

THE SOLAR DEHYDRATOR

Manyal



Solar Brother's mission is to design, produce and distribute solar energy products, in order to make the knowledge and use of this energy available to as many people as possible. To achieve this goal, we design solar innovations and make open source self-build plans available to everyone on Solarbrother.com.





When the harvest is here, the sun is there!

In June 2021, motivated by this evidence and a growing demand from our users, we embarked on the design of a solar dryer. Efficient, usable everywhere and accessible to all with the aim of brightening up the planet!

After 9 months of development, 7 prototypes and lots of sunshine, here is Omy! We thank our friends and partners Bernhard Müller, German solar designer and Ferdinand, director of Fredjoy in Congo for their contribution and their solar commitment.

We thank you for your confidence and we wish you beautiful solar drying!

Corinne, Gatien and Gilles

#Summary

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Use of solar dehydrator

5 Construction Assembly steps

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Indicative table drying steps



of / the benefits of solar dehydration Handle Start St

ï I am using available energy
ï I'm saving, free energy for life!
I eat fruits & vegetables all year round
ï I keep aromatic & medicinal plants
I vary the tastes in winter
I stock up on vitamins and minerals
I store easily and durably
ï I value my production surpluses
I consume ecologically
ï I make my light outdoor snacks
I'm taking advantage of the sun !

finished them! of production

02 / the principle of solar dehydration **H2Shares**

Drying food & plants to keep the best of them is an old, effective and healthy method!

ï Principle

The drying process is successful as much by raising the temperature (between 35 and 55°C) as by the action of ventilation, it is this double action which allows the evaporation of water and optimal dehydration of your food.

ï Temperature rise (1)

The sun's rays reflected by the mirror or which penetrate directly through the window are captured by the black plate and converted into heat. The glass keeps the sun's rays trapped in the box. The hot air rises naturally in the drying tunnel

passing through all the racks to exit through the openings in the roof. The inclination of the mirror makes it possible to adjust the rise in temperature according to the needs

ï Airflow (2)

When the temperature rises, a fan (powered by a photovoltaic panel) reinforces the natural air flow and evacuates the humidity from the food. It thus makes it possible to promote the extraction of hot air on hot summer days, to maintain drying temperatures and to adjust the drying temperature according to the food.





(2) airflow

ES



From principle to practice!

When drying, a whole set of parameters must be taken into account: the weather for the day or days to come, the drying time needed to dehydrate the food, the thickness of the cut, the number of trays used, the texture desired (...). The result depends on these multiple criteria. This is why mastering solar drying requires practice and multiple experiments in order to understand and learn through repetition, in a factual and intuitive way, how to successfully dehydrate your food or plants. At stake, the sun, autonomy, the pleasure of making and tasting your creations!

Installation of several racks on the OMY solar dehydrator.



03 / Building manual

#GO

Assembly steps

The innovation of the OMY Solar Dehydrator is based on a 4-point design:

1 ï A system of modular racks for simple and intuitive use, with rack or wire drying depending on the food. 2 ï Use at any

latitude, in any season, with a reflector designed for optimum capture of the sun's rays. 3 • An adjustable

airflow day and night, for optimal and continuous drying. 4 ï Compact and

stable design, easy to move and store.

Assembly

To assist you in assembling the OMY dehydrator, we have divided the assembly into 5 steps. We advise you for more ease to assemble the elements with two people for steps 1 and 2.

The tools

To assemble the wooden elements, you will need a Phillips screwdriver. We recommend using an electric screwdriver for faster assembly.

Estimated time

1 hour for experienced handymen. 2 to 3 hours for motivated beginners! Take the time to properly align the woods and ride OMY at your own pace.



OMY is made in France and comes from self-managed forests. Eco-designed, it is durable

and easy to maintain.

#rooms



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List of pieces **Sensor**



Related Items



List of pieces Reflector



Racks

[K]' X6 Rack frame width	[1] X6 Rack frame length	Skewers 25 cm x25
v v	5	
Food grade stainless X3 steel grid 395*249 mm. 10x10 mm mesh	Protective grid X1 395*249 mm. 3x3 mm mesh	

List of pieces

bof



Screw /



#5 steps

- **1 . Sensor** P. 14 / 15
- 2. Reflector
- 3 . Racks
- 4 ï Roof P.18
- 5 ï Assembly P. 19 / 20





1 / Positioning of the fan and the USB connector

On the board [B] screw your fan at the level of the hole on the inside face of the box, after having placed the mosquito net between the wood and the fan. Position the fan so that its label is on the inside of the casing. Then screw your USB port, located above, on the outside face in the rectangular hole.

2 / Positioning of the plexiglass plate [F]

Take the sensor side [C] and the plexiglass plate [F]. Lay [C] on the ground and slide [F] into the vertical groove after removing the protective film. Pay attention to the direction of the plate, it must fit perfectly into the groove. The shorter side (40.2 cm) is the one that fits into the groove.

3 / Positioning of the ground [A], of the rear [B] then of the second side [D] of the sensor »

Add the floor [A] then the back [B] by sliding the plexiglass [F] well into the groove. Finally, position the second side of the sensor [D] so that it fits perfectly with the rest. Warning: Check the alignment of the parts with each other before fixing them. The grooves and the edge of the pieces must be continuous for a perfect result.



4 / Screwing the sensor

Once the sensor is correctly assembled, screw it. Turn the sensor over each time so as to always screw on the part that is at the top. This will provide better support. Do not forget to tighten the 2 screws on the back of the sensor [B].

5 / Installation of the rod [E]

a / Then fix the rod [E] just above the plexiglass window [F] in the notches provided for this purpose. Make sure the bump on [E] is up. b / Screw. Warning: you will not be able to remove the plexiglass window once this board is fixed. Check that it is correctly positioned: the front face of the board must be well aligned with the window and the sides of the sensor.



Fix the handles [P1] and [P2] on the sides of the sensor. Screw y1 to y6 using spacers e1 to e6 to ensure spacing with sensor and handles. First place the three screws in the handle and then the spacers before installing the handle. Finally, place the thermometer on the side of the sensor [D] (hole 4 above the handle).



3 2 Reflector

[2 people recommended]

1 / Attach the skis to the sensor

Attach one of the skis [G] using a vX screw and a tightening handle to screw it to the sensor (screw from inside the box). Do the same with the second ski. The tightening handles will make it possible to modify and block the inclination of the solar reflector.



1/

b)

2 / Panel positioning [H] on sensor and skis [G]

a) Position the sensor on your back and align the skis [G] on the edges of the

sensor. b) Take the panel [H] and place it on the skis so that the panel is aligned with the top of the sensor, then screw.

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[2 people recommended]

3-step assembly

1/ Assemble 2 edges [K] and [L] together by fitting them correctly using the "p" shaped notches. Then screw. Caution: Make sure you are well in stop so that the racks have the right spacing.

2/ Then place the other edge [K] to your set [K] + [L] and screw.

3/ Finish your rack by placing [L] and screwing.





Too much gap



GOOD fit!





3 4 Roof 🧼

by placing the side [N] and screw.

1 / Frame assembly

a) Start by assembling one side [M] with the roof board [O]. Do not hesitate to force to bend the board a little and allow it to enter the groove. b) Take the second side [M2] and do the same so

that the board [O] enters the groove. c) Then place an edge [N] and screw it to the other two sides. Check that the board [O] is in the groove of [N1]. d) Finish the roof

Warning: check that the board [O] is in the groove of [N].

2 / Pulleys

Take the pulleys [R] and screw them to the roof with the screws vZ until they no longer turn.

3 / The mosquito net

Position the parts [S] at the level of the roof vents. Do not forget to put the pieces of mosquito net between the rooms [S] and the vents to prevent insects from entering. Use VW screws.







5 Assembly

1 / Installation of the solar absorber

Remove the protective film from the solar absorber [U] and slide the absorber into the groove inside the collector. Caution: Position the side that had the protective film towards the front of the sensor so that it receives the sun's ravs.

2 / Protective grid

Place the protective grid (with a 3 mm mesh) on the sensor. A ledge to accommodate it is provided for this purpose.

3 / Mounting the racks

1) Place a grill or skewers (3 to 5) on the racks. For the use of skewers, we recommend that you notch the inside of your racks on the edge which

accommodates the stainless steel grill in order to form a "V" to stabilize them on the rack. Then place your racks on the sensor.

4 / Closure of OMY

a) Attach a rope to the handle by making a knot at the bottom spacer. Do the same on the second handle.

b) Place the roof on the racks and check that everything is well aligned for good insulation from heat and light (UV rays from direct sunlight degrade the nutritional

qualities of food). c) Wrap a rope around the handles [P] passing it through the roof pulley [R] and back to the handle [P]. Carry out the same closing operation on the other side.



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6 / Finishes

We chose a wood lined with Oukoumé poplar for its durability. However, before use, it is necessary to varnish OMY in order to protect the wood to prolong its appearance and its resistance to humidity. For this, you can varnish it with natural oils We recommend linseed oil for the exterior and sunflower oil for the interior (food contact). Apply with a brush and let dry 24 hours before use.

Congratulations !,

You have completed your OMY solar dryer. All you have to do is harvest, dry and ... enjoy!







03 / Using the dehydrator

The OMY dehydrator is designed for easy, intuitive handling and optimal drying.

1 / Position the food on the racks Arrange the

#Omy

food on a grid or on a spit depending on the type of food. ï The grid: place

the food on food-safe stainless steel racks (10 mm mesh). Space foods in a single layer and spread across the entire rack. During drying, you can move the food or stir the plants regularly for even drying. i The skewers: place the food in the skewer, then place the skewers on the wooden rack.

. Be careful to remain horizontal when moving the racks. ï Small

or juicy foods: Place baking paper on the protective grid to limit food deposits (leave a margin of 1 to 2 cm around to allow the flow of air).

2 / Place the racks on the sensor

Arrange the racks one on top of the other, well all We advise you to place foods that take longer to dry on the lower part. Alternate the racks during drying so that it is even. Add new racks and remove dehydrated foods during drying for continuous use.

3 / Close the dehydrator After

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having aligned the racks with the roof for good insulation, close OMY with the ropes.



Arrangement of garlic & onions on the same rack.

4 / Direct the dryer to the sun Its

shadow must be aligned behind. Position the dryer to the South-South/East in the morning and to the South-South/West in the afternoon. It is necessary to reorient it every hour to remain optimal in winter. By taking a little lead on the

Arrange the racks one on top of the other, well aligned course of the sun, you can position it for a period We advise you to place foods that take longer to dry on the lower part. Alternate the racks during dry on the lower part. Alternate the racks during

5 / Adjust the reflector

Direct the rays towards the heat absorber using the tightening knobs. They must not illuminate the racks above the sensor, that would mean that the reflector is too low. In this case, refit the reflector.

6 / Optimize the temperature

Dry food at low temperature (from 35°C to 55°C) in order to preserve the nutritional quality of food. The thermometer allows you to monitor the drying temperature. Located at the top of the sensor, it will accurately indicate the temperature close to the 1st rack. You can adjust the temperature using the fan and the reflector according to your needs. ï If the temperature is higher than the desired temperature, you can activate the fan which will allow you, depending on its position, Slow, Medium, High, to adjust

the temperature by approximately 10 degrees. $\ddot{\text{i}}$ If the temperatures are still too high, we recommend

maintain the continuity of the dehydration process. You can plug the fan into an electrical outlet or an external battery (with a male/male USB).

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Maintenance Store OMY in a dry place. Do not dryer will leave it, the wood will swell and the lose its tightness in the rain. Regularly remove the black absorber to clean any food that may have fallen into the box. To do this, use a slightly damp cloth. Clean the grills before and after each use.

that you cover all or part of the mirror with a fabric in ordesto-limit the incoming solar flux.

7 / Drying at night

If you dry food over 2/3 days, put your dryer in a room where it won't get wet.

Leave it closed well to prevent the entry of insects. Turn the fan on L/M to prevent your food from rehydrating overnight and thus Only use the solar dryer for drying plants, fruits and vegetables. • The temperature in the dryer can reach high temperatures (>50°C): handle the stainless steel racks with heat-resistant gloves. Do not let children use the dryer without supervision. ï Clean well after use to avoid bacteria.

Arrangement of bananas on the food grade stainless steel grid.





03 / Dehydrate A few tips #tipS

You will find p.28/29 an indicative table on the dehydration of fruits, vegetables and plants to guide you in your first steps. We advise you to make your own table in order to note in time the fruit of your discoveries !

The weather

Check the weather forecast The drying

activity requires sun and time.

To finalize the drying process, allow the necessary time (see indicative table on the drying time of food).

ï Start early in the morning

The more you have a long day available the more you will have the possibility of finalizing the dehydration. Avoid long times between harvesting and drying operations. Do not dry in wet weather.

Adapt to your situation The drying

time depends on many criteria: the type of food, the amount of sunlight, the thickness of the food, the ambient air temperature, the number of racks used (...). Refer to the indicative table P.28.

Before drying

ï Choose the

material Avoid overripe fruits, they contain more to obtain thin and sugar which slows down dehydration and promotes the appearance of mould. Choose them in season, firm **anthealte**xture.



Use of a mandolin for a fine and regular cut.

- Prepare the material before drying
- Wash the food before drying, dry well.
- Remove pits, seeds and soft parts.
- Allow juicy foods to drain (tomatoes, peaches, etc.) for 5/10 minutes before placing them on the rack.
 Optional: in order to preserve their color or to prepare their skin for more efficient drying (peaches, grapes, etc.), certain foods can be blanched in water or steam (Caution, high temperature can destroy vitamins and nutrients), or marinated in lemon juice to avoid browning or oxidation (the taste may be affected).

Food thickness

The choice of thickness is made according to the food, vegetable to be dried and the desired result. We recommend cutting the fruit with a stainless steel knife to prevent it from browning.

Thin slices from 1 to 3 mm

We advise you to cut the food using a mandolin to obtain thin and regular slices. To make vegetable crisps, prefer a thickness of 1 mm for a anthbayltexture.



Drying of lemon zest for powder conservation for yoghurt, seasonings and pastry recipes.

• Thick slices of 3 to 5 mm The drying time will be longer, resulting in an often softer texture (see indicative table).

Small vegetables or

fruits Place the material cut in half. Place the flesh up or down depending on the food.

Plants

For certain herbs, slice them before drying in order to increase their evaporation surface (mint, parsley, etc.). For flowers, remove the leaves and We recommend that you place a net or baking paper on the rack before placing the vegetables on it.

Indempérentpres adéale

Maintain a temperature between 35°C to 55°C. The ideal temperature is 35°C to preserve the properties of plants and 45°C the nutrients of your fruits and vegetables. Ensure continuous ventilation to evacuate moisture from food.

Conserves dstraibablyent

To avoid any mold after drying: • Sufficiently dehydrate fruits, vegetables and plants according to their moisture content. To check that a food has dried well, you can place a few pieces in a plastic bag and check that there is no water vapor released after a day. ï Allow dried foods to cool before putting them in a jar or bag. ï Store food in

an airtight or vacuum-sealed container, away from light. When putting in a jar, you can slip in a small bag of rice which will finish absorbing the humidity.

After storage, it is possible to rehydrate certain foods by soaking them in hot water or steaming them gently.

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Email us !, family@solarbrother.com

Tell us about your successes and share your photos and tips with the Solar family so that we can all enjoy the Sun together!



Above, harvesting and drying lime trees.









Drying workshop: Tomatoes, carrots, radishes.



Enclositive tab

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06 / Indicative table of dehydration stages

Fruit 40°C/55°C	food preparation	Indication of drying time	State of matter
Apples	Seed . Cut into 5mm slices	++	tender to crunchy
Bananas	Peel . Cut into rounds or 3 mm slices	++	hard
Mangoes	Blackberries with firm flesh in 5/6 mm slices	+++	tender
Apricots	Pit in 5/6 mm slices	···· · · ·	tender
Strawberries	Wash . Cut in 2 into strips	++	tender
Kiwi fruit	Peel . Cut into 5mm slices	+++	soft
Figs	Cut in 2. Place the flesh side down	••••	hard, sticky
Citrus zest	Wash . Grate the skin	· ·	friable
Melon	Seed . Cut into 6 mm strips	+++	soft
Vegetables 40/50°C			
Carrots.turnips	Peel . Cut into 5mm slices	++	tender to crunchy
Onions	Firm & germ-free in 3/4 mm slices		crunchy to brittle
Tomatoes	Farms. drained in 5 mm slices	++++	soft
The second second second second second			and the second

Estimated time

+ 3 / 6 hrs ++ 6 / 12 hrs +++ 12/6 p.m. ++++ 6 p.m. and more

	food preparation	Indication of drying time	State of matter
Garlic	Peel . Cut into 2/3 mm pieces	++	brittle, reducible to powder
eggplant	Cut into thin 5mm strips	+++	soft
Peppers/chili peppers	Firm, remove the seeds in strips, 5 mm rounds	++	crisp
Potatoes	Farm . sliced or 4/5 mm sticks	+++	tender to crunchy
Green beans	Taper. stem	++	brittle
Herbs / flowers 35/45°C			
leaves	Rinse the leaves Dry with a towel	the the second	friable
flowers	Whole, leaves and stems cut	• • • • • •	friable
Mint.parsley	Remove the rods Whole		friable
Basil . chive	Remove the rods Whole	++	friable
Others 35/50°C			
Mushrooms	Brush. Cut into strips	N. 19	tough
fruit leathers	Bake . Spread out into a 5 mm puree on baking paper	+++	rubbery





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