

## Halogen Lamps

Halogen Lamps are similar in construction to conventional gas filled tungsten filament lamps except for a small trace of halogen (normally bromine) in the fill gas. The halogen gas reacts with the

tungsten that has evaporated, migrated outward, and been deposited on the lamp wall. As the quartz envelope wall reaches a temperature of approximately 250°C, the halogen reacts with the tungsten to form tungsten halide, which is freed from the wall of the lamp and migrates back to the filament. The halide compound reacts at the filament where temperatures approximating 2,500°C cause the tungsten and halogen to dissociate. The tungsten deposits onto the colder portions of the filament, and the halogen is freed to continue the cycle.

The filament of a Halogen Lamp has two purposes. One is to generate light, and the second is to generate the heat necessary to obtain a wall temperature exceeding 250°C. These lamps have been designed to maintain this required wall temperature when operated at design voltage. A reduction of voltage exceeding 10% from the design voltage will probably result in the wall temperature falling below the required 250°C. Tests reveal that in most cases this reduced operating condition is not detrimental to the operation of the lamp. By the time the wall temperature drops to a point where the halogen cycle ceases to function,

the filament temperature has diminished to a point where the tungsten evaporation is negligible. If wall blackening is noticed, the operating voltage range at which this occurs should be avoided. Burning the lamp at design voltage for a short period of time can usually clean up lamp blackening due to temporary operation in such a voltage range. However, on rare occasions halogen lamps derated by more than 10% could experience an adverse reaction of the corrosive halogen attacking the tungsten filament causing premature lamp failure.

Operating Halogen Lamps at voltages exceeding design voltage is not recommended as the lamps are normally designed to their maximum limits. Lamp seal temperatures must not exceed 350°C or oxidation of the molybdenum ribbon will occur resulting in premature lamp failure.

Halogen Lamps specified in this catalog are ideal light sources for spectrophotometers as they provide broad band spectral radiation ranging from the ultraviolet, through the visible and into the infrared out to five microns. Some radiation output can be obtained at 320 and 340 nanometers.