



## Notice

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## University of Arizona Chooses Panorama<sup>®</sup> Window Film to Reduce Energy

The University of Arizona in Tucson is committed to “Greening the Campus,” a campus - wide initiative to minimize the ecological footprint of the university. Like many other schools nationwide, the University of Arizona strives to develop sustainability practices despite challenges including old construction, aging utility systems and a lack of financial resources. In addition, the university is also challenged with the high cooling costs associated with Arizona’s hot climate and renovation standards set forth by the University of Arizona’s Historic Preservation Plan.

When confronted with soaring energy costs and unstable temperatures in classrooms, facility management officials needed to solve the problems in a way that would stay true to their mission of ecological responsibility while keeping costs down and adhering to building restrictions. Facilities Management Director Al Tarcola thought that retrofitting the university windows with window film might provide a solution.

Local dealer Tim Burns of Sierra Sun Control installed virtually invisible Panorama<sup>®</sup> Hilite<sup>®</sup> 70 film on the windows in the university’s Bio-Sciences East building. Using Panorama’s energy analysis tools and mounted temperature gauges, he was able to record actual temperature reduction and energy savings.

Once the film was installed throughout the building, students and faculty immediately felt its cooling effects. Temperature peaks fell significantly. The maximum inside temperature before the installation was 119.5° F, which dropped to 85° F after the film was installed.

Utility usage fell drastically because the Panorama film reduced the need for air



**Installation of Panorama<sup>®</sup> Hilite 70 at the University of Arizona led to energy savings and cooler classrooms**

### Installation Summary

<b>Building name:</b>	University of Arizona Bio-Sciences East Building
<b>Building type:</b>	Institutional
<b>Location:</b>	Tucson, Arizona
<b>Problem:</b>	High energy costs associated with air conditioning Heat gain
<b>Solution:</b>	Panorama <sup>®</sup> Hilite <sup>®</sup> 70
<b>Benefits experienced:</b>	Lower energy costs Lower temperatures inside classrooms Complied with renovation standards set forth by the University of Arizona’s Historic Preservation Plan

conditioning. In the month after the installation, energy use fell by 30% compared to the same month the previous year, according to preliminary data.

The initial results of installing Panorama film were a dramatic success, significantly lowering energy use, cutting cooling costs and increasing the comfort of students and faculty.

### Energy Analysis Before and After the Installation of Panorama Hilitite 70 Window Film

Temperatures inside the University of Arizona's Bio-Sciences East building were considerably lower after the installation of Panorama Hilitite 70 window film. The data below from two areas of the Bio-Sciences East building was captured during a test from May 27 to June 19, 2009.

Bio-Sciences East Building South Facing Windows	Average Temps	Maximum Temps
Before Panorama Install	84.3	119.5
After Panorama Install	77.1	85.0

Bio-Sciences East Building West Facing Windows	Average Temps	Maximum Temps
Before Panorama Install	76.4	93.8
After Panorama Install	80.3	82.9

### Energy Savings in Kilowatt Hours

Electricity use fell sharply because the window film reduced the need for air conditioning. The table below shows savings in energy use after installing Panorama film.

Month	Usage (kWh)	Reduction in Energy Use
June 2008	43,351.50	
June 2009	30,346.60	-13,004.9 kWh
July 2008	42,728.50	
July 2009	39,449.20	-3,279.30 kWh

### Energy Savings in Cooling Degree Days

Because Panorama window film better regulates internal temperatures by preventing heat infiltration, energy use fell as the number of cooling degree days – those days when it was hot enough to require the use of air conditioning – leveled out.

To determine the effect of Panorama window film, cooling days were reviewed for both 2008 and 2009. This effect is analyzed by reviewing BTU (the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit), energy used (mmbtu), and the number of cooling degree days (CDD). Cooling degree days are the number of degrees at which cooling must occur multiplied by the number of days, so the function is weighted (two days at one degree is the same as one day at two degrees). By dividing energy use by the cooling degree days, the amount of energy used per CDD is given.

The data shows that electric power use and chilled water use (as it applies to air conditioning) both declined significantly.

