

*Heat Panel Fabrication Manual*  
HAETLE PANEL ASSEMBLE MANUAL ver. 3.3

strictly forbidden to copy



NPO **ESCOT** Energy Saving Conference & Organic Technology

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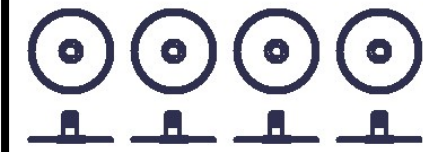
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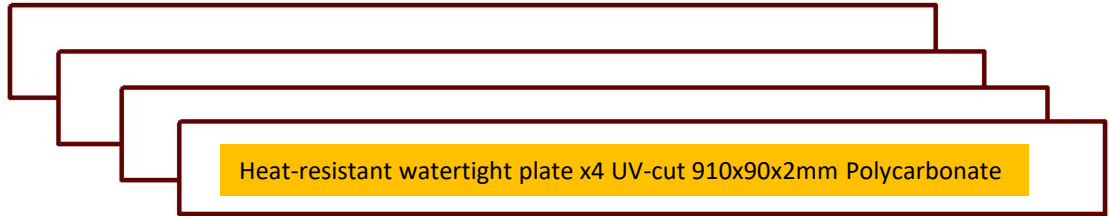
# Heatl Panel Kit Contents



The heatlle panel is made up of four different parts.



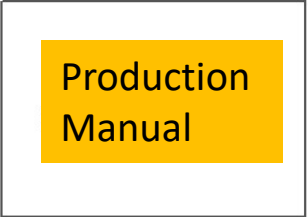
Heat-resistant nozzle x4  
1/2 size (13) parallel thread  
Carbonate



Heat-resistant watertight plate x4 UV-cut 910x90x2mm Polycarbonate



Watertight cap: 1/2 size (13) Stainless steel



Hollow polycarbonate side for repair x 1

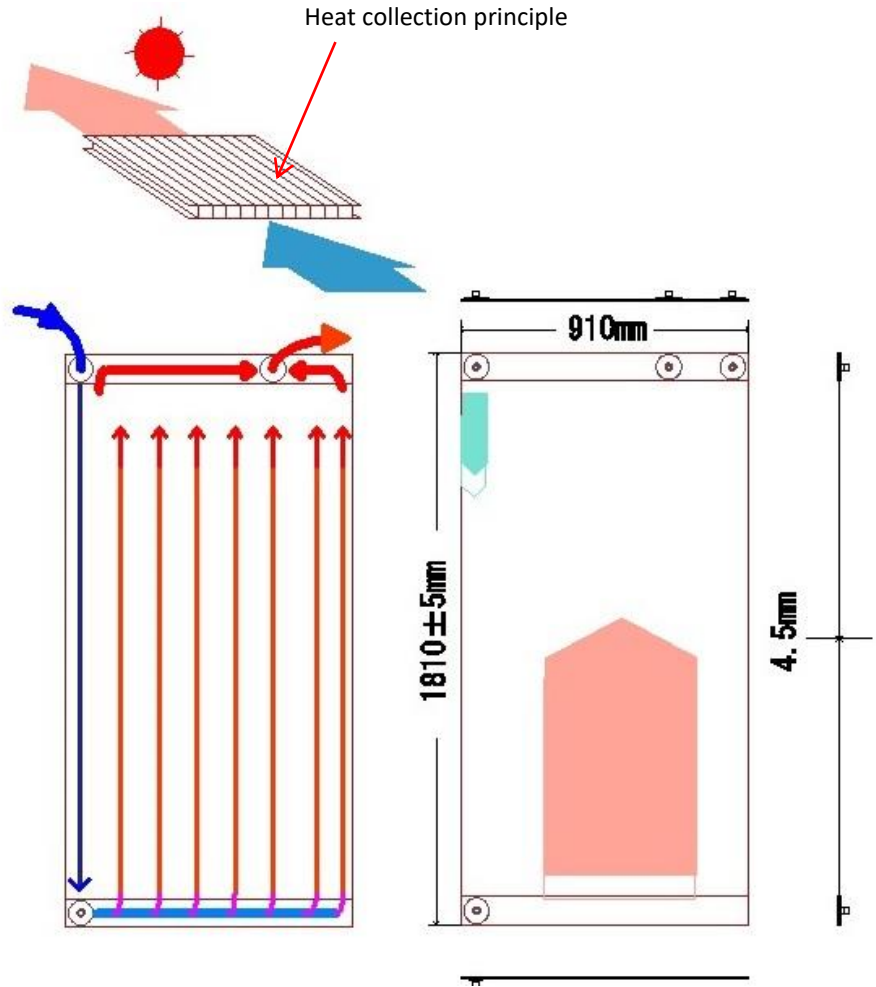
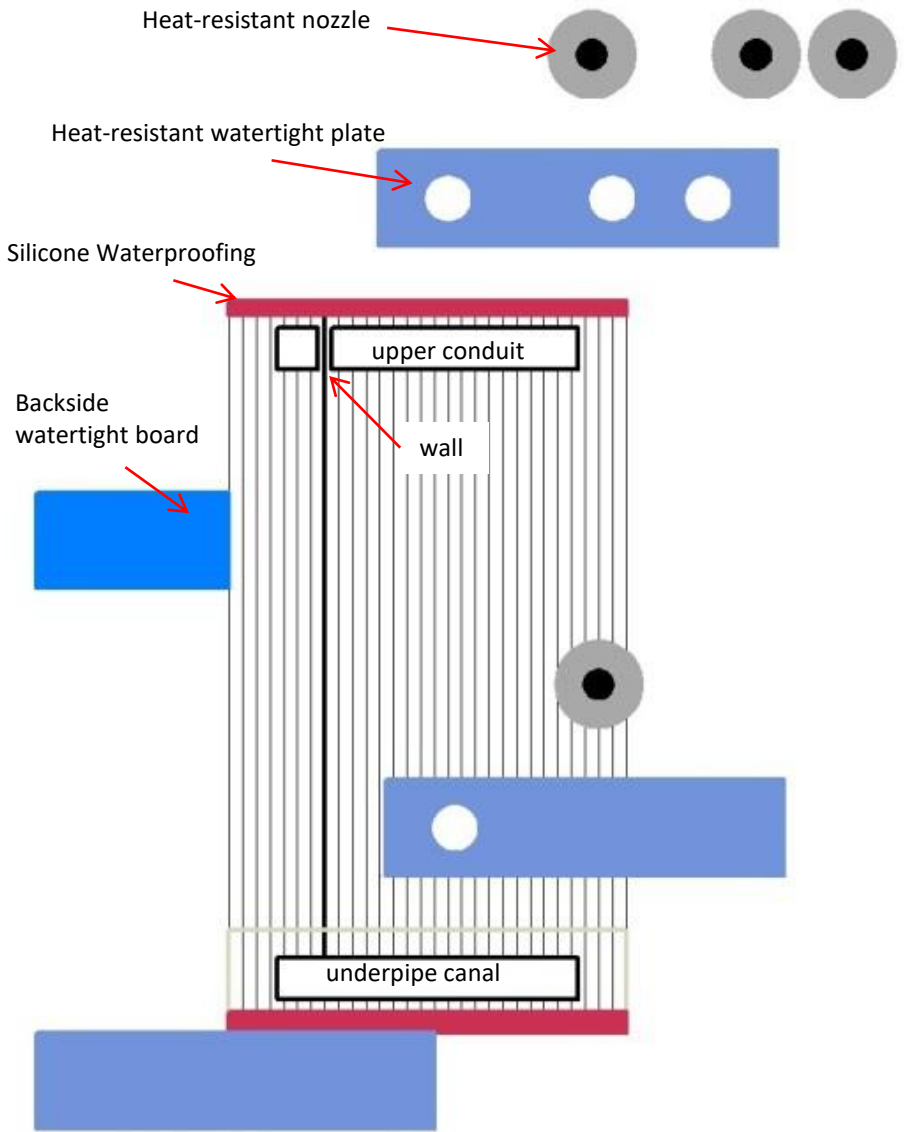


Nipple with nut x2  
Hose band x 2

- \*The heat-resistant nozzle is designed to hold an appropriate amount (0.5 mm thick) of silicone.
- \*A guide (convex part) is provided for easy finding of  $\phi 25\text{mm}$  holes when gluing.
- \*Alcohol type silicone for adhesion must be used.

# Heat Panel Structure, Heat Collection Principle, and External Dimensions

Two types and eight parts are simply laminated to hollow polycarbonate with the channel cut.



## Heatl Panel Fabrication Procedures

- (1) Place the hollow polycarbonate on a flat work surface such as plywood. **\*Don't forget to remove the film on both sides!**
- (2) Fill the panel cut surface (hamonica structure) with silicone material to waterproof it.
- (3) After the silicone has dried, cut the channel section from the panel.
- (4) Stretch the heat-resistant watertight board on the "surface" of the panel. **\*Do not forget to remove the film from both sides of the panel!**
- (5) After the silicone has dried, invert the panel and open the four nozzle openings.
- (7) After the silicone has dried, invert the panel again and put up the heat-resistant watertight board on the back side.
- (8) After the silicone has dried, install the four heat-resistant nozzles on the surface.
- (9) Wait 4 to 7 days (depending on the season) for complete drying. Wait 4 to 7 days (depending on the season) for complete drying.
- (10) Before use, discard water to flush out internal debris, etc.

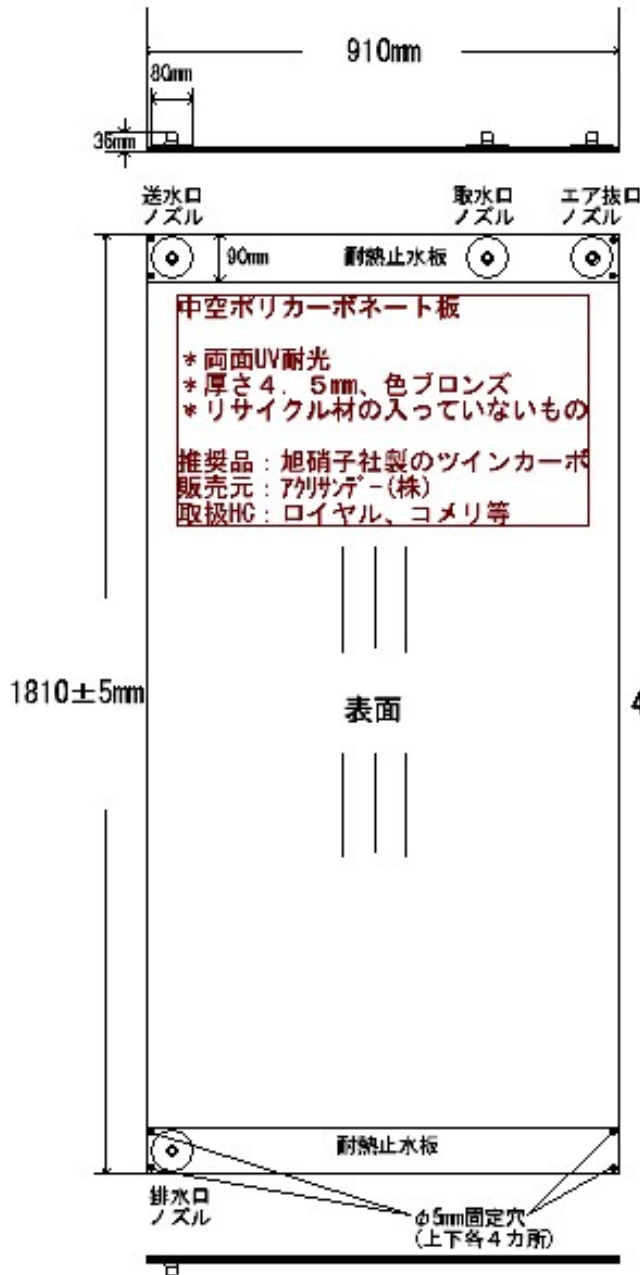
**\*The degree of drying of silicone depends on the temperature, location of use, and other factors.**

**(Approximate time required is 1 to 2 days in summer and 4 to 7 days in winter.)**

**\*When applying heat-resistant watertight plates and nozzles, remove any oil with alcohol or the like.**

# 「構造、寸法、キット部品、工具、資材等について」

ご用意頂く工具、資材等  
 電動ドリル、ホルソー直径25mm、ドリル5mm、カッターガイド・カッターナイフ  
 アイスピック、バリ取り、シリコン充填用ガン、固定用クランプ  
 油膜取り用アルコール等



## キット内容

- ①耐熱ノズル  
 配管の取り付け  
 1/2インチ(13)、オス型平行ネジ  
 底面部φ80mm  
 ポリカーボネート
- ②耐熱止水板(両面UVカット)  
 流水経路を裏裏両面から止水  
 UVカット、ポリカーボネート製  
 905 x 90 x 2mm
- ③止水キャップ
- ④ナット付ニップル  
 ホースバンド x 2セット
- ⑤マニュアル

**Important!**

Hollow polycarbonate and adhesive silicone products listed on page 6. Please use it.

This may cause leakage, peeling, or damage after completion.



# Parts, components, tools, jigs, working environment

## work environment

**Workbench:** Composite board  
**Line drawing over 1 m:** El-type angle, etc.  
**vacuum cleaner**

## Tools & Jigs

**Required tools** → indicated in red  
**Recommended tools and jigs** → indicated in black

## Required Parts and Components

- (1) Hollow polycarbonate board: 1820x910x4.5mm UV cut  
 Product name: Twin Carbo, Color: Bronze, Distributed by: Acrisunday Co.
- (2) Heat-resistant nozzle: ESCOT Original
- (3) Heat-resistant watertight plate: 905 x 2.0 mm UV-cut
- (4) Watertight cap



**Alcohol Mold Silicone**  
 \*Recommended: Cemedine 8051N  
 \*Note: Inexpensive oxime types are not acceptable.  
 (Rubber-like properties weakly peel off.)  
**Application:** Hollow polycarbonate section sealed waterproofing  
 Adhesion of heat-resistant watertight plate  
 Heat-resistant nozzle bonding

**electric drill**  
 Applications: Water supply inlet, water intake  
 Air vent and drain openings  
 Drilling holes for installation upon completion

**Holesaw 25mm dia.**  
 Applications: Openings for water supply, water intake, air vent, drainage, etc.  
 \*Note: Fine type  
 \*Recommended: 454 BOSCH 25mm

**ice pick**  
 Application: Positioning of hole saws

**Centering jig**  
 Purpose: Centering of 25 mm hole.  
 \*Inoac hose caps are converted

**Fuel alcohol**  
 Application: Cleaning dirt and oil film on adhesive surfaces  
 \*Recommended: Takasugi Pharmaceutical Co. 30% ethanol Methanol 70  
 \*Precaution: Use in a fire-free environment.

**clamp**  
 Resin holding part is recommended.

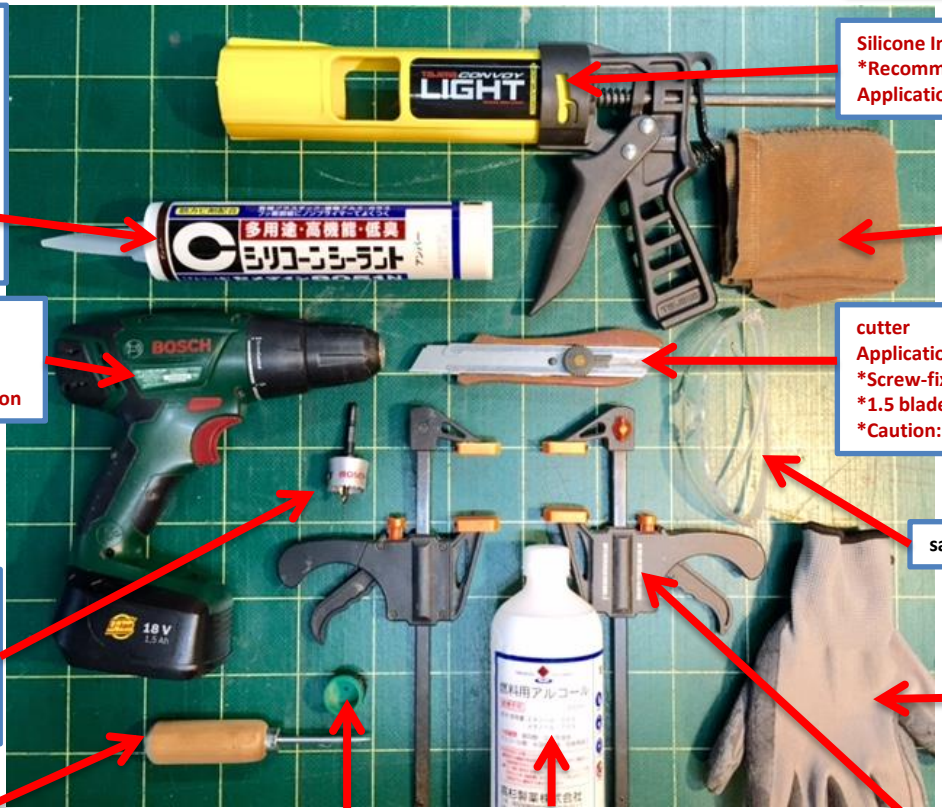
**Silicone Injection Guns**  
 \*Recommended pressure reducing type: TAJIMA CONVOY LIGHT  
 Applications: Silicone extrusion

**waste (cloth)**  
 Application: Removal of dirt, oil film, etc.

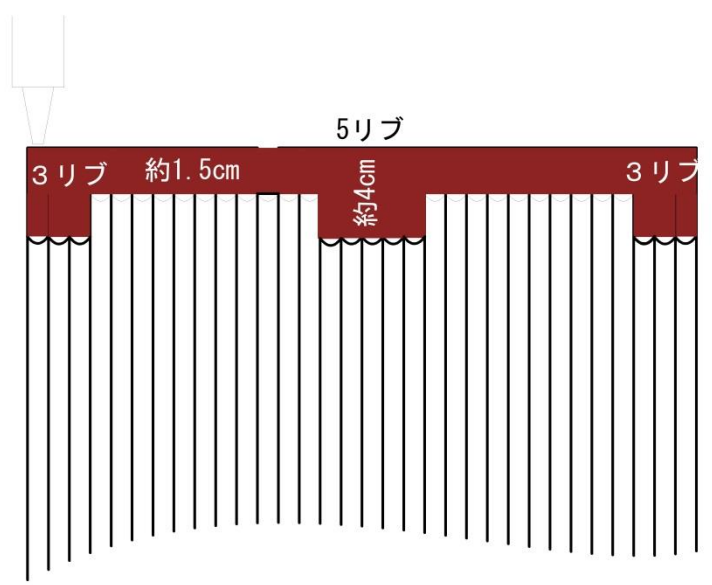
**cutter**  
 Applications: Waterway, edge cutting, etc.  
 \*Screw-fixed type  
 \*1.5 blade tips out for use.  
 \*Caution: Dangerous as it may break if taken out too far.

**safety goggles**

**safety gloves**



# Waterproofing and reinforcing of cut surfaces



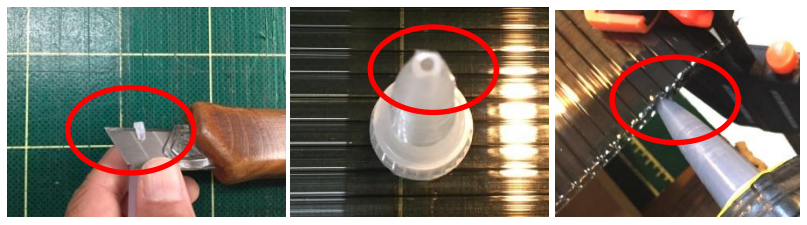
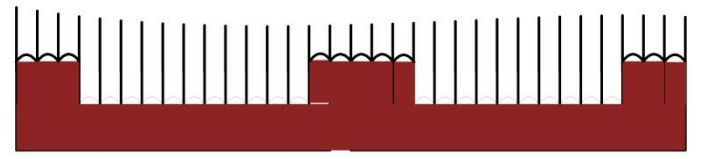
Inject about 1.5 cm of silicone into the ribs (elongated space) on the upper and lower cut surfaces.

Place silicone up to about 4 cm in the center 5 ribs and 3 ribs on the left and right sides.  
This area is for waterproofing and reinforcement, with the possibility of driving in screw nails, etc. for fixation.

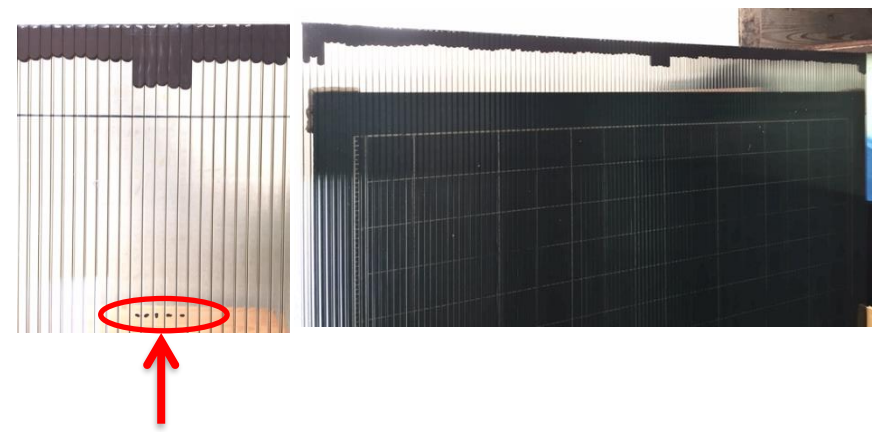
Tools: silicone injector, plastic clamps, tip-machined nozzles

Explanation of terminology: A rib is an elongated space surrounded by a polycarbonate plane on the top, bottom, left, and right sides.

Note: Allow to dry for a while after injection. The time required for drying depends on the temperature.  
*\*Usually, allow to dry for half a day to a full day.*

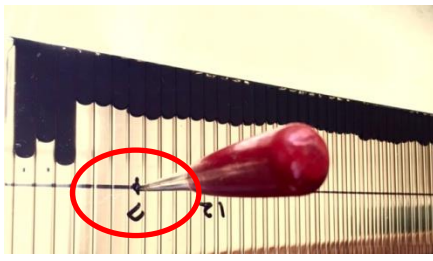
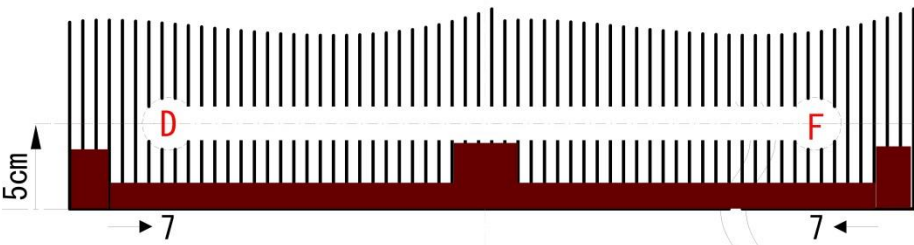
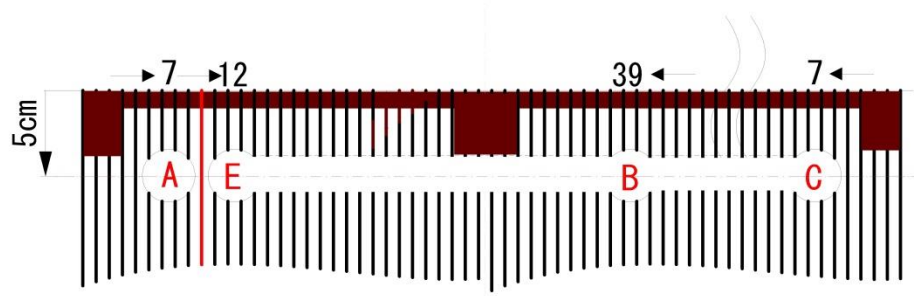


Silicone nozzle tip processed for easy entry



Pre-mark the 5 ribs in the center.

## 2. cutting out the water flow path



### Crepaths.

(1) Mark the bottom position with an ice pick or similar tool (A-F).

- A Pump: 5cm from the top cross section, "7" rib from the left
- B Water intake: 5 cm from the top cross section, 39" rib from the right.
- C Air vent: 5 cm from top cross section, "7" rib from right
- D Drain: 5cm from bottom section, "7" ribs from left

*\*E,F are auxiliary holes to facilitate cutting with a cutter.*

- E. Machining aid hole: 5 cm from the top cross section, "12" rib from the left.
- F Machining aid hole: 5cm from lower section, "7" rib from the right

(2) Use a 25 mm dia. hole saw to open 6 anas on the hollow polycarbonate.

(iii) Cut a water passage path approximately 2 cm wide with a cutter.

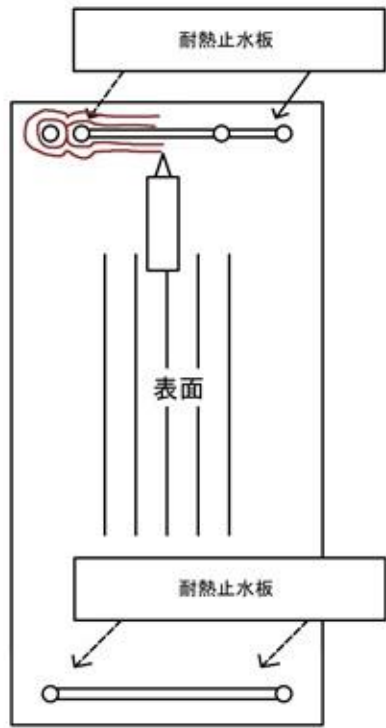
Create an upper water passage path approximately 2 cm wide between E and C.  
 Create a water supply inlet, intake, drain, air vent, and lateral water passage  
 Create a lower water passage path approximately 2 cm wide between D-F.

- Tool: Cutter (screw-fastening type)
- Cutter guide (Aluminum unequal angle, etc.)
- Clamp = Guide fixation
- Ice pick (or a stapler)
- 25mm dia. hole saw

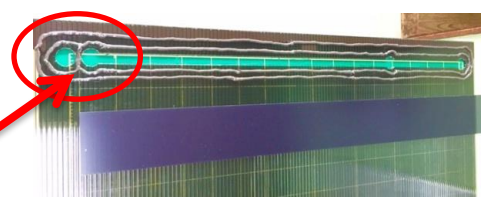
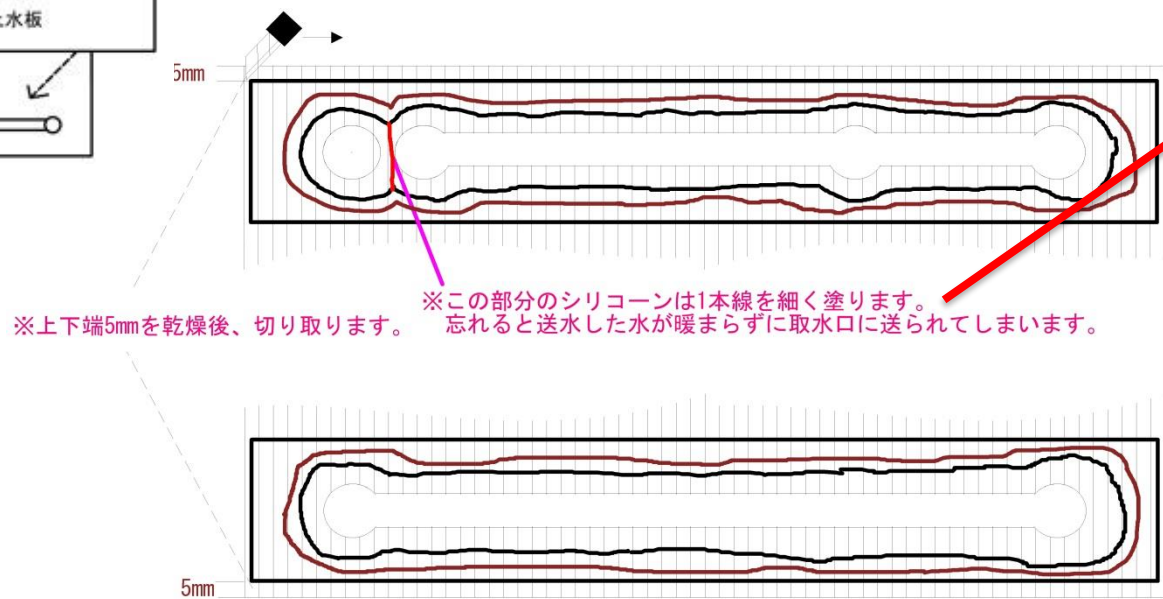
The cutter is lightly flushed at first, then moves to the cutting motion.  
**CAUTION: Protect hands with gloves, etc.**



### 3. installation of heat-resistant watertight plate on the surface



- Stretch heat-resistant watertight panels in the upper and lower two places on the surface.
- (1) Remove shavings by suction, and wipe off oil, dirt, and moisture on the laminated surfaces with alcohol, etc.  
**\*Do not forget to remove the vinyl from the surface of the heat-resistant watertight board.**
  - (2) Apply silicone in a linear pattern about 5 mm away from the edge of each hole and water passage path.  
 Furthermore, silicone is applied to the outside of it.
  - (3) Place the heat-resistant watertight plate on the inside of 5 mm from the top and bottom cut edges of the hollow polycarbonate.
  - (4) Press your finger on top of the heat-resistant watertight plate to lightly spread the silicone.  
 After spreading to a certain extent, fix the heat-resistant watertight plate at two points on either side with clamps or the like to prevent it from shifting, and then push it further apart.
  - (5) After the laminating process is completed, let dry for about half a day to one day.
  - (6) After drying, cut off the top and bottom edges leaving 5mm with a cutter. **This work is optional, as it makes the top and bottom edges look clean.**

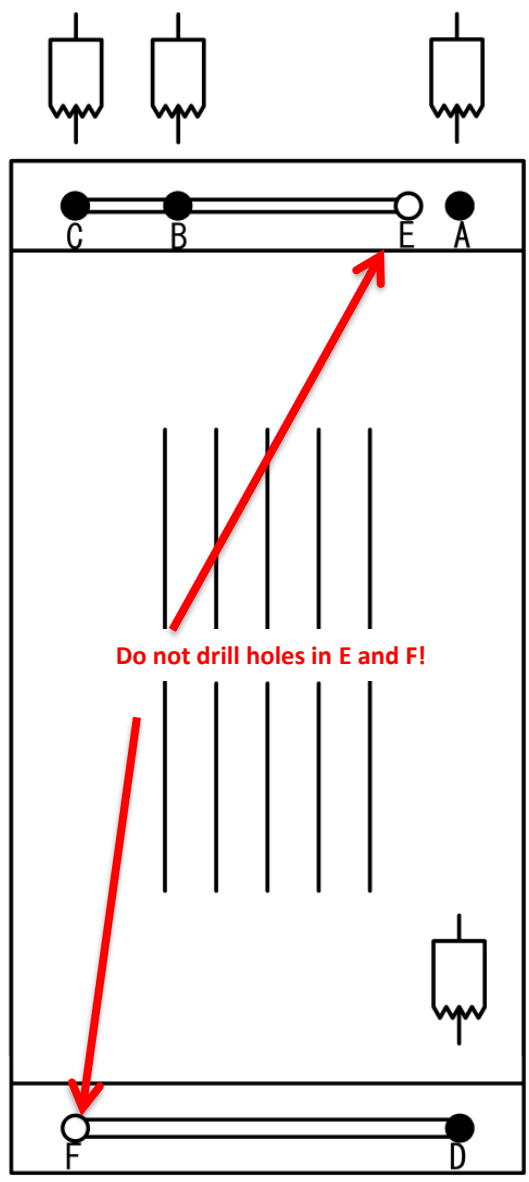


\*Silicone is just at the waterway line. The trick is to extend it to

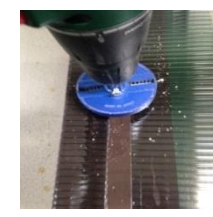
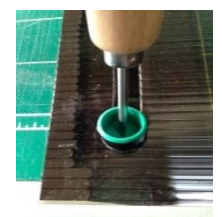
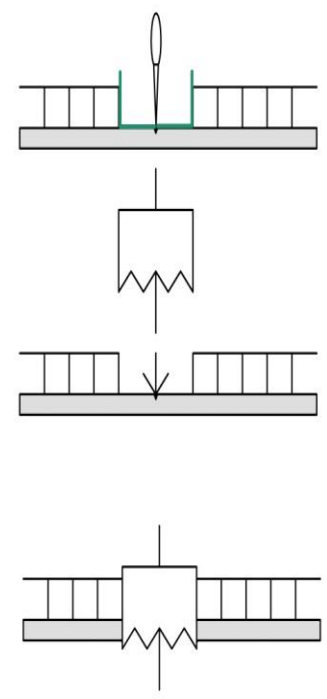


Remove the oil film with alcohol, etc., and then remove the oil film from both sides. Press the corner with a clamp or other fixed object. The tension can be stretched well without any slippage.

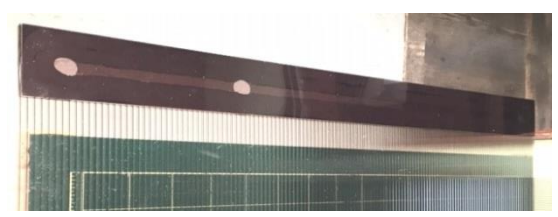
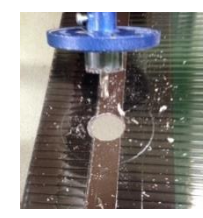
# 4. drilling nozzle holes for the "front" heat-resistant watertight plate, and installing the "back" heat-resistant watertight plate



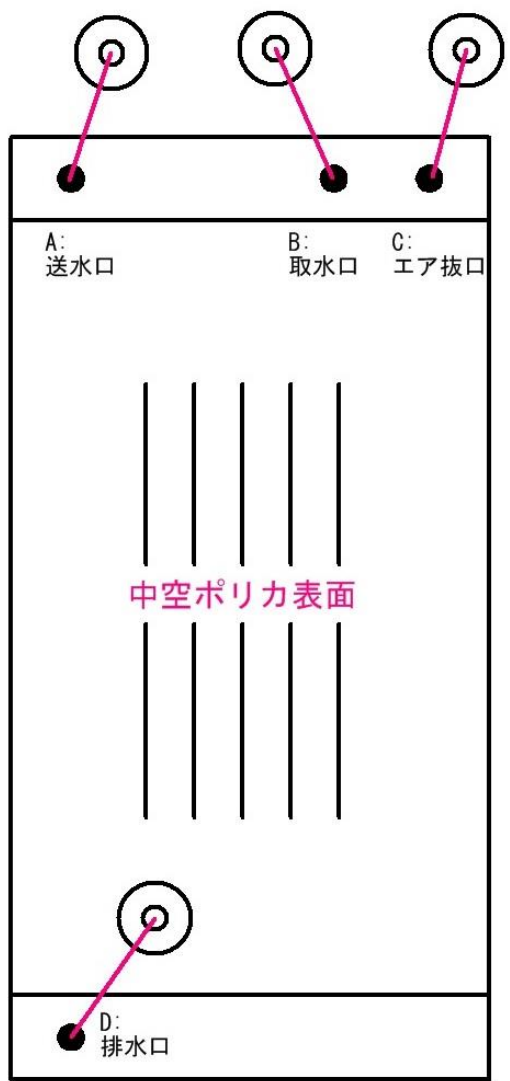
- Turn the** heat-resistant watertight plate **over and** drill holes for nozzles at A, B, C, and D.
- (1) Turn over the hollow polycarbonate. The position of the holes on the hollow polycarbonate is opposite to the left and right.
  - (2) Mark the center of circles A, B, C, and D on the heat-resistant watertight plate with an ice pick or similar tool to prevent the tip of the drill from shifting.  
**The heat-resistant watertight plate does not open an anatomical hole in E and F.**  
**To determine the center axis of the hole saw, it is recommended to prepare a piece of cardboard or similar material with a diameter of  $\phi 25$  mm and a hole drilled in the center.**
  - (3) Drill four holes for nozzles with a 25 mm dia. hole saw and remove burrs from the surrounding area.
  - (4) Vacuum shavings and thoroughly remove oil, dirt, and moisture with alcohol, etc.  
  
Stretch the heat-resistant watertight board on the back side.
  - (5) Stretch the heat-resistant watertight board on the back side of the hollow polycarbonate in the same manner as for the surface.



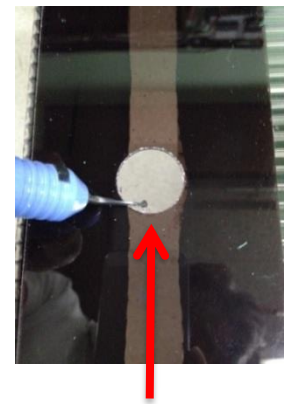
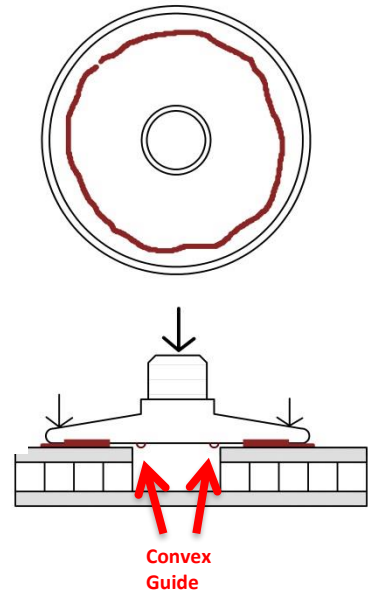
Remove shavings with a vacuum cleaner, etc.



# 5. nozzle installation



- Attach the four nozzles to the heat-resistant watertight plate on the surface.
- (1) Turn the hollow polycarbonate over again, surface side up.
  - (2) Remove oil, dirt, and moisture from the laminated surfaces of the nozzle and heat-resistant watertight plate with alcohol, etc.
  - (3) Apply silicone to the back of the nozzle.
  - (4) Move the nozzle to fit the convex guide on the nozzle to the anna on the heat-resistant water stop plate.
  - (5) Once the position is determined, press the center of the nozzle directly down while pressing with the other finger. Press the outer edge of the nozzle.
  - (6) Adhesion is complete when the silicone slightly protrudes from the outer edge of the nozzle.
  - (vii) Allow to dry for 1 to 3 days.
  - (8) After drying, run water to rinse off internal debris before use.**
- Completion. Thank you for your hard work!



Remove large burrs.



Attach silicone.



Press until it protrudes a little.

# Precautions and recommendations for use

Do not open or close on the water intake side.

## (1) Precautions for pumping water

- \*Open and close the water supply side.
- If water is supplied with the intake side closed, the inside of the panel will be damaged.
- Pressure buildup may result in damage.

## (2) Precautions for installation

- When drilling holes in the light-receiving panel, limit them to 3 ribs from the edge.
- The holes on the heat-resistant watertight panel should be about 5 mm in diameter,
- Fix with stainless steel screws of  $\phi 4\text{mm}$ .

## (3) Recommendations for improving heat collection efficiency

- Use 4mm-thick black plastand in order to reduce heat dissipation to the backside.
- \*A food coloring agent is added to the circulating water to improve the absorption rate of sunlight.
- Blue food coloring can be purchased at supermarkets for about 200 yen.
- \*4 mm thick hollow polycarbonate (product name: HAMONICARBO) is stretched on the light-receiving side and double-layered.

## (4) Recommendations for freezing

- \*Dispose of the water inside the panel and do not use it during the freezing period.
- \* 1 or 2 liters of glycerin (safe) is added.
- \*Use antifreeze, etc. (Safety?) \*Collect heat inside greenhouses, etc.
- \*Collect heat inside a house, etc.
- \*Use an anti-freeze heater.

## Recommended hose

Super Water Hose SW-12  
(Available for purchase on the Internet)

## ⑤ Recommended pump

Heat-resistant, solar cell-driven pump manufactured by US SOLAR PUMP Co.  
Important! Withstands high temperatures and can be used for long periods of time with only a small amount of solar cell power.

No compatible products were found for domestic or Chinese products.

