OSRAM Halogen Lamps for Rapid Thermal and Heat Treatment Processes
Introduction

WHAT?
Single and double-ended quartz halogen lamps used in RTP (Rapid Thermal Process) or CVD (Chemical Vapor Deposit) applications. Quartz infrared lamps efficiently convert electrical energy into radiated heat.

WHERE?
Semiconductor processing equipment manufactured by OEMs such as Applied Materials and AG Associates utilize heat sources to irradiate wafer surfaces.

WHY?
Halogen quartz lamps designed into systems for heat applications allow for high heat transfer operations to be performed in short duty cycles. Quartz halogen filament lamps also allow flexibility for temperature variability as needed for the process because power can be varied.

Rapid Thermal Processing (RTP)
Irradiation process where infrared light is used to perform material changes on a chip substrate or silicon wafer.

Lamps normally are arranged in groups within the thermal system in close proximity to the wafer.

Most systems are serviced with a ‘group relamping’ after a number of wafer processing cycles usually 50,000 or so dependent on the system and processes used.

Process/Lamp Parameters
- Thermal cycle is about 30 seconds including rise, hold, cool
- Halogen lamp output, control, and compactness are important factors in accomplishing process quickly and consistently
- Thermal uniformity within and between wafers is extremely important. Process can usually self adapt to a limited number of failed lamps (dependent on relative positions in the array).
- Infant mortality is highly undesirable
Halogen Lamps for Rapid Thermal and Heat Treatment Processes

Advantages compared to other heating methods

- Heating is quicker than with convection
- Very efficient conversion of electrical energy into infrared energy
- Higher productivity, shorter process cycles
- Temperatures can be precisely controlled via feedback loop system
- Process is reproduced reliably
- Improved electrical contact and excellent reliability
- Quick thermal ramp up
- Robust coil design that converts roughly 90% of electrical energy into radiant heat
- Lamp power and irradiation intensity fully controllable
- Easy to adjust and to replace

Types of infrared lamps

- RTP (Rapid Thermal Processing) lamps
- Double-ended quartz IR lamps

Other Applications

- Rapid Thermal Processing (RTP)
- Chemical Vapor Deposition (CVD)
- Wood processing
- Ink drying
- Food warming
- Heat sterilizing
- Compound melting
- Paint drying

Specification

- The wattage of the available lamps vary between 500W and 3800W
- The range for voltage begins at 80V and goes up to 575V
- For further technical information see the attached Product Information Bulletins (PIBs) and specification sheets
Halogen Lamps for Rapid Thermal and Heat Treatment Processes

3650/T3QIR CL 480V
Naed 59859

500T3QIR/7 120 V
Naed 59822

64773 (2000 T8Q FRN)
Naed 54588

FEP/240V
Naed 54515
### RTP/IR Halogen Product Line

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Full case quantities required on all lamps.
Stock available on all items.