

Lineup

Vacuum Soldering System Model: **Mini**

Mini is a very simple system designed for R&D and ideal for evaluation of formic acid reduction. Applications can be expanded by options.

Vacuum Soldering System Model: **VS2**

VS2 is a compact batch module designed for small-scale production from R&D and equipped with convenient automatic work transfer mechanism.

Standard specification	
Number of chamber	1
Dimensions	W850 x D850 x H1,460 mm
Process area	W200 x D250 x H60 mm
Reducing agent	Formic acid (98%)
Work supply	Automated load/unload unit
Exhaust detoxification	Formic acid decomposition unit
Solder type	Solder preform
Heating	IR heaters (temperature up to 400°C)
Cooling	Water plate
Machine operation	Touch panel
Vacuum pump	Corrosion-proof type dry pump

Vacuum Soldering System Model: **MP2**

MP2 is a mass-production system equipped with two process chambers (heating + cooling). The process area in W380 x D310 x H100mm, large module can be mounted.

Standard specification	
Number of chamber	2 (Heating + Cooling)
Dimensions	W2,550 x D1,750 x H2,120mm
Process area	W380 x D310 x H100mm
Reducing agent	Formic acid (76-98%)
Work supply	Automated load/unload unit
Exhaust detoxification	Formic acid decomposition unit
Solder type	Solder preform
Heating	IR heaters (temperature up to 400°C)
Cooling	Water plate
Machine operation	Touch panel
Vacuum pump	Corrosion-proof type dry pump

Mini Entry model



VS2 Batch type



MP2 Inline type



Formic Acid Reduction Reflow Vacuum Soldering System

Flux-less Soldering

Ideal for high-quality soldering with **formic acid reduction** and **compression process**.

- Requires no flux and its cleaning
- Creates no splash in process and results no void

Origin offers the best solutions in system and process.



Origin Electric Co., Ltd.

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Flux-less Soldering

Ideal for high-quality soldering with **formic acid reduction** and **compression process**.

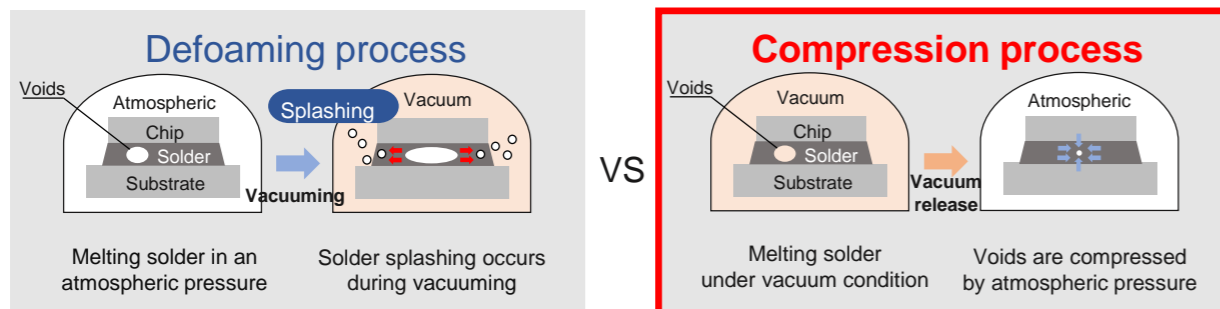
Removal of surface oxide in flux-less soldering

■ **Formic acid reduction:** In comparison with hydrogen, formic acid has excellent reduction effect at low temperature. Application of formic acid removes surface oxide and obtains excellent wettability.



Control of voids and solder splashing both by vacuum use

■ **Compression process:** By compressing voids, creates no splash in process and results no void. On the other hand, in conventional defoaming process, solder splash occurs during vacuuming.



Synergy from formic acid reduction and compression process

- Pb-free soldering generally creates poor wettability, yet Origin's process gives excellent soldering.
- Thin wafer demands higher level of soldering, yet Origin's easily meets requirement.

Process	Hydrogen	Formic acid (Origin's system)
Atmospheric pressure	<ul style="list-style-type: none"> ■ Voids 	<ul style="list-style-type: none"> ■ Voids
Compression process (Origin's system)	<ul style="list-style-type: none"> ■ Voids 	<ul style="list-style-type: none"> ■ Voids
	<ul style="list-style-type: none"> ■ Shape of the edge 	<ul style="list-style-type: none"> ■ Shape of the edge

Synergy from formic acid reduction and compression process brings **optimum soldering result**

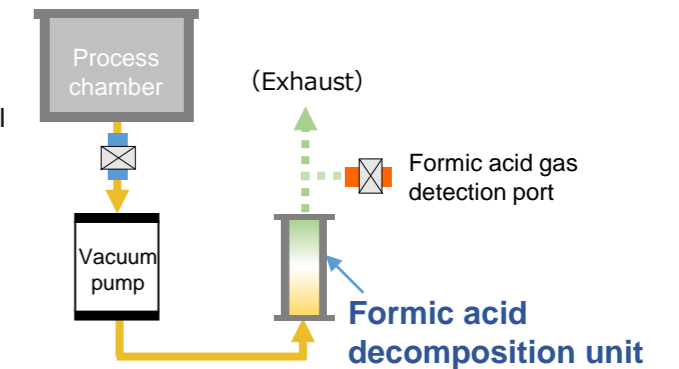
Safe operation of formic acid by closed system

Origin established closed system of formic acid within equipment, such as the following technologies, "Minimum usage of formic acid", "Auto removal sequence for residual formic acid", "Formic acid decomposition unit".

Formic acid decomposition unit:

Most of formic acid gas used in the reduction process is thermally decomposed. However a small amount remains.

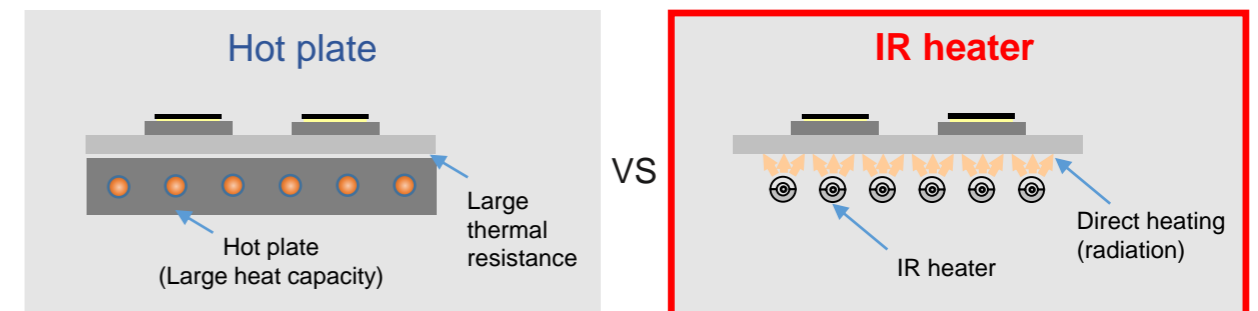
Origin's system completely decompose the formic acid gas. External exhaust treatment equipment is not required.



High speed heating under vacuum condition

Although it is difficult to control temperature without significant over-shoot during high speed process, especially under vacuum condition, Origin now offers systems capable of high speed and smooth temperature control with both vacuum and atmospheric condition.

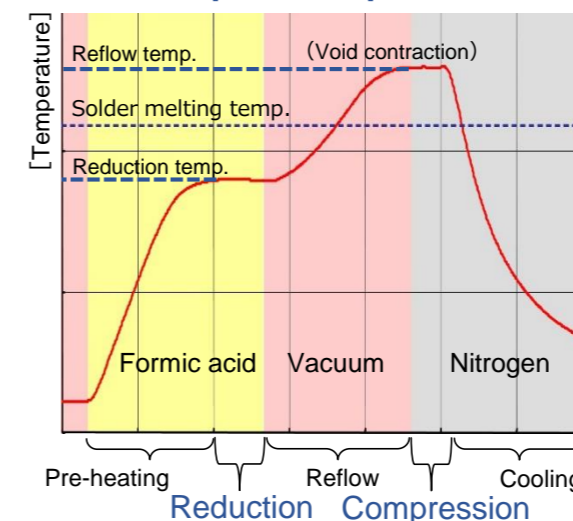
■ **IR heater:** Origin's system adopts the directly heated by IR heater, to achieve a high-speed heating. In contrast, typical hot plate is not suitable for high-speed heating, since the heat capacity of itself is large, and also there is large thermal resistance between the work under vacuum condition.



Temperature profile

Programmable temperature profile settings. An example of the formic acid reduction and compression process.

formic acid reduction and compression process



Applications

Origin's system is suitable for applications requiring clean soldering, flux residues and solder splashing is not allowed.

Example of power device

