

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.
- 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.

Non-wet formed 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:

Currently most fiberglass ceiling panel products use a phenol-formaldehyde binder. It is anticipated that in the future the market will shift to bio-based products. Most fiberglass tiles are faced with a cloth, fiberglass, or vinyl scrim sheet. At least one manufacturer offers a closed-loop ceiling tile reclamation program. Fiberglass ceiling panels are available with up to 90% 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 typically free of mineral fibers and formaldehyde. Medium density fiberboard panels (MDF) should conform to ANSI A208.2 – 1994 to ensure no emissions. 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.
- Wood-based panels with substantial recycled content are available on the market.

Metal ceiling products:

Metal can contain a high percentage of recycled content. These tiles and panels may include a backing 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.

Residential acoustical ceiling panels:

Not available in as many materials or styles as commercial products but commercial products may be used in a residential setting.

Definitions:

Polyvinyl Chloride (PVC) – Waste management programs that involve the controlled burning of PVC 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.

Pre-consumer Recycled Content - Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Post-Consumer Recycled Content – Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

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.

Ceiling Attenuation Class (CAC) – An acoustic characteristic of ceiling materials. A 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. .

Leadership in Energy and Environmental Design (LEED) - 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.
- Ceiling tiles (except for composite wood ceilings) tested and evaluated in accordance with California Department of Public Health (CDPH) Standard Method VI.1-2010 using the applicable exposure scenario.
- For wet or high moisture areas tiles, meet RH-90 humidity requirements.

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:

- 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.
- Medium density fiberboard (MDF) panels conforming to ANSI A208.2-1994 for emissions.
- Finish products (paints, stains, etc) for ceiling panels where specified must have low VOC content.

Non wet-formed 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

Affected entities are encouraged to:

- Provide effective and sufficient ventilation and attention to sequencing of installation in order to support good indoor air quality (IAQ) during and after installation of ceiling tiles. Most tiles are absorptive and can act as “sinks” to volatile organic compounds (VOCs) being emitted by other products such as paints and sealants.
- Select panels with a noise reduction coefficient (NRC) of 0.65 or higher for closed plan spaces and 0.75 for open plan spaces. Utilize highly reflective (white) ceiling panels coordinated with lighting and daylighting designs to effectively distribute daylighting and electrical lighting.
- Seek to specify ceiling tiles and panels from product manufacturers that operate a ceiling tile recycling program available for use throughout the State of New York.
- Coordinate with manufacturers for a maintenance agreement, take back program, ceiling tile recycling 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, regional or national 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%).