

EFFECTIVITY OF TEMPERED GLASS ON LAMINAR FLOW CABINET IN PROVIDING UV PROTECTIONEquipment and Materials

- UVX Radiometer (SN: E28803 & E32267) from Ultra Violet Products Incorporated
- Airstream® Gen 3 LVG-6AG-F8

Objective

This report aims to investigate the effectiveness of tempered glass sides of Laminar Flow Cabinet to provide user protection against UV.

Testing Proper

The cabinet used for the test was an Airstream® Vertical Laminar Flow (Gen 3 LVG-6AG-F8) fitted with UV Lamp. Figure 1 shows placing a front cover to obstruct UV from escaping.



Figure 1. A front cover blocking the UV Light for protection of investigators.

The testing was done by **(1) putting markings on the surface of tempered glass** in which the UV Radiometer will be scanned. The markings were equally distributed to ensure all areas were covered upon measuring the UV intensity as shown in *Figure 2*.



(a)



(b)

Figure 2. Markings on tempered glass sides; (a) Left side and (b) Right side.

(2) Measuring of UV light intensity across the surface of tempered glass sides. An Ultraviolet Radiometer (*Figure 3*) was used to measure the radiation intensity emitted through the tempered glass sides. The scanning was done at about 1 cm away from the surface and the values registered from UV Radiometer was recorded. *Figure 4* shows the measuring and scanning using the UV Radiometer.



Figure 3. Radiometer used for UV measurement.

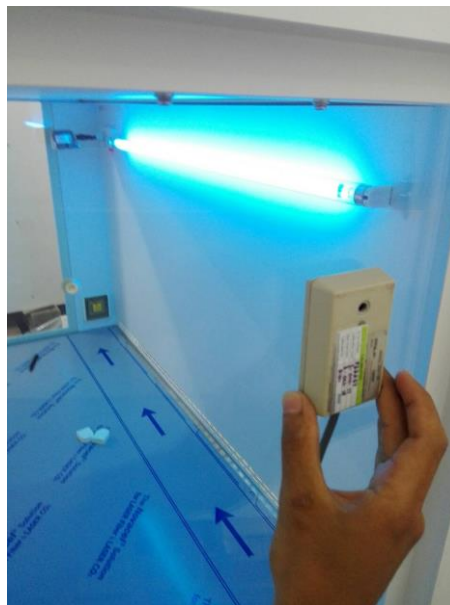


Figure 4. Measuring UV Light Intensity using Radiometer.

(3) Recording the values and obtaining the average light intensity separately for left and right tempered glass sides. The average was obtained by solving for the mean value.

Results

Left Tempered Glass	Right Tempered Glass	Australian Standard
0.11 $\mu\text{W}/\text{cm}^2$	0.1 $\mu\text{W}/\text{cm}^2$	40 $\mu\text{W}/\text{cm}^2$

Table 1. Average measurement of tempered glass sides and International Standard.

Table 1 shows the light intensity measurement. In the surface of left tempered glass, the average value was 0.11 $\mu\text{W}/\text{cm}^2$. On the other hand, right tempered glass has an average of 0.1 $\mu\text{W}/\text{cm}^2$.

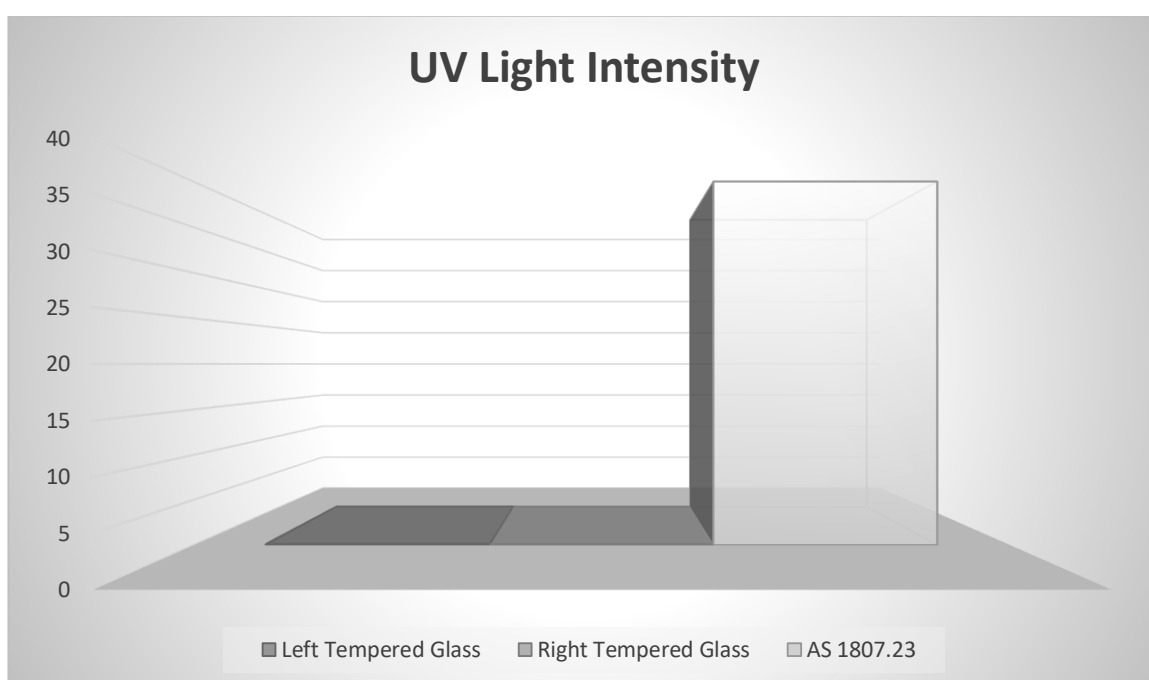


Figure 5. Diagram of UV Light values in contrast with AS 1807.23 (Australian Standard).

Discussion

The Standard used to compare the values gathered was Australian Standard for Germicidal UV Lamp of Laminar Flow Cabinet and Biosafety Cabinet. Where UV lamp are fitted, the intensity of radiation at a wavelength shall be not less than 40 $\mu\text{W}/\text{cm}^2$.

According to AS 1807.23, the minimum requirement to effectively disinfect microorganism is 40 $\mu\text{W}/\text{cm}^2$ in which, it is already considered harmful to human. Left Tempered Glass with 0.11 $\mu\text{W}/\text{cm}^2$ was about 0.28% of the requirement while Right Tempered Glass with 0.1 $\mu\text{W}/\text{cm}^2$ was about 0.25% of the requirement.

Conclusion

It was concluded that the tempered glass sides of Laminar Flow Cabinet (LVG-6AG-F8) were effective in providing UV protection to the users since the testing values were only a small percentage (0.28% and 0.25%) of the Australian Standard (AS 1807.23) based on its effectiveness to disinfect microorganism. Thus, LVG-6AG-F8 tempered glass sides were UV absorbent.