

HELLER INDUSTRIES

THE TECHNOLOGY LEADER

ADVANCED TECHNOLOGY FOR DEMANDING PROCESSES



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INNOVATIONS IN TECHNOLOGY

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Heller Industries was founded in 1960 and pioneered convection reflow soldering in the 1980s. Over the years, Heller has partnered with its customers to continually refine the systems to satisfy advanced applications requirements. By embracing challenge and change, Heller has earned the position of World Leader in Reflow Technology...



Heller has been honored with many major industry awards including: 2018 Service Excellence Award, 2017-2018 Vision Award for Innovation, Market Share Leader, and 2018 Frost &Sullivan for Global Company of the year award.



2018 Service Excellence Award



2018 Winner -Global Company of the Year Award



- ★ Heller Factories
- Heller Sales/Service Offices
- Heller Industry Representatives



Benefits of Partnering with the World Leader

Working with the industry leader carries many other important benefits:

- **Partnership:**

We provide the V.I.P.service and support that has come to symbolize Heller Industries.

- **Corporate Strength and Longevity:**

Over 55 years in the electronics industry gives us a solid corporate and management base that ensures stability and continued support.

- **Direct Access to Upper Management:**

Our upper management staff is continually traveling to meet our customers to gain their feedback and input.

- **Distributed“Lean”Manufacturing:**

With factories in China and Korea ,we provide “local” sourcing and utilize a “copy exactly” paradigm that ensures Six Sigma performance oven-to-oven and factory-to-factory.



HELLER

Mark 7 REFLOW SYSTEM

NEW!
MARK VII



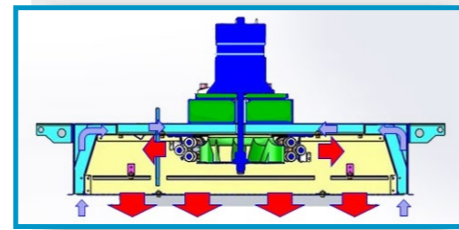
The New MK7 platform revolutionizes the Reflow industry with several new and ground breaking designs! The MK7 incorporates all of the customer requests for lower Delta T, reduced nitrogen consumption and extended PM into a new low height package that makes it easy to see across the production floor. We invite you to visit any one of our 3 locations to run profiles and gather DATA for yourself to see the strong advantages of the MK7 for your production! Or if you prefer, send us your toughest board and we will run profiles and generate the data for you. We are happy to work with you to custom configure the system to suit your needs.

■ New Low Height Top Shell

New low height top shell provides much easier access for operators. All skins have double insulation to save up to 10-15% in energy losts.

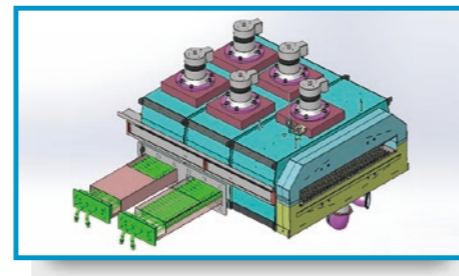
■ Enhanced Low Height Heater Modules

Enhanced low height heater module provides the lowest Delta Ts on the product with better air flow and uniformity! The Uniform Gas Management system eliminates “net flow” which results in nitrogen consumption reductions of **up to 40%**! New semi-circular heater is more robust and efficient with much longer life time.



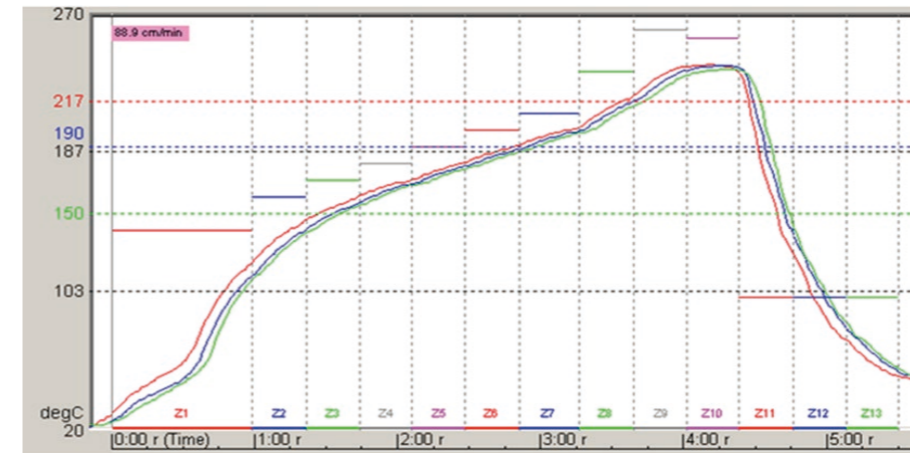
■ Revolutionary Flux Management System

Our revolutionary flux collection system traps the flux in collection jars that can be easily removed and replaced **while the oven is running** — saving time consuming P.M. The new flux filtration box also has no risk of flux clogging for a longer term P.M. interval. Additionally, our proprietary Flux-Free Grill system limits the flux residue on the cooling grills giving the Heller system the highest production yields of any oven!



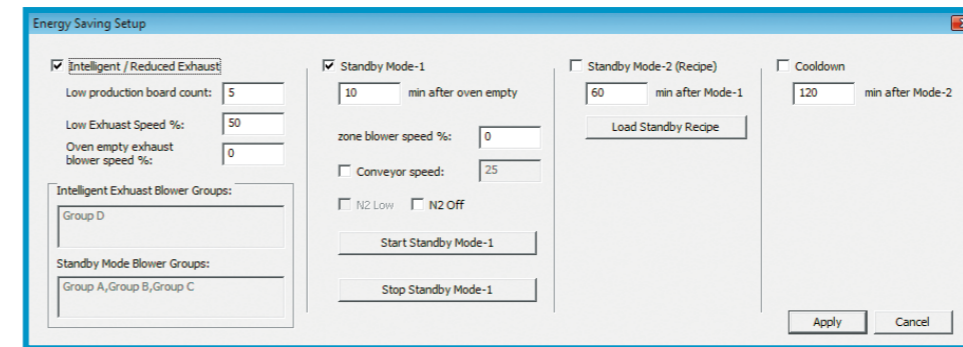
■ Programmable Cooling

The new Big Flat Coil Cooling module provides cool rates of $>3^{\circ}\text{C}/\text{sec}$. That rate meets even the most demanding lead-free profile requirements. Heller can also easily achieve slow cooling rate required by the flip chip process. Heller's unique design using a 10-inch (250 mm) long heater module provides more modules within the same heating length which means more process control and reduced liquid times.



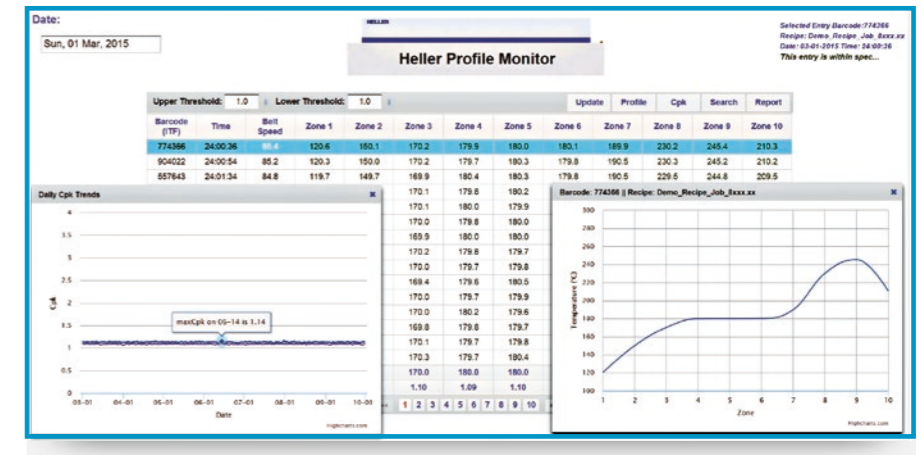
■ Energy Management Software

Proprietary software allows you to program exhaust draw to optimize energy consumption during the various production times — heavy, light or idle. **Energy savings of up to 10-20% have been realized!**



■ Reflow Oven CPK

Heller provides dynamic 3 tiered system (Tier 1: Oven CPK, Tier 2 Process CPK, Tier 3 Product Traceability) enables customer to quickly improve product quality and yield while reducing costs. And the additional benefits of automatic record keeping and recall provide customers with the peace of mind that all process parameters are under control and within spec .



Heller Reflow Oven MK5 + MK7 Basic Models and Specifications

	Model	Overall Length	# of Heat Zones	# of Cool Zones	Max PCB Width
1505	1505	79" (2m)	5	1 Top(std.) External Cool optional	22"
1707	1707	142" (3.6m)	7	1 Top (std.) Bottom Cool/ External Cool optional	22"
1826/1809	1826	183" (4.65m)	8	2 Top (std.) Bottom Cool/ External Cool optional	22"
	1809	183" (4.65m)	9	2 Top (std.) Bottom Cool/ External Cool optional	22"
1936/1913	1936	232" (5.89m)	10	3 Top (std.) Bottom Cool/ External Cool optional	22"
	1913	232" (5.89m)	13	3 Top (std.) Bottom Cool/ External Cool optional	22"
2043	2043	267" (6.78m)	13	3 Top (std.) Bottom Cool/ External Cool optional	22"
2049	2049	292" (7.44m)	15	4 Top(std.) Bottom Cool/ External Cool optional	22"
2156	2156	342" (8.69m)	17	5 Top(std.) Bottom Cool / External Cool Optional	22"

NOTE: 1826+1936+2043+2049+2156 models utilize a 30" wide by 12" long heater module to allow drop-in profile compatibility with other vendors' ovens. 1707+1809+1913 models utilize a 30" wide by 10" long heater module to provide improved profile "sculpting" and reduced liquid times. Module sizes up to 36" wide are available upon request for large boards up to 28" wide and increased dual rail width.

Vacuum Assisted Reflow

Heller Industries has developed a vacuum module that inserts directly in its reflow oven line to meet rising demand of high volume, void free, automated inline soldering. This vacuum assisted reflow has been shown to reduce the voids in a solder joint by 99% and allows thermal profiles to be directly ported from non-vacuum reflow applications to achieve low COO and high UPH.

Features

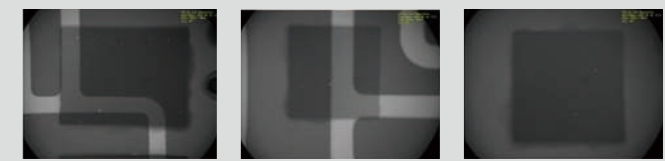
- Applies multi-zones to suit various thermal profile requirements
- Able to achieve < 1% total void area spec
- Provides optimized cycle (average 30-60s) to achieve high UPH
- Utilizes advanced pumping package for fast pump down time
- Adopts high efficient flux collection system to eliminate flux condensation
- Utilizes a heater in the Vacuum chamber to minimize liquid time



Without Vacuum (> 15-25% VOIDS)



With Heller Vacuum (< 1% VOIDS)



VS

Heller Vacuum Assisted Reflow Oven Specifications

Model	1808MK5-VR	1911MK5-VR	1912MK5-VR	1936MK5-VR	2043MK5-VR
Power Supply	400/415/480 VAC	400/415/480 VAC	400/415/480 VAC	400/415/480 VAC	400/415/480 VAC
Process Gasses	N2 Option: Formic Acid	N2 Option: Formic Acid	N2 Option: Formic Acid	N2 Option: Formic Acid	N2 Option: Formic Acid
Heating Zones	Convection Heating/ Top 7+Bottom 7+1 IR(Top)	Convection Heating/ Top 10+Bottom 10+1 IR(Top)	Convection Heating/ Top 11+Bottom 11+1 IR(Top)	Convection Heating/ Top 8+Bottom 8+1 IR(Top)	Convection Heating/ Top 10+Bottom 10+1 IR(Top)
Cooling zones	2 Top Option: Bottom	3 Top Option: Bottom	3 Top Option: Bottom	3 Top Option: Bottom	3 Top Option: Bottom
Min. Vacuum Level	Standard: < 10 Torr Option: 5 Torr	Standard: < 10 Torr Option: 5 Torr	Standard: < 10 Torr Option: 5 Torr	Standard: < 10 Torr Option: 5 Torr	Standard: < 10 Torr Option: 5 Torr
Max. Working Temperature	Standard: 350 °C Option: 400 °C/450°C	Standard: 350 °C Option: 400 °C/450°C	Standard: 350 °C Option: 400 °C/450°C	Standard: 350 °C Option: 400 °C/450°C	Standard: 350 °C Option: 400 °C/450°C
Max Board Size (cm)	500Lx450Wx29H	500Lx450Wx29H	350Lx350Wx29H	350Lx350Wx29H	500Lx450Wx29H

* We can configure the machine you need.

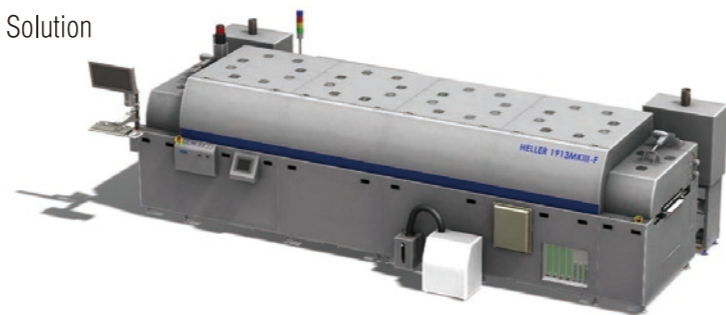
Fluxless Reflow (Formic Acid)

Heller Industries has developed fluxless reflow which utilizes Formic Acid (HCOOH) to replace standard flux agents. Formic Acid has been shown to be an effective reducing agent in fluxless solder reflow. It eliminates the need for pre-reflow fluxing and post-reflow flux cleanup steps. Heller industries can map the formic acid concentration profile and reduce O2 ppm to ~10 ppm for bumping application. Excellent results demonstrated for wafer bumping application and C4 Flip Chip process.

Features



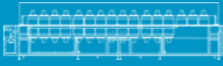
- Can use any reflow profile (e.g., tent or soak profile) with formic acid
- Can adjust formic acid profile in oven in conjunction with thermal reflow profile
- Includes Formic acid safety system (i.e., sensors/detectors) adheres to industry standards
- Offers optional Formic acid abatement systems for Green Process Solution
- Offer optional real time formic acid concentration monitor system
- Capable of running both formic acid process and flux process *
- SEMI S2-S8 certified *

* Option



Heller Fluxless Reflow Oven

- 13 convection heating zones and 4 convection cooling zones
- Formic acid delivery system
- Real time formic acid concentration and O2 PPM measuring
- Environmental monitoring system and exhaust abatement system for operation safety

MK5 Basic Models Specifications	Overall Length	# of Heated Zones/ Heated Length	# of Cooling Zones
 1826	465 cm (183 in.)	8 Top 8 Bottom / 260 cm (102 in.)	2 Top (std.) Bottom Cool / External Cool optional
 1936	589 cm (232 in.)	10 Top 10 Bottom 360 cm (141 in.)	3 Top (std.) Bottom Cool / External Cool optional
 2043	678 cm (267 in.)	13 Top 13 Bottom 430 cm (170 in.)	3 Top (std.) Bottom Cool / External Cool optional

INDUSTRY 4.0 Compatibility

Internet of Manufacturing (IoM) —Smart factories, intelligent machines and networked processes through the use of cyber-physical systems.

Heller offers Host Computer/IoM Interfacing.

This integration provides:

- Central control
- Production reporting — # of boards processed, up time, down time
- MTBF / MTTA / MTRR
- Energy management and control
- Traceability of product

Heller offers compatible interfacing for:

- CFX (AMQP MQTT)
- Hermes
- PanaCIM & iLNB
- Fuji Smart Factory
- ASM
- Custom interfaces available upon request

Heller Pressure Cure Oven

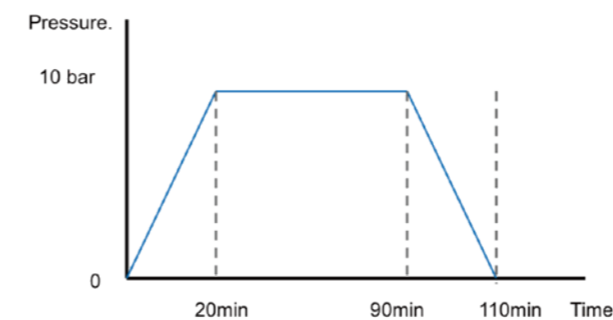
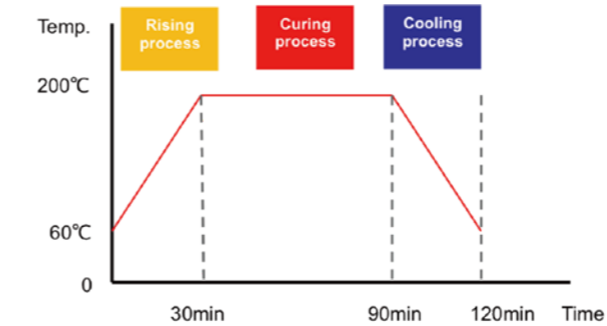
Heller has developed Pressure Cure Oven (PCO) or Autoclave to minimize voiding and increase adhesion strength for bonding processes typically used in die attach and underfill applications. PCO pressurizes air into a rigid vessel and heats with forced convection. When the curing process is complete, the pressure oven automatically relieves its pressure to 1atm and cools.

Heller Pressure Cure Oven Specifications

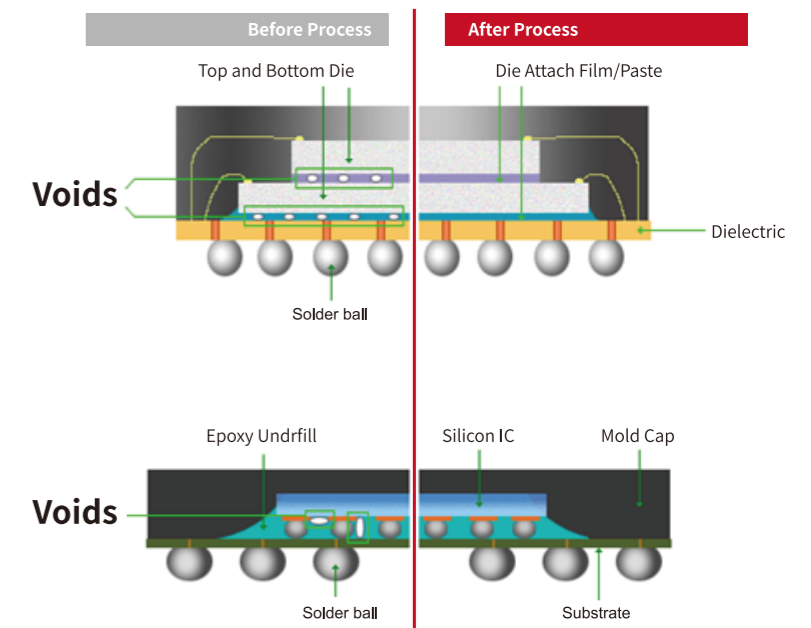
- Process time: Generally 120 min or User's spec
- Operating temp: 60°C ~220 °C
- Maximum temp: 220°C
- Operating pressure: 1 bar – 10 bar
- Capacity: 24 Magazines (typical)
- Cooling method: PCW (17°C~23°C)
- Cooling water pressure: 25 – 40 psi



Representative Pressure/Temp Profiles (User Configurable)



Applications



Vertical Curing Oven

Heller has developed Vertical Curing Ovens for inline applications. By the design of vertical transfer, it is able to save the costly floor space and get stable temperature profiles. Compared with traditional ovens, vertical curing oven can fulfill the automatic in line production with superior temperature uniformity. Major applications: Die Attach, Flip Chip, Underfill, COB Encapsulation.

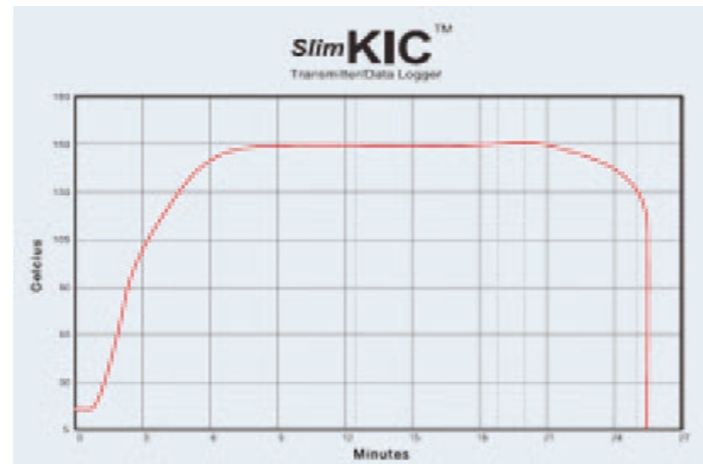


Heller Vertical Oven Specifications

Vertical Oven Models	755-250	755-350
Height (mm)	1670	2000
Length (mm)	1850	2500
Width (mm)	1500	1800
Vertical Pitch(mm)	19.05	31.75
Edge width clearance (mm)	5	5
Max board width(mm)	250	350
Min board width (mm)	75	90
Max board length (mm)	250	350
Maximum Board weight	0.15 kg	1 kg
Minimum Cycle Time (sec)	18	12
Min Process Time (min)	15	7/18+
Max Zone Temperature Setpoint	150C	180C
Max Product Temperature	125C	150
Up/Down Conveyor(Boards)	24 Up /24 Down	18 Up /18 Down

Features

- Small Footprint-as small as 185cm
- Fast Curing Time-down to 7.5 minutes
- Adjustable Curing Times-up to several hours
- Adjustable Product Width-from 7.5cm to 35cm
- Air Atmosphere
- SMEMA Compatible



Vacuum Clamp Conveyor

Heller Industries has invented a vacuum clamp that moves within a conveyor belt system inside a horizontal vacuum reflow oven. Vacuum clamp carriers return underneath oven from exit to entrance to provide continuous operation. This vacuum clamping design has proved effective for wafer or substrate warpage mitigation.

