

LAZOLA

Initiative zur Verbreitung solaren Kochens e.V.

Lazola Solarkocher, Glesekerstr. 13, 33098 Paderborn

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The new Box-Cooker LAZOLA 3 of galvanized sheet metal for manual production

The Lazola-Initiative developed another box-cooker, the LAZOLA 3, that can almost entirely be manufactured by hand. It is as good as the LAZOLA 2 which is an industrially manufactured box-cooker of light metal and unfortunately too expensive for underdeveloped countries.

The new LAZOLA 3 has been designed for local mass production by hand, particularly in underdeveloped countries. The material costs will only amount to about 65 Euro, VAT included.

*All instructions in writing and technical drawings available are **not** suited for making small numbers of cookers only, for the preliminary work involved would then be disproportionately high.*

We felt urged to develop this new cooker due to inquiries by people who had made good experience with the LAZOLA 2 and who wanted to know whether this cooker could not also be produced by hand. Thus we worked hard to find a solution. Now we hope that with the LAZOLA 3 we have found a satisfactory answer. As far as shape, function and efficiency are concerned the new LAZOLA 3 resembles the LAZOLA 2 very much.

Main features of the LAZOLA 3:

- All parts of the cooker have been redesigned in such a way that they can be cut by hand by means of a hand lever guillotine and bent by a bending brake.¹⁾ The use of these tools can easily be learned and requires no special skill.
- The cooker is no longer of aluminium but of 0.5 and 1.0 mm galvanized sheet iron which is less expensive and should be available in most countries.
- The cooker has – like the LAZOLA 2 – a black “hot plate” on which pots and baking tins are placed and which conducts heat more efficiently than box cookers normally do. This makes cooking faster and even shiny pots may be used.²⁾
- Like with the LAZOLA 2 various parts are of wood: The two wooden frames³⁾ as with the LAZOLA 2 and, in addition the reflector-cover, the two supports and the handles.⁴⁾ All these parts can be cut to measurement by a circular saw.⁵⁾ If this is not available in the beginning, Lazola will find a way to help.

- For the Reflector-cover highly reflecting polyester foil is used. The slightly radiating reflection allows the use of ordinary 4 mm window glass to be used covering the box without fear of cracking.
- For insulating the cooker bin locally grown renewable materials like hay and straw are used. Various simple jigs allow the compact filling-in of the material so that no heat can escape. Hay and straw are as good as rockwool.⁶⁾
- By merely changing some measurements the size and the output of the cooker can be increased:
 - If the cooker is made broader by 370 mm⁷⁾ the cooker's capacity can be doubled. This cooker allows for the provision of food for approx. 10 – 15 people thrice a day.⁸⁾ Only the measurements regarding the width are affected.
 - The box may be deepened so that a 12 litre pot, like the one used for parabolic cookers, can be put into the LAZOLA.⁹⁾ Only the measurements regarding the depth of the two bins have to be changed.
- Two or more reflectors may be attached temporarily on both sides, if occasionally needed. With them the efficiency can be improved by another approx. 20 %. If not needed they can easily be removed and stored without needing much space.

The manufacturing concept for the LAZOLA 3

- > The rather complex production process has been broken up into small units so that can easily be understood. All small steps have been documented by pictures and are available in a film. All pictures and short scenes are subtitled by short explanations. Thus they can easily be followed even by unskilled workers.
- > All steps of production are connected logically and aim at mass production.
- > For all stages of the production process various simple jigs of wood have been designed to facilitate work considerably and allow precise results.
- > Thanks to the clear structuring of the production process the whole project is ideal for training in vocational schools for metal and wood work. The instructions available supply a lot of plain and thorough skill which may easily be transferred to other tasks.

Instruction-materials and jigs available

- 1. Manufacturing instructions on a 105 min. DVD / Video** showing the whole production process with subtitled explanations.
- 2. Supplement comprising all texts of the film.** Thus explanations can be looked up any time.
- 3. A Workbook comprising background-information** concerning the whole LAZOLA 3 project. It conveys basics of all aspects of the manufacturing process. All constructive details have been explained. These informations should by all means be read before watching the film.

4. Full-scale templates. They will be used for making cutting fences for all parts of the two bins, for marking-off und drilling templates of metal. Thus all parts can be cut and drilled easily to precision.

5. All kinds of simple jigs of wood for the different facets of the production process. They can easily be made by a joiner according to accurate drawings which are available. The jigs can also be supplied by Lazola.

6. Brochure: “The wooden parts of the LAZOLA 3”. It includes:

Work drawings of all wooden parts to be cut to size.

Work drawings of all jigs used for manufacturing.

7. Info: Manufacturing the enlarged LAZOLA 3. Those points are explained as far as they differ from manufacturing the cooker of normal size.

For the time being all instructions are only available in German and – partially – in English. French and Spanish versions will follow. For details see the table below.

Order number	Available training material and jigs	Length	Notes	Price ²⁾	Postage and packing in Euro		
					Germ.	Europe	World
1	Manufacturing instructions on DVD / Video	110 minutes	No. 1 is only available together with 2 and 3	15,-	2,00	5,00	8,50
2	Supplement comprising all texts of the film	15 pages		3,-			
3	Workbook comprising background-information	25 pages	No. 3 may be ordered separately	7,-	2,00	5,00	8,50
4	Templates	15 pages DIN A3		5,-			
5	All kinds of simple jigs of wood	On request	Price and delivery according to agreement				
6	Brochure: “The wooden parts of the LAZOLA 3”.	23 pages		7,-	2,00	5,00	8,50
7	Info: Manufacturing the enlarged LAZOLA 3	2 pages		-----	e-mail attachment		

1) If possible the DVD-Version should be favoured. It allows for a much more flexible handling and direct data-access. (DVD-players are affordable these days.)

2. Dispatch once the amount due has been paid into the Lazola-account.

We of the Lazola-Initiative know that it is easier to develop a scheme for producing a good cooker rather than create an awareness among people of accepting solar cooking. On the other hand this acceptance depends on the quality of the device, on its efficiency, stability and the easy handling of it. Thus we hope, nevertheless, to make a useful contribution towards dissemination of solar cooking.

The Lazola-Initiative does not have the capacity of organising any solar cooking project on its own. But we are prepared and capable of consulting other bigger organizations who intend to do so. We share our know-how free of charge.

The Lazola-Initiative

Notes:

1. These two devices are part of almost every plumber's workshop in Germany. In case they are not available in developing countries, in the long run it would be economical for a workshop to buy them. There are e.g. new and used machines offered by Ebay. For a test period this would, however, not be advisable. In this case the cut parts can be supplied by Lazola from a workshop that has the facility of cutting these parts at low cost.
2. This „hot plate“ is, as it were, the heart of the LAZOLA: By it the cooker achieves up to 40 % better results than other box cookers. In addition, with a small loss of output, not only black pots – like generally used in box cookers – but also shiny ones may be used.
For two reasons the hot plate cannot be made from sheet iron but must be of aluminium: Aluminium conducts heat approx. 20 % better than iron. And once sheet iron gets hot, it generates high tension and may get twisted.
The hot plate has a black cover. It has to be very durable for it has to withstand more than 150° Celsius whilst pots will be pushed around on it and some food may be spilled. The Lazola-Initiative supplies a hot plate with anodized finish that gives very good results.
Therefore the hot plate is the only part of the cooker that has to be ordered. (For more see Workbook: Background Information.)
3. The LAZOLA cannot do without these two wooden frames for they are vital for the interruption of heat from the inside to the outside. They are firmly connected to the metal parts of the cooker and are not to be exposed to the sun. Thus they remain fully functioning in the long run.
4. The painted parts are only partially exposed to the sun and any slight deformation that might occasionally arise on account of this does not affect their function.
In case it is not possible to obtain all wooden parts in the country where the cooker is to be produced, these parts can – at least for the beginning – be ordered by mediation of Lazola. These parts take little space and freight will be almost negligible.
5. Ideal is the cutting to size with a big circular saw, in case it is accessible. But even the purchase of a much smaller table circular-saw, around which a big table top is mounted will do. Suggestions for construction can be found in the brochure: “The wooden parts of the LAZOLA 3”. For a start all wooden parts could be supplied by a German workshop as well (cf. Note Nr. 1).
6. Insulating the box is one of the crucial points of box-cookers. If available, mineral wool is most ideal. It keeps its shape and insulates very well.
Recommendations to use all sorts of bulky materials should be distrusted. It must be made sure that the material in question can at all stand the heat and would not lose its shape in time. If they shrink the insulating effect will be insufficient.
7. This limit is compulsory on account of the breadth of the bending break and the size of iron sheet of 1000 x 2000 mm.
8. It is recommended to acquire a bigger cooker only if somebody makes frequent use of the higher capacity. It is less suitable for smaller amounts of food and it is not as manageable as the standard version.
9. Compared to parabolic cookers box cookers always have the one disadvantage namely that they are slower in heating up food. For this reason it is advisable that institutions that cater for bigger numbers of people have one parabolic cooker and one or more LAZOLA would be an ideal match: The parabolic cooker heats up a big pot of food rather quickly. Then this pot is transferred to a LAZOLA cooker in order to simmer. In the meantime the parabolic cooker is ready to heat up the next pot and so on. The food in the LAZOLA-cookers will not only get tender but will even remain hot for hours.