ENERGY STAR
INDOOR AIR PACKAGE
Specifications, version 2

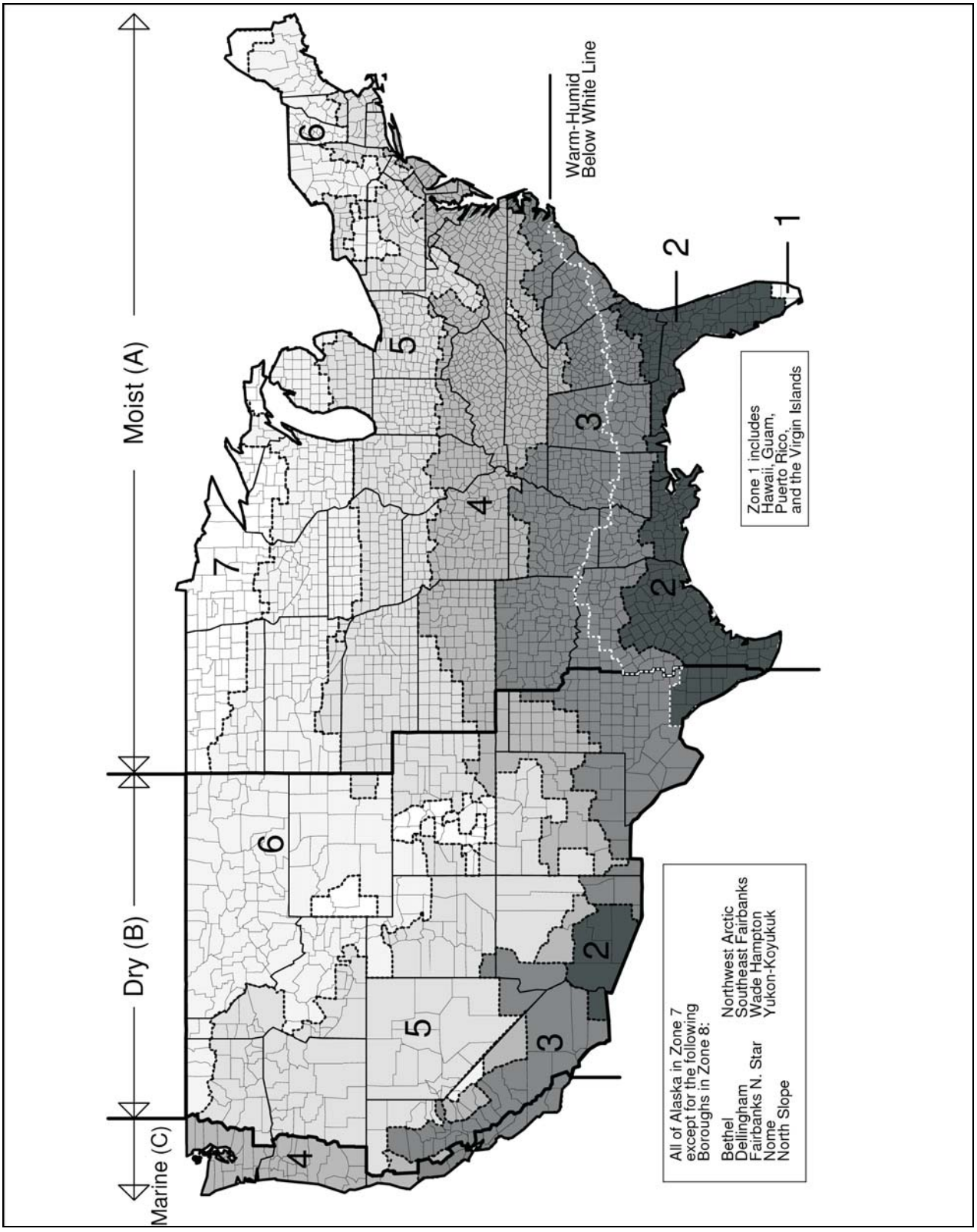
April 19, 2007

The following specifications have been developed by the U.S. Environmental Protection Agency (EPA) to recognize homes equipped with a comprehensive set of Indoor Air Quality (IAQ) features. Homes that comply with these specifications and are ***verified with a completed Indoor Air Package Verification Checklist*** (separate document) can use the "***Indoor Air Package***" as a complementary label to ENERGY STAR for homes. ***Only ENERGY STAR qualified homes are eligible for this label.***

These specifications were developed with significant input from external sources, based on best available science and information about risks associated with IAQ problems, and balanced with practical issues of cost, builder production process compatibility, and enforceability. EPA may change these specifications as more information becomes available.

The construction practices and technical specifications that comprise the ENERGY STAR Indoor Air Package are designed to contribute to improved IAQ in new homes compared with code-built homes. However, these measures alone will not guarantee that homebuyers will not experience IAQ problems in their homes. Rather, the Indoor Air Package should be viewed as a way to reduce the likelihood of experiencing such problems. For example, homeowner behavior may negatively impact the home's IAQ and the performance of the measures specified in the Indoor Air Package.

More program information, including Verification Checklist and brochures, available at:
www.energystar.gov/homes , then click the link for "Indoor Air Package"



1. Moisture Control	
Water Managed Foundations	
1.1	Surface water management shall be provided as follows: • Patio slabs, walks and driveway shall be sloped ¼ inch per foot away from house; AND • Final grade shall be back-fill tamped to accommodate settling and be sloped away from the foundation ½ inch per foot within the first 10 feet. Where setbacks limit space to less than 10 feet, provide swales or drains designed to carry water from foundation. Back-fill tamping is not required if proper drainage can be achieved using non-settling compact soils, as determined by a certified hydrologist, soil scientist, or engineer.
1.2	Install drain tile at footings below basement and crawlspace walls, level or sloped to discharge to outside grade (daylight) or to accessible sump pump. Top of drain tile pipe must always be below bottom of concrete slab or crawl space floor. Pipe shall be surrounded with min. 6 inches of ¾ inch washed or clean gravel that is fully wrapped with fabric cloth.
1.3	Capillary break shall be installed at all concrete slabs with either: • 4 inch bed of ½ inch diameter or greater clean aggregate, covered with minimum 6 mil polyethylene sheeting in direct contact with the concrete slab, lapped 6 to 12 inches at joints; OR • A minimum 4 inch uniform layer of sand, overlain with a layer or strips of geotextile drainage matting, covered with polyethylene sheeting lapped 6 to 12 inches at joints. **Exceptions**: • In areas with free-draining soils, identified as Group 1 in the IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel bed or geotextile matting is not required. • Polyethylene sheeting not required in Dry climates as defined by IECC, Figure 301.1, unless required for radon resistance (2.1).
1.4	Exterior surface of below grade walls shall be finished as follows: • Poured concrete, concrete masonry and insulated concrete forms with damp proofing coating; AND • Wood framed walls with trowel-on mastic and polyethylene, or equivalent water proofing.
1.5	Sump pump covers shall be air sealed (e.g. mechanically attached with full gasket seal or equivalent.)
1.6	Crawl spaces shall be unvented and conditioned, as follows: • Crawl space floors shall be covered with a capillary break, using either: - Concrete slab over lapped polyethylene (i.e. a "rat slab"); OR. - 6 mil. polyethylene (10 mil. recommended) sheeting, lapped 6 to 12 inches and sealed or taped at seams. Sheeting shall be attached to walls and piers with adhesive and furring strips; AND • Crawl spaces shall be sealed to prevent outside air infiltration and be provided with conditioned air at a rate not less than 0.02 cfm per square foot of horizontal area; AND • In areas designated by local jurisdiction as flood zones, a sump pit and pump shall be installed in the crawlspace, with discharge point at least 10 ft. outside foundation. **Exceptions:** • Raised pier foundation with no walls. • Dry climates as defined by IECC, Figure 301.1 and Table 301.1. • Marine climates as defined by IECC, Figure 301.1 and Table 301.1, if no air handler or return ducts are installed in the crawlspace.
1.7	Do ***not*** install a continuous vapor barrier on interior or living space side of basement or crawlspace walls (semi-vapor permeable rigid insulation is not considered a vapor barrier).
Water Managed Wall Assemblies	
1.8	Install flashing or equivalent drainage system at the bottom of exterior walls to direct water away from drainage plane and foundation. Include weep holes for masonry veneer and weep screed for stucco cladding systems, per manufacturer specifications.
1.9	Install continuous drainage plane behind exterior wall cladding. Drainage plane material shall lap over flashing (1.8) and be fully sealed at all penetrations. Any of the following systems meet this requirement: • Monolithic weather resistant barrier (i.e. house wrap) sealed or taped at all overlap joints, top, and bottom; OR • Weather resistant sheathings (e.g. faced rigid insulation), fully taped at all "butt" joints; OR • Lapped shingle-style building paper or felts.

1. Moisture Control (continued)	
1.10	Prevent condensation problems (e.g. mold and rot) related to air leakage in exterior wall assemblies, by meeting all wall assembly requirements of the ENERGY STAR Thermal Bypass Checklist.
1.11	Fully flash all window and door openings, including pan flashing at sills, side flashing that extends over pan flashing and top flashing that extends over side flashing.
1.12 **Flex**	All deck ledger boards shall be attached to homes with either: • Minimum 3/8 inch spacers and full flashing shingle fashion from drainage plane to over framing; OR • Adhesive membrane strip taped to drainage plane running over ledger board and folded around joists over hanger with adhesive membrane cap patch over each joist. **Advisory:** If ledger is ACQ preservative-treated lumber, flashing material should be ACQ resistant to prevent corrosion.
Water Managed Roof Assemblies	
1.13	Prevent condensation problems (e.g. mold and ice dams) related to air leakage at attic/ceiling interfaces, by meeting all roof assembly requirements of the ENERGY STAR Thermal Bypass Checklist.
1.14	Install step flashing at all roof/wall intersections, with the exception of continuous flashing at metal and rubber membrane roofs. "Kick-out" flashing shall be installed at the low end of roof/wall intersections to direct water away from walls, windows, and doors below. In all cases, flashing shall extend at least 4 inches on the wall surface above the roof deck and shall be integrated with drainage plane above (shingle style) to direct water flow onto and not behind flashing. In addition, intersecting wall siding shall terminate a minimum of 1 inch above roof, or higher per manufacturer's recommendations.
1.15	Direct roof water from house with guttering and downspouts that empty to lateral piping that deposit water on sloping finish grade a minimum of 5 ft. from foundation. When lot space limits or prevents required grading, direct roof water to underground catchment system (not connected to foundation drain system) that deposits water 10 ft. from foundation. **Exception:** Dry climates as shown in IECC, Figure 301.1 and Table 301.1.
1.16 **Flex**	Install minimum No. 30 roof felt underlayment or equivalent.
1.17 **Flex**	Install metal drip edge or equivalent at roof decking edges. **Exception:** Dry climates as shown in IECC, Figure 301.1 and Table 301.1.
1.18	Install self-sealing bituminous membrane or equivalent at all valleys and roof decking penetrations for durability at failure points. **Exception:** Dry climates as shown in IECC, Figure 301.1 and Table 301.1.
1.19	In colder climates (IECC Climate Zones 5 and higher), install self-sealing bituminous membrane or equivalent ("ice flashing") over the sheathing at eaves for ice-dam protection. Ice flashing shall extend 2 feet inside the vertical plane of the exterior wall. **Exception:** Climate Zones 1-4, as shown in IECC, Figure 301.1 and Table 301.1.
Plumbing Systems	
1.20 **Flex**	Minimize risk of water leakage & material damage in areas with high risk for plumbing leaks, including: • Insulate piping installed in exterior walls, AND • Install water heaters near floor drain and/or provide catch pan, piped to home exterior, AND • Install moisture resistant backing material behind tub and shower enclosures (i.e. cement board or equivalent, not paper-faced).

2. Radon Control	
2.1	Homes built in U.S. EPA Zone 1 and Zone 2 Radon areas shall be constructed with approved Radon-resistant features (i.e. passive radon control), according to any of the following codes or standards: NFPA 5000, Chapter 49; IRC, Appendix F; CABO, Appendix F; or ASTM E1465. The following requirements shall be visually verified: • Capillary break installed according to 1.3 or 1.6; AND • Vertical vent pipe, clearly labeled "Radon Pipe" or "Radon System", 3"-4" in diameter, open at the bottom, extending from below the capillary break and terminating a minimum of 12" above the roof opening; for crawlspaces, perforated drain tile attached to the bottom of the radon vent pipe (beneath the sheeting) with a T-fitting and running horizontally, parallel to the long dimension of the house; AND • Electrical circuit installed in accessible location near the passive vent pipe, to facilitate fan installation if post-occupancy radon test reveals the need for an active system; AND • Foundation air sealing with polyurethane caulk or equivalent in all slab openings, penetrations, and control or expansion joints. **Exception:** Not required in U.S. EPA Zone 2 Radon areas if local radon potential is low, according to state or local jurisdiction, based on local indoor radon measurements (documentation required).
2.2	Provide owners of homes in U.S. EPA Zone 1 and Zone 2 radon areas two radon test kits designed for 48-hour exposures, including instructions for use and guidance for follow-up actions to testing results. **Advisory:** The U.S. Surgeon General and EPA recommend that all homes be tested for Radon (including homes built in Zone 3). Refer interested homebuyers to http://www.epa.gov/radon/ for more information.

3. Pest Barriers	
3.1	Minimize pathways for pest entry, by air sealing with blocking, foam, and polyurethane caulk or equivalent, including penetrations and joints in and between foundation and exterior wall assemblies. Completion of the ENERGY STAR Thermal Bypass Checklist meets this requirement.
3.2	Provide corrosion proof rodent/bird screens (e.g., copper or stainless steel mesh) for all building openings that cannot be fully sealed and caulked (e.g. ventilation system intake/exhaust outlets and attic vent openings), except clothes dryer vents.
3.3	In areas subject to "Heavy" termite infestation probability, provide the following: • Foundation walls shall be solid concrete or masonry with top course of solid block, bond beam, or concrete-filled block; AND • Construct all interior concrete slabs with 6" x 6" welded wire fabric or equivalent, and concrete walls with reinforcing rods to reduce cracking; AND • Sill plate shall be of preservative-treated wood. **Exception:** Areas with low risk of termite infestation: i.e. areas with no termite certification requirements or areas identified in IRC Figure R301.2(6) as "None to Slight" or "Slight to Moderate" probability areas.
3.4	In areas subject to "Very Heavy" termite infestation, the following additional requirements apply, Below grade: • Do not install foam plastic insulation on exterior face of below-grade foundation walls, or under slabs;AND Above-grade: • Foam plastic insulation installed on exterior of above-grade foundation walls shall be kept a minimum of 6 inches above the final grade and any landscaping bedding materials, and shall be covered with moisture resistant, pest-proof material (e.g., fiber cement board, galvanized insect screen at bottom-edge of openings); AND • Foam plastic insulation applied to the interior side of conditioned crawl space walls shall be kept a minimum of 3 inches below the sill plate and a minimum of 2 inches above the floor of the crawl space. **Exception:** This requirement only applies to areas identified in the IRC Figure 301.2(6) as "Very Heavy" probability of termite infestation, including AL, FL, GA, LA, MS, SC, and parts of CA and TX. All other areas are exempted.

4. HVAC Systems	
Heating and Cooling Equipment	
4.1	Heating & cooling design loads shall be determined for each room according to ACCA Man J, ASHRAE Handbooks, or equivalent software. Heating & cooling equipment shall be properly sized and selected to meet the design loads, including accommodation for pressure drop from specified filter (4.18). This requirement shall be verified by: • Documentation of design load calculations (i.e. load calculation worksheet or software report), AND • System design documentation (i.e. sizing calculations and equipment performance information), AND • Verification that outdoor and indoor coils match in accordance with ARI standards.
4.2	Air handling equipment shall not be located in garages.
4.3	No equipment is permitted that intentionally produces ozone (rather than as an incidental by-product).
4.4	Drain pans shall be sloped, corrosion resistant (e.g. stainless or plastic) with drains at the low point. Condensate lines shall be drained to drainage system; ***not*** just deposited under slab.
4.5	In "Warm-Humid" climates as defined by IECC Figure 301.1 (i.e. climates with prolonged periods of sustained warm-humid weather), equipment shall be installed with sufficient latent capacity to maintain Relative Humidity (RH) at or below 60%. This requirement shall be met by either of the following: • Additional dehumidification system(s), OR • Central HVAC system equipped with additional controls to operate in dehumidification mode. **Exception:** Not required in Climate Zones 2B, 3B, 3C, 3A above the white line, and 4-8, as shown by IECC Figure 301.1. **Advisory:** Also recommended in Climate Zones 3A and 4A as shown by IECC Figure 301.1.
4.6 **Flex**	Seams in the HVAC cabinet, plenum, and adjacent duct work shall be sealed with either or a combination of mastic systems or tape that meet the applicable requirements of UL 181A or UL 181B; and/or gasketing systems. **Performance Alternative:** Total system leakage meeting requirements of 4.13.
4.7	HVAC and duct systems shall be protected from dust/debris during construction activities: • If HVAC equipment is not used during construction, supply and return duct boots shall be covered with "duct mask" or similar sheeting to keep ductwork clean, OR • If HVAC equipment is used during construction, properly fitting filter (see 4.18 & 4.19) must be installed during operation.
4.8 **Flex**	During final preparation (prior to 7.3), remove all supply and return duct registers/grilles and vacuum accessible ductwork.
Ductwork	
4.9	Duct system(s) shall be designed and installed according to ACCA Man D, ASHRAE Handbooks, or equivalent software. This requirement shall be verified by appropriate documentation (i.e. duct sizing worksheet or annotated layout). **Performance Alternative:** Room-by-room airflows balanced and verified within +/-20% of calculated room airflows to meet design loads (see 4.1), except for baths, closets, and pantries.
4.10	Ductwork shall not be installed in garage.
4.11	Building cavities shall not be used as part of the forced air supply or return system.
4.12	Ductwork shall be sealed with either or combination of: • Mastic systems that meet the applicable requirements of UL 181A, or UL 181B, OR • Aerosol sealant closures meeting UL 723, OR • Gasketing systems.
4.13	Duct system leakage shall be measured at 25 Pascals, with duct boots and air handler in place, according to ASTM E1554, ASHRAE 152, or other RESNET approved method, to either of the following specifications: • Total system leakage no greater than 6 CFM per 100 s.f. floor area (or 9% design fan flow), OR • Duct leakage to outdoors meeting ENERGY STAR requirements (i.e. 6 CFM per 100 s.f. for the Performance Path, or 4 CFM per 100 s.f. for the National BOP Path).

4. HVAC Systems (continued)	
4.14	Transfer grilles or jump ducts shall be provided for any closed room without a dedicated return, except for baths, kitchens, closets, pantries, and laundry rooms. Opening size shall be 1 square inch capacity (grille area) per CFM of supply (including free area undercut below door as part of the area). **Performance Alternative:** Measured pressure differential no greater than 2.5 Pa (0.01" w.c.) between closed rooms and adjacent spaces with return.
Ventilation	
4.15	Provide mechanical whole-house ventilation meeting all ASHRAE 62.2 requirements. The following requirements shall be visually verified: • Whole house mechanical ventilation system & controls installed to deliver prescribed outdoor air ventilation rate (62.2 section 4), including ventilation restriction in 62.2 section 4.5 (i.e. max 7.5 cfm/100 sq.ft.) for "Warm-Humid" climates as defined by IECC Figure 301.1; AND • Transfer air (i.e. air from adjacent dwelling units or other spaces such as garages, crawlspaces, or attics) shall not be used to meet ventilation requirements (62.2 section 6.1); AND • Air inlets shall be located a minimum of 10 ft. from contaminant sources (62.2 section 6.8), AND • Airflow tested to meet rated fan airflow (at 0.25 in. w.c.), or duct(s) sized per requirements of 62.2 Table 7.1 and/or manufacturer's design criteria (62.2 section 7.3). **Notes:** • Outdoor air ducts connected to the return side of an air handler shall be permitted as supply ventilation only if manufacturers' requirements for return air temperature are met (e.g., "air shall be tempered to maintain minimum 60 degree F continuous air flow across furnace heat exchanger"), • The ventilation restriction for "Warm-Humid" climates is not applicable when Energy Recovery Ventilators (ERV's) or whole-house dehumidification are installed, per manufacturer's instructions.
4.16	Provide local mechanical exhaust ventilation to outdoors in each bathroom and kitchen, meeting ASHRAE 62.2 section 5 requirements. In addition, all bathroom ventilation fans shall be ENERGY STAR qualified unless multiple bathrooms exhausted with a multi-port fan.
4.17	Clothes dryers shall be vented to outdoors. **Exception:** Electric condensing dryers, equipped with condensate drain.
Air Filtration	
4.18	HVAC filters shall be rated MERV 8 or higher at 295 feet per minute according to ASHRAE 52.2.
4.19	There shall be no visible bypass between the filter, the filter rack, and the plenum/blower housing. In addition, the filter rack shall be designed to ensure the filter is in complete contact with the rack as follows: • The filter rack shall be fitted with flexible, air-tight (e.g. closed cell foam) gasketing on the surface that contacts the air-leaving (downstream) side of the filter, or equivalent method; AND • The filter shall be held firmly in place by friction fit, spring clips in the filter rack (installed on the upstream side of the filter), or equivalent method. **Note:** Manufacturer filter media boxes designed to accomplish these purposes meet these requirements.
4.20	If central vacuum system is installed, system shall be vented outdoors at least 10 ft. from ventilation system air inlets (see 4.15), or power/filtration unit installed in garage per manufacturer instructions.

5. Combustion Systems & Garage Isolation	
Combustion Appliances	
5.1	Combustion fueled heating equipment ***located in conditioned spaces:*** • Gas-fired furnaces/boilers shall be direct vented, • Oil-fired furnaces/boilers shall be power vented or direct vented. **Exception:** Climate Zones 1-3, as shown in IECC, Figure 301.1 and Table 301.1. **Note:** Unfinished basements and crawlspaces (except raised pier foundation with no walls) are considered "conditioned spaces" for the purpose of this requirement and 5.2 below.
5.2	Combustion fueled water heaters ***located in conditioned spaces*** shall be direct vented or power vented. **Note:** See note 5.1 above regarding conditioned spaces. This requirement also applies to water heaters installed in attached garages that are air-sealed to the outside for intended use as work space or living space.
5.3	Fireplaces and Fuel Burning Appliances located in conditioned spaces shall meet the following efficiency or emissions standards and restrictions: • **Masonry fireplaces** are not permitted, with the exception of masonry heaters, as defined by ASTM E1602, and the IBC, 2112.1. • **Factory-built, wood-burning fireplaces** shall meet the certification requirements of UL 127, and meet the emission limits in EPA 40 CFR Part 60. • **Natural gas and propane fireplaces** shall be power vented or direct-vented, as defined by NFPA 54, 3.3.108, have a permanently fixed glass front or gasketed door, and comply with ANSI Z21.88/CSA 2.33. • **Wood stove and fireplace inserts** as defined in Section 3.8 of UL 1482, shall meet the certification requirements of that standard, and shall meet emission requirements of EPA 40 CFR Part 60 and WAC 173-433-100 (3). • **Pellet stoves** shall meet the requirements of the ASTM E1509. • **Decorative gas logs** as defined in K.1.11 of NFPA 54 (National Fuel Gas Code) are not permitted. • **Un-vented combustion appliances** are not permitted, with the exception of kitchen-type cooking devices with exhaust ventilation meeting ASHRAE 62.2 section 5.
5.4	Fireplaces and Fuel Burning Appliances located in conditioned spaces shall meet the following additional design and installation requirements: • Vented to the outdoors; AND • Adequate combustion and ventilation air shall be provided, minimizing the potential for spillage or "back-drafting", either by complying with ASHRAE 62.2 section 6.4 or equivalent design requirements, or by conducting a Worst Case Depressurization Combustion Air Zone (CAZ) Test according to an established protocol.
Garage Isolation	
5.5	Common walls and ceiling between an attached garage and living space shall be visually inspected to be air-sealed before insulation is installed.
5.6	All connecting doors between living space and garage shall include an automatic closer, and shall be gasketed or made substantially air-tight with weather stripping.
5.7	Attached garages shall include a 100 cfm ducted or 80 cfm unducted exhaust fan, venting to outdoors and designed for continuous operation. Alternatively, automatic fan controls may be installed that activate the fan whenever garage is occupied, and for at least 1 hour after garage is vacated. **Advisory:** ENERGY STAR qualified fans are highly recommended.
Carbon Monoxide Alarms	
5.8	All homes with combustion appliance(s) or attached garage shall have one carbon monoxide (CO) alarm installed in a central location outside of each separate sleeping area in the immediate vicinity of the bedrooms. They shall be placed according to NFPA 720, and be hard-wired with a battery back-up function. The alarm devices shall be certified by either CSA 6.19-01 or UL 2034.

6. Building Materials	
Preparation and Installation	
6.1	Building materials with visible signs of water damage or mold shall not be installed. In addition, interior walls shall not be enclosed (e.g. with drywall) if either the framing members or insulation products have a high moisture content. For wet-applied insulation products, follow manufacturer's drying recommendations. **Advisory:** Lumber should not exceed 18% moisture content.
6.2	Raise paper covered gypsum board ½ inch above concrete slabs.
Materials	
6.3	Structural plywood conforming to PS1 and PS2 and oriented strand board shall be made with exterior-type adhesives. Exterior-type adhesive is evidence by the appearance of "Exposure 1" or "Exterior" in the panel trademark.
6.4	Particleboard and medium density fiberboard (MDF) shall be certified compliant with ANSI A208.1 and A208.2, respectively.
6.5	Hardwood plywood shall be compliant with ANSI/HPVA HP-1-2004 and U.S. HUD Title 24, Part 3280.
6.6	Wall-to-wall carpet shall not be installed adjacent to toilets and bathing fixtures (i.e. tubs and showers).
6.7 **Flex**	Install water-resistant hard-surface flooring in kitchens, entryways, laundry areas, and utility rooms.
6.8	Permeability rating of finishes used on the interior side of a home's exterior walls in hot humid or humid mixed climates shall be greater than '1'.
6.9	Carpets, carpet cushion (i.e. padding), and carpet adhesives shall be labeled with the Carpet & Rug Institute (CRI) Green Label or documented to meet the CRI Green Label testing program criteria. Products labeled with the CRI Green Label Plus also meet this requirement.

7. Home Commissioning	
Final Preparation & Verification	
7.1	Inspect ductwork before installing registers, grilles, and diffusers, to verify it is dry and substantially free of dust/debris, and that there are no disconnects or large air gaps between boots and framed openings.
7.2	Inspect air-handling equipment and verify: • Heat exchangers/coils are free of dust created by construction activities (e.g., drywall, floor sanding); AND • Filter is new and clean, and matches specified MERV rating (4.18).
7.3	After installation of registers, grilles, and diffusers, verify airflows as follows: • Measured airflow or pressure drop across the cooling coil and/or heat exchanger documented to be within +/- 15% of system design airflow, or manufacturer specified operating range, tested according to ASTM E1554, ASHRAE 152, or equivalent method, AND • Detectable airflow from each supply outlet.
7.4	Verify HVAC contractor has documented installation and testing of proper refrigerant charge. This requirement may be met by any of the following: • Superheat method test measurement within 5% of manufacturer recommended charge, OR • Sub cooling method test measurement within 3% of manufacturer recommended charge, OR • Other equivalent method/tolerance approved by equipment manufacturer. **Note:** If weather conditions do not meet required test conditions, verify builder has arranged for future test.
7.5	Verify home has been ventilated with outside air at the highest rate the ventilation system can produce, *if practical*, during and shortly after installing products that are known sources of contaminants (e.g. cabinets, carpet padding, and painting), and during the period between finishing and occupancy, meeting ventilation requirements for outdoor air flow and humidity control (4.15). If whole house ventilation is impractical prior to occupancy, advise home buyer to do so during the first few months of occupancy.
Owner's Checklist/Manual	
7.6	Provide home buyer with a checklist listing all required measures from this specification along with the signature of official representative of builder indicating full compliance with the checklist.
7.7 **Flex**	Provide home owner's manual including at a minimum documentation on all special equipment with instructions for proper operation and maintenance, and HVAC load calculations.

Refer to cover page for verification requirements and expected impact of specified measures.

References

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ANSI Z21.88/CSA 2.33: ANSI Standard Z21.88-2005/CSA Standard 2.33-2005: Vented Gas Fireplace Heaters. 2005. American National Standards Institute / Canadian Standards Association.

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ASHRAE 62.2: ANSI/ASHRAE Standard 62.2-2004: Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. 2004. American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

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ASTM E1554: ASTM Standard E1554-03: Standard Test Methods for Determining External Air Leakage of Air Distribution Systems by Fan Pressurization. 2003. American Society for Testing and Measurement.

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CSA 6.19-01: CAN/CSA Standard 6.19-01: Residential Carbon Monoxide – Alarming Devices. 2001. Canadian Standards Association.

ENERGY STAR Thermal Bypass Checklist: U.S. Environmental Protection Agency. http://www.energystar.gov/homes

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IBC: International Building Code. 2003. International Code Council, Inc.

IRC: International Residential Code for One- and Two-Family Dwellings. 2006. International Code Council, Inc.

IECC: International Energy Conservation Code. 2006. International Code Council, Inc.

IFGC: International Fuel Gas Code. 2006. International Code Council, Inc.

NFPA 54: National Fuel Gas Code. 2006. National Fire Protection Association.

NFPA 720: Standard for the Installation of Household Carbon Monoxide (CO) Warning Equipment. 2005. National Fire Protection Association.

NFPA 5000: Building and Construction Safety Code. 2006. National Fire Protection Association.

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