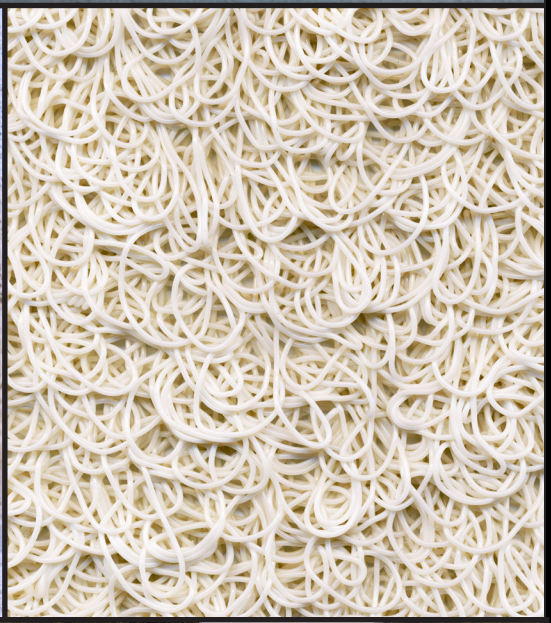
INSTALLATION GUIDELINES

SPECIFICATIONS



flexxcape.com

Important General Guidelines & Expectations

GENERAL CONDITIONS FOR INSTALLATION

Flexxcape can be installed in a wide range of conditions. However, depending on upper and lower temperature ranges, specific guidelines MUST BE FOLLOWED in order to insure a correct, successful, and trouble-free installation.

Please read thoroughly ALL INSTRUCTIONS AND GUIDELINES before planning and executing your project.

PRODUCT STORAGE

Flexxcape is a specially formulated PVC material which has many great properties for use in a golf course bunker setting. The material maintains it's strength and flexibility so that it can be a permanent bunker management solution.

After delivery of Flexxcape to the facility, the material can be stored outside for extended periods of time. Depending on the time of year and your scheduled installation, several handling and storage requirements will need to be followed for a trouble free installation. Make sure to carefully review the Product Storage Section of this document.

FLEXXCAPE BONDING AGENT

Flexxcape Bonding Agent is a specially formulated cement to work specifically with Flexxcape. Standard cements or adhesives will not correctly fuse Flexxcape segments for a permanent bond.

The Bonding Agent is manufactured with highly flammable solvents and can be dangerous with contact to skin and extremely dangerous if ingested of fumes inhaled. Please follow all recommendations in the Material Safety Data Sheet (MSDS) for proper handling and use.

SUCCESSFUL INSTALLATION

We have had successful installations occur in a wide range of temperatures. In addition, we have installed Flexxcape during rain events. Following these guidelines will insure your project is successful.

Should you have any questions regarding, contact:

Customer Support at 888-970-5111 or info@ivi-golf.com

Product Storage & Installation Scheduling

GENERAL CONDITIONS FOR INSTALLATION

Flexxcape can be installed in a wide range of conditions. When seasons change and temperatures become colder, certain precautions are necessary to avoid installation delays or inconveniences.

Flexxcape is shipped in palletized form. During our manufacturing and packaging processes, the shape of the Flexxcape roll will flatten slightly. When exposed to colder temperatures in the palletized state, the Flexxcape material will have "memory". When unrolled from this state in cold weather, the material will be flexible but maintain some waves and not lay as flat to the bunker base as desired. By storing in a heated, inside area prior to use, the material will become much softer and the "memory" will be eliminated.

PRODUCT STORAGE

Follow the table below to determine what basic storage and pre-installation storage measures should be followed. Should any doubt exist, always default to a "warmer is better" plan to avoid installation challenges. NOTE: Pre-installation storage is described as the amount of material needed for the next day's installation effort. We typically state that a 3-man team can install 1,100 square feet of product (approximately 7 rolls) in under 2 hours.

Nighttime Low Temps	Basic Storage	Pre-Install Storage
>75° F (23.8° C)	Outside Storage	Outside Storage
>60° F (15.5° C)	Outside Storage	Inside Storage
>45° F (7° C)	Outside Storage	Heated Inside Storage
>30° F (-1.1° C)	Outside Storage	Heated Inside Storage (20+ hours)
>30° F (-1.1° C)	Inside Storage	Heated Inside Storage (8+ hours)

Depending on the personnel and amount of product intended for installation on the following day, storage can remain on pallets. In colder temperatures, it is advisable to remove from pallet and stand rolls vertically on end for pre-installation storage. We package 15 rolls of Flexxcape per pallet, so it is conceivable to have 2 or 3 pallets in pre-installation storage.

Following these guidelines will insure that the material's shape memory will not cause waves in the material when rolled out in the bunker. Proper storage will allow material to lay flat when unrolled and improve the bonding process of material segments. High temperature ranges experienced during warmer months have no negative impact on installation.

GENERAL DESCRIPTION - FLEXXCAPE BONDING AGENT

The Flexxcape Bonding Agent is a specialized adhesive designed just for the Flexxcape material. It is manufactured in a viscosity similar to honey. Colder temperatures when storing or installing, will slightly thicken the Bonding Agent.

It is not a fast acting epoxy or contact cement. The bonding agent chemically fuses the Flexxcape material for a permanent bond. It has a low initial tack or stickiness, so one should not expect the bonding agent to immediately hold segments together.

Unless segments are in relative close conformity and can be temporarily held by stapling (discussed later in this document), the bonding agent will not keep them together.

The initial setting time typically occurs within 15 minutes. Cooler/colder temperatures will increase the initial set time. Should gaps in the bonding agent exist on the material, additional bonding agent can be applied.

Product Installation Procedures

PREPARATION

The bunker to be lined should have the base and slopes of the surface firm and compact. All drainage should be checked, repaired, or installed prior to Flexxcape installation.

PRODUCT HANDLING

Each roll of Flexxcape weighs approximately 120 lbs. and can moved around the facility in a utility vehicle and placed into bunker with two people. Each Flexxcape roll has a hard cardboard core to which it is rolled.

PLACEMENT

Flexxcape can be rolled out into strips covering the bottom of the bunker. This can be done by simply pushing the roll across the bunker to unroll (two persons). Optionally, one can insert a pipe into the roll core, hold the roll stationary and pull and extend to unroll (three persons).

When initially placing Flexxcape, a small amount of material should go beyond the actual edge. This will help when positioning material for final fit prior to bonding.

Each segment can be easily cut from the roll using a standard utility knife with ease. Should blade dull, replace frequently to speed the trimming process. Be careful to closely pre-fit segments prior to cutting from roll to minimize waste.

BUTTING EDGES

One segments are pre-positioned, the edges of each section are butted together. In order to temporarily hold segments and edges together, a standard 3/8" staple can be driven across the seam.

Some have preferred a slight overlap of segments. This essentially avoids having to temporarily staple to hold, but will increase the amount of Bonding Agent used during installation.

IVI-GOLF recommends the butted edges method. This results in a completely smooth final surface.

PREPARATION FOR BONDING

The Flexxcape Bonding Agent is manufactured in a viscosity similar to honey and is supplied in a one gallon tin container.

In order to simplify application of the Bonding Agent, we recommend transferring to a narrow-tipped squeeze bottle. These can typically be located at local home supply/hardware stores or large box stores.

Some have found success using something as simple as a used condiment or liquid soap squirt-bottle (must be thoroughly cleaned). These are many times present in employee break rooms.

Bonding Segments & Finishing

BONDING SEGMENTS

The Flexxcape Bonding Agent is a specialized adhesive designed just for Flexxcape. It will not instantly affix pieces, but will slowly melt the PVC strands and chemically fuse when curing. It is not a fast acting epoxy or contact cement. Initial setting time is approximately 15 minutes.

Initial setting time will be longer in colder weather and more rapid in hotter weather. Rain or moisture will have little impact on the application process or curing time. Avoid getting the Flexxcape material covered in dirt or mud.

Apply a heavy, steady stream of Bonding Agent over the butted edges. It will slowly drip down and seep into the entire profile, around all of the strands. Should some areas not get full coverage of Bonding Agent, additional material can be applied.

After the initial set has occurred, the Bonding Agent will be slightly soft, but will be holding pieces lightly together. If aggressively pulled at, the Bonding Agent will separate.

A small area can be tested to determine if a proper bond is achieved. Should more Bonding Agent be needed, re-apply as necessary. For final cure, 12 to 18 hours is required. Warmer or hot temperatures will decrease set time and final cure time.

TRIMMING EDGES

Once the edges are bonded, the excess material at the bunker edge can be trimmed. Trimming can be performed easily with a standard utility knife. The sharper the blades, the smoother the finished cut will be.

SECURING FLEXXCAPE

The weight of Flexxcape will keep it in place. The flexible nature of the product will allow it to conform to any irregularities in the bunker base, including drainage lines/gravel. There is no need to staple the product. Should one wish to secure Flexxcape on the perimeter, this can be done with standard sod staples.

MAINTENANCE

Flexxcape requires no maintenance. The PVC formulation is incredibly durable while maintaining conformity even in a frozen state. Flexxcape will not crack or break-up under repetitive freeze/thaw cycles.

PRODUCT DEVELOPMENT

As the manufacturer and marketer of the popular Sandtrapper product line, we took our expertise in geophysical controls and applied them to the seamless bunker liner concept. We focused on maintaining simple handling and installation requirements. We focused on washout control and consistent playability. We focused on maintenance durability.

Flexxcape is a non-degradable, synthetic material manufactured with precision specifications and capable of standing up to the most rigorous environmental conditions. It withstands freeze/thaw cycles, mechanical raking, and ultraviolet exposure.

PERMANENT & FLEXIBLE MATERIAL

Flexxcape is manufactured from an industrial PVC in a patented extrusion process that chemically bonds strands together. During the process, small loops are created which increase surface area and adhesion. The proprietary PVC formulation is incredibly durable while maintaining conformity even in a frozen state. Flexxcape will not crack or break-up under repetitive freeze/thaw cycles.

Flexxcape is manufactured with precision specifications and packaged for convenience. The patented manufacturing process results in a material that can be counted on day in and day out.

PHYSICAL PROPERTIES

Material	Flexible PVC	
Color	Natural	
Thickness	3/8 inch	9.5 mm
Roll Width	42 inches	1.067 m
Roll Length	45 feet	13.72 m
Roll Area	157.5 ft²	14.63 m²
Weight	.768 lbs ft²	3.75 kg/m²
Roll Weight	121 lbs	54.88 kg
Rolls per Pallet	15	
Area per Pallet	2,362.5 ft²	219.48 m²
Pallet Weight	1,832.5 lbs	831.2 kg
Pallets per Truckload	24	
Area per Truckload	56,700 sq. ft.	5,267.6 m²

MECHANICAL PROPERTIES

Grab Tensile Strength (ASTM D-4632)	120.5 x 90.6 lbs	54.66 x 41.1 kg
Grab Elongation (ASTM D-4632)	99.7 x 89.3 %	
Trapezoidal Tear (ASTM D-4533)	64.6 x 53.5 lbs	29.3 x 24.5 kg
CBR Puncture (ASTM D-6241)	165.3 lbs	75 kg
Flow Rate (ASTM D-4491)	549.8 gpm/ft²	
Permittivity (ASTM D-4491)	7.35 sec-1	
Permeability (ASTM D-4491)	6.059 cm/sec	
Transmissivity (ASTM D-4716)	1.92E-03 m²/sec	