



Tetreon Technologies Product Specification for Thermco Horizontal Furnace Systems

PRODUCT SPECIFICATION

Specification
Number: SYM-SCV1

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SYMMETRICAL FLOW SCAVENGER

The symmetrical exhaust scavenger system has been designed to address a number of the problems normally associated with the processing of silicon wafers in a horizontal furnace, these include:-

- QSS problems caused by back streaming into the process tube associated with high exhaust flows.
- The escape of heat and corrosive gases into the clean room as a result of inadequate exhaust flows.
- Improved uniformity through more repeatable and uniform exhaust.

Features:

The symmetrical exhaust scavenger system includes:-



- All stainless steel continuously welded scavenger box.
- All stainless steel removable inner drum designed to provide the symmetrical exhaust of process gases.
- All stainless steel transition section designed to allow linear flow to the exhaust and incorporating a manually adjustable throttle valve allowing a range of settings from 0-200 CFM. The exhaust flow can be monitored using a photohelic flow detector connected to the monitor port provided on the transition sector.
- All stainless steel water cooled clamp assembly.
- Flexible graphite seals are used throughout the construction to eliminate the problems associated with the hardening of silicon and rubber seals in use at temperatures continuously in excess of 100°C.



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Construction:

The mounting of the scavenger system to the furnace end wall incorporates a flexible graphite gasket and uses 32 stainless steel bolts. This provides an highly efficient seal which is resistant to toxic and corrosive gases down to a level of 50 barrs of helium at a continuous operating temperature in excess of 600°C.

The exhaust manifold assembly can be mounted for either top or bottom connection to the facility main exhaust. The design incorporates four individual exhaust ports allowing each scavenger system to be connected to the house exhaust and to be separately adjusted, preventing both exhaust flow disturbance of the other scavengers and cross tube contamination.

Operating Advantages:

The symmetrical scavenger design provides a linear exhaust around the circumference of the drum providing for a wide variation in exhaust flows up to 200 CFM without producing the venturi effect within the process tube. The use of a higher exhaust flow provides a number of advantages:-

- Reduced QSS and oxide uniformity problems caused by the venturi effect of air being pulled into the process tube which is common with single port exhaust systems.
- Prevents contaminants and particles being drawn across the surface of the wafer during push and pull cycles.
- Minimises heat loss into the clean room.
- Eliminates corrosive gases entering the equipment or clean room.
- Provides improved temperature control. and uniform cooling across the wafer during unload
- Prevents the warpage of the load station and furnace end walls during high temperature fast boat unload cycles.

There are also a number of other advantages associated with the general system design:-

- Improved exhaust control which is controllable at tube level.
- Accurate and repeatable setting of exhaust flows.
- The elimination of exhaust turbulence in the exhaust port and scavenger box.
- The prevention of cross tube contamination.
- The inner baffle can be removed for routine cleaning or replacement.
- The general construction and the use of graphite seals and gaskets minimises maintenance requirements and the risk of contamination from brittle or de-vitrified silicon or rubber seals.

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