

GEOFOAM STANDARD SPECIFICATION

PART 1 General

- 1.1 This specification covers the types, physical properties and dimensions of expanded polystyrene (EPS) intended for use as Geofoam.
- 1.2 This specification does not cover the layout, placement and workmanship for proper installation and performance of Geofoam.
- 1.3 Geofoam shall be protected from certain chemicals, fire sources, extended exposure to sunlight, and concentrated loads. Specific design considerations with Geofoam may include strength, deformation, thermal conductivity and buoyancy.
- 1.4 This specification does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of specific regulatory limitations prior to use.

PART 2 Referenced ASTM Standards

- 2.1 **ASTM D 6817** Standard Specification for Rigid, Cellular Polystyrene Geofoam
- 2.2 **ASTM C-578** Standard Specification for Rigid Cellular Polystyrene Insulation
- 2.3 **ASTM D-1621** Test Method for Compressive Properties of Rigid Cellular Plastics
- 2.4 **ASTM D-1622** Test Method for Apparent Density of Rigid Cellular Plastics

PART 3 Terminology

- 3.1 Definitions:
- 3.2 Terms used in this specification are defined in Terminology D 4439.
Geofoam—block or planar rigid cellular foam polymeric material used in geotechnical engineering applications.
- 3.3 Definitions of Terms Specific to This Standard:
- 3.4 EPS, XX—number designation for expanded polystyrene Geofoam Type(s) having a minimum density of XX kg/m³(lb/ft³).
- 3.5 RCPS—letter designation for EPS and XPS rigid cellular polystyrene geofoam covered by this specification.

PART 4 Submittals

- 4.1 General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- 4.2 Product Data: Submit product data, including manufacturer's DATA SHEET, for specified products.
- 4.3 Shop Drawings: Submit shop drawings showing layout, profiles and product components.
- 4.4 Quality Assurance Submittals: Submit the following:
 - 4.4.1 Test Compliance: Summary of test compliance with specified performance characteristics and physical properties.
 - 4.4.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements. Manufacturer shall supply a hard copy product certificate showing Third Party Quality Control.

PART 5 Quality Assurance

- 5.1 Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- 5.2 Regulatory Requirements: [Specify applicable requirements of regulatory agencies.]
Specifier Note: (1) Installation must comply with the requirements of all applicable local, state and national jurisdictions. (2) Approvals: EPS (Geofoam) is made to exacting standards monitored by Underwriters Laboratories. Contact Harbor Foam for applicable compliance information.
- 5.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, installation instructions, and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.

PART 6 Delivery, Storage & Handling

- 6.1 General: Comply with Division 1 Product Requirements Sections.
- 6.2 Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- 6.3 Delivery: Deliver materials in manufacturer's original packaging with identification marks intact.
Storage and Protection: Store materials protected from damage.

PART 7 Warranty

- 7.1 Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- 7.2.1 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

Specifier Note: Coordinate paragraph below with manufacturer's warranty requirements. Harbor Foam provides a warranty covering compliance to ASTM D 6817 for its EPS Geofoam. Contact the manufacturer for details regarding the warranty program.
Warranty Period: [Specify term.] years commencing on Date of Substantial Completion.

PART 8 Products

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards, and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal," or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

- 8.1 Manufacturer: Harbor Foam,
2950 Prairie Street SW, Suite 300
Grandville, MI 49418
Telephone: (616) 855-8150; Fax: (616) 855-8149

Specifier Note: (1) Please refer to Harbor Foam DATA SHEET for performance properties.
(2) Limitations: EPS contains a flame retardant additive; however, it should be considered combustible. It should not be stored near open flames or any source of ignition.

Expanded Polystyrene Block: Expanded polystyrene block shall be "Harbor Foam Geofoam" as manufactured by Harbor Foam. The EPS Block shall conform to ASTM D-6817 and shall be Type EPS__ with a density of ___ lbs. Per cubic foot and a minimum compressive stress of ___ at 1% deformation. The other properties shall be as follows:

Thermal Resistance (1.0 in. thickness), min.	
@ 40F	_____ F ft2 h/BTU
@ 75F	_____ F ft2 h/BTU
Compressive Strength (at 10% deformation), min.	_____ psi
Flexural Strength, min.	_____ psi
Modulus of Elasticity, min.	_____ psi
Dimensional Stability, max.	2.0 %

8.2 Harbor Foam Geofam Connector Plates: The Geofam Connector Plate shall be used to restrain Geofam from moving laterally in layer over layer applications. The Geofam Connector Plate shall be supplied by Harbor Foam. The plate shall be made of galvanized steel with two-sided multi-barbed design capable of piercing geofam. Each plate shall be capable of a lateral holding strength of 60 lbs. It is the responsibility of the designer/applicator to determine the load requirement of the project for determining the number of Geofam Connector Plates needed. However, two plates for each 4' x 8' section of EPS block is a minimum recommendation.

Specifier Note: Edit article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division Project Requirements (Product Substitutions Procedures) Section.

8.3 PRODUCT SUBSTITUTIONS
Substitutions: No substitutions permitted.

8.4 RELATED MATERIALS
Related Materials: Refer to other sections for related materials as follows:

8.5 SOURCE QUALITY
Source Quality Assurance: Each system component required shall be supplied by manufacturer and shall be obtained from selected manufacturer or its approved supplier.
Source Quality: Obtain lightweight EPS Geofam from a single manufacturer.

PART 9 Execution

Specifier Note: Revise article below to suit project requirements and specifier's practice.

9.1 Manufacturers instructions: Comply with manufacturer's product data, including product technical bulletins, and product catalog.

PART 10 Examination

- 10.1 Site Verification of Conditions:
- 10.2 Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- 10.3 Verify conditions of substrate, grade and other conditions which affect installation of geofam. Any adverse conditions shall be reported in writing. Do not proceed with installation until adverse conditions are corrected.
- 10.4 Verify details prior to starting Geofam installation.
- 10.5 Verify base preparation to support the Geofam.

PART 11 Preparation

11.1 Surface Preparation: [Specify applicable product preparation requirements.]

Specifier Note: Coordinate article below with recommended installation details and requirements.

PART 12 Installation

Specifier Note: Harbor Foam recommends installation shall be in accordance with published instructions, details and the drawings that are part of the contract documents for project. Conflicts between these documents shall be resolved in writing.

- 12.1 Installation: [Specify instructions to suit project requirements.]
- 12.2 Site Tolerances: [Specify applicable site tolerances for specified product(s) installation.]
- 12.3 Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related products installation.

PART 13 Field Quality Requirements

Specifier Note: Edit paragraph below. Establish number and duration of periodic site visits with Owner and manufacturer, and specify below. Consult with manufacturer for services required. Coordinate paragraph below with Division 1 Quality Assurance Section and Part 1 Quality Assurance Submittals herein. Delete if manufacturer's field service not required.

- 13.1 Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of periodic site visit for inspection of product.
Site Visits: [Specify number and duration of periodic site visits.]

PART 14 Cleaning

- 14.1 Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Remove construction debris from project site and legally dispose of debris.

PART 15 protection

- 15.1 Protect installed product and finish surfaces from damage during construction.
- 15.2 Prolonged exposure to sunlight can lead to discoloration and dusting due to ultraviolet (UV) degradation. Property changes related to UV degradation are superficial in nature. Once installed and properly covered UV degradation will not be an important concern for belowground geofoam applications. Discoloration and dusting due to prolonged sunlight exposure can be minimized by covering the geofoam stockpile with opaque sheeting during extended periods of open-air storage.
- 15.3 Geofoam is combustible and protecting against fire hazard is important. Smoking and the use of open flames, such as welding, near Geofoam should be strictly prohibited.