Technical Guidelines

Brock PowerBase PRO
(PBPRO)

Synthetic Base System for Synthetic Turf Fields

Materials, Installation, and Performance Guidelines for Synthetic (Drainage and Impact) Underlayment

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

Synthetic Base Material and Performance

Scope:

This document defines requirements for the installation and operating performance of an athletic field synthetic base underlayment material needed for a professional-grade synthetic turf field. Defined are the primary system requirements for ensuring quality, environmental compatibility, optimum safety of the playing surface (impact attenuation/surface playability) and high capacity subsurface drainage of the installed playing field.

Specifications listed are defined per applicable ASTM standard test methods or other national or international testing standards. All other specifications and tolerances listed shall be defined under standard ANSI and/or ISO drawing and specification rules.

Note: This specification requires prior installation of stabilized subsurface base, including a perimeter foundation-grade concrete curb and high-capacity trenched storm drain system.

Part 1: Specification References

1.1 Related Specification Sections

Section 32 18 13: Synthetic Grass Surfacing
Section 32 18 23: Athletic Surfacing

Part 2: Testing References

2.1 American Society for Testing and Materials (ASTM), International Standards Organization (ISO), European Committee for Standardization (EN), German Institute for Standardization (DIN), Cradle to Cradle Products Innovation Institute (C2CPII), Environmental Protection Agency (EPA):

ASTM D3575-20, Suffix T	Standard Test Methods for Flexible Cellular Materials Made from Olefin Polymers – Tensile strength and elongation
ASTM D3575-20, Suffix D	Standard Test Methods for Flexible Cellular Materials Made from Olefin Polymers – Compression deflection
TSM5725G (modified)	Toyota Method for determination of Coefficient of Linear Thermal Expansion (modified, -30 to 30 °C)
DIN 53428	Testing of cellular materials - Determination of the resistance to liquids, vapours, gases and solid materials
EN 12616	Surfaces for sports areas - Test methods for the determination of vertical water infiltration and horizontal water flow rates
ASTM D4716	Standard Test Method for Determining the (In-plane) Flow Rate per

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

	Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head – TRI procedure using characteristic flow equation
ASTM F355-23, Missile E (HIC)	Standard Test Method for Impact Attenuation of Turf Playing Surface Systems, Other Protective Sport Systems, and Materials Used for Athletics, Recreation and Play
ASTM F355-23, Missile A (Gmax)	Standard Test Method for Impact Attenuation of Playing Surface Systems, Other Protective Sport Systems, and Materials Used for Athletics, Recreation and Play
ASTM F3146-18	Standard Test Method for Impact Attenuation of Turf Playing Systems Designated for Rugby
ASTM F3189-20	Standard Test Method for Measuring Force Reduction, Vertical Deformation, and Energy Restitution of Synthetic Turf Systems Using the Advanced Artificial Athlete
ASTM F1936-19	Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field
ASTM F925 (modified)	JSP Method based on ASTM F925 (Test Method for Resistance to Chemicals of Resilient Flooring)
EN 14030:2010	Resistance to Acid and Alkaline Liquids
ISO 13438:2004	Resistance to Oxidation (Accelerating Aging)
ASTM G22	Standard Practice for Determining Resistance of Plastics to Bacteria
ASTM G21	Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
ISO 14001:2015	Environmental Management Systems
ISO 9001:2015	Quality Management Systems
C2CPII	Cradle to Cradle Product Innovation Institute
EPA 6010B 7470A, 7471A	Heavy Metals, Mercury
EPA 8260B	Volatile Organics Compounds (VOCs)
EPA 8270C	Semi-Volatile Organic Compounds (SVOCs)

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

Part 3: Synthetic Turf Underlayment Description

3.1 General Requirements for Underlayment System – A white impact energy absorbing sub-base drainage system designed specifically for use with synthetic turf is required. The specified material must have physical, drainage and performance properties that meet the following requirements:

3.1.1 Nominal Thickness ≥ 25 mm – material thickness must be within ± 1.5 mm

3.1.2 Tensile Strength > 80 psi (ASTM D3575-20, Suffix T)

3.1.3 Tensile Elongation > 20% (ASTM D3575-20, Suffix T)

3.1.4 Compression Strength > 30 psi @ 25% strain (ASTM 3575-20, Suffix D)

3.1.5 Linear Thermal Expansion < 0.10 mm /m /° C (TSM5725G – modified, -30 C to 30 C)

3.1.6 Water Permeability > 1500”/hr (EN 12616)

3.1.7 Lateral Transmissivity at 0.005 gradient (0.5% slope) ≥ 0.50 gpm/ft (ASTM D4716 – TRI Environmental method using characteristic flow equation)

3.1.8 Head Injury Criterion (HIC) < 1000 from a 0.90 m drop height (ASTM F3146-18, Procedure A)

3.1.9 Gmax < 95 G’s (ASTM F355, Missile A)

3.1.10 Shock Absorption > 60% (AAA; ASTM F3189-20)

3.1.11 Vertical Deformation < 9.0 mm (AAA; ASTM F3189-20)

3.1.12 Material Water Absorption ≤ 2% (vol.) after 24 hr (DIN 53428)

3.1.13 Material Resistance to Chemicals ≤ 2 (JSP Method based on ASTM F925)

3.1.14 Material Resistance to Acid and Alkaline Liquids: <10% average tensile strength loss, 100-year model (EN 14030:2010)

3.1.15 Material Resistance to Accelerated Aging (Oxidation) < 10% average tensile strength loss, 100-year model: 56 days at 110 °C (ISO 13438:2004)

3.1.16 Material Resistance to Bacteria - no growth (ASTM G22)

3.1.17 Material Resistance to Fungi - no growth (ASTM G21)

Impact Safety Requirements for Installed Surface System of Infilled Synthetic Turf and Underlayment:

3.1.18 Surface system must provide average HIC <1000 from a 1.3 m drop height during warranty period of artificial turf. (ASTM F355-23, Missile E)

3.1.19 Surface system must provide field average Gmax of <100 g upon initial testing of installed field (ASTM F1936-19)

3.1.20 Surface system must provide field average Gmax of field of <120 g during warranty period of artificial turf. (ASTM F1936-19)

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

Part 4: Quality Assurance and Guarantees

4.1 Product must be made in ISO accredited facility in the United States of America according to the Federal Trade Commission Made in USA Standard.

4.2 Shock pad must be all white in color to avoid excessive thermal movement due to sunlight exposure during installation.

4.3 Material must be manufactured in an ISO 9000:2015 certified facility.

4.4 Product must be of a homogenous material composition, with a documented chain of custody of all raw materials. Variable content material will not be accepted.

4.5 Manufacturer must provide documentation of material content and pre-approved standard OSHA SDS sheet.

4.6 Manufacturer must demonstrate successful athletic field shock pad installation in the United States of at least 40 million square feet (approx. 500 fields) over a minimum period of 10 years.

4.7 Manufacturer must demonstrate a minimum of 50 fields that have had the turf replaced over the original shock pad and are on their “second turf cycle” over original shock pad.

4.8 Material must be covered by a pre-approved and binding 25-year limited product and performance warranty issued by a company in the United States of America. Warranty shall include the provision that manufacturer will deliver to the Owner and install new panels to replace the non-conforming panels. The installation shall include the temporary removal and repair or replacement of the artificial turf and infill over the affected area.

4.9 Warranty must specify static and dynamic load limits in pounds per square inch. Warranty must not specify monetary limits of liability. Warranty must allow owner a notice period of at least 30 days for non-compliance claims.

4.10 Warranty must include guarantee for surface system Gmax < 120 g according to ASTM F1936 for warranty period of artificial turf.

4.11 Product must be designed to freely drain and not designed to hold or retain water. Any product that intentionally holds or retains water will not be accepted.

4.12 Underlayment system seams should be mechanically locked into place by hand without cutting, splicing, use of additional materials, glue, fasteners, or secondary processes and equipment.

4.13 Material must be installed according to manufacturer’s instructions, without exceptions.

4.14 Manufacturer must provide written procedures to selected turf supplier or contractor for the installation of turf on top of underlayment.

4.15 Product is to be shipped as flat panels on pre-packaged pallets. Rolled products are not acceptable.

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

4.16 As part of a Buy American requirement, shock pad must be of a raw material 100% sourced in the USA and the pad produced in a factory within the continental United States.

Part 5: Environmental Compatibility

5.1 Product must be manufactured in an ISO 14001:2015 certified facility.

5.2 Product must be Cradle to Cradle™ Certified Bronze (or higher) by the Cradle to Cradle Products Innovation Institute (Material Health Certificate and Product Circularity Certificate, or Full-Scope Certification)

5.3 Product material must not contain concentrations of metals, volatile organic compounds (VOCs), or semi-volatile organic compounds (SVOCs) at concentrations greater than EPA Regional Screening Levels or Department of Toxic Substances Control Human Health Risk Assessment (HHRA) Note 3 thresholds. (EPA 6010B, EPA 7470A EPA 7471A, EPA 8260B, EPA 8270C).

5.4 Product material must not contain leachable concentrations of metals, VOCs, or SVOCs (using the synthetic precipitation leaching procedure) greater than maximum contaminant levels (MCLs) or Regional Water Quality Control Board Environmental Screening Levels for groundwater and surface water - fresh water aquatic habitat. (EPA 60108, EPA 7470A EPA 7471A, EPA 8260B, EPA 8270C).

5.5 Manufacturer must provide a product lifetime recycle / reuse program within the United States of America.

<u>Additional Requirements for California:</u>

5.6 Product must not contain a chemical on the current California Proposition 65 Safe Drinking Water and Toxic Enforcement Act of 1986

5.7 Product must not contain concentrations of substances at hazardous waste levels per California Code of Regulations, Title 22, Division 4.5, Chapter 11 – Identification and Listing of Hazardous Waste.

Part 6: Submittals

6.1 General: Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the design architect/engineer 10 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Township/School District will assume that the specified product is included in the bid package and will not consider substitutions.

6.2 Product Data: Submit 8.5” x 11” product sample and typical properties sheet.

6.3 Shop Drawings: Submit cross-sectional view showing product installation in relation to sub-base and synthetic turf (including edge attachment).

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

6.4 Test Data: Submit all applicable test data for compliance to specifications. All testing to be performed following applicable ASTM or other internationally recognized standards and procedures.

6.5 Installation: Submit copy of product installation instructions. Submit copy of installation recommendations.

6.6 Warranty: Submit copy of product 25-Year warranty coverage as specified in 4.8 - 4.10.

Part 7: Products

7.1 Description: Resilient Molded Expanded Polypropylene Base System

7.2 Product: Brock PowerBase PRO (PBPRO) or pre-approved equal

7.3 Contact Information:
Brock USA LLC
3090 Sterling Circle
Boulder, CO 80301
Telephone: (303) 544-5800
sales@brockusa.com
www.brockusa.com

Ronnie Pascale
National Director of Sales
Telephone: (804) 366-1368
rpascale@brockusa.com

7.4 Manufacturing/Ordering Information:
Brock USA LLC
3090 Sterling Circle
Boulder, CO 80301
Telephone: (303) 544-5800
sales@brockusa.com

7.5 Product format: Interlocking panels
Size: Approximately 73.5 x 49.0 inches (1867 x 1245 mm) overall dimensions
Area: Nominal net coverage per panel of 24.15 ft^2 (2.24 m^2)
Thickness: 1.00” (25.4 mm) ± 0.06” (1.5 mm)
Panel Weight: Approximately 5.87 lbs / panel

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.

Part 8: Product Substitutions

8.1 Product substitutions are allowed only in accordance with pre-bid substitution request procedures outlined in the contract documents. No substitutions will be allowed after the bid date. Bidding contractor must identify performance base system with bid package. If a non-specified product is identified, the proposed alternate product must be submitted and pre-approved by the design architect/engineer 10 days prior to the bid opening. If bidding contractor does not identify a manufacturer, the Township/School District will assume that the specified product is included in the bid package and will not consider substitutions.

Part 9: Installation

9.1 Per manufacturer's recommendation - obtain written installation instructions and procedures from the manufacturer.

Part 10: Surplus Material

10.1 Surplus materials to be determined by the Owner prior to order and delivery of product to the installation site. Surplus quantities to be identified in writing by the General Contractor at the time of order placement.

Part 11: Project Completion

11.1 Upon completion of installation, a walk-through will be conducted to inspect the quality of work and ensure all details meet specifications.

11.2 A punch list of unacceptable or incomplete items will be documented and agreed upon for completion prior to final project closeout and acceptance.

Part 12: Approvals

12.1 Finished synthetic base installation workmanship must be approved in advance by the turf manufacturer. Approvals to be based on a physical inspection performed at the site prior to installation of any synthetic turf material.

12.2 Any approvals sought after turf installation will be declined. Any associated repair or replacement costs associated with rework of the synthetic base will be the responsibility of the turf supplier/installer.

END OF SECTION

This document does not create any warranty, express or implied. Limited warranties will be established by separate documents provided by the vendors of the respective materials and the installation contractor.