



# **SMART FILMS INTERNATIONAL**

## **SWITCHABLE SMART GLASS INSTALLATION GUIDE**

---

# CONTENT

---

<b>1</b>	Smart Glass Precautions -----	1
<b>2</b>	Preparations for Switchable Smart Glass Installation -----	3
<b>3</b>	Electrical Wiring of Switchable Smart Glasses -----	7
<b>4</b>	Connecting Smart Glasses -----	7
<b>5</b>	Use of Silicone -----	9
<b>6</b>	Light Optimization for Minimizing Haze -----	11



# SMART GLASS PRECAUTIONS



## Silicone

You can use only certified Silicone types; other silicones will cause a chemical reaction and will damage the Smart Glass. Certified Silicones: Toshiba 83/381; Dow Corning 791, 795, 995, 1199.

Installing Smart Glass units in exterior or wet interior conditions, the units must be wet-sealed and impervious to moisture and with provisions to allow for weeping of condensation that may infiltrate the system.



## Power off during installation

Never install with live circuit. Install only on a GROUNDED circuit protected by 10A fuse or breaker. The circuit must also be protected by a ground fault circuit interrupter (GFCI).

Make sure that the Power unit is disconnected from the power outlet when installing.



## AC Voltage

The Smart Glass works on Alternate voltage, do not apply DC Voltage as it will damage the Smart Glass. Use the Power Unit provided by Smart Films International only.

In wet environment applications electrical connections must exit at the head of any Smart Glass panel.



## Wall Switch

When connecting the Power unit to a Wall switch, it must be without providing any electricity via the wall switch, it is a dry contact therefore if you will have live current in the wall switch it will damage the Power unit.



## Haze

Smart Glass panels will not be as optically clear as standard float glass. Some degree of haze will always appear due to the nature of the product makeup (light scattering) and will not be considered as a quality failure to replace or refund to the customer.



## Unpacking Smart Glass

The Smart Glasses are packaged in a custom-made crate, you should open the package carefully from the side with the note "Unpacked Surface". You should notify us immediately if the package is damaged or if any glass is broken with order details, pictures, and a short description.



## Cleaning

Cleaning of the Smart glass during the subsequent weathering period is necessary. Abrasive cleaners should never be used, particularly when the surface to be cleaned has a reflective coating. For routine cleaning, use a conventional window washing solution or mild soap and water. Uniformly spray the cleaning solution or apply it with a clean, soft, grit free applicator and rinse thoroughly. The glass surface should then be either wiped dry with a clean, grit free cloth or squeegeed dry. Do not allow any metal or hard parts of the cleaning equipment to contact the glass surfaces.



## Direct Sunlight

Will damage the standard Smart Glass, therefore for direct sunlight installation we offer Smart Glass in IGU (Insulated Glass Unit).

# PREPARATIONS FOR SWITCHABLE SMART GLASS INSTALLATION

## 1 Wood Strengthening

When using a drywall ceiling, you will need a wood to be inserted into the drywall for stability of the glass wall.

## 2 Power Unit Location

prepare the required space. (See more information on Power Unit Data detailed below)

## 3 Easy Access

The power unit can locate in a specific box, the ceiling or elsewhere, easy access for maintenance is necessary. (For example, fuse replacement)

## 4 Power Outlet

You will need to prepare a power outlet nearby the power unit location, up to 2 feet / 0.6 meter away from the power unit.

## 5 Wall Switch

Conduit between wall switch and the power unit is necessary if you wish to use a wall switch. No live "circuit" to the wall switch it should be "dry" connection.

## 6 Fixed Smart Glasses

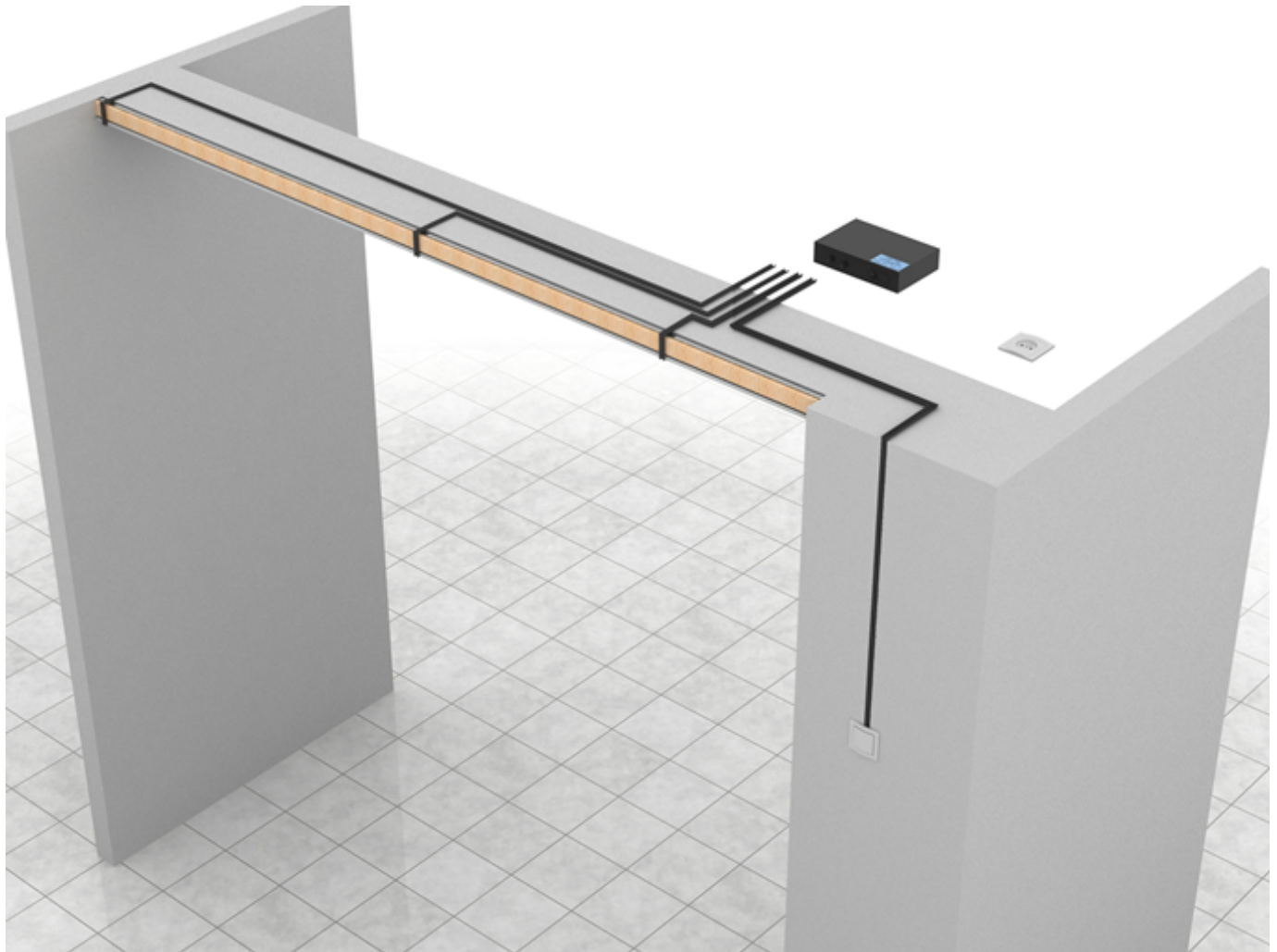
A conduit between the app. center of each fixed Smart Glass (top edge) and the power unit.

## 7 Smart Glass Door

A conduit between the top or side hinge location of the Smart Glass door and the power unit.

# SMART GLASS PREPARATIONS ILLUSTRATION

- Conduit - Flexible, non-conductive 3/8" (10cm)
- Electrical wires – 2-Core, Flexible, Copper, 22 gauge 0.028" /0.7mm diameter.

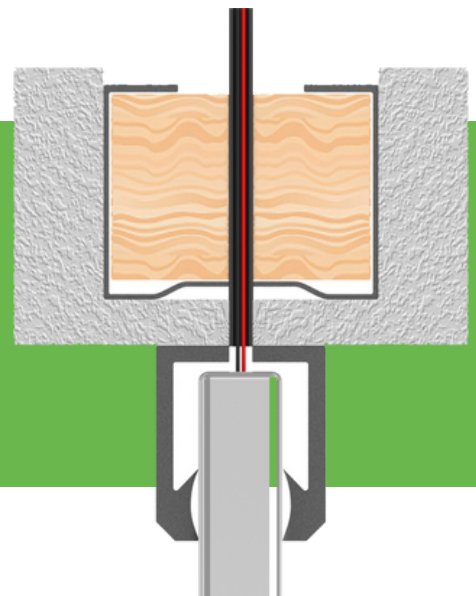


## Basic Preparations Section:

The conduit should go through the wood and drywall allowing the wires from power unit to meet the wires from the Smart Glass.

Position the conduit in the center, it should meet the U channel or upper frame.

Edges where the busbars are placed must be covered by minimum 1/2" (12mm) of frame, we recommend 3/4" (18mm)





# POWER UNIT DATA

		Input (VAC)	Output (VAC)	Weight (Kg)	Max Smart Glass (Sq.f/Sq.m)
100 VA	209 (L) 120 (W) 47 (H)	230/120	48	2.85	100 / 10
200 VA	255 (L) 158 (W) 60 (H)	230/120	48	5.2	200 / 20
300 VA	255 (L) 158 (W) 60 (H)	230/120	48	5.4	300 / 30
400 VA	255 (L) 158 (W) 60 (H)	230/120	48	6.1	400 / 40
500 VA	255 (L) 158 (W) 60 (H)	230/120	48	6.5	500 / 50

## Fuse housed in the transformer:

Power Unit	230VAC	120VAC
100 VA	T1AL250V	T5AL250V
200 VA	T5AL250V	T10AL250V
300 VA	T5AL250V	T20AL250V
400 VA	T5AL250V	T20AL250V
500 VA	T10AL250V	T20AL250V

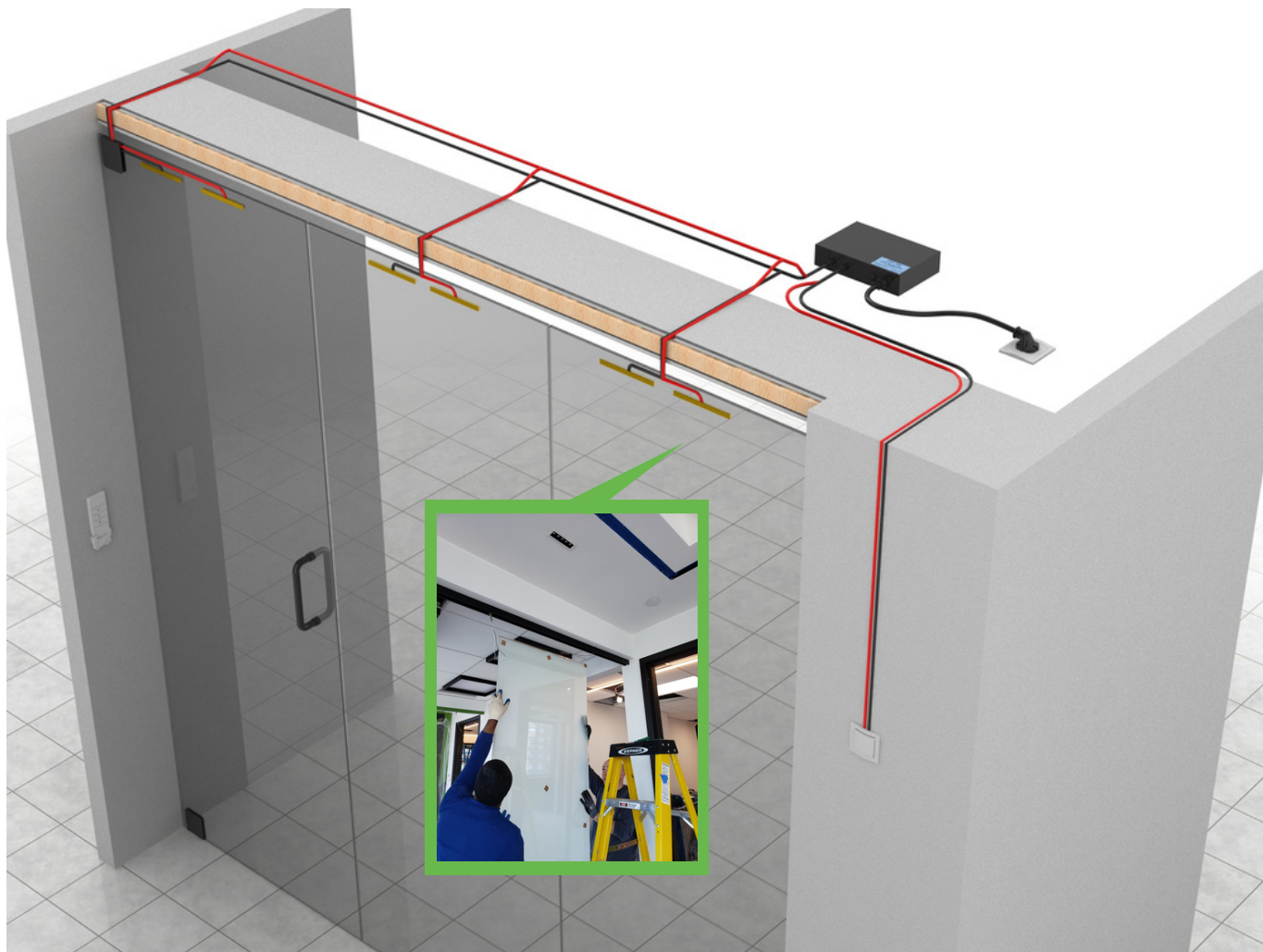


Component	Connectivity	Notes
Power unit	Power outlet, Smart Glasses, Wall switch. Power unit to Power Outlet	Must be accessible as it contains a fuse within the housing.
Power Cord		Connect it upon completion of installation, do not work with "live" circuit.
Output Wires Cable	To all Smart Glasses in parallel.	All RED wires from the glasses to the Brown or Blue wire of the Output Wires cable and all BLACK wires to the other wire of the Output Wires Cable.
Wall Switch Wires	1. Wall Switch Wires cable to a Wall Switch with two electrical wires without live circuit. 2. Smart Home/Office system as the Wall Switch Wires are "dry" contacts.	You need to remove the plastic transparent cover before using the remote-control buttons.  Red lights when pressing any button indicates that battery is healthy.
Remote Control	Wireless synced with the Power unit and control the glasses on/off simultaneously with the Wall Switch.	You need to remove the plastic transparent cover before using the remote-control buttons.  Red lights when pressing any button indicates that battery is healthy.
Spare Fuse		We recommend keeping it in the Power unit fuse housing





# ELECTRICAL WIRING OF SWITCHABLE SMART GLASSES



## CONNECTING SMART GLASSES

- **Testing** - you should inspect and test each Smart Glass prior to installation. Please connect each Smart Glass directly to power unit for pre installation inspection.
- **Wiring** - Smart Glass will be provided with twin (dual) wires attached to each of the busbars (the silver copper conductive tape). You only need one, the dual is to compensate in the case of a wire detached or dislodged during installation. Two Black pigtail wires attached to one busbar, two Red pigtail wires to the other busbar. You may use one Red and one Black; the spare ones you may cut to app. 10" and fix it to the glass edge as spare.

## Connecting Accessories:

Connecting methods:

1. Soldering and insulation with Heat-shrink tube.
2. Solder Seal Sleeve Heat Shrink Terminals Butt Wire Connectors



3. Insulated Cable Connectors.



Connections Box

You can connect all wires from the glasses in a connection box nearby the glasses and one lead wire will be connected from the connecting box to the Power Unit.



Moving Glasses

You can use standard Power Transfer Unit when to lead wire to a door.



You can use a flexible guide for electrical wire.



You can use a spring electrical wire when connecting to a sliding doors.



You can use a Cable Drag Chains for sliding doors



You can use magnetic contacts for sliding or hinged doors



# USE OF SILICONE

## Silicone

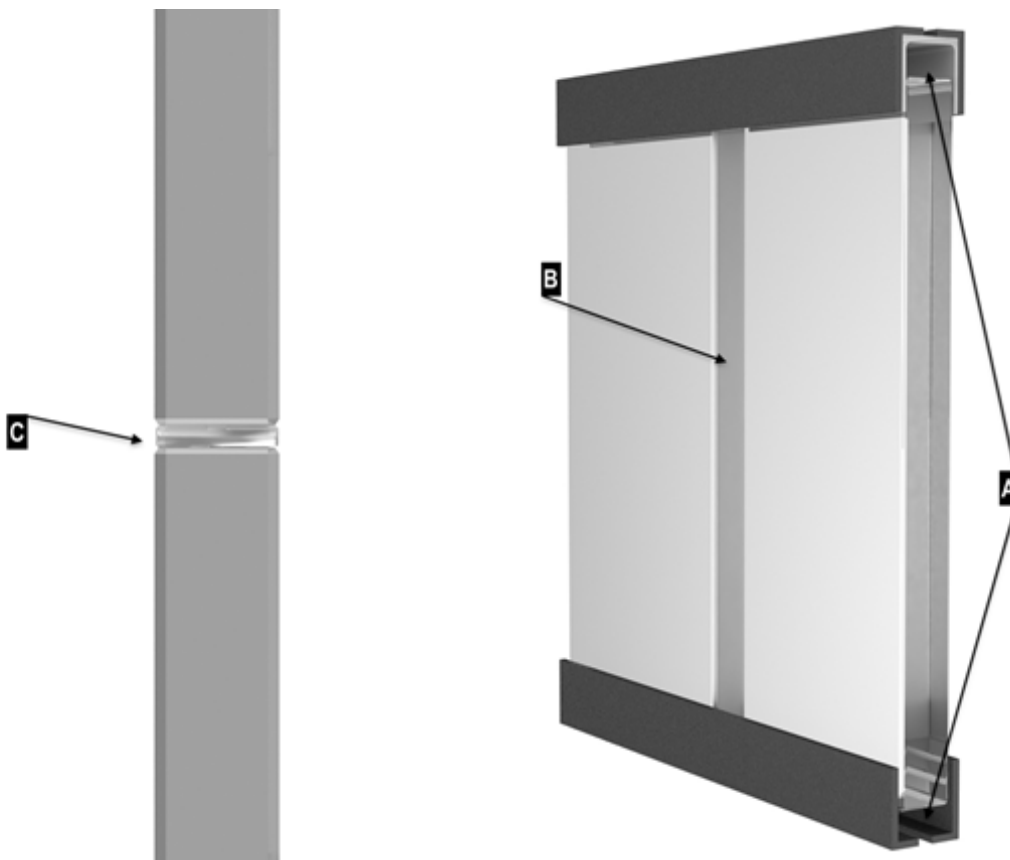
You can use only certified Silicone types; other silicones will cause a chemical reaction and will damage the Smart Glass. Certified Silicones:

Certified Silicones: Toshiba 83/381; Dow Corning 791, 795, 995, 1199.

## Recommendations:

**Dow 1199** - when you have a glass wall for butt joint in wet areas (B and C in the illustration below). We recommend a 1/8" 3mm gap.

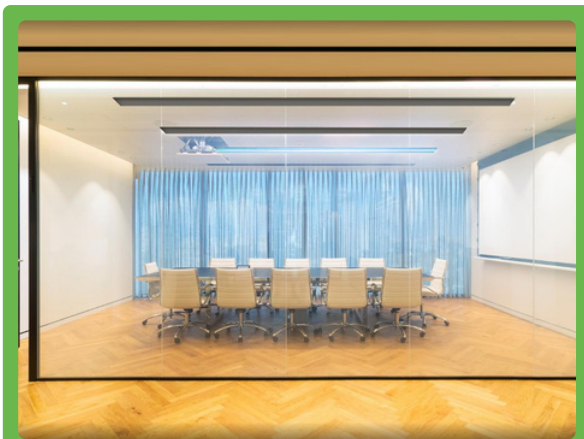
**Dow 995** - when you need to use silicone in U channels or any frames where the glass edges are covered by silicone. (A in the illustration below)



# LIGHT OPTIMIZATION FOR MINIMIZING HAZE:

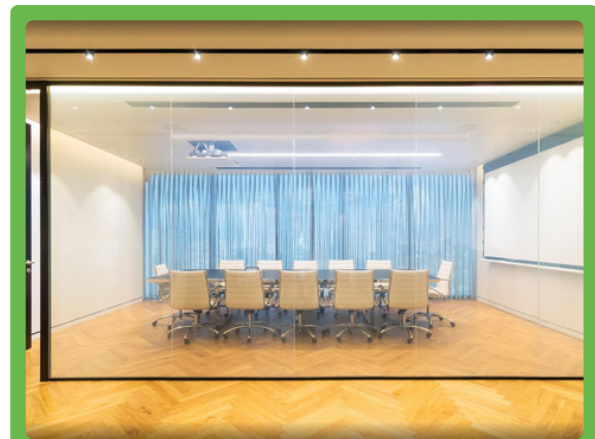
All glass, under certain light conditions, will reflect images and at times be difficult to see through clearly. This will sometimes be more obvious when the glass is viewed from an angle. The same applies to Smart Glass. Additionally the Smart film within its EVB layers in this laminated glass product manifests a slight haze in its 'on' state, and more so when viewed at an angle. To minimise this effect and to get the best out of your product, it is important that you, your Architect or Designer should consider the ambient and/or artificial lighting adjacent to the panels prior to its installation as per the image suggestions below.

Light conditions and intensity will influence the haze level. Therefore, it is important to provide lighting recommendations to the Architect.



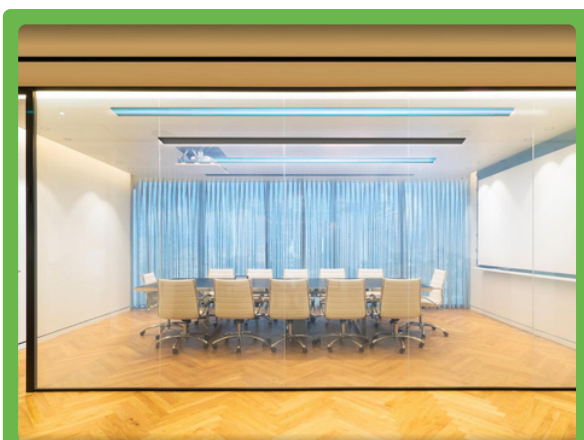
### **Worst Lighting Conditions**

Lights that are only on the outside of the conference room will cause an imbalance in light intensity. This will increase the haze.



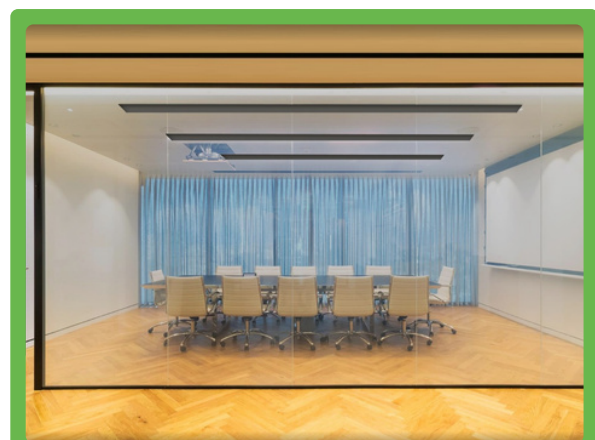
### **Better Lighting Conditions**

Lights on the outside of the conference room are higher in intensity than on the inside. This will result in a slight haze.



### **Best Lighting Conditions**

Lights on the inside of the conference room and outside are evenly balanced in intensity and sufficiently diffused at appropriate



### **Low Haze In Dark State**

(all lights 'off') No lights on the inside or outside of the conference room will result in little haze.





 **SFI GROUP LOCATIONS**

**SFI AMERICA**

1120 Avenue of the Americas Floor 20  
New York, NY 10036 United States

**SFI CHINA**

A18, 2F, Building 5, 958 Ling Shan Road  
Shanghai 200135 China

**SFI JAPAN**

Ichihara City Chiba  
299-0108 Japan

**SFI MIDDLE EAST**

4 Ariel Sharon St. Givatayim  
5320047 Israel

 [www.smartfilmsinternational.com](http://www.smartfilmsinternational.com)

 [info@smartfilmsinternational.com](mailto:info@smartfilmsinternational.com)