

California Title 24 Compliance with View Dynamic Glass

What is Title 24?

The California Code of Regulations (CCR) contains the rules and regulations of various state regulatory agencies for California, divided into 28 titles. Title 24 contains the California Building Standards Code. Within Title 24 are 12 “parts” that cover different aspects of building construction. Part 6 is the California Energy Code, also titled The Energy Efficiency Standards for Residential and Nonresidential Buildings. The goal of the California Title 24 energy standards is the reduction of energy use. As such, the standards address the energy efficiency requirements of new and altered homes and commercial buildings. These are updated on an approximately three-year cycle.

On January 1, 2017, the 2016 California Building Energy Efficiency Standards (Title 24, Part 6) went into effect.

How Does View Dynamic Glass help buildings comply with Title 24?

View Dynamic Glass has the ability to change its performance properties (SHGC, Tvis) with automatic control to modulate the amount of heat and light entering a space. **Dynamic Glazing is accepted as a product in Title 24 and is classified under chromogenic glazing.**

Projects can comply with Title 24 using either of two methods: Prescriptive or Performance.

Prescriptive Path

Under the Prescriptive method, each component of the building envelope must meet a specific, energy-efficiency requirement (Section 140.3(a) - 140.9). The prescriptive approach is the simplest but also the least flexible.

To receive credit for chromogenic glazing **T-24 allows the use of the lower-rated SHGC and the higher-rated VT.** For the standard View Glass dual pane IGU the values are 0.09 (SHGC) and 0.58 (VT)

Envelope Criteria for Prescriptive and Performance Compliance							
	Fixed Window	Curtain wall/Storefront	Skylight, Curb Mounted	Tint 1	Tint 2	Tint 3	Tint 4
U-factor	0.36	0.41	0.58	0.29	0.29	0.29	0.29
RSHGC	0.25	0.26	0.25	0.40	0.28	0.11	0.09
VLT	0.42	0.46	0.49	0.58	0.40	0.06	0.01

All View Glass values are for Standard Dual Pane glass with Argon.

Performance Path

Under the Performance path, the energy budget calculated for the proposed design should be no greater than the energy budget calculated for the prescriptive design using an approved energy analysis program.

Modelling for Title 24 Compliance

The California Energy Commission (Energy Commission) has approved specific energy analysis computer programs that include all Alternative Calculation Methods approved for the 2016 Building Energy Efficiency Standards (2016 Energy Standards) in accordance with the California Code of Regulations: Title 24, Part 1, Article 1, Section 10-109.

These are CBECC-Com, EnergyPro, and IES-Virtual Environment. The compliance engine used by these software packages does not yet have the option of modeling multistate dynamic glazing with time varying properties. Only one value for SHGC, VLT and U-Factor can be defined for the entire annual simulation.

To receive credit for chromogenic glazing under the performance approach the following is recommended

- **Use the best rating as model inputs in the software** (typically the lower-rated SHGC and the higher-rated VT)
- Ensure that the automatic controls to receive best rating values are verified per the protocols listed in Appendix NA7 ; **OR**
- Provide a NFRC Dynamic Glazing Compliance Label

Title 24 Installation and Verification Protocol for Dynamic Glazing

(Appendix NA7- Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes)

These procedures detail the installation and verification protocols necessary to meet acceptance requirements of dynamic glazing. Each dynamic glazing product shall be provided with a temporary NFRC Label on the glazing or an NFRC Label Certificate to identify the thermal performance (e.g. U-factor, Solar Heat Gain Coefficient (SHGC), and Visible Transmittance (VT)) of each product being installed. The labels, an Energy Commission Default Values FC-1 form or an NFRC label shall be located at the job site for verification by the enforcement agency. In addition, the responsible person shall fill out the Installation Certificate (ENV-INST) and the Certificate of Acceptance (ENV-2A), Fenestration Acceptance Certificate. The responsible person shall verify 1) the dynamic glazing to be installed matches the energy Certificate of Compliance (ENV-1C) documentation and building plans. A copy of the Installation and Acceptance certificate shall be given to the building owner and the enforcement agency for their records.

NA7.4.3.2 The Responsible Person or Installer Shall Meet the Following Protocols before Installation:

- (a) Verify the dynamic glazing matches with building plans and Energy Compliance forms;
- (b) From the building plans or energy compliance forms, identify the azimuth orientation in degrees or in cardinal orientation for each of the dynamic glazing to be installed to ensure the correct dynamic glazing specifications or model are installed in the appropriate orientation;
- (c) Verify dynamic glazing controls if applicable matches the building plans schedule;
- (d) Verify NFRC's Certified Product Directory (CPD) number if applicable. See <http://cpd.nfrc.org/cpd2/>;
- (e) If no NFRC Label or FC-1 is Form is included, then verify with the Responsible Person of the building construction or enforcement agency to ensure the dynamic glazing is actually meets or exceeds the energy specifications before installation;
- (f) Installation of dynamic glazing shall meet the manufactures installation instructions;
- (g) After the installation the installer completes and signs the Declaration Statement on the Installation Certificate ENV-INST. A signed copy of the ENV-INST Certificate(s) shall remain at the job site for verification by the building inspector.

NA7.4.3.3 Field Technician or Responsible Person Shall Meet the Following Protocols After Installation:

- (a) Verify the Installation Certificate ENV-INST and the Declaration Statement is signed before inspection of the installation; and
- (b) When controls are installed with the dynamic glazing, it should be verified that it meets the exact operation specifications of the dynamic glazing installation, functional and testing instructions.
- (c) After dynamic glazing inspection is complete ensure the ENV-2A certificate form is completed and including the signature of the Declaration Statements; and
- (d) Provide certificates and additional copies to the builder, enforcement agency and building owner at occupancy.

NA7.4.3.4 Documentation at Occupancy:

The following documentation shall be made available to the responsible party of construction or building owner at occupancy;

- (a) A completed and signed ENV-INST and ENV-2A, form(s);
 - 1. If supplied by the manufacturer, a copy of the manufacturer's warranty and user manual

Does View provide a NFRC label or certification?

NFRC certifications are obtained for the entire window assembly and not for just the insulated glass unit (IGU). View only provides the IGU, and therefore cannot provide an NFRC label for it. The glazier or window fabricator (whoever is responsible for providing the entire window assembly) typically provides the NFRC testing and report. View can provide the NFRC approved center of glass performance values to the responsible party for proper modeling. The product specifications are listed in the latest International Glazing Database (IGDB) database.