DEMAND SPECS

EXPECT RESULTS

SAND TRAPPER®

Greetings!

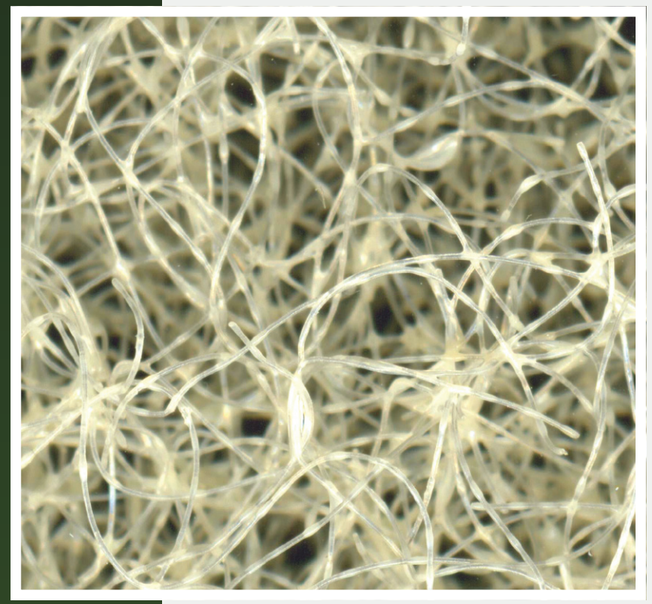
Bunker maintenance has come a long way since the early days of Sandtrapper. Over the years, we've seen important changes to how turf professionals implement bunker liner technologies and we've adapted our product line to meet those conditions

With the pressures on budgets higher than ever before, facilities are constantly rethinking their strategies. The result has been not what one might expect. Over the past few years, we've seen more courses aggressively tackle their bunker problems by investing in Sandtrapper.

We've worked closely with these facilities, builders, and architects to reach the best possible results for their maintenance dollar. We've innovatively tackled logistics by improving on our distribution points and helped project managers with reliable and fast order processing.

At Sandtrapper, we invite you to take a close look at our product line-up, commitment to excellence, and customer service focus to determine the realities of why Sandtrapper remains at the top of the bunker products category.

John Brauer



SPECIFICATIONS

The effectiveness of a bunker liner is determined by the characteristics of the product. It's not simply about a product's thickness or the fact that is a non-woven matrix. The ability of a product to work in a bunker setting is about the fibers and binders that define the matrix.

It has long been the philosophy of Sandtrapper product developers that the integrity of the three dimensional matrix is the single most important performance characteristic. That is why we incorporate higher denier (fiber thickness) and stronger, more durable binders in the product line-up. When looking at products with lightweight fibers and binders, the matrix will compress under the load of just a few inches of sand.

Without the matrix intact, sand particles cannot be constrained. Water dynamics will force sand particles into an active state during rain events, increasing the occurrences of washouts. For this purpose, consider carefully your product choices and balance the need for value and price against performance in the bunker setting.

EXPECTATIONS

Making the right choice in a product comes down to confidence. It's about identifying the product that carries with it the reliability and consistency that you can put your trust in. But it's also about the organization that provides it.

At Sandtrapper, we build confidence through the right product line-up, the right product warranty, and the right delivery mechanisms. We built this confidence across a wide array of industry professions, from Superintendent, Managers, and Owners to Builders and Architects.

TRENDS AT TODAY'S COURSES

Facilities continue to install the premium product choices over the more value-based options by a margin of two to one. At Sandtrapper, we believe that this confirms a common paradigm - "Do the Job Right the First Time".

Additionally, we believe that turf professionals know that the cost of Sandtrapper is an easy measure to implement. Especially when considering the cost of sand and labor, the use of Sandtrapper makes the bunker investment more secure.

One trend that is worth noting is the concept of "hybrid" installations. We've seen that facilities continue to rely on the premium Sandtrapper choices, but they focus that choice on the bunker slopes. In order to squeeze more value out of the budget, facilities will incorporate less aggressive, more cost-focused products on the bunker bases.

CONSIDERING PRODUCT SELECTION

During the development of the Sandtrapper product back in the late 1990's, considerable analysis was performed on the mechanics of water flow in bunker settings. The result was a specific selection of synthetic fibers and binders to create precise product characteristics that combat washouts or contamination. This resulted in two introductory styles -- Sandtrapper II (our premium performer) and Sandtrapper I.

Over the years, we've made additions to the product line-up. In 2004, we added a contamination-only choice with Sandtrapper GEO. In 2007, we added Sandtrapper MD as a mid-range choice to fit between, Sandtrapper II and I. Just recently, we added Sandtrapper SL, a divergent technology for those looking at soft-loft product alternative.

Review the characteristics of the product line-up, request samples for comparison, and consult with our product advisors for help in making the product choice for your project

ORDER PROCESSING & DELIVERY

We believe that working with us on your product needs should be a simple, easy process. That's why our entire order processing system and network of distribution points is set-up for speed and efficiency. Ever since the inception of the product line-up, we've always had inventory ready to go.

Over the years, this philosophy has served the industry well. No three week waiting periods for material to be manufactured and no uncertainties when loading trailers and getting them on the road. In fact, we've seen many examples of order turnaround of just a few hours when critical demands require next day delivery.

Many in our network of distributors also hold inventory that can moved on-demand as well. Consult with the distributor in your area for more information (available on the Sandtrapper website - www.sandtrapper.com.

LONG HAUL PERFORMANCE & MAINTENANCE

Since 1999, the Sandtrapper product has been installed in over 1,500 courses worldwide. And for all of the early customers, Sandtrapper has extended the life of the bunker.

Traditionally, most bunker projects had a life-cycle of 3 to 5 years, requiring excavation, drainage system and sand replacement. The use of Sandtrapper has extended the life of a bunker to more than 7 to 10 years. We even have some of our first customers relying on the product today, when it was installed over 13 years ago.

Getting the most from the Sandtrapper investment may require a few simple adjustments to a maintenance schedule. The most important routine is the checking of sand depths. For those that have mechanical rakes and frequent raking schedules, bunker sands can and do shift.

THE BEST CHOICE IN THE INDUSTRY

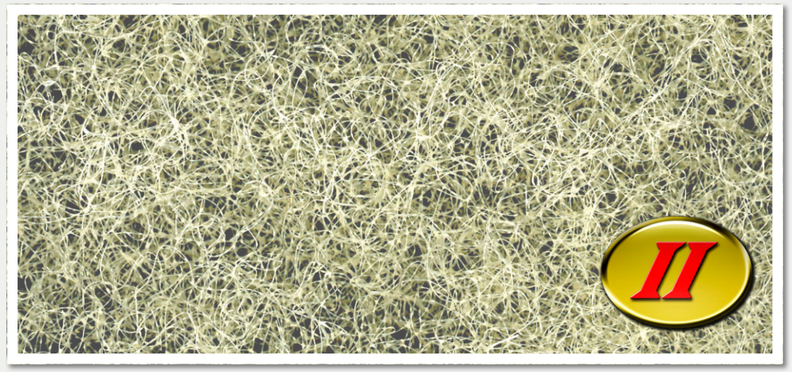
Dramatic, high-flashed bunkers are common in many of today's TOP 100 Modern courses. The extreme nature of these aesthetic hazards can wreak havoc on maintenance budgets. With Sandtrapper II, maintenance is significantly reduced and Superintendents have more money to spend on other important course features.

CHARACTERISTICS

Sandtrapper II utilizes heavy synthetic fibers and a rigid binder system to create a matrix that will not compact. This allows sand to be held in place and provides high performance over the long haul.

In recent product tests, Sandtrapper outperformed the competition's "best". No other product in the industry can compare. Some may try, but take a look and feel for yourself, it's obvious, Sandtrapper II is built to perform.

Test	Sandtrapper II	Competition's Best
Fiber Thickness	200 denier	25/45 denier
Weight	16 oz. sq. yd.	12 oz. sq. yd.
Thickness	.81 inches	1.0 inches
Tensile Strength	59.4 lbs.	30 lbs.
Compression	43.5 lbs.	25 lbs.
Permittivity	7.22 sec^{-1}	3.5 sec^{-1}
Flow Rate	567.27 gpm/sq. ft.	250 gpm/ sq. ft.



IMPLEMENTATION

For many, the choice is easy -- use the best available product and get what you pay for. In fact, over eighty percent of all Sandtrapper installations, facilities have made that very decision.

Sandtrapper II is also used with other Sandtrapper products in hybrid configurations. It is used along the high-flashed areas and carried into the drainage system. Sandtrapper MD or Sandtrapper I are then used to line the remainder of the bunker.

SPECIFICATIONS - SANDTRAPPER II

Color	Opaque
Weight - oz. sq. yd./ kg. sq. m. (lbs. per roll)	16 / .376 (75)
Thickness in/(mm)	15
Fiber Type	Polyester
Binder	Cross-Linking Non Soluble
Area Per Roll - 56" (1.42m)	560 ft^2 (51.93m^2)
Area Per Roll - 90" (2.286m)	1125 ft^2 (106.8m^2)
Trapezoidal Tear (MD x XD) ASTM D4533	40.5 x 38.7 lbs
Grab Tensile Strength (MD x XD) ASTM D4632/D751/D5035	59.4 x 51.6 lbs
Grab Elongation (MD x XD) ASTM D4632/D751/D5035	87.3 x 88.9 %
Mullen Burst Strength (incl. tare) ASTM D3786	149 psi
Mullen Burst Strength (w/o tare) ASTM D3786	98.5 psi
Permittivity ASTM D4491	7.22 sec-1
Permeability ASTM D4491	14.01 cm/sec
Water Flow Rate ASTM D4491	567.27 gpm/ft2

PERFORMANCE & VALUE

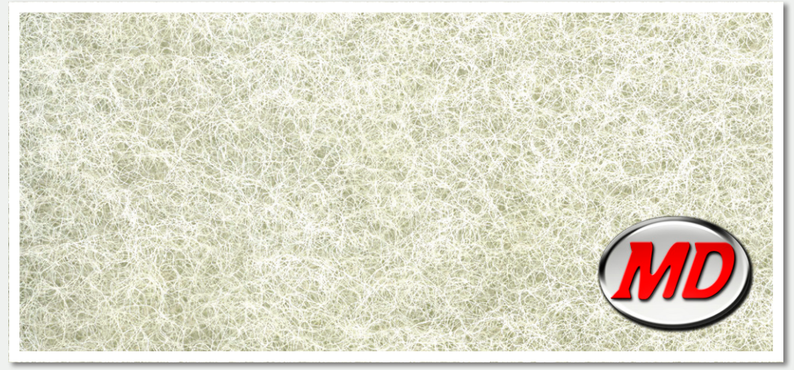
Sandtrapper MD combines high performance and affordability, addressing those needs where budgets are paramount. Utilizing Sandtrapper's proven technical assets, MD shares the critical performance characteristics of it's top-of-the-line product, Sandtrapper II. In cases where budgets are limited, Sandtrapper MD is the right choice.

Sandtrapper MD doesn't replace the premium Sandtrapper II product. MD augments the product line-up by adding an important tier that competes directly with other products in the market. Sandtrapper MD outperforms other alternatives, has greater resistance to compaction, and a matrix that will keep sand on steep bunker slopes. It's designed to work in bunker applications where slopes are moderate to extreme. Its affordability lends itself to lining an entire bunker for top performance.

CHARACTERISTICS

Sandtrapper MD was designed as a mid-range option and carries with it characteristics from both the top-of-the-line Sandtrapper II and the value-based Sandtrapper I. Sandtrapper MD uses lighter denier fibers in a dense matrix and is held together with a firmer binder. This results in solid performance across all applications.

Sandtrapper MD is a good choice when washouts are a concern. In geographic areas where heavy rainfall event occur, but are not as common as would be in sub-tropical regions, Sandtrapper MD creates the best value and performance balance.



IMPLEMENTATION

The use of Sandtrapper MD varies by facility and geography. In most cases, lining an entire bunker is the preferred method. Sandtrapper II can be installed on the extreme parts of the bunker slopes with Sandtrapper MD then used to line the remainder, from the edge of Sandtrapper II into the drainage and base of the bunker.

Having these product choices puts the flexibility and control into the hands of the professional, tailoring each installation for the application at hand.

SPECIFICATIONS - SANDTRAPPER MD

Color	White
Weight - oz. sq. yd./ kg. sq. m. (lbs. per roll)	12 / .284 (100)
Thickness (mm)	14
Fiber Type	Polyester
Binder	Cross-Linking Non Soluble
Area Per Roll - 56" (1.42m)	1120 ft^2 (104.5m^2)
Area Per Roll - 90" (2.286m)	1350 ft^2 (125.42m^2)
Trapezoidal Tear (MD x XD) ASTM D4533	30 x 31.5 lbs
Grab Tensile Strength (MD x XD) ASTM D4632/D751/D5035	51.5 x 50.1 lbs
Grab Elongation (MD x XD) ASTM D4632/D751/D5035	99.3 x 95.2 %
Mullen Burst Strength (incl. tare) ASTM D3786	170 psi
Mullen Burst Strength (w/o tare) ASTM D3786	119.5 psi
Permittivity ASTM D4491	5.92 sec-1
Permeability ASTM D4491	7.06 cm/sec
Water Flow Rate ASTM D4491	464.88 gpm/ft2

THE VALUE LEADER

For those facilities that have less severe bunker designs, Sandtrapper I delivers solid control and is an extremely affordable choice. As with both styles II and MD, it's great for fighting sand contamination and offers long term protection.

When Sandtrapper I was first developed, the design parameters were set to create a mid-level range of product characteristics. The lighter synthetic fibers and more flexible binder create a tight matrix. This combination is great for controlling sand contamination and preventing washouts in these less demanding settings.

The lighter construction keeps cost to a minimum, making it a good budget choice. Affordable, however, doesn't mean cheap. Sandtrapper I carries the same great manufacturing as the rest of the product line, delivering solid performance over the long haul.

CHARACTERISTICS

Many courses lack the severe designs or have bunkers with little or no sand flashing. Even in cases where bunker slopes are gradual, washouts and contamination can occur. These moderate settings, paired with lower precipitation climates, create a need for affordable protection.

In these situations, Sandtrapper I is the perfect choice. Effectively controlling washouts and sand contamination, the lighter matrix creates the right balance of protection and cost.

IMPLEMENTATION

Sandtrapper I is used as a great complimentary product to the more robust product styles. The cost advantages make it the sensible option for the base of the bunker, where little slope exists. Where the design is moderate and precipitation levels are less, lining the entire bunker with this style is recommended.

In hybrid configurations, Sandtrapper I should be implemented from the toe of the slope through and amongst the drainage lines. Many allow this style to cover the drainage lines for additional protection from contamination.

SPECIFICATIONS - SANDTRAPPER I

Color	White
Weight - oz. sq. yd./ kg. sq. m. (lbs. per roll)	6 / .17 (70)
Thickness (mm)	11
Fiber Type	Polyester
Binder	Cross-Linking Non Soluble
Area Per Roll - 56" (1.42m)	1120 ft^2 (104.5m^2)
Area Per Roll - 90" (2.286m)	1800 ft^2 (167.22m^2)
Trapezoidal Tear (MD x XD) ASTM D4533	24.0 x 18.0 lbs
Grab Tensile Strength (MD x XD) ASTM D4632/D751/D5035	44.5 x 35.5 lbs
Grab Elongation (MD x XD) ASTM D4632/D751/D5035	83.4 x 135.1 %
Mullen Burst Strength (incl. tare) ASTM D3786	118 psi
Mullen Burst Strength (w/o tare) ASTM D3786	68 psi
Permittivity ASTM D4491	5.94 sec-1
Permeability ASTM D4491	4.46 cm/sec
Water Flow Rate ASTM D4491	466.77 gpm/ft2

SOFT LOFT OPTION

Sandtrapper SL is a newer product style that was designed as a direct, comparative product -- for instances when competitive products incorrectly pair their “best” products against Sandtrapper II and Sandtrapper MD.

The “soft-loft” technology is very different that other Sandtrapper styles. The SL option is constructed with thinner, low-denier polyester fibers and a lightweight binder. The product is much thicker than other Sandtrapper styles, but doesn’t share the critical compressive-resistant properties that define the best performing bunker liners.

The new soft-loft style provides a low-cost option for those looking to have solid, baseline performance against washouts and sand contamination. With soft-loft technologies, the ratio of fibers to binder increases while the lightweight binder provides a more flexible matrix.

Direct and proper product comparisons show that tensile strength is greater than competitive products while basic product characteristics such as thickness fall within the same parameters.

COMPRESSION RESISTANCE

It has long been the philosophy of Sandtrapper product developers that the integrity of the three dimensional matrix is the single most important performance characteristic. The lightweight fibers and binders compress on the load of just a few inches of sand.

Without the matrix intact, sand particles cannot be constrained as well as with other Sandtrapper styles. Water dynamics will force sand particles into an active state during rain events, increasing the occurrences of washouts. For this purpose, Sandtrapper SL should be used in bunkers with shallow, less severe slopes.

IMPLEMENTATION

Sandtrapper SL is used for low to moderate bunker environments. The soft loft format of the product would suggest that use on high slopes be avoided.

Sandtrapper SL should be used in geographic areas where rainfall events are not severe and where they are less common than in sub-tropical environments.

SPECIFICATIONS - SANDTRAPPER SL

Color	White
Weight - oz. sq. yd./ kg. sq. m. (lbs. per roll)	11 / .31 (00)
Thickness (mm)	25
Fiber Type	Polyester
Binder	Cross-Linking Non Soluble
Area Per Roll - 56” (1.42m)	560 ft^2 (52.02m^2)
Area Per Roll - 90” (2.286m)	900 ft^2 (83.61m^2)

CONTAMINATION ONLY

Sandtrapper GEO is the contamination only choice. Its thin design allows water and fines to permeate through while keeping larger particles separate from the bunker sand. It's also a great compliment to other Sandtrapper styles.

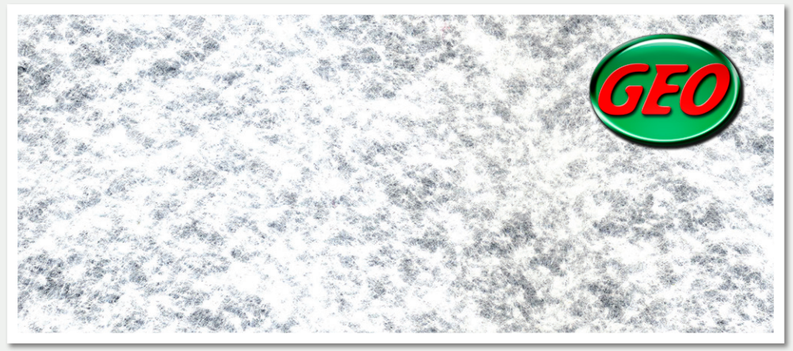
Washouts may get more attention, but every bunker will contaminate. It's just a matter of time. Nature's forces are certain and predictable. Precipitation, no matter how slight, will force larger particles in a substrate to the surface.

Larger particles can be present in native soils or brought in as gravel forming the drainage system. In either case, a barrier should be present to combat migration.

SEPARATION OF SOIL & SAND

The product characteristics of Sandtrapper GEO are far different than Sandtrapper I, II, or MD. Developed without the three dimensional matrix of these products, GEO should never be used to combat washouts.

The design of Sandtrapper GEO allows for filtration of water and creates a precise barrier between the bunker base and bunker sand. Where contamination is the more prevalent maintenance concern, Sandtrapper GEO's extremely low cost make it an important planning consideration.



IMPLEMENTATION

Used primarily in hybrid configurations, Sandtrapper GEO is best used in very flat areas of the bunker. Allowing the more robust Sandtrapper styles to fight washouts, GEO works effectively as an under-layment in transitional areas.

In situations where complete coverage is desired, Sandtrapper I is the preferred option. For those preferring easy access to drainage lines, GEO is butted up to, but doesn't cover the drainage system.

SPECIFICATIONS - SANDTRAPPER GEO

Color	White
Weight - oz. sq. yd. / kg. sq. m.	2.7 / .064
Thickness (mils)	23
Fiber Type	Polypropylene
Binder	n/a
Area Per Roll - 102" (2.59m)	8,500 (789.67)

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