

Alternative Infills for Synthetic Turf - Properties as Infill Summary

Type of Alternative Infill	Mineral ¹	Color	Shape	Abrasiveness	UV Stability	Typical Turf Pile Height	Availability ⁴	Resilient Shock Pad Recommended	Irrigation Recommended	Expected Life Span	Typical Mixture (By weight)	Approximate Cost ²	Comments ^{2,3}
Crumb Rubber	Styrene butadiene Rubber (SBR) Recycled tire rubber shredded	Black	Angular shaped granules	Low	Stable	2.25" - 2.50"	Readily Available	No	No	Life of Carpet	50% Sand 50% Rubber	\$50,000 per field	1. SBR Rubber sand is the typical infill system used in the majority of synthetic turf fields installed since 1997. 2. SBR rubber maintains its resiliency over a wide range of temperature and environmental conditions. 3. Shock pads are required to provide shock absorption. 4. Consider turf hatch layer for fly up prevention.
Silica Sand	Round silica Sand	Tan/Brown	Round particles	High	Stable	1.50" - 2.0"	Readily Available	Required (See Comments)	No	Life of Carpet	100% Silica Sand	+50 net for additional sand +\$130,000 for resilient pad	1. Shock pads are required to provide shock absorption. 2. Sand stays hard under cold/frozen conditions (regardless of shock pad). 3. Use turf patch gauge of 5/8" or less. 4. Consider turf hatch layer for fly up prevention.
Organic	Cork or Coconut-Husk or rice hulls	Natural appearance (tan/brown)	Angular shaped granules	Low	Low Stability	1.50" - 2.50"	Limited Availability	Yes (See Comments)	Yes ⁵	Unknown ³ ability to decompose	10%-15% Organic 90% to 85% Sand	+5180,000 for materials +\$130,000 for resilient pad +\$15,000 for UV685ton +\$325,000 total net add	1. Reports of early degradation and floating of particles. 2. Organics can stay hard under frozen conditions (regardless of shock pad). 3. Shock pad is recommended to provide shock absorption over wear/any period. 4. Consider turf hatch layer for fly up prevention.
Coated Crumb Rubber	SBR (Styrene butadiene Rubber) Recycled tires shredded and coated with acrylic or EPDM	Custom colors available	Angular shaped granules	Low	Medium stability	2.25" - 2.50"	Readily Available	No	No	Life of Carpet	50% Sand 50% Coated Rubber	+220,000 materials	1. Still contains SBR Rubber. 2. Coating may be chipping in capillaries. 3. Shock pad is not required, consider a combination of shock pad and other infill material to reduce quantity of needed material.
EPDM (Ethylene Propylene Diene Monomer) Rubber	Virgin rubber produced for infill of athletic fields only	Custom colors available	Angular shaped granules	Low	Medium stability	2.25" - 2.50"	Limited Availability	No (See Comments)	No	Not proven long term	50% Sand 50% EPDM	+580,000 materials	1. Similar material to SBR rubber. 2. Shock pad is not required, consider a combination of shock pad and other infill material to quantity of EPDM needed. 3. EPDM is generic term and quality can vary greatly. Proven source and properly formulations are recommended.
TPE (Thermoplastic Elastomer)	Extruded plastic pellets	Custom colors available	Typically Uniform pellets Shape depends on manufacturer	Low to Medium	Stable	1.5" - 2.50"	Limited Availability	Recommended	No	Not proven long term	50% TPE 50% Sand	+380,000 materials +130,000 resilient pad +490,000 total net add	1. Turf hatch layer is suggested to help reduce fly up/displacement of material. 2. Some manufacturers have used combination of shock pad and TPE to reduce quantity of infill needed. 3. TPE is generic term - Quality can vary greatly. Proven source and properly formulations are recommended.
Coated Sand	Polymer Coated Silica Sand	Green	Fairly Round Particles	Med	Stable	1.50" - 2.0"	Limited Availability	Required (See Comments)	No	16 Year Warranty (See Comments)	100% Coated Silica Sand Particles	+150,000 to \$250,000 for materials +130,000 resilient pad +380,000 total net add	1. Coating has been reported to last shorter than warranty period. 2. Some manufacturers suggest a mix with TPE to obtain required resiliency (Genak). 3. Turf patch gauge of 5/8" or less is recommended to prevent displacement. 4. Turf hatch layers should be considered to
Nike Grind	Nike's Environmentally Perfected Rubber (Meets or exceeds restricted substance standards set for wearable consumer goods)	Multiple Colors	Angular shaped granules	Low	Stable	2.25" - 2.50"	Very Limited Availability	No	No	Per Nike, Expected life 10 years of play at 40 hours per week	50% Sand 50% Nike grind	+130,000 materials	1. Proprietary. 2. Reports that infill is not aesthetically pleasing. 3. Has occasionally been used as a supplement to SBR rubber or silica of SBR to provide "renewable" label since 1993.

Notes:

- Information provided was compiled by available online data, manufacturers literature and conversations with turf and infill distributors. Gale has not conducted any independent testing of infill materials and does not guarantee the accuracy of information provided here in.
- Installations of fields with alternative infill material (other than SBR Rubber and Sand) are somewhat limited and many have not been proven long term. Gale does not guarantee performance of any turf system.
- Few older installations in U.S. More common in Europe. Only one supplier warranties for life of turf (geoturf) in U.S.
- May become more or less available as demand and popularity fluctuates. Cost fluctuates with availability.
- Costs are generalized approximations. Costs are NET addition to cost of a typical sand/SBR turf infill system. Actual costs will vary based on depth of infill/turf depth, type of resilient pad used. Market costs can vary greatly due to materials demand and availability.
- Organic infill suppliers recommend keeping infill moist to aid with resiliency, improve longevity, prevent compaction and material displacement.

Alternative Infills for Synthetic Turf - Pros and Cons

Type of Alternative Infill	Material	Brand/Trade Names	Pros	Cons
Crumb Rubber	Styrene butadiene Rubber (SBR) Recycled tire rubber shreds	None SBR Ambient, or Ecogranic	Low Cost / Recycled Material Highly Analyzed and Tested for safety, environmental and health concerns when as turf infill Good Drainage Good UV Stability Low Maintenance, High UV Stability - Maintains Resiliency Manufacturers Warranties Warm fields in freezing climates Resaly available	Poor Resiliency / Perception as "trash" Perception as Hazardous to Human Health "Heat of Play" - Hot Fields / Concern in Warm Climates Stark Climb - sets in Uniforms and Equipment
Silica Sand	Round Silica Sand	Sand Name	Low Cost Low UV Stability Low Maintenance Good Drainage Common Mineral Manufacturers Warranties Adds Weight/ Stability to Infill Systems	Relative "hardness" Abrasive Cost (Requires Resilient Pad / used alone)
Organic	Cork or Coconut Husk or Rice Hulls	PuroGen - GenTurf PureFill - Field Turf Ge-Fill - Show Sports NarzeFill	Natural Material / Renewable Perception as Natural Material Reported to reduce Heat Concerns as Infill Natural Color & appearance Good Resiliency Reported Common Use in Europe	High Cost - High materials Costs Cost - Resilient Pad Recommended Cost - must be kept moist - Requires Irrigation System Cost - High Maintenance cost/ Shorter "Life Cycle" Poor UV Stability Freezes- Hard fields in freezing climates Potential for weed and mold growth Limited availability Flats: Should not be used in Flood Prone Areas
Coated Crumb Rubber	SBR (Styrene, butadiene Rubber) Recycled tires shredded and coated with acrylic or EPDM	Polytan BPU - Polycan CushTurf Sports CoolFill - SpinnTurf	Low Maintenance Good Drainage Maintains Resiliency Coating reported to encapsulate SBR rubber outgassing & improve heat concerns Manufacturers Warranties Does not float Does not require Resilient pad or Irrigation	High Cost - High materials Costs Some chemical make-up & potentials as SBR Rubber Limited availability as turf infill Limited availability
EPDM (Ethylene Propylene Diene Monomer) Rubber	Wear rubber produced for infill of athletic fields only	EPDM Melios EPDM ST - APT Melios Biotic EPDM - APT GeFill - Gealan corp.	Low Maintenance Good Drainage High UV Stability - Maintains Resiliency Manufacturers Warranties Does not require Resilient pad or Irrigation	High Cost - High materials Costs Very Similar chemical make-up & potentials as SBR Rubber Relatively little analysis as turf infill Proprietary formulations for quality Limited availability in quantities needed for fields
TPE (Thermoplastic Elastomer)	Extruded plastic pellets	Ecogran - Field Turf EcoMax - Field Turf BioPro - Polycan PureFill - Target Indust.	Low Maintenance Good Drainage High UV Stability Manufacturers Warranties Does not require Irrigation Common plastic used widely in medical, food and toy manufacture Some Other U.S. Installations	High Cost - High materials Costs Cost - Use of Resilient Pad Recommended Relative hardness - Needs Resilient Pad Limited availability in quantities needed for fields Limited availability for use as infill
Coated Sand	Polymer Coated Silica Sand	Flexsand EnviroFill	Low Maintenance Very Good Drainage Manufacturers Warranties Variety of Colors - Reported to reduce heat concerns Does not float Can add weight/ stability to infill systems	High Cost - High materials Costs Cost - Use of Resilient Pad Recommended Relative hardness - Needs Resilient Pad Generic Material - Must use Proven - Proprietary formulations for quality Limited availability for use as infill Unproven - Limited use as infill
Nike Grind	Nike Environmentally Preferred Rubber Ground crumb (Meets or exceeds restricted substance standards set for wearable consumer goods)	Nike Grind Ecogrid - Field Turf	Low Maintenance Very Good Drainage Good Resiliency & Life cycle Does not require Irrigation or Resilient Pad Has been used for years with SBR or Sand alone infill additive	High Cost - High materials Costs Very limited availability No color choices - Poor aesthetics - can look "trashy" Very Similar chemical make up & potentials as SBR Rubber Stark Charge - sticks to equipment and clothing

NOTES:

This Summary is assembled from available information some of which was obtained from materials vendors literature. This summary is intended as a general reference. It is not specific in nature, and is not intended as a stand alone document.