

Ref No.	Topic	Comment	EPA Response
1	Certification for Structural/Air Leakage	<p>A few stakeholders provided additional information on certification for structural and air leakage:</p> <ul style="list-style-type: none"> -In addition to AAMA and WDMA, manufacturers employ other agencies to certify air leakage. The sole reference to AAMA and WDMA is misleading, since NAMI and other entities have certification and labeling programs in place. All approved NFRC Inspection Agencies have accredited structural certification programs that encompass air leakage. Suggest working with ANSI and IAS to get more complete information. -There are four agencies that offer NAFS certification services. EPA underestimated the portion of ENERGY STAR partners participating in NAFS certification because it failed to take into account those certifying through Keystone Certifications or NAMI. 56 of the 195 partners qualified by Keystone also used Keystone for NAFS certification. This represents an additional 13% of partners. 	<p>These comments pertain to the following statement that EPA made in the Framework Document: "At this time, however, less than a quarter of ENERGY STAR's partnership base currently participates in NAFS certification through the American Architectural Manufacturers Association (AAMA) or the Window and Door Manufacturers Association (WDMA). This raises concerns that requiring NAFS certification at this time may result in a backlog at labs and inundation of AAMA and WDMA resources. Thus, EPA proposes that the Agency reconsider this suggestion during the next criteria revision."</p> <p>EPA appreciates the additional information stakeholders provided to clarify the matter and plans to reach out to the named organizations to request additional information.</p>
2	Structural Requirements	<p>Several stakeholders feel that structural requirements should be added to the ENERGY STAR criteria.</p> <ul style="list-style-type: none"> -EPA should require full NAFS certification instead of air leakage alone. -Most products are already certified to NAFS, so the addition of a structural requirement would not create a backlog at labs. -Agree with EPA that NAFS certification would create a backlog at labs. Suggest that EPA require partners to demonstrate proof of testing to structural standards without requiring actual certification. -NAFS certification should be a prerequisite for ENERGY STAR qualification. Labs are equipped to handle any additional testing/certification activity that would arise. The 2010 residential market size was 41.6 million units and within AAMA alone, 26.2 million NAFS labels were sold. -Should also require water penetration and air infiltration resistance requirements in accordance with NAFS. -Adding a structural component to the program (including an air leakage requirement) would bring it more in line with the Canadian program. NRCAN plans to add similar requirements to the ENERGY STAR program in Canada and will ideally add a third-party certification requirement. If EPA opts to keep third-party certification, it should also consider adding CSA, Intertek, and Quality Auditing Institute. -Ask that EPA take a longer look at structural testing after the true scope of products currently certified to meet the NAFS standard is defined. NAMI and Keystone are two other agencies that certify products (particularly skylights and TDDs) to NAFS. Manufacturers rarely invest money in structural testing for "special order" products that, while listed in NFRC's CPD, are purchased too infrequently to justify testing costs. 	<p>In the Framework Document, EPA indicated that it did not intend to include any structural requirements in the draft specification.</p> <p>In light of the additional information EPA has received regarding the number of agencies certifying structural performance, EPA plans to take a closer look at the possibility of including a structural requirement in the draft criteria.</p>

Ref No.	Topic	Comment	EPA Response
3	Structural Requirements	<p>Other stakeholders did not agree that structural requirements should be added to the ENERGY STAR program.</p> <ul style="list-style-type: none"> -Structural requirements do not translate to immediate energy-saving benefits, nor do they align with ENERGY STAR's principles. Other groups, such as ASTM, UL Environment Partnership, AAMA, and WDMA would be better suited to institute these requirements. -The only structural criteria that impacts energy performance is air leakage, which is already being considered as a separate criterion. -What data is there demonstrating a link between structural performance and energy performance? If EPA moves forward with a structural requirement, it should consider allowing an alternative to NAFS, such as the AMD 100 for side-hinged exterior door systems. 	<p>The additional of a structural requirement to the criteria was listed under "Program Elements Considered for Adoption" in the Framework Document. These elements were initially ruled out due to "insufficient data and/or justification" for inclusion in the Version 6.0 criteria. The main reason cited was lack of certification agencies, about which EPA now has additional information. However, EPA plans to also consider these comments on the potential for energy savings as it reevaluates the feasibility of including a structural requirement in the draft criteria.</p>
4	Products Installed at High Altitude	<p>Several stakeholders agreed that exemptions or separate criteria should not be allowed for products installed at high altitude citing the small percentage of products affected and available technologies and alternative paths which allow these products to meet the proposed criteria.</p>	<p>EPA appreciates this position and does not plan to provide separate criteria for these products.</p>
5	Products Installed at High Altitude	<p>A few stakeholders spoke in favor of special allowances for products installed at high altitude:</p> <ul style="list-style-type: none"> -There should be a separate criteria for windows designed to be installed at high altitudes as products installed at high altitudes require breather tubes. If there are other ways to handle the problems brought on by pressure changes, EPA should let industry know what they are and if they are cost effective. -U-factor allowances (e.g. 0.03 or 0.04) should be provided to high altitude fenestration products since there are 21 million people across 8 states living at elevations at or above 4,000 feet. 	<p>Multiple stakeholders have indicated that they have found ways (both proprietary and non-proprietary) to achieve high-efficiency in products installed at high altitudes and offered no concerns about manufacturing cost-effective product for these regions. Specifics of the technologies involved have not been disclosed to EPA, so EPA encourages manufacturers to continue research and development in this area.</p> <p>Additionally, many stakeholders offered during the last criteria revision that elevation did not become an issue until 6,000 feet and DOE determined that the population living at or above that elevation was small enough not to greatly affect aggregate national savings.</p>
6	Products Installed at High Altitude	<p>Suggest that high-altitude allowances be provided in one of two ways: either by adding a high-altitude sub-zone in each climate zone or by providing the allowance to certain product lines.</p>	<p>DOE evaluated the sub-zone recommendation during the last criteria revision and determined that the zones would be too small to be discernable on a product qualification map. Additionally, it is not reasonable to request allowances for entire product lines as the primary issue is where the product is installed. Creating allowances for entire product lines might encourage the sale of products intended for high-elevation installation at lower elevations simply so the products could receive the ENERGY STAR label.</p>
7	Impact-Resistant Products	<p>Several stakeholders agree that exemptions or separate criteria should not be allowed for impact-resistant products. Many such products can already qualify in the Southern Zone. Other groups, such as ASTM, UL Environment, AAMA, or WDMA would be better suited to monitor impact-resistant products.</p>	<p>EPA appreciates this position.</p>

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
8	Impact-Resistant Products	<p>Several stakeholders think impact-resistant products should have an exemption from the ENERGY STAR specification or an allowance to make it easier for them to meet the specification.</p> <ul style="list-style-type: none"> -Recommend a U-factor allowance of up to 0.05 to accommodate design changes needed for impact resistance. -The market for these products continues to grow, and efficient versions of the product can be expensive, making them cost prohibitive if there are not less stringent criteria for them. -Suggest creating sub-climate zones for areas where impact-resistant products are used or providing allowances to specific product lines. Alternatively, impact-resistant products that qualify under the current criteria could be kept in the program under the revised criteria. 	<p>There is no database of impact-resistant products with which EPA can assess the performance of these products. Additionally, requests to industry to provide the necessary performance data have gone unanswered. Without solid data with which to evaluate the performance of these products, EPA cannot make an objective decision regarding separate criteria or an allowance for these products.</p> <p>Additionally, DOE considered the idea of sub-zones in the last criteria revision, but determined that the zones would be too small to be discernable to the consumer on a product qualification label. Further, the recommendation to allow products to qualify under the current criteria would create too much confusion for the consumer and increase the difficulty of identifying improperly labeled products.</p>
9	Impact-Resistant Products	<p>Recommend that single-laminated impact products not be required to comply with ENERGY STAR V6.0 criteria in the Northern Zone.</p>	<p>There are some high-performance impact-resistant products available on the market today and the number of households required to buy impact-resistant products in the Northern Zone is very small.</p>
10	Daylighting	<p>EPA received many comments on both sides of the daylighting issue:</p> <ul style="list-style-type: none"> -Daylighting is an important aspect of high performance green buildings. Thus, daylighting indicators should be required in the ENERGY STAR program. Glare control may be another good indicator to consider, and ENERGY STAR should consider providing additional support to glare control technologies. -Agree with EPA's decision to not include a daylighting criterion in the ENERGY STAR specification as there is no generally-accepted rating system in the fenestration industry. 	<p>As stated in the Framework Document, EPA considers "daylighting" a property that can only be evaluated at a room or whole-building level. Individual fenestration products cannot truly be evaluated for their daylighting properties. This notion seems to be supported by the lack of an NFRC-certified daylighting metric. Similarly, glare results from a number of issues beyond the window product itself, e.g. orientation and shading outside the building. As such, glare and glare control fall outside the scope of the ENERGY STAR windows program as well.</p>
11	Daylighting	<p>While consumers purchase windows and doors for a variety of reasons, skylights and TDDs are typically purchased for lighting benefits, particularly in rooms that do not receive daylight from other sources. Since VT and SHGC are closely related, perhaps EPA should consider a light-to-solar gain (VT/SHGC) ratio.</p>	<p>EPA plans to perform a correlation analysis on VT versus SHGC on the skylight CPD data to better evaluate this issue.</p>
12	Lifecycle Analysis	<p>Several stakeholders agree that EPA should not include lifecycle analysis, citing that more research and analysis is needed before such a requirement is included in the specification. Others support accurate life cycle analyses, but only if the "use phase" impacts are properly accounted for.</p>	<p>EPA appreciates these comments.</p>
13	Lifecycle Analysis	<p>A few stakeholders wanted EPA to be aware that industry was supportive of the lifecycle analysis project attempted by the Center for Sustainable Building Research.</p>	<p>In the Framework Document, EPA stated that "...the study was canceled due to lack of industry support." EPA understands that this statement does not fully or accurately represent the complex reasons the study was unable to continue. EPA did not intend to imply that industry was not supportive of the effort while it was underway and appreciates industry clarifying this point.</p>

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
14	Lifecycle Analysis	Suggest that EPA support further study of lifecycle assessments for fenestration products; industry participation is an essential part of this work.	EPA plans to support such assessments as resources allow. EPA also understands that industry participation is an important aspect of such assessments.
15	Lifecycle Analysis	For the ENERGY STAR brand to remain relevant, EPA will need to consider long-term energy performance, environmental impacts, durability, lifecycle impacts, and recyclability of qualified products so the ENERGY STAR brand can remain relevant as the market moves towards evaluating products in a broader sense than energy performance alone.	EPA plans to continue to monitor developments in fenestration lifecycle assessment.
16	Lifecycle Analysis	EPA would be correct to include a lifecycle assessment (LCA) requirement in the ENERGY STAR specification. EPA is encouraged to defend a structure of Product Category Rule that would outline the methods manufacturers could use to create Environmental Product Declarations (EPD). Until a standardized LCA or EPD framework exists, it will not be possible to make "apples-to-apples" comparisons of windows and doors.	EPA appreciates these comments and plans to keep these recommendations in mind.
17	Lifecycle Analysis	EPA should dedicate more resources to ensure that a lifecycle analysis requirement can be included in the next ENERGY STAR specification. In the meantime, EPA should consider credits for recycled or bio-based content as a short-term substitute until a lifecycle analysis procedure is viable.	EPA plans to support industry efforts as resources allow. As to the credits suggested, EPA would prefer to defer such an effort until a more complete picture of product impact is available through lifecycle assessment.
18	Climate Zones	<p>Several stakeholders requested changes to the climate zone map:</p> <ul style="list-style-type: none"> -Suggest adding a Central Zone to increase granularity of climate zone map. -The Pacific Northwest (specifically Seattle and Portland) has a very different climate from other parts of the Northern Zone and thus does not need to adhere to the same specifications. -Propose that the climate zone map be restructured by combining the South-Central and North-Central Zones into a new South-Central Zone, shifting most of the current Northern Zone to North-Central, and creating a new Northern Zone that incorporates all of Canada and the coldest climates in the northern United States. These climate zones would better align with IECC and ASHRAE 90.1. This would also help to align the U.S. and Canadian programs. Such a unification between the U.S. and Canadian programs would be of great benefit to manufacturers. -New Northern Zone comprised of IECC 6-8. New North-Central Zone comprised of the rest of the former Northern Zone. The current North-Central Zone would then become the Central Zone. (See Window Suggestion No. 13 in attached document for corresponding criteria.) 	<p>As stated in the Framework Document, the climate zone map was the subject of ample discussion and research efforts during the Version 5.0 criteria revision process. EPA has no intention of revising the map further, unless stakeholders can supply compelling evidence that it is necessary and desirable to do so. Additionally, changing the map would require a change in the ENERGY STAR label and related graphics, which would mean increased costs for manufacturers.</p> <p>As pointed out during the last criteria revision, Washington and Oregon tend to have very progressive codes and many incentive programs that reward highly efficient windows. ENERGY STAR needs to stay ahead of code and remain relevant with energy efficiency programs in this region.</p> <p>The current climate zones do align with IECC. ASHRAE 90.1 focuses on high-rise buildings. The ENERGY STAR specification only allows qualification for low-rise residential construction. Further, there are relatively significant differences in codes across the border in some regions.</p>
19	Tubular Daylighting Devices (TDDs)	A few stakeholders agree that there is not a compelling reason to require TDDs to meet unique criteria, but another stakeholder felt that EPA should separate TDDs from skylights in its analyses in order to determine whether or not they warrant unique criteria levels.	EPA did evaluate TDDs separately and ultimately concluded that TDDs could continue to qualify under the skylight criteria. EPA plans to provide additional information in the full criteria analysis report.

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
20	Tubular Daylighting Devices (TDDs)	TDDs warrant unique criteria due to their unique use and design. EPA should also note that manufacturers will be required to launch product changes in 2012 to pass new physical testing requirements, which will result in a 10% cost increase. These changes will not meet the proposed U-factor numbers that may take effect in 2013, so another round of product alterations (at an additional 10-20% cost increase) will take place.	Other stakeholders have commented that the physical test did not present any problems for their products, citing the same or better U-factors using the physical test versus the simulation. EPA welcomes test reports demonstrating a disparity between the simulation and physical test. EPA also encourages stakeholders to explicate why the changes necessary to improve results for the physical test can't also assist TDDs in meeting the next round of ENERGY STAR criteria.
21	Tubular Daylighting Devices (TDDs)	NFRC and the Construction Specification Institute identified the need to establish a unique product category for TDDs so new test methods could be developed. ENERGY STAR should follow and create a separate TDD specification.	A separate test method does not necessarily require a separate specification, and EPA analysis indicates that a separate specification is not required. EPA plans to provide additional information in the full criteria analysis report.
22	Air Leakage	Certification to NFRC 400 or NAFS through any accredited certification entity should be acceptable. There is no need to deviate from industry standards. Similarly, current documentation and labeling practices for air leakage should be sufficient.	EPA does not plan to deviate from established test procedures. EPA plans to investigate current labeling practices to determine if they are sufficient for ENERGY STAR purposes. EPA plans to work with industry and industry organizations to find the best solution.
23	Air Leakage	Encourage EPA to use NFRC 400 because it references ASTM E 283, but the test size identified in NFRC 400 differs from that used in ASTM E 283 and concerned that this means duplicative costs/testing for manufacturers.	EPA appreciates this insight and plans to consult NFRC when developing any air leakage standard to ensure minimal additional costs and testing for manufacturers wherever possible.
24	Air Leakage	While a few stakeholders agree that EPA should add an air leakage requirement, some suggested that this requirement be more stringent than code (perhaps as low as 0.2). Other stakeholders did not agree that an air leakage requirement should be part of the ENERGY STAR specification. Justification given was that other programs already require this testing, so an ENERGY STAR requirement would be duplicative and costly.	EPA analysis indicates that there is minimal benefit in moving between 0.3 and 0.2 AL rating. EPA plans to work with NFRC and other certification bodies to minimize additional labeling costs by avoiding duplicative labeling wherever possible. Additionally, EPA hopes to ensure that those already testing for air leakage would not have to perform additional testing.
25	Air Leakage	Several stakeholders agree with EPA's proposed air leakage requirements and offered the following: -Already test to and compliant with the proposed air leakage requirements. Criterion more challenging for skylights and TDDs, though these challenges may be surmountable. -Suggest adding verbiage to the NFRC 400 language that adopts the AAMA 101 standard. -12 months would be a reasonable amount of time to implement an air leakage requirement.	EPA appreciates this position. Stakeholders looking to have changes made to the NFRC 400 should work directly with the NFRC. EPA aims to provide 12 months between specification finalization and implementation, so the timeline recommended should be met.
26	Air Leakage	Results of air leakage testing should be readily available to the public, allowing for better purchasing decisions.	EPA hopes that adding an air leakage requirement results in better information for consumers.
27	Air Leakage	Agree that an air leakage requirement could have potential benefits, but request more information about the relationship between air leakage and energy performance, durability, and other characteristics that EPA considers important.	EPA plans to provide additional information on this in the full criteria analysis report.

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
28	Air Leakage	Stakeholders requested that: -Public air leakage data be a binary "pass"/"fail" for the requirement, rather than specific performance metrics. -AL be placed on the NFRC label for consistency.	EPA plans to consider these options.
29	Air Leakage	Propose placing air leakage on the ENERGY STAR label, rather than the NFRC label.	This would require a label redesign and mean additional labeling costs for manufacturers, which EPA plans to avoid.
30	Air Leakage	Suggest reporting to one significant figure, since results can be sensitive.	EPA does not plan to require more than one significant digit.
31	Air Leakage	Stakeholders offered the following on air leakage: -Suggest allowing the NFRC 400 and AAMA certification. -Support NAFS certification for air leakage. -EPA should allow the AAMA Gold Label and WDMA Label in addition to or instead of listing air leakage on the NFRC label. -Even if the impact on performance is minimal, an air leakage requirement would improve the integrity of the window and protect consumers. NFRC 400 has a limited reach and fewer manufacturers test to this standard. Prefer complete standards such as NAFS. -Support allowing both the AAMA Gold Label and the WDMA Hallmark Label.	As stated in the Framework Document, EPA plans to consider AAMA/WDMA certification/labeling as a proxy for NFRC 400 testing.
32	Air Leakage	Several stakeholders noted that testing per ASTM E283 can cost \$1500-2000 per door configuration, resulting in significant costs per product line. AMD plans to develop an air leakage standard starting this fall to get around this issue. However, doors should not have a problem meeting the proposed criteria.	EPA looks forward to learning more about this new test standard when it is complete and encourages AMD to obtain third party certification of test results using the new standard.
33	Air Leakage	Several stakeholders requested changes to programs or procedures not governed by EPA: -Proposed a component-based testing that would allow component substitution in door systems and remove the testing burden from pre-hangers. Testing/labeling would be the responsibility of each component manufacturer. -Recommend two changes before implementing an air leakage requirement for doors. First, the CPD format must be changed to accommodate the needs of the door industry. Second, component air leakage performance must be added to the NFRC CPD. The verification protocol should be developed by the NFRC.	EPA appreciates these suggestions, but recommends taking these recommendations up with the NFRC.
34	Air Leakage	Unit skylights and TDD domes are more susceptible to interior condensation. Thus, air leakage limits are more difficult to meet since provisions may need to be made for condensation to be drained through the product onto the roof. That said, it has been proven feasible for a product to drain condensation without sacrificing air leakage.	EPA appreciates this insight.
35	Air Leakage	Air leakage does not get to the root of the problem: poor installation can render a well-sealed door ineffective. This should be clearly communicated to the customer.	EPA encourages manufacturers to emphasize this in their installation instructions.

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
36	Air Leakage	Support testing air leakage using the NAFS method. NAFS allows air leakage testing for any size window, while NFRC 400 relies on the standard NFRC test size. Do not support using the NFRC air infiltration standard. Also, NFRC does not allow the NAFS air infiltration values to be printed on the NFRC temporary label or included in the CPD.	EPA plans to work with industry and NFRC to develop an air leakage requirement that creates minimal cost and testing burdens for manufacturers. EPA appreciates stakeholder insight on the differences in test sizes and plans to research this issue further.
37	Air Leakage	A few stakeholders would only support an air leakage requirement if it is accompanied by an operating force prerequisite.	It is EPA's understanding that NAFS requires operating force testing and that the NFRC 400 cites the NAFS operating force test standard.
38	Air Leakage	In addition to the AAMA and WDMA labels, all recognized labels should be allowed (such as NAMI, Keystone, etc.). The temporary label provides a performance number about air leakage results compared to a permanent label where the overall results are shown. Referencing the permanent label for air leakage results will create extra work for building inspectors and others.	EPA plans to research the other labeling options before preparing language on any air leakage requirement.
39	Installation Instructions	Recommend the consideration of air infiltration in installation recommendations. This would help to address the problem that high levels of air infiltration are often the result of improper installation.	EPA plans to consider including this in any installation instructions requirement.
40	Installation Instructions	Several stakeholders agree that the EPA should require manufacturers to post online installation instructions. Some stakeholders pointed out that print instructions are a good way to provide this information to installers, but given variations in products and situations, manufacturers should have flexibility in how they provide instructions to installers. Instructions should address sealing and the application of flashing around the window.	EPA plans to take these issues into account when developing any installation instructions requirement.
41	Installation Instructions	A few stakeholders do not agree that manufacturers should be required to post online installation instructions. Reasons given include the limited industry-standard instructions and potential inconsistency of manufacturer-developed instructions.	There is at least one organization that has developed "standard" instructions for installation for use across the industry, and manufacturers are welcome to use these instructions to meet this requirement. As all products are different, EPA does not see "inconsistency" among manufacturer-developed instructions as an issue. EPA does not plan to seek to standardize installation instructions across the industry. Any installation instructions requirement would include minimal, general criteria that the instructions must meet.
42	Installation Instructions	A few stakeholders think it is not unreasonable for the EPA to require manufacturers to make installation instructions available, but feel it should be noted that AAMA and ATI's InstallationMasters instructions have already been developed for the industry. EPA should not require inclusion of instructions with products installed by the manufacturer, but it is reasonable to do so when products are installed by a third party.	EPA appreciates the suggestion that manufacturers could use the AAMA/ATI instructions. While some manufacturers may install their products, most do not. Any installation instructions requirement should apply uniformly to all ENERGY STAR qualified products.
43	Installation Instructions	Two distinct types of instructions are needed: instructions for new construction and instructions for replacement windows. These instructions should focus on AWDI's concept of 5 barriers: water, moisture, air, thermal, and vapor.	EPA plans to consider requiring at least two sets of installation instructions (one for new construction and one for replacement). EPA plans to allow manufacturers to use any instructions that they would like.

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
44	Installation Instructions	It is not clear which entity would be responsible for auditing posted instructions or what the acceptable criteria would include.	EPA has not yet made any determination as to what entity would review installation instructions. EPA plans to include criteria for any installation instructions requirement in the draft criteria.
45	Installation Instructions	A few stakeholders noted that installer training programs and courses are an effective method of education.	EPA encourages partners to use and promote these methods.
46	Installation Instructions	Clearly understandable, step-by-step visual instructions or videos are the most effective way to deliver installation information to consumers and professionals. These should be included with the product.	EPA appreciates this suggestion and plans to consider these comments when drafting language for any installation instructions requirement.
47	Installation Instructions	<p>A few stakeholders offered specific recommendations regarding installation instructions:</p> <ul style="list-style-type: none"> -EPA should work with industry to develop a generic set of instructions to publish on the ENERGY STAR website. Alternatively, the best way to provide installation instructions is to ship them with the product. -Agree that it is important to include clear, visual, step-by-step installation instructions with a product. Given that 57% of replacement doors purchased by consumers are not installed by professionals, a marketing program should be used to build consumer awareness. 	<p>EPA does not want to limit manufacturers by requiring a specific, standard set of installation instructions.</p> <p>EPA plans to consider requiring manufacturers to ship installation instructions with each product.</p> <p>EPA plans to evaluate available resources after the specification is finalized to determine the feasibility of a marketing program to build consumer awareness.</p>
48	Installation Instructions	For door installation, it is important to obtain a good seal around the frame without hindering opening/closing.	EPA appreciates this suggestion and plans to consider this comment when drafting language for any installation instructions requirement.
49	Installation Instructions	A requirement that installation instructions are placed online is not problematic, but the requirement should not be too prescriptive.	EPA does not plan to create a requirement that is too prescriptive.
50	Installation Instructions	One potential downfall to requiring online installation instructions is the wide variety of installation situations that could arise with replacement windows. Instructions could therefore be misleading.	EPA acknowledges that the variety of installation situations and encourages manufacturers to clarify this for consumers in any installation instructions.
51	Installation Instructions	Installation procedures are already a requirement for every product that is certified through an Inspection Agency under the NFRC standard. These are required to be attached to each individual product and made available to installers and customers. This should only be reinforced by the inspection agency. EPA has an opportunity to ensure the availability of proper manufacturer installation procedures by, for example, requiring proof of an installation certification program.	EPA plans to review the NFRC documents and consider the recommendation of having the IAs enforce this requirement. EPA does not plan to require installation certification at this time.
52	Installation Instructions	All of the elements listed in the Framework Document should be included in the installation instructions, however, manufacturers should not be required to include instructions for all conceivable site conditions. The best way to provide instructions is to include graphically-rich, printed instructions with the product. The documents should also be available online. Recommend against defaulting to generic instructions.	EPA appreciates this assessment and plans to consider these suggestions.

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
53	Installation Instructions	Request more detail regarding how EPA plans to handle an installation instructions requirement and data demonstrating the relationship between the availability of installation instructions and the prevalence of properly installed products.	EPA plans to include more details in the full criteria analysis report.
54	Installation Instructions	Proper installation could be promoted through trade ally partnerships like CEE did for ENERGY STAR HVAC equipment.	EPA appreciates this insight and plans to consider this option.
55	Analyses and Methodologies	It is not clear that the fraction of CPD products that EPA looked at were further analyzed to determine if they are actually manufactured, available, and what the price premium of these products would be.	An availability analysis was conducted to verify the existence of products listed in the CPD. EPA plans to provide additional details in the full criteria analysis report.
56	Analyses and Methodologies	EPA should try to keep payback periods for its labeled fenestration products to 5-7 years.	EPA plans to consider this recommendation as it performs the cost-effectiveness analysis.
57	Analyses and Methodologies	Not comfortable with criteria levels justified by only the CPD and LBNL analyses alone.	EPA plans to set criteria levels based on market research, availability analysis, and cost-effectiveness analysis in addition to considering all stakeholder comments provided throughout the process.
58	Analyses and Methodologies	If EPA intends to use other considerations for determining product criteria levels that depart from the 25% program target, would like to understand the rationale and data behind choosing those criteria. Additionally, any information regarding market penetration, incremental retail price, payback, and energy savings will help the efficiency program community to assess their abilities to include ENERGY STAR in their programs.	EPA plans to provide the information requested in the full criteria analysis report.
59	Analyses and Methodologies	Any incremental cost analyses should take the price elasticity for buying and installing skylights into account, since these products are highly discretionary. The analyses should also recognize the unique characteristics of the skylight market and account for significant costs of converting regional manufacturers to national manufacturers, should that be necessary.	EPA cannot perform an analysis on the price elasticity of buying and installing skylights unless manufacturers volunteer the necessary data to perform such analysis. EPA plans to revisit its availability analysis on skylights to ensure that products are available across the country.
60	Analyses and Methodologies	The TDD market caters to different uses-smaller rooms and hallways-than traditional skylights. EPA should separate these markets in its analyses, which might ultimately yield a different approach between skylights and TDDs.	TDDs were evaluated separately from skylights. EPA plans to provide additional details in the full criteria analysis report.
61	Analyses and Methodologies	Request further clarification on what is meant when EPA analyzes products "available for sale."	EPA plans to provide full descriptions of all analyses in the full criteria analysis report.
62	Analyses and Methodologies	There is a benchmark swinging door calculation spreadsheet that EPA should use to calculate whole product U-factors and SHGC values.	EPA could consider using this spreadsheet if it is volunteered for EPA's review.

Ref No.	Topic	Comment	EPA Response
63	Proposed Windows Criteria	<p>Several stakeholders expressed concerns about surface 4 low-E:</p> <ul style="list-style-type: none"> -Suggest that EPA consider a minimum Condensation Resistance (CR) Rating, given that the efficiency levels proposed may lead manufacturers to use surface 4 low-E coatings. Minimum CR Ratings suggested were 50 and 55. -Concerned that a U-factor maximum of 0.25-0.27 could lead to surface 4 low-E coatings, which would result in higher costs. -Does ENERGY STAR intend to address the potential condensation issue with efficient, surface 4 low-E hard-coats? -A 0.25 U-factor in the Northern Zone will be costly and only attainable by using an inside surface low-E coating, which could lead to condensation problems. -More stringent criteria may result in an increase of surface 4 glazing. Recommend seriously studying the possible condensation implications and consider releasing guidance to consumers on how best to avoid condensation problems. 	<p>Preliminary results of EPA's feasibility analysis demonstrated that surface 4 low-E coatings were not a necessity to achieve the proposed criteria. Further, the number of products using surface 4 coatings is very small. EPA plans to provide additional details on this research in the full report.</p> <p>EPA plans to consider developing consumer guidance on avoiding condensation as time and resources allow.</p>
64	Proposed Windows Criteria	<p>A few stakeholders had concerns about the criteria's affect on Visible Transmittance (VT):</p> <ul style="list-style-type: none"> -In most windows, lower SHGC corresponds with lower VT. This may lead to increased energy consumption due to increased lighting use. -Any lowering of SHGC requirements may result in darker tints, potentially increasing lighting use. 	<p>EPA plans to perform a VT versus SHGC correlation analysis on the CPD data to better evaluate this issue.</p>
65	Proposed Windows Criteria	<p>Stakeholders offered many comments on the proposed windows criteria:</p> <ul style="list-style-type: none"> -While several stakeholders felt that the proposed specifications are achievable and reasonable, others felt the criteria were too aggressive. Still others felt the criteria could/should be more aggressive. Specific criteria recommendations are outlined in the attached document. -Many stakeholders expressed concern that the proposed Northern Zone criteria could require triple glazing, which would result in higher costs. Some feel that the savings will not justify the increase in cost. Others thought that triple glazing or other high performance options should be made standard in the northern climate zones. -Some stakeholders cited significant costs related to manufacturing a unit with an SHGC of 0.25, and others stated that an SHGC of 0.25 is difficult to achieve even with a good low-E coating. -There is significant cost involved in moving the U-factor requirement from 0.30 to 0.25 (as opposed to moving from 0.30 to 0.27). -RESFEN analysis shows little savings in Florida when the U-factor is reduced below 0.60. SHGC reductions provide more than twice the savings, so tradeoffs in the Southern Zone may be appropriate. -Would like more information on U-factor proposal in Southern Zone. -Several stakeholders agree with EPA's decision to remove the Northern Zone tradeoff, while others disagreed. Some manufacturers take advantage of this tradeoff. 	<p>The preliminary criteria ranges presented in the Framework Document were based on feasibility analysis using the CPD, market availability research for the top 20 window manufacturers, cost data analysis for a subset of manufacturer volunteers, and numerous discussions with industry stakeholders. These ranges also take into consideration new data provided by Ducker Research and early results of LBNL's energy savings analysis.</p> <p>This research was preliminary. EPA plans to take these comments and the specific criteria suggestions offered by stakeholders (and shown in the attached document) into consideration as it evaluates the feasibility, availability, energy savings, and cost effectiveness analyses. EPA also plans to take into consideration market penetration rates, programmatic goals, and prevailing energy efficiency codes. EPA plans to make full results of these analyses and the corresponding research available in the Draft 1 Criteria and Analysis Report.</p>

Ref No.	Topic	Comment	EPA Response
66	Proposed Windows Criteria	<p>-EPA should consider the environmental impacts of disallowing aluminum products in the south.</p> <p>-Concerned about the reduction in U-factor in the Southern Zone where SHGC is more important for energy savings. This reduction would effectively eliminate aluminum frames, which are more durable in extreme heat. Plastic windows in this heat can distort and/or degrade.</p>	<p>EPA analysis indicates that some aluminum products still qualify in the Southern Zone. EPA plans to provide additional details in the full criteria analysis report.</p>
67	Proposed Doors Criteria	<p>Full-lite patio doors are essentially large windows and thus should be subject to the ENERGY STAR windows specification.</p>	<p>Changing the door classifications at this point would cause confusion, especially since NFRC makes no differentiation between full-lite patio doors and full-lite French style doors in terms of labeling or reporting in the Certified Products Directory.</p>
68	Proposed Doors Criteria	<p>A few of stakeholders cited concerns about door and window glass "matching" at the proposed SHGC levels:</p> <ul style="list-style-type: none"> -Higher SHGC should be permitted on full-lite doors to allow for uniformity in the fenestration throughout a residence. -Concerned that the glass may not match in efficient windows and doors. 	<p>EPA appreciates this feedback, but asks for additional information and data supporting this point.</p>
69	Proposed Doors Criteria	<p>Stakeholders offered many comments on the proposed door criteria:</p> <ul style="list-style-type: none"> -While U-factors of 0.30 can be achieved with double-glazing, 0.27 will likely require triple glazing. The proposed SHGC values do not present a concern, nor do they impact any doors disproportionately. -Support the door criteria and categorization as proposed. -The proposed lower SHGC values are of concern since they could add up to \$15-40 per configuration for doors with decorative glass without appreciably improving performance. -Stakeholders proposed the following energy performance criteria: <ul style="list-style-type: none"> -Opaque: 0.19 U-Factor, Any SHGC -≤1/2 Lite: 0.25 U-Factor, 0.25 SHGC ->1/2 Lite: 0.30 U-Factor, 0.30 SHGC -Other stakeholders concurred with the U-factors proposed above, but recommend no change to the current SHGC criteria for doors. -Full lite doors will require triple glazing under the proposed criteria. If U-factors are kept at or above 0.30, some PVC sliding glass doors should be able to qualify for the ENERGY STAR label. -Sliding glass doors will be challenged by the specification, with many technologies unable to meet the specification. The criteria for these products should remain unchanged. -While proposed U-factors are appropriate, SHGC should vary with climate zones. 	<p>The preliminary criteria ranges presented in the Framework Document were based on feasibility analysis using the CPD, cost data analysis for a subset of manufacturer volunteers, and numerous discussions with industry stakeholders. These ranges also take into consideration new data provided by Ducker Research.</p> <p>This research was preliminary. EPA plans to take these comments into consideration as it evaluates the feasibility, energy savings, and cost effectiveness analyses. EPA also plans to take into consideration market penetration rates, programmatic goals, and prevailing energy efficiency codes. EPA plans to make full results of EPA's analyses and research available in the Draft 1 Criteria and Analysis Report.</p> <p>Additionally, EPA welcomes any cost data that manufacturers would like to volunteer.</p>

Ref No.	Topic	Comment	EPA Response
70	Proposed Doors Criteria	At the 0.25 SHGC level, full-lite doors will be forced to use low-E glass, impacting the aesthetics of decorative glass and increasing costs \$15-40. Many decorative products already have low SHGC, which is not always reflected in simulation models, so these simulation models should be revised and decorative glass should be exempt from the SHGC requirement. Alternatively, SHGC should be set at 0.28.	EPA welcomes any cost data and additional information that manufacturers would like to share on this point. If there are issues with the NFRC simulations, manufacturers should work through the NFRC process to get these issues resolved.
71	Proposed Skylights Criteria	A few of stakeholders are concerned that RESFEN 6 does not completely model the energy effects of top lighting. If EPA used RESFEN 6 to justify the proposed skylight or TDD criteria, request opportunity to review and analyze the data that EPA used.	EPA plans to use RESFEN 5 for the TDD and skylight analysis. EPA plans to provide additional information in the full criteria revision report.
72	Proposed Skylights Criteria	Agree with EPA's proposed U-factor criteria for skylights.	EPA appreciates this support.
73	Proposed Skylights Criteria	Question EPA's claims that efficient skylights with double glazing would be able to earn the ENERGY STAR label and EPA's exclusion of plastic skylights in its analyses.	EPA plans to make details of the feasibility analysis available in the full criteria revision report. EPA plans to reevaluate its exclusion of plastics skylights from the analysis.
74	Proposed Skylights Criteria	<p>Stakeholders offered several comments on the proposed skylight criteria:</p> <ul style="list-style-type: none"> -While the proposed levels for the North and North-Central Zones are reasonable, would like to see U-factors set at the more stringent ends of the proposals. An SHGC requirement in the Northern Zone, however, is not necessary. -A few of stakeholders recommend the following ranges: <ul style="list-style-type: none"> -North: 0.47-0.52 U-Factor, Any SHGC -North-Central: 0.52-0.55 U-Factor, 0.35-0.40 SHGC -South-Central: 0.55-0.58 U-Factor, 0.30 SHGC -South: 0.58-0.65 U-Factor, 0.30 SHGC -One best-selling product would only qualify in the North-Central Zone given the proposed criteria. Developing qualified products would likely increase cost by 20-30%. -Any skylight SHGC lower than the SHGC for windows is both unjustified and contrary to the goal of energy savings. SHGC should not be limited in the Northern Zone. EPA has proposed skylight/TDD criteria that are 0.05-0.10 too low across the board. 	<p>The preliminary criteria ranges presented in the Framework Document were based on feasibility analysis using the CPD, market availability research for nearly all skylight manufacturers, cost data analysis for manufacturer volunteers, and numerous discussions with industry stakeholders. These ranges also take into consideration new data provided by Ducker Research.</p> <p>This research was preliminary. EPA plans to take these comments into consideration as it evaluates the feasibility, availability, energy savings, and cost effectiveness analyses. EPA also plans to take into consideration market penetration rates, programmatic goals, and prevailing energy efficiency codes. EPA plans to make full results of EPA's analyses and research available in the Draft 1 Criteria and Analysis Report.</p>

Responses to Comments on ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Product Specification Framework Document

Ref No.	Topic	Comment	EPA Response
75	Timeline	<p>Stakeholders offered the following about the criteria revision timeline:</p> <ul style="list-style-type: none"> -Suggest delaying the effective date until 2015 to allow enough time for manufacturers to redesign, test, and build products. -An effective date of 1/1/2015 would allow manufacturers more time to comply and would align better with IECC revisions. Short-lived changes are over-burdensome to industry. -The time between the announcement of the new specification and the effective date is too short. It does not allow enough time for product redesign, prototyping, testing, and production ramp-up on multiple product lines. -The proposed timeline is neither reasonable nor feasible and will force companies to choose equipment retrofitting over employee retention. The open-ended implementation date should be 2015 and should be revisited at that time. -Given current economic troubles and the bad housing market, now is not the time to have manufacturers endure the investment required for R&D and marketing due to a new ENERGY STAR specification. There is concern that this shift in focus could impact employment or dilute other resources. Customers are not asking for or willing to pay for these improvements. 	<p>ENERGY STAR seeks to create product differentiation, however, ENERGY STAR market share increased with the last criteria revision and is approaching 90%. EPA's goal with this criteria revision is to reduce market share to a more reasonable level. As with other product categories, the expectation is that market share drops with the criteria revision, leading partners to adapt, with increasing market share as time passes.</p> <p>ENERGY STAR is a voluntary program aimed at improving energy efficiency of products. EPA plans to consider a January 2014 implementation date, making it a full four years since the last criteria revision.</p> <p>EPA 2005 requires that EPA provide 270 days notice before implementation of a new specification, however, EPA aims to provide industry with a full year's notice before final implementation. Additionally, EPA hopes to provide industry with at least two years from the publication of the Framework Document until the implementation date of the final specification.</p>
76	Timeline	<p>EPA should wait to release Version 6.0 of the Windows, Doors, and Skylights criteria until the end of IECC code cycle 2016, since many changes have just taken place and it is questionable whether Florida or other southern states can even adopt IECC 2012.</p>	<p>The proposed changes align with the latest IECC changes, allowing manufacturers to develop new products for IECC 2012 and the new ENERGY STAR spec at the same time. Additionally, since ENERGY STAR seeks to recognize the most energy-efficient products, it is driven by product improvements rather than code adoption.</p>
77	Other Comments	<p>The current matrix door label is prone to error and misinterpretation by the consumer. Recommend ENERGY STAR allow only one set of NFRC values on the labeled door.</p>	<p>EPA suggests taking this up with NFRC, but commends those partners who take it upon themselves to use an NFRC label on doors that only shows one set of values.</p>
78	Other Comments	<p>Urge EPA to forgo the use of a transition label.</p>	<p>EPA appreciates this comment and plans to evaluate transition strategy once the criteria have been finalized.</p>
79	Other Comments	<p>As codes become more stringent, there may be less room for ENERGY STAR to select cost-effective criteria that beat codes. In these instances, there are still benefits to be realized if ENERGY STAR were to match codes, so as to accelerate code adoption.</p>	<p>EPA acknowledges that there are diminishing returns in energy savings as products become more efficient. This is true with any product category, and EPA sunsets those programs that cease to have potential to pull the market forward in energy efficiency. Windows have not yet reached that point. Further, encouraging code adoption is beyond the scope of the ENERGY STAR program.</p>
80	Other Comments	<p>Several stakeholders inquired about the most efficient program, citing the meaningful product differentiation such a program would provide to consumers. Without such a program, one stakeholder claimed that EPA must choose between a more inclusive criteria with high market share and a more exclusive criteria that saves more energy per window. Suggest that EPA adopt the levels found in DOE's High Performance Windows Volume Purchase Program if choosing the latter.</p>	<p>EPA appreciates this input, but notes that the Most Efficient program is being managed through a separate process. EPA encourages stakeholders interested in a Most Efficient program for windows to supply comments when they are requested through the Most Efficient program development process.</p>

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81	Other Comments	Very concerned about the Independent Verification Program (IVP). Since this program is under development at NFRC, it is understood that NFRC members should be able to provide input into the program's structure. The IVP should be a vehicle through the ratings process used for ENERGY STAR is verified, including audits of computer simulations using LBNL's WINDOW and THERM. Physical testing to confirm NFRC performance ratings should not be performed, as it would add additional complexity for the NFRC and manufacturers.	Under the Enhanced Testing and Verification program, EPA has committed to post-manufacture verification testing of all ENERGY STAR qualified products. Requirements for such verification testing programs are outlined in the requirements for Certification Bodies. As an EPA-recognized CB, NFRC has committed to creating a program that meets these requirements. Stakeholders with questions or concerns about the development of NFRC's IVP should contact NFRC directly.
82	Other Comments	Will EPA require separate labeling of sidelites and transoms?	EPA does not plan to change the current sidelite and transom label policy. EPA invites comments or questions from manufacturers regarding this policy if companies have any concerns.
83	Other Comments	Stakeholders ask that ENERGY STAR reconsider the way it handles dynamic glazing products.	EPA recognizes the potential benefits of dynamic glazing, but until energy savings can be documented by verifying consumer behavior or by using automated controls, EPA cannot consider making special allowances for these products.
84	Other Comments	Stakeholders project that ENERGY STAR market share will be 41%. This is too high, especially considering that manufacturers will alter production toward more efficient products. Thus, EPA should set the criteria such that it only allows 25% of products to qualify.	Unlike other product categories, there is no federal standard for fenestration that prevents the most inefficient products from being sold, which means a 25% market share may not be as achievable as with other products without sacrificing cost-effectiveness. Further, a 41% market share would represent more than a 50% reduction from the current market share. EPA recognizes that this is a drastic change in and of itself.
85	Other Comments	Agree that commercial window performance is best addressed through a whole-building program.	EPA appreciates stakeholder support in this matter.
86	Other Comments	The proposed criteria could create pressure on the Canadian ENERGY STAR specification, leading to unnecessarily tight criteria.	ENERGY STAR Canada has a separate criteria revision process. EPA encourages stakeholders to engage with NRCan regarding any concerns they may have with the Canadian criteria.
87	Other Comments	Encourage EPA to focus on education about and enforcement of building energy codes.	Education on and enforcement of building energy codes is outside the purview of the ENERGY STAR program. There are many organizations that specialize in building code education. Concerns about enforcement should be directed at local and/or state governments responsible for these matters.
88	Other Comments	Would like to see more effort to convert single pane windows installed in existing housing to more efficient ENERGY STAR products.	EPA currently encourages those seeking to replace single-pane windows to install ENERGY STAR qualified products by communicating directly to consumers through the ENERGY STAR website and providing marketing materials to partners for their use and distribution.
89	Other Comments	Suggest replacing U-factor with a new metric, "E-factor", which takes into account the tradeoff between U-factor and SHGC to yield one overall rating. EPA should work with the NFRC to establish this new metric.	EPA recommends that stakeholders work directly with and through NFRC to develop any new metrics.