Load/unload tower, main console, and remote control panel
No. 1 — all within easy reach from central operating platform.
Main chamber port below furnace tower gives access for ser-
vicing. High capacity gas handling provided by 10,000 liter/-
sec. diffusion pump, freon-cooled baffle and full-bore right
angle valve connection.

Application: Specifically designed for sintering oxygen and nitrogen sensitive, high temperature mate-
rials, the system's 2200°C heat zone is ideally suited for tantalum PM compacts. The completely
integrated system provides for loading, sintering, and cooling mass produced, pre-sintered PM under
controlled conditions of temperature, vacuum and inert cooling gas. Similar Vacuum Industries' furnace
systems are available for processing carbides and other PM products.

DESCRIPTION

Introduction: Air-to-air processing advantages are combined with high throughput in this convenient
to operate, space conserving design. A rotary table in the main vacuum chamber indexes each succes-
sive load from loading position to heating position and on to six (6) vacuum cooling positions —
then back to the starting position for gas cooling and unloading. A remotely operated vertical ram
located below the rotary table lowers (and raises) loads from (and into) the load/unload tower. A
similar ram raises (lowers) loads into (from) the furnace heat zone tower. The furnace heat zone
operates continuously and is always charged ex-
cept during the short time when all loads are lowered to the rotary table for indexing.

Each load is cooled in vacuum on the rotary table through six (6) stations. Cooling in inert gas is
possible when the load is returned to the load/un-
load tower just before unloading. The forced draft
cooling system includes a high speed blower and
a water-cooled heat exchanger to extract heat
from the load, thus ensuring a safe exit tem-
perature. The complete system is fully interlocked for
automatic fail-safe control with manual override
capability for maximum versatility.
Controls and Instrumentation
Main Control Console: free-standing, front access, NEMA-1 console with interlocked power disconnect switch; two (2) vacuum system control panels, each with mode selector switch, keylocking overrides and pilot lights for sequence controlled, semiautomatic pumping; furnace control panel with digital potentiometer for power adjustment, start-stop pushbuttons, ammeters and voltmeters, and cooling water pilot lights; load handling control panel (graphic display) with pushbuttons and pilot lights to control loading ram, furnace ram, table index and index lock, all interlocked for error-free operation.

Remote Panel #1 (convenient to load lock cover): operating controls for isolation valve, gas backfill, gas blower/heat exchanger, load ram, and load lock vent.

Remote Panel #2 (next to main chamber manhole cover): operating controls for rotary table index mechanism and furnace station ram.

Power Center
Housed in console base; includes main fused disconnect switch, starters, contactors, control power transformer. Completely wired, color coded and ready for connection to user service.

Power Supply
Balanced three-phase low voltage air-cooled transformer, 100 kVA saturable core reactor. Manual start, shunt trip, circuit breaker interlocks with cooling water supply.

Utilities
- Electrical: 440 volts, 3-phase, 60 Hz; 210 amps.
- Water: 40 gpm, 30-50 psig, 60-70°F, filtered.
- Air: 80-100 psig, 10 CFM, filtered and lubricated 1 hr. duty cycle.

Space Required
Approximately 17'-0" long x 13'-0" wide x 9'-6" high including height of 72" platform mounted console. Pit required to accommodate hydraulics — 3' x 3' square x 7' deep.

Auxiliaries from rear, top left to right: cooling water distribution manifold, drain bosh; cooling gas heat exchanger and direct-drive blower with suction line to load lock; load lock pumping system and main chamber pumping system (mechanical pumps and blower out of view).