ENERGY SAVING ANALYSIS

Customer: 妙法寺劉金龍中學				Remarks
WINDOW FILM (Spec.)			**Film Model**	
			SI-35	
Performance Results	(%)			
Solar Energy	Transmittance		28	
	Absorptance		33	
	Reflectance		39	
Visible Light	Transmittance		37	
	Reflectance (Ex/Int)		36	
UV Rejected			>97	
Shading Coefficient			0.43	
U-value			0.98	
Total Solar Energy Rejected			63	
Thickness			1.5mil	
Tensile Strength (kg/cmSq)			2000	
Calculation on the Energy saving				
FORMULA:	**Q = AREA OF GLASS X [(Shading Coefficient X Solar Load) + (U-Factor X Temperature,O - Temperature,I)]**			
INPUT WITHOUT FILM	Clear Glass - existing			
Area of Glass (in square feet)	玻璃窗面積 (平方		8,010	
Shading Coefficient	(clear glass)		0.89	
Solar Load (Btu's/Hr/Sq. Ft)			200	sunlight pass through window
U-Factor			1.04	
Temperature Outdoor - Degree C	室外溫度 Degree		30	
Temperature Indoor - Degree C	室內溫度 Degree		25	
Temperature Outdoor - Degrees F			86	
Temperature Indoor - Degrees F			77	
Heat Gain or Q (Btu's /hour) =			1,500,754	
Total Daily Solar Load = (btu)			6,003,014	Daily 4hrs Solar heat gain
AC Tonnage Required, Daily =		a	500	One ton of A/C = 12000 btu
INPUT WITH FILM				
Area of Glass in square feet			8,010	
Shading Coefficient			0.38	0.89 x 0.43
Solar Load (Btu's/Hr/Sq. Ft)			200	
U-Factor			1	
Temperature Outdoor - Degrees F			86	
Temperature Indoor - Degrees F			77	
Heat Gain or Q (Btu's /hour) =			613,094	
Total Daily Solar Load = (btu)			2,452,378	Daily 4hrs Solar heat gain
AC Tonnage Required, Daily =		b	204	One ton of A/C = 12000 btu
Savings in AC Tonnage =		a-b	296	
Full-Load Efficiency (kW/Ton), Small Unit		c	0.80	
SAVINGS FOR SMALL UNIT (TONS)		(a-b)xc	237	
KWH CHARGE	每度收費	HK$	1.0	
DAILY SAVINGS ($), Small Unit		$	237	
Number of School Days per month			20	
Total Monthly Savings with Film	每月節省電費	**$**	**4,734**	
Annual Saving (6 months of year using air-con) (May-July, Sep-Nov)	每年節省電費 (每年以 6個月用冷氣計算)		**HK$28,405**	

U-value

The U-value (or U-factor), more correctly called the overall heat transfer coefficient, describes how well a building element conducts heat. It measures the rate of heat transfer through a building element over a given area, under standardized conditions. The usual standard is at a temperature gradient of 24 °C, at 50% humidity with no wind[6] (a smaller U-value is better).

U is the inverse of R with SI units of W/(m²K) and US units of BTU/(h °F ft²)

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Shading coefficient , is a value that determines one type of thermal performance of a glass unit (panel or window) in a building.

It is basically the ratio of solar gain (due to direct sunlight) passing through a glass unit to the solar energy which passes through 3mm Clear Float Glass . It is referred to as an indicator to how the glass is thermally insulating (shading) the interior when there is direct sunlight on the panel or window.

The shading coefficient (SC) depends on the color of glass and degree of reflectivity. It also depends on the type of reflective metal oxides for the case of reflective glass. Sputter-coated reflective and/or sputter-coated low-emissivity glasses tend to have lower SC compared to the same pyrolitically-coated reflective and/or low-emissivity glass.

It is usually a value ranging from 1.00 to 0.00, but experiments[which?] show that the value of the SC is between 0.98~0.10.