

Multihearth 270° Sources

Sloan multihearth 270° sources offer high evaporation rates and efficiency with four separate, water-cooled hearths. They are ideally suited for long, continuous production runs, or for the deposition of multilayer films.

The multihearth is mechanically rotated by a pinion gear and shaft mechanism, and each hearth is accurately positioned for evaporation by a positive detent. Unused hearths are completely shielded during evaporation to prevent contamination of the source material.

When operated at the maximum power level of 12 kilowatts, these sources are capable of evaporating more than 35,000 angstroms of aluminum per minute on a substrate located 10 inches from the hearth.

Sloan multihearth 270° sources are available with four hearths each holding 30 cc of material, or with two hearths holding 30 cc each and two holding 15 cc each. The latter configuration is especially useful in applications requiring the evaporation of small quantities of precious metals.

For evaporating dielectrics and subliming metals, the sources can be equipped with controlled beam sweep across both axes of the hearth. The swept beam assures even heating of the source material and eliminates the deep, irregular erosions that can be caused by a stationary beam.

SPECIFICATIONS

Beam Voltage..... 10,000 volts
 Beam Current..... up to 1.2 amperes
 Maximum Power..... 12 kilowatts
 Operating Pressure below 5×10^{-4} Torr
 Filament Supply 0 to 6 vac, 40 amperes maximum
 Cooling Water Supply 2 gpm (7.6 lpm) minimum
 Electrical Feedthrough Requirement..... 15 kv, 40 amperes, 2 conductors

180° Sources

Two small sources are available with 180° beam deflection: a single-hearth model with a 3.2-cc hearth and a multihearth model with four 3.2-cc hearths. When operated at the maximum power level of six kilowatts, these sources can deposit more than 8,000 angstroms of aluminum per minute on a substrate located 10 inches from the hearth.

These sources can be used with the X-sweep capabilities built into Sloan electron-beam power supplies. The controlled sweep of the beam spot across the hearth spreads the beam power over a larger area of the source material for more efficient evaporation.

Routine maintenance such as filament replacement is fast and simple. The 180° sources can be readily disassembled for cleaning, permitting the use of various evaporants without the danger of contamination from previous runs.

SPECIFICATIONS

Beam Voltage..... 10,000 volts
 Beam Current..... up to 0.6 amperes
 Maximum Power..... 6 kilowatts
 Operating Pressure below 5×10^{-4} Torr
 Cooling Water Supply 2 gpm (7.6 lpm) minimum
 Electrical Feedthrough Requirement..... 15 kv, 30 amperes, 2 conductors

Electron-Beam Source Accessories

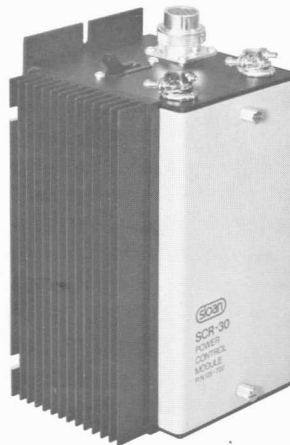
Several options are available to enhance the operating efficiency and versatility of Sloan electron-beam sources.

Automatic hearth rotators respond to the commands of programmed deposition control equipment to rotate the multihearth to any desired position. A manual version is also available.

For 270° sources, optional magnets and pole pieces can be installed to add beam sweep in the Y axis.

Sloan hearth liners permit higher evaporation rates at a given power level, reduction of source spattering, and exchange of evaporants without cleaning the hearth. Available types include intermetallic composite (titanium diboride/boron nitride), vitreous carbon, and reinfiltrated graphite.

All necessary feedthroughs for operation of electron-beam sources are available from Sloan.



RESISTANCE SOURCE POWER EQUIPMENT

The Model SCR-30 Power Control Module is a constant-current device capable of controlling currents up to 30 amperes with silicon-controlled-rectifier circuitry. In conjunction with stepdown power transformers (see below), the Model SCR-30 serves as the control element of a closed-loop resistance-source power supply.

Model SCR-30 is also widely used as a power controller for substrate heaters and other closed-loop applications.

Sloan Filament Power Transformers are used to drive resistance sources at voltages from 3 to 30 vac. These transformers are available with output ratings of 2.5 kva and 5.0 kva, both compatible with the Model SCR-30 power control module. They are rated for continuous duty with a maximum 80°C temperature rise.