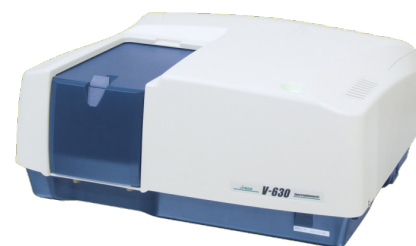


Transmittance, Reflectance, and Emittance Measurements of Flat Glasses and the Evaluation of Solar Heat Gain Coefficient using a UV-Vis/NIR Spectrophotometer

Introduction

Many heat shield glasses are made eco-friendly materials that prevent global warming and reduce energy costs. Testing methods for the evaluation of these heat shield glasses is stipulated by JIS R3016 and require visible transmittance, visible reflectance, solar transmittance, solar reflectance, and emittance measurements. From these measurements, the solar heat gain coefficient can be calculated, which is defined as the fraction of incident solar radiation admitted through a window.



V-630
UV-Vis Spectrophotometer

This application note illustrates how to obtain and evaluate transmittance/reflectance spectra of a flat glasses using an integrating sphere and calculate the solar radiation absorbance using the *Solar Transmittance/Reflectance Visible Light Transmittance/Reflectance* program.

Keywords

V-670, UV-Visible/NIR, ISN-723 Integrating sphere, VWST-774 Solar Transmittance/Reflectance Visible Light Transmittance/

Experimental

Measurement Conditions			
Measurement Range	2500-300 nm	Data Pitch	0.5 nm
UV/Vis Bandwidth	5.0 nm	NIR Bandwidth	20.0 nm
Scan Speed	400 nm/min	Response	Fast

Results

Spectra of both heat shield glass and conventional glass were measured and are shown in Figure 1.

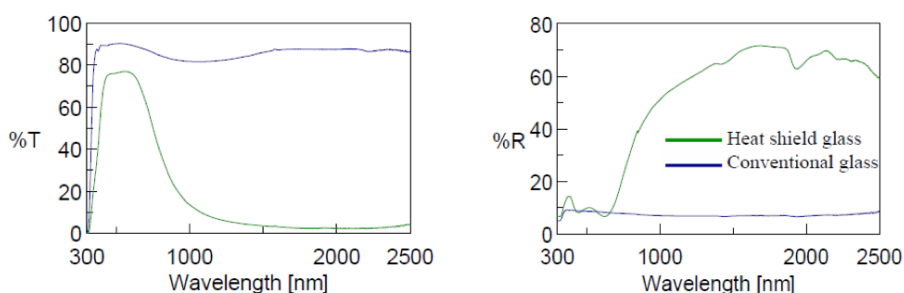


Figure 1. Transmittance (left) and reflectance (right) spectra of heat shield glass (green) and conventional glass (blue).

The solar radiation results of the heat shield and conventional glass were calculated using the *Solar Transmittance/Reflectance Visible Light Transmittance/Reflectance* program and are shown in Figure 2 and Table 1.

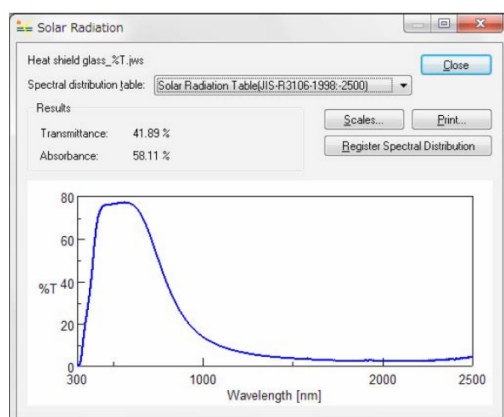


Figure 2. *Solar Transmittance/Reflectance Visible Light Transmittance/Reflectance* program.

Table 1. Solar radiation transmittance/reflectance/absorbance and visible light transmittance/reflectance results of heat shield and conventional glass.

	Heat Shield Glass %	Conventional Glass %
Solar Radiation Transmittance	41.89	86.10
Solar Radiation Reflectance	31.85	7.82
Solar Radiation Absorbance	26.26	6.08
Visible Light Transmittance	76.38	89.95
Visible Light Reflectance	8.80	8.52