

# HELLER INDUSTRIES

THE TECHNOLOGY LEADER  
技术领导者

## 全球领先的回流焊系统

满足特殊制程要求的先进技术  
ADVANCED TECHNOLOGY FOR DEMANDING PROCESSES



■ 美国东海岸公司 Eastern US Office 973.377.6800  
info@hellerindustries.com

■ 美国西海岸公司 Eastern US Office 512.454.4057  
info@hellerindustries.com

■ 欧洲公司 / Europe Office +441.16.223.8107  
info@hellerindustries.com

■ 日本办事处 / Japan +81.3.6717.4001  
info@hellerindustries.com



■ 中国 China +86.21.6442.6180  
info@hellerindustries.com.cn

HELLER 上海分公司地址  
Heller Industries, Inc. Shanghai

上海市莘庄工业区元山路318号10-11号厂房  
Building 10-11 No.318, Yuan Shan Road  
Min Hang District, Shanghai 201108, P.R. China



■ 韩国 Korea +82.31.740.9210  
info@hellerindustries.co.kr

HELLER 韩国分公司地址  
Heller Industries, Inc. Korea

125-5, Saneop-ro 156 Beon-gil,  
Gwonseon-gu Suwon-si, Gyeonggi-do, Korea

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INDUSTRIES  
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Heller Industries, Inc.

4 Vreeland Road  
Florham Park, New Jersey 07932 USA  
Tel: 973.377.6800 | Fax: 973.377.3862  
E-mail: info@HellerIndustries.com  
Web Site: www.HellerIndustries.com

INNOVATIONS IN TECHNOLOGY



# HELLER INDUSTRIES

THE TECHNOLOGY LEADER

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...

成立于1960年的HELLER公司，在二十世纪80年代首创对流式回流焊接。多年来，HELLER与其客户一起合作，不断对设备进行持续改善和创新，已满足更新的工艺要求。通过持续的技术创新和变化，HELLER获得并一直保持着回流焊接系统的全球领先地位。



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.

HELLER在业界屡获殊荣，2018年度又获奖项包含：年度最佳服务奖，Vision Award年度最佳创新奖，行业领导奖及 Frost & Sullivan 全球SMT企业年度奖



2018 优秀服务奖  
2018 Service Excellence Award



全球SMT企业年度奖  
2018 Winner - Global Company of the Year Award



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



## Benefits of Partnering with the World Leader 携手HELLER, 创新价值

Working with the industry leader carries many other important benefits:

作为回流焊的领导者，HELLER不仅致力于为客户提供最先进的回流焊技术，还能为客户创造其他重要的价值。

### ■ Partnership 合作伙伴关系:

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

通过与客户密切合作，我们提供的VIP式的服务和支持在业界树立了良好的口碑。

### ■ Corporate Strength and Longevity 公司实力:

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

涉足电子行业超过55年的经验，使HELLER公司拥有强大的实力和完善的管理制度，从而能为客户提供长期，稳定和持久的服务。

### ■ Direct Access to Upper Management 与高层管理人员直接沟通:

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

管理层定期拜访客户以获取客户的反馈和新的需求。

### ■ Distributed "Lean" Manufacturing 分布式精益制造:

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.

我们在中国和韩国的两个工厂实现本地化运作，并利用“准确复制”模式保证每台焊炉和每个工厂达到6 Sigma标准。



# HELLER



# Mark 7 REFLOW SYSTEM 最新MK7回流焊系统

**NEW!** MARK VII



MK7 系列具有多项革命性和突破性的设计。MK7系列结合客户需求，优化Delta T，减少耗氮量，延长保养间隔时间。汇集各项优化功能的同时降低了机身高度，使视野更开阔。Heller欢迎您参观我们的研发中心和制造工厂，亲自在MK7的设备上做PROFILE测试，共同见证MK7系列的强大功能及优势。或者将您的产品寄给我们，我们会将PROFILE的测试结果与您分享。Heller很高兴为您提供定制化的产品满足您特殊的制成需求。

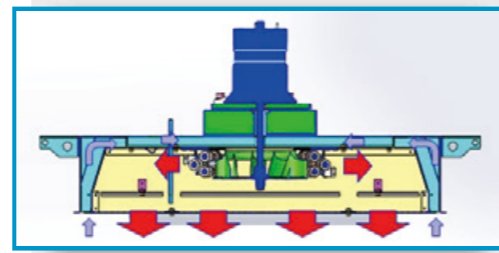
## ■ New Low Height Top Shell 最新低顶盖设计

New low height top shell provides much easier access for operators. All skins have double insulation to save up to 10-15% in energy costs. MK7采用最新低顶盖设计，方便客户的操作和保养，机器的表面温度更低，环保节能。

## ■ Enhanced Low Height Heater Modules 优化的新型加热模组

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.

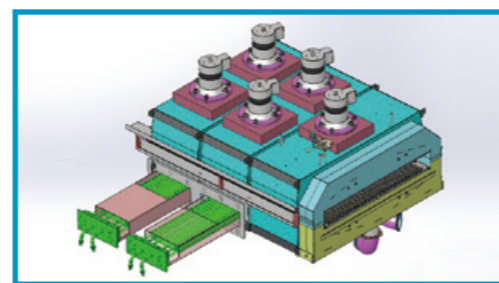
优化的低高度加热模组，实现最佳均温性；最高可减少氮气消耗40%，均衡气流节省氮气。新型加热丝加热效率更高，寿命更长。



## ■ Revolutionary Flux Management System 革新的助焊剂回收系统 最少维护时间，最多生产时间，最高产量！

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!

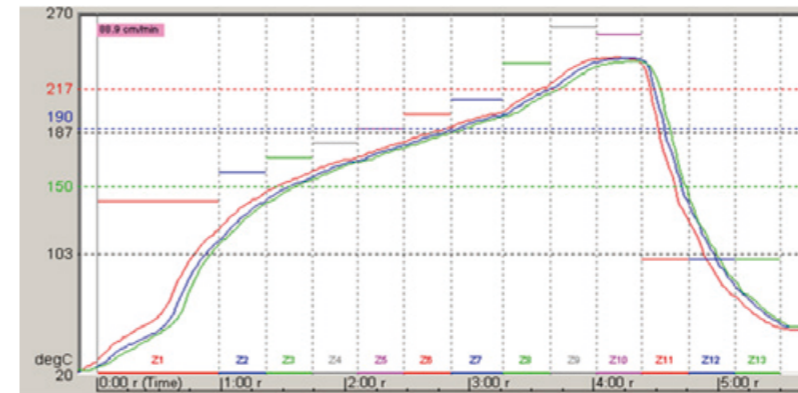
革新的助焊剂回收系统，用收集瓶回收助焊剂，易更换清理；可实现在线保养维护，延长保养周期，缩短保养所需时间；特殊冷却区设计，冷却区层板无助焊剂残留。



## ■ Programmable Cooling 极富灵活性的下降斜率

The new Big Flat Coil Cooling module provides cool rates of >3°C/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.

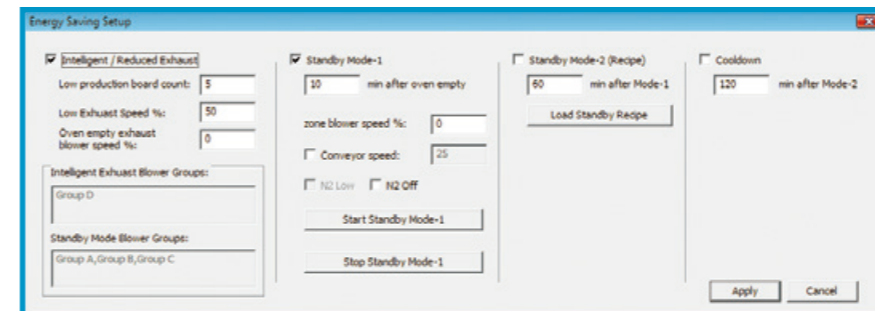
最新平板式冷却模组，能满足最严苛的温度曲线要求；可达到3度/秒以上的下降斜率，亦可轻松应对缓慢下降要求；独特的10英寸加热模组，拥有业内相同加热长度下最多温区，最多温控点。



## ■ Energy Management Software 能源管理软件

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!

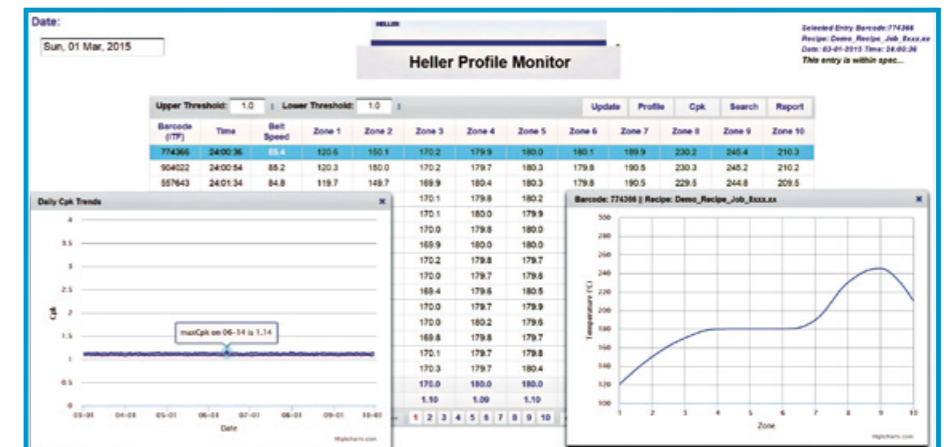
HELLER专有能源管理软件，智能化管理能源消耗；依据生产状态（满载，少量或闲置），自动调整设备抽排风。实现能耗节省高达10~20%！



## ■ Reflow Oven CPK 回流炉CPK—实时监控工艺参数，有效提升产能和品质！

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.

- 三阶数据管理：
- 第一阶：回流炉CPK
- 第二阶：工艺CPK
- 第三阶：产品追溯性管理



# Heller Reflow Oven MK5 + MK7 Basic Models and Specifications

型号 Model	设备长度 Overall Length	加热区数量 # of Heat Zones	冷却区数量 # of Cool Zones	最大板宽 Max PCB Width
1505	79" (2m)	5	1 Top (std.) External Cool optional	22"
1707	142" (3.6m)	7	1 Top (std.) Bottom Cool/ External Cool optional	22"
1826/1809	183" (4.65m)	8	2 Top (std.) Bottom Cool/ External Cool optional	22"
	183" (4.65m)	9	2 Top (std.) Bottom Cool/ External Cool optional	22"
1936/1913	232" (5.89m)	10	3 Top (std.) Bottom Cool/ External Cool optional	22"
	232" (5.89m)	13	3 Top (std.) Bottom Cool/ External Cool optional	22"
2043	267" (6.78m)	13	3 Top (std.) Bottom Cool/ External Cool optional	22"
	284" (7.23m)	13	4 Top (STD) Bottom Cool / External Cool optional	22"
2049	292" (7.44m)	15	4 Top (std.) Bottom Cool/ External Cool optional	22"
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.

备注: 1826+1936+2043 是用30"(W)x12"(L)加热模组, 与其它不同品牌回流焊炉的PROFILE具有兼容性。1707+1809+1913 是用30"(W)x10"(L)加热模组, 此模组可增强PROFILE的可塑性。另有一款宽度为36"的加热模组可用于宽度要求更大的产品及双轨需求。

## INDUSTRY 4.0 Compatibility 引领工业4.0的兼容性

制造业互联网 (IoM) — 通过信息物理融合系统的运用实现智能工厂, 智能机器人和网络化系统。

Heller 为工业4.0系统提供相应的电脑主机 / IoM 接口, 包括:

- 中央控制系统
- 产品的生产数据 — 生产的板子数量、制程参数、生产和停机时间
- MTBF/MTTA/MTTR管理
- 能源管理和控制系统
- 产品的追溯性数据

Heller 配合多种的管理系统软件, 提供相应的兼容接口

- CFX(AMQP MQTT)
- Hermes
- PanaCIM & iLNB
- Fuji 智能工厂
- ASM
- 根据客户实际需求提供兼容接口

# Vacuum Assisted Reflow 在线式真空回流炉

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.

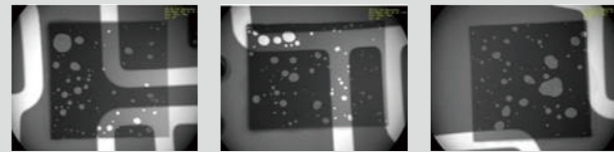
Heller在线式真空回流炉可实现真空焊接的自动化规模量产, 降低生产成本; 内置式真空模组, 分五段精准抽取真空, 实现无空洞焊接 (Void < 1%); 可直接移植普通回流炉的温度曲线, 曲线方便可调。

### Features 主要特点

- Applies multi-zones to suit various thermal profile requirements 多温区设计, 更多温控点, 满足不同温度曲线要求
- Able to achieve < 1% total void area spec 有效消除空洞, 总空洞面积可控制在1%以下
- Provides optimized cycle (average 30-60s) to achieve high UPH 高效生产能力, 平均生产节拍在30-60秒
- Utilizes advanced pumping package for fast pump down time 高效无油真空泵机组, 可实现最短降压时间
- Adopts high efficient flux collection system to eliminate flux condensation 高效助焊剂回收系统, 预防助焊剂残留
- Utilizes a heater in the Vacuum chamber to minimize liquid time 通过在真空腔体内安装加热丝, 最小化锡膏液态时间



## Without Vacuum (> 15~25% VOIDS)



VS

## With Heller Vacuum (< 1% VOIDS)



# Heller Vacuum Assisted Reflow Oven Specifications 真空辅助回流炉规格

Model	1808MK5-VR	1911MK5-VR	1912MK5-VR	1936MK5-VR	2043MK5-VR
Power Supply	220/380/400/415/480 VAC	220/380/400/415/480 VAC	220/380/400/415/480 VAC	220/380/400/415/480 VAC	220/380/400/415/480 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 (mm)	500Lx450Wx29H	500Lx450Wx29H	350Lx350Wx29H	350Lx350Wx29H	500Lx450Wx29H

\* We can configure the machine you need.



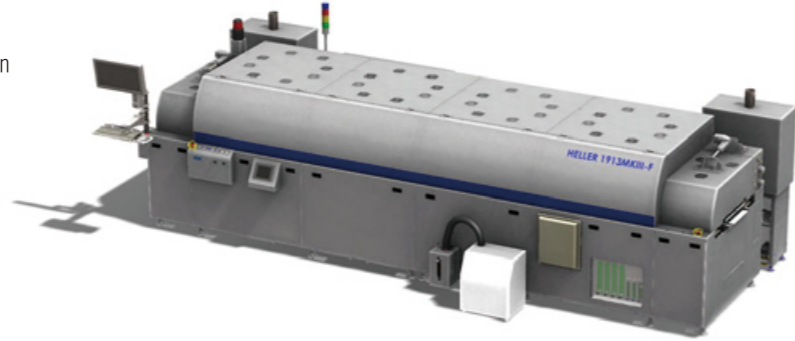
# Fluxless Reflow (Formic Acid) 无助焊剂回流炉（酸性气体炉）

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.

Heller的酸性气体炉，使用酸性气体(HCOOH)实现无助焊剂焊接；提供实时酸性浓度曲线，氧含量可在10ppm以下，焊接效果优良；优化工艺流程，无需助焊剂涂布工艺，也无需助焊剂清洗工艺。




## Features 主要特点

- Can use any reflow profile (e.g., tent or soak profile) with formic acid  
在酸性气体环境中，满足各类温度曲线要求（如帐篷型曲线或是浸润型曲线）
  - Can adjust formic acid profile in oven in conjunction with thermal reflow profile  
温度曲线和酸性气体浓度曲线均灵活可调
  - Includes Formic acid safety system (i.e., sensors/detectors) adheres to industry standards  
配备酸性气体防泄露安全系统，符合工业生产安全标准
  - Offers optional Formic acid abatement systems for Green Process Solution  
提供酸性气体递减排出功能，绿色环保
  - Offer optional real time formic acid concentration monitor system  
提供酸性气体实时浓度监控系统
  - Capable of running both formic acid process and flux process \*  
可兼顾无助焊剂回流工艺和助焊剂回流工艺（选配）
  - SEMI S2-S8 certified \*  
符合SEMI S2-S8标准（选配）
- ★ Option



# Heller Fluxless Reflow Oven 酸性气体炉规格

- 13 convection heating zones and 4 convection cooling zones  
13个热风对流加热区和4个冷却区
- Formic acid delivery system  
内含酸性气体传输注入系统
- Real time formic acid concentration and O2 PPM measuring  
提供实时的酸性气体浓度和氧含量监测
- Environmental monitoring system and exhaust abatement system for operation safety  
配备环境监测系统和酸性气体递减排出功能

MKS 之型号	设备长度	加热区数量及长度	冷却区数量
1826 	465 cm (183 in.)	上下各为8个加热区/长度 260 cm (102")	上面2个冷却区（标准）/ 下冷却区及外部冷却区（选配）
1936 	589 cm (232 in.)	上下各为10个加热区/长度 360 cm (141")	上面3个冷却区（标准）/ 下冷却区及外部冷却区（选配）
2043 	678 cm (267 in.)	上下各为13个加热区/长度 430 cm (170")	上面3个冷却区（标准）/ 下冷却区及外部冷却区（选配）

\*2017 ver.1

# Heller Pressure Cure Oven 压力烤箱

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.

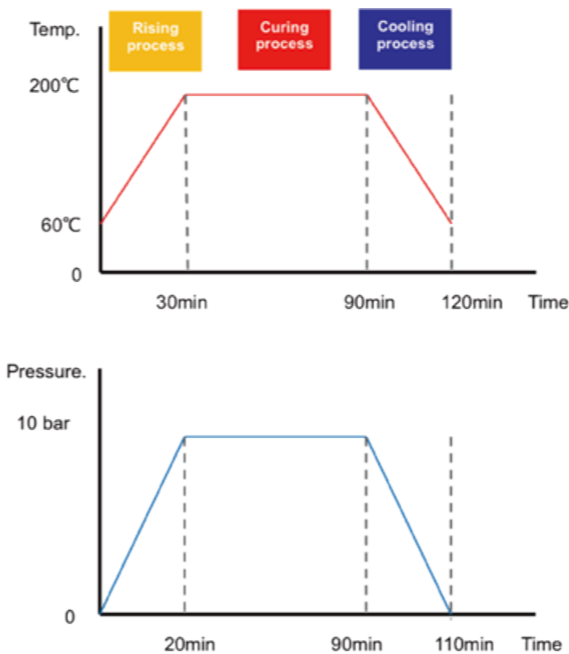
Heller的压力烤箱主要应用于芯片贴装和填胶工艺；可有效消除气泡，增加芯片贴装和填胶的粘着力；采用强制热风对流加热，在密闭容器内加压烘烤；烘烤完成后，自动释放压力，并进行冷却。

## Heller Pressure Cure Oven Specifications 压力烤箱规格

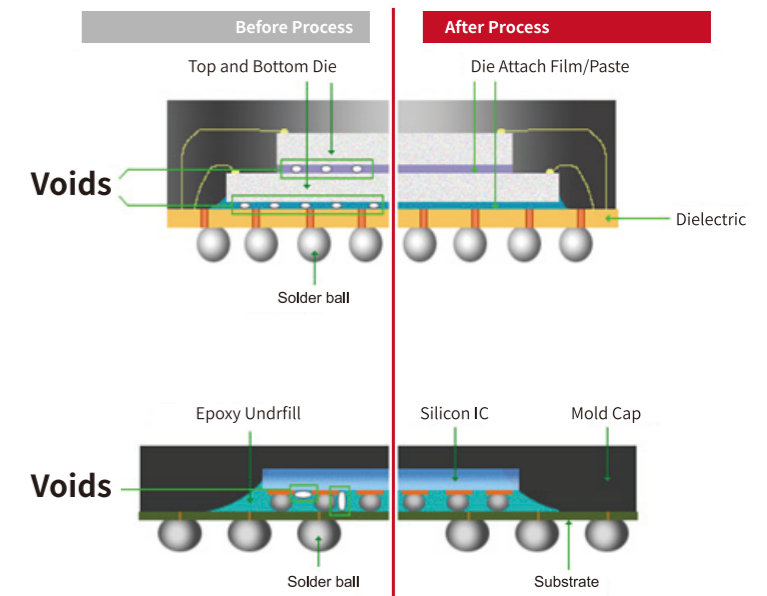
- Process time 加热时间: Generally 120 min or User's spec
- Operating temp 工作温度: 60°C ~220 °C
- Maximum temp 最高温度: 220°C
- Operating pressure 工作压力: 1 bar – 10 bar
- Capacity 产能: 24 Magazines (typical)
- Cooling method 冷却方式: PCW (17°C~23°C)
- Cooling water pressure 冷却水压力: 25 – 40 psi



# Representative Pressure/Temp Profiles (User Configurable) 典型压力 / 温度曲线（可调节）



## Applications



## Vertical Curing Oven 垂直烘烤炉

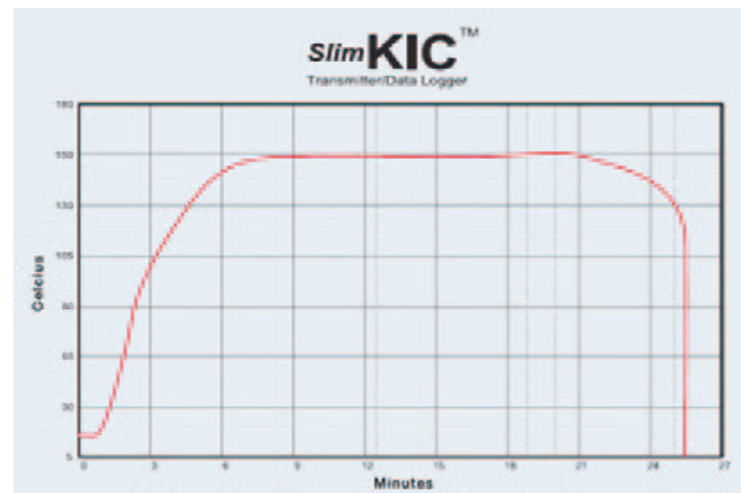
Heller has developed Vertical Curing Ovens for inline applications. By the design of vertical transfer, it is able to save costly floor space and get stable temperature profiles. Compared with traditional ovens, vertical curing oven can fulfill the automatic in line production with superior temperature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

Heller开发的垂直炉可取代原有的普通烤箱，实现自动化在线烘烤制程；通过特殊的垂直方向传输，可大幅减少占地面积，获得稳定的温度曲线；克服了传统烤箱无法进行自动化生产的缺点，且均温性明显优于传统烤箱；垂直烘烤炉的主要应用包括：芯片贴装，倒装，填胶，COB封装等。



### Features 主要特点

- Small Footprint-as small as 185cm  
占地面积小，总长度仅有185cm
- Fast Curing Time-down to 7.5 minutes  
可用于快速烘烤，最短烘烤时间仅为7.5分钟
- Adjustable Curing Times-up to several hours  
烘烤时间可调，最短几分钟，最长几个小时
- Adjustable Product Width-from 7.5cm to 35cm  
产品宽度可调，最小7.5厘米，最大35厘米
- Air Atmosphere (nitrogen optional)  
空气炉
- SMEMA Compatible  
兼容SMEMA标准



## Heller Vertical Oven Specifications Heller垂直烘烤炉型号与规格

Vertical Oven Models 垂直烘烤炉型号	755-250	755-350
Height (mm) 高度	1670	2000
Length (mm) 长度	1850	2500
Width (mm) 宽度	1500	1800
Vertical Pitch(mm) 垂直间距	19.05	31.75
Edge width clearance (mm) 边缘宽度	5	5
Max board width(mm) 最大板宽	250	350
Min board width (mm) 最小板宽	75	90
Max board length (mm) 最大板长	250	350
Maximum Board weight 最大承重	0.15 kg	1 kg
Minimum Cycle Time (sec) 最小生产间隔	18	12
Min Process Time (min) 最短制程时间	15	7/18+
Max Zone Temperature Setpoint 最高设置温度	150C	180C
Max Product Temperature 最高产品温度	125C	150
Up/Down Conveyor(Boards) 可容纳产品数量	24 Up /24 Down	18 Up /18 Down

## Vacuum Clamp Conveyor 真空夹具

Heller Industries has invented a vacuum clamp that moves within a conveyor belt system inside a horizontal 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.

Heller 开发的真空夹具系统，是和配置真空轨道的回流焊设备一体化的整套系统。真空夹具从炉膛入口处到出口处循环运转，自动回收，实现在线式生产。无论是晶圆回流还是基板回流，这套真空夹具都可有效解决产品的板弯板翘问题。

