

CHAPTER 4

RESIDENTIAL MANDATORY MEASURES

Division 4.5 – ENVIRONMENTAL QUALITY

SECTION 4.501 GENERAL

4.501.1 Scope. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 4.502 DEFINITIONS

4.502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGRIFIBER PRODUCTS. Agrifiber products include wheatboard, strawboard, panel substrates and door cores, not including furniture, fixtures and equipment (FF&E) not considered base building elements.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. Composite wood products do not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber as specified in "Structural Glued Laminated Timber" (ANSI A190.1-2002) or prefabricated wood I-joists.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "base reactive organic gas (ROG) mixture" per weight of compound added, expressed to hundredths of a gram (g O₃/g ROG).

Note: MIR values for individual compounds and hydrocarbon solvents are specified in CCR, Title 17, Sections 94700 and 94701.

MOISTURE CONTENT. The weight of the water in wood expressed in percentage of the weight of the oven-dry wood.

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

Note: PWMIR is calculated according to equations found in CCR, Title 17, Section 94521(a).

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

VOC. A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and

may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a).

Note: Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 4.503 FIREPLACES

4.503.1 General. Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with U.S. EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.

SECTION 4.504 POLLUTANT CONTROL

4.504.1 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation or during storage on the construction site and until final startup of the heating and cooling equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust or debris which may collect in the system.

4.504.2 Finish material pollutant control. Finish materials shall comply with this section.

4.504.2.1 Adhesives, sealants and caulks. Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality management district rules apply:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Table 4.504.1 or 4.504.2, as applicable. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products, as specified in Subsection 2 below.
2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than 1 pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain

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toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

4.504.2.2 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Suggested Control Measure, as shown in Table 4.504.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 4.504.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in subsections 4.21, 4.36, and 4.37 of the 2007 California Air Resources Board, Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 4.504.3 shall apply.

4.504.2.3 Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8, Rule 49.

4.504.2.4 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer’s product specification.
2. Field verification of on-site product containers.

4.504.3 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the following:

1. Carpet and Rug Institute’s Green Label Plus Program.
2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
3. NSF/ANSI 140 at the Gold level.
4. Scientific Certifications Systems Indoor Advantage™ Gold.

**TABLE 4.504.1
ADHESIVE VOC LIMIT^{1,2}
Less Water and Less Exempt Compounds in Grams per Liter**

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Other adhesives not specifically listed	50
SPECIALTY APPLICATIONS	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Top and trim adhesive	250
SUBSTRATE SPECIFIC APPLICATIONS	
Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

1. If an adhesive is used to bond dissimilar substrates together, the adhesive with the highest VOC content shall be allowed.
2. For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168.

**TABLE 4.504.2
SEALANT VOC LIMIT
Less Water and Less Exempt Compounds in Grams per Liter**

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
SEALANT PRIMERS	
Architectural	
Nonporous	250
Porous	775
Modified bituminous	500
Marine deck	760
Other	750

TABLE 4.504.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS^{2,3}
Grams of VOC per Liter of Coating,
Less Water and Less Exempt Compounds

COATING CATEGORY	EFFECTIVE 1/1/2010	EFFECTIVE 1/1/2012
Flat coatings	50	
Nonflat coatings	100	
Nonflat-high gloss coatings	150	
Specialty Coatings		
Aluminum roof coatings	400	
Basement specialty coatings	400	
Bituminous roof coatings	50	
Bituminous roof primers	350	
Bond breakers	350	
Concrete curing compounds	350	
Concrete/masonry sealers	100	
Driveway sealers	50	
Dry fog coatings	150	
Faux finishing coatings	350	
Fire resistive coatings	350	
Floor coatings	100	
Form-release compounds	250	
Graphic arts coatings (sign paints)	500	
High temperature coatings	420	
Industrial maintenance coatings	250	
Low solids coatings ¹	120	
Magnesite cement coatings	450	
Mastic texture coatings	100	
Metallic pigmented coatings	500	
Multicolor coatings	250	
Pretreatment wash primers	420	
Primers, sealers, and undercoaters	100	
Reactive penetrating sealers	350	
Recycled coatings	250	
Roof coatings	50	
Rust preventative coatings	400	250
Shellacs		
Clear	730	
Opaque	550	
Specialty primers, sealers and undercoaters	350	100
Stains	250	
Stone consolidants	450	
Swimming pool coatings	340	
Traffic marking coatings	100	
Tub and tile refinish coatings	420	
Waterproofing membranes	250	
Wood coatings	275	
Wood preservatives	350	
Zinc-rich primers	340	

1. Grams of VOC per liter of coating, including water and including exempt compounds.
2. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
3. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.

4.504.3.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

4.504.3.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 4.504.1.

4.504.4 Resilient flooring systems. Where resilient flooring is installed, at least 50 percent of floor area receiving resilient flooring shall comply with the VOC emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.

4.504.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 4.504.5.

4.504.5.1 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications
2. Chain of custody certifications
3. Other methods acceptable to the enforcing agency

TABLE 4.504.5
FORMALDEHYDE LIMITS¹
Maximum Formaldehyde Emissions in Parts per Million

PRODUCT	CURRENT LIMIT	JANUARY 1, 2012	JULY 1, 2012
Hardwood plywood veneer core	0.05		
Hardwood plywood composite core	0.08		0.05
Particleboard	0.09		
Medium density fiberboard	0.11		
Thin medium density fiberboard ²	0.21	0.13	

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333-96(2002). For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.

2. Thin medium density fiberboard has a maximum thickness of 8 millimeters.

SECTION 4.505

INTERIOR MOISTURE CONTROL

4.505.1 General. Buildings shall meet or exceed the provisions of the *California Building Standards Code*.

4.505.2 Concrete slab foundations. Concrete slab foundations required to have a vapor retarder by *California Building Code*, CCR, Title 24, Part 2, Chapter 19, shall also comply with this section.

4.505.2.1 Capillary break. A capillary break shall be installed in compliance with at least one of the following:

1. A 4-inch (101.6 mm) thick base of $\frac{1}{2}$ inch (12.7 mm) or larger clean aggregate shall be provided with a