



Recommended Care and Operation of Metal Arc Discharge Bulbs

The Dymax BlueWave® 200 light-curing system uses enhanced metal arc discharge bulbs to provide curing energy for light-curable formulations. These bulbs consist of a quartz bulb into which two electrodes are sealed at opposite ends. The sealed ends of the electrode assembly are vacuum tight and are referred to simply as the seals of the bulb. The electrodes provide the electrical contact between the bulb power source and the arc discharge which takes place inside the bulb. During operation, areas of the bulb typically reach temperatures of 1,000°C. Extreme care must be taken in handling these bulbs to ensure a proper operating environment and long life for the assembly.



Metal Arc Discharge Bulb

Depending on intensity requirements, bulbs generally have a usable lifetime of approximately 2,000 hrs (but never longer as controlled by a built-in “change bulb/reset” feature in the *BlueWave* unit). Over its lifetime, a bulb’s intensity output will slowly drop until it is no longer useful. This is considered to be normal life cycle and the fix is a simple bulb replacement. However, a bulb can also occasionally break or shatter during use. This atypical event is called a “non-passive failure” and requires a thorough cleaning and servicing of the unit and replacement of the bulb.

Sources of Non-Passive Bulb Failure

Overcooling or Undercooling the Bulb. Overcooling can prevent the bulb from reaching an optimal operating temperature and under cooling can allow the bulb to exceed a safe operating temperature and result in failure. Contributing factors include (but are not limited to):

- Clogged Fan Filters - At a minimum, fan filters must be replaced when the bulb is replaced. In dirtier operating environments, the filters may need to be inspected, removed, and cleaned weekly as an interim to the 2,000-hour replacement.
- Restricted Air Flow - Providing inadequate clearance behind the unit will prevent the cooling system from functioning properly.
- Worn Fan - Like all fans, they do not last forever. If you suspect the fan is operating slow or if it begins making noise, it should be replaced.
- Ambient Operating Environment – An environment that is excessively cold, hot, or humid.
- Excessive Air Flow Through the Unit - After shutdown, excessive air flow through the unit will rapidly overcool the bulb and stress the quartz/metal junctions.

Using the Bulb Over 2,000 Hours. While it may be tempting to reset the hour meter after it indicates a necessary bulb change without actually changing the bulb, **DO NOT RESET**. Even if the unit still has sufficient intensity, **NEVER** do this. Eventually, most bulbs will fail in a non-passive manner if operated beyond 2,000 hours.

Excessive Cycling. During the bulb's warm-up phase, the different coefficients of thermal expansion between the quartz and metal components in the bulb cause stress in the quartz. The more frequently a bulb is cycled (more than 1 power-up cycle per 8 hours), the more fatigue and stress are imparted to the bulb. Best practice is to leave the unit on as long as possible to avoid excessive power on-off cycling.

Vibration. This can occur during operation, but also during transport on a rolling cart on an excessively rough floor surface or across a raised threshold.

Contamination. Finger oil residue will damage the quartz. When heated to operating temperature, the contamination will cause aggressive etching of the surface that will weaken the bulb.

Improper Location. Providing adequate air clearance is not the only factor when positioning units; you must also ensure the hot exhaust of one BlueWave® 200 unit is not feeding into the intake of a nearby unit. Stacking of units or side-by-side operation is not recommended. Similarly, any other device that has hot or cold exhaust could be influencing the intake air on a BlueWave.

Extreme Temperature Transitions. In addition to over or undercooling, rapid temperature changes can also cause stress on the bulb. This can occur if the unit is in a warm environment and a nearby air conditioning duct or opened window allows chilled air to enter the unit.

Unexplained Non-Passive Failure. As with any component, occasional failures occur, and sometimes without explainable cause.

Cleanup and Maintenance of the Cure Unit Following a Non-Passive Failure

If your cure unit experiences a non-passive bulb failure, the unit must be properly cleaned and serviced.

Cleanup of the unit can be accomplished with a portable vacuum cleaner. All glass shards should be carefully vacuumed out of the unit. While wearing gloves, the bulb chamber area of the inside of the unit and fan blades should then be carefully wiped with disposable wipes and isopropyl alcohol to capture any remaining residue. The low-level mercury content in the bulb was in vapor state during operation but condenses back to liquid form and will likely be trapped in the fan filters. These filters should be disposed of according to local laws and regulations regarding mercury cleanup. The same should be done with any vacuumed particles and disposable wipes used in this cleaning method. For a comparison, the small amount of mercury contained in the BlueWave bulb is similar to the amount found in a standard 4' fluorescent bulbs commonly found in many industrial, office, and consumer environments. Replace the bulb, test the unit for proper operation, and return into operation.

You can also return your unit to Dymax for clean-up and evaluation. Dymax will clean and evaluate the unit when received at our Torrington, Connecticut, facility to ensure correct operation.



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