

Energy Code Update



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Energy Codes Update

Our mantra: **Defend and Promote**

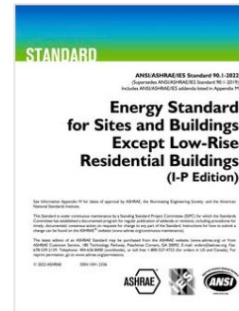
- *Defend* against changes harmful to the industry
- *Promote* the positive attributes of glazing in the B&C sector

Energy and Green Codes & Standards:

- International Energy Conservation Code (IECC), ASHRAE 90.1
- International Green Construction Code (IgCC), ASHRAE 189.1
- National Fenestration Rating Council (NFRC)
- Attachments Energy Rating Council (AERC)
- National Green Building Standard (NGBS)
- Partnership for Advanced Window Solutions (PAWS)
- ...

ASHRAE 90.1 – 2025 Fenestration Criteria

- After 2 years of analysis and negotiation, successfully completed next step in fenestration criteria.
 - Comprehensive changes in fixed windows, operable windows, skylights / sloped glazing. No changes to glazed entrance doors.
 - Completed 2nd review with unanimous support, no unresolved comments – will be published in 90.1-2025.
 - Cost effective, practical.
- ***No reduction in window area.***
- Roughly 3-13% changes in U-factor.
- SHGC already mostly optimized so main change is extending the 0.23 SHGC up to zone 2 in nonresidential spaces.
- Continued incremental advancement.
 - Increased use of thermally broken frames, warm edge spacers, gas-fill in all zones
 - 4th surface low-e and higher performance thermal breaks in northern zones
 - triple glazing in far north (zones 7-8)



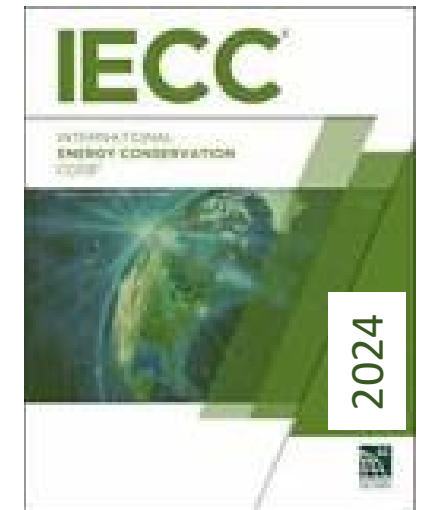
ASHRAE 90.1-2025 Other Items

- Increased required **on-site renewable energy** by 50% from 0.5 W/sf to 0.75 W/sf.
 - Increased demand for solar glass – both regular PV as well as BIPV
 - Options for off-site community solar and other renewable energy.
- Credits for higher performance envelopes, extra renewable energy, tighter air leakage.
- Expanded ability to take credit for **automated shading** and **dynamic glazing**.
- *Voluntary* addenda for **net-zero energy buildings** (performance and prescriptive).
 - Notch above main energy code + increased on-site renewable energy.
 - High performance target, but no direct limit or attack on window area.



International Energy Conservation Code (IECC)

- Work on the 2027 IECC has started.
- Committees formed. From our industry:
 - Helen Sanders (Technoform) and I are on commercial committee
 - Craig Drumheller (WDMA) is on the residential committee
 - I am vice-chair of commercial envelope subcommittee. Helen and Morrison Hershfield / Stantec also on it.
- 159 commercial proposals, 215 residential proposals
 - Fenestration U-factor, SHGC including alignment with ASHRAE
 - Fenestration and spandrel ratings
 - Thermal bridging
 - Automated shading
 - Renewable energy
 - Residential backstops
- We will review with Glazing Industry Code Committee (GICC). Join us!



ASHRAE 189.1 / International Green Construction Code

- Continuing to discuss EPD requirements – not just how many to submit, but embodied carbon requirements.
- Introduced bird-friendly glazing requirements as a jurisdictional option.
 - Based on NGA Design Guide,
 - specify where required
 - prescriptive criteria for glazing
 - testing threat factors *not* included.
- Broad support, will be voted on next week.



ASHRAE 189.1 / IgCC – Bird Friendly Glazing

9.10 [JO] Bird-friendly Design.

9.10.1 Bird-Friendly Glazing Required Locations. Bird-friendly glazing shall be installed in new buildings and additions, and where 25% or more of the *vertical fenestration area* is being replaced during existing building alterations. Bird-friendly glazing compliant with Section 9.10.2 shall be installed in the following locations:

- a. Not less than 90% of the area of *vertical fenestration*, glass spandrel, and *skylights* below 75 feet (23 m) above grade.
- b. For existing buildings, not less than 90% of the area of *vertical fenestration* being replaced.
- c. Not less than 90% of the area of *vertical fenestration*, glass spandrel, and *skylights* adjacent to and three *stories* or fewer above roof areas with vegetation or water features.
- d. Where glazed, all glazed corners, fly-through conditions, glazing adjacent to courtyards, skywalks, building connectors, railings, noise barriers, and wind barriers below 75 feet (23 m) above grade.

Exceptions to 9.10.1:

1. Buildings listed on the National Register of Historic Places.
2. Places of religious worship.

ASHRAE 189.1 / IgCC – Bird Friendly Glazing

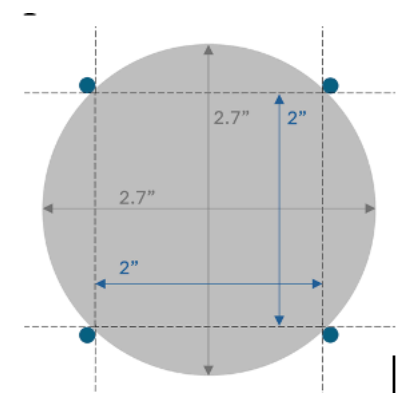
9.10.2 Bird-Friendly Glazing Characteristics

Where required by Section 9.10.1, qualifying bird-friendly glazing shall comply with not less than one of the following:

- a. The first or second surface of the glazing shall have solid fill visual markers not smaller than 1/8" (3 mm), no more than 2" (50 mm) between linear continuous visual markers, and a density pattern such that a circle with diameter no more than 2.7" (69 mm) will fit between discrete point visual markers.
- b. Comply with Clauses 3.3.1 through 3.3.3 of CSA A460.
- c. Glazing shall be covered by permanently-attached exterior building-integrated structures that do not have gaps larger than 2" (50 mm) in any dimension, including but not limited to metal screens or fixed solar shading.

(**Informative Note:** Refer to NGA DG01-21 Best Practices for Bird-Friendly Glazing Design in Informative Appendix L.)

Example of largest circle that will fit between markers in a 2 x 2 inch grid.



Colorado



- Colorado has new law requiring residential windows, doors, and skylights to meet **Energy Star v7** criteria starting 2026.
 - However, currently reviewing market availability and cost, and considering backing off to **2021 IECC**. Decision due in June.
- New “**Colorado Model Low Energy and Carbon Code**” out for comment.
 - Based on 2024 IECC but with electrification aspects added back in.
 - When a local jurisdiction updates their code, required to use this.
- Colorado is also establishing new **Building Performance Standard** to update existing buildings, including windows.

AERC Reglazing Ratings



- Attachments Energy Rating Council (AERC) already has ratings for commercial secondary windows, low-e storm windows, and shading products.
- Considering new rating for glazing-only replacement, at suggestion of LBNL.
 - U-factor, SHGC, VT in AERC's commercial baseline window.
 - But also interested in other metrics related to daylight, visual comfort, thermal comfort, view.
 - This broader picture of performance and metrics can help with the “why windows matter” message.
 - However, I'm concerned no one (we) will not want to use it, as performance will be understated in AERC's artificially small baseline window and poor frame.
 - For example, not as attractive to sell U going from 1 to 0.5, instead of selling that the center-of-glass U-factor went from 1 to 0.2 or R-value of the glazing went from R1 to R5.



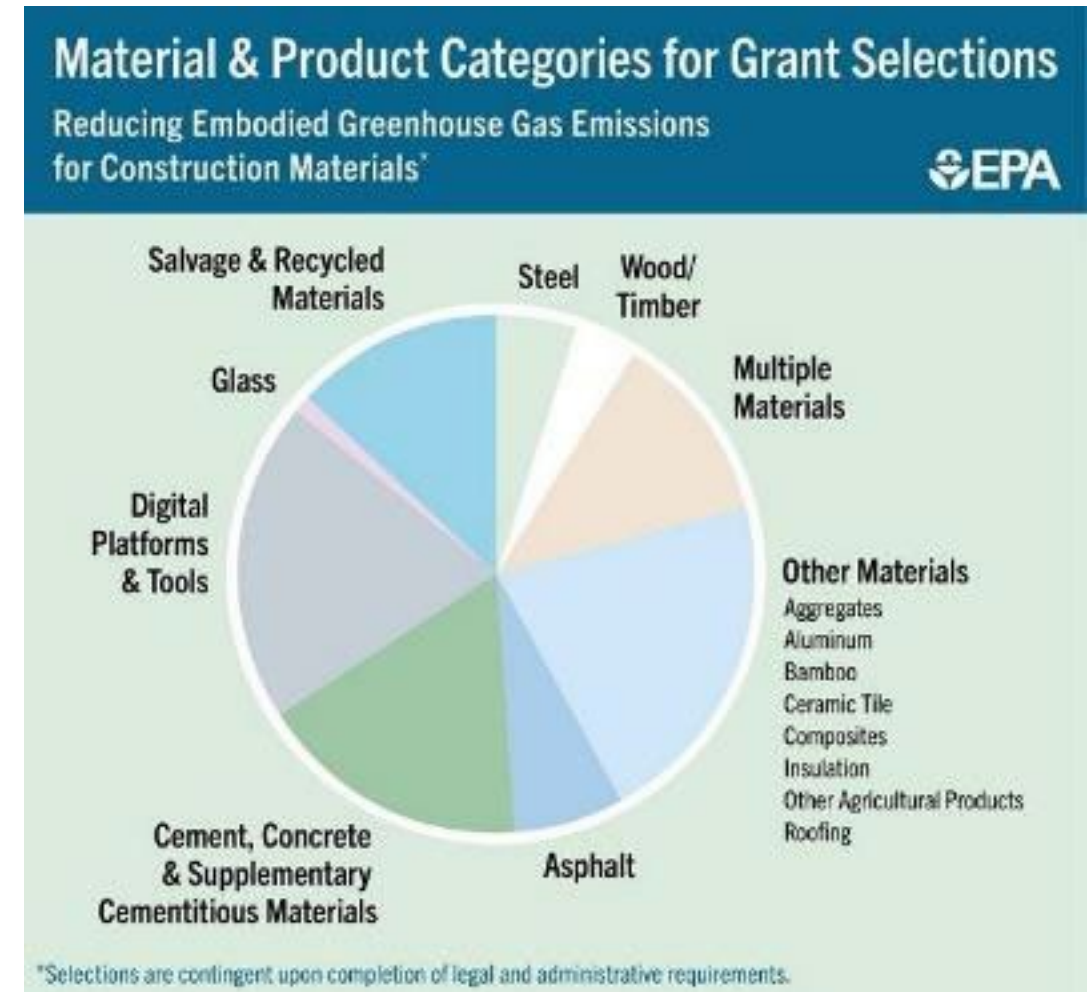
Spandrel Research

- Charles Pankow Foundation research project to improve thermal characterization of spandrel, refining 2D and 3D models against detailed hot box thermal testing.
- Technical work led by SGH, Stantec, RDH. Detailed testing at Oakridge National Lab.
- First test unitized curtain wall specimen tested last fall.
 - Thank you Permasteelisa, Tristar Glass, GCC, Mapes, NGA!
- Next test specimen up is stick-built curtain wall
 - Thank you YKK AP, Tristar, GCC, LuxWall, NGA!



EPA Grant to Assist in EPD Development

- NGA is an EPA grant selectee – finalizing grant details now.
- \$2.1 million over 5 years
- 38 proposals selected, 14 material types
- NGA is the **only glass representative**



EPA Grant to NGA

Four Subprojects

1. Primary Flat Glass LCI Data Aggregation (\$333k)

Provide support to improve granularity of primary flat glass LCI data, as well as PCR update.

2. EPD Generator Tool for Processed Glass (\$379k)

Develop robust generator tool capable of producing both LCA data reports and full 3rd party reviewed EPDs for processed glass products in conformance with ISO.

3. EPD Development Assistance for Glass Fabricators (\$1.2M)

Provide technical, educational, and financial assistance to glass fabricator members for EPD development.

4. End-of-life LCA data collection on architectural glass recycling (\$226k)

Improve understanding about glass end-of-life and quality of LCA part D data, quantify glass recovery rates and track end-use outcomes for recycled glass on 1-3 deconstruction projects.

Will now be done jointly with Aluminum Extruders Council (AEC), tracking both recovered glass and aluminum.