

Technically Speaking

Solar Optical Properties and the NFRC

Recently, Madico had the distinction of having 45 of our solar control window films certified by the National Fenestration Ratings Council (NFRC). The NFRC is a non-profit organization that administers the only uniform, independent rating and labeling system for the energy performance of windows, doors, skylights, and attachment products. Their goal is to provide fair, accurate, and reliable energy performance ratings. Madico's certifications may be seen, and printed, at www.nfrc.org.

It is important to understand exactly what specifications NFRC certifies. Currently, the only solar optical properties certified by the NFRC are Solar Heat Gain Coefficient (SHGC) and Visible Light Transmission (VLT). These are illustrated in the form of *window performance*. The certified window performance values are based on several types of standardized windows, both residential and commercial, single and dual pane, clear and tinted glass. These tables list a window type and give simulated values for that window with and without film applied.

Other important solar optical properties, i.e., visible light reflected, solar absorption, et cetera, while not certified by the NFRC, will still be published by Madico due to the importance of these properties in selecting the proper films for each installation. Although these properties are not certified by the NFRC, they have been measured using NFRC standards, were verified by an independent laboratory and a 30 member peer group, and submitted to Lawrence Berkeley National Laboratories (LBNL) for use in simulating the window performance certifications. These properties are also available in the International Glazing Database. (www.windows.lbl.gov/materials/IGDB)

When viewing our film's solar optical properties, you will notice discrepancies between what is reported by the NFRC and what we have reported historically. The reason for this discrepancy is quite simple. Madico, as have most window film manufacturers, has always read the transmission and reflectance of their solar control window film based on test method ASTM E-1175. The NFRC uses ASTM E-903. These test methods are quite similar, both using integrated sphere spectrophotometers. There is the potential, however, for the two test methods to yield slightly different results.

Calculating the remaining solar properties was historically done using ASHRAE recommendations. Today these calculations are carried out based on NFRC guidelines. These guidelines are also available on the NFRC site and are noted as NFRC-200 and NFRC-300. Because of the subtle differences between the two methods, there will frequently be variations between our solar properties as reported via NFRC from our historical values. These differences apply not only to the NFRC certified properties (SHGC, VLT), but to the ancillary properties that we publish as well. As a reminder, the SHGC is the accepted NFRC measure of solar heat rejection—and this calculation includes IR rejection. Separating the IR rejection for purposes of heat gain reporting can be misleading.

It is important to note that there is a difference between the performance of film on actual window constructions (window performance) and performance on an isolated piece of glass. When solar optical properties are measured on an isolated pane of glass they are referred to as "center of glass" readings. It is important to understand that "center of glass" measurements will be different from the same film applied to an actual constructed window, which consists of the glass itself, as well as the frame. The analysis of "total window performance" is calculated using two programs, Optics 5 and Windows, available from LBNL. These reported values represent a standard window construction as identified by the NFRC and represent the entire window construction.

Moving forward, all solar optical data published by Madico will be updated to reflect the NFRC data, including both "center of glass" measurements and simulated window performance. This changeover in publishing will take some time as we re-design our specification sheets and have new ones assembled utilizing the new data. In the interim, please use the attached data sheets to ensure you have the most up-to-date specifications for our products. Rest assured, we are doing everything we can to make the literature upgrades as fast as possible.

In addition, all film boxes will soon carry NFRC labels stating the certified properties. This is a very large step in the recognition of solar control window film as a viable energy saving component. The NFRC is widely recognized as the foremost expert in solar control glass. Having our products added to that family is a very significant accomplishment that can only benefit our industry.