

Acoustical Ceiling Tiles and Panels

Covered Products:

Ceiling tiles and panels including: wet pressed mineral fiber, perlite, fiberglass, gypsum wall-board, metal tiles and panels, and wood or agri-based composite tiles and panels.

This specification does not include the suspension systems for acoustical ceilings.

Goal:

To set minimum environmental goals for ceiling tile installations in State properties.

Background:

Typical criteria for selection:

The selection of acoustical ceiling materials varies depending on the specific performance criteria desired (e.g., durability, light reflectance, sound absorption, washability, design flexibility, recycled content, and/or fire resistance).

Wet-pressed mineral-fiber tiles and panels:

These are the most commonly used tiles in commercial suspended ceiling applications and are typically made from a mixture of waste paper, mineral fiber (which may include slag, a waste product from steel-making), cornstarch, and various other mineral-based components. A number of these products have high recycled content.

- Some mineral fiber tiles may contain low levels of formaldehyde, which can adversely affect ongoing air quality within the space.
- Rock wool has been identified as possibly carcinogenic to humans by the International Agency Research and the National Toxicology Program.
- Biocides are often used in composite ceiling tiles and sometimes also contain components such as corn starch that may contribute to the growth of mold or bacteria.

Perlite ceiling tiles:

Tiles that are manufactured from expanded volcanic perlite, ceramic clay and inorganic binders. These products are fireproof and will not harbor or provide nutrients for microbial growth. Light reflectance and noise reduction values of these tiles are somewhat lower than mineral fiber and fiberglass.

Fiberglass ceiling panels:

Most fiberglass ceiling panel products use a phenol-formaldehyde binder. Most fiberglass tiles are faced with plastic scrim sheet. As a general rule, fiberglass ceiling tiles cannot be included in ceiling tile reclamation programs.

- These are also available with recycled content, though the percentage is typically lower than with mineral-fiber products.
- Fiberglass tiles may have as much as 40% reclaimed glass fiber.
- An international manufacturer of high performance fiberglass ceiling tiles claims up to 90 percent post-consumer recycled content.

Wood or agri-based (composite) tiles or panels:

Though far more common in Europe, these panel products are also available in the U.S. They are free of mineral fibers and formaldehyde but are typically more expensive and usually contain no recycled content. Wood is a

grown product and the wood fiber content can be obtained from sources under sustainable forestry management such as those certified by the Forest Stewardship Council (FSC).

- Biocides are often used in composite ceiling tiles and sometimes also contain components such as corn starch that may contribute to the growth of mold or bacteria.

Metal ceiling products:

Metal can contain a high percentage of recycled content. These tiles and panels may or may not include a backing of fiberglass for better sound performance.

PVC covering or scrubbable paint finish:

Products for use in food service facilities, hospitals, or other areas with high sanitary standards may have a coating of scrubbable paint or PVC containing application.

Effective and sufficient ventilation is critical to achieving good indoor air quality (IAQ) during and after installation of ceiling tiles because most tiles are absorptive and can act as “sinks” to volatile organic compounds (VOCs) being emitted by other products such as paints and sealants.

Residential acoustical ceiling panels:

Not available in as many materials or styles as commercial products.

Definitions:

Polyvinyl Chloride (PVC) – Waste management programs that involve the controlled burning of PVC (polyvinyl chloride) may release dioxins. Production of PVC has also been linked to creation of dioxin which is a known human carcinogen listed with EPA.

Volatile Organic Compounds (VOC) – VOCs are human-made or naturally occurring organic chemical compounds that are used and produced in the manufacture of paints, adhesives, some building materials, petroleum products, pharmaceuticals, and refrigerants. Reduction of the introduction of VOCs in interior environments is a part of maintaining good indoor air quality.

Post-Industrial Recycled Content – Referred to by the USGBC LEED Guidelines as Pre-consumer material which is the material diverted from the waste stream during the manufacturing process.

Post-Consumer Recycled Content – The amount of recovered product that goes back into new products at the end of its useful service life.

ASTM E84 – A standard test method used to determine the surface burning characteristics such as smoke development index and flame spread index of a material.

ASTM E2129 – Standardized protocol for Data Collection for Sustainability Assessment of Building Products.

CAC – An acoustic characteristic of ceiling materials. “Ceiling Attenuation Class” (CAC) rating of 35 or greater is recommended for spaces with noisy plenum equipment. This represents the ceiling’s efficiency as a barrier to airborne sound transmission.

Noise Reduction Coefficient (NRC) - a measure of how much sound is absorbed by a material and should be no less than 0.65. An acoustic characteristic of ceiling materials.

LEED (Leadership in Energy and Environmental Design) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and

built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Standard Setting and Certifying Programs:

ASTM International (ASTM) - American Society for Testing and Materials is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

Collaborative for High Performance Schools (CHPS) - a best practices manual to help schools, districts and practitioners to achieve high performance design, construction and operation.

Forest Stewardship Council (FCS) – an independent review body which certifies wood products that are grown, harvested, milled and delivered in a process that manages forestry resources.

Specifications:

Affected entities shall specify ceiling tiles that include the following:

- Environmental data in accordance with Table 1 of ASTM E2129.
- Post-consumer recycled content when possible.
- Low VOC content when available in tile products and finish products.
- Installation scheduling to provide sufficient ventilation during the installation of other products like paints, etc. that may emit VOCs that could be absorbed by the ceiling tiles.

In addition, the following specifications relate to specific ceiling tile products.

Wet pressed mineral fiber tiles and panels shall be specified to meet the following criteria:

- Classified as formaldehyde-free by the Collaborative for High Performance Schools
- Recycled content of 75% minimum post-industrial (pre-consumer) materials
- In standard ¾" thickness:
 - Class A
 - Acoustic performance of: CAC range 35-39 and NRC range 0.65-0.75
- If moisture-resistant vinyl-wrapped:
 - Class A, flame spread not exceeding 25 and smoke-developed rating not exceeding 50 when tested in accordance with ASTM E84.
- Avoid mineralized wood-fiber panels in areas susceptible to moisture.

Fiberglass ceiling tiles shall be specified to meet the following criteria:

- Use non-woven fiberglass with formaldehyde-free binders
- Classified as formaldehyde-free by the Collaborative for High Performance Schools

Wood or agri-based (composite) tiles or panels shall be specified to meet the following criteria:

- Content is rapidly renewable (such as bamboo and straw) or FSC certified.
- Note: Finish products (paints, stains, etc) for ceiling panels must be specified to reduce introduction of VOCs into interior spaces.

Perlite ceiling tiles shall be specified to meet the following criteria:

- For wet or high moisture areas or;

- If there is a preference for products without biocides or;
- For areas where smoke and flame spread are required to be minimized
 - 0 flame spread, 0 smoke development, 0 fuel contribution

Gypsum Wallboard shall be specified to meet the following criteria:

- Recycled content where available.
- For applications required to be secured, monolithic, scrubbable, or capable of withstanding chemicals.
- Note: Finish products (paints, stains, etc) for ceiling panels must be specified to reduce introduction of VOCs into interior spaces.

Affected entities are encouraged to:

- Utilize highly reflective (white) ceiling panels coordinated with lighting and daylighting designs to effectively distribute daylighting and electrical lighting.
- Coordinate with manufacturers for a maintenance agreement, take back program, or green lease service for acoustical ceiling tiles installed.
 - Service shall reclaim materials for recycling and/or reuse.
 - Service shall not landfill or incinerate reclaimed materials for energy recovery, unless there are no cost effective means of managing the materials.
 - Confirm service parameters for take-back including packing requirements, minimum recycling load, and pick-up options
- Reduce the State's carbon footprint by procuring local or regional products.
 - For projects registered with a LEED rating system, some contribution to achievement of credits may be realized in purchasing units that are manufactured within 500 miles of the project site.

Toxics in Packaging:

In accordance with Environmental Conservation Law section 37-0205, packaging shall not contain inks, dyes, pigments, adhesives, stabilizers, or any other additives to which any lead, cadmium, mercury or hexavalent chromium exceed the following concentration level: 100 parts per million by weight (0.01%).