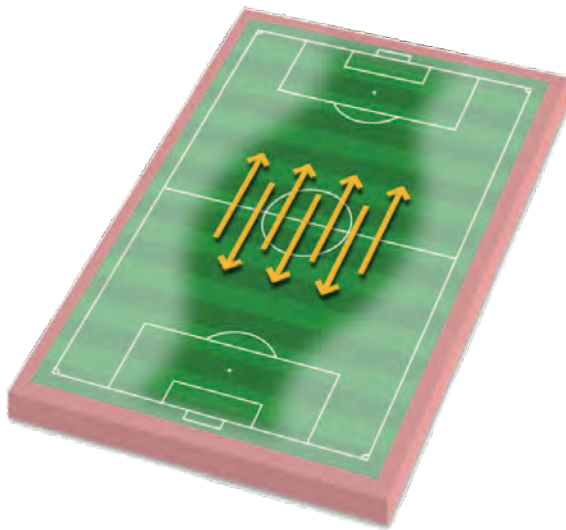
!Attention!

For both methods it must be ensured that the brush passes over the lines without exerting any pressure on them or a zigzag pattern may form.

A turf tractor with a hydraulic system will be a major help as it will be able to raise the ACS unit from the turf on the edge of the pitch quickly and easily.

Travel Direction on older or heavily used football turfs

In particularly heavily used areas, brushing perpendicular to the installed direction can also help to reach all the fibres so that they can then be brought upright again during the subsequent brushing pass.



Direction of brushing in heavily used areas



Direction of travel for maintenance of ageing turf. The final pass must always be against the installation direction.



!Attention!

The important thing to remember is that the final pass must always brush against the pile direction

Special lining features

If a zigzag pattern on the side lines (opposite installation) or bows are formed, this generally indicates excessive pressure during brushing. In most cases the pressure exerted by the fixed brush must be reduced and these areas can then also be corrected using the pile direction.

One helpful way to correct this problem is to pass along the side lines. This applies to turf strips which are installed in the same direction and those which are installed in opposite directions.

Maintenance along side lines



Texturised turf

Essentially the same maintenance methods should be used for texturised turf when using the brush on the ACS unit, but the frequency of this maintenance may vary depending on the level of usage.

Turf without an elastic layer

The same applies to turf without an elastic layer.



!Attention!

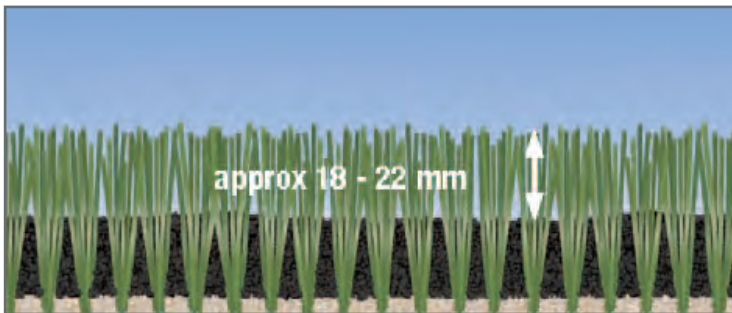
During maintenance of newly installed systems using a brush you may often see loose fibre on the surface. This does not mean that the synthetic turf is damaged! These fibres are caused by so-called wrapping yarn (auxiliary yarn used in the production process). This will be caught during the first brushing and removed. It has no influence on the function and durability of the turf and should simply be removed.

4.3 Rubber granules maintenance

After the pitch has been brushed for the first time, the rubber granulate is evenly distributed over the entire area of the pitch to ensure that the artificial turf fibres project evenly out of the turf.

4.3.1 Infill Height

For straight yarn the sand and rubber infill material always needs to be filled uniformly between 18-22mm below the tips of the fibres.



Fibre projection length for straight turf



!Attention!

The turf appearance is slightly different for texturised turf types. The texturised fibres have a crimped structure making them more voluminous so that they already have a certain height on the turf surface even if they are not completely upright.

The fibre projection length in this case can be between 10-16mm depending on the intensity of usage.

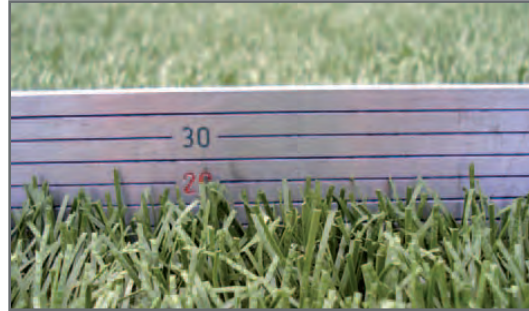


Pile projection length for texturised fibres

4.3.2 Measuring the fibre projection length

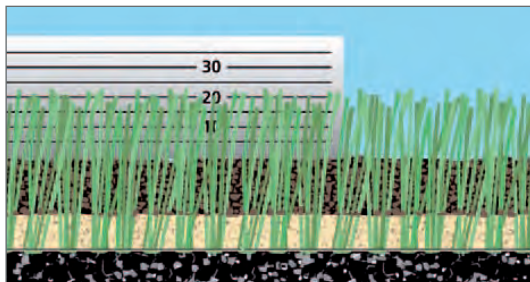
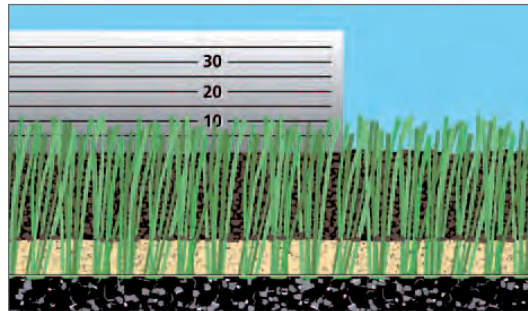
The easiest method of measuring the fibre projection length is with a gauge. This should be done at several points around the pitch. Measuring points can be the check point for the ball roll test (see chapter 7)

Measuring the fibre projection length



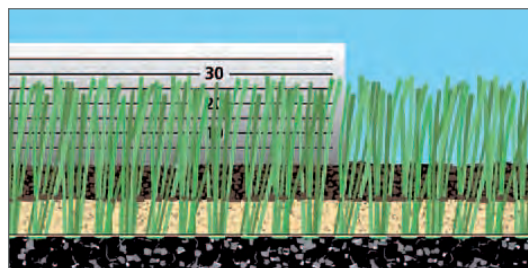
For texturised fibres the measurement can be facilitated by a piece of cardboard.

Projection length too low



Correct projection length

Projection length too high



4.3.3 Heavily used areas

During game play and training the field is used with different intensity. One side-effect of this stress is that the infill moves from the inside to the outside zones. Regular inspections of the infill volumes are therefore essential.

Stress distribution around the pitch:

Orange = high stress
Green = low stress



!Attention!

The goal areas and the penalty spots must be checked particularly carefully to ensure that they have uniform rubber granule infill material. Intensive use can result in major infill displacements in these areas

It may be better to fill the penalty spots with a little more sand than rubber infill if they are used intensively (for example for goalkeeper training). The fibre projection length in these areas as well should still remain consistent with the rest of the pitch between 18-22mm (or 10-16mm depending on type of fibre).

4.3.4 Amount of infill material

Play, usage and also clearing of foreign objects such as leaves, may result in rubber granules being removed and lost. Missing infill material must therefore be replaced at regular intervals, which means that grounds-persons must have an adequate quantity of replacement material stored near the pitch. A road brush with slightly harder plastic bristles is all that is required to distribute the new material correctly. Approximately 1 metric ton/7000 sqm of rubber infill will be required for the first two years depending on the usage and the condition of the pitch.

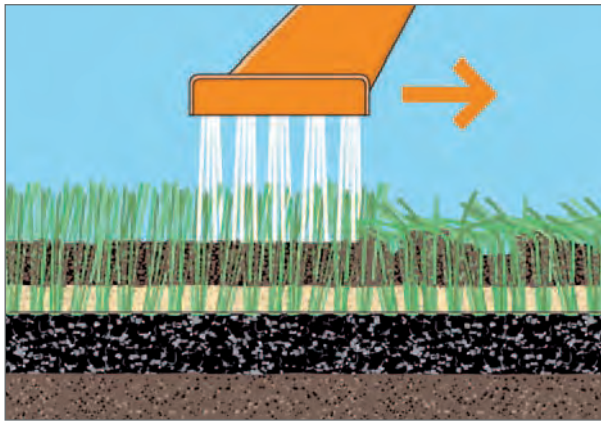


!Attention!

To avoid undesirable reactions between different infills, it is essential to ensure that only infill material of the same type and from the same manufacturer is used for maintenance refills.

4.3.5 Levelling of rubber granules with fixed brush ACS unit

The rubber infill is most easily levelled using a fixed drag brush attached to the rear of a suitable tractor unit. It is important to set the correct working depth of the brush. The setting should always be set to ensure the brush is levelled at a correct fibre projection length (18-20mm or 10-16mm depending on fibre type) whilst resting on the surface of the infill.



Correct brush setting

Driving speed should be adjusted accordingly, so no 'hopping' or 'bouncing' of the brush occurs.

4.3.6 Maintenance frequency for levelling the infill

Please note that if the pitch is used every day for three to four hour it must be brushed at least once per week to level the infill. If it is used every day for five to six hours the frequency of brushing must be increased to twice per week.



!Attention!

Brushing and levelling can be executed in one operation. No separate cycles are necessary for individual maintenance steps.

If the pitch it is used even more frequently (a lot of players and teams using the pitch daily) it must be brushed correspondingly more often to retain the required play properties.

**Special recommendations for maintenance of turf fibres
and levelling infill**



!Attention!

With new turf systems the “settling in” period for infill takes approximately 6-12 weeks depending on the usage of the pitch



!Attention!

The turf must only be brushed in dry weather conditions



!Attention!

Maintenance work on the infill should only be carried out when the infill is dry and in dry weather conditions. Only under these conditions is it possible to distribute the infill uniformly throughout the turf without individual granules sticking to the maintenance equipment and fibres.

4.4 De-compacting the infill

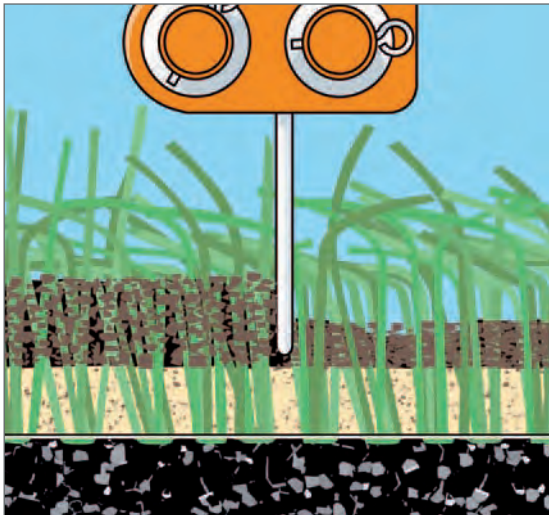
4.4.1 APT turf systems with an elastic layer

The decompacting of the infill material can be achieved by using a ACS unit with two steel needle bars.



ACS unit with needle bars

Decompacting the infill using the two steel needle bars must be carried out with care and precision. If used incorrectly integrity of the entire system (sand, rubber and turf fibers) may be adversely affected.



Correct setting for needle bars

4.4.2 APT turf systems with texturised fibres

Settings are the same for both texturised and smooth fibres (see exact fibre description in chapter 7).

4.4.3 Frequency of maintenance for de-compacting the infill

Infill in new turf systems must be de-compacted no later than one year after installation depending on the kind of infill and the intensity of usage. Thereafter de-compacting should be carried out every six to nine months.

4.4.4 Turf systems without an elastic shock layer

The maintenance intervals are generally shorter with turf systems without an elastic shock layer. The first de-compaction should be carried out six months after installation and thereafter every six months.



!Attention!

Infill de-compaction should only be carried out during dry weather conditions.



!Attention!

If the needles reach too deep into the turf the turf backing is at risk of being seriously damaged.

5. Special service and maintenance cases

The following section contains a list of circumstances where special maintenance is required.

5.1 Winter

5.1.1 Snow clearance

In general, mechanical snow clearing from football turf systems is possible so long as a few precautions are taken.

5.1.2 Clearance depth

Never attempt to clear the full amount of snow from the turf. Always leave approximately 2cm of snow on the turf. This will protect the fibres from suffering mechanical damage from the shovels.

5.1.3 Use of snow ploughs

Only small (manually operated) snow ploughs should be used to clear snow from the turf.

5.1.4 Use of thawing products (salt, liquid)

The use of thawing products (in liquid or powder form) is generally possible. If winter salt or other thawing products are used the infill material or turf fibres may suffer temporary discolouration.

5.1.5 Removing snow with a shovel mounted on the turf tractor

Snow may only be removed with a mounted shovel immediately after it has fallen so as to achieve best results and exert the minimum loads on the turf. The snow must be removed line by line from the middle towards the outer areas.

After the settlement process or if the snow is frozen on top, *do not* use a mounted shovel as this will damage the fibres.

5.1.6 Topping up infill after winter

Rubber granule infill will stick to snow as it is removed from the turf. The rubber infill should be collected up again after winter and spread back on the pitch or new infill

5.2 Summer

Watering, irrigation

In general the turf does not need any watering however in extreme situations watering can improve the usage properties of the turf.

In very high temperatures, watering the pitch shortly before a game can reduce the temperature on the playing surface. The layer of sand acts as a water reservoir to ensure that the effects continue for a lengthy period. The sliding properties of older artificial turf can be improved by watering it.

5.3 Temporary game line markings

These may only be applied to the turf using correct paints. Temporary linemarking will always be subject to natural wear and will never remain permanently on the playing surface.

The method of paint application and its subsequent removal can also affect the pitch surface. Please speak with an APT representative about selecting suitable paints and how best to undertake temporary line marking with least impact on the pitch surface.

6. General instructions for use and warranty

Footwear

- Football boots with moulded studs or cleats are perfect for artificial turf.
- Football boots with metal (steel or aluminium) studs are not suitable for use on artificial turf.
- Sports shoes with flat soles are not suitable for artificial turf.
- Normal shoes or shoes with high heels should not be worn on artificial turf.

Events

- No naked flames or fireworks should be brought onto the turf.
- Covers should not be placed on the turf until the last possible minute before an event and removed as soon as possible afterwards. After covers have been removed the turf fibres should be brushed using the ACS brush to return the fibres to their correct position.
- Loading of the complete system must be considered.

7. Recommended maintenance equipment

There are a variety of brush types on the market with a variety of effectiveness. The most commonly used are dragged brushes. These are normally attached to the rear of tractor units either hydraulically or as a simple attachment. They are particularly effective at levelling infill in the surface. Rotary brushes are also used. These are typically attached to the front of the tractor unit. Normally they can rotate forward or in reverse. Rotating forward is particularly effect at the removing of material from the surface.

The following section contains a brief description of the maintenance equipment recommended to maintain football turf systems. It also describes how the equipment should be adjusted for various types of maintenance work. This equipment can be sourced through APT.



Maintenance equipment

Load and driving on the turf

Maintenance work can only be carried out economically and effectively using mechanical means it is particularly important to observe a few basic rules relating to loads and driving on the artificial turf surface. Systems with an elastic shock pad layer and artificial turf without an elastic shock pad layer have load limits which in some cases differ considerably from each other.

Wheel load

The overall weight of the machines and equipment used must not exceed five metric tonnes. The maximum wheel load is two tonnes per individual wheel. This only applies to systems with an elastic shock layer and with a bound base course or an elastic base course. The vehicles must have pneumatic tyres to ensure that the pressure is well distributed.

Driving on the artificial turf

Drive vehicles at moderate speed and avoid sudden braking and accelerating. Sudden changes in speed can displace infill and pull out turf fibres.

The same applies to steering movements. Do not turn the steering wheel whilst the vehicle is stationary. Avoid full steering locks as this can displace the turf and damage whole sections.

7.1 Brush unit

A specially designed brush units mounted to a mini tractor is an ideal piece of equipment for the maintenance of synthetic turf pitches.

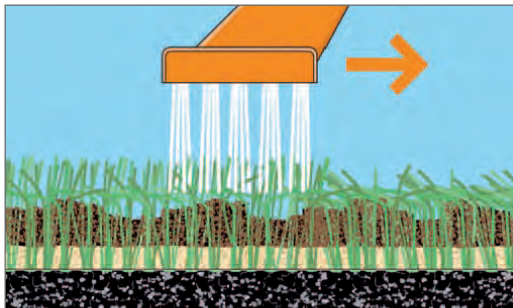


Unit with fixed brush and needle bars



Rear mounted oscillating suspended brushers

The correct setting of the brush is of absolute importance to achieve the desired results.

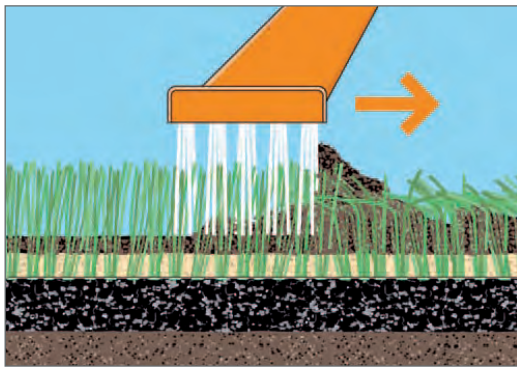


Brush settings too high



!Attention!

If the brushes stand too high above the rubber infill layer not all fibres are brought upright. Only a few are brushed up and insufficient material will be redistributed to the areas where material is required.



Brush setting too low



!Attention!

If the brushes are set into the rubber infill too deep, the rubber granules are displaced from the football turf and there is not enough rubber left in the turf.



!Attention!

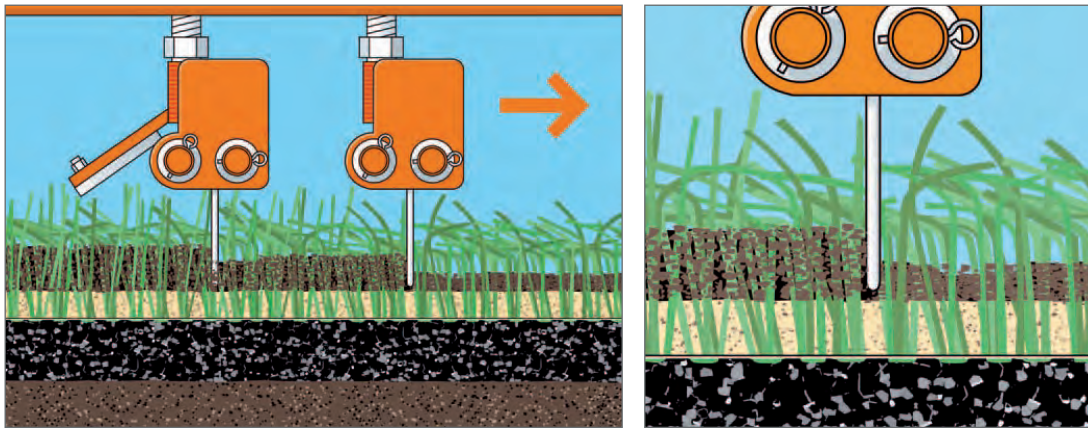
The lack of infill will change the playing properties and safety conditions considerably.

Detailed information regarding the correct operation of such units can be obtained from the manufacturers or through your APT representative.

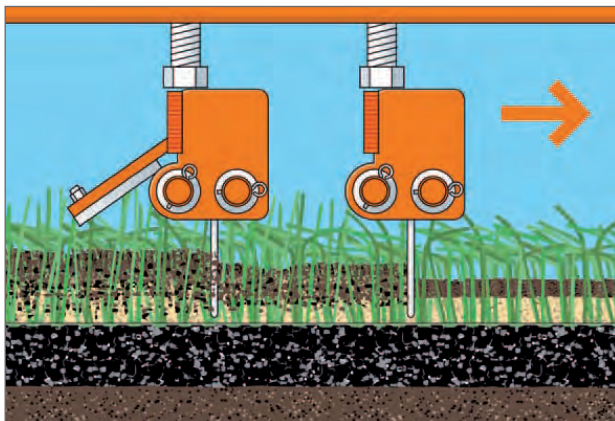
7.2 Needle bars

Needle bar units can be used to loosen the consolidated rubber infill after the turf has been in use for a lengthy period of time. The purpose of needle bar attachments differs to that of fixed brush attachments. Loosening the infill will lift up compacted rubber infill making it susceptible to brushing and even distribution.

The equipment manufacturer's instructions should be closely followed to ensure that the needle settings are correctly to avoid damaging any part of the turf. Incorrect settings have the potential to cause major damage to the turf primary backing.



Correct adjustment of the working units above the stabilizing sand infill



Wrong adjustment of the working units – displacing stabilizing sand infill and possibly damaging the turf backing

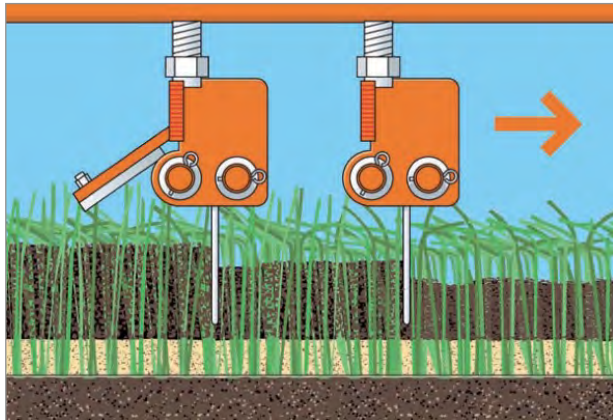


If the needle bars are adjusted too deeply the turf backing can be heavily damaged. Height control is therefore a crucial aspect of maintenance work.

!Attention!

Adjustment for turf without an elastic layer

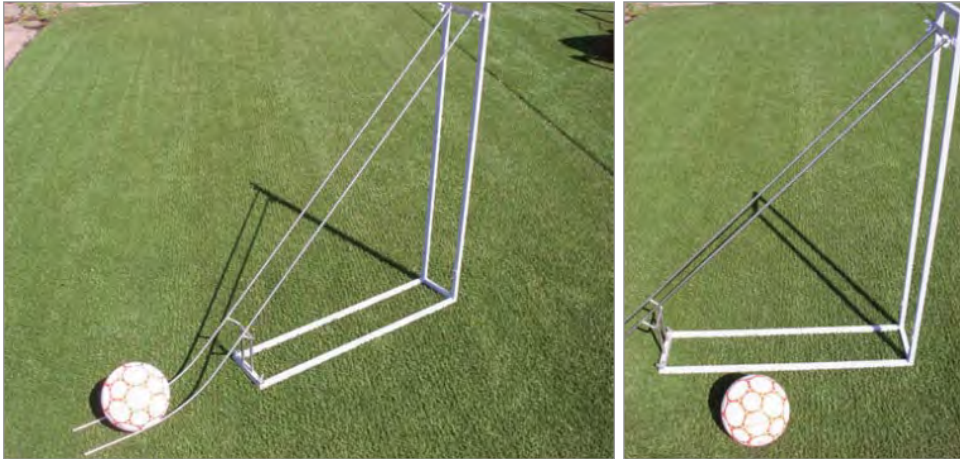
On turf systems without an elastic layer the depth of the infill should be measured at various points around the pitch. The needles should then be adjusted accordingly to ensure that the rubber infill layer is loosened without interference with the sand infill layer and to avoid damaging the turf's primary backing.



*Correct adjustment of needles for turf systems
Without an elastic shockpad layer*

7.3 Ball roll ramp

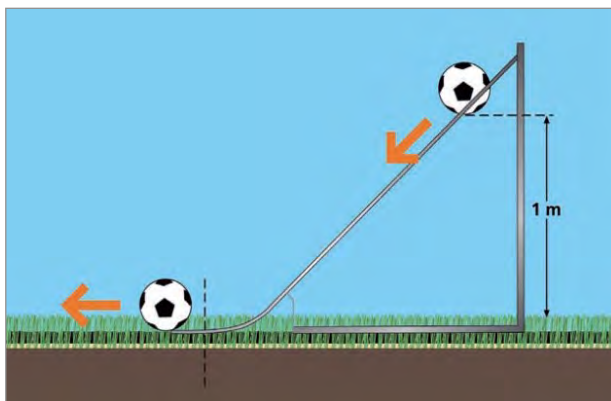
The ball roll ramp is a useful tool to check the success of the maintenance. It is particularly suitable to checking whether the turf fibres have been returned to their upright position.



Examples of ball roll ramp

To conduct the ball roll test ensure the following:

- The ramp is level on the service and is not on any angle.
- The base of the ramp should be pushed into the turf so that it rests against the infill and the fibres extend over the base.
- The ball should be placed on the ramp at a maximum height of one meter.
- The ball should be let go without any pushing force behind it.
- Once the ball comes to a standstill the distance it has travelled should be measured from approximately 50 mm behind the ends of the struts to the centre of the ball as shown in the sketch below.



Example of ball roll test and measurement

The better and more regularly the maintenance work is carried out, the less the distance the ball will travel. This applies regardless of the distances achieved but differs between straight and texturised

The sketch below shows the measuring points for FIFA testing. The points represent the areas with variances in usage.



FIFA measuring points for ball roll test

7.3 Adjustment of equipment

A measurement at the edge of the pitch (for example behind the goal) is most suitable for adjusting the equipment because the fibres are exposed to the least stress in these areas and the infill will not be as compacted.



Summary – Maintenance Action and Frequency for APT Football Turf Systems

Maintenance Type	Maintenance Action	Daily	Weekly	Monthly	Yearly	Every 3 Years	As Required
General inspection and service work	Remove surface dirt	✓					
	Remove natural grass growth	✓					
	Check lines and seams	✓					
	Check infill	✓					
	Check penalty spots	✓					
Service work for turf and rubber infill	Brushing of synthetic turf ¹		✓				
	Levelling rubber infill		✓				
	Loosening rubber infill						✓
	Top-up rubber infill levels						✓
Special maintenance work	Deep cleaning – standard				✓		
	Deep cleaning – intensive					✓	
Ball roll testing	Ball roll testing at six suggested measuring points		✓				

¹ For less than 40 hours usage per week, weekly grooming is recommended. For 40-60 hours usage per week, twice weekly grooming is required. For usage >60 hours, contact APT for assistance.



Maintenance Log

Record of all maintenance action carried out including ball roll tests (ball roll test results to be recorded separately in ball roll test log)

Date	Maintenance Personnel	Maintenance Type	Maintenance Action	Outcome of maintenance	Any further action required
<i>Insert date maintenance carried out</i>	<i>Insert name of grounds staff carrying out maintenance activity</i>	<i>Insert Type of Maintenance:</i> <ul style="list-style-type: none"> • General inspection /service work • Service work for turf and infill • Special maintenance work • Ball roll testing 	<i>Insert Action carried out:</i> <ul style="list-style-type: none"> • Remove surface dirt • Remove natural grass growth • Check lines and seams • Check infill • Check penalty spots • Brush turf • Level rubber infill • Loosen rubber infill • Refill rubber infill • Standard deep cleaning • Intensive deep cleaning • Ball roll testing (results of testing to be recorded in ball roll test log). 	<i>Record result of maintenance carried out, note any anomalies ie: removal of snow, major infill levelling action due to recent tournament.</i>	<i>Record and note any further action that needs to be carried out due to conditions, ie: abnormal ball roll test recorded in four points, intensive de-compacting and infill re-levelling scheduled</i>



PERFORMANCE ENHANCING SURFACE TECHNOLOGY

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