

1. SCOPE

This document establishes the requirements and specifications for implementation of Environmentally Preferable Purchasing (EPP) as mandated by the California Public Contract Code (PCC), Chapter 6, Sections 12400-12404.

The law requires, “the procurement or acquisition of goods and services that have a lesser or reduced effect on human health and the environment when compared with competing goods and services that serve the same purpose.” Comparison requires evaluating for associated impacts from the product’s raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, disposal, energy efficiency, product performance, durability, safety, the needs of the purchaser, and cost. As part of this solicitation bidders must be compliant with mandatory requirements and may receive preference when compliant with non-mandatory environmental specifications

2. APPLICABLE SPECIFICATIONS / STANDARDS

2.1 Specifications and standards referenced in this document in effect on the opening of the request for proposal form a part of this specification.

2.2 Bidder shall comply with requirements of following standards and codes as they apply:

2.2.1 California Health and Safety Code §108920 – Limits presence of “penta BDE” or “octaBDE”.

2.2.2 Air Toxics Hot Spots Information and Assessment Act – AB 2588, Connelly, as amended by SB 1731, Calderon.

2.2.3 California Code of Regulations, Title 17 §93120.2 – Air Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products.

2.2.4 American National Standards Institute / Business and Institution Furniture Manufacturer’s Association (ANSI/BIFMA) Standards M7.1-2007 & X7.1-2007 (adopted September 26, 2007)
<http://www.bifma.org/standards/index.html>.

2.2.5 National Fire Protection Association (NFPA) Standard No. 701

2.2.6 American Society for Testing and Materials (ASTM) Standard E-84, Standard Method of Test for Surface Burning Characteristics Building Materials.

2.2.7 ASTM Standard C423-90, Noise Reduction Coefficient (NRC) or Speech Frequency Sound Absorption Average.

3. CERTIFICATIONS

3.1 ISO 9001:2000 – Quality Assurance Plan

3.2 Forest Stewardship Council (FSC)

3.3 California State Agency Buy Recycle Campaign (SABRC) compliant

3.4 ISO 17025 Laboratory Performance Testing

3.5 ISO14001 – Environmental Management Plan

4. REQUIREMENTS

4.1. Flammability Requirements (Mandatory)

- 4.1.1 All panel face units and panel inserts offered shall have a maximum smoke development rating of 450 and a maximum flame spread rating of 25 when tested.
- 4.1.2 Face fabrics shall comply with National Fire Protection Association (NFPA) Standard No. 701 or shall have a maximum smoke development rating of 450 and a maximum flame spread rating of 25.
- 4.1.3 The fire test shall be conducted in accordance with American Society for Testing and Materials (ASTM) Standard E-84, Standard Method of Test for Surface Burning Characteristics Building Materials, by an independent laboratory, or may be conducted in-house. If the manufacturer chooses to perform the flammability testing and certification, they must also be ISO 9001:2000 certified.
- 4.1.4 Alternatively, testing may be conducted in accordance with Underwriter Laboratories (UL) Standard No. 723 or NFPA Standard No. 255

4.2. Toxic Reduction (Mandatory)

- 4.2.1. Limit the presence of "pentaBDE" or "octaBDE" to not more than one-tenth (1/10) of one (1) percent.
- 4.2.2. Lamps shall be Toxicity Characteristic Leaching Procedure (TCLP) compliant.
- 4.2.3. Limit mercury (Hg) content in lamps to not more than 5mg.
- 4.2.4. Plastic foam that is manufactured or formulated using chlorofluorocarbon (CFCs) or hydro chlorofluorocarbon (HCFCs) is prohibited.
- 4.2.5. Limits emission concentrations from open office panel system for total volatile organic compounds (TVOC), formaldehyde, total aldehydes, 4-phenylcyclohexene (4-PCH) and the non-cancer chronic reference exposure limits (cREL) for individual toxic VOCs established by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment. See Indoor Air Quality specification for details.

4.3. Noise Reduction (Mandatory)

- 4.3.1. The acoustical test for sound absorption and for the Noise Reduction Coefficient (NRC) or Speech Frequency Sound Absorption Average shall be conducted by an Independent laboratory in accordance with ASTM C423-90.
- 4.3.2. The manufacturer may conduct the aforementioned tests if the manufacturer is ISO 9001:2000 certified.
- 4.3.3. The test shall be conducted on the entire panel, full-face area (the complete core,

adhesive, decorative fabric, frame and joining components).

- 4.3.4. Both sides of the panel shall be tested.
- 4.3.5. The test must be conducted on each different construction offered as an acoustical panel.
- 4.3.6. The test for Sound Transmission and Sound Transmission Class (STC) shall be conducted in accordance with ASTM E-90 and E-413.
- 4.3.7. All panels designated "acoustical" over sixty (60) inches high shall meet the acoustical requirements; Minimum Noise Reduction Coefficient (NRC) of 0.50 and a minimum Sound Transmission Coefficient (STC) of 15.

4.4. Electrical (Mandatory)

- 4.4.1. Electrical System/Components: All electrical systems and components shall be in full compliance with the latest edition of NEC and with the latest edition of UL Standard 1286.
- 4.4.2. Power Supply: The power supply system shall provide a minimum of three (3) 20 ampere (minimum 8-wire), three (3) circuit capability with two (2) 20 ampere, 120 volt general circuits and one (1) 20 ampere, 120 volt, isolated ground circuit or two (2) 20 ampere, 120 volt, isolated ground circuits and one 20 ampere, 120 volt general circuit., A maximum of four (4) workstations shall be connected to any power distribution eight-wire circuit.
- 4.4.3. Power System: The power system shall be modular and be able to provide power selectively only at needed locations, and be rearranged without altering or disassembling the panel system. The power system shall have access to any circuit via triplex, duplex, or simplex receptacles. The minimum eight-wire electrical system shall allow circuits to share a common ground or change to sharing and isolated ground in the field with only change of electrical harness or receptacle. Electrical components shall be non-handed for ease of assembly and reconfiguration.
- 4.4.4. Receptacles: Each powered panel, 30" wide or wider, shall be capable of having a minimum of four (4), 15 ampere grounded electrical plug-in locations per side. Receptacles shall be commercial grade and identified easily by line/circuit identification numbers, letters or color-codes. Appropriate receptacles shall be indicated with an orange alpha symbol and triangle on the face to identify the isolated ground. Receptacles shall be field interchangeable anywhere along the wiring harness. All panels must be capable of wire management and pass through power harness.
- 4.4.5. Base-Feed Modules: Base-feed modules shall supply power to the base panels by plugging into either side or the end of the raceway through connection ports or door.
- 4.4.6. Top-Feed Modules: Top-feed modules shall supply power to the panel base through an adjustable height raceway which carries power from hard-wired connection at junction box in ceiling or wall to plug into base raceway.
- 4.4.7. Internal Panel-to-Panel Power Connections: Internal panel-to-panel power connections shall be straight or flexible plug-in and plug-out grounded connections (i.e. 1+2, 2+1, 1+3, 2+2, 3+1,

etc.).

- 4.4.8. Commercial Grade Receptacles: Receptacles shall be commercial grade and easily identified by line or circuit identification number, letters, or color-codes. Appropriate receptacles shall be indicated with an orange color alpha symbol and triangle on the face to identify the isolated ground. Receptacles shall be field interchangeable anywhere along the wiring harness. All panels must be capable of wire management and pass through power harness.
- 4.4.9. In-Feed Modules: In-feed modules should supply power to the base panels by a conduit built into a panel, or a conduit which attaches to a panel connection post, and shall provide access doors for routing the communication cables.
- 4.4.10. Wire Management Capacity: Actual wire management capacity should allow for wire twist and right angle corner radius loss.

4.5. Task Lighting (Mandatory)

All task lights shall be equipped with only linear fluorescent, circular fluorescent, or compact fluorescent systems. Light Emitting Diode (LED) lighting systems are optional. No task lights shall contain a screw base socket. No task lights shall use incandescent lamps of any type.

- 4.5.1. Fluorescent Lamps: (Mandatory) There shall be no proprietary fluorescent lamp types, including electrical operating conditions, lamp sockets, adaptors, or bases. Fluorescent task lights shall not require a proprietary lampshade. Fluorescent task lights shall have ANSI recognized lamp sockets for which replacement lamps are readily available from a minimum of three (3) manufacturers

4.5.1.1 Linear Fluorescent Task Lighting (Mandatory)

- 4.5.1.1.1 Lamps shall have a minimum Color Rendering Index (CRI) of 80.
- 4.5.1.1.2 State has option to select from a range of common Color Temperature lamps (CCT) (2700K through 4100K).
- 4.5.1.1.3 Additional color temperatures, like 5000K, may be offered as an option. Ballasts shall have a minimum power factor of 97%.
- 4.5.1.1.4 Systems shall have a minimum efficacy of 76 lumens per watt based on rated mean lamp lumens divided by rated system input watts.
- 4.5.1.1.5 Ballast shall be high frequency electronic (no less than 20khz).
- 4.5.1.1.6 Systems shall have a maximum Total Harmonic Distortion (THD) of 20%.
- 4.5.1.1.7 Lamps shall have a minimum rated lamp life of 15,000 hours.
- 4.5.1.1.8 Lamps shall have a maximum lamp diameter of 1inch (T8 or smaller).
- 4.5.1.1.9 Lamps shall be Toxicity Characteristic Leaching Procedure (TCLP) compliant.
- 4.5.1.1.10 Lamps shall have no than 5mg per lamp of mercury (Hg) content

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- 4.5.1.2 Compact fluorescent or circular task lights (Mandatory)
 - 4.5.1.2.1 Lamps shall have a minimum Color Rendering Index (CRI) of 80
 - 4.5.1.2.2 State has option to select from a range of common Color Temperature lamps (CCT) (2700K through 4100K). Additional color temperatures, like 5000K, may be offered as an option.
Ballasts shall have a minimum power factor of 97%.
 - 4.5.1.2.3 Systems shall have a minimum efficacy of 50 lumens per watt based on rated mean lamp lumens divided by rated system input watts.
 - 4.5.1.2.4 Lamps shall have four (4) pins.
 - 4.5.1.2.5 Ballast shall be high frequency electronic (no less than 20khz).
 - 4.5.1.2.6 Systems shall have a maximum Total Harmonic Distortion (THD) of 20%.
 - 4.5.1.2.7 Lamps shall have a minimum rated lamp life of 10,000 hours.
 - 4.5.1.2.8 Lamps shall have a maximum lamp diameter of 1inch (T8 or smaller).
 - 4.5.1.2.9 Lamps shall be Toxicity Characteristic Leaching Procedure (TCLP) compliant.
 - 4.5.1.2.10 Lamps shall have no more than 5mg per lamp of mercury (Hg) content.

4.5.2. Light emitting diode (LED) (Non-Mandatory Scored)

Varying lengths of LED task lights shall be considered a single model when LED lighting is offered. Aka, "Solid State Lighting (SSL)" task lights, shall meet all of the following requirements:

- 4.5.2.1 Minimum Color Rendering Index (CRI) of 75.
- 4.5.2.2 Color Temperature lamps (CCT) (2700K through 5000K).
- 4.5.2.3 Minimum power factor of 90%.
- 4.5.2.4 Maximum Total Harmonic Distortion (THD) of 20%.
- 4.5.2.5 Has replacement warranty for minimum of three (3) years due to manufacturer's defect or failure.
- 4.5.2.6 Minimum system efficacy of 40 lumens per watt when tested by an independent testing lab in a United States nationally recognized testing lab, as follows:
 - 4.5.1.6.1 Lumens per watt (LPW) of the LED lighting system shall be the quotient of measured total luminous flux (lumens) and the measured electrical input power (watts) of the LED lighting system under test. Luminous flux shall be measured after the system has stabilized.
 - 4.5.1.6.2 Measured electrical input power (watts) shall be the maximum rated input wattage of the LED lighting system; including power used by fans, transformers, and power supply devices, and shall be tested according to all of the following conditions:

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- The ambient temperature in which measurements are being taken shall be maintained at 25°C ± 1°C
 - The AC power supply shall have a frequency of 60 Hz, and a sinusoidal voltage wave shape.
 - The voltage of an AC or DC power supply shall be regulated to ±0.2 percent.
 - The LED lighting system under test shall be burned-in for 100 hours before testing.
 - The LED lighting system under test shall be operated and stabilized before testing at ambient temperature and burning position as specified until the LED product reaches thermal equilibrium. Stability is reached when the variation of light output remains within 1% for a period of 10 minutes at constant ambient temperature and constant electrical input.
 - The LED lighting system under test shall be measured at the bumping position in which it will be installed in the task light.
 - The LED lighting system under test shall be operated at the rated voltage (AC or DC) according to the specification of the LED lighting system for its normal use.

4.5.3. Cord Set (Mandatory)

Each task light shall be equipped with a 6-foot minimum length, factory installed, electrical cord-set with a grounded plug. The cord-set shall be UL listed and California Electric Code (CEC) compliant. All task lights shall have readily accessible on-off switch

4.5.4. Access (Mandatory)

All task light shall have structurally sound mounting devices which prevent accidental displacement, and shall allow easy removal and replacement when necessary to permit cleaning and re-lamping.

All adjustable arm cabinet task lights shall have adjustable, fully articulated and balanced head and arms; and shall be capable of mounting to support components, beneath overhead shelves, to overhead storage units, with table clamps, or with weighted table base as appropriate for the selected furniture systems

4.5.5. Compatibility (Mandatory)

Task lights shall be aesthetically compatible with the workstation. Task lights shall not

adversely affect the performance of any workstation component.

4.5.6. Glare Minimization (Mandatory)

All task lights shall have a prismatic lens, baffle, or reflector system configured to minimize glare and shield the lamp from the view of a seated user. All fluorescent task lights shall have a built-in reflector. Under-shelf task lights shall be equipped with a shielding device that prevents direct glare into an occupant's eyes when the occupant is in a typical working position

4.6. Recycle Content (Mandatory Scored)

Require recycle content reports from the manufacturer. Report as a percentage by weight, contained in the "primary components" of an open office panel system for Material Types listed in Table A.

Definitions for Determining Recycle Content

Post-consumer Content (PC): Post-consumer is defined as material that comes from products that were bought by consumers, used, and then diverted from the waste stream through a collection program or effort to prevent materials from being landfilled. For example, a newspaper that has been purchased and read, and recycled, and used to make another product would be considered post-consumer material.

Recycled Content (RC): Recycled content is defined as fragments of finished products of a manufacturing or agricultural process. Recycled material is also referred to as post-industrial, pre-consumer, and/or secondary material. It does not include post-consumer material. Examples of recycled material include paper trimmed for an oversized roll in the printing plant and a rough edge trimmed from a molded plastic product. These excess materials are recycled prior to the finished product reaching a consumer. Therefore, that material would be considered recycled material.

Recyclable Material: Recyclable material is defined as a product that can be used as an ingredient in another manufactured process to create another product. Examples of recyclable materials include aluminum, corrugated cardboard, plastics, paper, and glass.

Reuse / Reusable Material: Reuse / reusable material is defined as a product that is used again for the same original purpose or other purpose without alteration to the product. Examples of reuse / reusable material is the use of original packaging materials repeatedly to repackage goods for shipping and/or refilling a container to store the same or alternative material.

Fiberglass: Post-consumer glass cullet content (within the fiberglass) is defined as a glass container that has been filled with a beverage or food product, sold to the public, and returned by the consumer as recycled glass.

Primary Components: Primary components are the work surface, panels, panel covering and Storage Units.

Work surface: The top working surface of the furniture, including core materials, keyboard pullout and/or edging.

Panels: Furniture enclosure including frames, panel core, and insulation, excluding panel covering.

Panel Covering: Material covering panels including fabrics and/or other materials.

Storage Units: Include drawers, shelves, cabinets, and files.

Calculating Recycle Content

For each listed Material Type contained in any of the Primary Components, calculate the recycled content of that Material Type as a Percentage, by Weight, of the Total (T) Material Type using the following formula.

$$\text{Total Percentage of Recycled Product Content} = [(PC/T) + (RC/T)] \times 100$$

Where: PC = Total weight of post-consumer material content. RC = Total weight of post-industrial, pre-consumer, and/or secondary material content. T = Total weight of all material used in the primary components.

Table A

Recycled Content Raw Score Ranges for Material Types in
Primary Components of Open Office Panel Systems

| Material Type | Minimum Range Post-consumer Recycled and Recycled Content*, Percentage by Weight | Middle Range Post-consumer Recycled and Recycled Content*, Percentage by Weight | High Range Post-consumer Recycled and Recycled Content*, Percentage by Weight |
|---|--|---|---|
| | Raw score = 1 for each qualifying material | Raw score = 2 for each qualifying material | Raw score = 3 for each qualifying material |
| Corrugated Cardboard | 30-35% PC | 36-50% PC | >50% PC |
| Fabrics in Panel Coverings | 15-39% RC or PC and/or renewable resource | 40-75% RC or PC and/or renewable resource | >75% RC or PC and/or renewable resource |
| Fiberglass* | 10-15% PC glass cullet | 16-30% PC glass cullet | >30% PC glass cullet |
| Glass (Excluding the Glass Cullet in Fiberglass) | 10-12% PC | 13-15% PC | >15% PC |
| Honeycomb | 4-9% PC | 10-20% PC | >20% PC |
| Laminate | 4-9% RC or PC | 10-20% RC or PC | >20% RC or PC |
| Mineral Board | 10-29% RC or PC | 30-60% RC or PC | >60% RC or PC |
| Paper fiber | 30-35% PC | 36-40% PC | >40% PC |
| Plastic components | 10-15% PC | 16-20% PC | >20% PC |
| Steel | 10-20% PC | 21-30% PC | >30% PC |
| Paper-Based Structural Fiberboard (Homasote® or comparable) | 30-40% PC | 41-60% PC | >60% PC |
| Hardboard** | 10-39% RC or PC | 40-80% RC or PC | >80% RC or PC |
| Medium-Density** Fiberboard | 10-39% RC or PC | 40-80% RC or PC | >80% RC or PC |
| Particle Board** | 10-39% RC or PC | 40-80% RC or PC | >80% RC or PC |

* See - Definitions of Recycled, Post-consumer Content and Fiberglass

** For these Material Types, recycled content may include wood fiber, agriculture waste, FSC certified fiber, or any combination thereof.

4.7. Indoor Air Quality (Mandatory)

The Indoor Air Quality (IAQ) specification is intended to ensure good indoor air quality in office spaces that contain “open office panel systems” (OOPS) and to safeguard building occupants from adverse exposures to “volatile organic compounds” (VOCs). The requirements for testing and measuring VOCs emitted from office furniture systems are described herein. These protocols use, to the greatest extent possible, standardized industry accepted procedures for analytical testing including test chamber conditions, specimen acquisition and handling, and conditioning, models and parameters.

The IAQ specification requires laboratory testing of a representative OOPS workstation (i.e. a full OOPS workstation or each of the primary components of the OOPS workstation) in an environmentally-controlled chamber and evaluation of the “individual VOCs” (iVOCs, hereafter) emitted from the OOPS workstation. The iVOC emission concentrations expected in a typical office from the OOPS workstation are evaluated using a simple occupant exposure model (i.e. single compartment, no sinks) together with typical office parameters and the chamber measured emissions. This specification employs Business and Institutional Furniture Manufacturer's Association (BIFMA) office configuration parameters. This specification requires that the expected office emission concentrations from the OOPS workstation are below the health based chronic reference exposure limits set by the California Environmental Protection Agency's “Office of Environmental Health Hazard Assessment” (OEHHA).

Any reference to and/or sections of the “American National Standards Institute / Business and Institution Furniture Manufacturer's Association” (ANSI/BIFMA) Standards in this IAQ specification reflect the ANSI/BIFMA M7.1-2007 & X7.1-2007 (adopted September 26, 2007), respectively.

Waiver of ISO 17025 Certification: The State of California (State) shall waive the ANSI/BIFMA X7.12007 requirement that laboratories who provide testing data for compliance to this standard must be ISO 17025 certified. The State's position regarding this waiver is consistent with other entities currently using the ANSI/BFIMA X7.1-2007 standard. The State encourages and supports labs being and becoming ISO certified

IAQ Acceptance Criteria The offered OOPS shall meet the requirements of the ANSI/BIFMA X7.1-2007 Standard as described in IAQ Acceptance Criteria # 1 and shall meet the State of California iVOC emission concentration limits as described in IAQ Acceptance Criteria # 2.

IAQ Acceptance Criteria #1: The offered OOPS shall be chamber tested according to the

requirements of the ANSI/BIFMA X7.12007 Standard and shall meet the requirements of the ANSI/BIFMA X7.1-2007 Standard including the requirements of the Maximum Acceptable (IAQ) Limits shown in Table titled "Maximum Acceptable IAQ Limits".

Maximum Acceptable (IAQ) Limits Requirements

The offered OOPS office emissions shall meet the Maximum Acceptable IAQ Limits shown in Table B - Maximum Acceptable (IAQ) Limits at or before the 168 hour time point, after manufacture

Table B
Maximum Acceptable IAQ Limits

| Chemical Contaminant | Emission Limits System Furniture |
|-----------------------------|----------------------------------|
| TVOC | 0.5 mg/m ³ |
| Formaldehyde | 50 parts per billion |
| Total aldehydes | 100 parts per billion |
| 4-Phenylcyclohexene (4-PCH) | 0.0065 mg/m ³ |

IAQ Acceptance Criteria #2: State of California iVOC limits

The offered OOPS shall be chamber tested according to the requirements of the ANSI/BIFMA M7.1-2007 Standard and the calculated iVOCs office emissions concentrations shall be less than the "Maximum Allowable iVOCs Office Concentrations for Emissions Tests" in Section titled Maximum Allowable iVOCs Concentrations Requirements (336 hour) as shown in Table C -State of California Maximum Allowable iVOCs Concentrations Limits at a 336 hour time point, after manufacture. In addition, the proposed OOPS must meet the emission testing requirements described below.

Table C
Maximum Allowable iVOCs Concentrations Requirements (336 hour)
State of California Maximum Allowable iVOCs Concentrations Limits

| Compound Name | CAS Number | MW | C R E L | Maximum Allowable Conc. (µg/m3) |
|--|------------|--------|------------------|---------------------------------|
| Ethylbenzene | 100-41-4 | 106.2 | Y | 1000 |
| Styrene | 100-42-5 | 104.2 | Y | 450 |
| p-Xylene | 106-42-3 | 106.2 | Y | 350 |
| 1,4-Dichlorobenzene | 106-46-7 | 147 | Y | 400 |
| Epichlorohydrin | 106-89-8 | 92.52 | Y | 1.5 |
| Ethylene Glycol | 107-21-1 | 62.1 | Y | 200 |
| 1-Methoxy-2-propanol (Propylene glycol monomethyl ether) | 107-98-2 | 90.12 | Y | 3500 |
| Vinyl Acetate | 108-05-4 | 86.1 | Y | 100 |
| m-Xylene | 108-38-3 | 106.2 | Y | 350 |
| Toluene | 108-88-3 | 92.1 | Y | 150 |
| Chlorobenzene | 108-90-7 | 112.56 | Y | 500 |
| Phenol | 108-95-2 | 94.1 | Y | 100 |
| 2-Methoxyethanol | 109-86-4 | 76.1 | Y | 30 |
| Ethylene glycol monomethyl ether acetate | 110-49-6 | 118.13 | Y | 45 |
| n-Hexane | 110-54-3 | 86.2 | Y | 3500 |
| 2-Ethoxyethanol | 110-80-5 | 90.1 | Y | 35 |
| 2-Ethoxyethyl acetate | 111-15-9 | 132.2 | Y | 150 |
| 1,4-Dioxane | 123-91-1 | 88.1 | Y | 1500 |
| Tetrachloroethylene | 127-18-4 | 165.8 | Y | 17.5 |
| Formaldehyde | 50-00-0 | 30.1 | Y | 16.5 |
| Isopropanol | 67-63-0 | 60.1 | Y | 3500 |
| Chloroform | 67-66-3 | 119.4 | Y | 150 |
| N,N-Dimethyl Formamide | 68-12-2 | 73.09 | Y | 40 |
| Benzene | 71-43-2 | 78.1 | Y | 30 |
| 1,1,1-Trichloroethane | 71-55-6 | 133.4 | Y | 500 |
| Acetaldehyde | 75-07-0 | 44.1 | Y | 9 |
| Methylene Chloride | 75-09-2 | 84.9 | Y | 200 |
| Carbon Disulfide | 75-15-0 | 76.14 | Y | 400 |
| Trichloroethylene | 79-01-6 | 131.4 | Y | 300 |
| 1-Methyl-2-Pyrrolidinone | 872-50-4 | 99.13 | N | 160 |
| Naphthalene | 91-20-3 | 128.2 | Y | 4.5 |
| o-Xylene | 95-47-6 | 106.2 | Y | 350 |

Emission Testing Requirements Chamber emission testing in accordance with ANSI/BIFMA M7.1-2007 Standard – “Method for Testing VOC Emissions from Office Furniture Systems, Components And Seating” is required to show compliance to IAQ Acceptance Criteria # 1 and IAQ Acceptance Criteria # 2. In addition, the emission testing provisions found in Section 4.7 (A through H) required for laboratory testing conducted to meet IAQ Acceptance Criteria # 2.

A. Target VOC List Requirements All compounds identified in the chamber emission tests shall be quantified and reported.

Target VOC list of all of the compounds identified in the chamber emission tests indicating that have been quantified and reported to demonstrate compliance to this requirement and shall indicate where this information is located in the bid proposal.

B. Calibration Requirements Multi-point calibrations with pure compounds are required for quantification of all identified iVOCs listed in the State of California Maximum Allowable iVOCs Concentrations Limits Table. Multi-point calibrations with pure compounds are recommended for quantification of all of the other abundant iVOC peaks; calibrations may be conducted using toluene surrogate for chemical peaks not listed in State of California Maximum Allowable iVOCs Concentrations Limits Table.

C. Required Fabric Screening Requirements Each substantially different fabric (i.e. manufactured with different material or processes; different composition, ingredients, coatings, etc.) shall be small chamber test screened in accordance with the fabric screening procedure in the ANSI/BIFMA M7.1-2007 Standard to ensure that the net workstation emissions are below the maximum allowable limits indicated in State of California Maximum Allowable iVOCs Concentrations Limits Table

Bidder shall provide a copy of the laboratory report, and shall indicate where this information is stated in the lab report showing the fabric screen test results and calculations and shall indicate where this information is located in the bid proposal.

D. Alternative Low-emitting Component Screening To demonstrate compliance with the acceptance criteria of this IAQ specification it will be acceptable to offer an “Alternative Low-emitting Component Screening” test or materials from those tested in initial lab reports provided that laboratory emission screening tests are conducted on primary components only and provided they show that the calculated net workstation office emission concentrations are below the maximum allowable limits indicated in Table C.

Screening tests are restricted to primary components only. Small-scale chamber work-surface or panel screening tests must be conducted with representative full-component assemblies including laminates

and coatings adhered to it and shall include at least one (1) true manufactured edge to represent the relative proportion of edge to planar component surface area in the offered workstation system. Dry cutting methods shall be used to avoid grease, oil, solvents or other chemical contaminants. Non-true edges may be taped using a low-emitting aluminum tape or a paraffin wax. Pieces shall be suspended on an open gate exposing front and back surfaces in the chamber.

Laboratory report shall indicate where this information is stated in the lab report showing that the alternative low-emitting screening test and calculations indicated that the net emissions are below the maximum allowable limits show in State of California Maximum Allowable iVOCs Concentrations Limits Table.

E. Most Abundant Peaks Requirements The ten (10) most abundant peaks of identified compounds (greater than the lower limit of quantification) including those peaks listed in State of California Maximum Allowable iVOCs Concentrations Limits Table shall be quantified and reported. See calibration requirements for quantification.

A copy of the laboratory report, shall indicate where this information is stated in the lab report showing that the ten (10) most abundant peaks of identified compounds have been quantified and reported using required calibrations.

F. Power-law Model Option A power-law extrapolation may be applied in emission factor calculations in accordance with the ANSI/BIFMA M7.1-2007. Both 72 hour and 168 hour emission factors shall be used to estimate 336 hour values. When the emission factor at 336 hours is determined using the power-law defined in Sections 10.4 and 10.5 of the ANSI/BIFMA M7.1-2007, emission factors with $-0.20 < b < 0.20$ shall be reported as constant.

Laboratory report shall indicate where this information is stated in the lab report, including showing where the power-law coefficient calculations are.

G. Direct Measurement Option . When the power-law is not used, “direct measurements” are required. Any direct measurement collected between 72 hour and 336 hour is acceptable.

Indicate where this information is stated in the lab report, including showing where the “direct measurements” calculations are.

H. Office Concentrations Calculations Office emission concentrations shall be calculated per ANSI/BIFMA M7.1-2007 protocol using emission factors derived from chamber tests, and the ANSI/BIFMA M7.1-2007 office model parameters:

Qoffice= 15 m³/h, office floor area =5.94 m², office volume=16.3m³, and workstation component surface areas of the open plan workstation listed in Table A2.1 of the ANSI/BIFMA M7.1-2007: 11.08 m², for panels, 6.103 m² for work surfaces, and 4.569 m² for storage units respectively.

Indicate where this information is stated in the lab report, including showing where the office model calculation equations and parameters used are located in the lab report.

Laboratory Report Requirements Laboratory reports of chamber emission testing conducted to show compliance with the IAQ acceptance criteria shall be submitted. Laboratory reports for screening tests of offered fabrics or alternate components (any substantially different from those in the Primary test reports) shall be submitted. Laboratory reports shall include all of the information required in "Section 12.2 of the ANSI/BIFMA M7.1-2007 Standard" for the Open Plan condition including iVOC measurements. The laboratory report shall include results of each chamber test or screen conducted including the following information:

- 1 Name and address of the laboratory
- 2 Name and address of the client (where applicable)
- 3 Detailed description and unambiguous identification of the item(s) tested that match the offered groupings
- 4 Dates of manufacture, collection, and shipment of the item(s)
- 5 Dates of receipt of the test item
- 6 Date(s) of the performance of test
- 7 Statement that the BIFMA M7.1-2007 Standard test method was used
- 8 Statement that screening tests for fabric of backers were conducted
- 9 Signature and title, of the person(s) accepting responsibility for the content of the report. The Laboratory Report may be partitioned into sections and each section signed by persons accepting responsibility for each section. Each section of a partitioned Laboratory Report must be signed by each respective person accepting responsibility for the content. The complete Laboratory Report with all of its sections complying with the requirements must be bundled together into one document and submitted as an overall document called the "Laboratory Report".
- 10 Test conditions including all of the following:
 - a. chamber dimensions (chamber dimensions do not have to be reported if they are proprietary, if they are proprietary then all of the other conditions below be given)
 - b. volume
 - c. clean air supply flow rate
 - d. temperature
 - e. humidity

-
- f. amount and dimensions of the test
- 11 Measured test concentrations, including chamber test concentrations of VOCs between C6 and C16 measured by the GC/MS analysis. A table including; names of VOCs identified from the air samples, the collection time points, the measured concentrations in individual samples at the sample collections times, the mean concentrations and relative deviations of duplicates, the calibration compound used for each VOC concentration. A statement shall be provided describing the type of sorbent tubes used for air sampling, the sampling volumes, and the GC/MS operating conditions and calibration information. A statement shall be provided that multi point calibrations were conducted for all measured iVOCs. Chamber test concentrations shall be provided of Aldehydes measured by HPLC analysis. A table shall be provided including; the names of the aldehydes identified in the chemical analysis, including Formaldehyde and Acetaldehyde, the collection points, the measured concentrations of each of these compounds, the mean concentrations and relative deviations of the duplicates. A statement shall be provided at the bottom of the table describing the cartridges used for air sampling, the sampling volume, and the HPLC operating conditions and calibration information.
- 12 Calculation Equation and Office / Configurations Parameters used to calculate emission factors. Calculated Emission Factors of the iVOCs measured by GC/MS and the aldehydes measured by HPLC, and the TVOC Sum, TVOC Toluene calculated from the mean values at the collection time points. A statement indicating if the power law was used or if direct measurements were used and if power law was used then the value of coefficients a and b.
- 13 The 336 hour iVOC Office Emission Concentrations shall be calculated at all test time points and 336 hours calculated from the model equation using the emission factors for the defined Typical Office Environment of a Single Office Workstation calculated by BIFMA M7.1-2007 Equations (12), (13), (14), or (15), depending on the type of test and analysis conducted. A statement shall be provided at the bottom of each table stating that the calculated office concentrations are for Open Plan condition: 1 occupant, 5.94 m² (64 ft²) floor area, 4.17 L/s (8.84 cfm) clean air ventilation rate.

Laboratory reports used for compliance to the Section– IAQ Acceptance Criteria # 1 may also be used to show compliance with Section– IAQ Acceptance Criteria # 2.

Target VOCs Maximum Allowable Office Concentration Emission Tests The maximum allowable office VOC concentrations requirements for individual chemical compounds listed in Table titled State of California Maximum Allowable iVOCs Concentrations Limits in this IAQ specification, are based on relevant health-related guidelines from the California Environmental Protection Agency’s Office of Environmental Health Hazard Assessment (OEHHA), Air Toxicology and Epidemiology Section’s non-

cancer chronic Reference Exposure Limits (cRELs) for toxic individual VOCs (iVOCs). The cRELs for the iVOCs are established by OEHHA as mandated in the “Air Toxics Hot Spots Information and Assessment Act”, AB 2588, Connelly, as amended by SB 1731, Calderon. The Chronic Reference Exposure Levels (CRELs) are designed to protect individuals who work in the vicinity of emissions of these substances. They are based on the most sensitive relevant adverse health effect reported in the medical and toxicological literature. A Chronic Reference Exposure Level (CREL) is an airborne level that would pose no significant health risk to the most sensitive individuals in the population indefinitely exposed to that level. CRELs are based solely on health considerations, and are developed from the best available data in the scientific literature.

For screening of building materials based on their laboratory-derived emission factors, the maximum allowable office concentration limits are generally set at ½ of the control level (e.g., ½ CREL). This conservative approach is taken because there are often additional sources of iVOCs in the office space besides office furniture.

In the case of formaldehyde and acetaldehyde, ½ of their CRELs ($1.5 \mu\text{g}/\text{m}^3$, and $4.5 \mu\text{g}/\text{m}^3$, respectively), are close to levels encountered in outdoor air, as well as close to their limits of detection in air.

OEHHA developed an 8-hour cREL for formaldehyde based on its 1-hour acute cREL ($94 \mu\text{g}/\text{m}^3$); this value was set at $33 \mu\text{g}/\text{m}^3$. Hence, the acceptance criterion for formaldehyde has been set at $16.5 \mu\text{g}/\text{m}^3$.

OEHHA has yet to establish an 8-hour REL for acetaldehyde; this is likely to be several times higher than the current REL. In the interim, the maximum acceptable limit for this specification is a value, $9 \mu\text{g}/\text{m}^3$ for acetaldehyde.

4.8. Additional Environmental Attributes

Points may be awarded for the following additional Environmental Attributes provided that the proposed product(s) meet the following criteria:

4.8.1. Poly-Vinyl Compounds (Mandatory):

All components of the proposed open office panel system shall be manufactured without the use of added “poly-vinyl compounds, including poly-vinyl chloride (PVC) and poly-vinylidene chloride (PVDC) compounds.

4.8.2. Flame Retardants (Non-Mandatory Scored)

All components of proposed open office panel system to be manufactured without intentionally added chlorinated or brominated flame retardants.

4.8.3. Phthalates (Non-Mandatory Scored):

All components of proposed open office panel system to be manufactured without intentionally added dialkyl phthalates, including, but not limited to the following analogues

| | | |
|----|------------------------------|--------|
| 1. | Bis (2-ethylhexyl) phthalate | (DEHP) |
| 2. | Di-isononyl phthalate | (DINP) |
| 3. | Bis (n-butyl) phthalate | (DBP) |
| 4. | Butyl benzyl phthalate | (BBzP) |
| 5. | Di-n-octyl phthalate | (DOP) |
| 6. | Di-isooctyl phthalate | (DIOP) |

4.8.4. Take-back Shipping and Packing (Non-Mandatory Scored)

Shipping and packaging materials that are reusable and/or recyclable may be returned to shipper. Points may be earned for reusable recyclable shipping and packaging materials, including cardboard and polyethylene film, only if an established program for the return or collection of these materials is available at no additional cost. Points may be awarded based on the previous 12 months averages.

4.8.5. End-of-Life Management Program (Non-Mandatory Scored):

“End-of-life” management of products offering with verifiable documentation, including a detailed description of the offered program may earn points.

An acceptable end-of- life management program may include:

- 4.8.5.1 Reuse of products or components
- 4.8.5.2 Refurbishment of damaged products
- 4.8.5.3 Recycling of component materials, or
- 4.8.5.4 Other means to responsibly divert products and components from the solid waste stream.

4.8.6. Reduction of Greenhouse Gas (Non-Mandatory Scored):

Offer verifiable documentation that a program to reduce corporate greenhouse gas emissions has been implemented. A qualifying program has a baseline period ending no later than 12/31/2000, and an independent third-party certification of

baseline emissions and reduction of emissions to date. Points may be awarded based on targeted reduction and certified reductions to date demonstrating intermediate program goals have been met.

4.8.7. Corporate Environmental Management System (Non-Mandatory Scored):

Offer verifiable documentation that an Environmental Management System is implemented and meets the following requirements:

- 4.8.7.1 Includes a formal corporate environmental and/or sustainability policy.
- 4.8.7.2 Has set measurable goals in at least three areas such as pollution prevention, water conservation, energy conservation, or recycling. (Reduction of greenhouse gas emissions is not a qualifying goal for this requirement).
- 4.8.7.3 Includes regular assessment of corporate environmental performance documenting progress towards listed goals.
- 4.8.7.4 Has met or exceeded planned progress to date for 1 or more goals listed.
- 4.8.7.5 Includes ISO 14000 certification.

4.8.8. Use of Renewable Energy in Corporate Operations (Non-Mandatory Scored):

Offer verifiable documentation that an established program for the use of renewable energy in corporate operations. A portion of energy usage may include energy from renewable sources in the following ranges.

Acceptable Renewable Energy Sources may include the following; wind, solar, geothermal, wave or tidal action, low-impact hydro, bio-methane from landfill gas or other organic sources, biomass energy using solid organic fuels from dedicated energy crops, or from wood, forest or field residues that do not include wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol or copper-chrome-arsenic. Acceptable certifying organizations may include Environmental Resources Trust, Inc. and Green-e.

5. Evaluation and Selection

5.1. Evaluation of Administrative and Technical Requirements

5.1.1. Administrative Requirements

All bidders must “Pass” Administrative Requirements.

5.1.2. Technical Requirements

All bidders must receive a passing score prior to the pricing evaluation.

Mandatory Requirements: Mandatory requirements must be met in their entirety and are scored as pass/fail and assigned points, as applicable. The pass/fail may come in form of “yes/no” question or in the form of scored question.

Non-Mandatory Requirements: Non-mandatory questions will also come in the form of "yes/no" questions with or without a narrative description, and scored.

5.2. **Scoring Criteria** The cost score represents approximately 60% (1,764 points) of the total points. The total score is comprised of Administrative, Business, Technical and Pricing. Table D represents three areas of scored criteria.

| Table D Scoring Criteria | | |
|-----------------------------|--|------------------|
| Areas | Criteria | Points |
| Administrative Requirements | <ul style="list-style-type: none">• Mandatory Requirements• Incentives | Pass/Fail 70 |
| Technical Requirements | <ul style="list-style-type: none">• Mandatory Requirements• Mandatory Scored Requirements• Non-Mandatory Scored Requirements | Pass/Fail 930 |
| Pricing | <ul style="list-style-type: none">• Cost of New Projects• Cost of Match and Inter-member components | 1,764 |
| Total: | | 2,764 |

5.3. Technical Score

The Technical Score for environmental attributes represent approximately 34% (930 points) of the total points available. Offering options for reducing energy, substances of concern and waste adds value to commodity.

| Table E Technical Scored Requirements | | |
|--|-------------|--|
| Requirement | Type | Maximum Points Possible |
| Panel System Features <ul style="list-style-type: none"> • Frosted glass or equivalent for applications that require privacy without blocking light or HVAC units (2.5 pts) • Open Frame (2.5 pts) • Open bookcases (2.5. pts) • Wardrobes (2.5. pts) | NMS | 10 |
| LED Lamp Type Task Light | NMS | 10 |
| LED Task Lights with Adjustable Arm | NMS | 10 |
| Under Cabinet LED Task Light | NMS | 10 |
| Light Emitting Diode LED Option | NMS | 10 |
| Linear Fluorescent Efficacy Points will be awarded based on the following criteria <ul style="list-style-type: none"> • 82 lumens per watt (25 pts) • 90 lumens per watt (50 pts) | NMS | 50 |
| Compact Fluorescent Efficacy <ul style="list-style-type: none"> • 60 lumens per watt (25 pts) • 70 lumens per watt (50 pts) | NMS | 50 |
| LED Task Light Efficacy <ul style="list-style-type: none"> • 40 lumens per watt (20 pts) • 50 lumens per watt (40 pts) | NMS | 40 |
| Personal Occupancy Sensor (POS) | NMS | 20 |
| Recycled Content Reporting (MS / NMS) Total 300 <ul style="list-style-type: none"> • Mandatory Minimum Requirements (100 pts) • Non-Mandatory Requirements (200 pts.) | MS/ NMS | 300 |
| Poly-Vinyl Compounds Yes (25 pts.) No (0 pts.) | NMS | 25 |
| Flame Retardants Yes (50 pts.) No (0 pts.) | NMS | 50 |
| Phthalates Yes (25 pts.) No (0 pts.) | NMS | 25 |
| Take-Back Packaging Materials Program. Percentage of Packaging material in Take-Back for Reuse over prior year One-Half point for each percent up to 40 points | NMS | 40 |

| Requirement | Type | Maximum Points Possible |
|---|------|-------------------------|
| Shipping / Packing Materials Percentage of Packaging material that was Recyclable over prior year One-Half point for each percent up to 40 points | NMS | 40 |
| End-of-Life Management Program Percentage of product that is designed for Take-Back for Reuse in the manufacturing process One-Half point for each percent up to 30 points Percentage of product from Take-Back program for Reuse over prior year One-Half point for each percent up to 30 points | NMS | 60 |
| Commitment to Reduction of Greenhouse Gas Emissions Program / Plan in place (10 pts) Based on results of program, up to 40 more points can be earned as follows: 10-19.9% reduction as of July 1, 2008 (10 pts) 20-29.9% reduction as of July 1, 2008 (20 pts) 30-39.9% reduction as of July 1, 2008 (30 pts) 40% or more reduction as of July 1, 2008 (40 pts) | NMS | 50 |
| Corporate Environmental Management System Has a formal corporate environmental and/or sustainability policy (10 pts) Environmental Management System is ISO 14000 certified (10 pts) Has set measurable goals in at three areas such as; pollution prevention, water conservation, energy conservation, or recycling (10 pts) Regularly tracks, reports, and assesses corporate environmental performance against established goals (10 pts) Based on results of program, up to 20 more points can be earned as follows: Firm exceeds planned progress as of July 1, 2008 in one goal area (5 pts) Firm exceeds planned progress as of July 1, 2008 in two goal areas (10 pts) Firm exceeds planned progress as of July 1, 2008 in three or more (20 pts) | NMS | 60 |
| Use of Renewable Energy in Corporate Operations Program in place (10 pts) Based on results of program, up to 40 more points can be earned as follows: 10-19.9% of Total Energy as of July 1, 2008 is renewable energy (10 pts) 20-20.9% of Total Energy as of July 1, 2008 is renewable energy (20 pts) 30-30.9% of Total Energy as of July 1, 2008 is renewable energy (30 pts) 40% or more Total Energy as of July 1, 2008 is renewable energy (40 pts) | NMS | 50 |
| Environmental Certifications Obtained Requirements | NMS | 20 |
| Total: NMS = Non-Mandatory Scored MS = Mandatory Scored | | 930 |