Commercial CAL Green An Overview



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Notes and Questions















January 1, 2014
The 2013 California Building Standards Code, including the California Green Building Standards Code (CALGreen Code) in Part 11, became effective on January 1, 2014.
Supplementary changes adopted and approved in the 2013 Intervening Code Adoption Cycle will become effective on July 1, 2015.













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•	Chapter 1	Administration
•	Chapter 2	Definitions
•	Chapter 3	Green Building
•	Chapter 4	Residential Mandatory Measures
•	Chapter 5	Nonresidential Mandatory Measures
•	Chapter 6	Referenced Organizations and Standards
•	Chapter 7	Installer and Special Inspector Qualifications
•	Chapter 8	Compliance Forms and Worksheets
•	Appendix A4	Voluntary Tiers (Residential)
•	Appendix A5	Voluntary Tiers (Nonresidential)
		2013 California Commercial Cal Green, An Overview 1-Oct-14

Agenda
This training is designed to assist the Raters in California have a clear view of the Commercial CalGREEN code.
While there are many pathways through the code we will demonstrate opportunities for the builders to maximize their construction investment by working with HERS Raters.
We will also demonstrate the possibility of expanding Rater services to Mechanical Contractors by cooperating together to meet several of the new CalGREEN Mandatory requirements.
2013 California Commercial Cal Green, An Overview 1-Oct-14







Purpose of the Code

Minimize impact of building construction on the environment

- -Improve construction practices
- -Reduce greenhouse gases and air pollution
- -Improve indoor air quality

2013 California Commercial Cal Green, An Overview 1-Oct-14 The purpose of this code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories:

- 1. Planning and design.
- 2. Energy efficiency.
- 3. Water efficiency and conservation.
- 4. Material conservation and resource efficiency.
- 5. Environmental quality.

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1-Oct-14

How?

By enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encourage sustainable construction practices.

> 2013 California Commercial Cal Green, An Overview 1-Oct-14





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25 • • • • •	Chapter 1 Chapter 2 Chapter 3 Chapter 4 Chapter 5 Chapter 6 Chapter 7 Chapter 8 Appendix A4 Appendix A5	Administration Definitions Green Building Residential Mandatory Measures Nonresidential Mandatory Measures Referenced Organizations and Standards Installer and Special Inspector Qualification Compliance Forms and Worksheets Voluntary Tiers (Residential) Voluntary Tiers (Nonresidential)	าร
		2013 California Commercial Cal Green, An Overview	1-Oct-14











31	Administration	
	Chapter 1	
	2013 California Commercial Cal Green, An Overview	1-Oct-14













301.1.1

Additions and Alterations

Mandatory Measures in Chapter 4 apply to additions and alterations of residential buildings and specifies that the applicable regulations only apply to the specific area of the addition or alteration.

Applicable when the addition or alteration increases a building Conditioned Area, volume, or size.

ALSO, residential buildings undergoing alterations, additions or improvements shall replace noncompliant plumbing fixtures with water conserving plumbing fixtures. See Civil CODE SECTION 1101.1, for the definition of a noncompliant plumbing fixture.

2013 California Commercial Cal Green, An Overview

1-Oct-14

1-Oct-14



303.1 Phased Projects

The mandatory measures applicable to each phase of construction must be met.

During the initial construction phase (shell), only certain mandatory measures may be applicable.

The remainder of the CAL Green mandatory measures are required for compliance from either the initial tenant



or as occupancy improvements are completed in order to achieve compliance with the CAL Green regulations.

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2013 California Commercial Cal Green, An Overview





CalGREEN and Local Jurisdictions

CalGREEN is the foundation of many codes that have been or may be enacted in the State of California.

This presentation will state the requirements for CalGREEN. Jurisdictions may have greater code restrictions in force and supersede the definitions in CalGREEN.

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	Note	TABLE A5.601 NO Green Building Standards O	NRESIDENTIAL BUILDINGS: Code Proposed Performance Approac	sh r structure
	CATEGORY	ENVIRONMENTAL PERFORMANCE GOAL	TIER 1 TIER 2	
	All	Minimum Mandatory	Meet all of the provisions of Chapter 5	Meet all of the provision of Chapter 5
	Planning and Design	Designated Parking for Fuel Efficient Vehicles	10% of total spaces	12% of total spaces
		Cool Roof to Reduce Heat Island Effect	Roof Slope < 2:12 SRI 64 Roof Slope > 2:12 SRI 16	Roof Slope < 2:12 SRI 78 Roof Slope > 2:12 SRI 30
			1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
	Energy Efficiency	Energy Performance ^{2, 3}	Outdoor lighting power 90% of Part 6 allowance	Outdoor lighting power 90% of Part 6 allowance
			If applicable, solar water-heating system with minimum solar savings fraction of 0.15	If applicable, solar water-heating system with minimum solar savings fraction of 0.15
			If applicable, certain functional areas comply with residential indoor lighting requirements	If applicable, certain functional areas comply with residential indoor lighting requirements
			Energy Budget 95% or 90% of Part 6 calculated value of allowance	Energy Budget 90% or 85% of Part 6 calculated value of allowance
	1	1	1	1 I
	Energy Efficiency Energy Performance ^{2,3} Outdoor infining power 90% of Part 6 allowance Outdoor infining power 90% of Part 6 allowance If applicable, solar water-heating system with minimum solar savings fraction of 0.15 If applicable, solar water-heating system with minimum solar savings fraction of 0.15 If applicable, certain functional areas comply with residential indoor lighting requirements If applicable, certain functional comply with residential indoor lighting requirements Energy Budget 95% or 90% of Part 6 calculated value of allowance Energy Budget 90% or 85% of Part 6 calculated value of allowance			
Induct Product Performance Approach Note: This table is intended only as an aid in illustrating the nonresidential tier structure CATEGORY ENVIRONMENTAL PERFORMANCE GOAL TEE 1 TEE 2 All Minimum Mandatory Meet all of the provisions of Chapter 5 Meet all of the provisions of Chapter 5 Planning and Design Designated Parking for Fuel Efficient Vehicles 10% of total spaces 12% of total space Cool Roof to Reduce Heat Island Effect Roof Slope < 2:12 SR1 64 Roof Slope > 2:12 SR Roof Slope > 2:12 SR 10 Roof Slope > 2:12 SR 10 3 additional Electives from Division AS.1 Energy Efficiency Energy Performance ^{2.3} Outdoor lighting power 90% of Part 6 allowance Ut allowance If applicable, solar water-heating system with minimum solar savings fraction of 0.15 If applicable, certain functional areas comply with residential indoor lighting requirement comply with residential indoor If applicable, certain functional areas comply with residential indoor If applicable, certain functional areas comply with residential indoor If applicable, certain function of 0.15 If applicable, certain functional areas comply with residential indoor If applicable, certain function of 0.15 If applicable, certain function of 0.15 If applicable, certain function of 0.15 If applicable, solar water water, beating comply with residential				
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Water Efficiency and Conservation	Indoor Water Use	30% Savings	35% Savings
	Outdoor Water Use	Not to exceed 60% of ETo times the landscape area	Not to exceed 55% of ETo times the landscape area
		1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
Material Conservation and Resource Efficiency ⁴	Construction Waste Reduction	At least 65% reduction	At least 80% reduction
	Recycled Content	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
		1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
Environmental Quality	Low-VOC Resilient Flooring	90% of flooring meets VOC limits	100% of flooring meets VOC limits
	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation and comply with VOC limits
		1 additional Elective from Division A5.5	3 additional Electives from Division A5.5
Additional Measures	Added measures shall be achieved across at least 3 categories	1 Additional Elective	3 Additional Electives
Approximate Total Measures		14	24

Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.
 Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

2013 California Commercial Cal Green, An Overview





	Prerequisite Measures	Tier 1	Tier 2
Si	ite Development	Designated parking requirements for Fuel Efficient Vehicles A5.106.5.1 and Table A5.106.5.1.1	Designated parking requirements for Fuel Efficient Vehicles A5.106.5.1 and Table A5.106.5.1.2
D	ivision A5.1	Thermal Emittance and Solar Reflectance for Cool Roofs A5.106.11.2 and Table A5.106.11.2.1	Thermal Emittance and Solar Reflectance for Cool Roofs A5.106.11.2 and Table A5.106.11.2.1
	Elective	Tier 1	Tier 2
	Measures	1	3



5.106.1 Storm water pollution prevention plan 5.106.1.2 Best Management Practices, Implement an effective combination of erosion and sediment control and good housekeeping BMP. Soil loss BMP 1. Construction scheduling. a. Preservation of natural features, vegetation and soil. b. Drainage swales or lined ditches to control stormwater flow. C. d. Mulching or hydroseeding to stabilize disturbed soils. Erosion control to protect slopes e. f. Protection of storm drain inlets, gravel bags or catch basin inserts. Perimeter sediment control, silt fence, fiber rolls. g. h. Sediment trap or sediment basin to retain sediment on site. i. Stabilized construction exits. Wind erosion control. j. Other soil loss BMP acceptable to the enforcing agency. k. 2013 California Commercial Cal Green, An Overview 1-Oct-14







5.106.4

Bicycle Parking.

5.106.4.1 Must comply with sections 5.106.4.1.1 and 5.106.4.1.2

5.106.4.1.1 Short Term bicycle parking. If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.





5.106.4.1.2

Long-Term Bicycle Parking

For new buildings with over 10 tenant-occupants, or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5% of the tenant vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and shall meet one of the following:





5.106.5.2		
Designated parking.		
58		
In new projects or additions or al parking spaces, provide designa emitting, fuel-efficient and carpoo	terations that add 10 or more vehicular ted parking for any combination of low- pl/van pool vehicles per Table 5.106.5.2	
T/	ABLE 5.106.5.2	
TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES	
0–9	0	
10–25	1	
26–50	3	
51–75	6	
76–100	8	
101–150	11	
151–200	16	
201 and over	At least 8 percent of total	
	2013 California Commercial Cal Green, An Overview	1-Oct-14





5.106.8
 Light pollution reduction
 Comply with lighting power requirements in the California Energy Code, CCR, Part 6, and design interior and exterior lighting such that zero directbeam illumination leaves the building site.
 Meet or exceed exterior light levels and uniformity ratios for lighting zones 1–4 as defined in Chapter 10 of the California Administrative Code, CCR, Part 1, using the following strategies:





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a	XIMUM Allowable Backligr	it, Up	lignt a	na Gi	are	
17						
1	TABLE 5.106.	8 (N)				
	MAXIMUM ALLOWABLE BACKLIGHT, UPLIC	GHT AND GLAR	E (BUG) RATING	S ^{1,2}		
I	ALLOWABLE RATING	LIGHTING ZONE	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4	
1	Maximum Allowable Backlight Rating ³					
1	Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit	
1	Luminaire back hemisphere is 1 - 2 MH from property line	B2	B3	B4	B4	
1	Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3	
1	Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2	
1	Maximum Allowable Uplight Rating					
1	For area lighting ⁴	UO	U0	U0	U0	
1	For all other outdoor lighting, including decorative luminaires	UI	U2	U3	U4	
1	Maximum Allowable Glare Rating ⁵					
1	Luminaire greater than 2 MH from property line	G1	G2	G3	G4	
1	Luminaire front hemisphere is 1 – 2 MH from property line	G 0	G1	G1	G2	
1	Luminaire front hemisphere is 0.5 - 1 MH from property line	G0	G0	G1	G1	
1	Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G 1	
	 IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined tive Code. 	in the California E	Energy Code and Ch	hapter 10 of the Cal	ifornia Administra-	
	2. For property lines that abut public walkways, bikeways, plazas and parking lots, the purpose of determining compliance with this section. For property lines that abut pub to be the centerline of the public roadway or public transit corridor for the purpose. 3. If the nearest property line is less than or equal to two mounting heights from the bac rating shall be met.	property line may be blic roadways and po of determining co ck hemisphere of th	e considered to be 5 ublic transit corrido mpliance with this e luminaire distribu	feet beyond the actures, the property line section. ation, the applicable	ual property line for may be considered e reduced Backlight	
	 General lighting luminaires in areas such as outdoor parking, sales or storage lots sl shall meet U-value limits for "all other outdoor lighting." 	hall meet these red	uced ratings. Decor	rative luminaires lo	cated in these areas	
	If the nearest property line is less than or equal to two mounting heights from the front shall be met.	themisphere of the	luminaire distributi	ion, the applicable r	educed Glare rating	
	shall be met. 2013 Cali	ifornia Comm	ercial Cal Gre	en, An Overvi	ie	ew 1


















Prerequisi Measures	ite s	Tier 1	Tier 2
Water Efficient and Conservation	ncy tion	30% Reduction for Indoor Potable Water Use A5.303.2.3.1	35% Reduction for Indoor Potable Water Use A5.303.2.3.1
Division A	5.3	Outdoor Potable Water Use NOT to exceed 60% Eto A5.304.4.1	Outdoor Potable Water Use NOT to exceed 55% Eto A5.304.4.1
Elective		Tier 1	Tier 2
Measures	S	1	3







5.303.1.2 Excess consumption A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume > 1,000 gpd.



80	TABLE 5.303.2.2			
FIXTURE TYPE	BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS
Showerheads	2.0 gpm @ 80 psi	5 min.	1	X ^{2a}
Lavatory faucets, nonresidential	0.5 gpm @ 60 psi	.25 min.	3	х
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	X ^{2b}
Replacement aerators	2.2 gpm @ 60 psi			х
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]			х
Metering faucets	0.25 gallons/cycle	.25 min.	3	х
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.25 min.		х
Gravity tank-type water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	х
Flushometer tank water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	х
Flushometer valve water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	x
Electromechanical hydraulic water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	х
Urinals	0.5 gallons/flush	1 flush	2 male	х
Fixture "Water Use" = Flow rate × Duration × Occu 1. The daily use number shall be increased to three 2. Refer to Table A, Chapter 4, California Plumbin, a. Shower use by occupants depends on the typ occupants in an office building as determin b. Nonresidential kitchen faucet use is determin b. Use Worksheet WS-1 to calculate baseline water	pants × Daily uses if urinals are not installed in the room. g Code, for occupant load factors. e of use of a building or portion of a building, e.g., to ed by the anticipated number of users. ed by the occupant load of the area served by the fix use.	otal occupant load for ture.	a health club, but o	nly a fraction of

V	Table 5.303.2.3 Vater Reduction F	ixture Flow Rates
8		
	WATER RED	TABLE 5.303.2.3 DUCTION FIXTURE FLOW RATES
	FIXTURE TYPE	MAXIMUM FLOW RATE
	Kitchen faucets	1.8 gpm @ 60 psi
	Wash fountains	1.8 [rim space (in.)/20 gpm @ 60 psi]
	Metering faucets	0.20 gallons/cycle
	Metering faucets for wash fountains	.20 [rim space (in.)/20 gpm @ 60 psi]
		2013 California Commercial Cal Green, An Overview 1-Oct-14

5.30 Wate	03.3 ter conserving plumbing fixtures	
82		
.1	Water Closets ≤ 1 Tank type water closets shall be certified to meet the perform criteria of the EPA WaterSense Specification.	.28 (GPF) mance
	Note: The effective flush volume of dual flush toilets is define composite, average flush volume 2 reduced flushes and one of the second secon	ed as the full flush.
.2	Urinals ≤	0.5 (GPF)
.3.1	Single Showerheads @ 80 psi and certified to meet the performance criteria of th WaterSense Specification.	2.0 (GPM) e EPA
.3.2	Multiple Showerheads <2 @ 80 psi. The combined flow rate of all showerheads and/o shower outlets are controlled by a single valve and not exce above flow rate. OR only one shower outlet may be used at hand held shower is considered a showerhead.	2.0 (GPM) r other eed the a time. A
GP	PF-Gallons per Flush, GPM-Gallons per Minute, GPD-Gallons	per Day
	2013 California Commercial Cal Green, An Overview	1-Oct-14

28 Gallons Per Flush	Jilet)	
Anarican Standard Trin Thou Brink Brink ROUND FRONT 10" ROUGH-IN TOLE WIEGO E GMA	KOHLER.	
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Provide a fixture schedule

The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code.





5.303.6

Standards for plumbing fixtures and fittings

Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall be installed in accordance with the CPC and meet aplicable standards referenced in Table 1401.1 of the CPC and described in Chapter 6 of CAL Green..



5.304 OUTDOOR WATER USE

5.304.1 Water budget.

91

A water budget shall be developed for landscape irrigation use that when installed in conjunction with a new building or an addition or an alteration conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

Note: Prescriptive measures to assist in compliance with the water budget are listed in **Sections 492.5** through **492.8**, **492.10** and **492.11** of the ordinance.

Cited ordinance within CAL Green is a dead link.

2013 California Commercial Cal Green, An Overview

1-Oct-14

1-Oct-14

5.304.2

Outdoor potable water use.

For new water service or for addition or alteration requiring upgraded water service for landscaped areas of at least 1,000 ft² but not more than 5,000 ft² of cumulative landscaped area (the level at which the Water Code § 535 applies), separate submeters or metering devices shall be installed for outdoor potable water use.

2013 California Commercial Cal Green, An Overview

5.304.3 Irrigation design

In new nonresidential construction or building addition or alteration requiring upgraded water service for landscaped areas of at least 1,000 ft² but not more than 2,500 ft² of cumulative landscaped area (the level at which the MWELO, Model Water Efficient landscape Ordinance, applies), install irrigation controllers and sensors which include the following criteria and meet manufacturers recommendations.

2013 California Commercial Cal Green, An Overview

5.304.3.1

Irrigation controllers

Automatic irrigation system controllers installed at the time of final inspection shall comply with the following:

- 1. Controllers shall be **weather or soil moisture-based controllers** that **automatically adjust irrigation** in response to changes in plants' needs as weather conditions change.
- 2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

Note: More information regarding irrigation controller function and specifications is available from the Irrigation Association.

2013 California Commercial Cal Green, An Overview

1-Oct-14







Prerequisite Measures	Tier 1	Tier 2
MATERIAL CONSERVATION	Recycled content 10% A5.405.4	Recycled content 15% A5.405.4.1
AND RESOURCE EFFICIENCY	65% Reduction in Construction and Demolition Waste A5.408.3.1	80% Reduction in Construction and Demolition Waste A5.408.3.1
Division A5.4		
Elective Measures	Tier 1	Tier 2
incusures	1	3



5.407.2 Moisture control. Employ moisture control measures by the following methods. 5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent spray on structures. 5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings.

5.407.2.2.1 Exterior door protection

Primary exterior entries shall be covered to prevent water intrusion by using non absorbent floor and wall finishes within at least 2' around and perpendicular to such openings plus at least one of the following:







5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING 5408.1 Construction waste diversion. Recycle and/or salvage for reuse a minimum of 50% of the nonhazardous construction and demoliton waste in accordance with 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet local construction and demolition waste management ordinance, whichever is more stringent.





http://	/www.calrecycle.ca.gov/	
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5.410.2 Commissioning. For new buildings 10,000 ft² and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. Includes:

2013 California Commercial Cal Green, An Overview







- 5. Equipment and systems expectations.
- 6. Building occupant and operation and maintenance (O&M) personnel expectations.

2013 California Commercial Cal Green, An Overview

1-Oct-14

5.410.2.2

Basis of Design (BOD).

A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project.

The Basis of Design document covers the following systems:

- 1. Heating, ventilation, air conditioning (HVAC) systems and controls.
- 2. Indoor lighting system and controls.
- 3. Water heating system.
- 4. Renewable energy systems.
- 5. Landscape irrigation systems.
- 6. Water reuse systems.

2013 California Commercial Cal Green, An Overview



5.410.2.3 Commissioning plan
 Commissioning team information Commissioning process activities, schedules and responsibilities.
2013 California Commercial Cal Green, An Overview 1-Oct-14

5.410.2.4 Functional performance testing. Functional performance tests to demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

2013 California Commercial Cal Green, An Overview

5.410.2.5

Documentation and training.

A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in California Code of Regulations (CCR), Title 8, Section 5142, and other related regulations.

2013 California Commercial Cal Green, An Overview

1-Oct-14



5.410.2.5.2

Systems operations training.

A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and includes:

- 1. System/equipment overview
- 2. Review and demonstration of servicing/preventive maintenance
- 3. Review of the information in the Systems Manual
- 4. Review of the record drawings on the system/equipment





















Divisio	n 5.5		
Prerec Meas	uisite ures	Tier 1	Tier 2
Environ Qua	mental lity	Resilient Flooring Systems for 90% A5.504.4.7	Resilient Flooring Systems for 100% A5.504.4.7.1
Divisio	n A5.5	Thermal Insulation per 2009 CHPS A5.504.4.8	Thermal Insulation per 2009 CHPS A5.504.4.8.1
Elec	tive	Tier 1	Tier 2
weas	ures	1	3
		2013 California Comm	nercial Cal Green, An Overview 1-Oct-14





5.504 POLLUTANT CONTROL

5.504.1.3 Temporary ventilation.

The permanent HVAC system shall be used during construction if necessary to condition the building or areas of addition or alteration with the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or and average efficiency of 30% based on 52.2.1999. Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.



5.504.4 Finish material pollutant control.
136
Finish materials shall comply with 5.504.4.1 through 5.504.4.4
5.504.4.1 Adhesives, sealants and caulks.
Adhesives, sealants, and caulks used shall meet the following standards:
 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 1168VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2.
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.

2013 California Commercial Cal Green, An Overview



TABLE 5.504.4 ADHESIVE VOC LI	1 MIT ¹² unda in Grama Par Liter	TABLE	5.504.4.2
ABCHITECTUBAL APPLICATIONS	CURRENT VOC LIMIT	SEALANT VOC LIMIT	
Indoor camet adhesives	50	Less water and Less Exempt	compounds in Grams per Liter
Carnet rad adhesives	50	SEALANTS	CURRENT VOC LIMIT
Outdoor carnet adhesives	150	Architectural	250
Wood flooring adhesive	100	A contectual	250
Rubber floor adhesives	60	Marine deck	/60
Subfloor adhesives	50	Nonmembrane roof	300
Ceramic tile adhesives	65	Roadway	250
VCT and asphalt tile adhesives	50	in a second	
Drywall and panel adhesives	50	Single-ply roof membrane	450
Cove base adhesives	50	Other	420
Multipurpose construction adhesives	70	SEALANT PRIMERS	
structural glazing adhesives	100	OCALANT TIME TO	
Single-ply roof membrane adhesives	250	Architectural	
Other adhesive not specifically listed	50	Nonporous	250
SPECIALTY APPLICATIONS		Porous	775
PVC welding	510	Modified bituminous	500
CPVC welding	490	Marine deck	760
ABS welding	325	Warme deck	700
Plastic cement welding	250	Other	750
Adhesive primer for plastic	550	Note: For additional information regar	ding methods to measure the VOC
Contact adhesive	80	content specified in these tables, see S	outh Coast Air Quality Management
Special purpose contact adhesive	250	District Rule 1168.	
Structural wood member adhesive	140	L	
Top and trim adhesive	250		
SUBSTRATE SPECIFIC APPLICATIONS	20		
Metal to metal	30		
Plastic Toattis	50		
rorous material (except wood)	30		
VOOG	30		
Procession 1. If an adhesive is used to bond dissimilar st with the highest VOC content shall be allow 2. For additional information regarding methor specified in this table, see South Coast Air Rub 1168, http://http://brub/2019/DPD/PD/ 2019/2019/2019/2019/2019/2019/2019/2019/	abstrates together the adhesive ed. Is to measure the VOC content Quality Management District		

5.504.4.3 Paints and coatings. 139 Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 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 5.504.4.3 apply. 2013 California Commercial Cal Green, An Overview 1-Oct-14

able 5 504 4 3				
abic 0.004.4.0				
TARI E 5 504.4 (TABLE 5 504.4.2		
VOC CONTENT LIMITS FOR ARCHITE Grams of VOC Per Liter o Less Water and Less Exemp	VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS ^{2,3} Grams of VOC Per Liter of Coating, Less Water and Less Exempt Compounds		VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS ^{2,3} Grams of VOC Per Liter of Coating, Less Water and Less Exempt Compounds	
COATING CATEGORY	CURENT LIMIT	COATING CATEGORY	CURENT LIMIT	
Flat coatings	50	Mastic texture coatings	100	
Nonflat coatings	100	Metallic pigmented coatings	500	
Nonflat high gloss coatings	150	Multicolor coatings	250	
Specialty Coatings		Pretreatment wash primers	420	
Aluminum roof coatings	400	Primers, sealers and undercoaters	100	
Basement specialty coatings	400	Reactive penetrating sealers	350	
Bituminous roof coatings	50	Recycled coatings	250	
Bituminous roof primers	350	Roof coatings	50	
Bond breakers	350	Rust preventative coatings	250	
Concrete curing compounds	350	Shellacs:		
Concrete/masonry sealers	100	Clear	730	
Driveway sealers	50	Specialty primers scalers and undercoaters	100	
Dry fog coatings	150	Stains	250	
Faux finishing coatings	350	Stone consolidants	450	
Fire resistive coatings	350	Swimming pool coatings	340	
Floor coatings	100	Traffic marking coatings	100	
Form-release compounds	250	Tub and tile refinish coatings	420	
Graphic arts coatings (sign paints)	500	Waterproofing membranes	250	
High-temperature coatings	420	Wood coatings	275	
Industrial maintenance coatings	250	Wood preservatives	350	
Low solids coatings1	120	Zinc-rich primers	340	
Magnesite cement coatings	450	1. Grams of VOC per liter of coating including	water and including ever	
here a sub-	100	compounds.	water and melduling ever	
		2. The specified limits remain in effect unless revi	sed limits are listed in sub	
			ecified by the California A aggested Control Measu ble from the Air Resource	
		2013 California Commercial Ca	l Green, An Ov	
TABLE SEALAN Less Water and Less Exempt	5.504.4.2 I VOC LIMIT 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 Porous	250 775			
Modified bituminous	500			
Marine deck	760			
Other	750			
Note: For additional information rega content specified in these tables, see S District Rule 1168.	rding methods to measure the VOC outh Coast Air Quality Management			

5.504.4.3.1

Aerosol paints and coatings.

Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3), in Sections 94522(c)(2) and (d)(2) of California Code of Regulations, Title 17, commencing with Section 94520;

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.

2013 California Commercial Cal Green, An Overview







5.504.4.5

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 5.504.4.5.

Table 5.504.4.5				
e TABLE SEALAN Less Water and Less Exempt	5.504.4.2 I VOC LIMIT 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 Porous	250 775			
Modified bituminous	500			
Marine deck	760			
Other	750			
Note: For additional information rega content specified in these tables, see S District Rule 1168.	rding methods to measure the VOC outh Coast Air Quality Management	-		
2013	California Commercial Cal Green, A	n Overview 1-Oct-14		

5.504.4.5.2 Documentation.
148
Compliance shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:
 Product certifications and specifications. Chain of custody certifications. Product labeled and invoiced as meeting the Composite Wood Products regulation. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

2013 California Commercial Cal Green, An Overview



5.504.4.6

Resilient flooring systems.

For **80% of floor area** receiving resilient flooring, install resilient flooring complying with the VOCemission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria, listed on the Low-emitting Materials List (or Product Registry) or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program. Supply Verification documentation.



5.504.5.3

Filters.

In mechanically ventilated buildings provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 8.

Exceptions:

An ASHRAE 10% - 15% efficiency filter shall be permitted for a HVAC unit meeting the 2013 California Energy Code have 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4 W/cfm or less at design air flow.

Existing mechanical equipment.

2013 California Commercial Cal Green, An Overview













5.507.4.2 Interior sound. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40. Note: Examples of assemblies and their various STC ratings may be found in the catalog of STC and ICC Ratings for Wall and Floor/Ceiling Assemblies.

5.508 OUTDOOR AIR QUALITY 5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2. 5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs. 5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.





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163		
	2013 California Commletkofat Cayls Center Anir Advo Oxneen ly sis	10/0/2014



702.1 Installer Training HVAC System Installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or a contractor licensed to install HVAC systems.











Code Covers	
Planning and Design Energy Efficiency Water Efficiency and Conservation Material Conservation and Resource Efficiency	4.1 4.2 4.3
Material Conservation and Resource Efficiency Environmental Quality	
2013 California Commercial Cal Green, Ar	n Overview 1-Oct-14



173

Tier 1 and Tier 2 Requirements

Tier 1 and Tier 2 thresholds require compliance with the mandatory provisions of this code and incorporation of the required prerequisite measures listed in Section A4.601.4.2 for Tier 1 and A4.601.5.2 for Tier 2. Prerequisite measures are also identified in the Residential Occupancies Application Checklist in Section A4.602.

2013 California Commercial Cal Green, An Overview

Tier Groupings					
7 Required Measures Tier 1 Tier 2					
4.1 Planning and Design	Top Soil Protection (stockpiled) A4.106.2.3	Top Soil Protection (Stockpiled and Construction Area Flagged) A4.106.2.3			
	20% Permeable Paving A4.106.4	30% Permeable Paving A4.106.4			
	Cool Roof A4.106.5	Cool Roof A4.106.5			
	Comply with at least 2 additional elective measures selected from A4.1	Comply with at least 4 additional elective measures selected from A4.1			
4.2 Energy and Efficiency	Exceed T-24 by 15% A4.203.1.1 and A4.203.1.2.1	Exceed T-24 by 30% A4.203.1.1 and A4.203.1.2.2			
	Additions and Alterations A4.203.1.1 and A4.204.1.2.1	Additions and Alterations A4.204.1.1 and A4.204.1.2.2			
4.3 Water Efficiency and	Comply with landscape irrigation water budget requirements. A4.304.3	Comply with landscape irrigation water budget requirements. A4.304.3			
Conservation	Potable Water use reduction for Irrigation (65% ETo) A4.304.4	Potable Water use reduction for Irrigatio (60% ETo) A4.304.4			
	Comply with at least 1 additional elective measures selected from A4.3	Comply with at least 3 additional elective measures selected from A4.3			

Tier Groupings					
175					
Required Measures	Tier 1	Tier 2			
4.4 Material Conservation	20% Cement Reduction A4.403.2	25% Cement Reduction A4.403.2			
and Resource Efficiency	10% Recycled Content A4.405.3.1	15% Recycled Content A4.405.3.1			
	65% Reduction in Construction Waste A4.408.1	75% Reduction in Construction Waste A4.408.1			
	Comply with at least 2 additional elective measures selected from A4.4	Comply with at least 4 additional elective measures selected from A4.4			
4.5 Environmental Quality	90% Resilient Flooring A4.504.2	100% Resilient Flooring A4.504.2			
	Thermal insulation requirements (VOC Limits) A4.504.3	Thermal Insulation requirements (No formaldehyde) A4.504.3			
	Comply with at least 2 additional elective measures selected from A4.5	Comply with at least 1 additional elective measures selected from A4.5			
2013 California Commercial Cal Green, An Overview 1-Oct-14					

A El	A4.601.3 Elective measures.				
In bu ele ar	In addition to the required measures, Tier 1 and Tier 2 buildings must incorporate at least the number of elective measures specified in Sections A4.601.4.2 and A4.601.5.2.				
	Elective Measure	Tier 1	Tier 2		
	Planning and Design	2	4		
	Energy and Efficiency				
	Water Efficiency and Conservation 1 3				
	Material Conservation and Resource Efficiency 2 4				
	Environmental Quality 1 1				
	2013 California Commercial	Cal Green, An Ove	rview 1-0	ct-14	





A5.101 General The provisions of this division outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

A5.103 Site Selection

80

A5.103.1 Community connectivity

Where feasible locate project on a previously developed site within a $\frac{1}{2}$ mile radius of at least 10 basic services readily accessible by pedestrians including:

List of services:

bank, place of worship, grocery, day care, cleaners, fire station, barber shop, beauty shop, hardware store, laundry, library, medical clinic, dental clinic, senior care facility, park, pharmacy, post office, restaurant, school, supermarket, theater, community center, fitness center, museum, or farmers market.

2013 California Commercial Cal Green, An Overview

Wollin Group, Inc.





























Table A5.106.4.3					-22
195					
		TABLE A5.106.4.3	1	_	
	NUMBER OF TENANT- OCCUPANTS	SHOWER/CHANGING FACILITIES REQUIRED ²	2-TIER (12" X 15" X 72") PERSONAL EFFECTS LOCKERS ^{1,2} REQUIRED		
	0–10	0	0		
	11-50	1 unisex shower	2		
	51-100	1 unisex shower	3		
	101-200	1 shower stall per gender	4		
	Over 200	1 shower stall per gender for each 200 additional tenant-occupants	One 2-tier locker for each 50 additional tenant-occupants		
 One 2-tier locker serves two people. Lockers shall be lockable with either padlock or combination lock. Tenant spaces housing more than 10tenant-occupants within buildings shar- ing common toilet facilities need not comply; however, such common shower facilities shall accommodate the total number of tenant-occupants served by the toilets and include a minimum of one unisex shower and two 2-tier lockers. 					
2013 California Commercial Cal Green, An Overview 1-Oct-14					



Tier 1 and Tier 2 Parking					
197					
TABLE A5 TIE 10 PERCENT OF TOT/	.106.5.1.1 R 1 AL SPACES [DSA-SS]	Low	-EMITTING/		
TOTAL NUMBER NUMBER OF PARKING SPACES OF REQUIRED SPACES		FUE	FUEL EFFICIENT		
0–9	0	ONLY			
10-25	2				
26-50	4	TABLE A5.106.5.1.2 TIER 2 12 PERCENT OF TOTAL SPACES			
51–75	6				
76–100	9				
101-150	11				
151-200	18	TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES		
201 and over	At least 10 percent of total	0-9	1		
	and the second second	10-25	2		
		26-50	5		
		51–75	7		
CLAR ARE VIEW		76–100	9		
		101-150	13		
		151-200	19		
		201 and over	At least 12 percent of total		
2013 California Commercial Cal Green, An Overview 1-Oct-14					

A5.106.5.1.3

Parking Stall Marking

Paint the following characters within the parking stalls designated reserved for fuel efficient vehicles.

CLEAN AIR/ VANPOOL/EV

Vehicles bearing Clean Air Vehicles stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

2013 California Commercial Cal Green, An Overview






























Tables A5.106.11.2.1 and .2 and .3								
214								
	TABLE A5.106.11.2.1 VALUES OF SOILING RESISTANCE, 8, BY PRODUCT TYPE							
PRODUCT TY	PRODUCT TYPE		CRRC PRODUCT CATEGORY		ß			
Field-applied c	Field-applied coating		Field-applied coating		0.65			
Other	Other		Not a field-applied coating		0.70			
ROOF SLOPE	CLIMATE ZO	TABLE A5.106.11.2.2 [BSC TIER 1 Minimum Aged NE Solar Reflectance	Thermal Emittance		SRI			
> 2:12	1-10	0.00	0.75		16			
TABLE A5.106.11.2.3 TIER 2								
ROOF SLOPE	CLIMATE ZO	Minimum Aged NE Solar Reflectance	The	mal Emittance	SRI	ļ		
≤ <mark>2:1</mark> 2	1-16	0.65		0.85	78			
> 2:12	1–16	0.30		0.85	30	()		
		2013 California C	ommercia	I Cal Green, An	Overview	1-Oct-14		











A5.203.1.1.2

Tier 1 and Tier 2 Exceptions

Exceptions:

Buildings with a natural gas service water heater with a minimum of 95% thermal efficiency

Buildings where > 75% of the total roof area has annual solar access that is < 70%. Solar is the ratio of solar insolation, including shade, to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

2013 California Commercial Cal Green, An Overview

1-Oct-14



A5.203.1.2

Performance standard

Tier 1—Building projects, newly constructed or alterations and additions, that include indoor lighting or mechanical systems but not both. Project uses no more than **95%** of the complying energy budget.

Building projects that include indoor lighting and mechanical systems use no more **90%** of the complying energy budget.

Tier 2—Building projects, newly constructed or alterations and additions, that include indoor lighting or mechanical systems but not both. Project uses no more than **90%** of the complying energy budget.

Building projects that include indoor lighting and mechanical systems use no more **85%** of the complying energy budget.

2013 California Commercial Cal Green, An Overview

1-Oct-14



A5.211

Renewable Energy

A5.211.1 On-site renewable energy. Use on-site renewable energy source such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1% of the electric poewer calculated as the product of the building service voltage and the amperage.

A5.211.3 Green power. If offered by utility provider participate in a renewable energy portfolio program that provides a minimum of 50% electrical power from renewable sources.

2013 California Commercial Cal Green, An Overview



A5.212

Elevators, Escalators and Other Equipment

In buildings with more than 1 elevator or 2 escalators, provide systems and controls to reduce the energy demand as follows.

A5.212.1.1 Elevators. Traction elevators shall have a regenerative drive system that feeds electrical power back into the building grid when the elevator is in motion.

A parked elevator shall turn off its car lights and fan automatically until the elevator is called for use.

A5.212.1.2 Escalators. An escalator shall have a VVVF motor drive system that is fully regenerative when the escalator is in motion.

A5.212.1.4 Controls. Controls that reduce energy demand and do not interrupt emergency operations.

2013 California Commercial Cal Green, An Overview

1-Oct-14













TABLE A5.303.2	0				
TABLE A5.303.2.2 WATER USE BASELINE ³					
BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS ²		
2.0 gpm @ 80 psi	5 min.	1	X ²ⁿ		
.5 gpm @ 60 psi	.25 min.	3	х		
2.6 gpm @ 60 psi	4 min.	1	X ^{2b}		
2.6 gpm @ 60 psi			x		
2.2 [rim space (in.)/20 gpm @ 60 psi]			х		
0.25 gallons/cycle	.25 min.	3	х		
.25 [rim space (in.)/20 gpm @ 60 psi]	.25 min.	1 male ¹ 3 female	х		
1.28 gallons/flush	1 flush	1 male ¹ 3 female	х		
1.28 gallons/flush	1 flush	1 male ¹ 3 female	x		
1.28 gallons/flush	1 flush	1 male ¹ 3 female	x		
1.28 gallons/flush	1 flush	1 male ¹ 3 female	x		
0.5 gallons/flush	1 flush	2 male	х		
	BASELINE FLOW RATE 2.0 gpm @ 80 psi	BASELINE FLOW RATE DURATION 2.0 gpm @ 80 psi 5 min. .5 gpm @ 60 psi 25 min. 2.6 gpm @ 60 psi 4 min. 2.6 gpm @ 60 psi 2 2.2 [rim space (in.)/20 gpm @ 60 psi] 2.25 min. .25 [rim space (in.)/20 gpm @ 60 psi] .25 min. .25 [rim space (in.)/20 gpm @ 60 psi] .25 min. .1.28 gallons/flush 1 flush 1.28 gallons/flush 1 flush	BASELINE FLOW RATE DURATION DAILY USES 2.0 gpm @ 80 psi 5 min. 1 .5 gpm @ 60 psi .25 min. 3 2.6 gpm @ 60 psi .4 min. 1 2.6 gpm @ 60 psi .25 min. 3 2.6 gpm @ 60 psi		

Table A5.303.2.3.1					
234					
TABLE A5.303.2.3.1 FIXTURE FLOW RATES					
FIXTURE TYPE	BASELINE FLOW-RATE ²	MAXIMUM FLOW RATE AT 30 PERCENT REDUCTION			
Showerheads	2.0 gpm @ 80 psi	1.8 gpm @ 80 psi			
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	0.35 gpm @ 60 psi			
Kitchen faucets	2.2 gpm @ 60 psi	1.6 gpm @ 60 psi			
Wash fountains	2.2 [rim space(in.)/20 gpm @ 60 psi]	1.6 [rim space(in.)/20 gpm @ 60 psi]			
Metering faucets	0.25 gallon/cycle	0.18 gallons/cycle			
Metering faucets for wash fountains	0.25 [rim space(in.)/20 gpm @ 60 psi]	0.18 [rim space(in.)/20 gpm @ 60 psi]			
Gravity tank type water closets	1.28 gallons/flush	1.12 gallons/flush ¹			
Flushometer tank water closets	1.28 gallons/flush	1.12 gallons/flush ¹			
Flushometer valve water closets	1.28 gallons/flush	1.12 gallons/flush1			
Electromechanical hydraulic water closets	1.28 gallons/flush	1.12 gallons/flush ¹			
Urinals	0.5 gallons/flush	0.5 gallons/flush			
 Includes water closets with an effective flush rate of 1.12 gallons or less when tested per ASME A 112.19.2 and ASME A 112.19.14. See Table 5.503.2.3 for additional notes and references. Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction. 					
2013 California Commercial Cal Green, An Overview 1-Oct-1					

























































http://www.calrecycle.ca.gov/RCP/Product.asp					
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Home Reduce Waste Recy Buy Recycled Home Environ Environ Product Search Buinness Search SABRC Search SABRC Search Add1tBt Company Info Add1tBt Company Info FAQs RecycleStore More Resources More Resources	Lee Buy Recycled Beverage Containers Enforcement Proferable Purcharing Recycled Product Director Recycled Content Products Directory Product Search No results found. Product Search Bearch Product Search Lart-optical Dials and the conference Lart-optical Dials Lart-optical Dials	er Local Partners About Us y RacydeStore soci5CE/			
Uter Feddack Ditudation Back to Top Help Contact Us She Index Conditions of Use Phone Policy					
		2013 California	Commercial Cal Green, An Ove	erview 1-Oct-14	




















































































Davis Energy Group Filter Findings				
306				
	Table 6-1: Filters Selected for Testing	·		
	Filter Make & Model	Thickness		
	3M Filtrete 1000	1"	11	
	3M Filtrete 1085	1"	11	
	3M Filtrete 1550	4"	12	
	3M Filtrete 1700	1"	12	
	3M Filtrete 600	1"	8	
	Ace 30 day Model 10004.011625	1"	2	
	Ace Microparticle, Model No. 4122354	1"	11	
	Ace Pleated, Model 4044566	1"	8	
	Aeolus Synthetic Mini-pleat	2"	13	
	American Filters Dirt Demon Dust Shield	1"	6	
	Flanders NaturalAire Standard	1"	8	
	Flanders Pre-pleat 40	2"	8	
	WEB Lifetime	1"	8	
2013 California Commercial Cal Green, An Overview 1-Oct-14				



































702.2

Special inspection.

[HCD] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education

2013 California Commercial Cal Green, An Overview

1-Oct-14











