

ENERGY



How the WERS Star Ratings Work By Mike Palin

WERS is a scheme which awards a pair of star ratings to a window to provide the consumer with a simple scale with which to compare windows. One star rating is for heating performance and the other for cooling performance. The star ratings are on a 10-star scale much like the new, extended 10-star system that was recently announced by the Federal Government for electrical appliances. House energy ratings are also on a 10-star scale, using the software tools AccuRate, FirstRate5 or BERS Pro. However, the factors contributing to window rating stars are quite a bit more complex. This article is aimed to simply explain how the stars work, how they are generated, what they mean and what factors influence them.

Appliance star ratings (e.g. for refrigerators) are based on how much energy the appliance uses when compared with a base case appliance. Like appliances, the WERS stars are based on the Annual Energy Performance (AEP) of the window but unlike appliances, there isn't a simple annual energy figure, for that window on its own that can easily be established. A calculator of the AEP was developed by Dr Peter Lyons to take into account the impact of various characteristics of the window on the annual energy use of a typical house for heating and cooling. With the predicted energy use and compared to a benchmark house, a star rating can be calculated. All star ratings are a means of ranking a product against its peers – they are a relative measure, not an absolute one.

Windows under WERS have been rated using NFRC procedures and protocols. The NFRC report generates results for U-Value, SHGC and VT for the whole window, including glass, frame and seals. The U-Value relates to the insulation value of the window, with a lower U-Value meaning better insulation. The SHGC is the Solar Heat Gain Coefficient and

is the proportion of radiant solar heat that is able to pass through the window (directly and indirectly). The SHGC is a fraction between 0 and 1. The higher the SHGC, the more heat from the sun is able to pass through. As an example, a window with a SHGC of 0.78 allows 78% of heat to pass through (good in a cold climate) whereas a window with a SHGC of 0.30 only allows 30% of heat through (more suited to a hot climate). VT is visible transmittance. As with the SHGC, the VT is a fraction. A window with a VT of 0.68 allows 68% of natural light to pass through. The other value that WERS reports to is the Air Infiltration value. This is a value generated from the AS 2047 testing. It is a number which shows how much air leaks in through the window when a 75Pa positive air pressure is applied. Air leakage through a window occurs around the seals and tracks of the window.

The AEP calculator takes the U-Value, SHGC and Air Infiltration to predict the annual heat and cooling load in a typical house when that window is used. The predicted energy is then used to determine the stars and percentage improvements compared to the base case window. The calculator generates both heating and cooling stars and heating and cooling percentages for the given window.

The heating stars and percentages show a window that would be good where heating needs are normally greater than cooling needs, i.e. in Building Code of Australia (BCA) climate zones 5, 6, 7 and 8. Whereas cooling stars are more relevant to the hotter BCA climates 1, 2, 3 and 4, or for large east or west-facing windows generally.

WERS is a scheme for comparing windows on a fair, unbiased and equal basis. For more information, and a wide range of WERS rated products, visit www.wers.net.

| Certified Products Table | | | | % | % | Total Window System Values - NFRC | | | | |
|--|-----------------|---------------|---------------|-----|-----|-----------------------------------|-------|------|----------|--|
| Window ID | Glazing | Cooling Stars | Heating Stars | | | Uw | SHGCw | Tvw | Air Inf. | |
| WERS Generic Standard Industry Typical Timber Window - Double Glazed | | | | | | | | | | |
| WER_03_008 | 3/6/3 | ★ ★ ☆ | ★ ★ ★ ★ ☆ | 38% | 47% | 3.3 | 0.61 | 0.65 | 5 | |
| WER_03_011 | 3/12/3 | ★ ★ ☆ | ★ ★ ★ ★ ★ | 40% | 51% | 3.0 | 0.61 | 0.65 | 5 | |
| WER_03_014 | 3/12/4LE | ★ ★ ★ | ★ ★ ★ ★ ★ ☆ | 48% | 59% | 2.1 | 0.58 | 0.59 | 5 | |
| WER_03_021 | 5SuperToned/6/5 | ★ ★ ★ ☆ | ★ ★ ★ ★ | 55% | 37% | 3.3 | 0.41 | 0.34 | 5 | |



Sample of WERS Table
(not actual results)

