



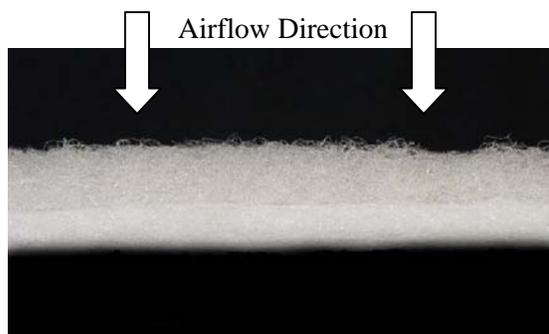
Filter Selection and Maintenance Reduces Unscheduled Downtime **John Guarniere**

Providing clean air to the UV lamps is an easy way to promote dependable lamp performance with less cleaning of the reflectors, bulbs, and RF screens. Clean air also prevents premature bulb or magnetron failure due to particulate contamination. These benefits reduce unscheduled downtime of the lamps, which improves process performance and your bottom line. Isn't that what we all want?

Fusion UV Systems' lamps receive clean air through proper filtration of the incoming air supply. The air filtration occurs at the head end of the UV curing system, otherwise known as the supply blower. This unit pulls air from the surrounding environment and forces it through air supply ductwork to the lamp irradiator. This type of supply blower is known as a "remote" blower, since it can be isolated from the process environment. The supply blower incorporates an inlet box with filter media for "cleaning" the incoming air via particulate entrapment. This filter is the system's first line of defense against poor lamp performance and unscheduled downtime. Therefore, proper filter selection and maintenance are critical to achieving and retaining the desired clean air supply.

Filter Selection

A clean air supply starts with proper filter selection. Fusion UV Systems provides a standard filter type for all of its remote supply blowers. These filters are constructed with non-woven two-ply polyester comprised of bonded polyester fiber, and they are approximately 1" thick. The filters are flame and fungus retardant as well as moisture resistant, and they can accommodate a maximum flow rate of 450 fpm at an operating temperature of 250 °F. Fusion's remote blower filters exhibit a coarse filtration side (fluffy) and a bonded fine filtration side (tacky). The bonded side should always be placed toward the inside of the blower's inlet box as depicted below:



The filter has two sides, fluffy and tacky. As shown, the tacky side is down. When installing the filter, place the tacky side in contact with the blower's support screen.

Tacky side in contact with support screen.



Some of Fusion UV's lamp systems are designed with a "modular" blower. With this arrangement, the blower box is attached to the irradiator and air supply originates inside the process facility. The modular blower filters are also constructed with non-woven two-ply polyester, and they are approximately 1/2" thick. These filters are white and blue, corresponding to the coarse and fine (tacky) filtration sides. The blue side should always be placed toward the inside of the modular blower's housing.



Filter Maintenance

A clean air supply is retained with proper filter maintenance. Fortunately, this is an easy task! Filter maintenance simply consists of replacing the system filter(s) on a regular schedule. So when should filters be replaced? The answer to this question depends entirely on the air quality to which the filters are subjected, and can range from days to months. For each filter, the time for it to become visibly dirty defines its replacement schedule. This method can be employed for remote blower filters, modular blower filters, and for the filters supplied on modular power supply enclosure (MPE) cabinets.¹

Whenever possible, remote supply blowers and MPE cabinets should be placed in locations where the air quality is best. In particular, remote blowers should be located outside of the process facility but isolated from any facility exhaust. This approach can reduce the filter replacement frequency by maximizing filter lifetime. For clean room applications, high-efficiency particulate air (HEPA) filters should be employed to minimize contamination of the processing environment. Further information regarding HEPA filtration can be obtained upon request.

Fusion UV Systems sells replacement filter media in pre-cut and roll form. Fusion's remote supply blower filters are rated with an average efficiency of 60%, based on the NIST discoloration test (ASHRAE equivalent of 34%).² For the I300MB and I6B modular blower units, the filters' average efficiency is 15% (NIST standard). Replacement filters should be rated with average efficiencies that meet or exceed these levels.

¹The MPE cabinets are fitted with expanded aluminum panel air filters that can be cleaned.

²The I250B irradiator's filter also exhibits a NIST efficiency rating of 60%.