



Daylighting Potential TG Status Report

2019 Fall Meeting

Charlotte NC

Chair: Ray Garries

Why is Daylighting Potential Rating Important?

- Industry and consumer needs a simple comparative measure for daylight at the fenestration plane, mainly in Residential market
- Daylighting is a key Green building factor
- NFRC needs to own this key measure for our products
- Our current VT measure is an incomplete measure of daylight and is embedded as a measure of inside- out darkness. This DPR will start the process for consideration of change

NFRC Daylighting Potential Task Group

A new way to explain natural lighting benefits and comparisons

Task Group Objective:

- ❑ To bring forth a standardized value to all fenestration products that expresses the overall Daylighting impact of the fenestration on the interior space as defined by the NFRC.

Need:

- ❑ Establish a new, simple product rating for vertical fenestration that provides the consumer with insight on annual daylighting potential provided by a rated product.

One method has proven to be the best path:

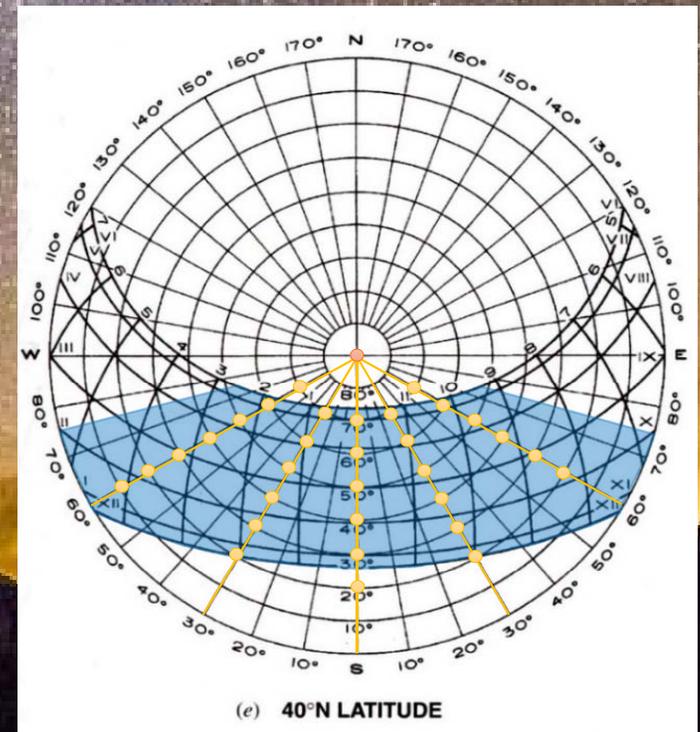
Apply VT_{annual} (as defined in NFRC203) as the foundation and Proxy for a new annualized performance rating applied to a product's label.

Daylight Potential

a new way to explain natural lighting benefits and comparisons

What is NFRC 203's VT_{annual} Rating?

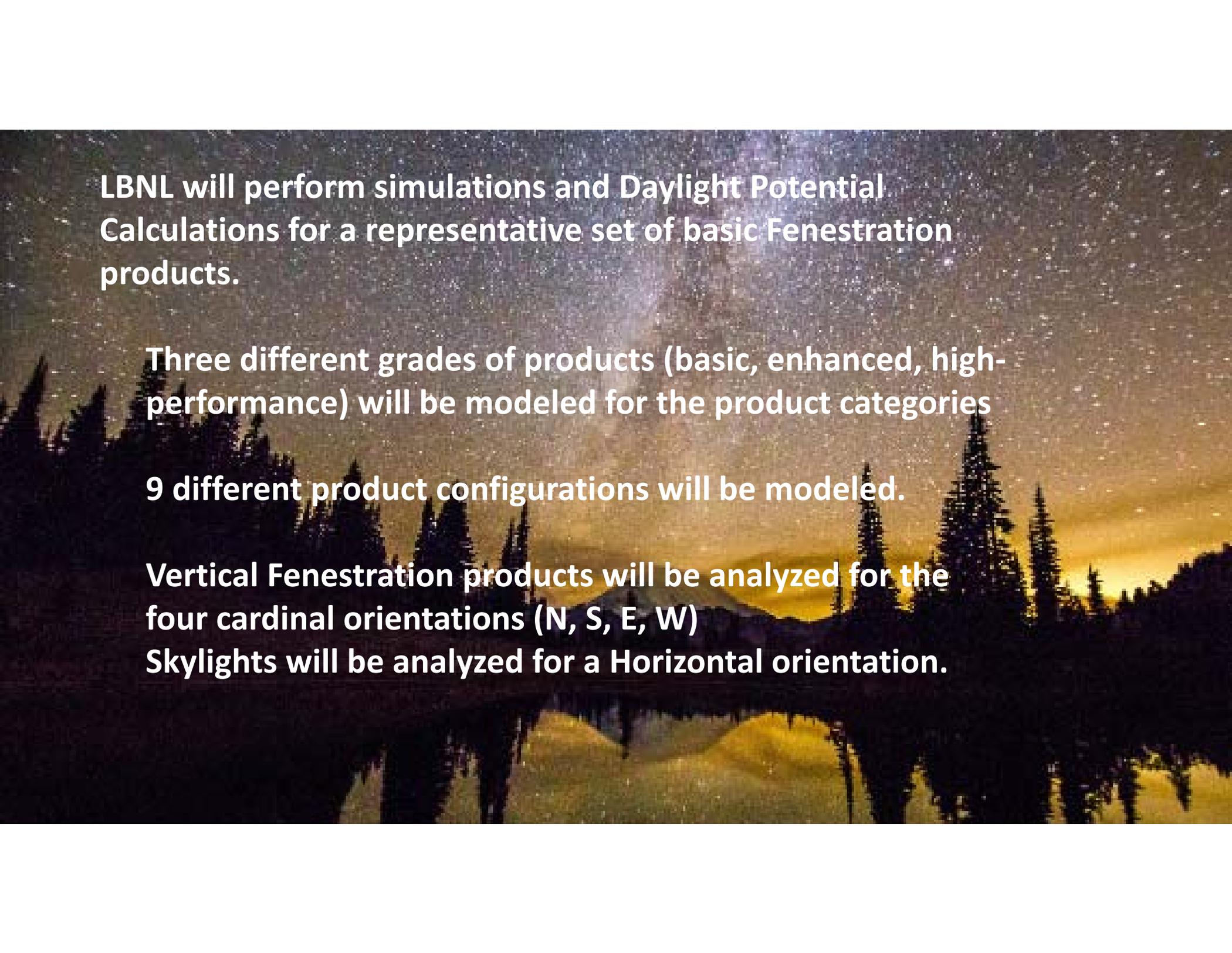
- Existing Certified Product Rating for a product's *real* Visible Light Transmittance (VT) used for TDD products
- VT_{annual} is *Different* from normal VT – don't compare VT_{annual} provides a product's yearly-average Visible Transmittance.
- Rating accounts for annual, clear sky sun path using 18 individual VT data points multiplied by Zonal Time Weighting Factors (ZT) representing the frequency with which the sun exists throughout the year in 30 different sky zones.
- Represents a product's annual average clear sky Visible Transmittance for 9:00 AM to 5:00 PM Day





Daylighting Potential TG action plan

- Create marketing study for Board approval
- Conduct and react to study findings
- Complete preliminary LBL study on 203
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LBNL will perform simulations and Daylight Potential Calculations for a representative set of basic Fenestration products.

Three different grades of products (basic, enhanced, high-performance) will be modeled for the product categories

9 different product configurations will be modeled.

Vertical Fenestration products will be analyzed for the four cardinal orientations (N, S, E, W)

Skylights will be analyzed for a Horizontal orientation.

LBL worklist for calculating Daylighting Potential

- 1. Determine window VT by considering range of profile angles on glazing surface. Use 5 degree intervals from 0-90, for 19 discrete profile angles (e.g., 0, 5, 10, 15, 20, ...80, 85, 90) - Task to be done by Charlie and his team**
- 2. Determine how much time Sun spends at each incidence angle. Either consider June 21 and December 21 in Denver for each desired surface azimuth (perhaps N, E, S, W), which would result in 8 sets of ZT, or consider full year for 4 sets of ZT data. Neall D to provide data**
- 3. Multiply VT at each profile angle with either 4 or 8 sets of ZT data for that angle (see above) and sum them up for a set of 4 or 8 composite VTs. Charlie and his team to provide**

Daylighting Potential Rating Optional Label Proposal

	World's Best Window Co. Series "2000" Casement Vinyl Clad Wood Frame Double Glazing • Argon Fill • Low E XYZ-X-1-00001-00001
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S. / I-P) 0.35	Solar Heat Gain Coefficient 0.32
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance 0.51	Condensation Resistance 51
Daylighting Potential Rating Non-North XXX LUMENS	Daylighting Potential Rating North XXX LUMENS
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

Marketing and cost study request

- The DPR TG has requested the board authorize a market study and cost benefit summary.
- Market study goal is to find reasons and demand for rating and how NFRC fits in to the market
- Cost study goal is to build budget and resource plan pending market study findings

Product Development Questionnaire – Daylighting

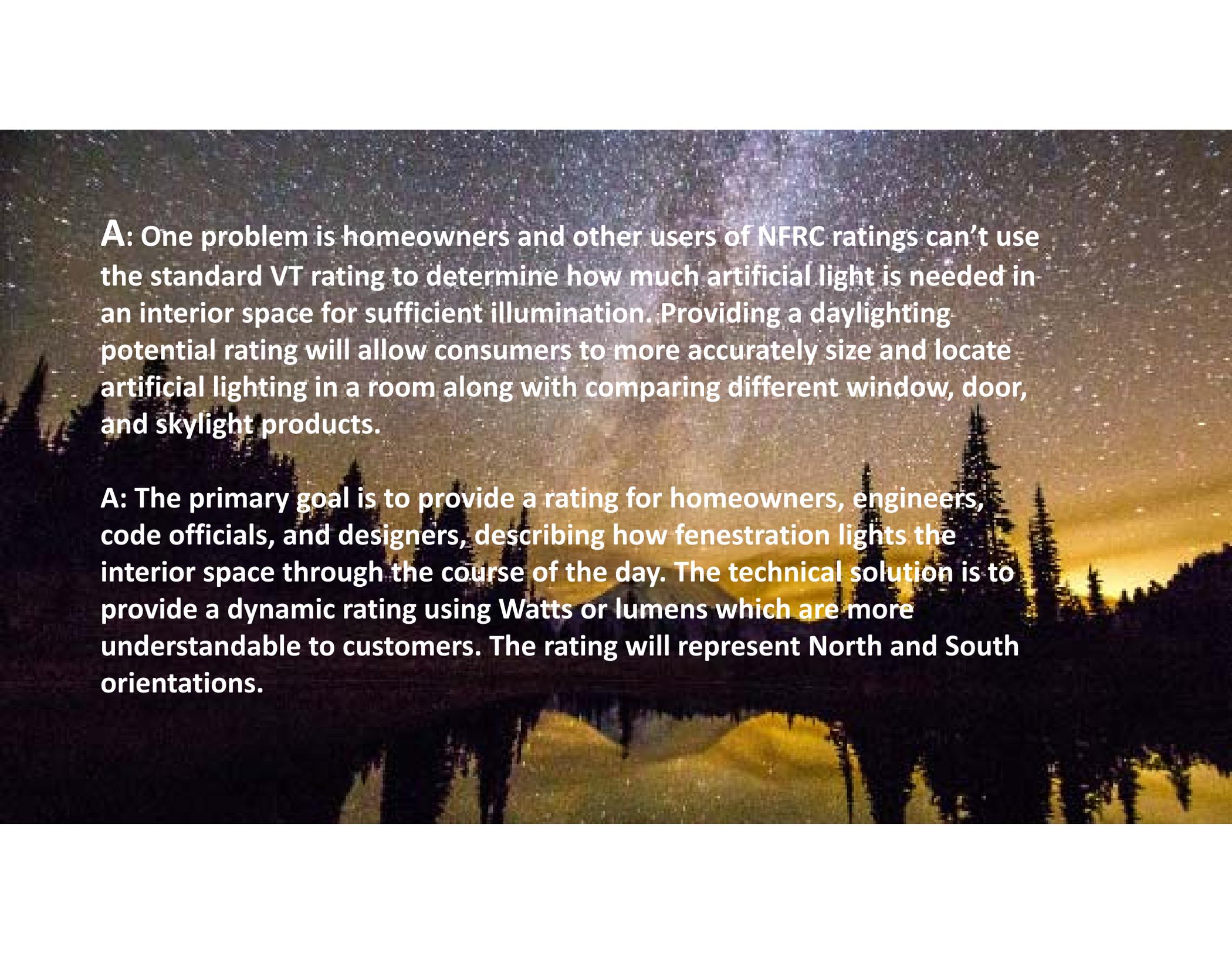
Potential Rating sample questions

Q: Provide a brief (50 words or less) *Product Description (What it is; for whom? Why? What is the problem and what is your proposed solution? The technical concept, product definition and specifications)*

Q: Who is my customer?

Q: Who else would be interested in this product?

Q: What features will this product include?



A: One problem is homeowners and other users of NFRC ratings can't use the standard VT rating to determine how much artificial light is needed in an interior space for sufficient illumination. Providing a daylighting potential rating will allow consumers to more accurately size and locate artificial lighting in a room along with comparing different window, door, and skylight products.

A: The primary goal is to provide a rating for homeowners, engineers, code officials, and designers, describing how fenestration lights the interior space through the course of the day. The technical solution is to provide a dynamic rating using Watts or lumens which are more understandable to customers. The rating will represent North and South orientations.



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A night landscape photograph featuring a starry sky with the Milky Way galaxy visible. The foreground shows dark silhouettes of evergreen trees and a mountain range reflected in a body of water. The text "Daylighting Potential Rating -- Questions?" is overlaid on the left side of the image.

- Daylighting Potential Rating --
Questions?