EPA
United States
Environmental Protection
Agency

VERSION 1 (REV. 03)

# Indoor airPLUS

Revised 3/23/16



Indoor Air Quality (IAQ)

# Contents

- Indoor airPLUS Basics
- How to Build and Verify Indoor airPLUS Homes
- Selling Indoor airPLUS
- Marketing and Technical Resources
- Partnership and Promotion

# Indoor airPLUS Basics

# ENERGY STAR + Indoor airPLUS



Indoor airPLUS is an EPA label that adds health protections to your ENERGY STAR value proposition


Indoor Air Quality (IAQ)

# ENERGY STAR + Indoor airPLUS


- Envelope
- HVAC
- Moisture
- CO

+


- Radon
- Pests
- Materials
- CO +
- HVAC +
- Moisture +

=

Comprehensive Indoor Air Quality Protection

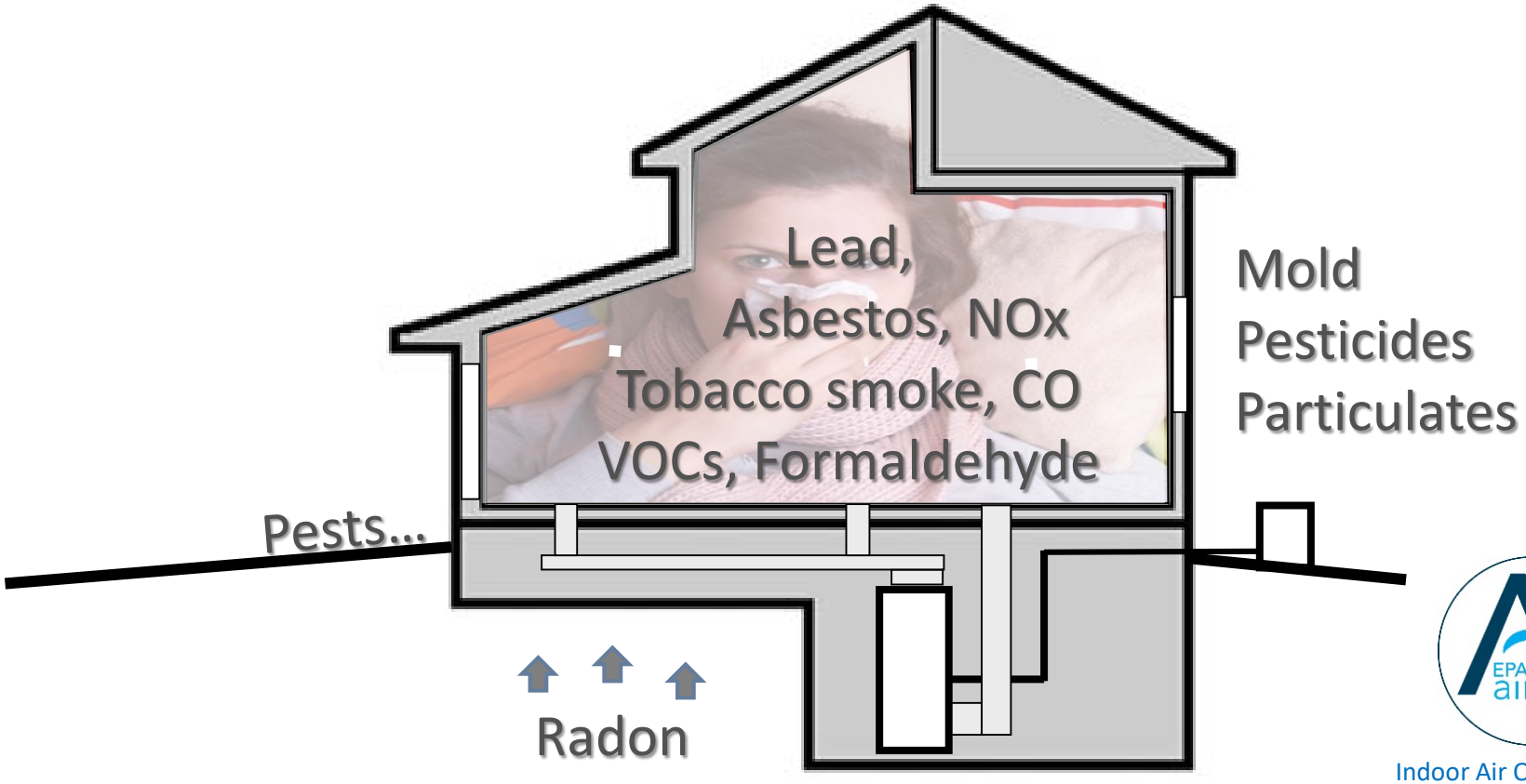

Indoor Air Quality (IAQ)

# What Causes Poor Indoor Air Quality?

- Pollution sources that release gases, moisture vapor, or particles into the air are the primary cause.
- Inadequate ventilation can increase indoor pollutant levels.

# Health Risks

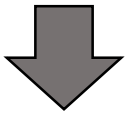
May appear after a single exposure, years after exposure, or only after long or repeated periods of exposure.



# Reducing Health Risks

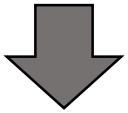
1. Source Control

(eliminate or manage)



2. Ventilation

(dilution)

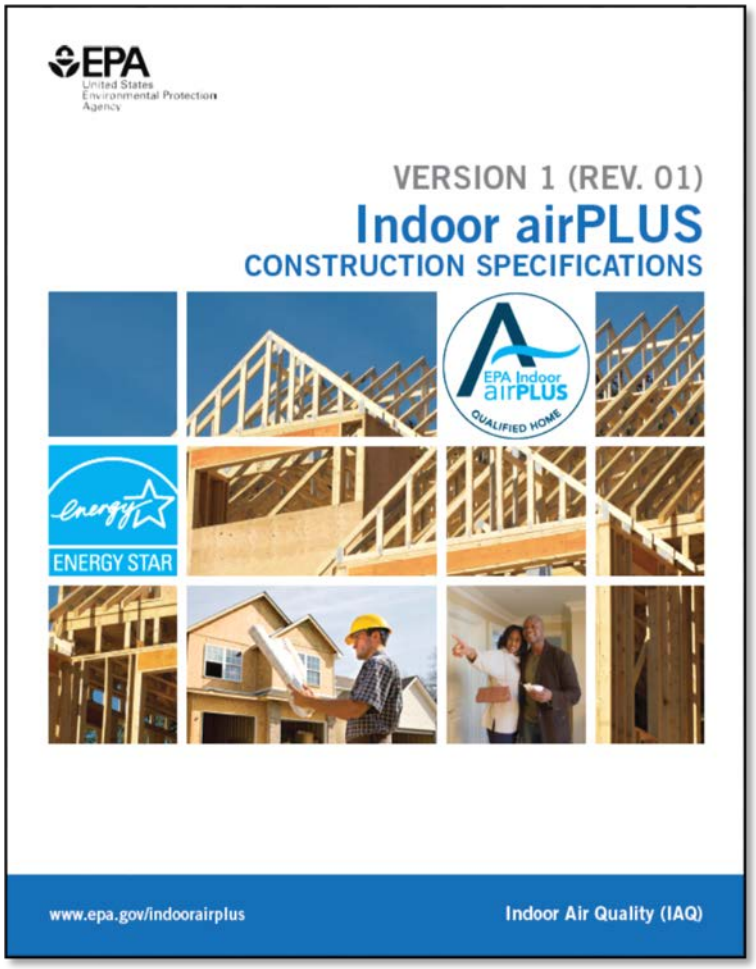


3. Filtration

# ENERGY STAR + Indoor airPLUS

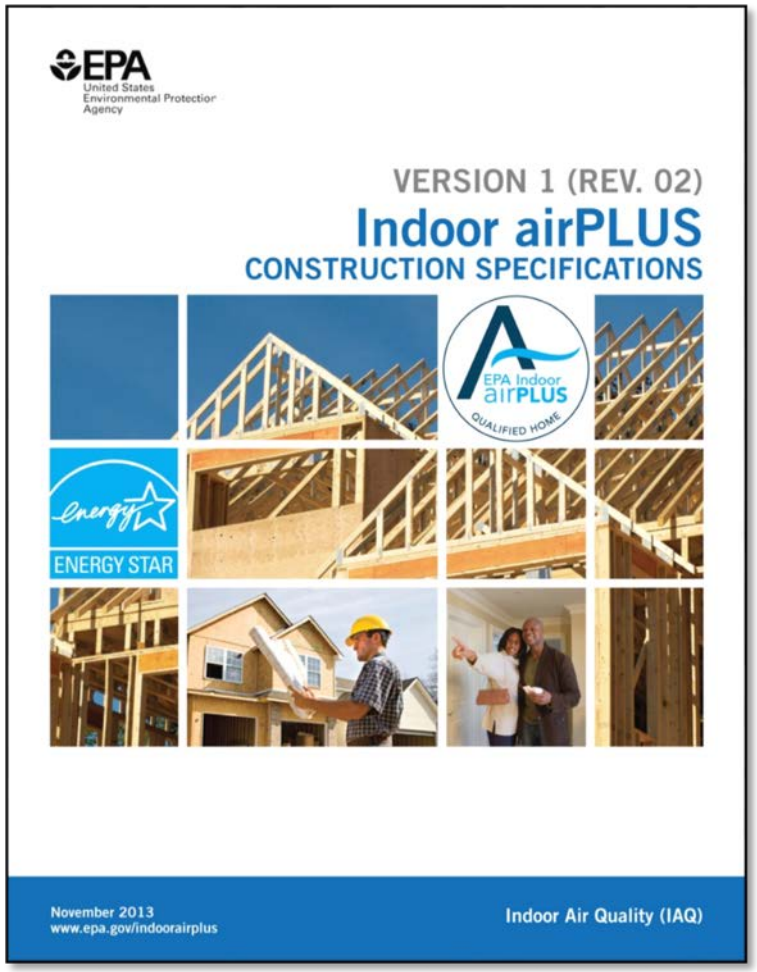
- Both programs are based on building science principles that use a systems approach to improve home performance issues.
- Both programs require completion of verification checklists by a certified Home Energy Rater.
- Visual inspection items can be verified during the same on-site visits by a certified Home Energy Rater.
- Reporting to EPA follows the same schedule and is completed using the same online program.

# Revision 1




- Released February 2013.
- Greater alignment with ENERGY STAR Version 3.
- Simplified, clearer specifications.
- More flexibility and climate specific exemptions.

# Revision 2

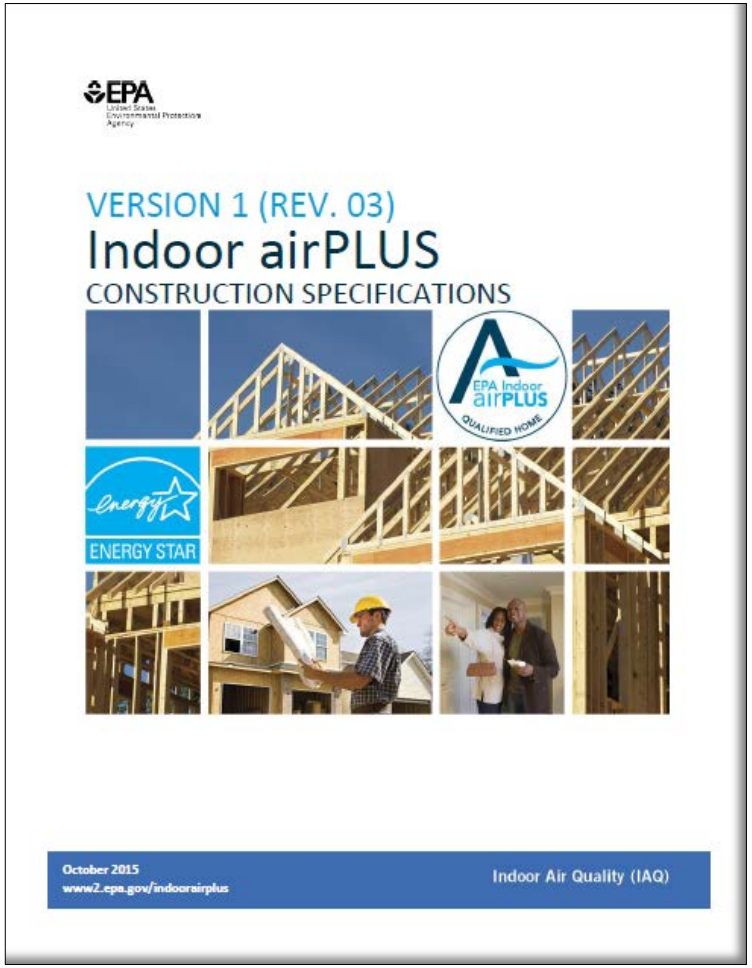



- Released November 2013.
- Revised requirements for attached garages (garage fan no longer required for most homes)
- New exception from aggregate or sand requirement for slab-on-grade foundations (non-Radon Zone 1 homes only)

*And it's easier to join!*

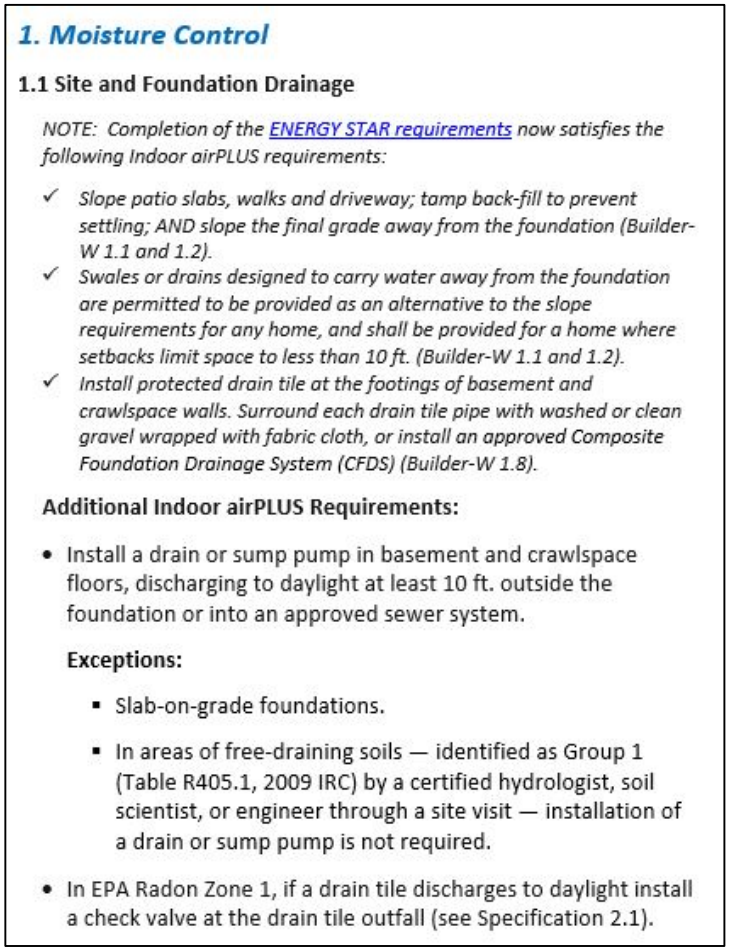
EPA Indoor airPLUS

# Revision 3




- Released October 2015.
- Further alignment with ENERGY STAR Rev. 8.
- Clarified multiple requirements.
- Provided additional advisories (e.g adhesives & sealants).
- Updated list of compliant products for Section 6 and developed a new resource, *How to Find Indoor airPLUS Compliant Low Emission Products.*

# How to use the Construction Specifications



***1. Moisture Control***

**1.1 Site and Foundation Drainage**

*NOTE: Completion of the ENERGY STAR requirements now satisfies the following Indoor airPLUS requirements:*

- ✓ *Slope patio slabs, walks and driveway; tamp back-fill to prevent settling; AND slope the final grade away from the foundation (Builder-W 1.1 and 1.2).*
- ✓ *Swales or drains designed to carry water away from the foundation are permitted to be provided as an alternative to the slope requirements for any home, and shall be provided for a home where setbacks limit space to less than 10 ft. (Builder-W 1.1 and 1.2).*
- ✓ *Install protected drain tile at the footings of basement and crawlspace walls. Surround each drain tile pipe with washed or clean gravel wrapped with fabric cloth, or install an approved Composite Foundation Drainage System (CFDS) (Builder-W 1.8).*

**Additional Indoor airPLUS Requirements:**

- Install a drain or sump pump in basement and crawlspace floors, discharging to daylight at least 10 ft. outside the foundation or into an approved sewer system.

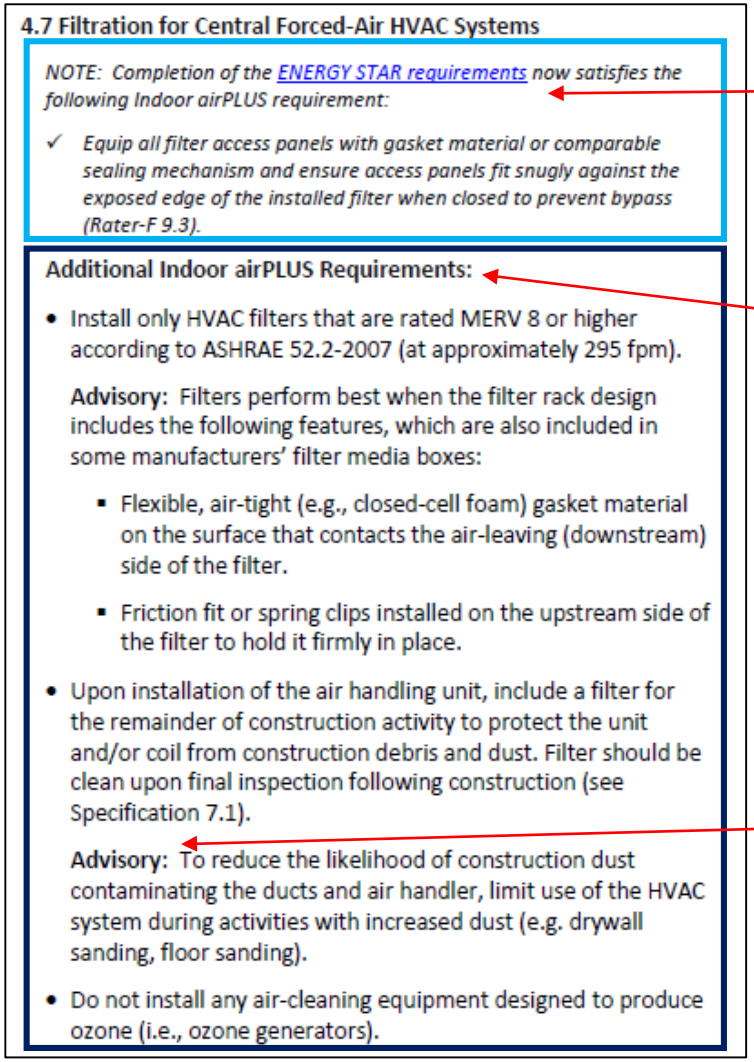
  **Exceptions:**

  - Slab-on-grade foundations.
  - In areas of free-draining soils — identified as Group 1 (Table R405.1, 2009 IRC) by a certified hydrologist, soil scientist, or engineer through a site visit — installation of a drain or sump pump is not required.

- In EPA Radon Zone 1, if a drain tile discharges to daylight install a check valve at the drain tile outfall (see Specification 2.1).

- Seven sections:
  - Moisture Control
  - Radon
  - Pests
  - HVAC Systems
  - Combustion Pollutants
  - Materials
  - Home Commissioning
- Specific items include measures to address each IAQ concern.

# How to use the Construction Specifications



**4.7 Filtration for Central Forced-Air HVAC Systems**

*NOTE: Completion of the ENERGY STAR requirements now satisfies the following Indoor airPLUS requirement:*

✓ *Equip all filter access panels with gasket material or comparable sealing mechanism and ensure access panels fit snugly against the exposed edge of the installed filter when closed to prevent bypass (Rater-F 9.3).*

**Additional Indoor airPLUS Requirements:**

- Install only HVAC filters that are rated MERV 8 or higher according to ASHRAE 52.2-2007 (at approximately 295 fpm).

  **Advisory:** Filters perform best when the filter rack design includes the following features, which are also included in some manufacturers' filter media boxes:

  - Flexible, air-tight (e.g., closed-cell foam) gasket material on the surface that contacts the air-leaving (downstream) side of the filter.
  - Friction fit or spring clips installed on the upstream side of the filter to hold it firmly in place.

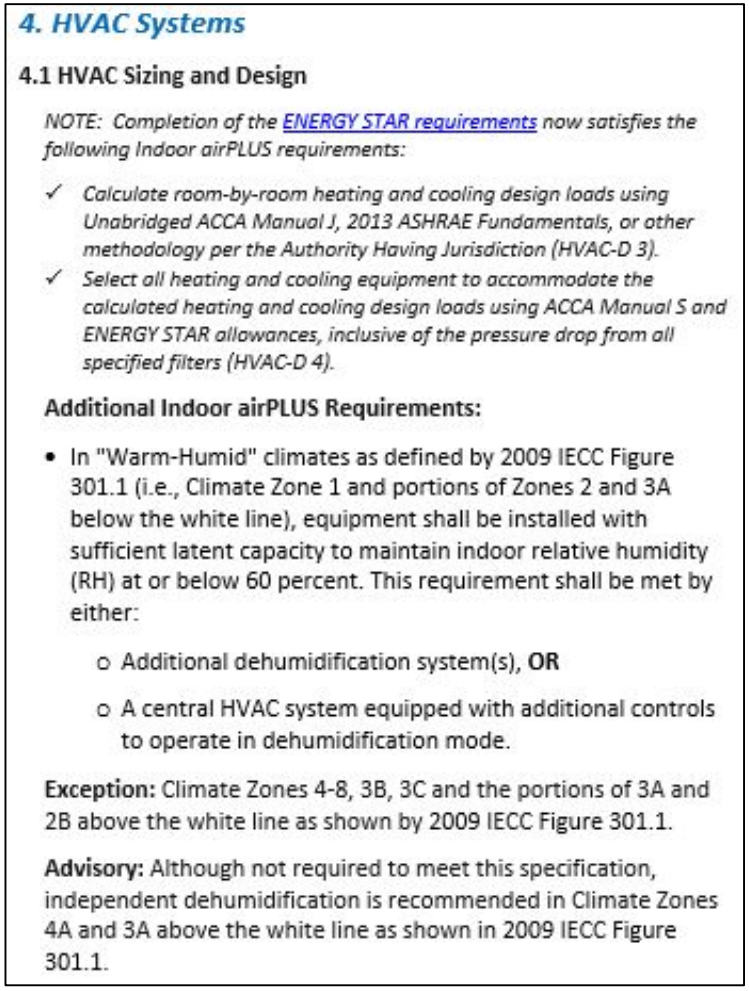
- Upon installation of the air handling unit, include a filter for the remainder of construction activity to protect the unit and/or coil from construction debris and dust. Filter should be clean upon final inspection following construction (see Specification 7.1).

  **Advisory:** To reduce the likelihood of construction dust contaminating the ducts and air handler, limit use of the HVAC system during activities with increased dust (e.g. drywall sanding, floor sanding).

- Do not install any air-cleaning equipment designed to produce ozone (i.e., ozone generators).

- Relevant ENERGY STAR checklist items are summarized and referenced at the beginning of each measure.
- Additional Indoor airPLUS requirements are listed separately. These include:
  - Items that provide additional indoor air quality protections.
  - Requirements that exclude an ENERGY STAR exception.
- Advisories, notes, and exceptions listed where applicable.

# How to use the Construction Specifications



### 4. HVAC Systems

**4.1 HVAC Sizing and Design**

*NOTE: Completion of the ENERGY STAR requirements now satisfies the following Indoor airPLUS requirements:*

- ✓ *Calculate room-by-room heating and cooling design loads using Unabridged ACCA Manual J, 2013 ASHRAE Fundamentals, or other methodology per the Authority Having Jurisdiction (HVAC-D 3).*
- ✓ *Select all heating and cooling equipment to accommodate the calculated heating and cooling design loads using ACCA Manual S and ENERGY STAR allowances, inclusive of the pressure drop from all specified filters (HVAC-D 4).*

**Additional Indoor airPLUS Requirements:**

- In "Warm-Humid" climates as defined by 2009 IECC Figure 301.1 (i.e., Climate Zone 1 and portions of Zones 2 and 3A below the white line), equipment shall be installed with sufficient latent capacity to maintain indoor relative humidity (RH) at or below 60 percent. This requirement shall be met by either:
  - Additional dehumidification system(s), **OR**
  - A central HVAC system equipped with additional controls to operate in dehumidification mode.

**Exception:** Climate Zones 4-8, 3B, 3C and the portions of 3A and 2B above the white line as shown by 2009 IECC Figure 301.1.

**Advisory:** Although not required to meet this specification, independent dehumidification is recommended in Climate Zones 4A and 3A above the white line as shown in 2009 IECC Figure 301.1.

- ENERGY STAR checklists are referenced as follows:

- **HVAC-D** = HVAC Design Report
- **HVAC-C** = HVAC Commissioning Checklist
- **Rater-D** = Rater Design Review Checklist
- **Rater-F** = Rater Field Checklist
- **Builder-W** = Water Management System Builder Requirements

# How to use the Construction Specifications

***7. Home Commissioning***

**7.1 HVAC and Ductwork Verification**

**Indoor airPLUS Requirements:**

- Inspect ductwork before installing registers, grilles and diffusers to verify it is dry and substantially free of dust or debris. If duct openings were not covered during construction, thoroughly vacuum out each opening prior to installing registers, grilles and diffusers.
- After all dust-producing construction activities are complete (e.g., drywall, trim carpentry, floor sanding), verify HVAC filters are new, clean, and meet specified MERV rating (see Specification 4.7).

**Advisory:** Air balancing of supply registers and return grilles is highly recommended to improve the performance of the HVAC system and comfort of the occupants, but is not required at this time for Indoor airPLUS qualification.

**7.2 Ventilation after Material Installation**

**Indoor airPLUS Requirements:**

- Ventilate the home with outside air at the highest rate and duration practical, meeting ventilation requirements for outdoor air flow and humidity control (see Specifications 4.5 and 4.8):
  - During and shortly after installing products that are known sources of contaminants (e.g., cabinets, carpet padding and painting), **AND**

- **EXCEPTIONS** to the requirements described in these construction specifications are noted as appropriate.
- **NOTES** provide additional information to clarify specification requirements.
- **ADVISORIES** provide additional guidance to be considered, but are not specification requirements.
- **PERFORMANCE TEST ALTERNATIVES** describe alternate compliance approaches where performance testing is practical and results are comparable to those of the prescriptive best practices required in the specification.

# How to Complete the Verification Checklist

- ENERGY STAR certification is required achieve Indoor airPLUS qualification.
- Check one box per line.
- Check “N/A” for specifications that do not apply for specific conditions (e.g., climate) according to the exceptions described.
- Check either “Builder Verified” or “Rater Verified” for all other items.

| Home Address: | City: | State: | Zip: | | |
|---|---|---|---|---|---|
| **Section** | **Requirements (Refer to full Indoor airPLUS Construction Specifications for details)** | **Must Correct** | **Builder Verified** | **Rater Verified** | **N/A** |
| | ***Note:* The Rev. 03 checklist has been modified to reflect only the additional Indoor airPLUS requirements and their corresponding section numbers that must be met after completing the ENERGY STAR requirements. ENERGY STAR remains a prerequisite for Indoor airPLUS qualification.** | | | | |
| **ENERGY STAR V3** | ENERGY STAR Version 3 Program Requirements must be followed and the home shall be ENERGY STAR certified in conjunction with Indoor airPLUS qualification. | ☐ | | ☐ | |

# How to Complete the Verification Checklist

- Items may be verified:
  - Visually on site during construction.
  - By reviewing photographs taken during construction.
  - By checking documentation.
  - Through equivalent methods as appropriate.

| Home Address: | City: | State: | Zip: | | |
|---|---|---|---|---|---|
| **Section** | **Requirements (Refer to full Indoor airPLUS Construction Specifications for details)** | **Must Correct** | **Builder Verified** | **Rater Verified** | **N/A** |
| | ***Note:* The Rev. 03 checklist has been modified to reflect only the additional Indoor airPLUS requirements and their corresponding section numbers that must be met after completing the ENERGY STAR requirements. ENERGY STAR remains a prerequisite for Indoor airPLUS qualification.** | | | | |
| **ENERGY STAR V3** | ENERGY STAR Version 3 Program Requirements must be followed and the home shall be ENERGY STAR certified in conjunction with Indoor airPLUS qualification. | ☐ | | ☐ | |

# How to Complete the Verification Checklist

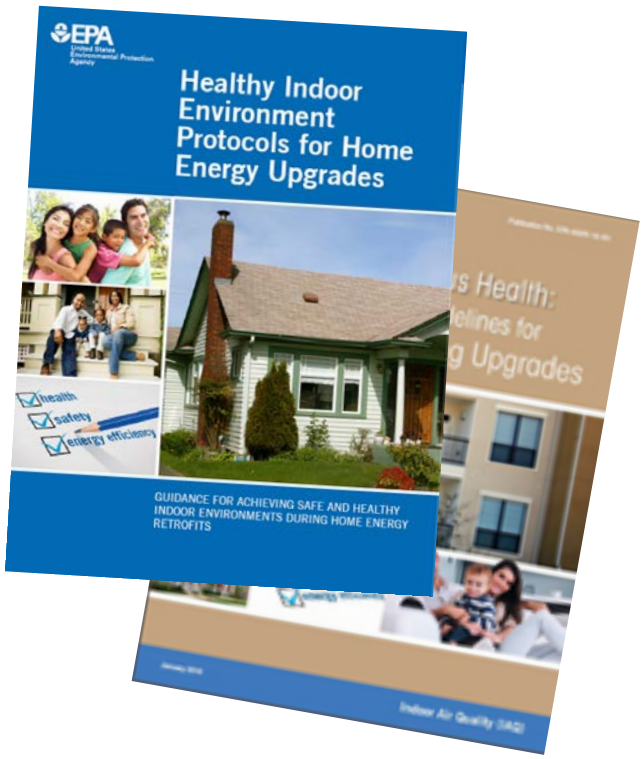
- Raters who operate under a Sampling Provider are permitted to use a RESNET-approved sampling protocol for Indoor airPLUS verification (for items “Rater Verified” on-site or through documentation).
- All items verified by the builder shall be verified for each qualified home.
- The builder provides the buyer with an Indoor airPLUS label and certificate along with an information kit including operations and maintenance instructions for equipment (HVAC, combustion appliances, radon system, etc.).
- The Rater and Rating Provider keep a copy of the Indoor airPLUS and ENERGY STAR documentation for the home for future reference.

# What About Multifamily Dwellings?

- Multifamily dwellings that meet the ENERGY STAR Certified Homes, Version 3 National Program Requirements can pursue Indoor airPLUS.
  - Buildings that would only be eligible for the ENERGY STAR Multifamily High Rise Program are not eligible for Indoor airPLUS at this time.
- Multifamily requirements are the same as single family, with the additions of:
  - Compartmentalization
  - Non-smoking policies

# What About Existing Homes?

- Indoor airPLUS qualification is **not** available for existing homes except in the case of gut rehabs if all ENERGY STAR requirements and Indoor airPLUS requirements are met.
- For most renovation and energy upgrade work, see EPA's Healthy Indoor Environment Protocols for Home Energy Upgrades.
- Renovating multifamily buildings? See Energy Savings Plus Health: Multifamily Building Upgrades.




More info at:
http://www2.epa.gov/indoor-air-quality-iaq/protect-indoor-air-quality-your-home

EPA Indoor airPLUS

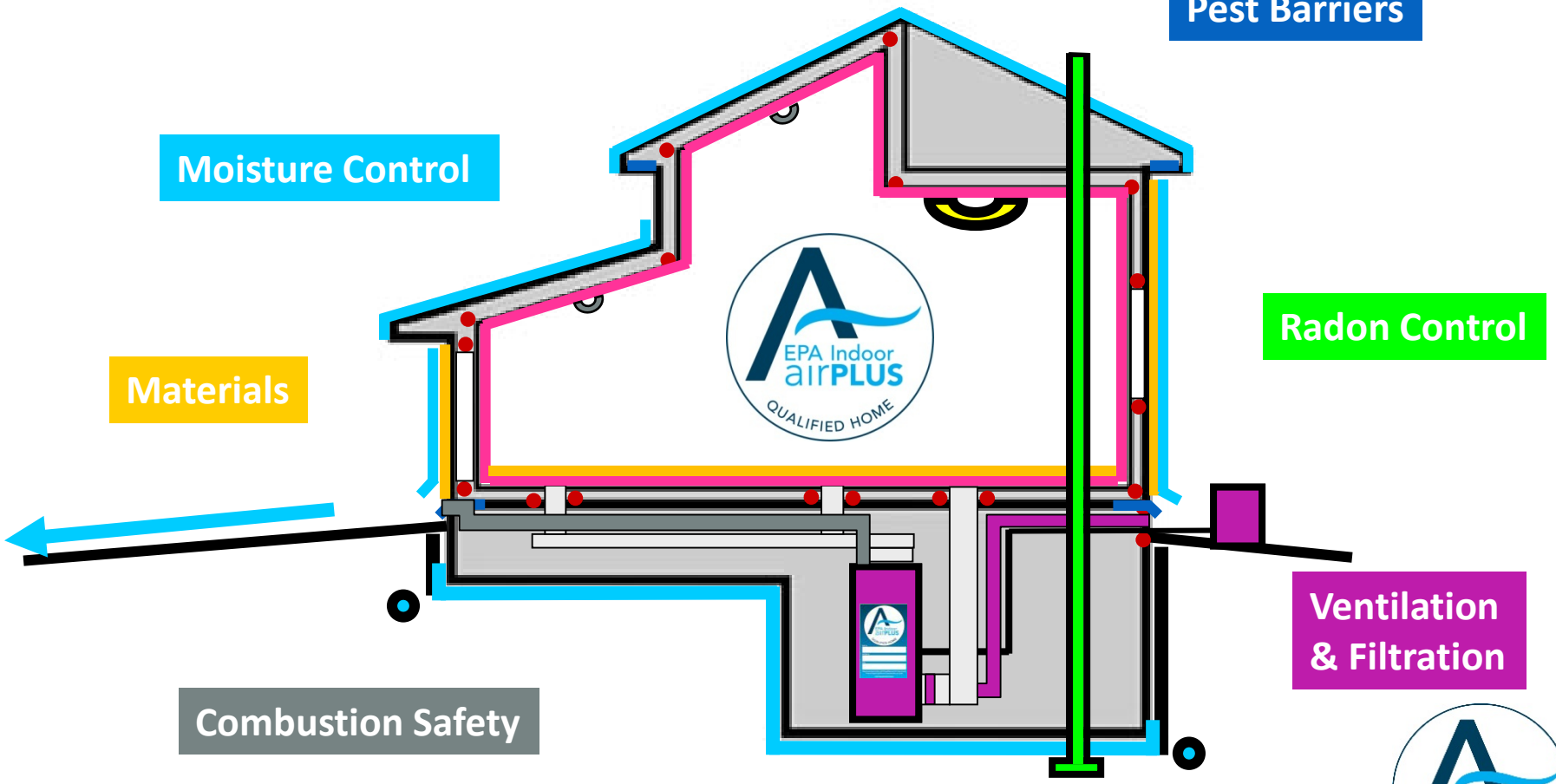
# What Does Indoor airPLUS Cost?

- No fee to participate in the EPA program.
- Raters may charge a verification fee.
- Cost of additional Indoor airPLUS features will vary based on:
  - Local code requirements and typical building practices
  - Type of foundation (e.g., below grade foundation or slab on grade)
  - Climate Zone (e.g., some exceptions in dry climates)
  - Radon Zone (passive system required in Radon Zone 1)
  - Availability of suppliers and cost of materials
- Cost of additional features could be a few hundred dollars in dry, non-Radon Zone 1 areas or up to a few thousand dollars in moist climates in Radon Zone 1.

# How to Build and Verify Indoor airPLUS Homes

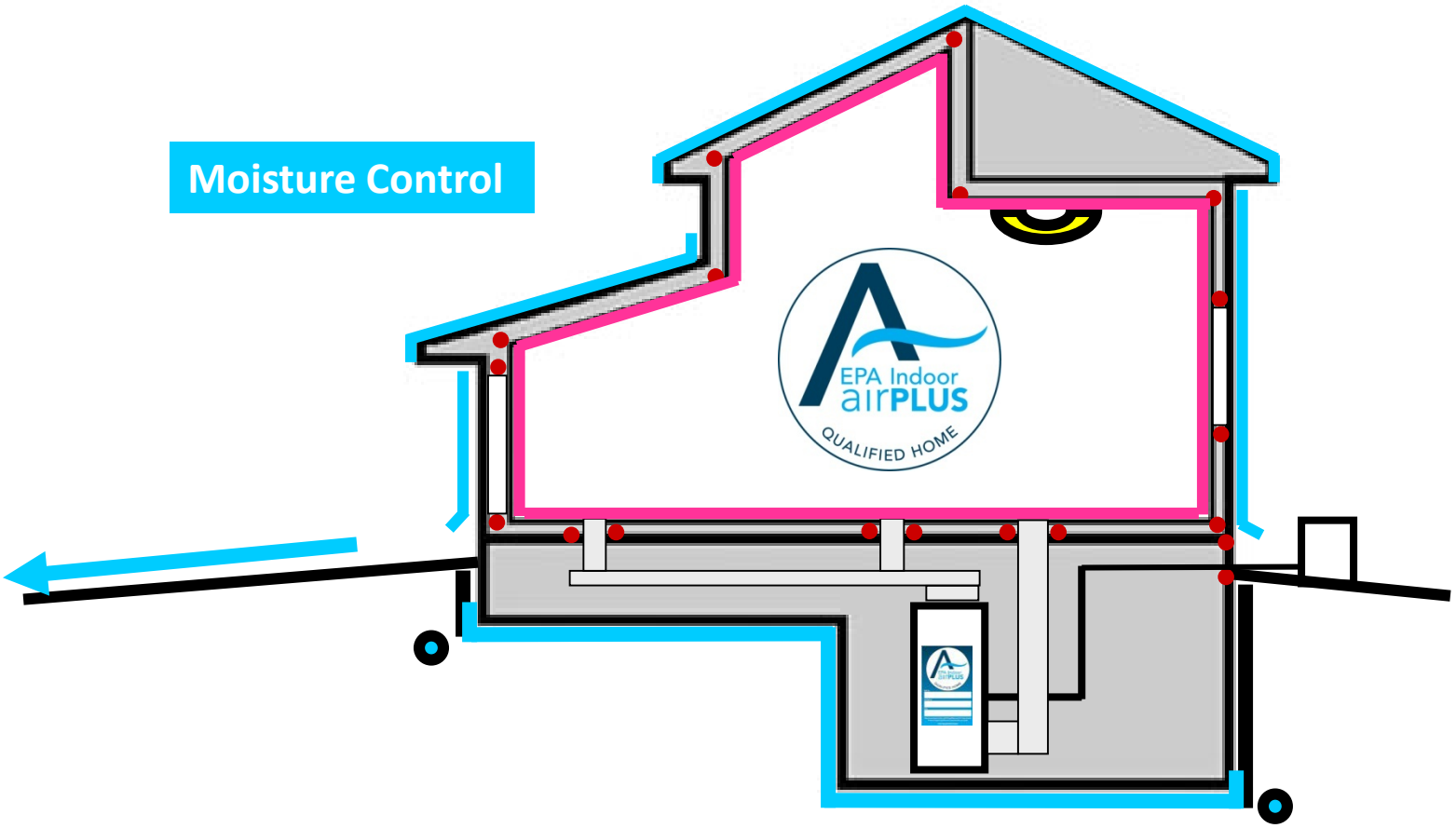

Indoor Air Quality (IAQ)

# Indoor airPLUS




Indoor Air Quality (IAQ)

# 1. Moisture Control



# 1. Moisture Control

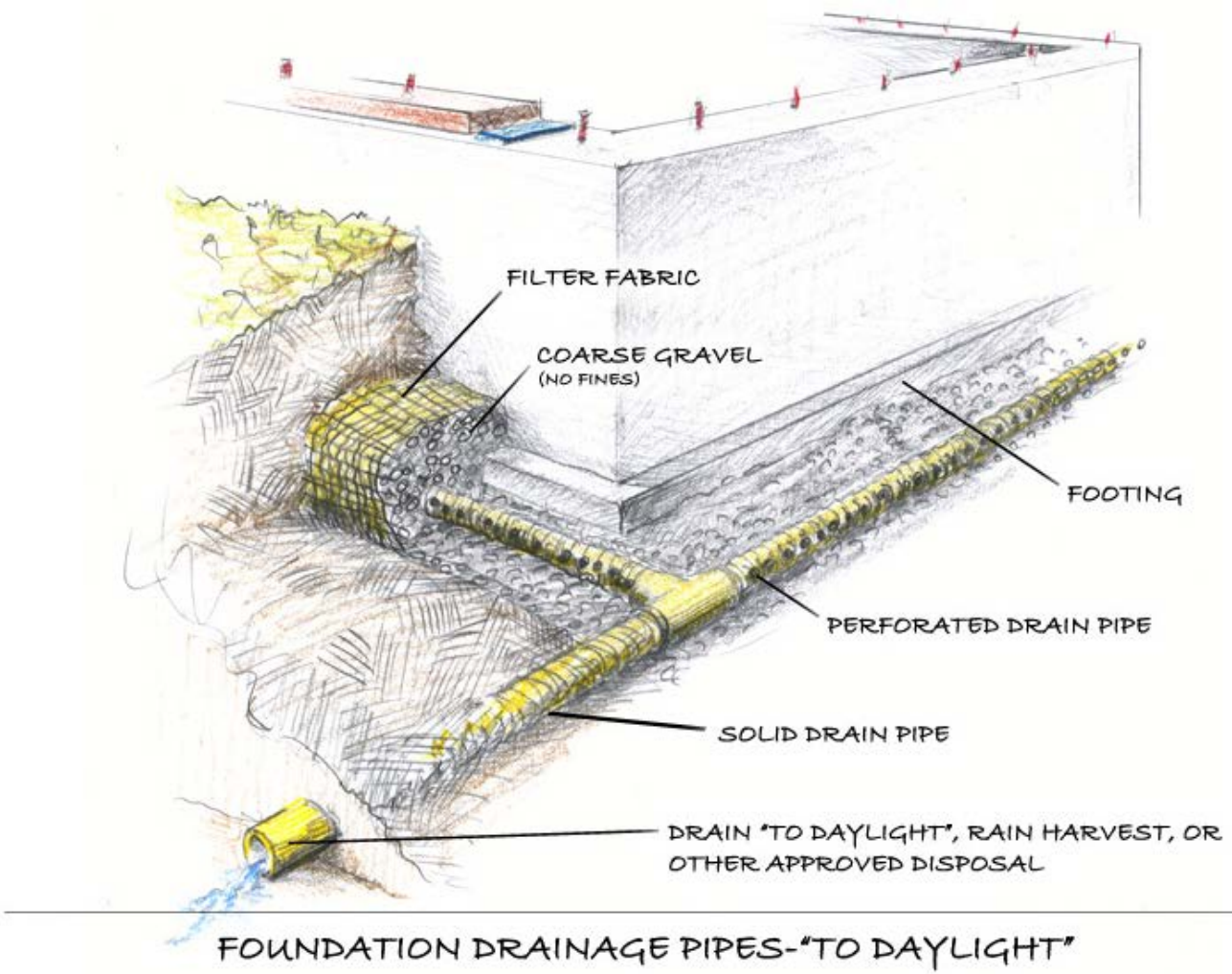
- Moisture is a leading cause of health, comfort and durability concerns in homes.
- 19% of U.S. households have at least one person with asthma.
- There is a 20-50% increased risk of asthma in damp houses.
- The economic cost of asthma amounts to more than $56 billion annually.
- Mold grows where there is moisture.
- Molds produce allergens, irritants, and in some cases, potentially toxic substances.

# 1.1 Site and Foundation Drainage

- ✓ *Slope hard surfaces and final grade away from the foundation.*
- ✓ *Install drain tiles at the footings of basement and crawlspace walls.*

- **Install a drain or sump pump in basement and crawlspace floors.**

# 1.1 Site and Foundation Drainage




FOUNDATION DRAINAGE PIPES-"TO DAYLIGHT"

# 1.1 Site and Foundation Drainage

Verification

- Can be builder or Rater verified.
- **Visually verify during pre-slab inspection** the drain or sump pump's discharge to daylight (including distance from the foundation) or connection to the sewer.
- In Radon Zone 1, visually verify check-valve installed on drain tile outfall.
- Review documentation of free-draining soils when the exception is used.

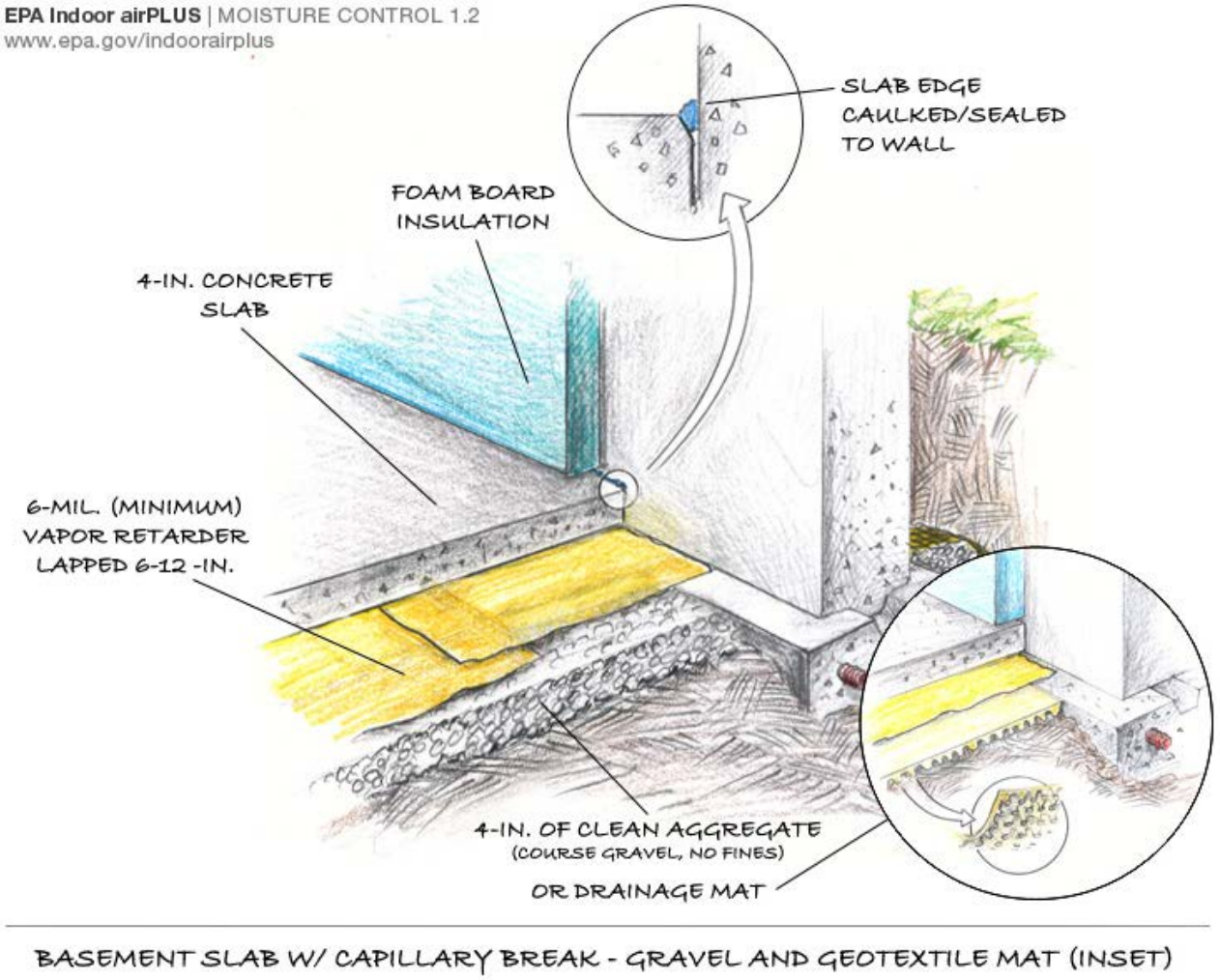
| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Moisture Control | 1.1 | Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 | Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 | Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 | Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 | Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |

# 1.2 Capillary Break Installation

- ✓ *Install polyethylene sheeting or extruded polystyrene beneath concrete slabs.*
- ✓ *Install a capillary break at all crawlspace floors using polyethylene sheeting.*

- **Under the polyethylene sheeting or extruded polystyrene (XPS) insulation:**
  - **Install a 4 in. layer of aggregate; OR**
  - **A uniform layer of sand, overlain with a layer of geotextile drainage matting.**
- **Alternate path for gut-rehabs:**
  - **Radon Zones 2 and 3: Alternate slab treatment in ENERGY STAR WMS footnote 5.**
  - **Radon Zone 1: Must install an active radon system utilizing sub-slab depressurization.**

# 1.2 Capillary Break Installation



# 1.2 Capillary Break Installation

Verification

- Can be builder or Rater verified.
- **Visually verify during pre-slab inspection** the capillary break is properly installed.
- In Radon Zone 1: Visually verify polyethylene sheeting has been overlapped 6 – 12 in. and the ENERGY STAR staking method for crawlspaces has not been used.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Moisture Control | 1.1 | Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 | Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 | Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 | Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 | Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |

# 1.3 & 1.4 Below-grade Foundation Walls

- ✓ *Waterproof crawlspace and basement perimeter walls.*
- ✓ *All floors above unconditioned spaces shall be insulated.*

- **Insulate crawlspace and basement perimeter walls.**
- **Seal crawlspace and basement perimeter walls.**
- **Provide conditioned air.**

# 1.4 Basement and Crawlspace

Verification

- Can be builder or Rater verified.
- **Visually verify during pre-drywall** inspection the proper sealing and insulation (IECC 2009) of the crawlspace/basement.
- Review **documented calculations before the start of construction** for the required rate of conditioned air.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Moisture Control | 1.1 | Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 | Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 | Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 | Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 | Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |

# 1.4 Basement and Crawlspace

Verification

**TABLE 402.1.1**
**INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]**

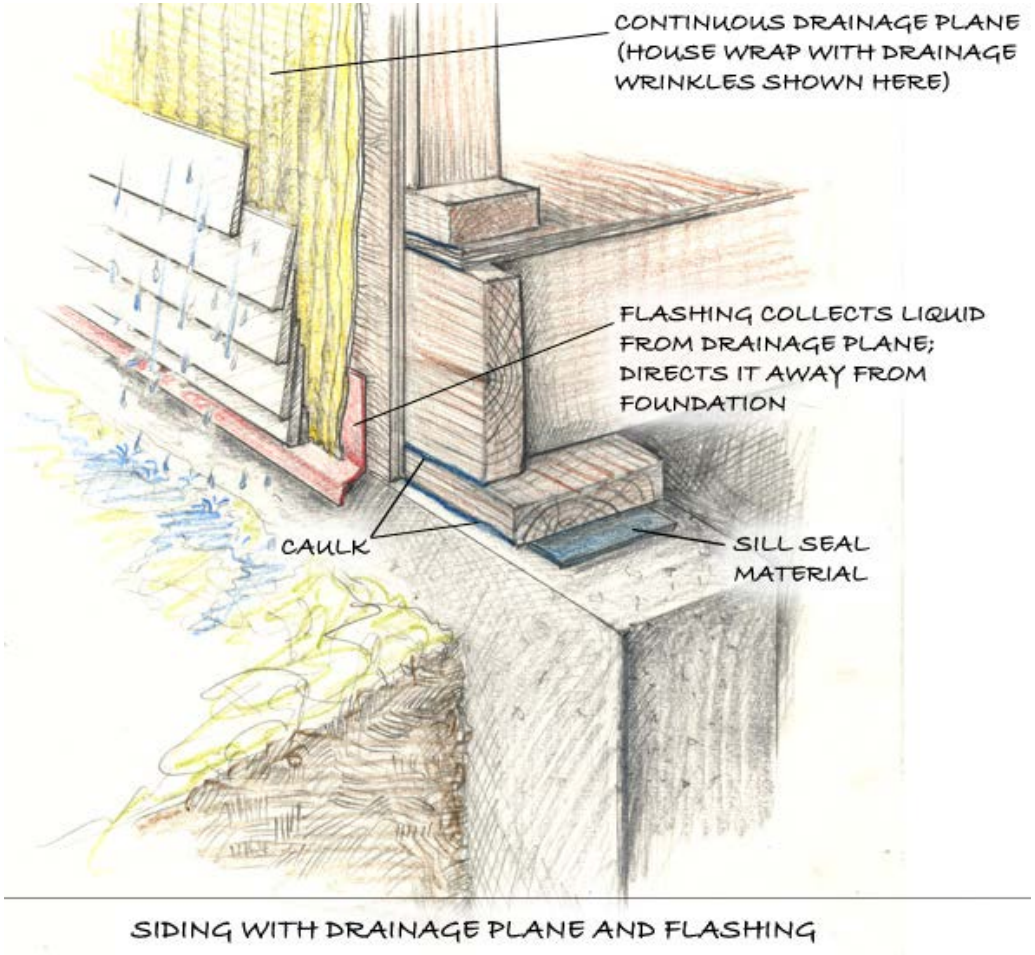
| CLIMATE ZONE | FENESTRATION *U*-FACTOR[b] | SKYLIGHT[b] *U*-FACTOR | GLAZED FENESTRATION SHGC[b, e] | CEILING *R*-VALUE | WOOD FRAME WALL *R*-VALUE | MASS WALL *R*-VALUE[i] | FLOOR *R*-VALUE | BASEMENT[c] WALL *R*-VALUE | SLAB[d] *R*-VALUE & DEPTH | CRAWL SPACE[c] WALL *R*-VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 0.75 | 0.30 | 30 | 13 | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.65[j] | 0.75 | 0.30 | 30 | 13 | 4/6 | 13 | 0 | 0 | 0 |
| 3 | 0.50[j] | 0.65 | 0.30 | 30 | 13 | 5/8 | 19 | 5/13[f] | 0 | 5/13 |
| 4 except Marine | 0.35 | 0.60 | NR | 38 | 13 | 5/10 | 19 | 10 /13 | 10, 2 ft | 10/13 |
| 5 and Marine 4 | 0.35 | 0.60 | NR | 38 | 20 or 13+5[h] | 13/17 | 30[g] | 10/13 | 10, 2 ft | 10/13 |
| 6 | 0.35 | 0.60 | NR | 49 | 20 or 13+5[h] | 15/19 | 30[g] | 15/19 | 10, 4 ft | 10/13 |
| 7 and 8 | 0.35 | 0.60 | NR | 49 | 21 | 19/21 | 38[g] | 15/19 | 10, 4 ft | 10/13 |

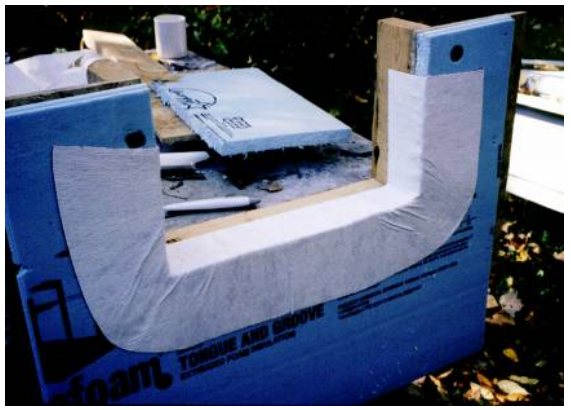
# 1.5, 1.6 & 1.7 Wall Drainage System

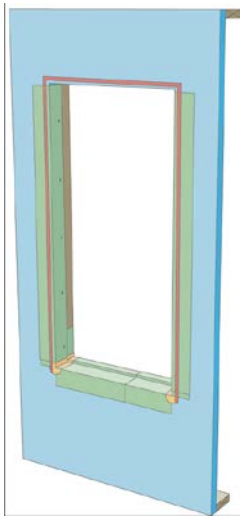
- ✓ *Install a drainage plane behind exterior wall cladding.*
- ✓ *Install flashing at the bottom of exterior walls.*
- ✓ *Fully flash all window and door openings.*
- ✓ *Direct roof water away from house using gutters or an underground catchment system.*

- **For homes that meet ENERGY STAR exceptions for gutters and downspouts, provide protection for water splash damage by one of the following:**
  - **Extend the foundation walls 16 in. above grade.**
  - **Provide a drip line that is 16 in. from the foundation.**
  - **Install cladding that can tolerate wetting and a drainage plane that extends 16 in. above grade.**

# 1.5, 1.6 & 1.7 Wall Drainage System





# 1.7 Gutters, Downspouts, and Site Drainage

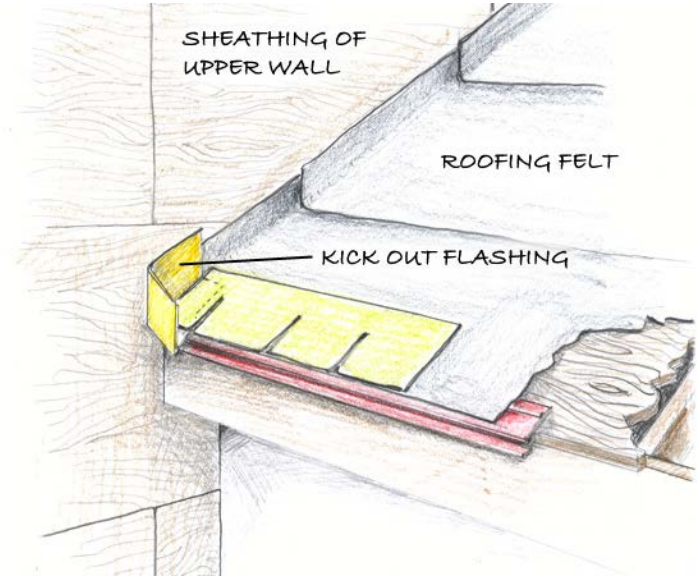
Verification

- Can be builder or Rater verified.
- The Rater should **coordinate with the builder before construction to verify** what ENERGY STAR or Indoor airPLUS compliance option is being pursued.
- The Rater should **visually verify at final inspection** that the selected compliance option is properly installed (for example, that the foundation wall is extended *at least 16 in.* above final grade).

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Moisture Control | 1.1 | Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 | Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 | Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 | Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 | Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |

# 1.8, 1.9 & 1.10 Water Managed Roof

- ✓ *Fully flash all roof-to-wall intersections and all roof penetrations.*
- ✓ *Install a bituminous membrane or the equivalent at all valleys and roof decking penetrations.*
- ✓ *Install ice flashing over the sheathing at eaves.*




# 1.11 Moisture-Resistant Materials

- ✓ *Install moisture-resistant backing material behind tub and shower enclosures.*
- ✓ *Install a corrosion-resistant drain pan.*

- **Install only water-resistant hard-surface flooring in kitchens, bathrooms, entryways, laundry areas, and utility rooms.**
- **Insulate water supply pipes in exterior walls with pipe wrap.**

# 1.11 Moisture Resistant-Materials

Verification

- Can be builder or Rater verified.
- The Rater should **visually verify at the pre-drywall inspection** that all water supply lines in exterior walls are properly insulated with pipe wrap.
- The Rater should **visually verify at final inspection** that only water-resistant hard-surface flooring is installed in the required rooms.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Moisture Control | 1.1 | Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 | Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 | Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 | Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 | Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |

# 1.12 Class 1 Vapor Retarders


✓ *Do not install Class 1 vapor retarders on the interior side of below-grade exterior walls or in any exterior walls in Warm-Humid climates.*

# 1.13 Materials with Water Damage/Mold


- ✓ *Do not install building materials that have visible signs of water damage or mold.*
- ✓ *Do not enclose framing members and insulation products having high moisture content.*
- ✓ *For wet-applied insulation, follow the manufacturer's drying recommendations. Lumber with water and/or mold damage may be used only if visible mold has been physically removed.*
- *Note: Lumber with "sap stain fungi" may be used as long as the lumber is structurally intact.*

EPA Indoor airPLUS

# 1.13 Materials with Water Damage/Mold

*Bad*

*Good*

Indoor Air Quality (IAQ)

# 1. Moisture Control & Water Management

| Benefits |
| --- |
| Water damage reduction |
| Flood mitigation |
| Structural durability |
| Reduces potential for mold growth – even in places you can't see. |
| Fewer maintenance issues from peeling paint and moldy grout |

# Revision 1 Moisture Control Changes

| Section | Changes |
|---|---|
| 1. Moisture Control | Majority of Indoor airPLUS requirements now incorporated into ENERGY STAR. |
| 1.1 Water Managed Site and Foundation | Exception Added: Drain or sump pump not required in areas of free draining soils. |
| 1.7 Gutters, Downspouts and Site Drainage | Compliance Option Added: Homes that meet the ENERGY STAR exceptions for gutter and downspouts must also provide protection for water splash damage (exemption for dry climates). |
| 1.13 Materials with Signs of Water Damage or Mold | Compliance Option Added: Lumber with signs of superficial water and/or mold damage may be used only if visible mold has been physically removed.<br><br>Exception Added: Wood with sap stains may be used as long as wood is structurally intact. |

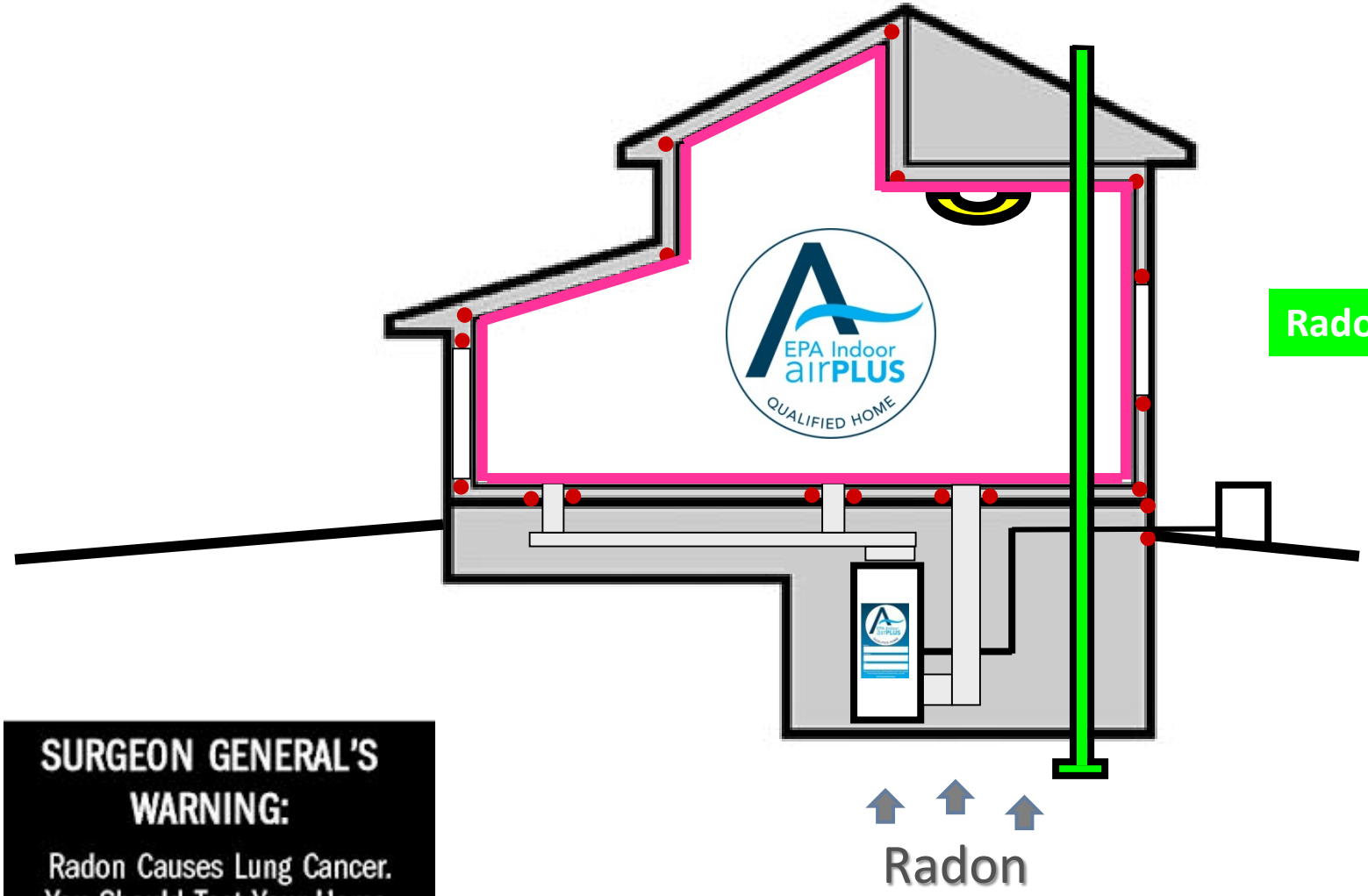
# Revision 2 Moisture Control Changes

| Section | Changes |
|---|---|
| 1.2 Capillary Break | Clarification added: XPS may be used under slabs provided it is used in addition to the required 6 mil polyethylene sheeting.<br><br>Exceptions added (non-EPA Radon Zone 1): Sand or aggregate under slab not required in areas with free-draining soils or homes with slab-on-grade foundations. |

# Revision 3 Moisture Control Changes

| Section | Changes |
|---|---|
| 1.2 Capillary Break Installation. | Clarified requirement for poly in Radon Zone 1 and added an alternative path for gut-rehabs. |
| 1.7 Protection from water splash damage if no gutters. | Clarified requirement; provided an additional advisory regarding self-adhering membranes; item can now be builder verified. |
| 1.11 Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | Item can now be builder verified. |

# 2. Radon



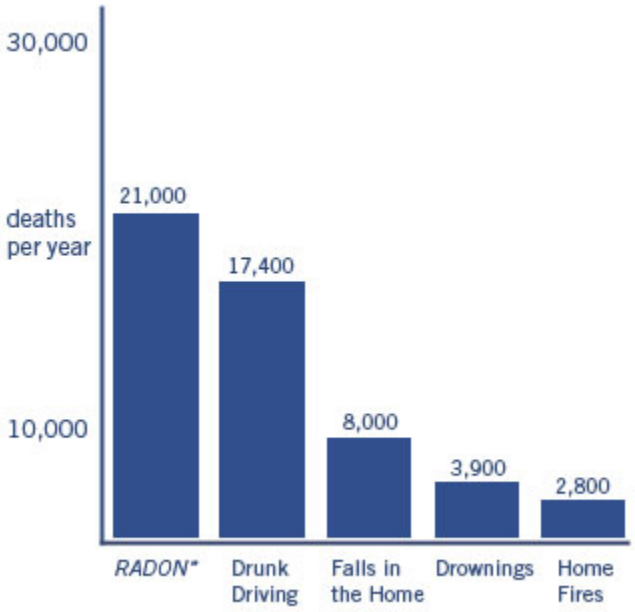

**SURGEON GENERAL'S WARNING:**

Radon Causes Lung Cancer.
You Should Test Your Home.

Indoor Air Quality (IAQ)

# 2. Radon

- Radon is a cancer-causing radioactive gas created by the natural breakdown of uranium in soil.
- Radon can be found all over the US.
- 1 in 15 homes have radon above 4 pCi/L.
- You are most likely to get your greatest exposure to radon at home.
- Radon is the second leading cause of lung cancer after smoking.



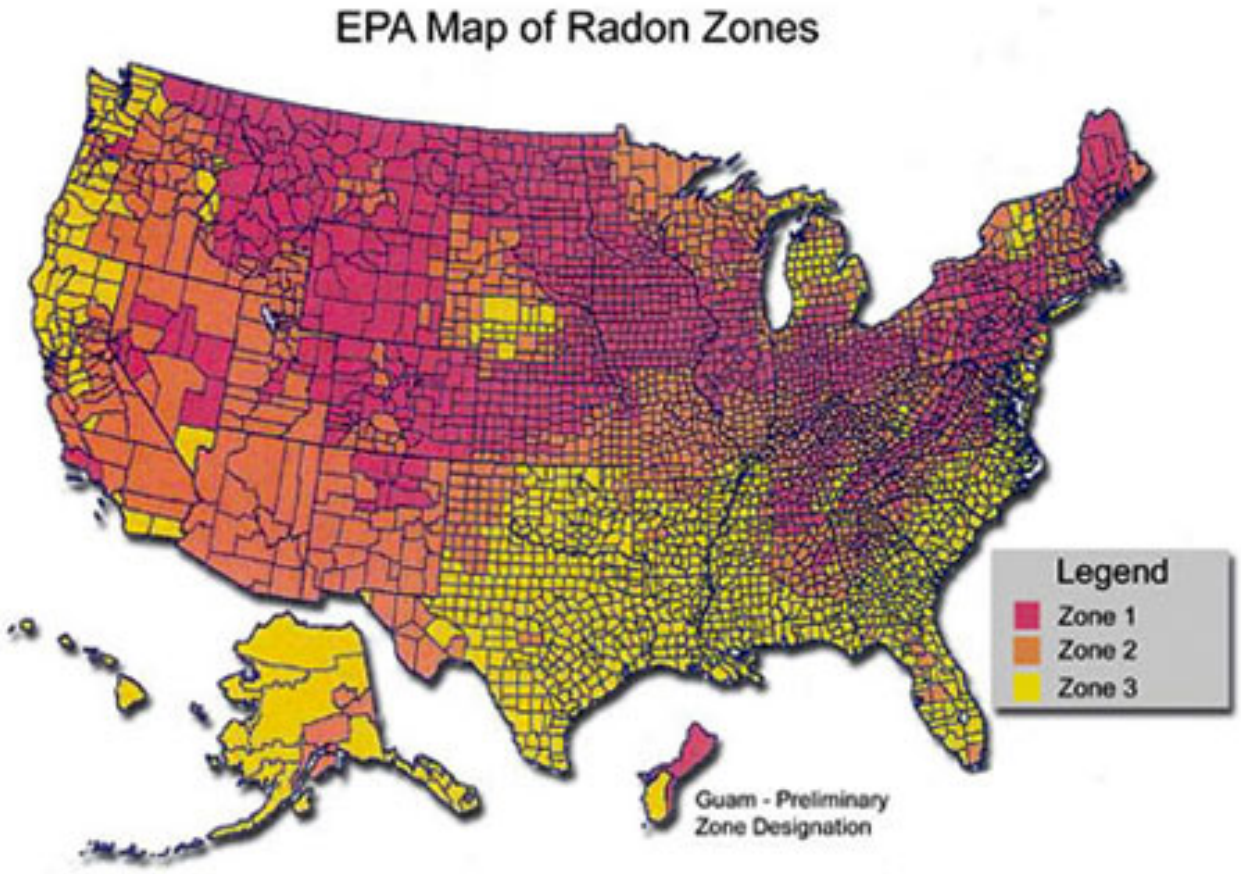
# 2.1 Radon Control

✓*Air seal all sump covers.*

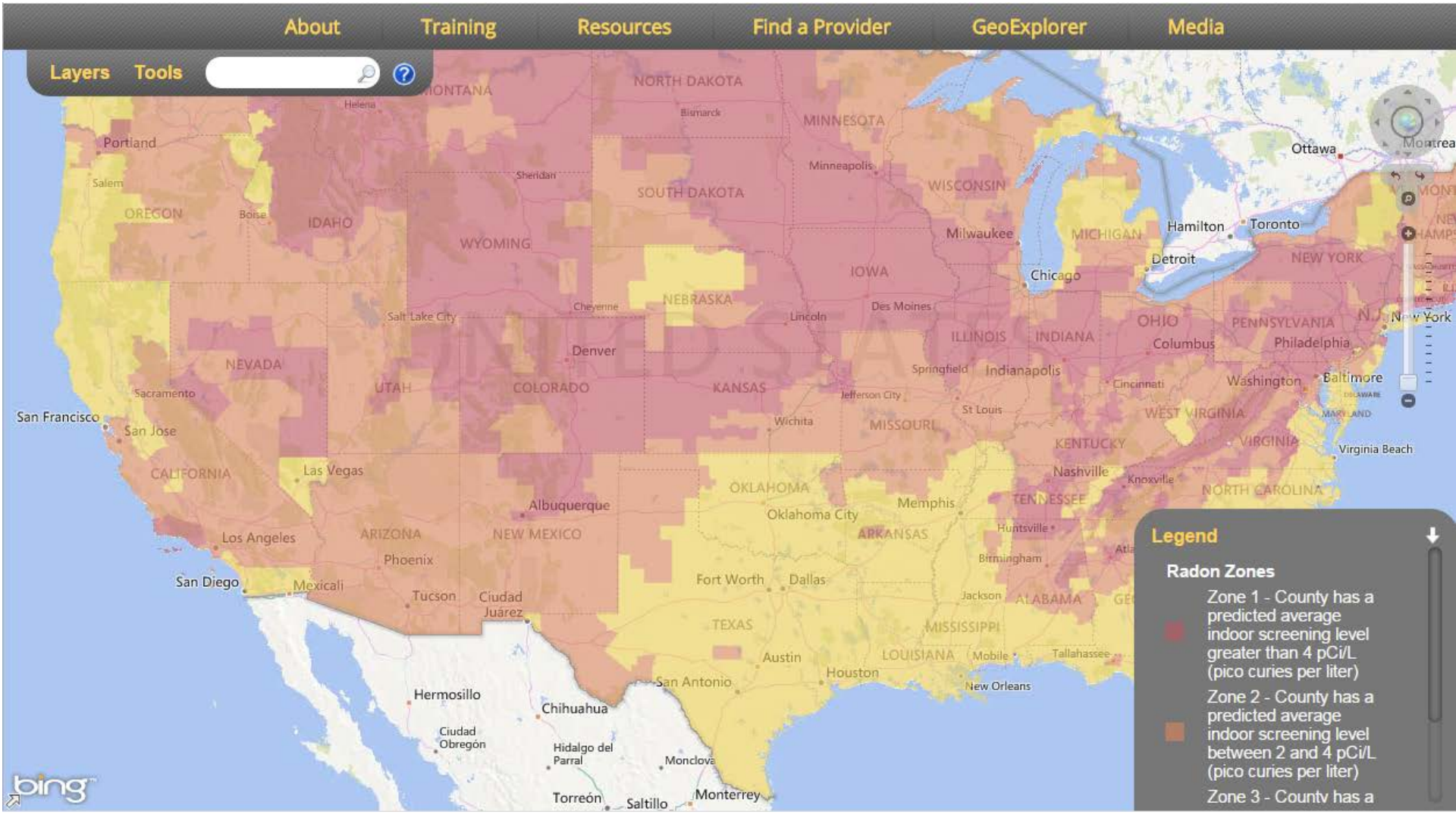
- **Construct homes built in EPA Radon Zone 1 with radon-resistant features.**
- **Advisory:**
  - **Passive Systems recommended in Zones 2-3.**
  - **Educate homeowners.**

For more on radon-resistant construction, see:
https://www.epa.gov/radon/radon-resistant-construction-basics-and-techniques

# 2.1 Radon Control




Note: These maps indicate average risk by county. However, high levels of radon can be found in any home. See: www.epa.gov/radon/zonemap.html or for an interactive map, see: http://www.wxplushealth.org/geoexplorer.



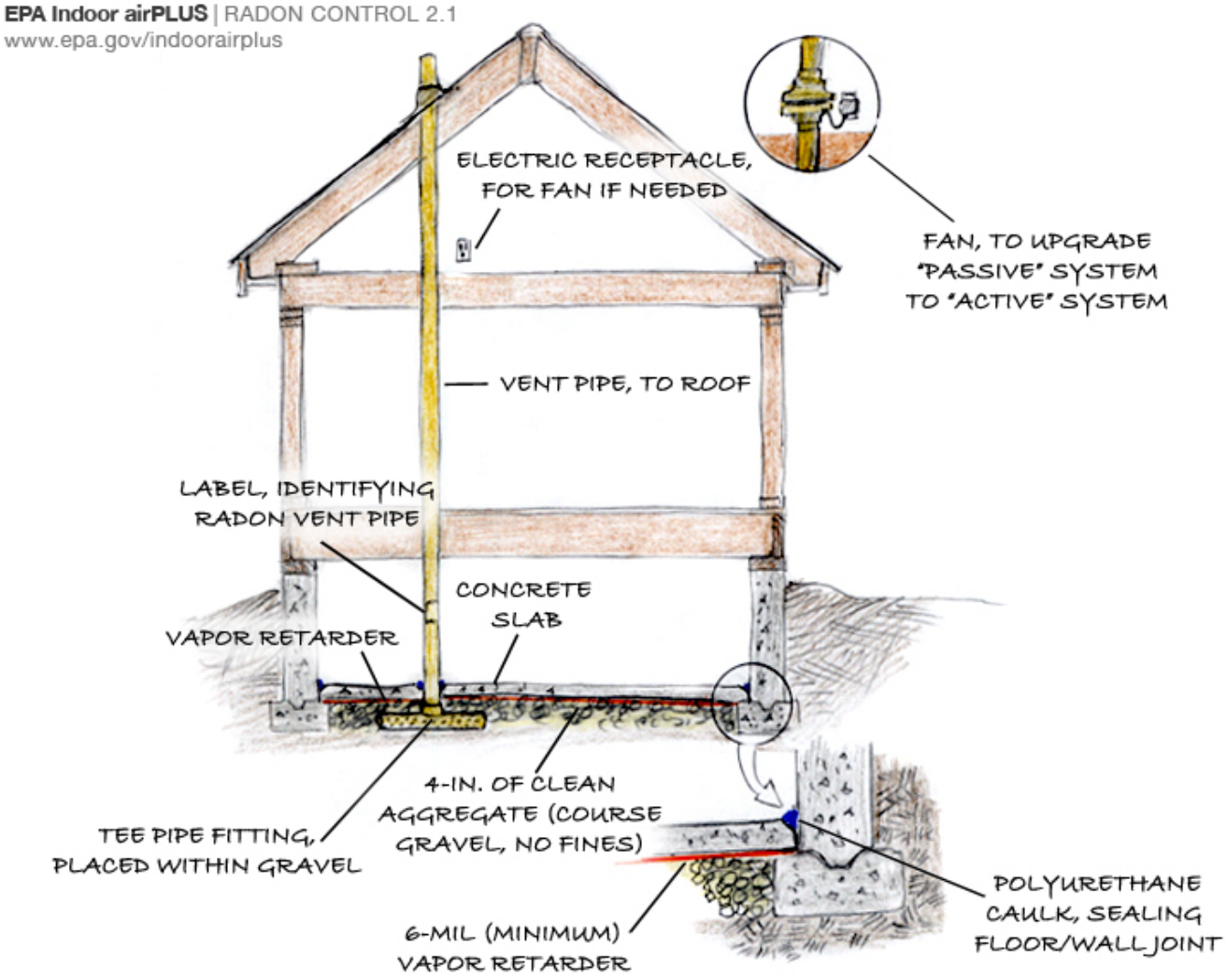

# Radon Zones – 1,2,3?

**For an easy-to-use map: Weatherization Plus Health GeoExplorer**
**http://www.wxplushealth.org/geoexplorer**

EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# 2.1 Radon Control




# 2.1 Radon Resistant Construction

Verification

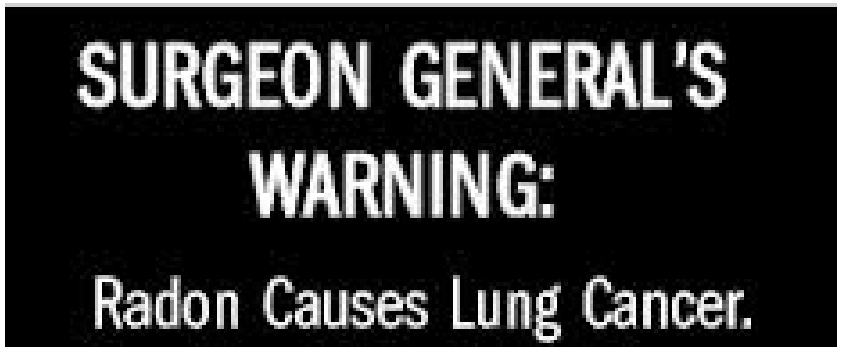
- Can be builder or Rater verified.
- **Verify documentation before the start of construction** of an approved radon mitigation system.
- The aggregate layer, connected to a vent pipe under overlapped polyethylene sheeting, should be **visually verified before pouring the slab**.
- The fully connected vent pipe, fan/electrical receptacle, and foundation air sealing should be **visually verified at pre-drywall inspection**.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Radon | 2.1 | Radon-resistant features installed in Radon Zone 1 homes in accordance with Construction Specification 2.1. | ☐ | ■ | ☐ | ☐ |

# 2.1 Radon Control

**Homeowner Benefits**

Protection against radon, the second leading cause of lung cancer in the U.S.

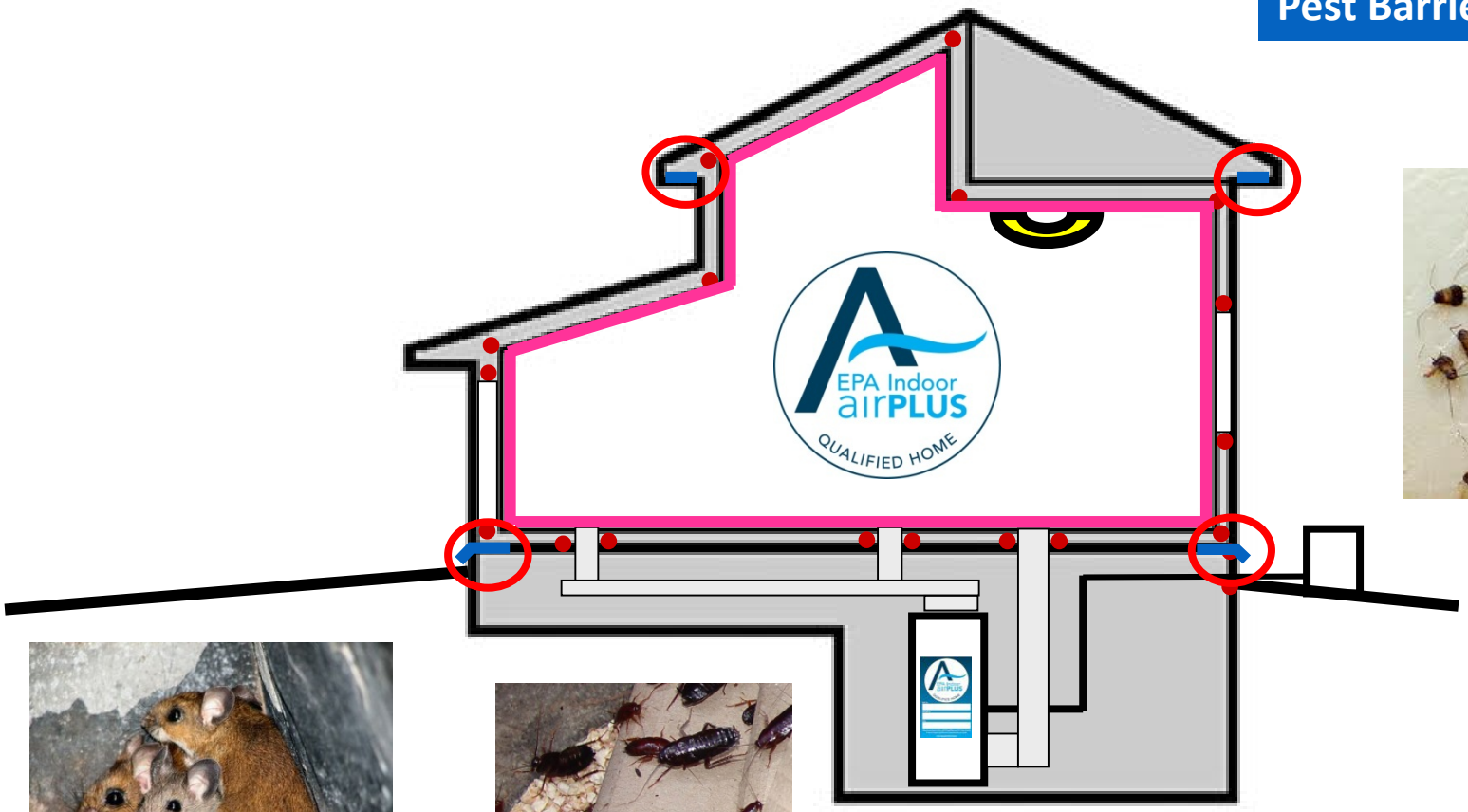


# Revision 1 Radon Changes

| Section | Changes |
|---|---|
| 2.1 Radon-Resistant Construction | References Removed: Appendix F; CABO.<br><br>Advisories Added: Including a radon vent fan and installing radon resistant features in EPA Radon Zones 2 and 3 are recommended.<br><br>Advisories Added: Radon testing recommended. |
| 2.2 Radon Test Kits | Requirement Removed: Radon test kits are no longer required to be provided to homebuyers. |

- No changes made in Revisions 2 & 3.

# 3. Pest Barriers




Indoor Air Quality (IAQ)

# 3.1 Minimize Pathways for Pest Entry

- ✓ *Seal all penetrations and joints between the foundation and exterior wall assemblies.*
- ✓ *Air seal all sump covers.*

**No additional Indoor airPLUS Requirements.**

**Advisories:**

- **When sealing large gaps use copper or stainless steel wool.**
- **Additional precautions should be taken in areas classifies as “Moderate to Heavy” termite infestation.**

# 3.2 Rodent/Bird Screens

- **Provide <u>corrosion-proof rodent/bird screens</u> for all opening that cannot be sealed or caulked.**

  *Note: Does not apply to dryer vents*

# 3.2 Rodent/Bird Screens

Verification

- Can be builder or Rater verified.
- **Visually verify at final inspection** that all openings are either sealed or covered by a corrosion-proof screen.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Pests | 3.2 | Corrosion-proof rodent/bird screens installed at all openings that cannot be fully sealed (Exception: dryer vents). | ☐ | ☐ | ☐ | |

# 3. Pest Barriers

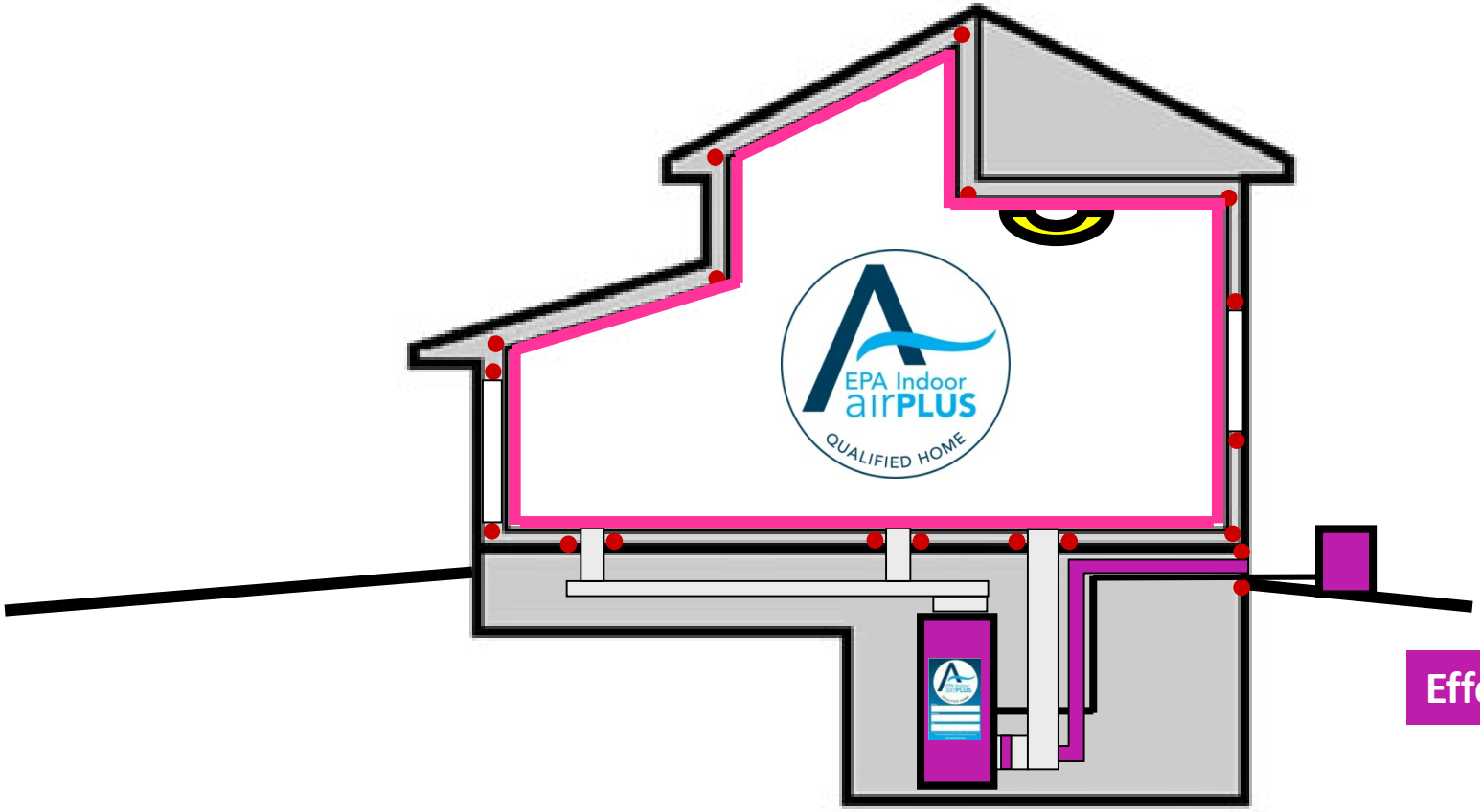
**Homeowner Benefits**

Prevention of potential damage from pests

Less vacuuming and dusting

Reduced pest-related allergens, asthma triggers and diseases

# 4. HVAC Systems




**Effective HVAC**

Indoor Air Quality (IAQ)

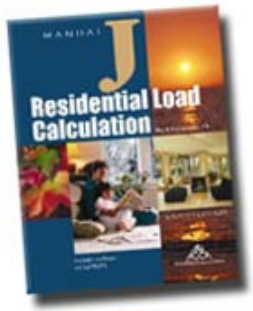
# 4. HVAC Systems


- Indoor relative humidity greater than 60% can encourage mold growth and attract organisms such as dust mites or other pests.
- HVAC components in wall cavities and garages can expose occupants to mold, carbon monoxide, hydrocarbons, nitrogen oxides, radon, pesticides and other contaminants.
- Ordinary residential panel filters collect less than 20 percent of the particles between 3 and 10 microns. A MERV 8 filter collects more than 70% of the particles in this range.

EPA Indoor airPLUS

# 4.1 HVAC Sizing and Design

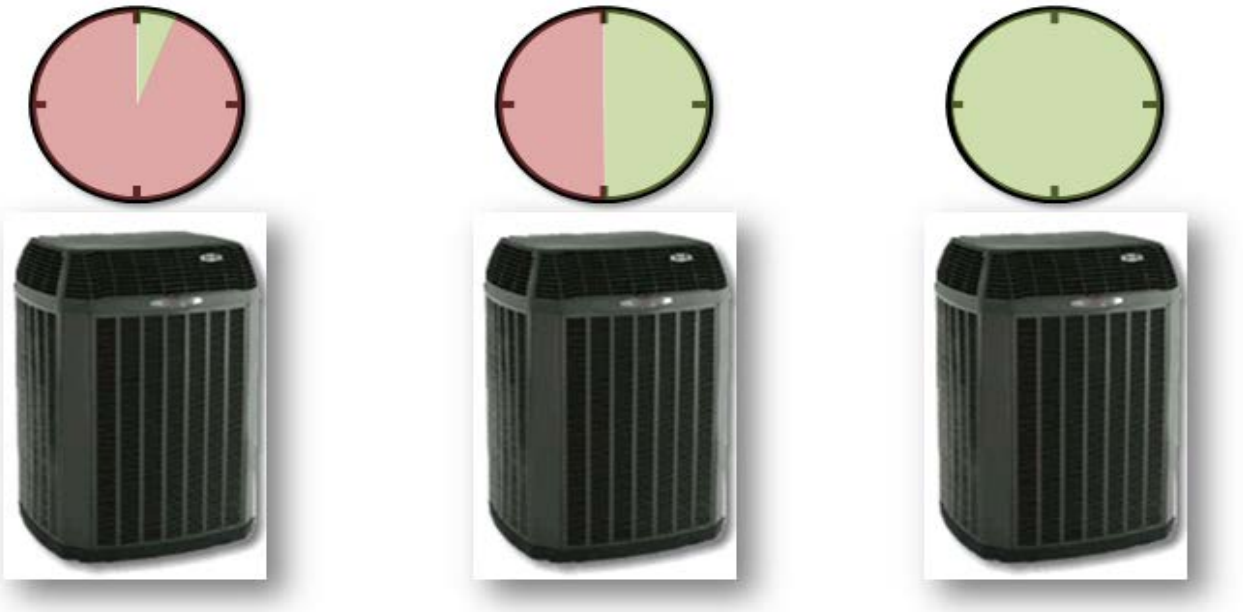
- ✓ *Properly size all heating and cooling equipment using ACCA Manual J, ASHRAE Handbooks, or equivalent software.*




- **"Warm-Humid" climates: equipment shall be installed with sufficient latent capacity to maintain indoor relative humidity (RH) at or below 60 percent.**

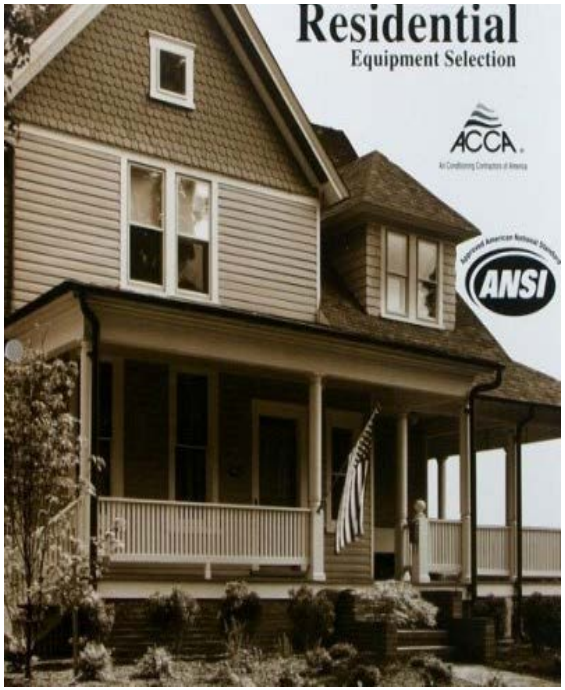
# 4.1 HVAC Sizing and Design

- Heating and cooling equipment generally have just two modes – on & off.
- Right sizing is key in controlling RH with HVAC systems.
- The HVAC system must operate to remove moisture.



# 4.1 HVAC Sizing and Design

- By following the procedures in Manual S for selecting HVAC systems you can ensure the HVAC system selected can cover the latent moisture load of the home.
- HVAC systems have a broad range of capabilities depending on fan speeds and controls.
- A humidistat may be used in some systems to achieve additional de-humidification.
- In some extreme cases a separate de-humidifier may be required to supplement moisture removal.



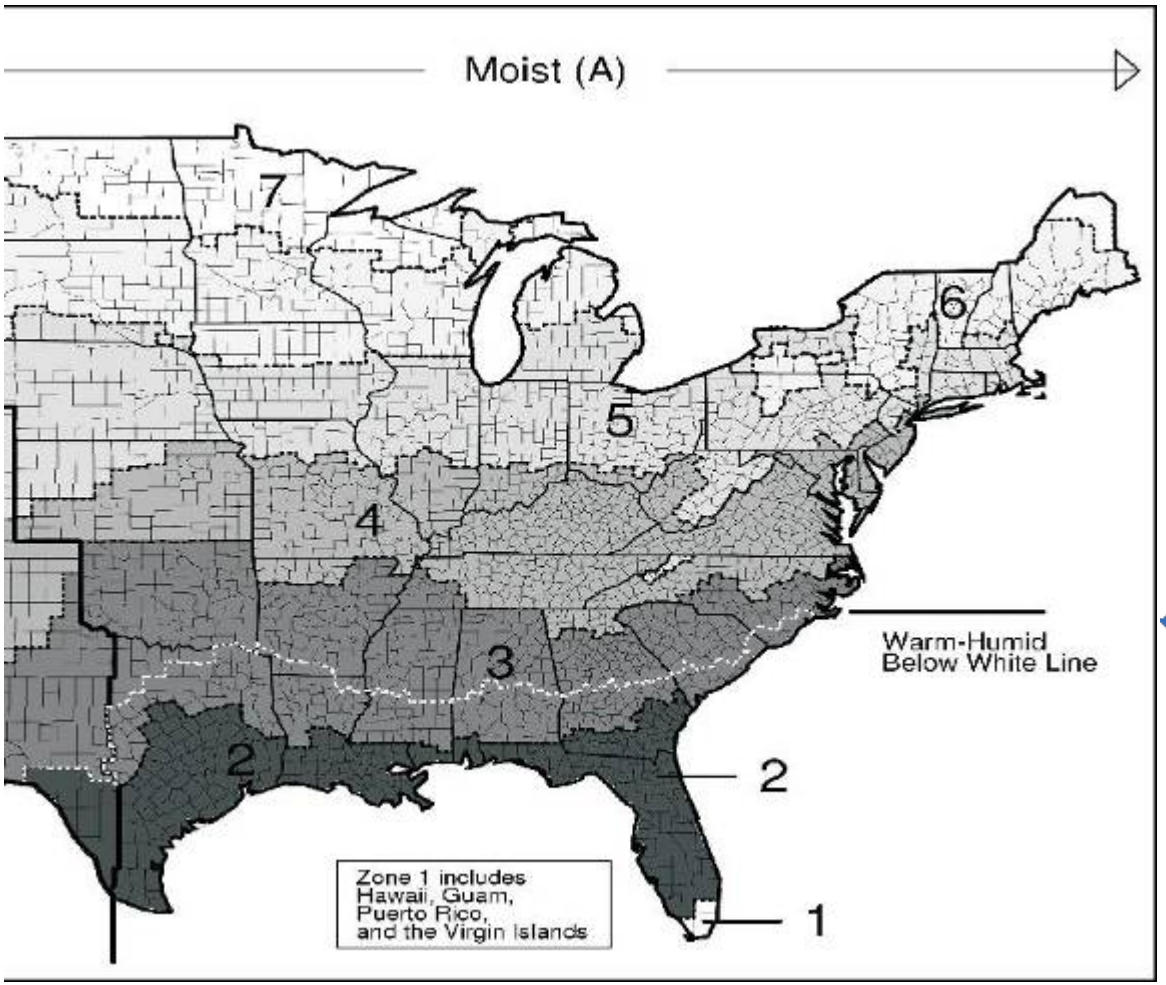
# 4.1 HVAC Sizing and Design

**14ACX-036-230-13 - C33-36B/C-6F + EL296UH045V36B**

| Entering Wet Bulb Temper-ature | Total Air Volume | Outdoor Air Temperature Entering Outdoor Coil | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 85°F | | | | | 95°F | | | | | 105°F | | | | | 115°F | | | | |
| | | Total Cool Cap. | Comp Motor Input | Sensible to Total Ratio (S/T) Dry Bulb | | | Total Cool Cap. | Comp Motor Input | Sensible to Total Ratio (S/T) Dry Bulb | | | Total Cool Cap. | Comp Motor Input | Sensible to Total Ratio (S/T) Dry Bulb | | | Total Cool Cap. | Comp Motor Input | Sensible to Total Ratio (S/T) Dry Bulb | | |
| | cfm | kBtuh | kW | 75°F | 80°F | 85°F | kBtuh | kW | 75°F | 80°F | 85°F | kBtuh | kW | 75°F | 80°F | 85°F | kBtuh | kW | 75°F | 80°F | 85°F |
| 63°F | 1020 | 33.6 | 1.95 | 0.77 | 0.92 | 1 | 32 | 2.21 | 0.79 | 0.94 | 1 | 30.2 | 2.51 | 0.81 | 0.97 | 1 | 28.4 | 2.84 | 0.84 | 0.99 | 1 |
| | 1210 | 34.8 | 1.95 | 0.81 | 0.97 | 1 | 33.2 | 2.22 | 0.83 | 0.99 | 1 | 31.4 | 2.52 | 0.86 | 1 | 1 | 29.8 | 2.85 | 0.89 | 1 | 1 |
| | 1370 | 35.6 | 1.96 | 0.85 | 1 | 1 | 34 | 2.23 | 0.87 | 1 | 1 | 32.6 | 2.53 | 0.9 | 1 | 1 | 30.8 | 2.85 | 0.93 | 1 | 1 |
| 67°F | 1020 | 35.2 | 1.96 | 0.61 | 0.75 | 0.88 | 33.6 | 2.22 | 0.62 | 0.77 | 0.91 | 31.8 | 2.52 | 0.64 | 0.79 | 0.93 | 30 | 2.85 | 0.65 | 0.81 | 0.96 |
| | 1210 | 36.6 | 1.97 | 0.64 | 0.79 | 0.94 | 34.8 | 2.23 | 0.65 | 0.81 | 0.96 | 33 | 2.53 | 0.67 | 0.83 | 0.99 | 31 | 2.85 | 0.68 | 0.86 | 1 |
| | 1370 | 37.4 | 1.97 | 0.66 | 0.83 | 0.98 | 35.6 | 2.24 | 0.68 | 0.85 | 1 | 33.6 | 2.54 | 0.69 | 0.88 | 1 | 31.6 | 2.87 | 0.71 | 0.91 | 1 |
| 71°F | 1020 | 36.8 | 1.97 | 0.47 | 0.6 | 0.73 | 35.2 | 2.24 | 0.47 | 0.61 | 0.74 | 33.4 | 2.53 | 0.48 | 0.62 | 0.76 | 31.6 | 2.86 | 0.48 | 0.64 | 0.79 |
| | 1210 | 38 | 1.98 | 0.48 | 0.63 | 0.77 | 36.4 | 2.24 | 0.49 | 0.64 | 0.79 | 34.6 | 2.55 | 0.49 | 0.65 | 0.81 | 32.6 | 2.87 | 0.5 | 0.67 | 0.84 |
| | 1370 | 39 | 1.98 | 0.49 | 0.65 | 0.8 | 37.4 | 2.25 | 0.5 | 0.67 | 0.83 | 35.4 | 2.55 | 0.51 | 0.68 | 0.85 | 33.2 | 2.88 | 0.52 | 0.7 | 0.88 |

- Total Design Capacity = 33.2 kBTU/h
- Sensible Design Capacity = 33.2 x 0.83 = 27.6 kBTU/h
- Latent Design Capacity = 33.2 - 27.6 = 5.6 kBTU/h

# 4.1 HVAC Sizing and Design




Homes in “Warm-Humid” climates use additional controls or dehumidification systems to maintain RH ≤ 60%

# 4.1 HVAC Sizing and Design

Verification

- Must be Rater verified.
- Rater should **verify documentation before the start of construction** showing the method and calculations for retaining an indoor relative humidity below 60 percent in “Warm-Humid” climates.
- Rater should **visually verify at final inspection** that the designed system has been properly installed.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| HVAC Systems | 4.1 | Equipment selected to keep relative humidity < 60% in “Warm-Humid” climates (Exception: see spec). | ☐ | | ■ | ☐ |
| | 4.2 | Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 | No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ☐ | |
| | 4.6 | Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer’s instructions. | ☐ | | ☐ | |
| | 4.7 | Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ☐ | |

# 4.2 Duct System Design and Installation

- ✓ *Design all duct systems according to ACCA Manual D, ASHRAE Handbooks, or equivalent software.*
- ✓ *Ensure that all duct systems are airtight and properly balanced.*

- **Do not use building cavities as part of the forced air supply or return systems.**
- **Cover duct openings throughout construction or vacuum out ducts prior to installing registers.**

# 4.2 Duct System Design and Installation

COVERING DUCT OPENINGS DURING CONSTRUCTION


SEALING WITH MASTIC

# 4.2 Duct System Design and Installation

Verification

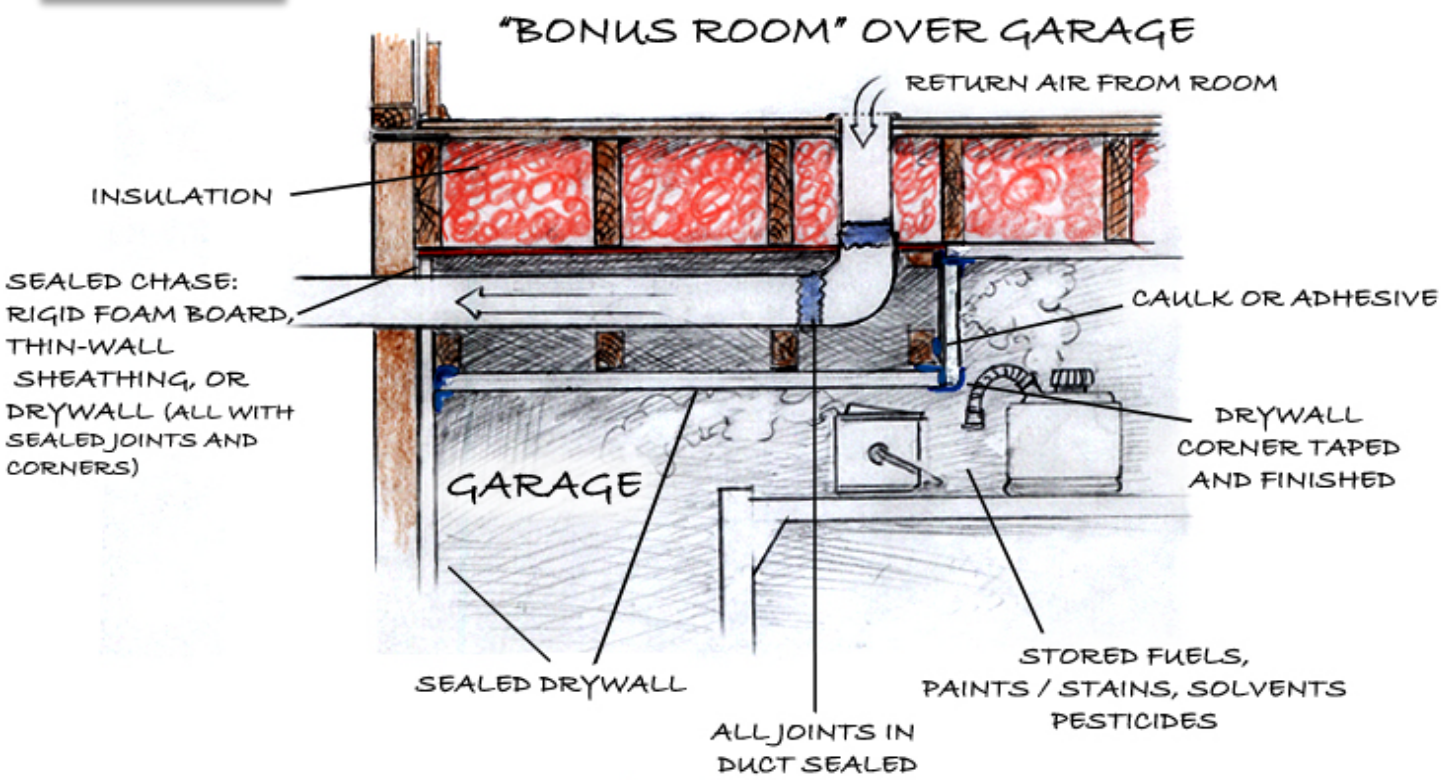
- Can be builder or Rater verified.
- **Visually verify at pre-drywall inspection** that no cavities are used as part of the forced air system.
- Verify that all duct openings were covered during construction or have been thoroughly vacuumed upon completion.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| HVAC Systems | 4.1 | Equipment selected to keep relative humidity < 60% in "Warm-Humid" climates (Exception: see spec). | ☐ | | ☐ | ☐ |
| | 4.2 | Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 | No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ☐ | |
| | 4.6 | Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions. | ☐ | | ☐ | |
| | 4.7 | Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ☐ | |

# 4.3 Location of Air Handler and Ducts

- **Do not locate air-handling equipment or ductwork in garages.**

***Note: Ducts may be located in building cavities adjacent to the garage if they are separated with a continuous air barrier.***



# 4.3 Location of Air Handler and Ducts

Verification

- Must be Rater verified.
- Rater should **visually verify at pre-drywall inspection** that no air-handling equipment or ductwork has been installed in the garage and any ducts or equipment located in adjacent framing spaces have been separated from the garage space by a continuous air barrier.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| HVAC Systems | 4.1 | Equipment selected to keep relative humidity < 60% in "Warm-Humid" climates (Exception: see spec). | ☐ | | ☐ | ☐ |
| | 4.2 | Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 | No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ■ | |
| | 4.6 | Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions. | ☐ | | ☐ | |
| | 4.7 | Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ☐ | |

# 4.5 Mechanical Whole-House Ventilation

- ✓ *Provide mechanical whole-house ventilation meeting ASHRAE 62.2-2010.*
- ✓ *Test airflows to ensure they meet ASHRAE 62.2.-2010.*

- **Advisory: Outdoor air ducts connected to the return side of an air handler should be used as supply ventilation only if the manufacturer's requirements for return air temperature are met.**

# 4.5 Mechanical Whole-House Ventilation

EXHAUST VENTILATION

DUCTED FRESH AIR SUPPLY


FRESH AIR DAMPER

EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# 4.6 Local Exhaust for Known Pollutant Sources

✓ *Provide local mechanical exhaust ventilation to the outdoors in bathrooms and kitchens.*

- **Vent conventional clothes dryers to the outdoors.**
- **Electric condensing dryers must be plumbed to a drain.**

# 4.6 Local Exhaust for Known Pollutant Sources

Verification

- Must be Rater verified.
- **Visually verify at final inspection** that all exhaust ventilation openings are properly vented to the outdoors.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| HVAC Systems | 4.1 | Equipment selected to keep relative humidity < 60% in "Warm-Humid" climates (Exception: see spec). | ☐ | | ☐ | ☐ |
| | 4.2 | Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 | No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ☐ | |
| | 4.6 | Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions. | ☐ | | ■ | |
| | 4.7 | Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ☐ | |

# 4.7 Filtration

✓ *Equip all filter access panels with gasket material or comparable sealing mechanism to prevent bypass air.*

- **Install only HVAC filters that are rated MERV 8 or higher.**
- **Do not install any air-cleaning equipment designed to produce ozone.**
- **Use a filter in the air handling unit during construction and a clean filter upon final inspection.**

# 4.7 Filtration for Central Forced-Air HVAC Systems

- Filters come in multiple sizes.
- Filters are typically 1”, 2”, or 4” in depth.
- Previously, the primary purpose for filtration was to just protect the HVAC system, not indoor air quality.

# 4.7 Filtration for Central Forced-Air HVAC Systems

**Typical Performance Data**

| Filter Depth | Nominal Size | Capacities (CFM) | | Resistance (inches W.G.) | | | Pleats per Linear foot | Media Area (SQ. FT) |
|---|---|---|---|---|---|---|---|---|
| | | Med | High | Med | High | Final | | |
| 1" | 12x24 | 600 | 1000 | .18 | .36 | 1.0 | 14 | 4.7 |
| | 16x20 | 650 | 1100 | .18 | .36 | 1.0 | 14 | 5.3 |
| | 16x25 | 850 | 1350 | .18 | .36 | 1.0 | 14 | 6.6 |
| | 20x20 | 850 | 1350 | .18 | .36 | 1.0 | 14 | 6.7 |
| | 20x25 | 1050 | 1750 | .18 | .36 | 1.0 | 14 | 8.3 |
| | 24x24 | 1200 | 2000 | .18 | .36 | 1.0 | 14 | 9.3 |
| 2" | 12x24 | 600 | 1000 | .14 | .26 | 1.0 | 10 | 6.7 |
| | 16x20 | 650 | 1100 | .14 | .26 | 1.0 | 10 | 7.8 |
| | 16x25 | 850 | 1350 | .14 | .26 | 1.0 | 10 | 9.7 |
| | 20x20 | 850 | 1350 | .14 | .26 | 1.0 | 10 | 9.4 |
| | 20x25 | 1050 | 1750 | .14 | .26 | 1.0 | 10 | 11.8 |
| | 24x24 | 1200 | 2000 | .14 | .26 | 1.0 | 10 | 13.3 |
| 4" | 12x24 | 600 | 1000 | .12 | .22 | 1.0 | 11 | 14.7 |
| | 16x20 | 650 | 1100 | .12 | .22 | 1.0 | 11 | 16.7 |
| | 16x25 | 850 | 1350 | .12 | .22 | 1.0 | 11 | 20.8 |
| | 20x20 | 850 | 1350 | .12 | .22 | 1.0 | 11 | 21.1 |
| | 20x25 | 1050 | 1750 | .12 | .22 | 1.0 | 11 | 26.4 |
| | 24x24 | 1200 | 2000 | .12 | .22 | 1.0 | 11 | 29.3 |
| | 25x29 | 1500 | 2500 | .12 | .22 | 1.0 | 11 | 37.1 |

- Filters have performance data that must be accounted for in the duct design.
- When selecting a filter, try to find a filter that creates the least amount of resistance.
- There are multiple types of filter sizes and depths.
- Media filters have a much greater surface area and will cause less restriction.

# 4.7 Filtration for Central Forced-Air HVAC Systems

Verification

- Can be builder or Rater verified.
- Coordinate with the builder and/or HVAC contractor **before the start of construction** to ensure that:
  - No ozone-producing air-cleaning equipment will be installed AND
  - A MERV 8 filter is accommodated in the HVAC design.
- **Visually verify at final inspection** that a clean filter has been installed.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| HVAC Systems | 4.1 | Equipment selected to keep relative humidity < 60% in "Warm-Humid" climates (Exception: see spec). | ☐ | | ☐ | ☐ |
| | 4.2 | Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 | No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ☐ | |
| | 4.6 | Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions. | ☐ | | ☐ | |
| | 4.7 | Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ■ | |

# 4. HVAC Systems

**Homeowner Benefits**

- Reduced exposure to mold and mildew
- Increased comfort
- Helps remove allergens, toxins, irritants and asthma triggers from the home
- House stays cleaner

# Revision 1 HVAC Systems Changes

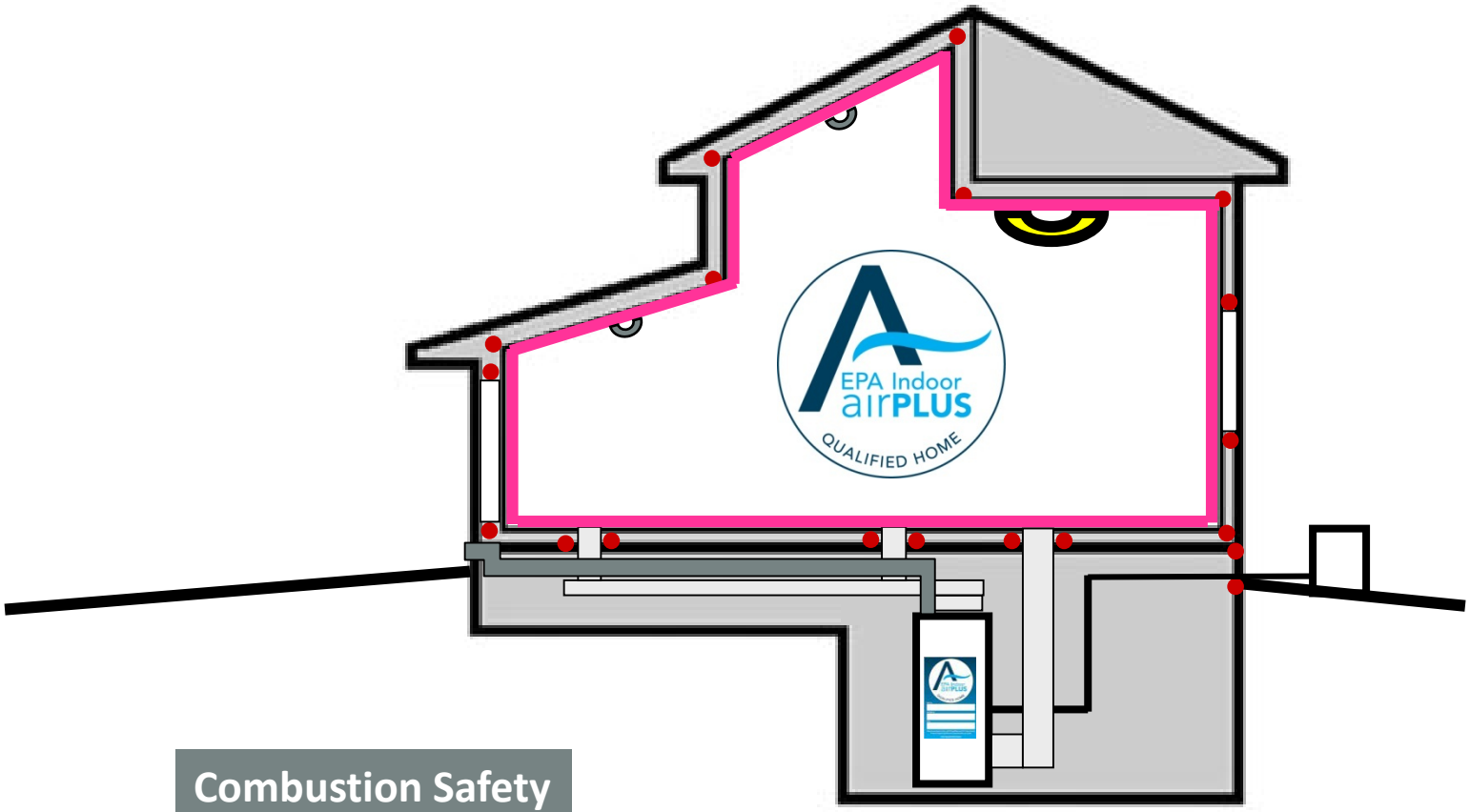
| Section | Changes |
|---|---|
| 4.1 HVAC Sizing and Design | Original Indoor airPLUS Specification numbers 4.1 and 4.8 now combined under the new 4.1. |
| 4.2 Duct System Design and Installation | Formatting revised to clarify that building cavities cannot be used as part of the forced air supply or return systems. |

- No changes made in Revision 2.

# Revision 3 HVAC Systems Changes

| Section | Changes |
|---|---|
| 4.6 Clothes dryers must be vented to the outdoors or plumbed to a drain according to manufacturer's instruction. | Requirement was reincorporated to specify venting conventional clothes dryers to the outdoors. |
| 4.7 Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | Modified requirement to include a filter in the air handling unit during construction and a clean filter upon final inspection; added advisory to minimize contamination of ducts and air handler construction dust. |

# 5. Combustion Pollutants




**Combustion Safety**

# 5. Combustion Pollutants

- Accidental carbon monoxide (CO) poisoning kills an average of 439 persons annually (CDC; MMWR; 12/21/2007).
- Carbon monoxide, an odorless, colorless gas, which can cause sudden illness and death, is produced any time a fossil fuel is burned.

# 5.1 Combustion Equipment

- ✓ *Mechanically draft or direct vent all gas- and oil-fired furnaces, boilers and water heaters.*
- ✓ *Fireplaces that are not mechanically drafted must meet exhaust flow or pressure differential.*

- **Do not install any unvented combustion space-heating appliances.**
- **Ensure that all fireplaces and other fuel-burning appliances are vented to the outdoors and supplied with ventilation air.**
- **Meet emissions standards and restrictions for all fuel-burning appliances located in conditioned spaces.**

# 5.1 Combustion Equipment – Emissions Standards


**For fuel-burning and space-heating appliances in conditioned spaces . . .**

- **Traditional masonry fireplaces** designed for open fires are not permitted, with the exception of "masonry heaters"
- **Factory-built wood-burning fireplaces** shall meet the certification requirements of UL 127 and shall have tight-fitting, gasketed glass doors and a dedicated outside air supply.

# 5.1 Combustion Equipment – Emissions Standards


**For fuel-burning and space-heating appliances in conditioned spaces . . .**

- **Wood stove and fireplace inserts** as defined in section 3.8 of UL 1482 shall meet the certification requirements of that standard, **AND** they shall meet the emission requirements of the EPA's New Source Performance Standards for new residential wood heaters. See: www2.epa.gov/residential-wood-heaters/final-new-source-performance-standards-residential-wood-heaters.

# 5.1 Combustion Equipment – Emissions Standards


**For fuel-burning and space-heating appliances in conditioned spaces . . .**

- **Pellet stoves** shall meet the requirements of ASTM E1509 AND they shall meet the emission requirements of the EPA New Source Performance Standards for new residential wood heaters.

# 5.1 Combustion Equipment – Emissions Standards

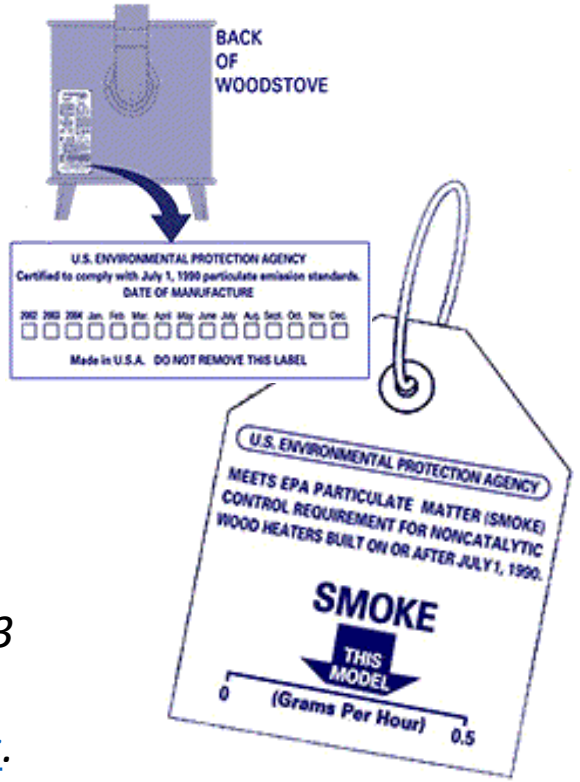

**For fuel-burning and space-heating appliances in conditioned spaces . . .**

- **Natural gas and propane fireplaces** shall have a permanently affixed glass front or gasketed door and be power vented or direct vented in accordance with ANSI Z21.88/CSA 2.33. Decorative gas logs as defined in ANSI Z21.84/CSA 2.33 are not permitted.

# 5.1 Combustion Equipment

DIRECT VENT FURNACE

POWER VENTED WATER HEATER




*Note: Naturally drafted equipment is allowed in Climate Zones 1-3 with a combustion safety test. Wood stoves and fireplace inserts shall meet UL 1482 and [EPA's New Source Performance Standards](#).*

# 5.1 Combustion Equipment

Verification

- Must be Rater verified.
- Rater should **verify documentation before the start of construction** that all combustion appliances meet the required emissions standards and **visually verify at final inspection** that the specified equipment has been installed or conduct a combustion air zone test if applicable.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Combustion Pollutants | 5.1 | Emissions standards met for fuel-burning and space-heating appliances. | ☐ | | ■ | ☐ |
| | 5.2 | CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720. | ☐ | | ☐ | ☐ |
| | 5.3 | Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | ☐ | ☐ | ☐ | ☐ |
| | 5.4 | Attached garages: Door closer installed on all connecting doors AND in homes with exhaust-only whole-house ventilation EITHER a 70 cfm exhaust fan installed in garage OR a pressure test conducted to verify the effectiveness of the garage-to-house air barrier. See spec for details. | ☐ | | ☐ | ☐ |

# 5.2 Carbon Monoxide Alarms

- **All homes with combustion appliance(s) or an attached garage shall have a carbon monoxide (CO) alarm installed in a central location in the immediate vicinity of each separate sleeping zone.**


CO ALARM

COMBINED CO & SMOKE ALARM

# 5.2 Carbon Monoxide Alarms

Verification

- Must be Rater verified.
- Rater should **visually verify at final inspection** that a carbon monoxide alarm has been installed in a central location in the immediate vicinity of each sleeping zone.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Combustion Pollutants | 5.1 | Emissions standards met for fuel-burning and space-heating appliances. | ☐ | | ☐ | ☐ |
| | 5.2 | CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720. | ☐ | | ■ | ☐ |
| | 5.3 | Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | ☐ | ☐ | ☐ | ☐ |
| | 5.4 | Attached garages: Door closer installed on all connecting doors AND in homes with exhaust-only whole-house ventilation EITHER a 70 cfm exhaust fan installed in garage OR a pressure test conducted to verify the effectiveness of the garage-to-house air barrier. See spec for details. | ☐ | | ☐ | ☐ |

# 5.3 Multi-family ETS Protections

- **Reduce exposure to environmental tobacco smoke (ETS) in multi-family buildings by:**
  - **Prohibiting smoking in indoor common areas.**
  - **Locating designated outdoor smoking areas.**
  - **Minimizing uncontrolled pathways for ETS transfer between individual dwelling units by sealing walls, ceilings, and floors of dwelling units.**

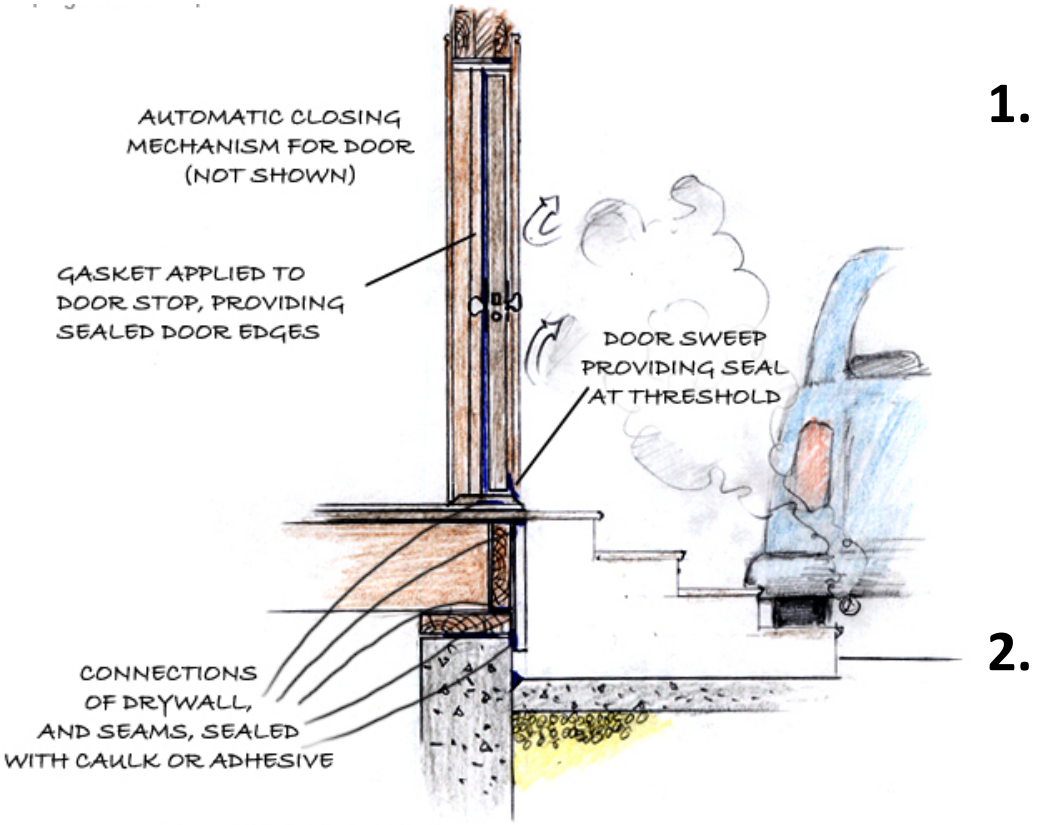
# 5.3 Multi-Family Environmental Tobacco Smoke Protections

Verification

- Can be builder or Rater verified.
- **Verify documentation** of prohibited smoking in common areas.
- **Visually verify at pre-drywall inspection** that units have been properly sealed to limit transfer of environmental tobacco smoke.
- **Visually verify at final inspection** the distance of designated smoking areas.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Combustion Pollutants | 5.1 | Emissions standards met for fuel-burning and space-heating appliances. | ☐ | | ☐ | ☐ |
| | 5.2 | CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720. | ☐ | | ☐ | ☐ |
| | 5.3 | Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | ☐ | ☐ | ☐ | ☐ |
| | 5.4 | Attached garages: Door closer installed on all connecting doors AND in homes with exhaust-only whole-house ventilation EITHER a 70 cfm exhaust fan installed in garage OR a pressure test conducted to verify the effectiveness of the garage-to-house air barrier. See spec for details. | ☐ | | ☐ | ☐ |

# 5.4 Attached Garages




AIR-SEALED WALL (AND CEILING WHEN LIVING SPACE OVER GARAGE) SEPARATING GARAGE POLLUTANTS FROM LIVING SPACES (SEE ALSO 4.3)

1. **Isolated** from conditioned spaces:
   - Common walls and ceilings are **air-sealed**.
   - **No HVAC equipment or ducts** in garage.
   - **Weather stripping and an automatic door closer** is installed on connecting doors between living space and garage.
2. **Appropriate ventilation strategy or pressure testing** ensures separation from living space.

# 5.4 Attached Garages

- ✓ *Isolate attached garages from conditioned spaces:*
  - ✓ *Air-seal common walls and ceilings.*
  - ✓ *Use weather stripping on all doors between living spaces and attached garages.*

- **Install an automatic door closer on all connecting doors between living spaces and attached garages.**
- **In homes with exhaust-only whole-house ventilation either:**
  - **Equip the attached garage with an exhaust fan with a minimum installed capacity of 70 cfm that is vented directly outdoors; OR**
  - **Conduct a pressure test to verify the effectiveness of the garage-to-house air barrier.**

# 5.4 Attached Garages

## Verification

- Must be Rater verified.
- Rater should **verify proper functioning of the automatic door closer** at final inspection.
- In homes with **exhaust only ventilation system**, at final inspection Rater should:
  - **Visually verify at final inspection** that an appropriate garage fan has been installed.
  - If the garage is ventilated by a ducted fan, a Rater should perform a flow test to confirm the required CFM is being met.

  **OR**
  - **Conduct 45 Pascal pressure test** with all garage openings closed to verify the garage-to-house air barrier.
    - Test can be performed during required ENERGY STAR blower door test.
    - If garage-to-house air barrier does not pass pressure test, additional air sealing or a garage fan required.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Combustion Pollutants | 5.1 | Emissions standards met for fuel-burning and space-heating appliances. | ☐ | | ☐ | ☐ |
| | 5.2 | CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720. | ☐ | | ☐ | ☐ |
| | 5.3 | Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | ☐ | ☐ | ☐ | ☐ |
| | 5.4 | Attached garages: Door closer installed on all connecting doors AND in homes with exhaust-only whole-house ventilation EITHER a 70 cfm exhaust fan installed in garage OR a pressure test conducted to verify the effectiveness of the garage-to-house air barrier. See spec for details. | ☐ | | ■ | ☐ |

# 5. Combustion Pollutants

**Benefits**

Reduced exposure to carbon monoxide.

Pollutants in attached garages isolated from living space.

Round-the-clock peace of mind.

# Revision 2 Combustion Pollutant Changes

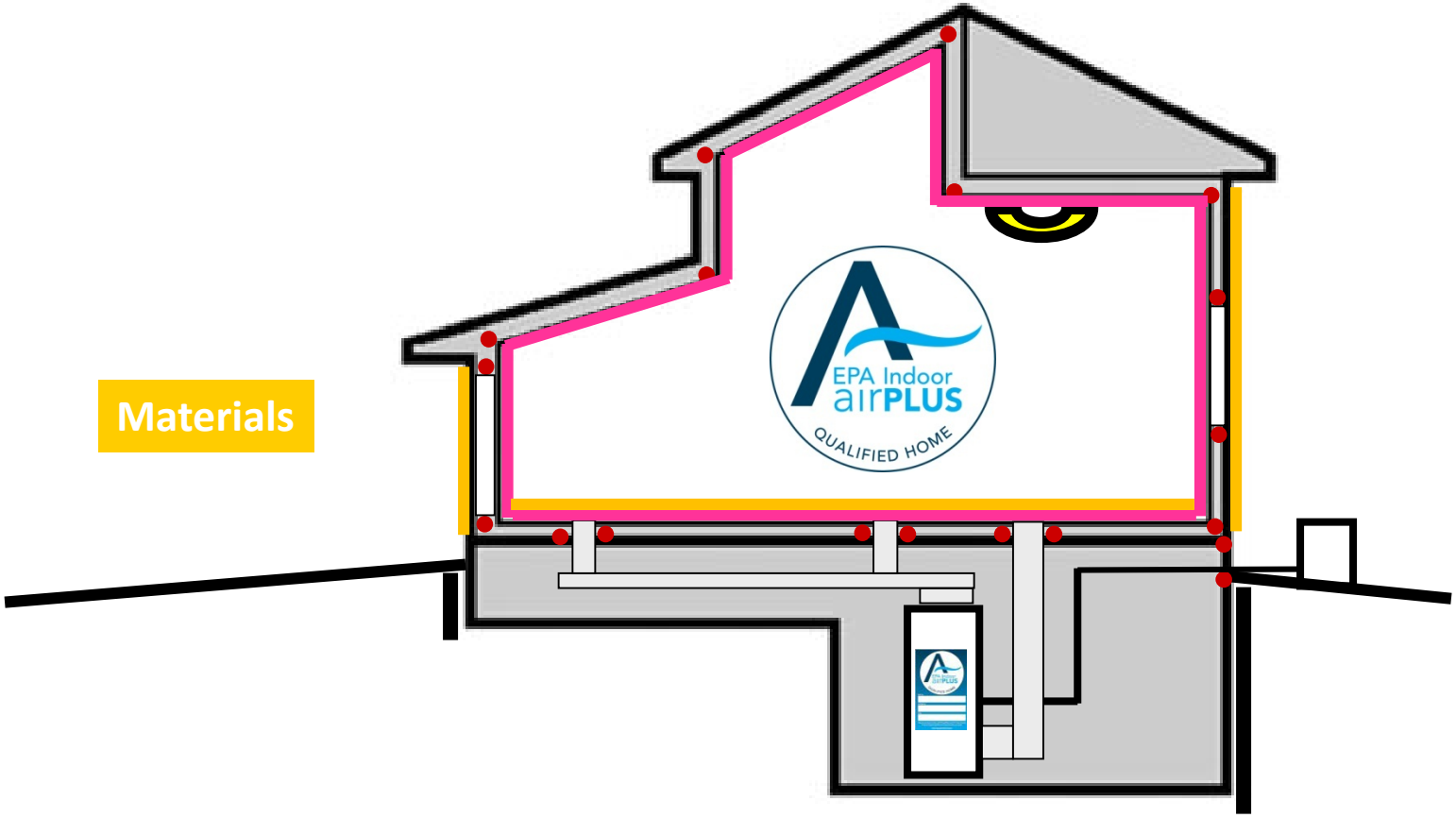
| Section | Changes |
|---|---|
| 5.4 Attached Garages | Change: Homes with a supply-only or balanced whole-house ventilation system designed to maintain the living space under a positive or neutral pressure relative to the garage are no longer required to install a garage exhaust fan.<br><br>Homes with exhaust-only whole house ventilation must meet one of the following two requirements:<br>-Equip the attached garage with an exhaust fan with a minimum installed capacity of 70 cfm that is vented directly outdoors.<br>OR<br>-Verify that the garage-to-house air barrier can maintain a pressure difference of greater than 45 Pascals while the home maintains a 50 Pascal pressure difference with respect to the outdoors. All operable garage openings shall be closed during this test. |

# Revision 3 Combustion Pollutant Changes

| Section | Changes |
|---|---|
| 5.1 Emissions standards met for fuel-burning and space-heating appliances. | Clarified and updated requirements for factory-built wood-burning fireplaces, gas fireplaces, and decorative gas logs.<br><br>Clarified references to EPA's New Source Performance Standards for new residential wood heaters. |
| 5.3 Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | Provided an advisory for air-tightness testing to ensure effective compartmentalization of multifamily units. |

# 6. Low Emission Materials

**Materials**




Indoor Air Quality (IAQ)

# 6. Low Emission Materials

**Potential Issues**:

- Indoor levels of many chemical pollutants can be **2-5 times higher than outdoor levels**.
- Volatile Organic Compounds (**VOCs**) include a variety of chemicals, some of which may have short- and long-term adverse health effects, including eye, nose and throat irritation, headaches, loss of coordination, nausea, damage to liver, kidney, and central nervous system.

# How to Find Indoor airPLUS Compliant Low Emission Products


- Guidance on identifying compliant low-emission products and 3rd party labels.
- https://www.epa.gov/indoorairplus/indoor-airplus-compliant-low-emission-products

EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# What are the Requirements?

**6.1 – Composite Wood**

Structural panels, cabinetry, shelving, trim, doors, stair treads, flooring, etc.

**6.2 - Interior Paints and Finishes**

Site-applied coatings only, but not simply "low-VOC".

**Indoor airPLUS – Section 6**

***Low-emission Materials***

**6.3 – Carpet and Carpet Adhesives**

CRI Green Label

**6.4 – Adhesives and Sealants**

Recommended but not yet required.

# 6.1 Composite Wood

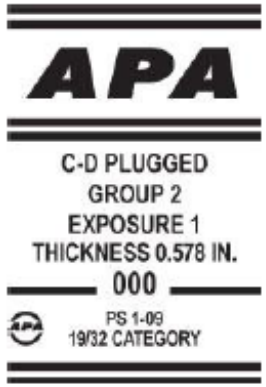
- Use certified low-formaldehyde products for all composite wood materials installed in the home including, but not limited to: **structural panels, cabinetry, shelving, trim, doors, stair treads, flooring, etc.**
- Specific standards or certifications apply to these product types:
  - **Structural Plywood**
  - **Hardwood Plywood**
  - **Particleboard & MDF**
  - **Cabinetry**

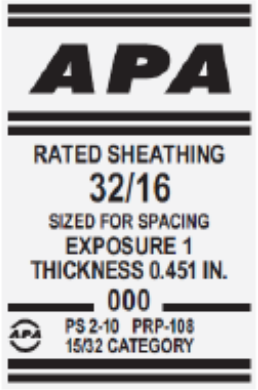
# 6.1 – Composite Wood

**Structural plywood and oriented strand board (OSB)**

**Requirement:** Use only products certified as compliant with PS1 or PS2, as appropriate, and made with moisture-resistant adhesives as indicated by "Exposure 1" or "Exterior" on the American Plywood Association (APA) trademark.

| Meet either standard below | How to find compliant products |
|---|---|
| ***PS 1-09 or***<br>***PS 2-10*** | **Look for the APA PS1 or PS2 label.**<br>Building codes in the U.S. require use of PS-1 or PS-2 panels when used for structural purposes. These products are widely available. List of manufacturers that produce APA PS1 or PS2 products: http://www.apawood.org/plywood |



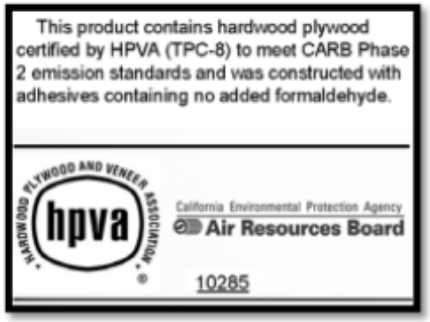



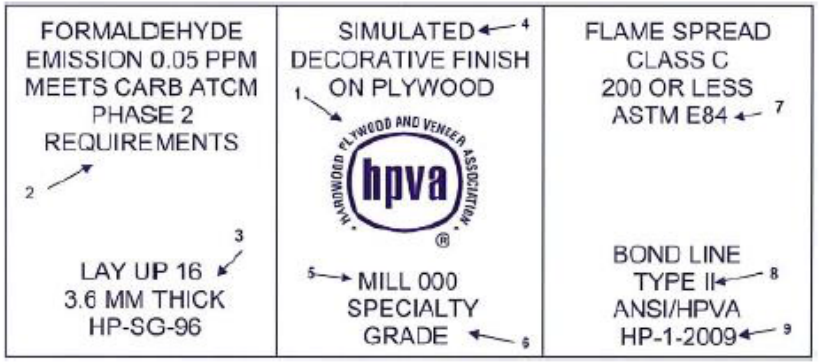
# 6.1 Composite Wood – Structural Wood Panels

## Hardwood Plywood

**Requirement:** Use only hardwood plywood products certified as compliant with Formaldehyde emissions requirements of ANSI/HPVA HP-1-2009; **OR** CA Airborne Toxics Control Measure (ATCM) to Reduce Formaldehyde Emissions from Composite Wood Products.

| Meet either standard below | How to find compliant products |
|---|---|
| ***ANSI/HPVA HP-1-2009*** | **Look for the HPVA HP-1 label on products, packaging, and/or spec sheets.**<br><br>The HPVA HP-1 certification label demonstrates compliance below California ATCM for formaldehyde and HUD Title 24 formaldehyde levels.<br><br>Find HPVA / TPC-8 CARB Compliant Composite Wood Products Manufacturers here: http://www.hpva.org/sites/default/files/CARB%20TPC8%20LIST%202015-6-4.pdf |



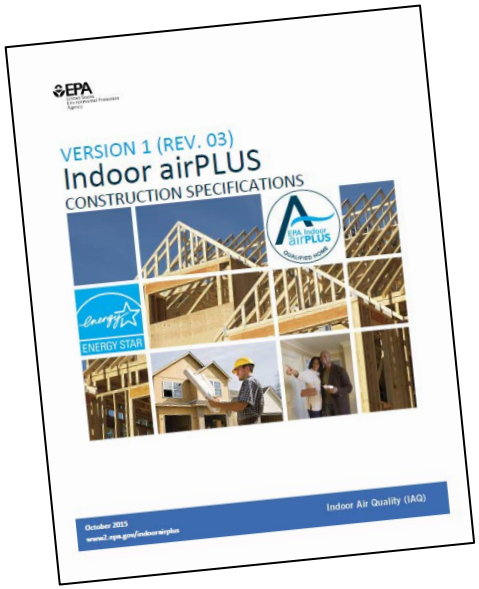




# 6.1 Composite Wood – Hardwood Plywood

# 6.1 Composite Wood - HWPW

# 6.1 Composite Wood - HWPW

# 6.1 Composite Wood - NAF…ULEF…NAUF




- GREENGUARD or GREENGUARD GOLD Certification for Cabinetry.

**Note:** "No added formaldehyde" (NAF) or "Ultra-low emitting formaldehyde" (ULEF) products that are specifically exempted from the California ATCM to Reduce Formaldehyde Emissions from Composite Wood Products are compliant with Indoor airPLUS.

**6.2 Interior Paints and Finishes**

Indoor airPLUS compliant

- NAF – No added formaldehyde
- ULEF – Emissions are consistently below Phase 2 standards

Not Indoor airPLUS compliant

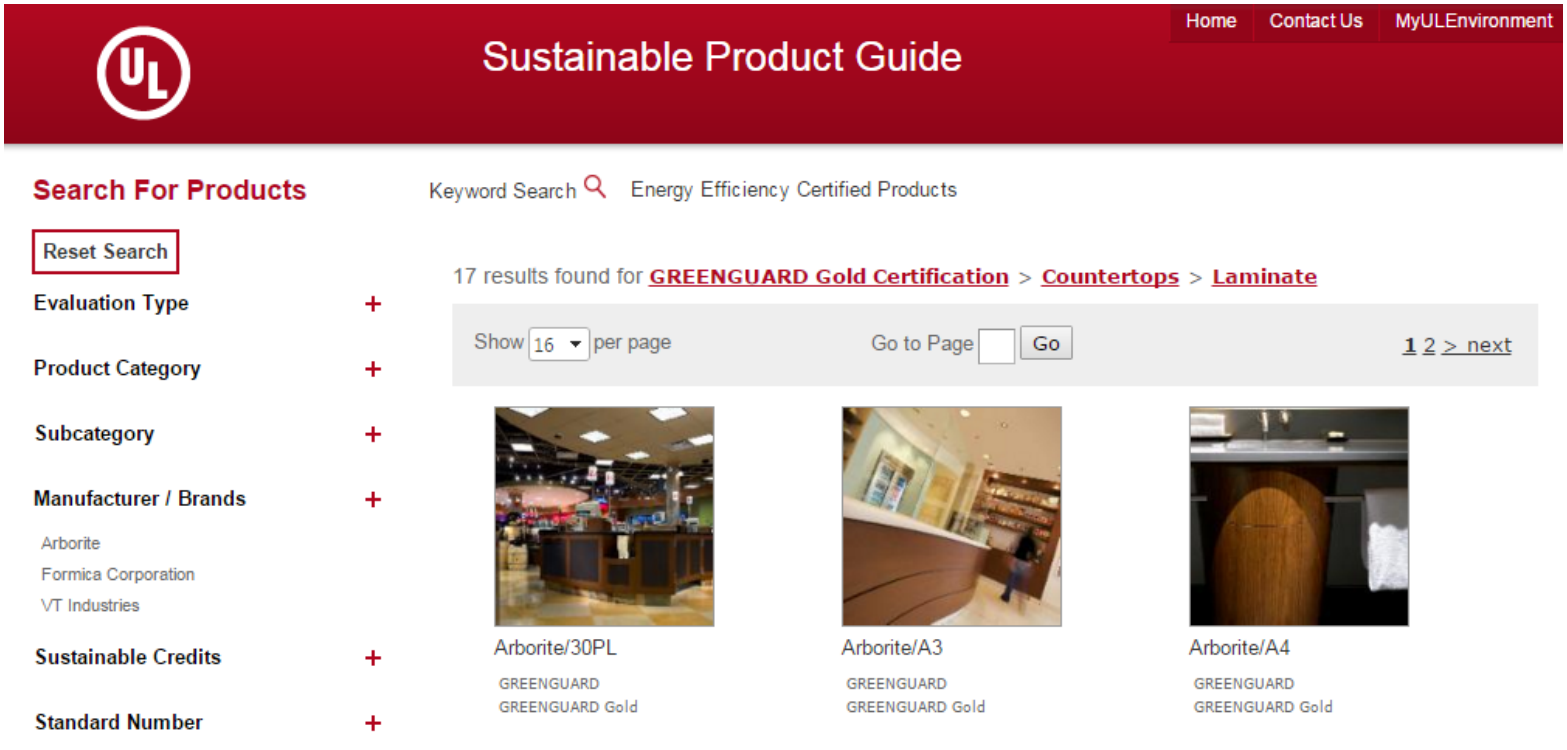
- NAUF – Products labeled only as "No added urea formaldehyde" are not addressed by CARB and are not compliant with Indoor airPLUS

For more info:
http://www.arb.ca.gov/toxics/compwood/naf_ulef/naf_ulef.htm

EPA Indoor airPLUS
Indoor Air Quality (IAQ)

# Particleboard & MDF

| | |
|---|---|
| ***GREENGUARD or GREENGUARD Gold Certification*** | For a list of GREENGUARD or GREENGUARD Gold certified products, visit:<br>http://productguide.ulenvironment.com/SearchResults.aspx?CertificationID=1 |



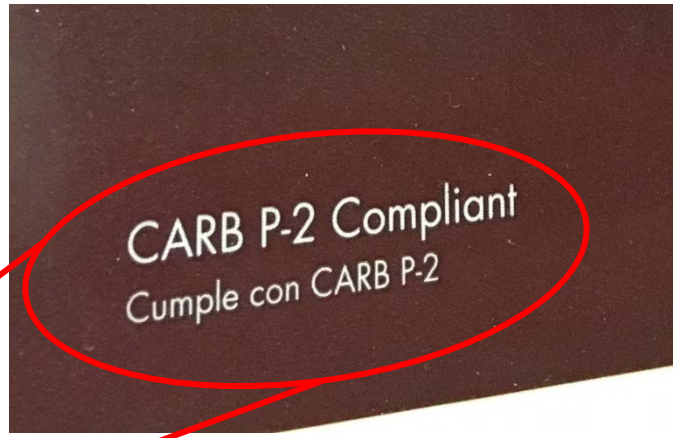

Search for GREENGUARD and GG Gold products under:

- Adhesives/Sealants
- Cabinetry
- Countertops
- Flooring
- Panels, Surfacing Materials, etc.

Indoor Air Quality (IAQ)

# 6.1 Composite Wood – What about flooring?

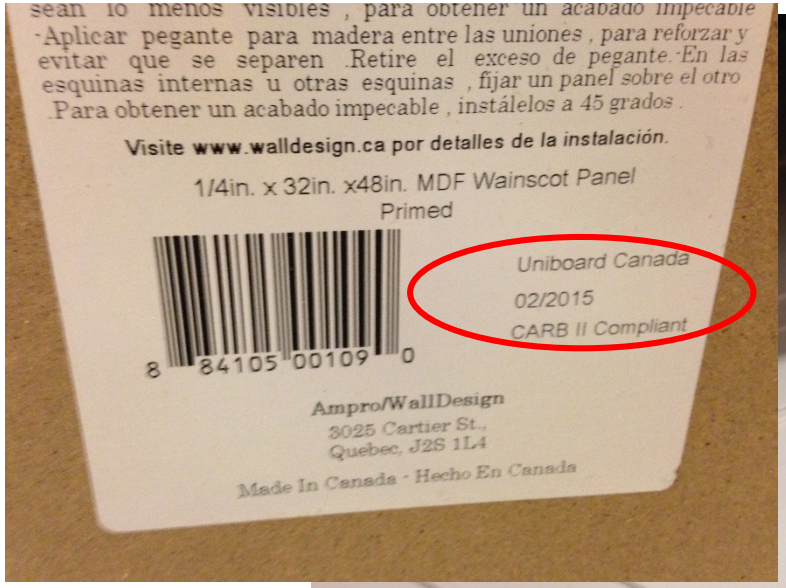
# 6.1 Composite Wood – Particleboard


EPA Indoor airPLUS

# 6.1 Composite Wood - MDF


# 6.1 Composite Wood – MDF (Wainscot Panel)




# 6.1 Composite Wood – Cabinetry

**Cabinetry**

**Requirement:** Use Cabinetry made with component materials (plywood, particleboard, MDF) that are certified to comply with the appropriate standards above; **OR** registered brands or products produced in plants certified under the Kitchen Cabinet Manufacturers Association's (KCMA) Environmental Stewardship Certification Program (ESP 05-12); **OR** GREENGUARD or GREENGUARD Gold Certification for Cabinetry.

| Meet at least one standard below | How to find compliant products |
|---|---|
| ***Cabinet components must comply with the appropriate standard above*** | **Look for:**<br>• **ANSI A208.1 or ANSI A208.2, OR**<br>• **the ECC label, OR**<br>• **GREENGUARD or GREENGUARD GOLD.** |
| ***KCMA's Environmental Stewardship Program (ESP 05-12)*** | **Look for the KCMA-ESP label on cabinets (often sink bases), product packaging, and/or spec sheets.**<br>For a list of KCMA certified manufacturers that produce compliant cabinets, visit: http://www.kcma.org/Members/ESP_Certified_Manufacturers<br>*Note: Manufacturers listed in the link above can be used as a resource, but partners should request confirmation from the manufacturer or supplier that the product lines they are using are indeed compliant.* |
| ***GREENGUARD or GREENGUARD Gold Certification for Cabinetry*** | For a list of GREENGUARD or GREENGUARD Gold certified cabinetry, visit:<br>http://productguide.ulenvironment.com/SearchResults.aspx?CategoryID=47 |

**Note: Do not confuse the 2 KCMA labels. Look for the green ESP label, not the standard KCMA label.**



# 6.1 Composite Wood – Cabinetry

# 6.1 Composite Wood – Cabinetry

# 6.1 Composite Wood

Verification

- Can be builder or Rater verified.
- **Verify documentation before the start of construction** that the composite wood materials supplied will meet the required emissions standards.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Materials | 6.1 | All composite wood products certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.2 | Interior paints and finishes certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.3 | Carpet, carpet adhesives, and carpet cushion certified low-emission. See spec. | ☐ | ☐ | ☐ | ☐ |

# 6.2 Interior Paints and Finishes


- At least 90% of the interior surface area covered by site-applied paints and coatings shall use low-VOC or no-VOC products certified by one of the following third-party standards or certifications:
  - **GREENGUARD or GREENGUARD Gold**
  - **SCS Indoor Advantage Gold**
  - **A third-party low-emitting product based on CA Section 01350 (CDPH Standard Method V1.1-2010)**
  - **Green Seal Standard GS-11**
  - **Green Wise and Green Wise Gold**
  - **MPI Green Performance Standards X-Green, GPS-1, or GPS-2.**

## 6.2 Interior Paints and Finishes

**Requirement:** At least 90 percent of the interior surface area covered by site-applied paints and coatings shall use low-VOC or no-VOC products certified by one of the following third-party standards or certifications:

| Meet at least one of the standards below | How to find compliant products |
|---|---|
| ***GREENGUARD or GREENGUARD GOLD Certification for Paints and Coatings*** | **Look for GREENGUARD labels on products, packaging, or spec sheets:**<br><br>Search for GREENGUARD and GREENGUARD Gold certified paint and coating products at:<br><br>http://productguide.ulenvironment.com/SearchResults.aspx?CategoryID=15&SubCategoryID=28 |
| ***Scientific Certification Systems (SCS) Standard EC-10.2-2007 or Indoor Advantage Gold*** | **Look for the Indoor Advantage Gold label on products, packaging, or spec sheets.**<br><br>OR find Scientific Certification Systems certified products at:<br>http://www.scsglobalservices.com/certified-green-products-guide?scscertified=1 |
| ***CA Section 01350 (CDPH Standard Method V1.1-2010)*** | **Look for low-emitting products found in the CHPS database.**<br><br>CA 01350 Certified products can be found in the Collaborative for High Performance Schools searchable high performance product database under the category "Interior Finish and Trim" with attribute "Low Emitting Material: http://www.chps.net/dev/Drupal/node/445 |

# 6.2 – Interior Paints and Finishes

| | |
|---|---|
| ***Green Seal Standard GS-11*** | **Look for the Green Seal label on products, packaging, or spec sheets:**<br>Green Seal Standard GS -11 products:<br>http://www.greenseal.org/FindGreenSealProducts andServices.aspx?vid=ViewProductDetail&cid=0&sid=6 |
| ***Green Wise and Green Wise Gold products*** | **Look for the Green Wise labels on products, packaging, or spec sheets.**<br>Find Green Wise and Green Wise Gold products: http://greenwisepaint.com/ products/interior-top-coat |
| ***Master Painters Institute (MPI) Green Performance ® Standards X-Green, GPS-1 or GPS-2.*** | **Look for the MPI labels on products, packaging, or spec sheets:**<br>Find MPI approved products: http://www.paintinfo.com/mpi/ approved/Specification_index.shtml |

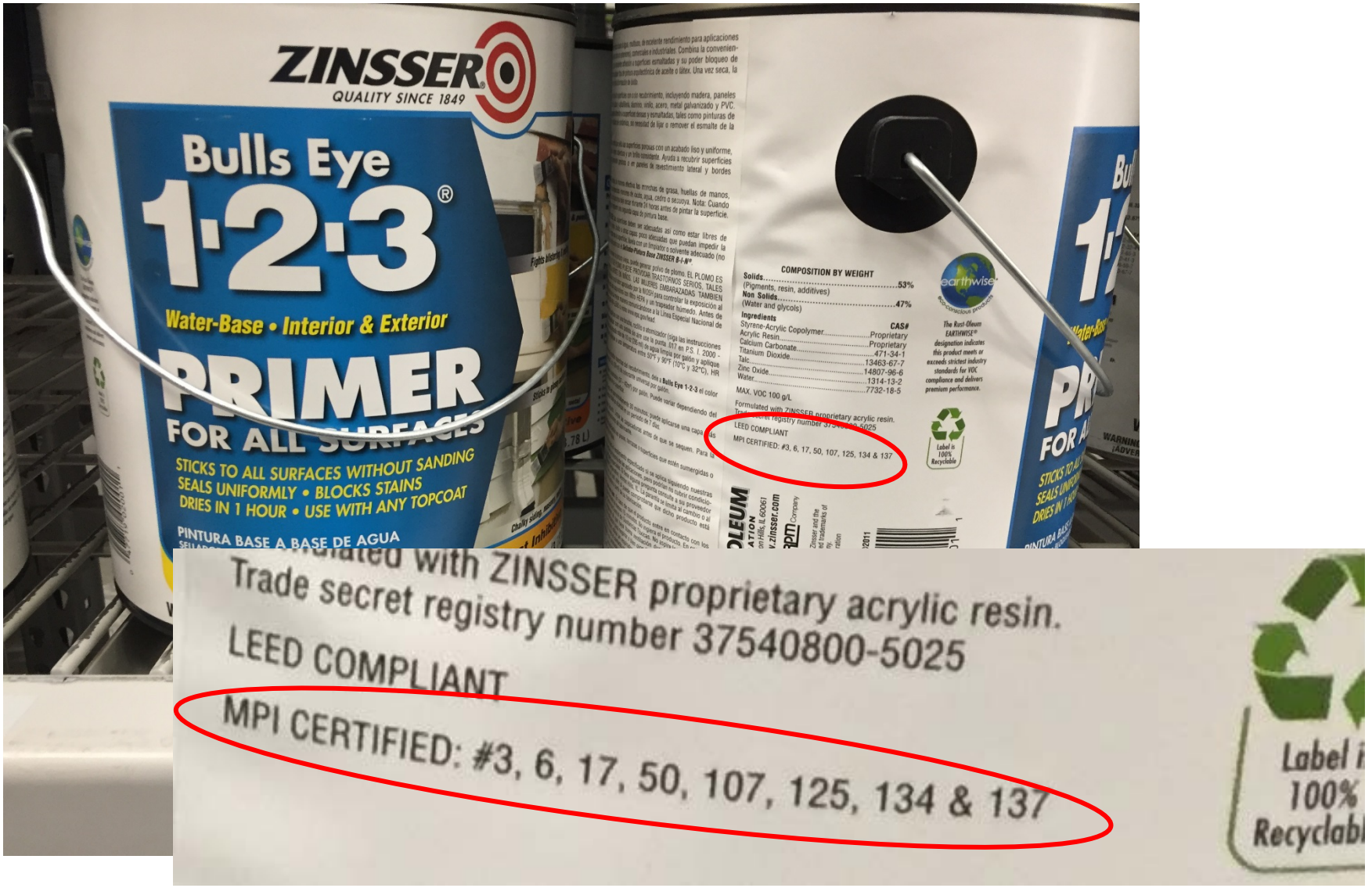
# 6.2 – Interior Paints and Finishes


EPA Indoor airPLUS

# 6.2 – Interior Paints and Finishes

# 6.2 – Interior Paints and Finishes

**Is this product compliant?**

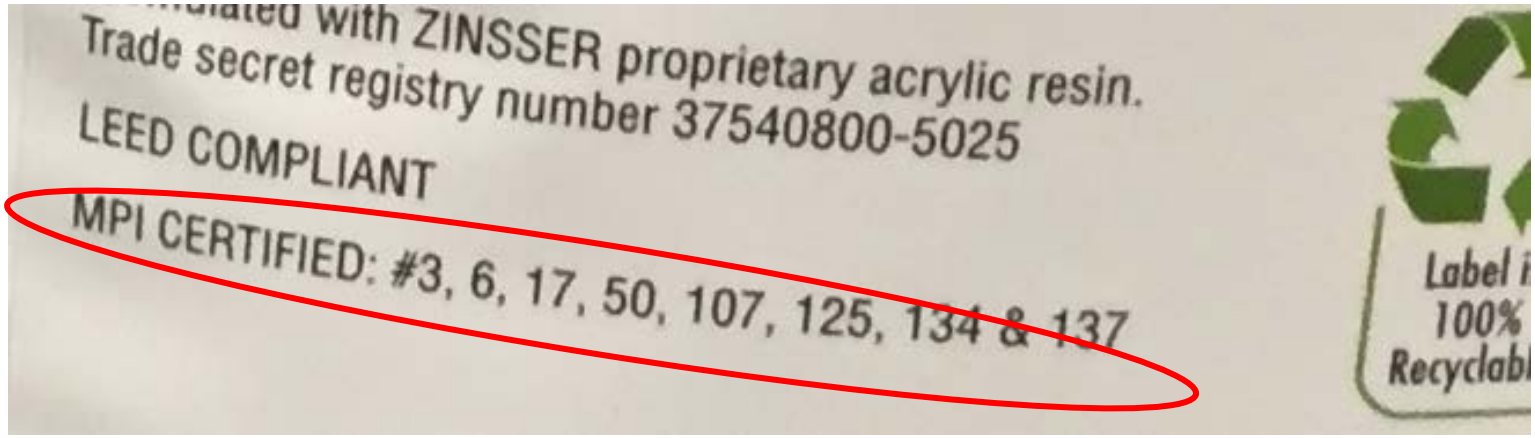


# 6.2 – Interior Paints and Finishes

**Is this product compliant?**

| | |
|---|---|
| ***Master Painters Institute (MPI) Green Performance ® Standards X-Green, GPS-1 or GPS-2.*** | **Look for the MPI labels on products, packaging, or spec sheets:**<br>Find MPI approved products:<br>http://www.paintinfo.com/mpi/approved/Specification_index.shtml |





# 6.2 – Interior Paints and Finishes

**Is this product compliant?**

Name, Label or Code | Product Index By MPI Number | Product Index By Alphabetical | Product Index By Type | GPS Products

## MPI Approved Products List

## Index Alphabetical - List Updated February 1st, 2016

Paintinfo.com | Approved Products>>

previous **MPI # 50 Primer Sealer, Latex, Interior** next

A white, pigmented, water based latex sealer used on new interior plaster, concrete and gypsum wallboard surfaces that are subsequently painted with latex or alkyd finish coat(s). Its purpose is to reduce the porosity of the substrate for finish coats. Not intended for use on wood or previously painted surfaces.

[Evaluated characteristics include consistency/viscosity, dry time, fineness of grind, hiding power by contrast ratio method, reflectance, alkali resistance holdout properties, and sanding properties. See MPI 'Detailed Performance' Specs for complete details, specific requirements, and/or reference specs.]

MPI Detailed Performance

| MPI VOC Ranges (grams/L) | E3 <51 g/l | E2 51 - 100 g/l | E1 101 - 150 g/l | E '0' - outside range, n/a - unavailable |
|---|---|---|---|---|

EPR - Environmental/Performance Rating (VOC & Relative Performance of Category+Gloss & Appropriate Specified Use). ✔ meets GPS-1, ✔ meets MPI GPS-2 for Standard Category: Primers, Sealers & Undercoaters ✔ meets RG (OTC or EC) ✔ meets LEED 2009 (excluding LEED for schools)

| Listing Mfr | Label | Product Name | Code | E Range | RG | L | EPR | GPS-1 | GPS-2 |
|---|---|---|---|---|---|---|---|---|---|

# 6.2 – Interior Paints and Finishes

**Is this product compliant? - Yes**

EPR - Environmental/Performance Rating (VOC & Relative Performance of Category+Gloss & Appropriate Specified Use). ✔ meets GPS-1, ✔ meets MPI GPS-2 for Standard Category: Primers, Sealers & Undercoaters ✔ meets RG (OTC or EC) ✔ meets LEED 2009 (excluding LEED for schools)

| Listing Mfr | Label | Product Name | Code | E Range | RG | L | EPR | GPS-1 | GPS-2 |
|---|---|---|---|---|---|---|---|---|---|
| PPG Architectural | Sico (CA) | Expert Interior Primer-Sealer Latex | 870-799 | E 2 | ✔ | ✔ | 2 | ✔ | |
| PPG Architectural | Sico (CA) | Expert Interior Latex Primer-Sealer | 870-130 | E 2 | ✔ | | 2 | ✔ | |
| Pratt & Lambert | Pratt & Lambert | Int/Ext Multi-Purpose Waterborne Primer | P1001/F2001 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rodda Paint Co. | Master Painter | UL Primer | 503601 | E 3 | ✔ | ✔ | 3 | ✔ | ✔ |
| Rodda Paint Co. | Rodda Paint | Scotseal Primer | 507801 | E 2 | ✔ | | 2 | | |
| Rust-Oleum | Rust-Oleum | Sierra Performance Griptec Multi Surface Primer | 208028 | E 3 | ✔ | ✔ | 3 | ✔ | ✔ |
| Rust-Oleum | Zinsser | AllPrime Interior-Exterior Primer Sealer | 250960 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rust-Oleum | Zinsser | Allprime Water Base Primer (Int) | 6821 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rust-Oleum | Zinsser | Allprime Zero | 291072 | E 3 | ✔ | ✔ | 3 | ✔ | ✔ |
| Rust-Oleum | Zinsser | Bull Eye Water-Based Primer | 2241 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rust-Oleum | Zinsser | Bulls Eye 123 Plus | 249937 | E 3 | ✔ | ✔ | 3 | ✔ | ✔ |
| Rust-Oleum | Zinsser | Bulls Eye 1-2-3 Primer/Sealer/Stain Killer | 2000, 2001, 2004 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rust-Oleum | Zinsser | Bulls Eye 2 | 285156 | E 2 | ✔ | ✔ | 2 | ✔ | |
| Rust-Oleum | Zinsser | Bulls Eye Zero Primer | 249019/20/21 | E 3 | ✔ | ✔ | 3 | ✔ | ✔ |

# 6.2 Interior Paints and Finishes

Verification

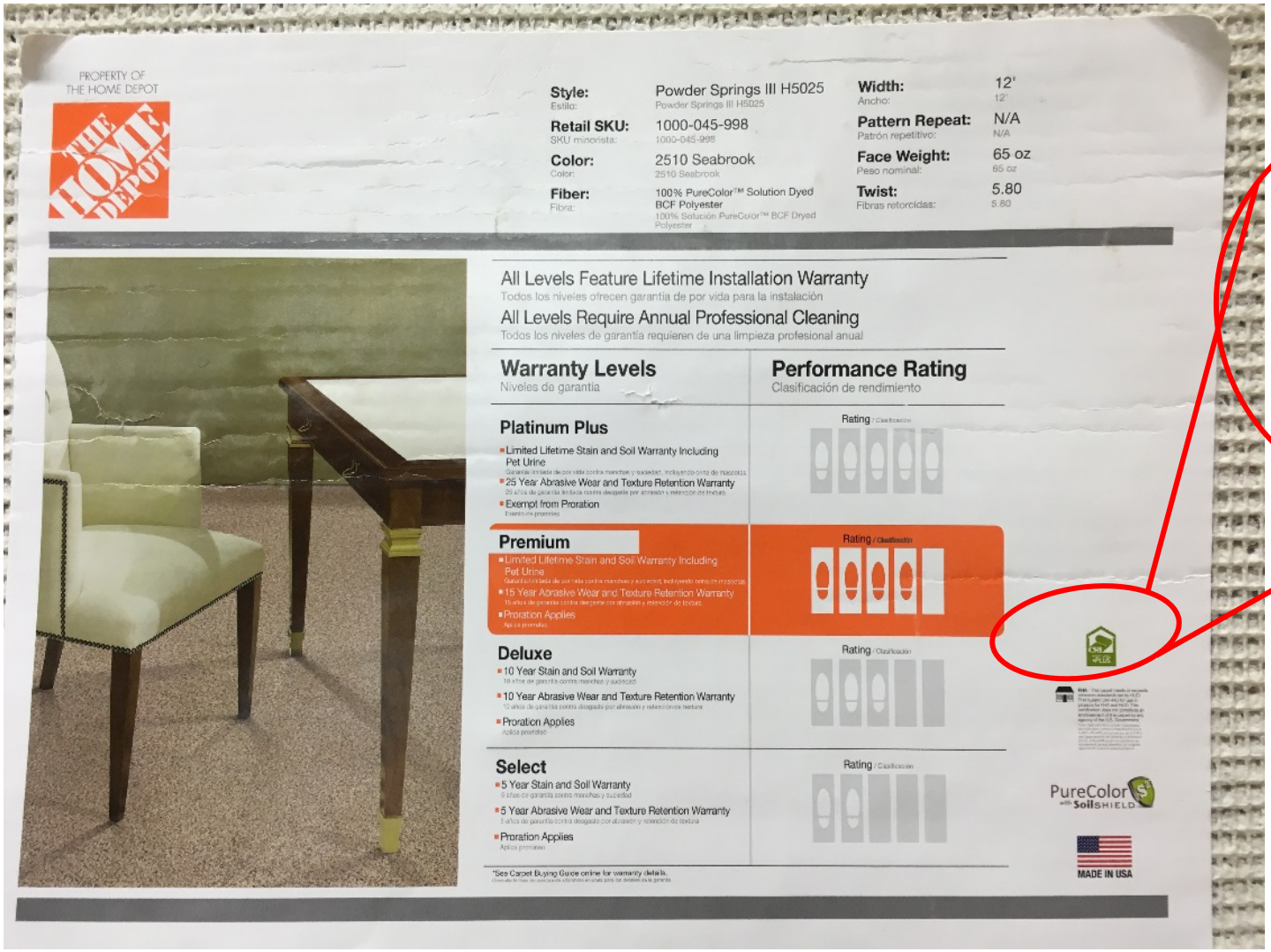
- Can be builder or Rater verified.
- **Verify documentation before the start of construction** that the paints and finishes supplied will meet the required emissions standards.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Materials | 6.1 | All composite wood products certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.2 | Interior paints and finishes certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.3 | Carpet, carpet adhesives, and carpet cushion certified low-emission. See spec. | ☐ | ☐ | ☐ | ☐ |

# 6.3 Carpets and Carpet Adhesives

- **Use carpets and carpet adhesives labeled with the Carpet and Rug Institute (CRI) Green Label Plus testing program criteria.**
- **Use carpet cushion products certified to meet the CRI Green Label Plus or Green Label testing program criteria.**

# 6.3 Carpet and Carpet Cushion



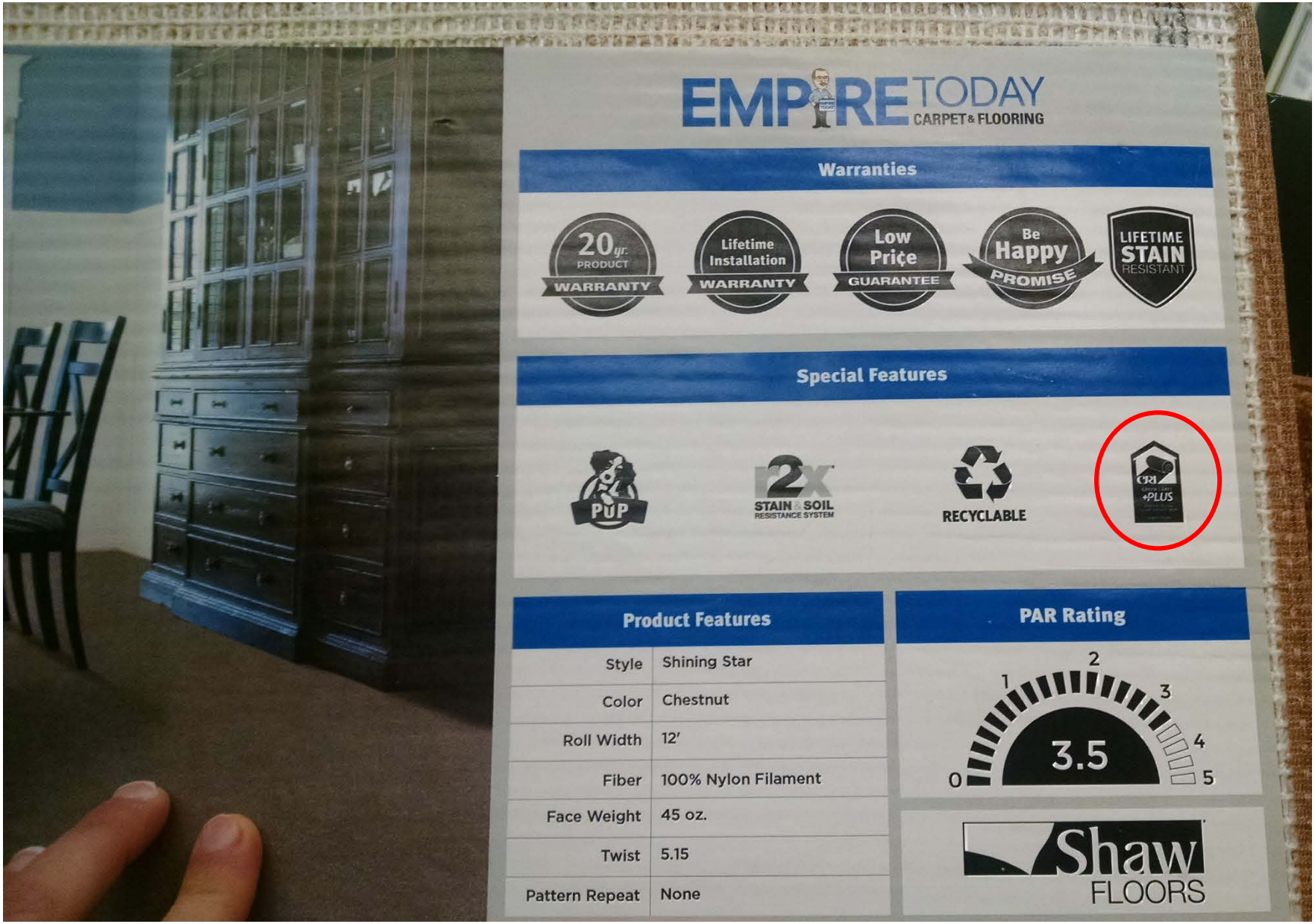


EPA Indoor airPLUS

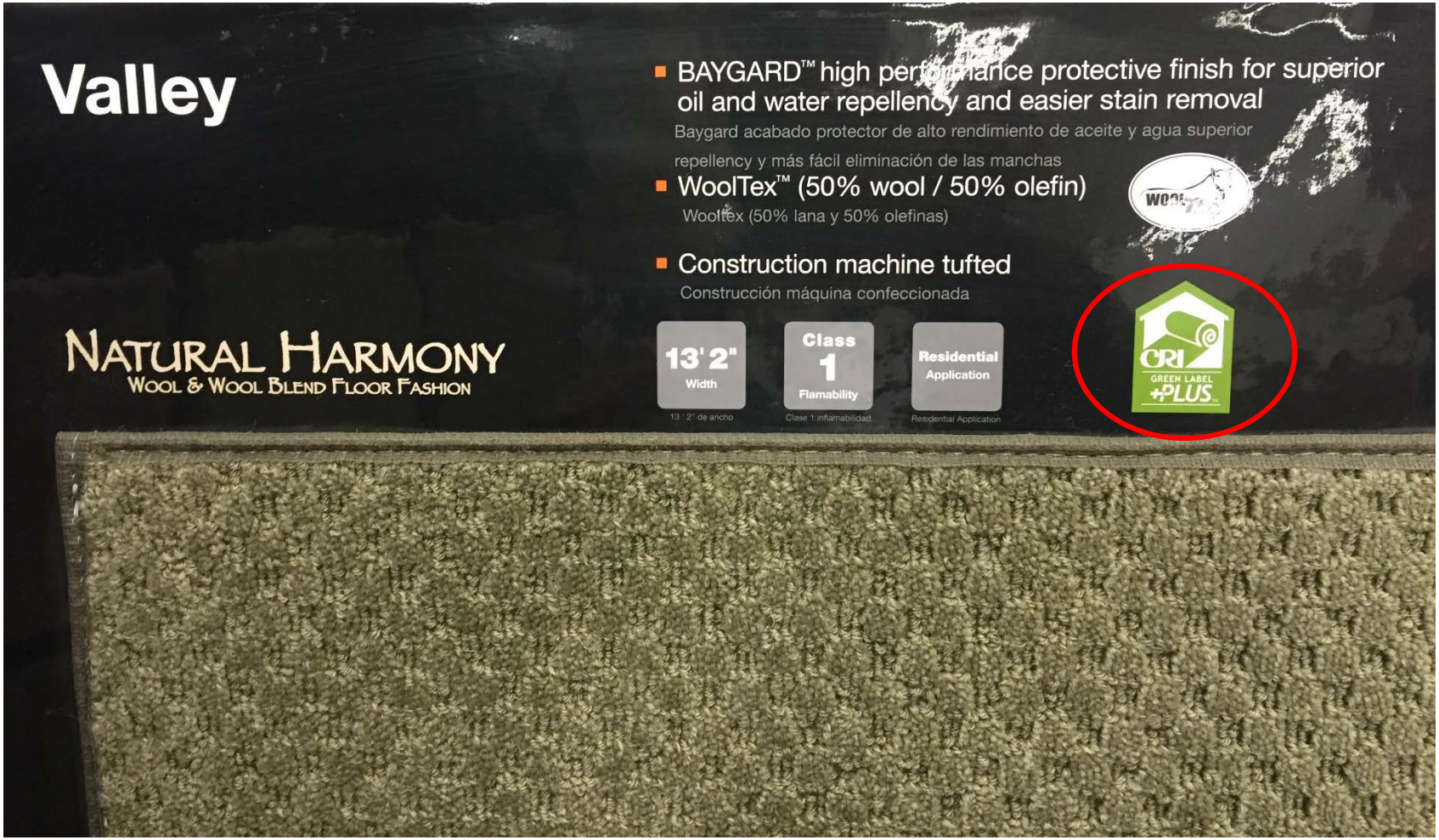
Indoor Air Quality (IAQ)

# 6.3 Carpet and Carpet Cushion

# 6.3 Carpet and Carpet Cushion



# 6.3 Carpet and Carpet Cushion




EPA Indoor airPLUS

# 6.3 Carpet and Carpet Cushion

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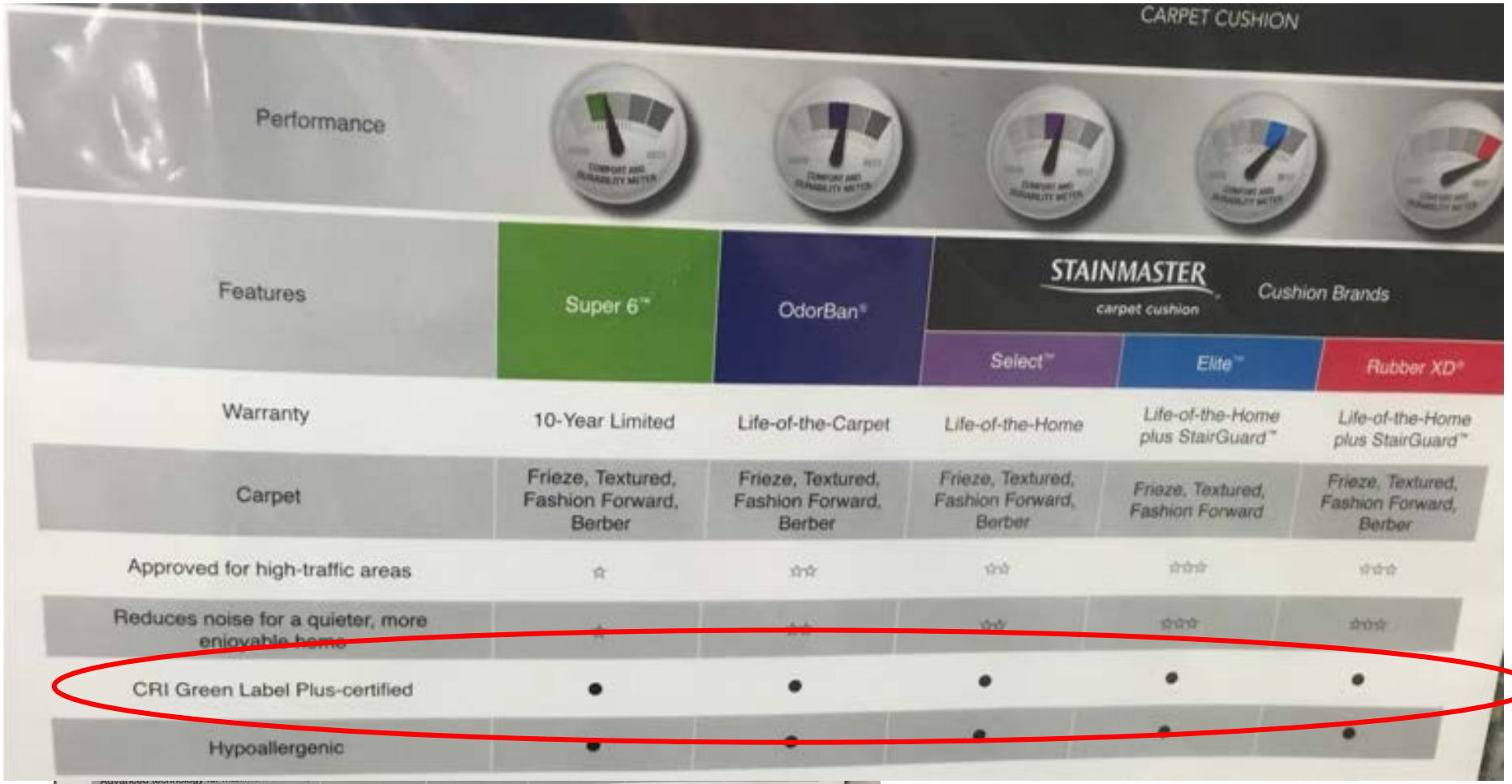
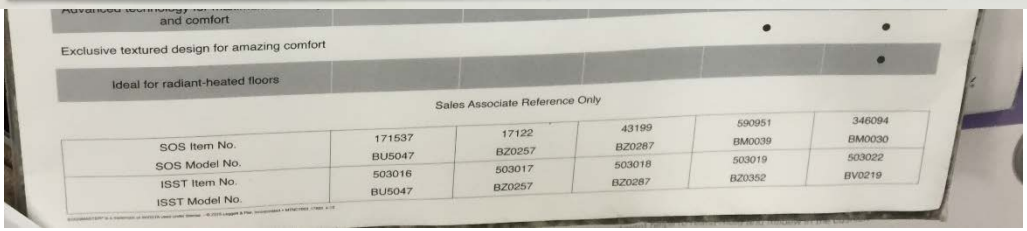



EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# 6.3 Carpets and Carpet Adhesives

Verification

- Can be builder or Rater verified.
- **Verify documentation before the start of construction** that the carpet and carpet adhesives will meet the required emissions standards.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Materials | 6.1 | All composite wood products certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.2 | Interior paints and finishes certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.3 | Carpet, carpet adhesives, and carpet cushion certified low-emission. See spec. | ☐ | ☐ | ☐ | ☐ |

# 6.4 Adhesives and Sealants


**Advisory: While not currently required by Indoor airPLUS, EPA recommends that at least 90 percent of site-applied interior adhesives and sealants be low-VOC or no-VOC products certified by one of the following third-party standards or certifications:**

- **Green Seal GS-36, or**
- **GREENGUARD or GREENGUARD Gold, or**
- **A third-party product based on CA Section 01350**

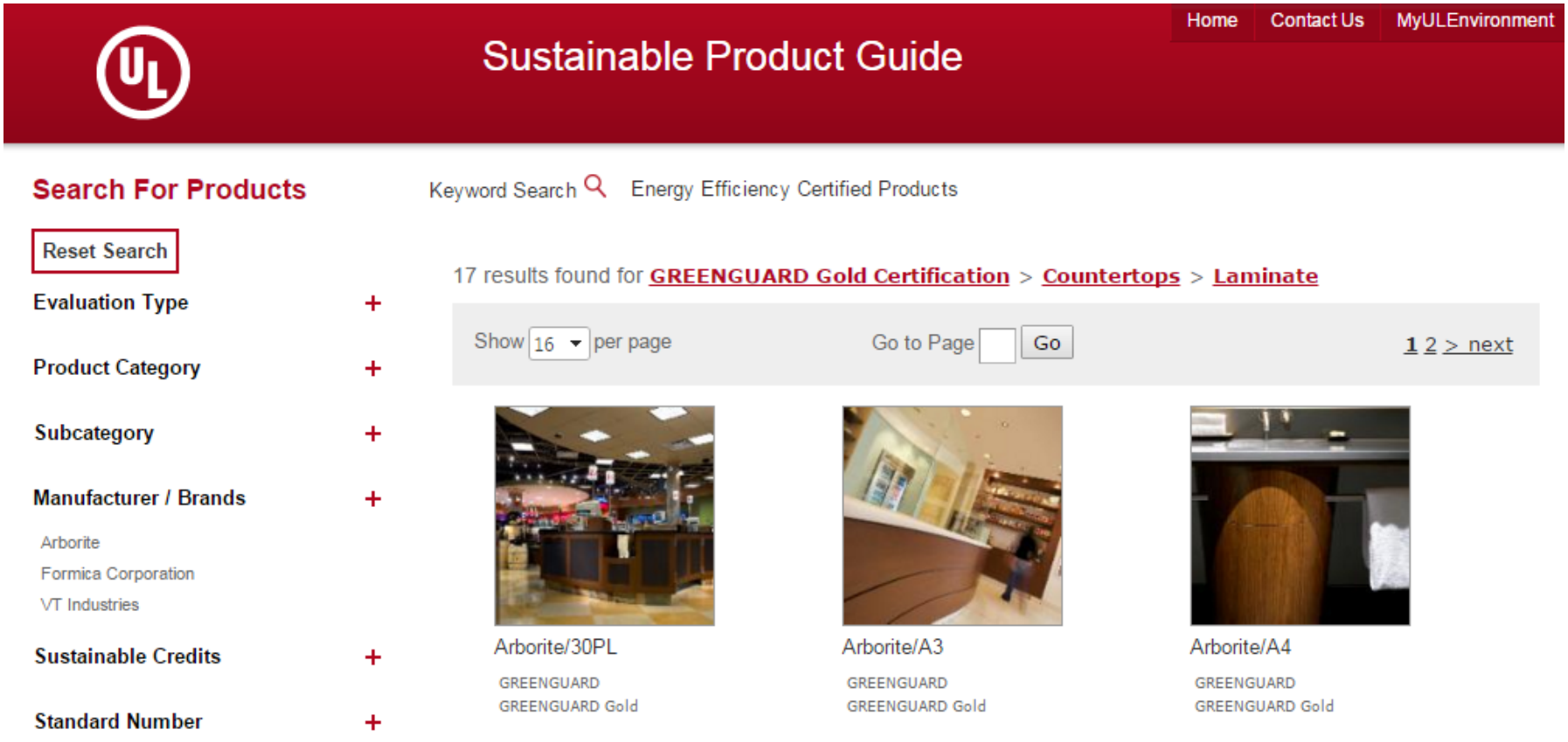
# 6.4 – Adhesives and Sealants

# 6.4 – Adhesives and Sealants


EPA Indoor airPLUS

# 6.4 – Adhesives and Sealants


# Can’t find a product?




Search for GREENGUARD and GG Gold products under: http://productguide.ulenvironment.com/SearchResults.aspx?CertificationID=1

- Adhesives/Sealants
- Cabinetry
- Countertops
- Flooring
- Panels, Surfacing Materials, etc.

# 6. Low Emission Materials

**Homeowner Benefits**

Less “chemical” smell

Lowered exposure to VOCs

Reduced potential for occupant health complaints

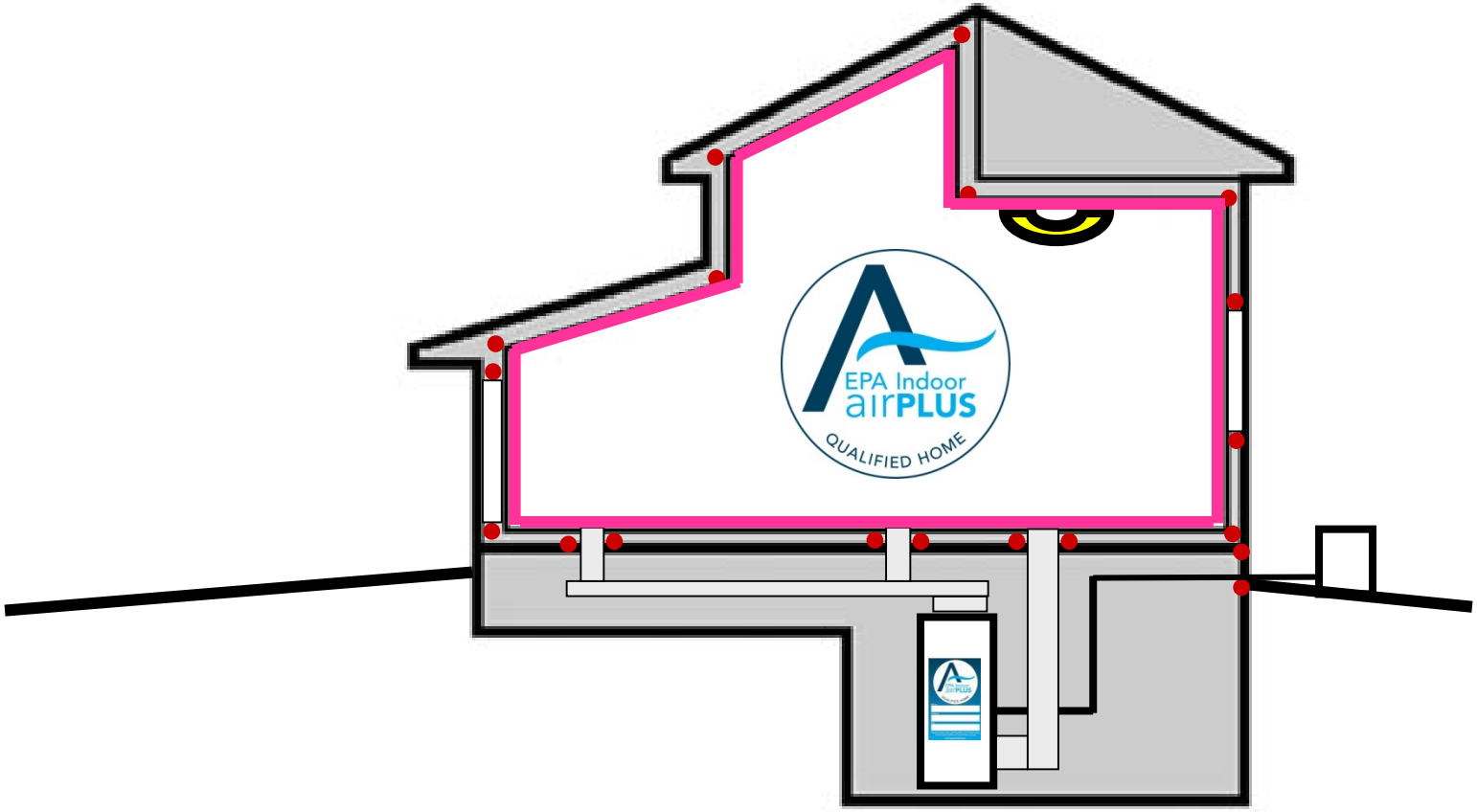
# Revision 1 & 2 Low Emission Materials Changes

| Section | Changes |
|---|---|
| 6. Low Emission Materials | |
| 6.2 Interior Paints and Finishes | Compliance Option Added: Master Painters Institute (MPI) X-Green. |
| 6.3 Carpets and Carpet Adhesives | Exception Added: 90% or more of finished surface area covered by carpet and carpet adhesives must comply with requirements.<br><br>Clarification Added: At least 90 percent of the surface area covered by carpet and carpet adhesives must use products labeled with, or otherwise documented as meeting, the Carpet and Rug Institute's (CRI) Green Label PLUS testing program criteria. |

# Revision 3 Low Emission Materials Changes

| Requirement | Revision |
|---|---|
| 6 Low-Emission Materials | New resource, *How to Find Indoor airPLUS Compliant Low Emission Products*, included for guidance on identifying compliant low-emission products and 3rd-party labels. |
| 6.1 Composite wood products certified low-emission | Updated list of compliant products for hardwood plywood, particleboard, MDF, and cabinetry. |
| 6.2 Certified low-VOC or no-VOC interior paints and finishes | Added GREENGUARD GOLD, Green Wise, and Green Wise Gold products to list of applicable third-party certifications. |
| 6.3 Carpet, carpet adhesives and carpet cushion certified low emission | Added Green Label Plus as a certifying option for carpet cushion. |
| 6.4 Low-VOC adhesives and sealants (recommended, not required) | Added advisory recommending that site-applied interior adhesives and sealants be low-VOC or no-VOC and certified by listed third-party standards or certifications. |

# 7. Home Commissioning




Indoor Air Quality (IAQ)

# 7.1 HVAC and Duct Verification

✓ *Verify that HVAC systems and ductwork are installed according to their design.*

- **Inspect ductwork to verify it is dry and substantially free of dust or debris. If duct openings were not covered during construction, thoroughly vacuum out each opening.**
- **Inspect air-handling equipment and verify that the filter is new, clean and meets specified MERV rating.**

# 7.1 HVAC and Duct Verification

Verification

- Can be builder or Rater verified.
- **Visually verify at final inspection** that the ductwork and air-handling equipment is substantially free of dust and debris.
- **Visually verify at final inspection** that HVAC filters are new, clean, and meet specified MERV rating.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Final | 7.1 | HVAC system and ductwork verified to be dry and clean AND new filter installed. | ☐ | ☐ | ☐ | |
| | 7.2 | Home ventilated before occupancy. | ☐ | ☐ | ☐ | ☐ |
| | 7.3 | Equipment manuals, Indoor airPLUS label, and certificate provided for buyer. | ☐ | ☐ | ☐ | ☐ |

# 7.2 Ventilation after Material Installation


- Ventilate the home with outside air at the highest rate and duration practical, meeting ventilation requirements for air flow and humidity control (see Item 4.5):
  - **During and shortly after installing products that are known sources of contaminants, AND**
  - **During the period between finishing and occupancy.**

# 7.2 Ventilation after Material Installation

Verification

- Can be builder or Rater verified.
- Verify that the home has been ventilated with outside air.
  - During and shortly **after installing products** that are known sources of contaminants, AND
  - During the period **between finishing and occupancy**.
- The builder should **maintain a record** of the times ventilation of the home is completed.

| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Final | 7.1 | HVAC system and ductwork verified to be dry and clean AND new filter installed. | ☐ | ☐ | ☐ | |
| | 7.2 | Home ventilated before occupancy. | ☐ | ☐ | ☐ | ☐ |
| | 7.3 | Equipment manuals, Indoor airPLUS label, and certificate provided for buyer. | ☐ | ☐ | ☐ | ☐ |

# 7.3 Buyer Information Kit


- Provide buyers with information and documentation of the home's IAQ protections, including:
  - **HVAC, duct, and ventilation system design documentation.**
  - **Operations and maintenance instruction manuals for all installed equipment and systems addressed by Indoor airPLUS and ENERGY STAR requirements.**
  - **Indoor airPLUS label and certificate.**

# 7.3 Buyer Information Kit

Verification

- Can be builder or Rater verified.
- The builder should **retain a copy** of the buyer information kit provided to the homeowner.
- EPA recommends that the builder and Rater coordinate prior to construction to confirm the features that will be utilized in the home, and post-construction to ensure the homeowner receives the Indoor airPLUS certificate and label to apply to the electrical panel or other permanent fixture.

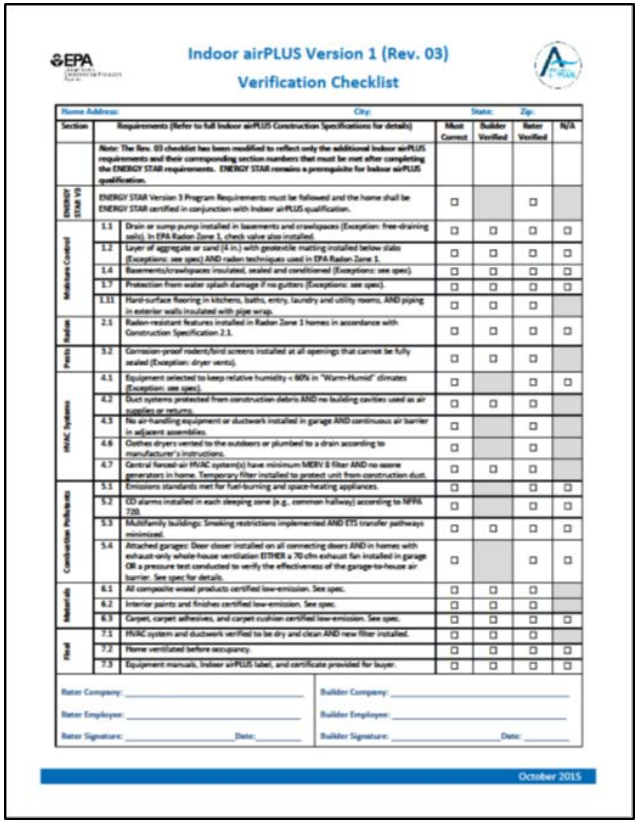
| Section | | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|---|
| Final | 7.1 | HVAC system and ductwork verified to be dry and clean AND new filter installed. | ☐ | ☐ | ☐ | |
| | 7.2 | Home ventilated before occupancy. | ☐ | ☐ | ☐ | ☐ |
| | 7.3 | Equipment manuals, Indoor airPLUS label, and certificate provided for buyer. | ☐ | ☐ | ☐ | ☐ |

# Sign and Date

The Rater who conducted the verification, or a responsible party from the Rater's company, must sign the completed Verification Checklist. The builder must sign the checklist if any items in the "Builder Verified" column are checked, and by so doing accepts full responsibility for verifying that those items meet Indoor airPLUS requirements.

| | |
|---|---|
| **Rater Company:** _____ | **Builder Company:** _____ |
| **Rater Employee:** _____ | **Builder Employee:** _____ |
| **Rater Signature:** _____ **Date:** _____ | **Builder Signature:** _____ **Date:** _____ |

# That's it. You are now ready to build and label Indoor airPLUS homes!



Indoor airPLUS Version 1 (Rev. 03)

Verification Checklist

Home Address: City: State: Zip:

| Section | Requirements (Refer to full Indoor airPLUS Construction Specifications for details) | Must Correct | Builder Verified | Rater Verified | N/A |
|---|---|---|---|---|---|
| | Note: The Rev. 03 checklist has been modified to reflect only the additional Indoor airPLUS requirements and their corresponding section numbers that must be met after completing the ENERGY STAR requirements. ENERGY STAR remains a prerequisite for Indoor airPLUS qualification. | | | | |
| ENERGY STAR V3 | ENERGY STAR Version 3 Program Requirements must be followed and the home shall be ENERGY STAR certified in conjunction with Indoor airPLUS qualification. | ☐ | | ☐ | |
| Moisture Control | 1.1 Drain or sump pump installed in basements and crawlspaces (Exception: free-draining soils). In EPA Radon Zone 1, check valve also installed. | ☐ | ☐ | ☐ | ☐ |
| | 1.2 Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs (Exceptions: see spec) AND radon techniques used in EPA Radon Zone 1. | ☐ | ☐ | ☐ | ☐ |
| | 1.4 Basements/crawlspaces insulated, sealed and conditioned (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.7 Protection from water splash damage if no gutters (Exceptions: see spec). | ☐ | ☐ | ☐ | ☐ |
| | 1.11 Hard-surface flooring in kitchens, baths, entry, laundry and utility rooms, AND piping in exterior walls insulated with pipe wrap. | ☐ | ☐ | ☐ | |
| Radon | 2.1 Radon-resistant features installed in Radon Zone 1 homes in accordance with Construction Specification 2.1. | ☐ | ☐ | ☐ | ☐ |
| HVAC Systems | 3.2 Corrosion-proof rodent/bird screens installed at all openings that cannot be fully sealed (Exception: dryer vents). | ☐ | ☐ | ☐ | |
| | 4.1 Equipment selected to keep relative humidity < 60% in "Warm-Humid" climates (Exception: see spec). | ☐ | | ☐ | ☐ |
| | 4.2 Duct systems protected from construction debris AND no building cavities used as air supplies or returns. | ☐ | ☐ | ☐ | |
| | 4.3 No air-handling equipment or ductwork installed in garage AND continuous air barrier in adjacent assemblies. | ☐ | | ☐ | |
| | 4.6 Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions. | ☐ | | ☐ | |
| | 4.7 Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust. | ☐ | ☐ | ☐ | |
| Combustion Pollutants | 5.1 Emissions standards met for fuel-burning and space-heating appliances. | ☐ | | ☐ | ☐ |
| | 5.2 CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720. | ☐ | | ☐ | ☐ |
| | 5.3 Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized. | ☐ | ☐ | ☐ | ☐ |
| | 5.4 Attached garages: Door closer installed on all connecting doors AND in homes with exhaust-only whole-house ventilation EITHER a 70 cfm exhaust fan installed in garage OR a pressure test conducted to verify the effectiveness of the garage-to-house air barrier. See spec for details. | ☐ | | ☐ | ☐ |
| Materials | 6.1 All composite wood products certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.2 Interior paints and finishes certified low-emission. See spec. | ☐ | ☐ | ☐ | |
| | 6.3 Carpet, carpet adhesives, and carpet cushion certified low-emission. See spec. | ☐ | ☐ | ☐ | ☐ |
| Final | 7.1 HVAC system and ductwork verified to be dry and clean AND new filter installed. | ☐ | ☐ | ☐ | |
| | 7.2 Home ventilated before occupancy. | ☐ | ☐ | ☐ | ☐ |
| | 7.3 Equipment manuals, Indoor airPLUS label, and certificate provided for buyer. | ☐ | ☐ | ☐ | ☐ |

Rater Company: _____ Builder Company: _____

Rater Employee: _____ Builder Employee: _____

Rater Signature: _____ Date: _____ Builder Signature: _____ Date: _____

October 2015

One additional checklist verified by the Rater

Place the Indoor airPLUS label adjacent to the ENERGY STAR label

EPA Indoor airPLUS

# Selling Indoor airPLUS


Indoor Air Quality (IAQ)

# Indoor airPLUS Sales Training Kit

- Educate your sales team and sell more Indoor airPLUS homes.
  - Improve sales agent's ability to effectively communicate the value of improved indoor air quality.
  - Gain knowledge and talking points on the features and benefits of the Indoor airPLUS Program.
- Included in the Sales Training Kit:
  - Trainers Guide and a Participant Guide
  - Interactive Activities
  - Scoring Matrix


EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# Indoor airPLUS Sales Training Kit

- Compatible with the ENERGY STAR Sales Training Kit, this training module can be integrated into regular sales training programs or can be used as a stand-alone training.
- Covers a variety of client profiles.
- Helps sales agents create value propositions around improved indoor air quality and the Indoor airPLUS Program.


EPA Indoor airPLUS

# Course Materials

# Course Materials

| Module 1 | |
|---|---|
| 5 min | Participant Introductions<br>Overall Training Goal<br>Learning Objectives |
| 10 min | What is an Average New Home?<br>What is an ENERGY STAR® Certified Home?<br>What is an Indoor airPLUS Home? |
| 5 min | Activity #1: Indoor airPLUS Features and Benefits (Video) |
| 15 min | Activity #2: Indoor airPLUS Features and Benefits (Brochures) |
| 20 min | Shelton Profiles<br>• True Believers<br>• Cautious Conservatives<br>• Working Class Realists<br>• Concerned Parents<br>Indoor airPLUS Target Profiles |

| Module 2 | |
|---|---|
| 15 min | Activity #3: Creating Value Propositions |
| 20 min | Activity #4: Role Play |
| 10 min | Activity #5: Scoring Matrix |
| 10 min | Questions and Closing |

# Course Materials - Preparation

| | |
|---|---|
| **2 weeks before training** | |
| ☐ | Download training documents from www.energystar.gov/mesa |
| ☐ | Review the Trainer's Guide thoroughly<br>Email energystarhomes@energystar.gov with any questions |
| **1 week before training** | |
| ☐ | Print out a copy of the Participant Guide and PowerPoint with notes |
| ☐ | Click through the PowerPoint and review the notes |
| ☐ | Complete all parts of the training as if you are a participant to understand the expectations of the participants |
| ☐ | Complete a dry run if this is the first time presenting the content. Ideally, you should use the computer you intend to use for the training to ensure it's working properly. Test out using the presenter view to view notes |
| **2 days before training** | |
| ☐ | Arrange the following materials to be available:<br>• Laptop connected to the Internet with external speakers to broadcast audio when the video is played<br>• Projector<br>• Blank wall or screen<br>• Easel with marker<br>• Pens<br>• Tables for group work, if desired<br>• Double-sided printout of Participant Guide for each participant<br>• One copy of the Trainer's Guide |

## Note to Trainer:

*Start your preparation two weeks in advance to give yourself time to schedule the training and familiarize yourself with the material. Preparation will take one to three hours depending on your familiarity with the content. The addition of a technical expert, like a home energy rater or a member of your construction team, as a co-trainer is an option and will enhance the course.*

*In essence, this training revolves around doing well on the scoring matrix, found on page 17. This matrix rates a sales agent's ability to engage a client in pursuing the idea of buying an Indoor airPLUS qualified home.*

# Learning Objectives

**Module 1**

1. Differentiate between:
   a. Average New Homes
   b. ENERGY STAR® certified homes
   c. Indoor airPLUS qualified homes
2. Describe the features and benefits
3. Identify an ideal Indoor airPLUS client

**Module 2**

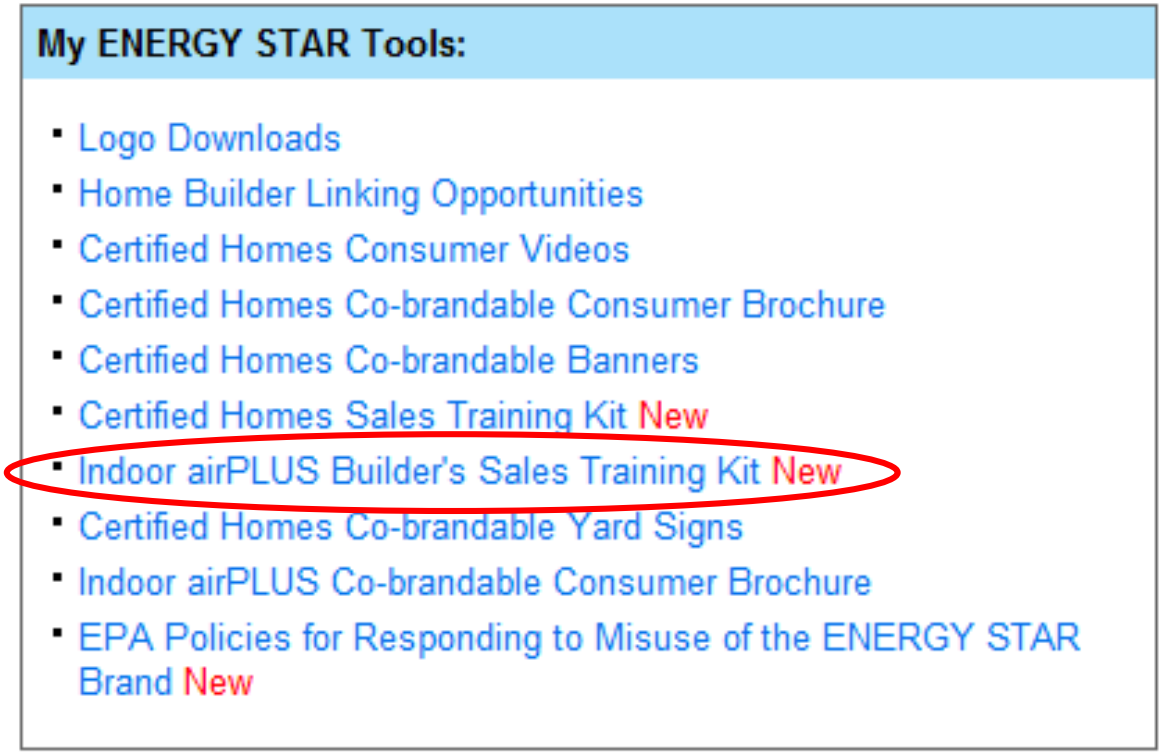
4. Create value propositions
5. Apply value propositions

# Typical Indoor airPLUS Clients

- When you roll these profiles all together into a likely ENERGY STAR + Indoor airPLUS Client, you find these consumers are more likely to be 25 to 50 years old, well-educated, affluent ($75K+) and white-collar / professional.
- They are also very **practical**. Although they want higher quality, they **expect a solid ROI**. They care about the resale value of their homes, and they **care deeply about their family's health and comfort**. Finally, they believe in the ENERGY STAR brand.
- Best target audiences are **True Believers** and **Concerned Parents**

# Indoor airPLUS Sales Training Kit

- Sign into your My ENERGY STAR Account (MESA) to access the Indoor airPLUS Sales Training Kit and download all materials.



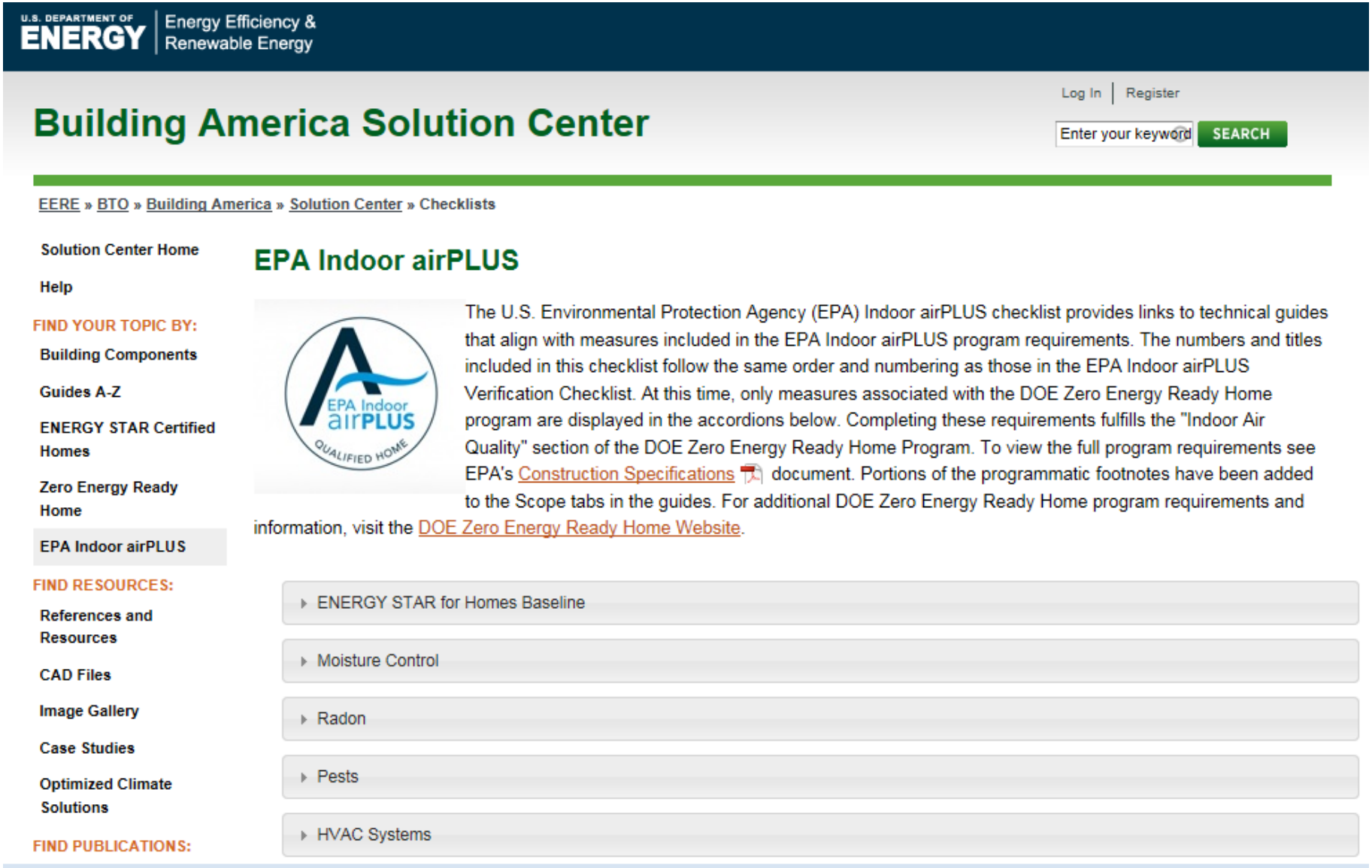
# Resources and Tools

## Marketing and Technical Support for Partners


- Builder and consumer resources
- Partner locator
- Website widgets
- Construction requirements
- Technical guidance


www.epa.gov/indoorairplus

EPA Indoor airPLUS

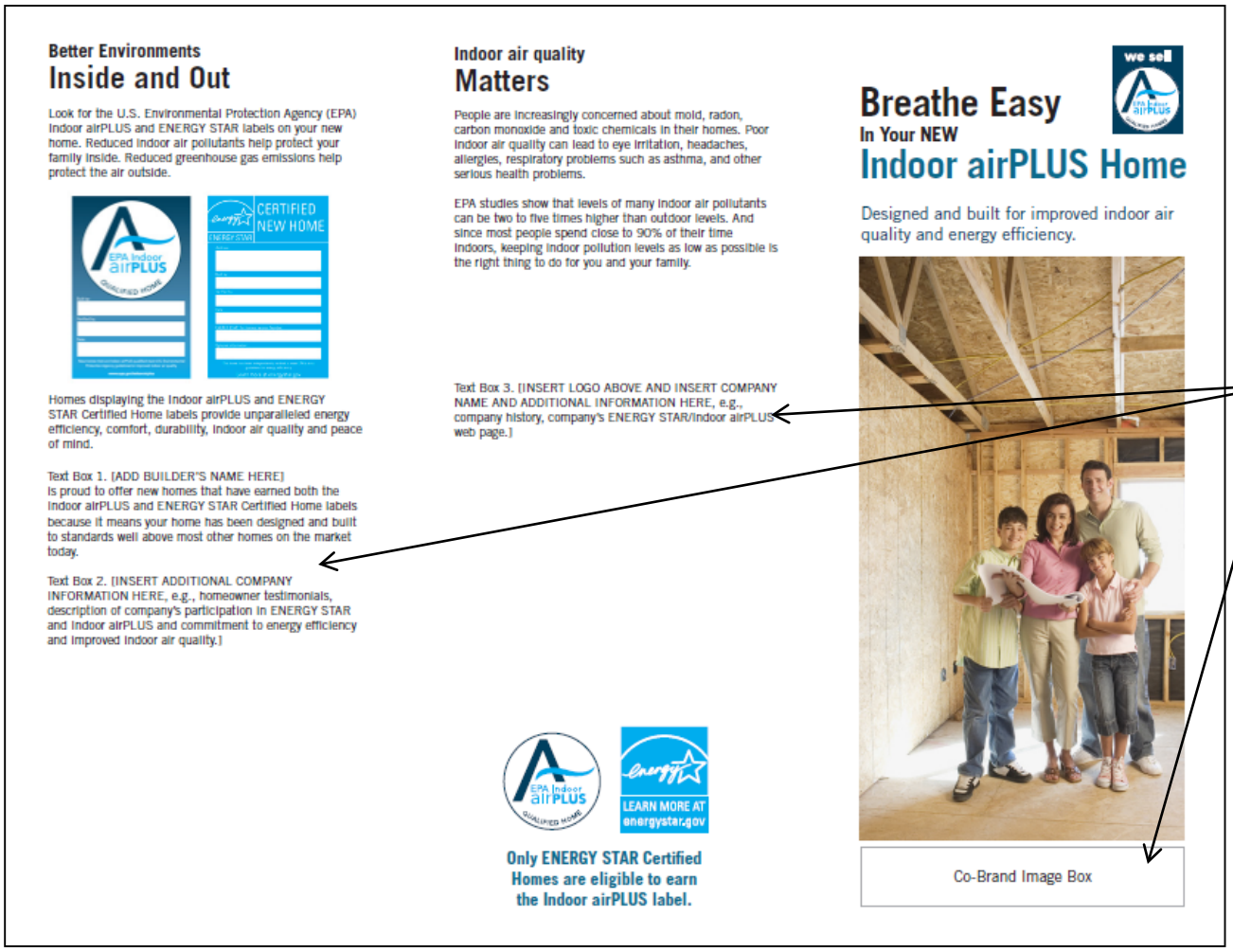



# Technical Resources and Tools

**https://basc.pnnl.gov/checklists/epa-indoor-airplus**

Indoor Air Quality (IAQ)

# Marketing Resources



Better Environments

## Inside and Out

Look for the U.S. Environmental Protection Agency (EPA) Indoor airPLUS and ENERGY STAR labels on your new home. Reduced indoor air pollutants help protect your family inside. Reduced greenhouse gas emissions help protect the air outside.

Homes displaying the Indoor airPLUS and ENERGY STAR Certified Home labels provide unparalleled energy efficiency, comfort, durability, indoor air quality and peace of mind.

Text Box 1. [ADD BUILDER'S NAME HERE] is proud to offer new homes that have earned both the Indoor airPLUS and ENERGY STAR Certified Home labels because it means your home has been designed and built to standards well above most other homes on the market today.

Text Box 2. [INSERT ADDITIONAL COMPANY INFORMATION HERE, e.g., homeowner testimonials, description of company's participation in ENERGY STAR and Indoor airPLUS and commitment to energy efficiency and improved indoor air quality.]

Indoor air quality

## Matters

People are increasingly concerned about mold, radon, carbon monoxide and toxic chemicals in their homes. Poor indoor air quality can lead to eye irritation, headaches, allergies, respiratory problems such as asthma, and other serious health problems.

EPA studies show that levels of many indoor air pollutants can be two to five times higher than outdoor levels. And since most people spend close to 90% of their time indoors, keeping indoor pollution levels as low as possible is the right thing to do for you and your family.

Text Box 3. [INSERT LOGO ABOVE AND INSERT COMPANY NAME AND ADDITIONAL INFORMATION HERE, e.g., company history, company's ENERGY STAR/Indoor airPLUS web page.]

LEARN MORE AT energystar.gov

**Only ENERGY STAR Certified Homes are eligible to earn the Indoor airPLUS label.**

## Breathe Easy

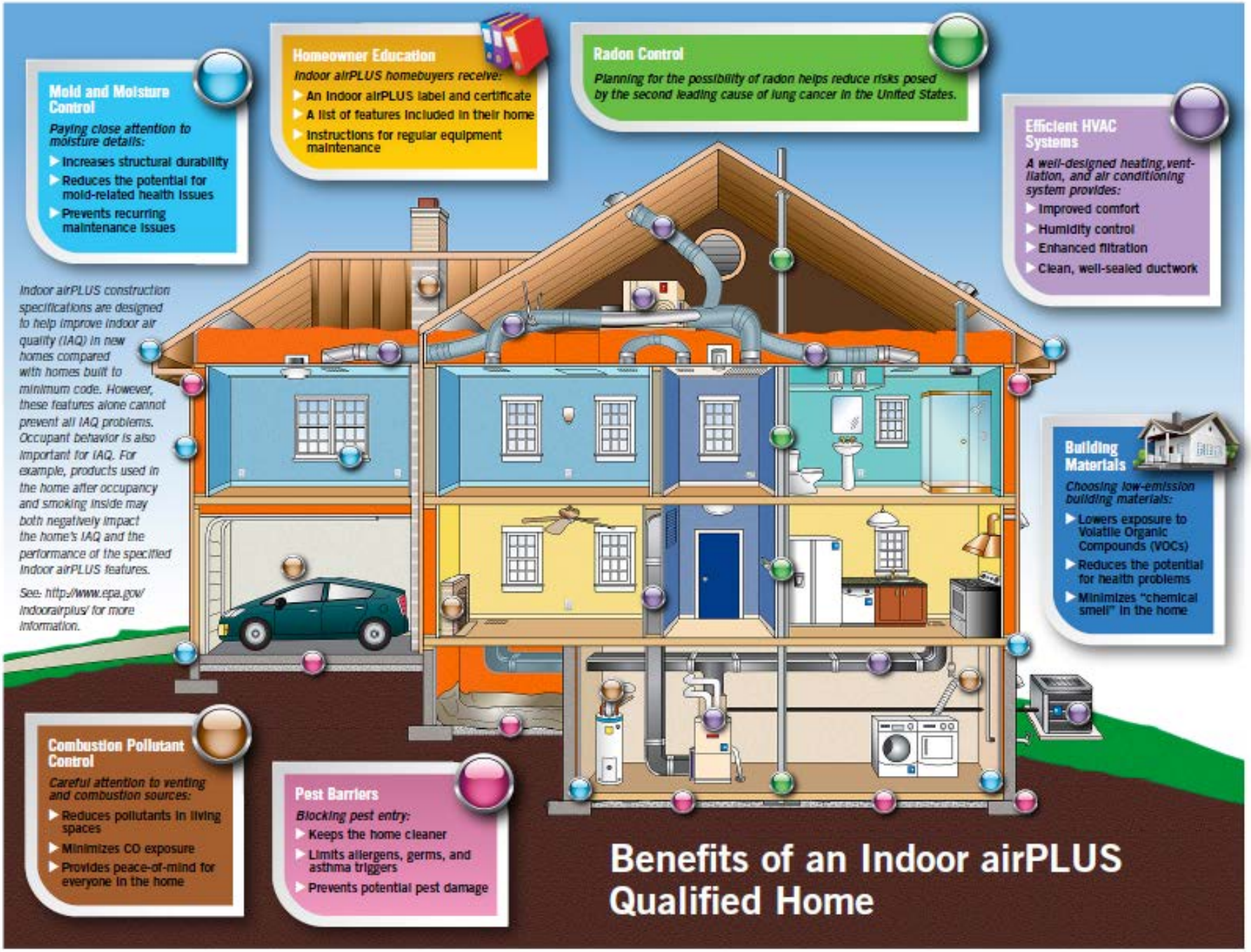
In Your NEW

## Indoor airPLUS Home

Designed and built for improved indoor air quality and energy efficiency.

Co-Brand Image Box

- Co-brandable Brochure available in MESA
- Add company name, logo, and other info (testimonials, etc.)


Mold and Moisture Control
Paying close attention to moisture details:
Increases structural durability
Reduces the potential for mold-related health issues
Prevents recurring maintenance issues
Homeowner Education
Indoor airPLUS homebuyers receive:
An Indoor airPLUS label and certificate
A list of features included in their home
Instructions for regular equipment maintenance
Radon Control
Planning for the possibility of radon helps reduce risks posed by the second leading cause of lung cancer in the United States.
Efficient HVAC Systems
A well-designed heating, ventilation, and air conditioning system provides:
Improved comfort
Humidity control
Enhanced filtration
Clean, well-sealed ductwork
Indoor airPLUS construction specifications are designed to help improve indoor air quality (IAQ) in new homes compared with homes built to minimum code. However, these features alone cannot prevent all IAQ problems. Occupant behavior is also important for IAQ. For example, products used in the home after occupancy and smoking inside may both negatively impact the home's IAQ and the performance of the specified Indoor airPLUS features.
See: http://www.epa.gov/indoorairplus/ for more information.
Building Materials
Choosing low-emission building materials:
Lowers exposure to Volatile Organic Compounds (VOCs)
Reduces the potential for health problems
Minimizes "chemical smell" in the home
Combustion Pollutant Control
Careful attention to venting and combustion sources:
Reduces pollutants in living spaces
Minimizes CO exposure
Provides peace-of-mind for everyone in the home
Pest Barriers
Blocking pest entry:
Keeps the home cleaner
Limits allergens, germs, and asthma triggers
Prevents potential pest damage
Benefits of an Indoor airPLUS Qualified Home

# Resources and Tools


Get the latest multimedia tools:

- YouTube Videos
- Mobile App
- Podcasts
- Facebook
- Twitter


https://www.epa.gov/indoorairplus/indoor-airplus-videos-podcasts-webinars-and-interviews

facebook twitter YouTube iTunes

EPA Indoor airPLUS

# Indoor airPLUS Leader Awards


The Indoor airPLUS Leader Awards were created to recognize and reward Indoor airPLUS Program partners who construct and verify Indoor airPLUS homes designed and built for improved indoor air quality.

This annual award recognizes market leading organizations who promote safer, healthier and more comfortable indoor environments by participating with Indoor airPLUS and offering enhanced indoor air quality protections for their new homebuyers.

http://www.epa.gov/indoorairplus/leader_awards.html

*2015 Winners*

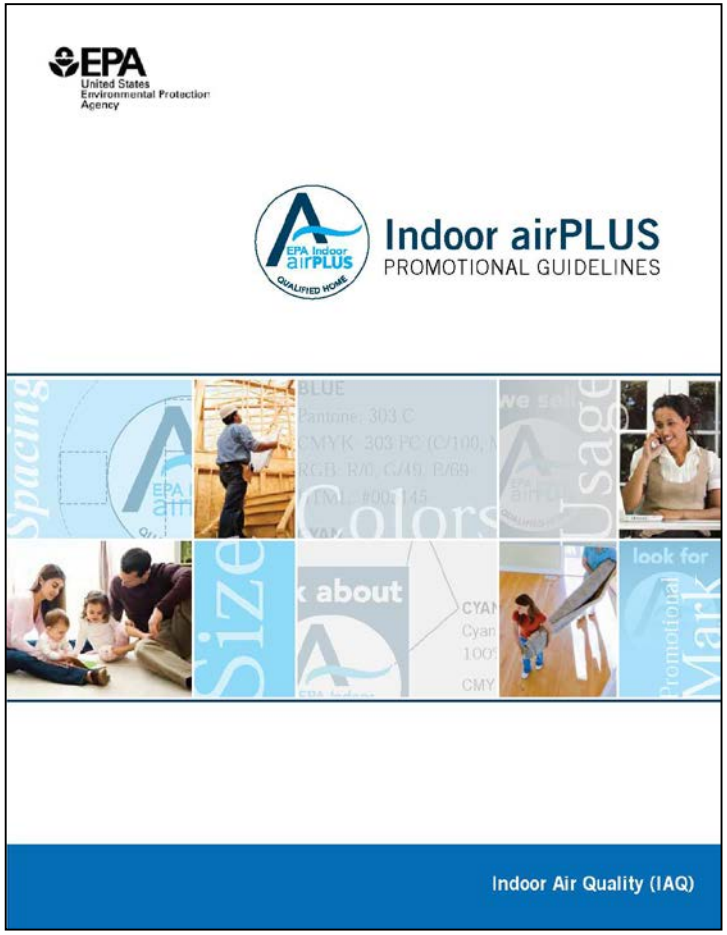
Raters:

- ASERusa
- E3 Energy
- Energy Inspectors
- Steven Winter Associates, Inc.

Builders:

- KB Home
- Fulton Homes
- Mandalay Communities
- Schell Brothers
- C&B Construction
- Charles Thomas Homes
- Habitat for Humanity – St. Louis
- Kettler Forlines Homes

# Promotional Guidelines




- Using Indoor airPLUS to maintain and build value.
- Using Indoor airPLUS marks.
- Using Indoor airPLUS with complementary programs.
- Indoor airPLUS general guidelines.
- Indoor airPLUS graphic technical guidelines.
- Incorrect usage.

# Add Value

# Homes with green labels can sell for an average of

# 9% MORE[1]

Tell homebuyers to ask for a Residential Green Appraiser.

1. Nils Kok and Matthew Kahn, The Value of Green Labels in the California Housing Market, July 2012.

EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# Differentiate Your Company

we sell

EPA Indoor airPLUS

QUALIFIED HOME

More than 25 million people, including 7.1 million children, have asthma and there is a 20-50% increased risk of asthma in damp houses.

EPA Indoor airPLUS

Indoor Air Quality (IAQ)

# Build a Reputation for Quality

*"We decided to build a new house after restoring and residing in two 100-year-old homes in a row. We didn't even know the health problems attributed to those old drafty houses until we had our son. After running some low-level allergy symptoms for about a year, we moved into our new home which is Indoor airPLUS certified. The health issues cleared up immediately - for all of us. It's amazing what a little clean air can do!"*

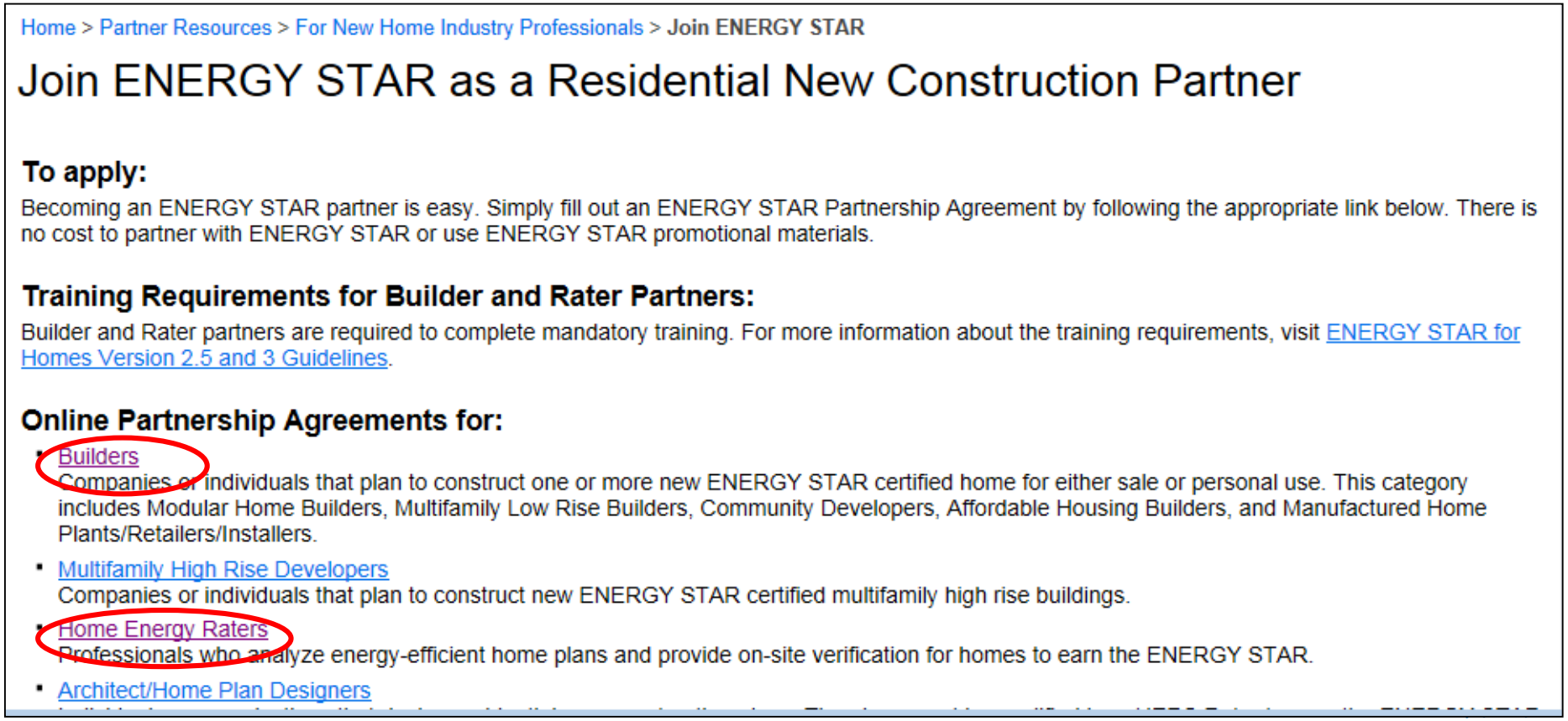
-Homeowner in Oklahoma City

# Become a Partner

# Become an Indoor airPLUS Partner

Note: Builders and Raters must also be active ENERGY STAR partners to report Indoor airPLUS homes

- For *new* ENERGY STAR & Indoor airPLUS Partners, visit: www.energystar.gov/newhomesPA



Home > Partner Resources > For New Home Industry Professionals > Join ENERGY STAR

## Join ENERGY STAR as a Residential New Construction Partner

**To apply:**

Becoming an ENERGY STAR partner is easy. Simply fill out an ENERGY STAR Partnership Agreement by following the appropriate link below. There is no cost to partner with ENERGY STAR or use ENERGY STAR promotional materials.

**Training Requirements for Builder and Rater Partners:**

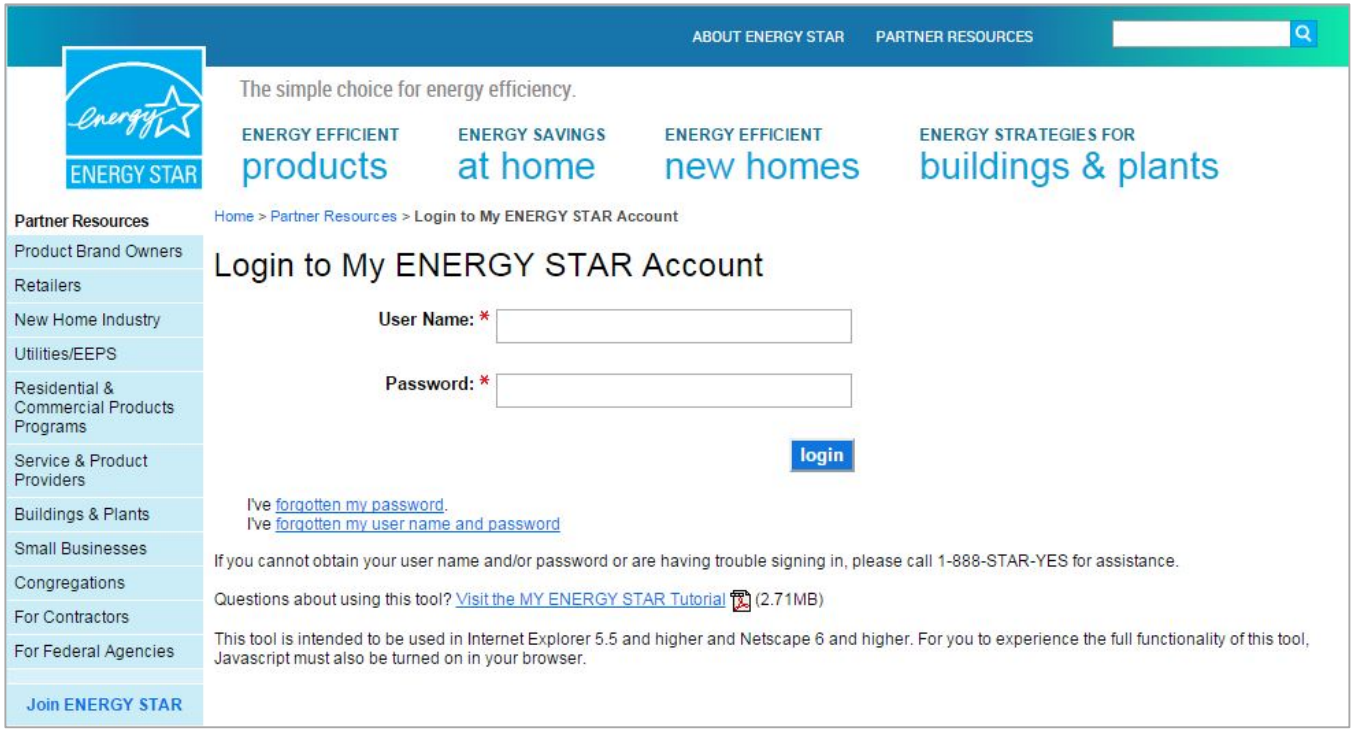
Builder and Rater partners are required to complete mandatory training. For more information about the training requirements, visit ENERGY STAR for Homes Version 2.5 and 3 Guidelines.

**Online Partnership Agreements for:**

- Builders
  Companies or individuals that plan to construct one or more new ENERGY STAR certified home for either sale or personal use. This category includes Modular Home Builders, Multifamily Low Rise Builders, Community Developers, Affordable Housing Builders, and Manufactured Home Plants/Retailers/Installers.
- Multifamily High Rise Developers
  Companies or individuals that plan to construct new ENERGY STAR certified multifamily high rise buildings.
- Home Energy Raters
  Professionals who analyze energy-efficient home plans and provide on-site verification for homes to earn the ENERGY STAR.
- Architect/Home Plan Designers

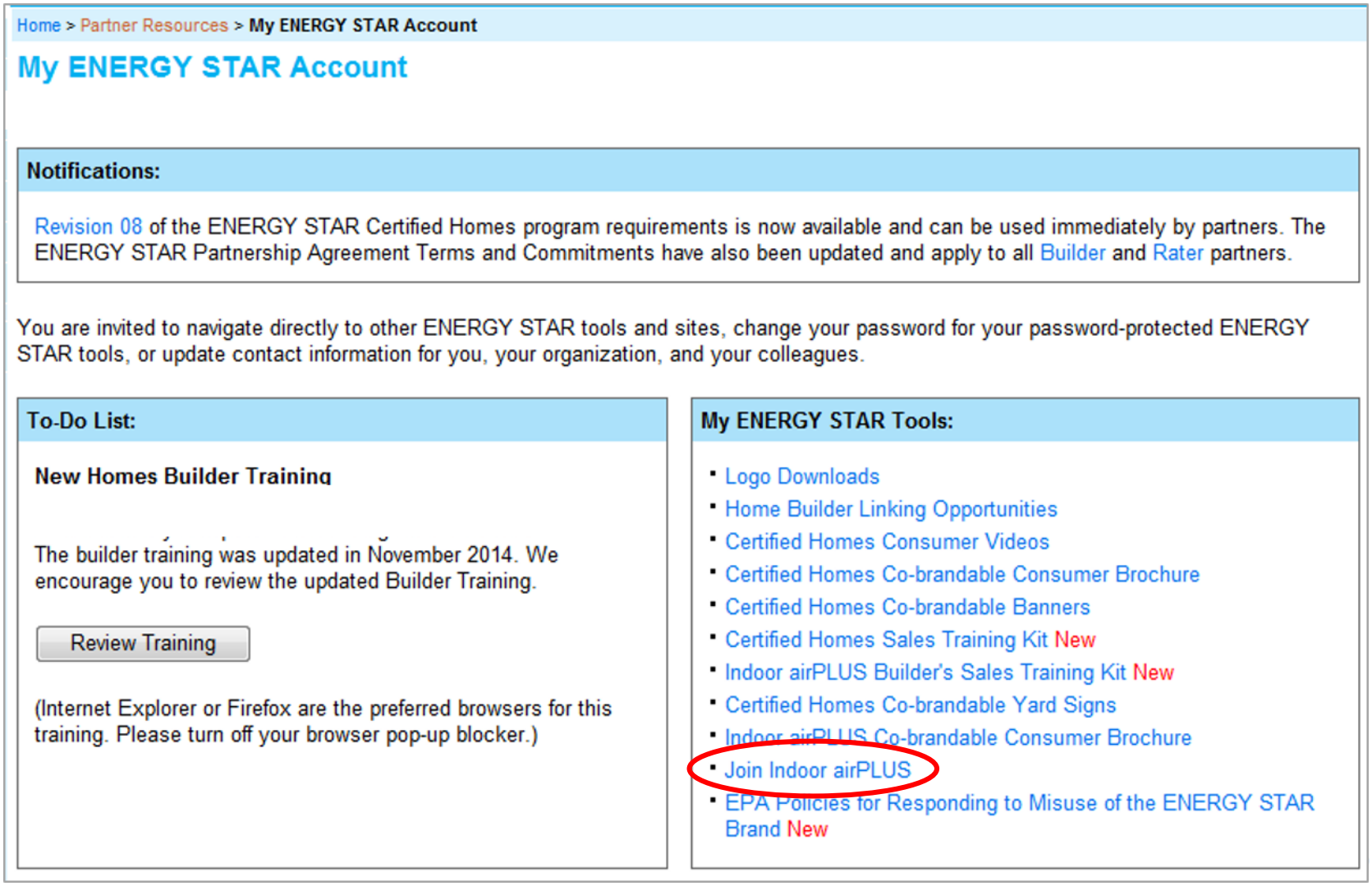
# Become an Indoor airPLUS Partner

- For *current* ENERGY STAR Partners:
  - Log into your My ENERGY STAR Account (MESA) www.energystar.gov/mesa
    - If you don't know your user name and password, click the link or email energystarhomes@energystar.gov for assistance.



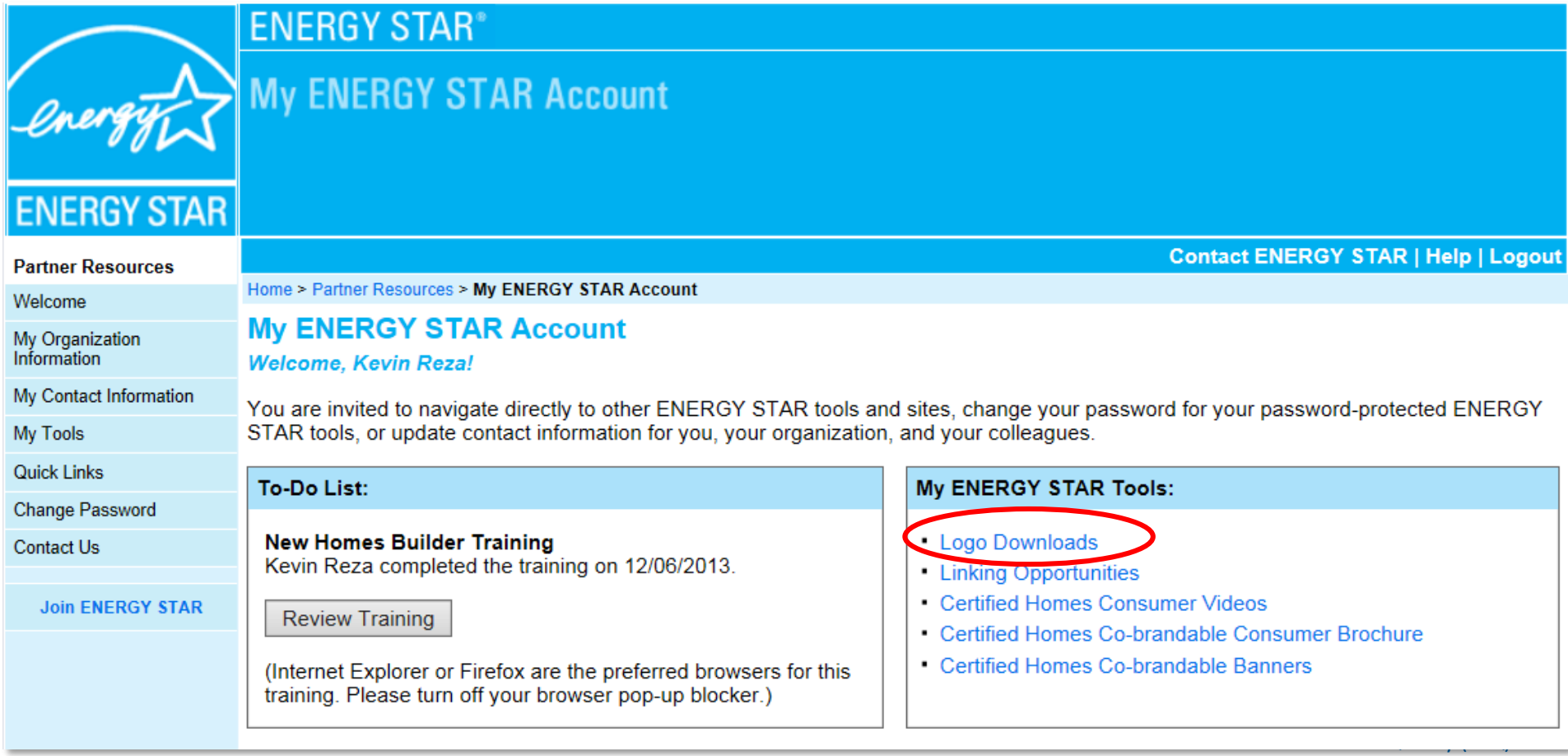
# Become an Indoor airPLUS Partner

- After accessing your account, click “Join Indoor airPLUS”.



# Become an Indoor airPLUS Partner

- When your partnership is activated, you'll have access to Indoor airPLUS logos.



# Become an Indoor airPLUS Partner

- Use the logos to promote your partnership and commitment to offering safer, healthier, more durable homes.

## Indoor airPLUS Certification Mark

| | |
|---|---|
| Indoor airPLUS Certification Mark (vertical)<br>EPS \| JPG | Indoor airPLUS Certification Mark (vertical)<br>EPS \| JPG |

Back to Top

## Indoor airPLUS Promotional Marks

| | | | | | |
|---|---|---|---|---|---|
| Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG | Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG | Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG | Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG | Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG | Indoor airPLUS Promotional Marks (vertical)<br>EPS \| JPG |

# Indoor airPLUS

A new opportunity for leading builders to create better environments inside and out

**Learn more at:**

**www.epa.gov/indoorairplus**

**OR contact the Indoor airPLUS Team at**

**indoor_airPLUS@epa.gov**