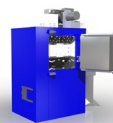
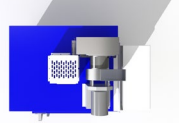
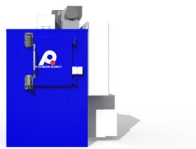


CASE STUDY

Electric Heated Cabinet Ovens for Paint Sample Curing and Test Processing

Pair of identical electric-heated X2-8-202020 horizontal-airflow cabinet ovens engineered for the batch curing of solvent-based liquid paint samples — featuring a 20 in W × 20 in D × 20 in H work chamber, 850°F operating temperature with ±10°F uniformity, 24 kW electric resistance heating, an internal 12 in diameter mild-steel rotating table at 5 RPM, NFPA 86 Class A safety architecture with powered exhaust and purge sequencing, and a WATLOW F4T ramp/soak controller.

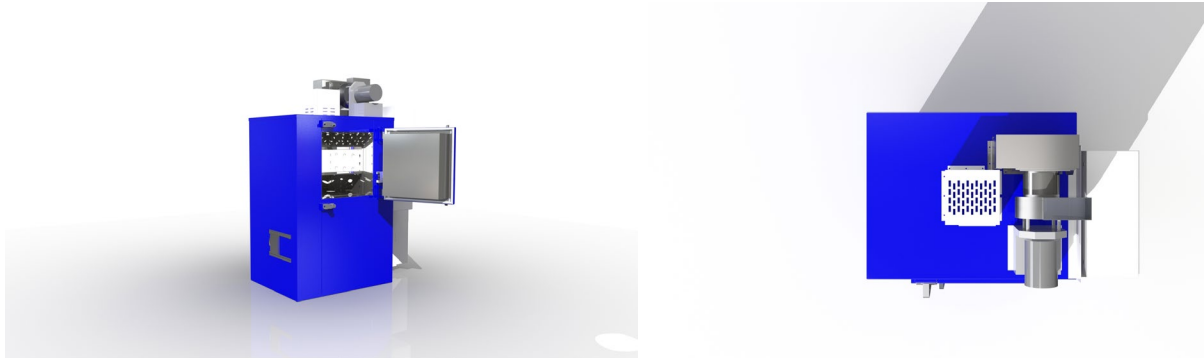


OVERVIEW

A pair of identical electric-heated cabinet ovens was engineered for curing solvent-based liquid paint samples. The system was based on the X2-8-202020 horizontal-airflow cabinet platform and configured as a Class A oven for volatile-bearing batch processing. The order provided two matching ovens with the same thermal architecture, safety logic, and control approach.

Each oven uses a 20 in W × 20 in D × 20 in H work chamber with full horizontal airflow, an operating temperature of 850°F, and a stated work-area uniformity of ±10°F. Heating is provided by electric resistance elements delivering 24 kW total. Airflow is supplied by a recirculation fan rated at 720 CFM, while a PQ1 exhauster delivers the powered exhaust required for Class A service.

A notable process-specific feature of the design is the rotating stand located inside the oven work area. The rotating table was included to continuously turn the paint samples during curing so the thermal process matches the test method. Each oven also ships with four 100 lb shelves to provide additional loading flexibility.



CUSTOMER PROCESS REQUIREMENTS

The equipment was developed for a coatings application requiring the batch curing of solvent-based liquid paint samples in a compact cabinet oven platform. The summary below focuses on the delivered equipment architecture and performance basis.

Application Requirement

- The equipment was used for curing solvent-based liquid paint samples.
- Two identical ovens were required to support repeatable testing or parallel batch processing with matched process conditions.

Work Chamber / Load Requirement

- Required work chamber: 20 in W × 20 in D × 20 in H.
- Each oven included a 12 in diameter mild-steel rotating table suspended from the top of the work area, rated for 20 lb evenly distributed capacity at 5 RPM rotation.
- Each oven also shipped with four shelves rated at 100 lb evenly distributed capacity each for alternate loading arrangements.

Process Requirement

- The process required elevated-temperature curing of paint samples with the rotating stand turning samples continuously during the curing cycle.
- Because the product was solvent-based, the oven had to support safe processing of volatile-bearing loads.
- The thermal architecture had to support matching process conditions across both ovens.

Safety Requirement

- The ovens were configured as NFPA 86 Class A units.
- The documented maximum VOC load basis was 0.12 gal/batch of o-xylene.
- The process required powered exhaust, purge sequencing, and airflow proving as part of the operating sequence.

Utility / Site Requirement

- Required electrical service: 460V / 3PH / 60Hz. Full load amperage: 34.4 A.
- Design elevation basis: 1,955 ft.

Material / Construction Requirement

- Exterior finish: PQ Blue. Control panel finish: PQ White. Interior finish: unpainted aluminized steel.
- The unit was designed as a compact insulated cabinet oven with 5 in thick walls.

THERMAL PROCESS REQUIREMENTS

These thermal process requirements were established from the need to cure solvent-based paint samples in a compact cabinet platform with repeatable thermal exposure and safe Class A ventilation.

Temperature Capability

- Operating temperature: 850°F.
- Maximum temperature: 850°F.
- Required work-area uniformity: $\pm 10^\circ\text{F}$.

Process Basis

- The thermal process basis is curing solvent-based liquid paint samples.
- The process required controlled elevated-temperature exposure while the internal rotating stand continuously turned the product during the curing cycle.
- The thermal architecture also had to support matching process conditions across both identical ovens.

Heat Input Requirement

- Heat source: electric resistance heat. Heater basis: 1 kW elements. Total installed heat: 24 kW.
- Heat control basis: solid-state relay control for the electric heat bank.

Airflow Delivery Requirements

- Airflow style: full horizontal airflow.
- Recirculation airflow basis: 720 CFM at 2 in. w.c. Recirculation fan motor: 0.75 HP.

Exhaust / Ventilation Basis

- Exhaust fan: PQ1 exhauster. Exhaust airflow: 225 CFM at 1 in. w.c. Exhaust fan motor: 0.75 HP.
- Powered exhaust and purge sequence included as part of the Class A operating logic.
- Airflow switches used on exhaust and recirculation fans as part of the safety sequence.

Thermal Instrumentation / Control Basis

- Primary controller: WATLOW F4T ramp/soak controller.
- Work-area high limit: Gefran 650L.
- Classification basis: NFPA 86 Class A. Maximum VOC load basis: 0.12 gal/batch of o-xylene.

EQUIPMENT CONCEPT & ARCHITECTURE

To deliver the customer and thermal process requirements for this paint-sample curing application, the following equipment concept and architecture was developed.

Overall Concept

- Two identical electric-heated X2-8-202020 horizontal-airflow cabinet ovens configured for solvent-based paint-sample curing.
- Designed as Class A full-horizontal-airflow ovens in a compact cabinet platform sized for test and sample work rather than large-scale production loads.

Heating Architecture

- Heat source: electric resistance. Heater bank output: 24 kW total from 1 kW elements.
- Heat control basis: solid-state relay control.

Airflow / Recirculation Architecture

- Airflow pattern: full horizontal airflow.
- Recirculation fan: Jan-Air 12.19 × 4.0 RBSS fan wheel — 720 CFM at 2 in. w.c.; 0.75 HP motor.
- Exhaust fan: PQ1 exhauster — 225 CFM at 1 in. w.c.; 0.75 HP motor.

Chamber / Construction Architecture

- Internal work chamber: 20 in W × 20 in D × 20 in H.
- Wall thickness: 5 in. Insulation: 4 in of 6 lb mineral wool plus 1 in of 8 lb Superwool.
- Interior material: unpainted aluminized steel. Exterior finish: PQ Blue. Control panel finish: PQ White.
- Door style: single swing door.

Product Handling / Process-Fixturing Architecture

- One 12 in diameter mild-steel rotating table per oven, supported from the top of the work area.
- Rotating table rated for 20 lb evenly distributed capacity at 5 RPM. Rotating stand control located on the control-cabinet face.
- Four 100 lb shelves included per oven for alternate loading arrangements.

Controls Architecture

- Oven-mounted NEMA 1 control enclosure, 42 in × 30 in × 12 in, listed to UL 508A Open Industrial Control Panel.
- WATLOW F4T ramp/soak controller. Work-area high limit: Gefran 650L.
- Applicable standards basis: NFPA 79, NFPA 86, UL 508A.

Shipping / Installation Architecture

- Each oven shipped assembled. Approximate shipping weight: 1,100 lb per oven.
- Compact cabinet platform supported shipment of two matching units for the order.

TECHNICAL SPECIFICATIONS

Oven Configuration	
Quantity	2 identical ovens
Type	Electric-heated X2 cabinet ovens
Model	X2-8-202020
Application	Paint sample curing
Product Basis	Solvent-based liquid paint
Internal Work Chamber	20 in W × 20 in D × 20 in H
Airflow Style	Full horizontal airflow

Thermal Heat Power System	
Operating Temperature	850°F
Maximum Temperature	850°F
Uniformity	±10°F
Heat Source	Electric resistance heat
Installed Heat	24 kW
Heater Basis	1 kW heating elements

Recirculation / Airflow System	
Airflow Pattern	Full horizontal
Recirculation Fan	Jan-Air 12.19 × 4.0 RBSS fan wheel
Recirculation Airflow	720 CFM
Recirculation Static Pressure	2 in. w.c.
Recirculation Fan Motor	0.75 HP

Exhaust System	
Exhaust Fan	PQ1 exhauster
Exhaust Airflow	225 CFM
Exhaust Static Pressure	1 in. w.c.

Exhaust Fan Motor	0.75 HP
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Construction Materials / Shell System

Wall Thickness	5 in
Insulation	4 in of 6 lb mineral wool + 1 in of 8 lb Superwool
Interior Material	Unpainted aluminized steel
Exterior Finish	PQ Blue
Control Panel Finish	PQ White
Door Style	Single swing door

Product Handling / Internal Fixtures

Rotating Table Diameter	12 in
Rotating Table Construction	Mild steel
Rotating Table Capacity	20 lb evenly distributed
Rotating Table Speed	5 RPM
Shelves Included	4 shelves per oven
Shelf Capacity	100 lb evenly distributed each

Controls & Electrical

Temperature Controller	WATLOW F4T ramp/soak controller
High Limit	Gefran 650L
Control Cabinet	Oven-mounted NEMA 1
Enclosure Size	42 in × 30 in × 12 in
Panel Listing	UL 508A Open Industrial Control Panel
Primary Power	460V / 3PH / 60Hz
Full Load Amperage	34.4 A

Safety & Compliance

Classification	NFPA 86 Class A
Maximum VOC Load Basis	0.12 gal/batch o-xylene
Applicable Standards	NFPA 79, NFPA 86, UL 508A

Process Summary

Product	Paint samples
Market / Application	Coatings / paint testing
Process Type	Batch curing of solvent-based liquid paint samples
Order Structure	Two identical ovens

Key Verification Concept

Repeatable temperature, airflow, rotation, and safe exhaust control for volatile-bearing sample curing



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