# Heat Management of UV lamps … staying cool under fire

Born under intense flame, forged under hydrogen and nurtured in the 1900 degree glow of a vacuum furnace, no wonder UV curing lamps operate the only way they know hot!

So how does something raised in Dante's Inferno enter into a manufacturing process that can't lose its cool? Often, extreme heat is the toughest problem to solve. Conversely, heat can improve cure, assists leveling of screen inks and encourages ink adhesion. The objective is to manage heat not abolish it.

## How do you spell relief?

There are various ways to manage substrate temperature. Some "solutions" to controlling heat are needlessly expensive. Oftentimes the least expensive approach yields the best results; I'll call them the ten commandments of curing heat management:

### 1. Reduce Infrared emissions from the source.

Don't waste your money on a 600 watt per inch lamp controlling a process requiring 200 watts per inch. It will be bigger, run hotter and wastes energy. Your goal here is to maximize UV output. Powering down a lamp designed for higher wattages is inefficient and prone to overcooling.
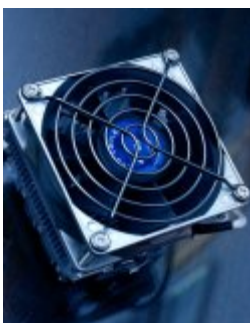
### 2. Speed up the process.

May sound silly but if your process can accommodate higher speeds, you're home free without costing anything.

### 3. Choose a lamp with the highest arc temperature for a given wattage.

Effective arc temperature is an indicator of level of UV output. One can have two identical wattage UV lamps derived from two sets of voltage/current relationships with different UV outputs. Your lamp supplier can provide arc temperature information.

### 4. Choose a lamp with the lowest operating pressure.

In general, as power increases, the lamp's arc temperature increases favoring near UV over visible. Conversely as mercury pressure increases, the arc temperature decreases

lowering UV output. For the same lamp operating voltage keep the lamp's diameter small which reduces mercury pressure and increases UV output. Your lamp supplier can tell you a specific lamp's operating pressure.