

## Topic: Halogen bulb theory of operation

**Problem:** Bulb is burning out too soon or is too hot.

If you have a little working knowledge of how Halogen lamps work it can help you address those questions. A halogen bulb is an ordinary incandescent bulb, with a few modifications. The fill gas includes traces of a halogen. The purpose of this halogen is to return evaporated tungsten to the filament. This process is known as the halogen cycle, and extends the life of the filament.

The temperature is crucial to the Halogen process and must be maintained to achieve peak bulb life. A common cause of early bulb failure in the dental field is running a bulb at a lower voltage than rated. A voltage that is too low will prevent the bulb from getting to the proper temperature to maintain the cycle causing the bulb to fail very quickly. **Always check the voltage as close to the bulb, while it is illuminated, as possible.**

As an example, a 3.5 vdc rated bulb that is powered with only 3.0 vdc will have a dramatically shortened life, possibly only 15% of it's peak life. Always try and make sure that a halogen bulb is powered with a voltage within 10% of the rated voltage.

This link provides a nice visual of the process.

<http://zeiss.magnet.fsu.edu/tutorials/halogencycle/indexflash.html>

