

- ▣ 제목 PCO2-14 폴리이미드 경화 오븐
- ▣ 작성자 한신CFT



PCO2-14™ 폴리이미드 경화 솔루션은 폴리이미드 베이킹, 경화 및 열균 용도로 설계된 세척 공정 오븐입니다. 다양한 반도체 제조 환경에서 첨단 기계류가 폴리이미드 경화에 사용되고 있습니다. 이 공정은 비용이 많이 들어 청결, 불활성 분위기 능력, 사이클 시간 또는 데이터 수집 측면에서 장비가 대개 폴리이미드 경화에 부적합합니다.

PCO2-14™는 반도체 웨이퍼 장치를 위해 폴리이미드 경화 공정을 최적화합니다. 4개 필수 특성을 하나의 컴팩트한 설계로 조합함에 따라 제품 생산에 사용되는 모든 웨이퍼에 대해 사이클 시간을 단축하고 경화 공정을 일관되고 반복 가능하게 할 수 있습니다. 세척 공정 작동(등급 100(ISO 등급 5) 재순환 에어 플로우), 불활성 분위기 능력(<20ppm의 산소), 최대 350°C 온도 및 +/- 1% 온도 균일도의 빠른 사이클 시간.

오븐 공정 모니터링 시스템에서는 PC와 오븐, 이더넷 연결부 및 15" 평판 디스플레이 스크린 간의 통신을 위해 Protocol Plus 소프트웨어가 설치된 PC를 사용합니다.

Protocol Plus™ 소프트웨어는 오븐의 Protocol Plus™ 컨트롤러, O2 컨트롤러, O2 모니터 및 통합 PC와 직접 통신하여 전체 사이클을 확인 및 데이터 로깅하며 공정 전반의 세팅 포인트, 실제 챔버 온도 및 O2 레벨과 관련된 실시간 정보를 사용자에게 제공합니다.

<표준기능> •최대 350°C(662°F) 온도 •재순환 공기는 등급 100(ISO 등급 5) 이상 조건 하에 작동하도록 99.99% HEPA(High Efficiency Particulate Air) 여과됩니다. •316L SST 유형의 수냉 코일이 있는 자동 용수 제어기가 제공됩니다. •3"(7.6cm) 센터 상의 조절 가능한 2개 스테인리스강 와이어 선반. •최대 50lb(23kg)의 선반당 부하 감당 능력과 400lb(181kg)의 총 부하 감당 능력 •이 오븐은 11개 선반까지 지탱합니다. •Protocol Plus™ 마이크로 프로세서 제어 시스템과 실시간 시계를 통해 간편하고 유연하게 작동할 수 있습니다. •설치 면적을 최소화하는 컴팩트한 캐비닛 설계 •작업 챔버의 오염을 방지하도록 모든 내부 이음새가 단열층에 연속 용접됨 •Magnehel 게이지는 필터 교체 시기를 알 수 있도록 HEPA 필터 압력을 모니터링합니다 •무실리콘 구조 •CE 및 Semi S2 인증

◆ PCO2-14™ Polyimide Curing Oven

A clean process oven designed for polyimide baking and curing applications



The Despatch PCO2-14™ electrically heated oven was designed to meet the specific process requirements for hard baking polyimide coatings in an inert atmosphere. This high-performance, clean process oven (ISO Class 5/Class 100 recirculated airflow) offers many unique components, including a pressure relief system, an oxygen control system and a process monitoring system which allows the oven to achieve the strict oxygen level and atmospheric requirements involved in polyimide curing.

Pressure Relief System: In the “hard bake” polyimide cure process, residual solvent is removed and desired surface properties are finalized. The process of removing solvents requires that the oven contain equipment to help prevent and collect solvent condensation. Despatch designed the PCO2-14™ with a pressure relief system that includes a removable “cold trap”, an easy-to-clean condensate trap that helps to prevent polyimide buildup in the oven’s exhaust.

Oxygen Monitor and Control System: The PCO2-14™ is an inert atmosphere oven which allows the oxygen level to be maintained at 20ppm or less to help prevent oxidation of the polyimides being cured. The oven contains an O2 monitor which is wired to the purge valve and turns the nitrogen purge on whenever the oxygen level is above the O2 monitor set point. Once the nitrogen purge is complete, the O2 level is maintained at a set point by a controller that operates a modulating valve during the curing process. This process minimizes the nitrogen usage and allows for consistent and repeatable product curing.

Process Monitoring System: The oven’s PC features Protocol Plus™ software to allow for communication between the PC and the oven, an Ethernet connection and a 15” (38.1cm) flat panel display screen. The Protocol Plus™ software communicates directly with the oven’s Protocol Plus™ controller, O2 controller, O2 monitor and integrated PC to observe and data log entire cycles and provide the user with real-time information on set points, actual chamber temperatures and O2 levels throughout the entire process.



PC02-14

PHYSICAL SPECIFICATIONS

Chamber size (width x depth x height) * Clear opening width is reduced by 1.5 in. (3.8 cm) due to 3/4 in. (1.9 cm) shelf supports on each side.	25.5* x 26 x 37 in. 64* x 66 x 94 cm
Capacity in cubic feet (liters)	14 (396)
Overall size (width x depth x height)	60 x 50 x 71 in. 152.4 x 127 x 180.3 cm
Electrical: Three phase 60 HZ, 208 volts	Heater: 16 kW
Electrical: Three phase 60 HZ, 240 volts	Heater: 16 kW
Electrical: Three phase 50 HZ, 380 volts	Heater: 16 kW
Electrical: Three phase 60 HZ, 480 volts	Heater: 16 kW
Ventilation exhaust diameter	3 in. (7.6cm) flange connection
Number of shelves provided	2 stainless steel
Maximum number of shelves	11 on 3" (7.62 cm) centers
Approximate net weight	1000 lbs. (455 kg)
Approximate shipping weight	1200 lbs. (545 kg)

FUNCTIONAL SPECIFICATIONS

Time to temperature with no load (50°C to 100°C)	3 minutes (non-ISO Class 5)
Time to temperature with no load (50°C to 200°C)	9 minutes (non-ISO Class 5)
Time to temperature with no load (50°C to 260°C)	15 minutes (non-ISO Class 5)
Time to temperature with no load (50°C to 350°C)	35 minutes (non-ISO Class 5)
Cooling time to temperature with no load (100°C to 65°C) *Based on cooling water supplied at 3 GPM (11.4 lpm), 13°C	15 minutes*
Cooling time to temperature with no load (175°C to 65°C) *Based on cooling water supplied at 3 GPM (11.4 lpm), 13°C	20 minutes*
Cooling time to temperature with no load (260°C to 65°C) *Based on cooling water supplied at 3 GPM (11.4 lpm), 13°C	25 minutes*
Cooling time to temperature with no load (350°C to 65°C) *Based on cooling water supplied at 3 GPM (11.4 lpm), 13°C	30 minutes*
Temperature uniformity at 100°C	+/- 1°C
Temperature uniformity at 200°C	+/- 2°C
Temperature uniformity at 260°C	+/- 3°C
Temperature uniformity at 350°C	+/- 3.5°C
Control stability	+/- 0.5°C
Operating range with 20°C ambient temperature	35°C-350°C (95°F-662°F)
Maximum load capacity	400 lbs (181 kg)
Maximum shelf capacity	50 lbs (23 kg)
1.5 HP recirculating fan with horizontal airflow	950 CFM (448 liter/sec)

Notes: Uniformity figures are based on a nine-point test conducted in an empty oven after stabilization period. Uniformity can vary slightly depending on unit and operating conditions. Minimum operating temperature and cooling times are based on 20°C ambient temperature measured at the fresh air inlet. Times to temperature with no load are based on non-ISO Class 5 (non-Class 100) conditions. Class 100 HEPA filtration will limit ramp rates to 5°C per minute. Specifications are subject to change without notice. If the existing specifications differ from yours, ask about our customizing capabilities.

Warning: Despatch PC02-14™ ovens are not to be used with flammable solvents, materials or enclosed containers. Soft bake of the polyimide coatings must be done in a Class A oven prior to hard baking in the PC02-14™.

SERVICE AND TECHNICAL SUPPORT

service parts: 1-800-473-7373
international service/main: 1-952-469-8230
service fax: 1-952-469-8193

service@despatch.com

GLOBAL HEADQUARTERS

phone: 1-888-DESPATCH (1-888-337-7282)
international/main: 1-952-469-5424
fax: 1-952-469-4513

sales@despatch.com
www.despatch.com

FEATURES AT A GLANCE

- ◆ Compact cabinet design that minimizes footprint
- ◆ All interior seams continuously welded on insulation side to protect the work chamber from contamination
- ◆ 4" (10.2cm) thick insulation in chamber to minimize heat loss, air leakage and external thermal spots
- ◆ Recirculation air is 100% filtered through a 99.99% HEPA filter for ISO Class 5 (Class 100) or better operation
- ◆ Magnehelic gauge monitors HEPA filter pressure to indicate when to replace filter
- ◆ Protocol Plus microprocessor-based digital programmable control with LED temperature display and LCD status panel
- ◆ Silicone-free construction
- ◆ End of cycle, high-limit audible and visual alarms
- ◆ CE compliant
- ◆ Programmable, electronic door lock
- ◆ Installation and burn-off of HEPA filter including post-burn off cleaning of the chamber
- ◆ Cleaning and triple bagging in clean room before shipment



- ◆ The removable "cold trap" is an easy-to-clean condensate trap that prevents polyimide buildup in the oven's exhaust.