



ENERGY STAR Indoor Air Package



Eric Werling, U.S. EPA
February 20, 2008

IAQ -

Is it **Green** or is it

Gray?

What is Indoor Air Quality (IAQ)?

3. DEFINITIONS

acceptable indoor air quality: air toward which a substantial majority of occupants express no dissatisfaction with respect to odor and sensory irritation and in which there are not likely to be contaminants at concentrations that are known to pose a health risk.

ASHRAE Standard 62.2-2004

What Contaminants Are “Known to Pose a *Health Risk*”?

- *Radon, ETS, Formaldehyde, & Benzene exposure can cause cancer*
- *Indoor dampness linked to respiratory illness*
- *Many known indoor asthma triggers*
- *Many VOC's linked to adverse health effects*
- *CO kills at high levels; other effects at low levels*
- *Pesticides linked to acute & chronic health effects*
- *PM linked to respiratory illness & heart disease*
- *Indoor air typically has 2 to 5 times more chemical contaminants than outdoor air*

Indoor Air Quality (IAQ) is

3. DEFINITIONS

acceptable indoor air quality: air ~~toward~~ which ~~a~~ ~~substantial majority of~~ occupants express no dissatisfaction with respect to odor and sensory irritation and in which there are not likely to be contaminants at concentrations that are ~~known~~ ~~likely~~ to pose a health risk.

~~ASHRAE Standard 62.2-2004~~ Eric

Does **Green** Mean Good IAQ?

- Certified
- Bronze
- Silver
- Gold
- Platinum
- Emerald

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Other Green Attributes Competing with IAQ for Points

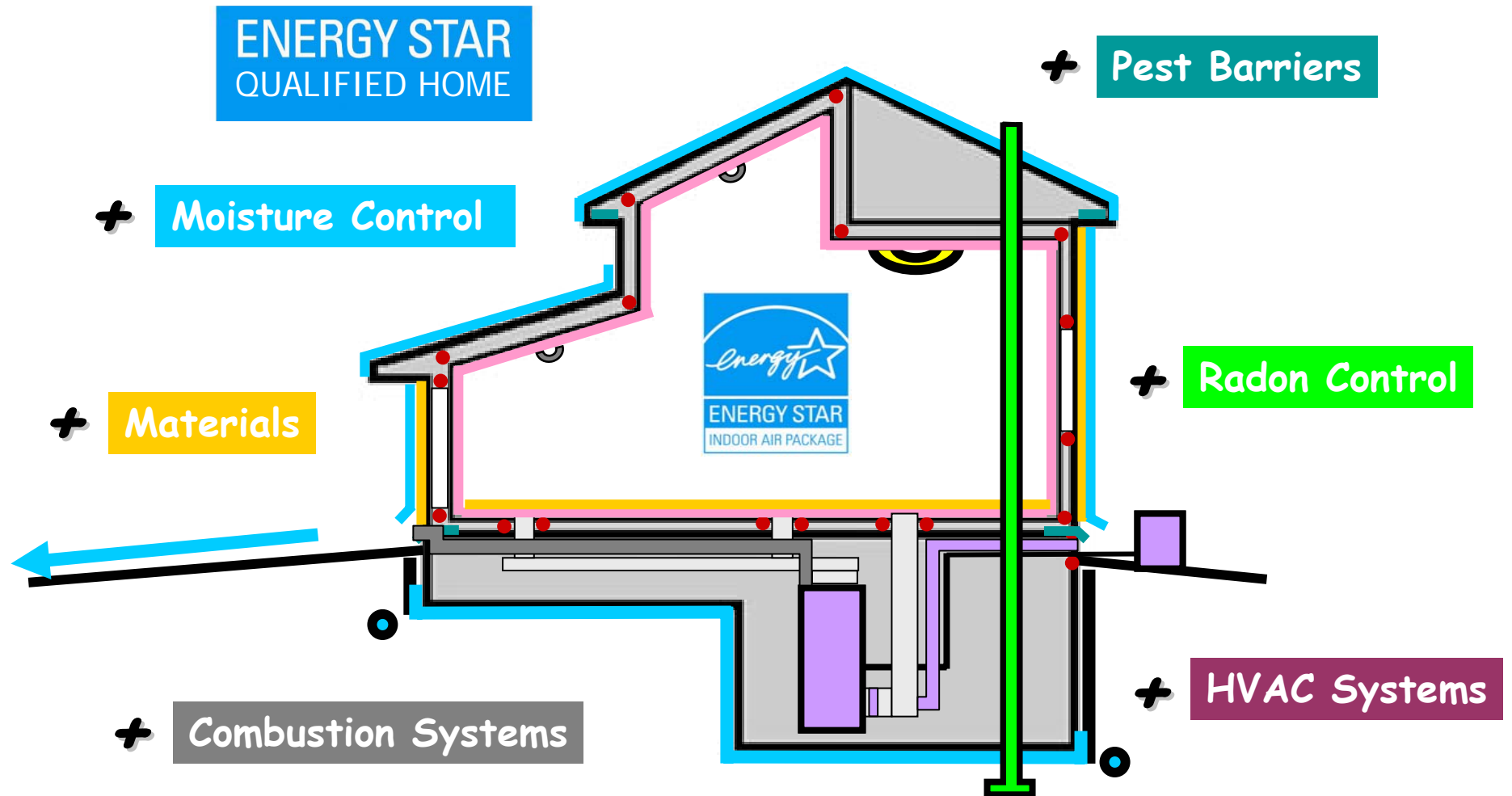
- Energy Efficiency
- Materials & Resources
- House Size
- Sustainable Sites
- *Indoor Air Quality*
- Water Efficiency
- Innovative Design

Which IAQ points
will most “Green”
builders choose?

Non-Mandatory Measures?

- Bulk Moisture Control
 - Water managed wall, roof, foundation system
- Radon Control
- Effective Garage Isolation
- Low VOC Materials
 - Low formaldehyde materials (boards, carpets/pads)
- Sealed Combustion
- Efficient, Low-emission Fireplaces

Indoor Air Package Summary



STEPS to Start Building With the ENERGY STAR INDOOR AIR PACKAGE

1. Work with a HERS Rater to evaluate your homes, just like your first ENERGY STAR qualified home
2. Build IAP qualified homes
3. Rater verifies during 2 ENERGY STAR inspections & labels homes
4. Market & sell homes with stronger promise of good IAQ
5. Tell us your story, so we can recognize your company



Indoor Air Package Details

turning Gray
into
Black &
White



ENERGY STAR Indoor Air Package Verification Sheet - DRAFT

for Review Only

Address or Div/Lot#:		ST:		Verified	
City:				Builder	Rater
Section	Requirements (see IAP Builder Guide for details)	N/A	Builder	Rater	
Moisture Control	Water Managed Site & Foundation per EEBA Guide or equivalent, including:				
	1.1	Site/foundation drainage: sloped grade, drain tile, & dampproofing		<input type="checkbox"/>	<input type="checkbox"/>
	1.2	Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3	Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4	No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Water Managed Wall Assembly per EEBA Guide or equivalent, including:				
	1.5	Continuous drainage plane, flashed to foundation		<input type="checkbox"/>	<input type="checkbox"/>
	1.6	Fully flash windows and doors		<input type="checkbox"/>	<input type="checkbox"/>
	Water Managed Roof Assemblies per EEBA Guide or equivalent, including:				
	1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.8	Fully flash roof-wall intersections (step & kickout flashing) and all roof penetrations		<input type="checkbox"/>	<input type="checkbox"/>
	1.9	Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Interior Water Management, including:					
1.11	No wall-to-wall carpet in bathing areas			<input type="checkbox"/>	
1.12	1/2 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Radon	2.1	Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.2	Provide 2 radon test kits & instructions for use to homebuyer (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	
Pests	3.1	Air seal foundation joints & penetrations			<input type="checkbox"/>
	3.2	Pest screens at all intentional openings (e.g. soffitt vents)		<input type="checkbox"/>	<input type="checkbox"/>
HVAC	4.1	HVAC load calc & equipment design documented and/or performance tested			<input type="checkbox"/>
	4.2	Duct system design documented and/or performance tested			<input type="checkbox"/>
	4.3	Duct system total leakage test <4 cfm/100 sf, OR no panned returns + sealed air handler			<input type="checkbox"/>
	4.4	No air handler or ducts in garage			<input type="checkbox"/>
	4.5	Rooms pressure balanced (individual room returns or jump/transfer grills)			<input type="checkbox"/>
	4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)			<input type="checkbox"/>
	4.7	Known pollutant sources vented outdoors (i.e. bath, kitchen, clothes dryers, central vac, etc.)			<input type="checkbox"/>
4.8	Filtration system: min. MERV 8, tight fitting filter rack, no ozone generators			<input type="checkbox"/>	
4.9	Independent dehumidification control to 60% RH (Warm Humid climates only - map pg 2)	<input type="checkbox"/>		<input type="checkbox"/>	
Combustion Pollutants	Combustion Source Controls:				
	5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances			<input type="checkbox"/>
	5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency stds (see Guide)			<input type="checkbox"/>
	5.3	Certified CO alarms outside each sleeping area			<input type="checkbox"/>
	5.4	No smoking common areas/outside smoking areas >25' from openings (Multi-family only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Attached Garages Isolated & Vented				
5.5	Common walls/ceilings completely sealed & openings gasketed			<input type="checkbox"/>	
5.6	Continuously rated exhaust fan (min. 50 cfm) in attached garages			<input type="checkbox"/>	
Material	6.1	Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions		<input type="checkbox"/>	<input type="checkbox"/>
	6.2	Low-VOC Paints & Finishes (approved labels only)		<input type="checkbox"/>	<input type="checkbox"/>
	6.3	Carpet, cushion, & adhesives qualified for CRI Green Label		<input type="checkbox"/>	<input type="checkbox"/>
Home Commissioning	HVAC & ductwork commissioned: dry, clean, proper refrigerant charge, & airflow to all registers				<input type="checkbox"/>
	Ventilate home before occupancy, or advise buyer				<input type="checkbox"/>
Provide home buyer with completed checklist				<input type="checkbox"/>	<input type="checkbox"/>
Rater/Provider:		Final Inspection Date:			
Company Name:		Builder Company Name:			
Signature:		Builder Signature:			

Questions?

- www.energystar.gov/homes/iap
- Werling.eric@epa.gov
- 202-343-9495

ENERGY STAR Indoor Air Package Verification Sheet - DRAFT		for Review Only		
Address or VIN/LABEL:		ST:	Verified	
Section	Requirements (see IAP Builder Guide for details)	N/A	Builder	Owner
Water Managed Site & Foundation per IEBA Guide or equivalent, including:				
1.1	Site/Foundation drainage: sloped grade, drain tile, & sump/pumping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Drainage: finish below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Basement/Crawlspace: vented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	No vapor barrier on back of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Managed Wall Assembly per IEBA Guide or equivalent, including:				
1.5	Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Full flush windows and doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Managed Roof Assemblies per IEBA Guide or equivalent, including:				
1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (D) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Full flush roof and downspouts: clog & backup: flush and seal and penetration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Stormwater maintenance at soffits & penetrations (Except Dry (D) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	No flashing at eaves (Except Climates 1 & 2 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interior Water Management, including:				
2.1	No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Do not find or create mold in exterior walls (Climate 1, 2, 3, 4 only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Bath: moisture barrier per ASTM E845, 20c, or equiv. (EPA Zones 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5	Air seal Foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6	Part access at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MVAC				
4.1	MVAC load calcs & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Duct system: Min leakage rate at 100/200 ft. OR no gross return + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Door pressure balanced (individual room return or jump/transfer grille)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Exhaust systems: compliant with ASHRAE 62.2-2009 (kitchen exhaust + whole house)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Exhaust pollutant sources: sealed exhausts (i.e. baths, kitchens, clothes dryers, central vac, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Exhaust systems: min. 400% B, tight fitting filter: min. no-cure protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Independent demand/Evaluation control to 60% SH (Warm Humid climates only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combustion Source Devices:				
3.1	Gas heat source: vented, oil heat & hot water source: vented, no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Fireplace & wood/ pellet stove: certified to appropriate emissions/efficiency class (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Certified CO alarm outside each sleeping area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	No smoking common areas/vehicle emitting areas (V): From openings (BIAI-family only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attached Garages: Insulated & Vented				
5.1	Common walls/ceiling completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Common walls/ceiling completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Proved wood materials (plywood, OSB, BIPF certified for formaldehyde emissions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	Low VOC Paints & Finishes (approved label only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Carpets, padding, & adhesives: modified for QDS Green Label	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	MVAC & ductwork commissioned: dry, clean, proper refrig. charge, & airflow to all registers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7	Provide home buyer with completed checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home Commissioning:				
Provide home buyer with completed checklist		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Builder/Provider: _____		Final Inspection Date: _____		
Company Name: _____		Builder/Company Name: _____		
Signature: _____		Signature: _____		

v3 - 1/21/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

Come back at 1 PM for the details!
And a sneak peek at new label concepts