

Test of the Linshang LS182 SHGS Window energy meter

Jacob C. Jonsson

Using the instrument

The instrument has a round 5V plug and comes with a USB-A that fits this as well as a USB-A female 110V adapter to provide the power. There is also a USB-micro port that can be used to power the instrument. The adapter is listed at 1A so if a computer port that provides that much current should be able to run it (tested successfully on my PC using both the USB-A to round option and the USB-A to USB-micro).



Once it is plugged in, turning it on is done with an obvious switch. At this point the gap between detectors and sensors should be unobstructed. Self-calibration happens quickly and after less than 10 seconds the display shows UV rejection 0, IR rejection 0, VLT 100% and SHGC 1.0.

As a glass sample is inserted, the display updates and quickly shows stable readings of the 4 values.

Testing the instrument

Three specular samples (clear 6mm low-iron, low-e on clear 6mm, and an applied film on clear 6mm) and one diffuse sample (V1086 on clear 6mm) were measured. Quick test by flipping samples indicated that all the 4 detectors are transmittance only (rejection really just means absorption). The samples used were also measured in the Lambda 950 spectrophotometer to see if it is possible to correlate the displayed values with spectrally resolved data. The diffuse sample gave Tvis 0.15 instead of 0.4.

Sample	Uv 182	1-Tuv	IR 182	1-TNIR	VLT182	Vt	SHGC182	SHGCW7
Clear	0.115	0.1653	0.103	0.129	0.898	0.911	0.895	0.8938
LowE	0.922	0.946	0.995	0.986	0.726	0.722	0.419	0.3232+-.003
AppFilm	1	1	0.827	0.839	0.168	0.173	0.164	.3092
Clear+LE*	0.934	0.927	0.996	N/A	0.645	0.658	0.372	0.28-0.38
Clear+AP	1	0.998	0.848	N/A	0.148	0.158	0.145	0.23-0.49

*Minimal variation between having the Low-E coating on surface 1,2,3, or 4 for the LS182 compared to WINDOW 7 variation suggests that there is no reflectance being measured

Additional feature – limited NIR range for IR rejection

The instrument has a toggle for upper NIR wavelength, 950, 1400, full. Calculating 1-Tsol for 780-upper for comparison. Maybe it is not really what it claims to be.

Sample	IR182_950	1-TNIR950	IR182_1400	1-TNIR1400	IR182_Full	1-NIR2500
Clear	.153	.123	.078	.131	.103	.129
LowE	.991	.964	.999	.982	.995	.986
AppFilm	.824	.817	.839	.824	.831	.839