

# Compost for Erosion/Sediment Control (Filter Berms and Filter Socks)

AASHTO Designation: MP 9-06 (2007)<sup>1</sup>



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## 1. SCOPE

- 1.1. This specification covers compost produced from various organic by-products for use as a filter berm media for erosion/sediment control. The technique described in this specification is primarily used for temporary erosion/sediment control applications, where perimeter controls are required or necessary.
- 1.2. This technique is appropriate for slopes up to a 2:1 grade (horizontal distance:vertical distance) and on level surfaces and should only be used in areas that have sheet flow drainage patterns (not areas that receive concentrated flows).
- 1.3. The filter sock technology is appropriate for areas outlined in Section 1.2 as well as areas of high sheet erosion, around inlets, and in other disturbed areas of construction sites requiring sediment control. Unlike filter berms, the filter sock technology may be used in areas that have concentrated flow drainage patterns, up to 10 gallons per minute per linear foot of filter sock.

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## 2. REFERENCED DOCUMENTS

- 2.1. *ASTM Standard:*
  - D 2977, Standard Test Method for Particle Size Range of Peat Materials for Horticultural Purposes
- 2.2. *U.S. EPA Test Method:*
  - U.S. EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
- 2.3. *TMECC Sampling and Test Method:*
  - Test Methods for the Examination of Compost and Composting (TMECC), jointly published by the USDA and USCC (2002 publishing as a part of the USDA National Resource Conservation Technical Bulletin Series)
- 2.4. *Other Standards:*
  - U.S. Composting Council Seal of Testing Assurance Program documents
  - Development of Landscape Architecture Specifications for Compost Utilization, The U.S. Composting Council and the Clean Washington Center, 1997

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### **3. GENERAL DESCRIPTION**

- 3.1. Compost is the product resulting from the controlled biological decomposition of organic material, occurring under aerobic conditions, that has been sanitized through the generation of heat and stabilized to the point that it is appropriate for its particular application. Active composting is typically characterized by a high-temperature phase that sanitizes the product and allows a high rate of decomposition, followed by a lower temperature phase that allows the product to stabilize while still decomposing at a slower rate. Compost should possess no objectionable odors or substances toxic to plants and shall not resemble the raw material from which it was derived. Compost contains plant nutrients but is typically not characterized as a fertilizer.
- 3.2. Compost may be derived from a variety of feedstocks, including agricultural, forestry, food, or industrial residuals; biosolids (treated sewage sludge); leaf and yard trimmings; manure; tree wood; or source-separated or mixed solid waste.
- 3.3. Proper thermophilic composting, meeting the U.S. Environmental Protection Agency's definition for a "process to further reduce pathogens" (PFRP), will effectively reduce populations of human and plant pathogens, as well as destroy noxious weed seeds and propagules.
- 3.4. Compost is typically characterized as a finely screened and stabilized product that is used as a soil amendment. However, most composts also contain a wood-based fraction (e.g., bark, ground brush and tree wood, wood chips, etc.) which is typically removed before use as a soil amendment. This coarser, woody fraction of compost plays an important role when compost is used in erosion and sediment control. It is even possible to add fresh, ground bark or composted, properly sized wood-based materials to a compost product, as necessary, to improve its efficacy in this application.
- 3.5. Compost products acceptable for this application must meet the chemical, physical, and biological parameters outlined in Section 4.

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### **4. CHEMICAL, PHYSICAL, AND BIOLOGICAL PARAMETERS**

- 4.1. Compost products specified for use in this application must meet the criteria specified in Table 1. The products' parameters will vary based on whether vegetation will be established on the filter berm or if it will be self-contained in a filter sock.
- 4.2. Only compost products that meet all applicable state and federal regulations pertaining to their production and distribution may be used in this application. Approved compost products must meet related state and federal chemical contaminant (e.g., heavy metals, pesticides, etc.) and pathogen limits pertaining to the feedstocks (source materials) in which they were derived.

**Table 1**—Filter Berm Media Parameters

| Parameters <sup>a,b</sup>                                                  | Reported as<br>(units of measure)                      | Filter Berm to<br>Be Vegetated                                                                                                                                                                                                                                                                                                                                                      | Filter Berm to Be<br>Left Unvegetated                                                                                                                                                                                                                                                                                                                                         | Filter Sock Media                                                                                                                                                                     |
|----------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pH <sup>c</sup>                                                            | pH units                                               | 5.0–8.5                                                                                                                                                                                                                                                                                                                                                                             | N/A                                                                                                                                                                                                                                                                                                                                                                           | 5.0–8.5                                                                                                                                                                               |
| Soluble Salt<br>Concentration <sup>c</sup><br>(electrical<br>conductivity) | dS/m (mmhos/cm)                                        | Maximum 5                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                                                                                                   |
| Moisture Content                                                           | %, wet weight basis                                    | 30–60                                                                                                                                                                                                                                                                                                                                                                               | 30–60                                                                                                                                                                                                                                                                                                                                                                         | <60                                                                                                                                                                                   |
| Organic Matter<br>Content                                                  | %, dry weight basis                                    | 25–65                                                                                                                                                                                                                                                                                                                                                                               | 25–100                                                                                                                                                                                                                                                                                                                                                                        | 25–100                                                                                                                                                                                |
| Particle Size                                                              | % passing a selected<br>mesh size, dry weight<br>basis | 3 in. (75 mm), 100%<br>passing<br>1 in. (25 mm), 90% to<br>100% passing<br><sup>3</sup> / <sub>4</sub> in. (19 mm), 70% to<br>100% passing<br><sup>1</sup> / <sub>4</sub> in. (6.4 mm), 30% to<br>75% passing (no more<br>than 60% passing<br><sup>1</sup> / <sub>4</sub> in. (6.4 mm) in<br>high rainfall/flow rate<br>situations)<br>Maximum particle length<br>of 6 in. (152 mm) | 3 in. (75 mm), 100% passing<br>1 in. (25 mm), 90% to 100%<br>passing<br><sup>3</sup> / <sub>4</sub> in. (19 mm), 70% to<br>100% passing<br><sup>1</sup> / <sub>4</sub> in. (6.4 mm), 30% to 75%<br>passing (no more than<br>50% passing <sup>1</sup> / <sub>4</sub> in. (6.4<br>mm) in high rainfall/flow<br>rate situations)<br>Maximum particle length of<br>6 in. (152 mm) | 2 in. (50 mm), 99% to<br>100% passing<br><sup>3</sup> / <sub>8</sub> in. (10 mm), 30% to<br>50% passing (or 50%<br>to 70% retained)<br>Maximum particle<br>length of 2 in.<br>(50 mm) |
| Stability/Maturity <sup>d</sup>                                            |                                                        |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                       |
| Carbon Dioxide<br>Evolution Rate                                           | mg CO <sub>2</sub> -C per g OM<br>per day              | <8                                                                                                                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                                                                                                   |
| Physical Contaminants<br>(man-made inerts)                                 | %, dry weight basis                                    | <1                                                                                                                                                                                                                                                                                                                                                                                  | <1                                                                                                                                                                                                                                                                                                                                                                            | <1                                                                                                                                                                                    |

<sup>a</sup> Recommended test methodologies are provided in *Test Methods for the Examination of Composting and Compost* (TMECC, The U.S. Composting Council).

<sup>b</sup> Landscape Architects and Project (Field) Engineers may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

<sup>c</sup> Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements, and how they relate to the compost in use.

<sup>d</sup> Stability/Maturity rating is an area of compost science that is still evolving, and as such, other various test methods could be considered. Also, never base compost quality conclusions on the result of a single stability/maturity test.

4.3. Very coarse (woody) composts that contain less than 30 percent of fine particles (1 mm in size) should be avoided if optimum reductions in total suspended solids (TSS) is desired or if the berm is to be seeded.

4.4. In regions subject to higher rates of precipitation and/or greater rainfall intensity, larger compost filter berms or filter socks should be used. In these particular regions, coarser compost products are preferred as the filter berm must allow for an improved water percolation rate.

**Design Note:** Engineers should inquire as to the flow rate per linear foot of filter sock in order to ensure drainage rate of tool being used is in accordance with total watershed management plan. Required flow through rates are outlined in Table 2.

**Table 2**—Suggested Compost Filter Sock Flow Rates

| Annual Rainfall/Flow Rate | Flow Rates          |
|---------------------------|---------------------|
| Low                       | 4–6 gallons/minute  |
| Average                   | 6–10 gallons/minute |
| High                      | >10 gallons/minute  |