



# DENVER AMENDMENT PROPOSAL FORM FOR PROPOSALS TO THE 2019 DENVER BUILDING CODE AMENDMENTS AND THE 2021 INTERNATIONAL CODES

**DENVER**  
THE MILE HIGH CITY

## 2021 CODE DEVELOPMENT CYCLE

1) **Name:** Kristen Salinas **Date:** 9/9/2021  
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2) One proposal per this document is to be provided with clear and concise information.

Is a separate graphic file provided ( "X" to answer): \_\_\_ Yes or  X  No

3) Highlight the code and acronym that applies to the proposal

<u>Acronym</u>	<u>Code Name</u>	<u>Acronym</u>	<u>Code Name</u>
DBC-AP	Denver Building Code–Administrative Provisions	IPC	International Plumbing Code
<b>IBC</b>	<b>International Building Code</b>	IRC	International Residential Code
IECC	International Energy Conservation Code	IFGC	International Fuel Gas Code
IEBC	International Existing Building Code	IMC	International Mechanical Code
IFC	International Fire Code	<b>DGC</b>	<b>Denver Green Code</b>

## AMENDMENT PROPOSAL

Please provide all the following items in your amendment proposal.

**Code Sections/Tables/Figures Proposed for Revision:**

**Instructions:** If the proposal is for a new section, indicate (new), otherwise enter applicable code section.

NEW Section: 809

Proposal 79 – Out of DGC into Mandatory

**Proposal:**

**Instructions:** Show the proposal using ~~strikeout~~, underline format.

**Place an “X” next to the choice that best defines your proposal:** \_\_\_ Revision  X  New Text  X  Delete/Substitute \_\_\_ Deletion

**IBC:**

**202 Definitions:**

salvaged material: material, component, or assembly removed in a whole form from a structure or site in which it was permanently installed and subsequently reused in the building project.

SECTION 809  
MATERIALS

**809.1 Low-volatile organic compound (VOC) materials.** All permanently installed interior finish materials such as flooring, sealants and adhesives, composite wood resilient flooring, carpeting and pad, site-applied paints and coatings, stains and varnishes, thermal and acoustic insulation, wall coverings and wall panels, gypsum board, acoustical ceiling tiles and ceiling panels, structural wood panels, hardwood veneer plywood, particle board, oriented strand board and fiber board building products shall meet specified volatile organic compound (VOC) emissions limits in accordance with California Department of Public Health (CDPH) 01350; GREENGUARD Environmental Institute GGPS.001 standard for building materials and finishes; or Green Seal® standards.

Exception 1: Furniture and inherently non-emitting materials, such as stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood) and has no binders, surface coatings, or sealants that include organic chemicals.

Exception 2: Salvaged materials that have not been refurbished or refinished within one year prior to installation.

**Supporting Information:**

All proposals must include a written explanation and justification as to how they address physical, environmental, and/or customary characteristics that are specific to the City and County of Denver. The following questions must be answered for a proposal to be considered.

- Purpose: What does your proposal achieve?

The purpose of this proposal is to regulate building materials in the mandatory code to limit the amount of Volatile Organic Compounds (VOCs) in interior applied products. This update includes moving voluntary measures from the Denver Green Code (DGC) into base code for all new construction projects. With the approval of this proposal, the VOC requirements will be stricken from the DGC and made mandatory in base IBC for new commercial construction projects. This language will also match the approved language in the IRC. Additional categories of materials will remain in the DGC but will be recommended to be mandatory if projects pursue the DGC.

- Reason: Why is your proposal necessary?

VOCs can affect human health or have adverse effects on the environment. Some are known carcinogens. Indoor VOC sources include many building materials – such as carpet, composite wood products, insulation, paints, adhesives. As most materials have VOC disclosure information available, this proposal language is in line with sustainability certifications and local Colorado ordinances requiring interior products to have low VOC content in their specific material category.

- Substantiation: Why is your proposal valid? (i.e. technical justification)

U.S. EPA studies have found that indoor levels of common organic pollutants are several times higher than outdoor levels. Many available low-VOC products reduce “off-gassing” of hazardous and potentially flammable vapor emissions. Local suppliers say performance of approved low-VOC building materials has steadily improved, matching or surpassing hazardous VOC products, with little or no price premium.

**DGC (FOR REFERENCE IN IBC HEARING):**

Remove 2019 mandatory requirement and replace with 2019 prescriptive requirement to build off base code.

~~**801.3.9 (8.4.2) Materials.** Reported emissions or volatile organic compound (VOC) contents specified in the following subsections shall be from a representative product sample and determined with each product reformulation or at a minimum of every three years. Products certified under third party certification programs as meeting the specific emission or VOC content requirements listed in the following subsections are exempted from this three year testing requirement but shall meet all the other requirements as listed.~~

~~**801.3.9.1 (8.4.2.1) Adhesives and Sealants.** Products in this category include carpet, resilient, and wood flooring adhesives; base cove adhesives; ceramic tile adhesives; drywall and panel adhesives; aerosol adhesives; adhesive primers; acoustical sealants; firestop sealants; HVAC air duct sealants; sealant primers; and caulks. All adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on site) shall comply with the requirements of either Section 801.3.9.1.1(8.3.9.1.1) or 801.3.9.1.2(8.4.2.1.2).~~

~~**801.3.9.1.1 (8.3.9.1.1) Emissions Requirements.** Emissions shall be determined according to CDPH/ EHLB/Standard Method V1.1 (commonly known as California Section 01350) and shall comply with the limit requirements for either office or class room spaces, regardless of the space type. The emissions testing shall be performed by an ISO/ IEC 17025 accredited laboratory that has CDPH/ EHLB/Standard Method V.1.1, USEPA Method TO 17, and ASTM Standard Method D5197 within the scope of its accreditation. Third party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.~~

**801.3.9.1.2 (8.4.2.1.2) VOC Content Requirements.** The VOC content of adhesives, sealants, and sealant primers shall be determined and limited in accordance with SCAQMD Rule 1168. HVAC duct sealants shall be classified as “Other” category within the SCAQMD Rule 1168 sealants table.

The VOC content of aerosol adhesives shall be determined and limited in accordance with Green Seal Standard GS-36, Section 3.

Exceptions: The following solvent welding and sealant products are not required to meet the emissions or VOC content requirements.

1. Cleaners, solvent cements, and primers used with plastic piping and conduit in plumbing, fire suppression, and electrical systems.
2. HVAC air duct sealants when the air temperature of the space in which they are applied is less than 40°F (4.5°C).

**801.3.9.2 (8.4.2.2) Paints and Coatings.** Products in this category include anticorrosive coatings, basement specialty coatings, concrete/masonry sealers, concrete curing compounds, dry fog coatings, faux finishing coatings, fire resistive coatings, flat and nonflat top-coats, floor coatings, graphic arts (sign) coatings, high temperature coatings, industrial maintenance coatings, low solids coatings, mastic texture coatings, metallic pigmented coatings, multicolor coatings, pretreatment wash primers, primers, reactive penetrating sealers, recycled coatings, shellacs (clear and opaque), specialty primers, stains, stone consolidants, swimming pool coatings, tub and tile refinishing coatings, under-coaters, waterproofing membranes, wood coatings (clear wood finishes), wood preservatives, and zinc primers. Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with either Section 801.3.9.2.1 (8.4.2.2.1) or 801.3.9.2.2 (8.4.2.2.2).

**801.3.9.2.1 (8.4.2.2.1) Emissions Requirements.** Emissions shall be determined according to CDPH/EHLB/Standard Method V1.1 (commonly known as California Section 01350) and shall comply with the limit requirements for either office or classroom spaces, regardless of the space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

**801.3.9.2.2 (8.4.2.2.2) VOC Content Requirements.**

a. The VOC content for flat and nonflat coatings, nonflat high gloss coatings, specialty coatings, basement specialty coatings, concrete/masonry sealers, fire resistive coatings, floor coatings, low solids coatings, primers, sealers and undercoaters, rust preventative coatings, shellacs (clear and opaque), stains, wood coatings, reflective wall coatings, varnishes, eon-jugated oil varnish, lacquer, and clear brushing lacquer shall be determined and limited in accordance with Green Seal Standard GS-11.

b. The VOC content for concrete curing compounds, dry fog coatings, faux finishing coatings, graphic arts coatings (sign paints), industrial maintenance coatings, mastic texture coatings, metallic pigmented coatings, multicolor coatings, pretreatment wash primers, reactive penetrating sealers, recycled coatings, specialty primers, wood preservatives, and zinc primers shall be determined and limited in accordance with the California Air Resources Board Suggested Control Measure for Architectural Coatings or SCAQMD Rule 1113r.

c. The VOC content for high temperature coatings, stone consolidants, swimming pool coatings, tub and tile refinishing coatings, and waterproofing membranes shall be determined and limited in accordance with the California Air Resources Board Suggested Control Measure for Architectural Coatings.

**801.3.9.3 (8.4.2.3) Floor Covering Materials.** Emissions of floor covering materials installed in the building interior, and each product layer within a flooring system containing more than one distinct product layer, shall be individually determined according to CDPH/EHLB/Standard Method V1.1 (commonly known as California Section 01350) and shall comply with the limit requirements for either office or classroom spaces, regardless of the space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/Standard Method V.1.1, USEPA TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

**801.3.9.3.1 (8.4.2.3.1) Deemed to Comply.** Floor covering materials that are composed of materials listed in Table 801.3.9.3.1 (8.3.9.3.1) shall be deemed to comply with the requirements of Section 801.4.2.3 (8.4.2.3). Where these products include integral organic-based surface coatings, binders, or sealants, or are installed using adhesives, sealants, paints, or coatings, those products shall be subject to other requirements of Section 801.3.9 (8.3.9).

**TABLE 801.3.9.3.1 (TABLE 8.3.9.3.1) FLOOR COVERING DEEMED TO COMPLY WITH VOC EMISSION LIMITS**

Ceramic and concrete tile
Natural stone
Gypsum plaster
Clay masonry
Concrete masonry
Concrete
Metal

**801.3.9.4 (8.3.9.4) Composite Wood, Wood Structural Panel, and Agrifiber Products.** Composite wood, wood structural panel, and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins. Composite wood and agrifiber products are defined as follows: particleboard, medium density fiberboard

(MDF), wheatboard, strawboard, panel substrates, and door cores. Materials considered furniture, fixtures, and equipment (FF&E) are not considered base building elements and are not included in this requirement. Emissions for products covered by this section shall be determined according to, and shall comply with, one of the following:

a. ~~Third party certification shall be submitted indicating compliance with the California Air Resource Board's (CARB) regulation, Air-borne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. Third party certifier shall be approved by CARB.~~

b. ~~CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350) and shall comply with the limit requirements for either office or classroom spaces, regard less of the space type.~~

~~**Exceptions:** Structural panel components such as plywood, particle board, wafer board, and oriented strand board identified as "EXPOSURE 1," "EXTERIOR," or "HUD-APPROVED" are considered acceptable for interior use.~~

#### DGC (Move from elective to mandatory)

**Materials (Mandatory).** The emissions of all of the following materials listed below and used within the building (defined as inside of the *weatherproofing system* and applied on-site) shall be modeled for individual VOC concentrations. The sum of each individual VOC concentration from the materials listed below shall be shown to be in compliance with the limits as listed in CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350), Section 4.3, and shall be compared to 100% of its corresponding listed limit. In addition, the modeling for the building shall include, at a minimum, the criteria listed in Normative Appendix D of this code. Emissions of materials used for modeling VOC concentrations shall be obtained in accordance with the testing procedures of CDPH/EHLB/Standard Method V1.1 unless otherwise noted below.

- a. ~~Tile, strip, panel, and plank products, including vinyl composition tile, resilient floor tile, linoleum tile, wood floor strips, parquet flooring, laminated flooring, and modular carpet tile.~~
- b. ~~Sheet and roll goods, including broadloom carpet, sheet vinyl, sheet linoleum, carpet cushion, wallcovering, and other fabric.~~
- c. ~~Rigid panel products, including gypsum board, other wall paneling, wallcovering, insulation board, oriented strand board, medium density fiber board, wood structural panel, acoustical ceiling tiles, and particleboard.~~
- d. ~~Insulation products.~~
- e. ~~Containerized products, including adhesives, sealants, paints, other coatings, primers, and other "wet" products.~~
- f. Cabinets, shelves, and worksurfaces that are permanently attached to the building before occupancy. Emissions of these items shall be obtained in accordance with the ANSI/BIFMA M7.1.
- g. *Furniture systems* and *seating* installed prior to initial occupancy. Emissions of these items shall be obtained in accordance with the BIFMA M7.1.

**Exception:** *Salvaged materials* that have not been refurbished or refinished within one year prior to installation.

#### Bibliography and Access to Materials (as needed when substantiating material is associated with the amendment proposal):

Fort Collins:

[https://www.fcgov.com/building/pdf/green-voc.pdf?1553703250#:~:text=Volatile%20organic%20compounds%20\(VOCs\)%20refer.and%20other%20liquid%20combustion%20fuels.](https://www.fcgov.com/building/pdf/green-voc.pdf?1553703250#:~:text=Volatile%20organic%20compounds%20(VOCs)%20refer.and%20other%20liquid%20combustion%20fuels.)

EPA: <https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds>

LEED Low Emitting Materials: <https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-38?return=/credits/New%20Construction/v4.1/Indoor%20environmental%20quality>

Third Party certifications and programs that meet CDPH Standard Method:

<https://www.cdph.ca.gov/Programs/CCDC/DEOD/EAH/IAQ/CDPH%20Document%20Library/List%20of%203rd%20party%20certifications%20for%20CDPH%20v1.2-Oct-10-2019%20ADA.pdf>

CDPH Standard 01350:

<https://www.calrecycle.ca.gov/GreenBuilding/Specs/Section01350/#CDPH%20Standard%20Practice%20for%20VOC%20Testing>

#### **Other Regulations Proposed to be Affected**

**\*For proposals to delete content from the 2019 Denver Green Code in conjunction with adding it to other mandatory Denver codes and/or regulations, only.**

Please identify which other mandatory codes or regulations are suggested to be updated (if any) to accept relocated content.

#### **Referenced Standards :**

List any new referenced standards that are proposed to be referenced in the code.

California Department of Public Health (CDPH) 01350 **version 1.2, 2017**; **most recent version of GREENGUARD** Environmental Institute GGPS.001 standard for building materials and finishes; or **most recent version of Green Seal®** standards

**Impact:**

How will this proposal impact cost and restrictiveness of code? ("X" answer for each item below)

Cost of construction:    \_\_\_ Increase    \_\_\_ Decrease    X No Impact  
Cost of design:        \_\_\_ Increase    \_\_\_ Decrease    X No Impact  
Restrictiveness:      X Increase    \_\_\_ Decrease    \_\_\_ No Impact