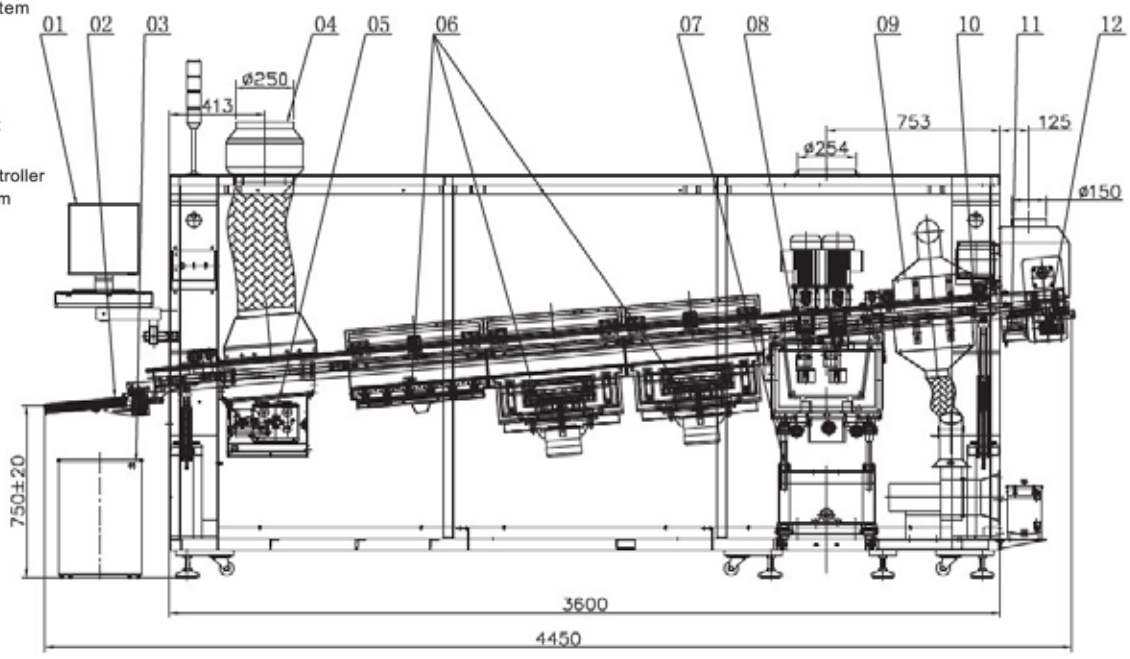
# HW450 HEAVY DUTY LEAD FREE WAVE SOLDER MACHINE

## DESIGN FOR HEAVY LOAD CARRIER & BOARD


## Machine Schematic

01 LCD
02 Buffer system
03 Flux auto-supply system
04 Exhaust fan
05 Flux spray system
06 Pre- heater
07 Solder pot lifting unit
08 Dual wave solder pot
09 Cooling system
10 Angle adjustment controller
11 Finger cleaning system
12 Conveyor system



## Main Features

- **Solder Pot** Long lifetime and Good heat uniformity
- **Oxidation Control** Less solder residue generated
- **Wave Generation** Patented design of impeller & channel for improving soldering wave stability
- **Flux Spraying** Spraying evenly and minimized the overlapping
- **Modular design** Convenience for maintenance

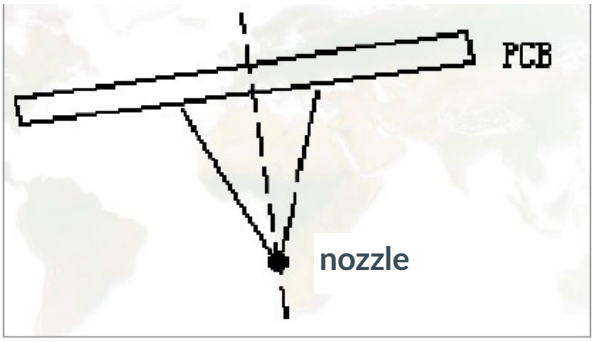
## Flux Spraying System

### Modularize Flux Spraying system

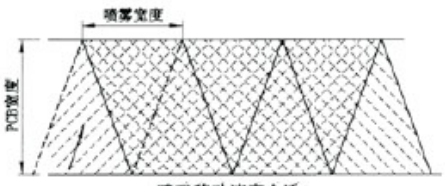
- Plug in and remove connector easily
- Drawer type structure that easy to install or disassemble to maintain
- Air filter easy to remove for cleaning

### Flux spraying is perpendicular to the PCB

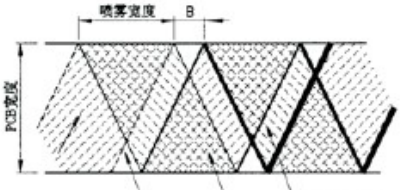
- Spread more even on PCB
- Enhance flux penetrating property to the holes
- Improve the adhesiveness of the solder metal
- Effectively reduce the customer's operating cost



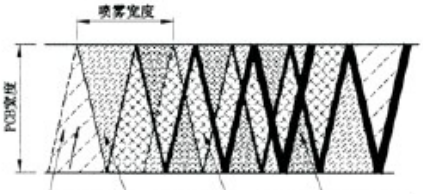

### Software will optimize the path to guarantee the flux coating uniformity



Suitable Nozzle speed
Spreading evenly



Nozzle speed too low.
spreading did not cover all



Nozzle speed too high. Introduce
spreading overlap

## Preheating System

### Modularize Flux Spraying system

- Plug in and remove connector easily
- Drawer type structure that easy to install or disassemble to maintain
- Easy from hot air to IR

## Soldering Pot

### Modularize solder pot

- Plug in and remove power source and thermocouple easily
- Standard solder pot, suitable different models and PCB size
- Automatic in/out & up/down

## Soldering Pot – Design Characteristics

### 10mm thickness casting iron solder pot

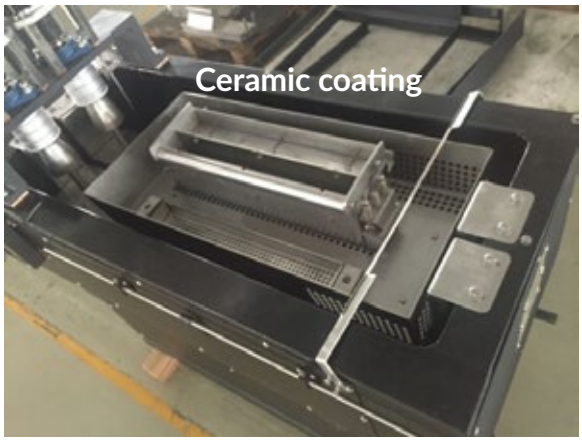
- No easy to deform when heating
- Well contact with heater for more uniform heating

### Used graphite for insolation

- Anti-moisture And Anti-corrosion

### Ceramic coating

- Smoother surface, anti-corrosion, longer lifetime




### Insolation and large solder pot

- Reduces heat loss
- Make the solder temperature to be more uniform
- Improves the solder pot heat storage capability

## Soldering Pot Warranty

Long lifetime and good temperature uniformity solder pot by casting iron solder with ceramic coating.

Casting Iron Solder Pot

**Guaranteed for 5 years**

| | Solder Pot Size (mm) | Solder Pot Thickness (mm) | Service life (year) 8 hour / day |
|---|---|---|---|
| 316 stainless steel | 1150 × 480 × 265 | 3 | ≥1 |
| Titanium | | 2 | ≥5 |
| Heat-resistant casting iron | | 10 | ≥8 |

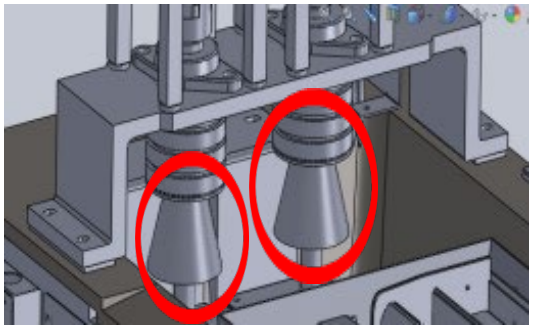
*Titanium solder pot guaranteed for 2 years

## Soldering Pot Anti-Oxidation

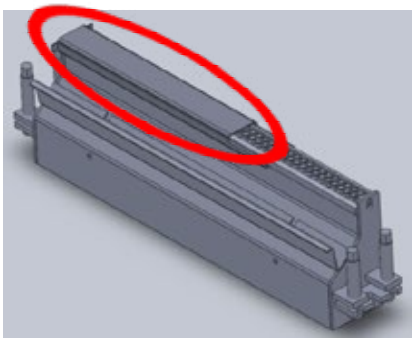
Reviewed the design by above factors. Solder residue is limited < 0.4kg per hour. Cost saved by better utilization.

Dynamic rotating cap isolate air and limit the oxidation

The oxidation reducing cover effectively control the wave flowing speed, lower the falling height and eliminate oxide.



Cap should be clean at least a week



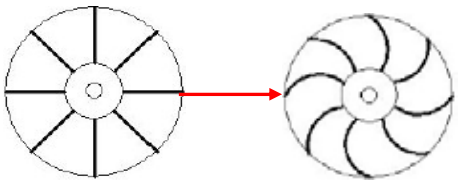
Solder residue should be removed everyday

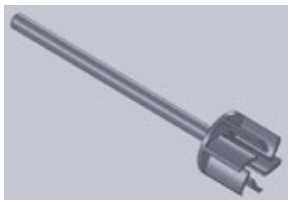
## Soldering Pot Wave Generation

- The structure of channel and impeller directly influence the soldering wave stability
- The variation of wave level can be controlled within 0.5mm to ensure good welding.

### Impeller design

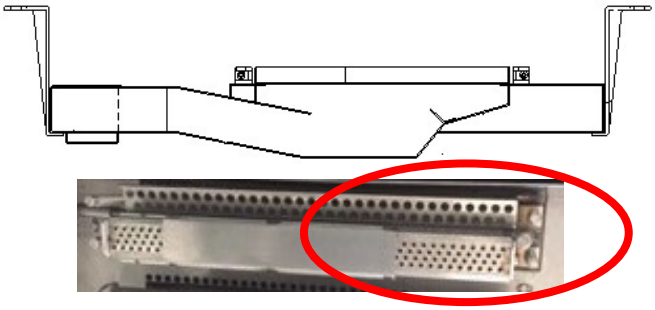
- The impeller design can convert the energy to solder pot constantly for forming more stable solder wave





### Channel design

- The channel design optimize the interference between solder wave (more stable)
- Rectifier make the peak of wave more flat



## Conveyor Finger

轻型双钩爪
Light-duty double Hook Finger

| Item | 参数(Parameter) |
|---|---|
| Technical distance | ⩾3mm |
| PCB thichness | ⩽2. 5mm |
| Carrying ability parameter : the whole conveyor | ⩽130kg |
| Material | 材料有不锈钢和钛合金两种 Material is stainless steel and titanium alloy |

Cost down version for double hook finger

Type 1 finger : Stainless steel
Type 2 finger : Titanium

▲ 重型双钩爪
Double hook finger
Type 3 finger : Titanium

| Item | 参数(Parameter) |
|---|---|
| Technical distance | ≥2mm |
| PCB thichness | ≤3. 5mm |
| Carrying ability parameter : the whole conveyor | ≤130kg |
| Material | 钛合金材料 Titanium alloy |

Current standard



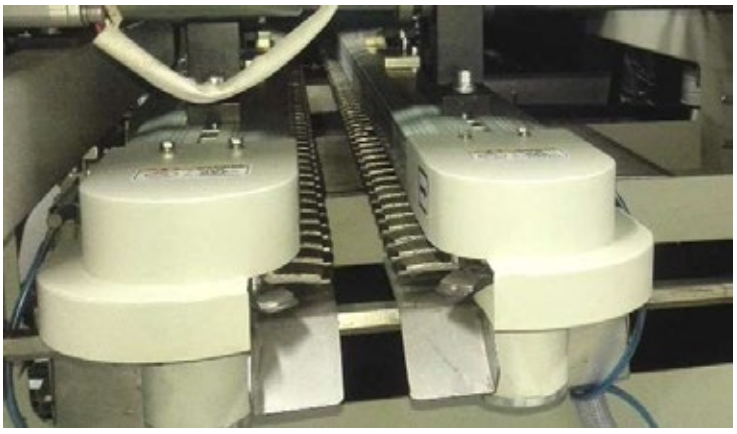
▲ 重型弹簧压片爪
Spring pressed finger
Type 4 finger

| Item | 参数(Parameter) |
|---|---|
| Technical distance | ≥4mm |
| PCB thichness | ≤5mm |
| Carrying ability parameter : the whole conveyor | ≤130kg |
| Material | 支撑片钛合金材料，压片不锈钢材料 support chip is titanium alloy, tabletting is stainless steel |

▲ D-40鸭嘴爪
D–40 duchbill finger
Type 5 finger

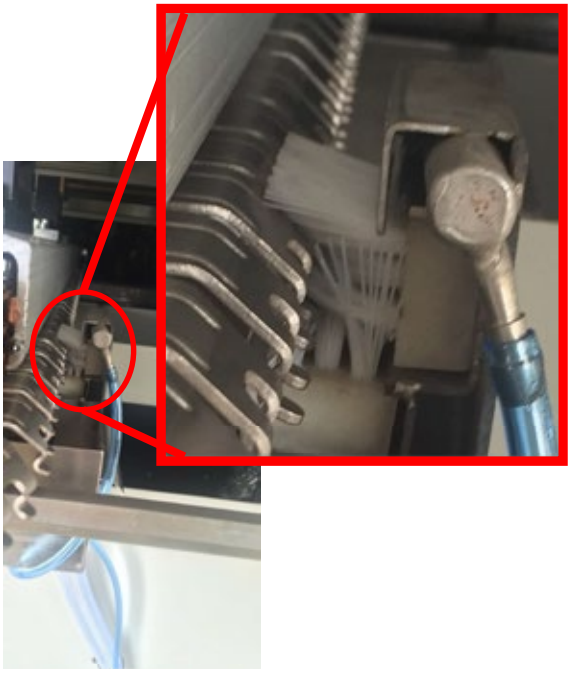
| Item | 参数(Parameter) |
|---|---|
| Technical distance | ≥3mm |
| PCB thichness | ≤2mm |
| Carrying ability parameter : the whole conveyor | ≤130kg |
| Material | 钛合金材料 Titanium alloy |

Options：L5 finger designed for heavy pallet.



## Cleaning

Alcohol will to pump to the brush and clean the clamp during moving




## User Friendly Interface


Direct input target temperature into the program
Display actual temperature

## Specifications

| Model | HW350 | HW450 | HW610 |
|---|---|---|---|
| Dimensions LxWxH(mm) | 4450x1400x1700 | 4450x1500x1700 | 4450x1670x1700 |
| Weight | Approx. 1800kg | Approx. 2100kg | Approx. 2600kg |
| Power Supply | 3PH 380V 50HZ | 3PH 380V 50HZ | 3PH 380V 50HZ |
| Startup Power | 32KW | 32KW | 45KW |
| Operation Power Cons | Approx. 8KW | Approx. 8KW | Approx. 11KW |
| Control System | PC+PLC | PC+PLC | PC+PLC |
| Spraying Movement | (step motor) | (step motor) | (step motor) |
| Spray Pressure | 0.2 Mpa - 0.4Mpa | 0.2 Mpa - 0.4Mpa | 0.2 Mpa - 0.4Mpa |
| Flux Flow Arranga | Option | Option | Option |
| Auto Fill Flux | Standars | Standars | Standars |
| Exhaust | Top Exhaust Side Exahust | Top Exhaust Side Exahust | Top Exhaust Side Exahust |
| Exhaust Ducting d (mm) | Ø 250 | Ø 250 | Ø 250 |
| Exhaust Capacity | 30M°/min | 30M°/min | 30M°/min |
| Preheating Mode | Convection/ IR emitter | Convection/ IR emitter | Convection/ IR emitter |
| Control Mode | PID | PID | PID |
| Preheating Zone Number | 3 | 3 | 3 |
| Preheating Lenght (mm) | 1800 | 1800 | 1800 |
| Preaheating Temperature | Room temp. -200°C | Room temp. -200°C | Room temp. -200°C |
| Warm-up Time (min) | Approx. 12min (settings: 150°C) | Approx. 12min (settings: 150°C) | Approx. 12min (settings: 150°C) |
| Blower Motor | 250W 3PH 220 VAC | 250W 3PH 220 VAC | 250W 3PH 220 VAC |
| PCB Width (mm) | 50-350 | 50-450 | 50-610 |
| Conveyor Direction | L→R (option: R→L) | L→R (option: R→L) | L→R (option: R→L) |
| Conveyor Speed (mm/min) | 500-1800 | 500-1800 | 500-1800 |
| Conveyor Height (mm) | 750±20 | 750±20 | 750±20 |
| Available Comp. H(mm) | Top 120 /Opt: 250) Bottom 15 | Top 120 /Opt: 250) Bottom 15 | Top 120 /Opt:250) Bottom 15 |
| Conveyor Speed Control Mode | Closed Loop | Closed Loop | Closed Loop |
| Fingers | New design Double-hook Type Finger: 2D-40 | Spring Pressing Double-hook Finger | New design Double-hook Type Option |
| Conveyor Angle | 4-7° | 4-7° | 4-7° |
| Type of Solder Pot | Motor Drive | Motor Drive | Motor Drive |
| Solder Pot Material | Casting Iron | Casting Iron | Casting Iron |

| | | | |
|---|---|---|---|
| Wave Height Adjustment | (Inverter) Approx: (Digital Control by PC) | | |
| Cooling Method | (Air Cooling ) Option: (Water cooling) | | |
| Heater Power | 220 V 13.5KW | 220 V 13.5KW | 380 V 18KW |
| Solder Pot Temperature | 300°C | 300°C | 300°C |
| Solder Pot Capacity | 500kg | 500kg | 650kg |
| Wave Drive Power | 180Wx2 3PH 220 VAC | 180Wx2 3PH 220 VAC | 180Wx2 3PH 220 VAC |
| Solder Por Warm-up Time | Approx: 150min (setting 250°C) | Approx: 150min (setting 250°C) | Approx: 150min (setting 250°C) |
| Temp. Control Mode | PID | PID | PID |
| Finger Cleaning System | (Brush) | (Brush) | (Brush) |