How to Ensure Strong Permanent Seam Joints

THERE IS A WIDE RANGE OF CARPETS WHICH ARE COMMONLY INSTALLED AS SYNTHETIC PLAYING SURFACES FOR TENNIS AND THE CHOICE IS DEPENDENT ON THE REQUIRED PLAYING CHARACTERISTICS AND INDIVIDUAL CHOICE OF THOSE USING THE COURTS. BRIAN SPENCER OF ENVIROSTIK ADHESIVES LTD, OFFERS ADVICE ON HOW BEST TO ENSURE A LONG LIFE FOR THOSE SURFACES.

For outdoor use it is very important that the correct use of a polyurethane adhesive for the seam jointing of sand filled artificial grass carpets will ensure the bonded joints will hold firm for the life of the carpet. However we still hear complaints of seam faults, often occurring in the first year or two after construction. Examinations of the faults often indicate that some basic errors were made when the carpet was first installed. In many instances these can be attributed to fundamental errors made in the use of the adhesive system to form the joints

In order to achieve high quality consistent seam joints it is vitally important to follow the correct procedures when installing with adhesive and jointing tape components, thus avoiding any mistakes that could lead to the subsequent failures of the joints.

The correct combination of polyurethane adhesive, tape and carpet will ensure seam bonds that will consistently meet any laboratory tests for joint strength, currently expected to meet a figure of 10N/mm for tennis surfaces.

Correct choice of adhesive and tape

The majority of carpet seam joints are made using a two component polyurethane adhesive in conjunction with specially constructed tapes, which are backed with a plastic film to prevent any possibility of the liquid adhesive coming into direct contact with the sub base structure. This type of adhesive is suitable for use outdoors in quite a broad temperature range and is relatively simple to use, provided some basic techniques are followed.

Certain single component adhesives are suitable for installing the needle punch variety of carpet, which are often more rigid than a tufted construction. These adhesives are of lower consistency than the two part adhesives, and are applied by roller, fine notched trowel or suitable spray equipment. It is important to use the correct grade of seaming tape with these specialized adhesives, which possess high tack and good initial holding powers. The bond is thus formed quickly, minimising the memory effect in the carpet,that causes edges to lift away from the joint.

Mixing procedure for 2-Component adhesive

The two components of the adhesive requires premixing before use and it is essential that a totally consistent mix is prepared prior to use. Gloves and eye protection should be worn during this process and a mechanical mixer used to facilitate consistent mixing. Any part of the mix that is not thoroughly consistent may not cure properly and if used on the joint could leave areas that are soft and weak. If in any doubt about the consistency of mix then pour the contents into an empty container and mix again.

Use of adhesive in hot and cold climates

Two component polyurethane adhesives are sensitive to temperature and should be stored prior to use ideally between 10-25°C. Although formulated to a thixotropic consistency at higher temperatures the mix is less viscous, cures more rapidly and hence gives a shorter open working time. As a result there is a tendency for increased absorption into the geotextile surface of the seaming tape and it is often necessary to increase the amount of adhesive applied to ensure enough is present to transfer to the carpet back.

If the adhesive is used in low external temperatures then the reverse effects occur with the mix being more viscous and taking longer to cure. Addition of small pre-weighed amounts of a third component, added to the mix can accelerate the curing to a more acceptable level.

The correct volume of adhesive

The adhesive is very often applied to the seaming tape by means of devices that have an inbuilt notched trowel which regulates the amount of adhesive that is applied to the tape.

The back of the carpets used for tennis surfaces have widely differing features depending on the structure and the manufacturing process. It is vitally important to apply the correct amount of adhesive to accommodate the stitching on the back of the carpet and a poor application of adhesive is the most common cause of joint problems today. It is vital to apply sufficient adhesive to just fill the cavities created by the lines of stitching extruding from the back of the carpet.

It is equally important, particularly on short pile carpets not to apply too much adhesive which after curing could cause a raised seam and affect the playing characteristics of the surface. It is also possible to use lighter weight tapes to also minimise this effect.

Therefore whatever the method of application it must be capable of adjustment to apply the correct amount of adhesive suitable for the carpet being installed. An effective method of testing for this is to apply adhesive to a length of seaming tape and lightly press the carpet into the wet adhesive.

Lifting the carpet should demonstrate a transfer of adhesive to the total area of the carpet backing. If the transfer is patchy and leaves areas of carpet uncoated then the amount of adhesive needs to be increased. A cross

section of the seamed joint, after adhesive curing, should show a continuous line of adhesive with the stitches inset into the adhesive film.

Correct use of the seam jointing tape

Standard carpet seam joints should be made using a tape of minimum 300mm width and adhesive should be applied to give a minimum bonding width of 200mm. Also it is important that the actual seam is aligned down the centre of the glued tape to even out stresses across the seam.
Seaming tapes supplied for use with two part adhesive are constructed of a strong geotextile material, that acts as the bonding agent, backed with a plastic coating that serves to prevent any adhesive penetrating through to the sub base and causing a hindrance to the free movement of the carpet. Polyurethane adhesives will not bond to the plastic backing and so it is important to remove this backing layer whenever an existing seam joint is partially removed to make way for a new joint. (for example where a cut in line is installed that cuts across the existing carpet seam joint. It is a simple process to score the plastic back of the tape and remove the area that would be in contact with the new application of adhesive. Failure to carry out this procedure will inevitably result in a joint weakness in this area and subsequent seam failure at a later date.

Consolidation of adhesive joint

After application of adhesive and fitting of the carpet seams the adhesive goes through a process of solidification. The time taken for the adhesive to reach a mastic state is dependent on external climatic conditions and during this curing cycle it is important to apply light pressure to the bonded areas.
This can be achieved by a number of methods all of which are effective, provided some precautions are taken.
Frequent light rolling will ensure pressure is applied when the adhesive is in the highly viscous mastic state, and the carpet will be unable to separate from the adhesive layer. It is important to note that heavy pressure is detrimental to this type of adhesive and will simply squeeze the adhesive away from the joint.
Immediate sanding of the joint after making the bond will maintain a good even pressure but care must be taken not to allow sand to work into the joint at the carpet edges.
Perhaps the oldest and most consistent practice is the use of flat planks to apply even pressure to the joint until curing of the adhesive bond has concluded.
The polyurethane adhesive and jointing tape systems, described in this guide, are manufactured to allow the sports surfaces of today to be installed by experienced operators, without the risk of seam bond failure in the future. Frequently sites require the seam bonds to be tested at the construction stage, and it is here that any faults in the use of adhesive should be detected. Provided the above good practice guide is followed then adhesive bonded seam joints should last for the life of the carpet.