

This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995.

.....

SECTION 09 51 00 (SECTION 09510) - ACOUSTICAL CEILINGS

SPECIFIER NOTE:

resource management: The major constituents of acoustical ceiling tiles are mineral wool (fabricated from slag and rock wool), cellulose, starch (primarily from corn), clay (for fire-rated products), fiber glass, and paint. Mining raw materials produces soil erosion, pollutant runoff, and habitat loss. Manufacture of acoustic ceiling tiles does not generate much waste because scrap material is recycled back into the process. Acoustic ceiling tile manufactured from recycled cellulose is available; generally the recycled cellulose is pre-consumer, industry waste. Ceiling tile manufactured from slag wool, which is a pre-consumer recycled material, is also available. Steel framing containing recycled steel is available. Specify reclamation of existing acoustical ceiling tiles for remodel projects in order to reduce waste generated by project and to promote closing the loop for recycling.

toxicity/IEQ: Paints used in ceiling tiles and panels are typically low VOC, water-based paints. PVC is used in the vinyl facing on some ceiling tiles. Refer to Section 09 65 00 (09650) – Resilient Flooring for additional, related information. Adsorptive materials may act as sinks for VOCs emitted from other sources. When the concealed spaces above suspended ceilings are used as return air plenums, both the upper and lower surfaces of the ceilings are exposed to the circulating air stream. And, the temperatures at the ceiling surfaces are generally among the warmest in the interior space due to the thermal stratification that normally occurs. The increased temperature results in increased emissions of VOC from the ceiling materials.

Cornstarch used as a binder can, in the presence of moisture, fuel growth of bacteria and mold.

performance: Performance of green materials for noise reduction coefficient (NRC) standards and light reflectance is comparable to standard materials. Cellulose, fiber glass, and mineral wool ceiling tiles are suitable for dry areas and moderate acoustical requirements. Where acoustical demands are higher, specify mineral fiber tiles or cellulose tiles which are coated with low-VOC, water-based paint. Cellulose, mineral fiber, and glass fiber can absorb moisture in a high humidity areas and promote microbial growth. In high humidity areas, specify tiles with non-absorptive cores such as glass fiber reinforced polyester.

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
1. Acoustical ceiling tile.
 2. Acoustical ceiling tile suspension system.

1.2 SUBMITTALS

- A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content. USGBC-LEED™ v3, for example, includes credit for materials with recycled content, calculated on the basis of pre-consumer and post-consumer percentage content, and it includes credit for use of salvaged/recovered materials. Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

1. Recycled Content:
 - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
 - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

SPECIFIER NOTE:

Specifying local materials may help minimize transportation impacts; however it may not have a significant impact on reducing the overall embodied energy of a building material because of efficiencies of scale in some modes of transportation.

Green building rating systems frequently include credit for local materials. Transportation impacts include: fossil fuel consumption, air pollution, and labor.

USGBC-LEED™ v3 includes credits for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Green Globes US also provides points for materials that are locally manufactured.

2. Local/Regional Materials:
 - a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
 - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
 - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
 - d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

SPECIFIER NOTE:

The Food, Conservation, and Energy Act of 2008 (also known as the 2008 U.S. Farm Bill) largely continues programs of the Farm Security and Rural Investment Act of 2002 ([2002 Farm Bill](http://www.usda.gov/farbill/)) <http://www.usda.gov/farbill/>. Section 9002 requires each Federal Agency to develop a procurement program which will assure that items composed of biobased products will be purchased to the maximum extent practicable and which is consistent with applicable provisions of Federal procurement law. USDA designates biobased products for preferred Federal procurement and recommends biobased content levels for each designated product.

USGBC-LEED™ v3 includes credits for use of rapidly renewable materials, which USGBC describes as plants harvested within a ten-year cycle.

Green Globes – US, provides credit for integration of materials from renewable sources that have been selected based on life-cycle assessment.

3. Biobased materials:
 - a. Indicate type of biobased material in product.
 - b. Indicate the percentage of biobased content per unit of product.
 - c. Indicate relative dollar value of biobased content product to total dollar value of product included in project.

- B. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.
- C. Documentation of manufacturer's **[maintenance agreement] [take-back program] [green lease]** for acoustical ceiling tile. Include the following:
 - 1. Appropriate contact information.
 - 2. Overview of procedures.
 - a. Indicate manufacturer's commitment to reclaim materials for recycling and/or reuse.
 - 3. Limitations and conditions, if any, applicable to the project.

1.3 MAINTENANCE

SPECIFIER NOTE:

Identify special maintenance agreements. Maintenance agreements are standard practice in the building industry. Take-back programs refer to programs in which the product manufacturer "takes-back" scrap material and/or packaging associated with its product. Green leasing is a new, but dramatic shift in the traditional perspective of leased equipment. Under a green lease, the product manufacturer is responsible for the disposition of the product at all times. Thus, when the customer no longer requires the use of the particular product or requires an updated model, the manufacturer is obligated to reclaim it and refurbish it or disassemble it for recycling as appropriate. This approach necessitates a revision of administrative services. It also requires a basic redesign of products in order to allow for future disassembly and upgrade. This has the potential to be cost effective for manufacturers and customers alike. It is also extremely resource efficient.

When such a service is not available, local recyclers should be sought after to reclaim the materials.

- A. Operational Service: Provide manufacturer's **[maintenance agreement] [take-back program] [green lease]** service for acoustical ceiling tile installed in project. Service shall reclaim materials for recycling and/or reuse. Service shall not landfill or burn reclaimed materials.

PART 2 - PRODUCTS

SPECIFIER NOTE:

EO 13423 includes requirements for Federal Agencies to use "sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products"

Specifically, under the Sustainable Building requirements per Guiding Principle #5 Reduce Environmental Impact of Materials, EO13423 directs Federal agencies to "use products meeting or exceeding EPA's recycled content recommendations" for EPA-designated products and for other products to "use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project."

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. <http://www.ofee.gov/execorders.asp> It expands upon the environmental performance requirements of EO 13423.

http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous federal requirements in several areas, including sustainable buildings and communities. Federal agencies must implement high performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction, including:

- Ensuring all new Federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030.
- Ensuring all new construction, major renovations, or repair or alteration of Federal buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings <http://www1.eere.energy.gov/femp/pdfs/mouhighperfsustainfedfacs.pdf>

- Ensuring at least 15% of existing agency buildings and leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress towards 100% compliance across its building inventory.

Additionally, for USDA-designated biobased products, Federal agencies must use products meeting or exceeding USDA's biobased content recommendations; and for other products, biobased products made from rapidly renewable resources and certified sustainable wood products.

2.1 MATERIALS

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content and may distinguish allowable credit for post-consumer and post-industrial (or pre-consumer) recycled content. USGBC-LEED™ v3, for example, factors 100 percent of post-consumer recycled content but only 50 percent of pre-consumer (post-industrial) recycled content into calculations for its recycled content materials credit. LEED v3 grants one credit to a project for using materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10 percent of the total value of the materials in the project; 10% (post-consumer + 1/2 post-industrial). It grants an additional point for 20% (post-consumer + 1/2 post-industrial).

Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

Recycled content is typically determined by calculating the weight of the recycled material divided by the total weight of the product and expressed as a percentage by weight. (The recycled content "value" of a product as assessed under LEED is determined by multiplying the recycled content percentage and the cost of the product.)

Verify with manufacturer for product availability and recycled content.

A. Acoustical Ceiling Tile:

1. Cellulose Base:

- a. Recycled Content: Minimum **[5]** **[10]** **[xxxx]** percent post-consumer recycled content, or minimum **[20]** **[40]** **[xxxx]** percent pre-consumer recycled content at contractor's option.

SPECIFIER NOTE:

Manufacturers offer different methods for anti-microbial treatments: coating based treatment and panel based treatment. Coating based consists of modifying the paint coating. Panel based incorporates treatment in the panel formula. The coating based method is more common. Verify availability of treatment methods with manufacturer.

Some mineral base products do not require antimicrobials in order to pass standard industry tests like ASTM C1338 and UL181.

- b. Toxicity/IEQ: **[Coating]** **[Panel]** based anti-microbial treatment to inhibit growth of mold and mildew:

- 1) Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment; and showing no mold or mildew growth when tested in accordance with ASTM D3273.
- 2) Panel-Based Antimicrobial Treatment: Provide acoustical panels manufactured with antimicrobial treatment in the panels.

2. Mineral Base:

- a. Recycled Content: Minimum **[5]** **[10]** **[xxxx]** percent post-consumer recycled content, or minimum **[20]** **[40]** **[xxxx]** percent pre-consumer recycled content at contractor's option.
- b. Toxicity/IEQ: **[Coating]** **[Panel]** based anti-microbial treatment to inhibit growth of mold and mildew:

- 1) Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment; and showing no mold or mildew growth when tested in accordance with ASTM D3273.
 - 2) Panel-Based Antimicrobial Treatment: Provide acoustical panels manufactured with antimicrobial treatment in the panels.
 - c. Toxicity/IEQ: Mold and mildew resistant:
 - 1) Perlite Acoustical Panels: Minimum **[100] [xxxx]** percent volcanic perlite, clay, and inorganic binders.
 - e. Toxicity/IEQ: Products shall contain no added formaldehyde.
3. Alternative Agricultural Products:

SPECIFIER NOTE:

For current designations under the Federal Biobased Products Preferred Procurement Program (FB4P), refer to www.biobased.oce.usda.gov. As of January 4, 2010, the Federal Register includes designations for approximately 60 product types. The requirements for purchasing biobased items apply to those items directly purchased by the federal agency. Under a construction contract, the contractor's use of hydraulic fluid in its bulldozers and backhoes is incidental to the purpose of its contract, so the contractor is not required to use biobased hydraulic fluids. The Office of the Federal Environmental Executive (OFEE) recommends that agencies encourage the use of these items, however.

Currently designated items that affect construction include:

- Roof Coatings
- Water Tank Coatings
- Adhesive and Mastic Removers
- Composite Panels
- Fertilizers
- Plastic Insulating Foam
- Carpet and Upholstery Cleaners
- Carpets
- Dust Suppressants
- Packaging Films
- Glass Cleaners
- Hydraulic Fluids – Stationary Equipment
- Wood and Concrete Sealers
- Cleaners

The USDA currently has identified about 150 items for which it is collecting test data needed for the additional designations of items that will extend preferred procurement status to include all qualifying biobased products.

- a. Biobased Content: Minimum **[xxxx]** percent biobased materials; **[compressed straw] [recycled wood fiber]**.
- B. Suspension System:
1. Steel Suspension System:
 - a. Recycled Content: Minimum **[5] [10] [xxxx]** percent post-consumer recycled content, or minimum **[20] [40] [xxxx]** percent pre-consumer recycled content at contractor's option.

PART 3 - EXECUTION

3.X SITE ENVIRONMENTAL PROCEDURES

- A. Waste Management: As specified in Section 01 74 19 (01351) – Construction Waste Management and as follows:

1. Coordinate with manufacturer for **[maintenance agreement] [take-back program] [green lease]**. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION