LCI LOCHABER CORNWALL INC

LA-306

COMPACT HIGH TEMPERATURE INFRARED FURNACE

- **Production and Laboratory Applications**
- **30-inch IR Heat Chamber, up to 1000°C**
- **3 Separately Controlled Heat Zones**
- **Controlled CDA, N2, & FG Process Atmospheres**
- **Dual gas option (N2 & Forming Gas) for Low O2**
- **BRAND NEW Digital Control System**

THE LA-306 FURNACE

A compact 3-zone furnace, this furnace is small enough to be used in a laboratory setting and robust enough to often be used for production applications. This model is approximately 10 feet (3070 mm) long and 2 feet (500 mm) wide. The LA-306 has a 6-inch (150 mm) wide belt and 2-inch (50 mm) high product opening. The small chamber offers excellent temperature control and rapid rise to 1000°C. The newly designed control system is easy to use and provides sophisticated zone temperature control. Upper and lower lamps can be independently enabled to operate the furnace in radiant mode, radiant convection mode, or convection mode.

IR color. Depending on supply voltage, the furnace will operate in the IR wavelength of 1900-2600 kelvin. Voltage compensation assures the lamps operate consistently at the design color temperature.

WHERE IT IS USED (ENVIRONMENT)

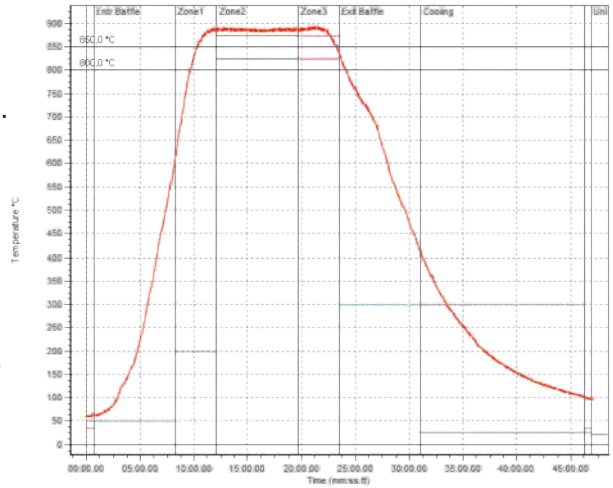
It is used in production and laboratory environments for thermally controlled continuous processes in a controlled atmosphere of nitrogen, forming gas or air. The furnace can heat to 1000C or ~1800F and typically reaches stable process ready in 30 minutes. It is available in a dual gas configuration, a second gas such as forming gas composed of nitrogen and up to 4% hydrogen can be introduced into the furnace chamber while pure nitrogen is used in the rest of the furnace. It runs on single phase 208-240 volt (50/60 Hz) power. It is efficient: when operated at 800°C it draws only 40 amps of current.

HOW IT IS USED (TYPICAL APPLICATIONS)

The LA-306 is used thermal processing of substrates, wafers, PCBs, metal ingots and manufactured parts, ceramic, glass, optical coatings and polycarbonate products. Specific applications include:

- Precise Curing of Coatings on Optical Lenses
- General Curing and Drying
- Semiconductor processing, Package sealing, Epoxy Die Attach, Polymer Curing
- Copper and Hybrid Thick Film firing
- Advanced thin film, crystalline silicone, cadmium telluride (CdTe alloys) and certain copper indium diselenide (CIS-alloys) solar cell processing

The LA-306 furnace is popular for dental labs and dental production applications.



Typical LA-306 880°C Temperature Profile

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LCI Furnaces DIVISION OF LOCHABER CORNWALL INC CONTINUOUS BELT IR FURNACE	EQUIPMENT SPECIFICATIONS	DOC NBR: STD - 802-101401 | R3 MODEL: LA-306N STD & HIGH POWER SERIAL NBR: ALL SIZE A SHT 1 OF 1

Equipment Model

Model	Base Equipment	Control Zones	Furnace Heated Length	Nominal Furnace Belt Width
LA-306N	Continuous Belt Controlled Atmosphere Furnace	3	30 in 762 mm	6.0 in 152 mm

Equipment Arrangement

Phase	Process	Max	Length	Process Gas	Temperature (typ)
Phase 1	IR Furnace, 3 Zones	1000 °C	30 in 762 mm	CDA, N2, FG	450-950 C
Phase 2	Gas Convective Cooling, Exterior Fan Heat Removal (includes transition tunnel)		45 in 1143 mm	CDA or N2	350-40 C

Process Sections

Function	Name	Location	Length	Process Gas	Temperature (typ)
Product Load	Load Station	Entrance load area	15 in 381 mm	none	ambient
IR Furnace	Entr Baffle/Entrance Eductor	Entrance barrier	15 in 381 mm	N2	80-250 C
	Zone 1	Heating chamber 1	7.5 in 191 mm	N2	80-975 C
	Zone 2	Heating chamber 1	15 in 381 mm	N2	80-975 C
	Zone 3	Heating chamber 1	7.5 in 191 mm	N2	80-975 C
Cooling Section	Trans Tunnel	Heat/cool barrier	15 in 381 mm	N2	80-450 C
	Gas Convection Cooling	Cooling section	30 in 762 mm	N2	55-360 C
Product Unload	Unload Station	Exit unload area	15 in 381 mm	none	ambient
	Frame Adjustment		1 in 21 mm		
	Total		121 in 3070 mm		

Process Gas

(If Single Gas combine GAS1 & GAS2. Dual Gas: GAS 2 = CDA, N2 or FG to furnace heating zones, GAS1=N2 or CDA to all except zones)

	Actual Conditons		Typical Opertion		Typical (low O2 operation)		Max (all flowmeters open)	
Furnace Replenishment Rate			2.0 rep/min		2.6 rep/min		6.1 rep/min	
	Temp °C	Press psi	Typical scfh	Typical sL/m	Typical scfh	Typical sL/m	Max Compressor scfh	Max Compressor sL/m
Gas1 Supply	21	70	177	84	229	108	1,085	512
TOTAL PROCESS GAS			177	84	229	108	1,085	512

Exhaust Gas

	Temp °C	Press in H_2O	Min Flow scfh	Min Flow sL/m	Typical scfh	Typical sL/m	Maximum Exhaust scfh	Maximum Exhaust sL/m
GAS 1 & 2, MIX	200	6	177	84	206	97	348	164

Cabinet Ventilation

Cabinet Ventilation Fans (vent to room or exhaust system)	Flowrate	550 cfm	930 m3/h	550 cfm	930 m3/h
	Temperature	<86°F	<30°C	<122°F	<50°C
Control Cabinet Ventilation Fans (vents to room)	Flowrate	212 cfm	360 m3/h	212 cfm	360 m3/h
	Temperature	<86°F	<30°C	<104°F	<40°C

Transport System

Belt width	6.0 in	152.4 mm		Belt Edge Heater(s):	none	
Belt type	Balanced spiral weave					
Product height	2 in (50.8 mm) above belt level.			Baffle plate clearance: 0.5" above belt		
Belt speed range	1-20 ipm			25-500 mm/m		
Conveyor height	36.0 in	+/- 1.5 in	adjustable	914.4 mm	+/-38.1 mm	adjustable

Electrical System	Standard				High Power			
Voltage (as configured)	208 Vac	220 Vac	230 Vac	240 Vac	208 Vac	220 Vac	230 Vac	240 Vac
Frequency, Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Phase	1	1	1	1	1	1	1	1
Power, maximum, kW	14.2	14.2	14.5	14.8	17.2	17.2	17.2	17.2
Current, maximum, A	67 Hz	64.4	62.9	61.6	82.7	78.1	75.4	72.3
Power,kW, operating @ 950 C	7.8	8	8.1	8.3	9.6	9.6	9.6	9.6
Current, A, operating @ 950 C	37.5	36.3	35.4	34.6	46.3	43.8	41.9	40.1
Power, kW, operating @ 425 C	5.8	5.9	6.0	6.2	7.1	7.1	7.1	7.1
Current, A, operating @ 425 C	27.8	26.9	26.2	25.6	34.2	32.3	30.9	29.6

Materials of Construction

Heating Chamber	304 Stainless steel	Cooling	Aluminum, aircraft	Belt	Nichrome V, 80%Ni,20%Cr, <1% Fe
Baffle & Eductor	304 Stainless steel	Belt support	Quartz rod, Quartz tube	Frame	Steel, epoxy or powder coated
Heating element	Quartz, near infrared	Belt Return	UHMW-PE	Cover Panels	18GA steel, epoxy coated

Furnace Dimensions

	Length	Width	Height (floor to stack)	Furnace Sect	Coolg Sectn	Total Net Wt
U.S.	121 in	25 in	80 in +/- 1.5 in	1100 LB	none	1100 LB
Metric	3.1 m	64 cm	203 cm +/- 3.8 cm	500 kg	none	500 kg

Standard Conditions	Pressure	14.7 psia	101.3 kPa	Temperature	70 °F	21 °C