

## Funnel concrete cooker



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The whole set of the concrete funnel cooker is composed by: a black pot, two glass vessels, a main piece in concrete and glass mirrors with a funnel shape, a rotating concrete piece in middle and a basement. 4 wheels can be adapted in the basement piece for displacement of the cooker in case of need. Fig 1 and Fig 2 show, respectively, the front and back sides of two cookers working in a Portuguese home since 2007. The middle piece enables the easy rotation of the cooker over the basement fixed piece.



Fig. 1 – Two concrete funnel cookers, front view

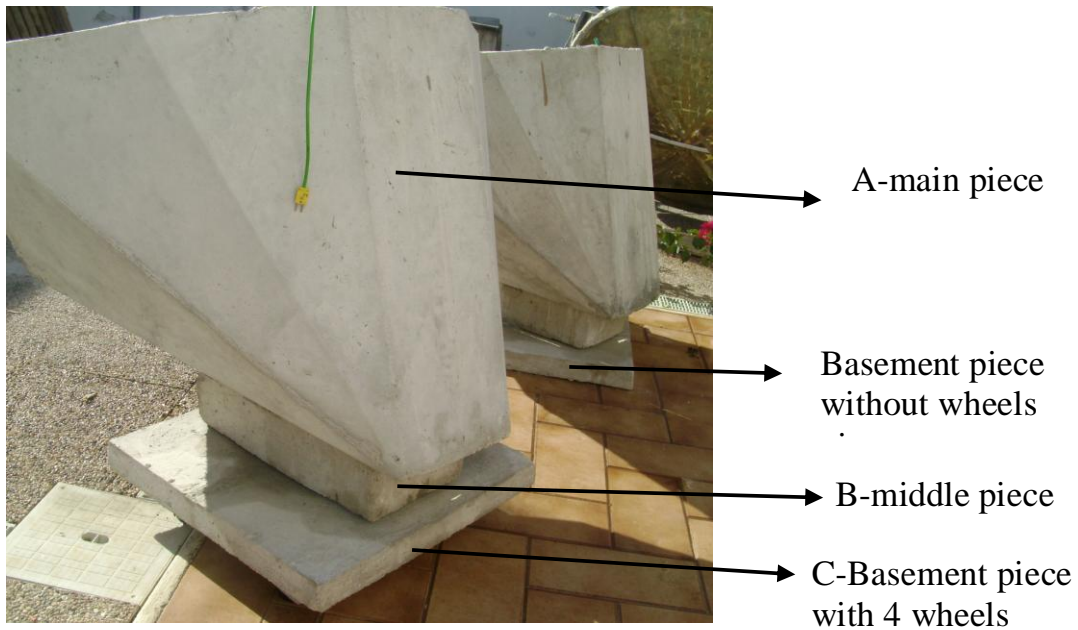


Fig. 2 – Two concrete funnel cookers, back view

The Fig. 3 shows the 3 pieces A, B and C after taking off the molds and after several days drying.



a)



b)



c)

Fig. 3 – Concrete pieces: a) main piece, b) middle piece and c) basement.  
1- Mold of the main piece

The mold of the main piece of concrete funnel cooker (Fig 3 a)) is composed of two funnel shape pieces. Both pieces are made in steel sheet of 2 mm thickness (approx.). Fig. 4 a) and b) show respectively the internal piece and the external piece.

Between the two funnel shape pieces there are 16 spacers with a length of 3 cm. The spacers are steel tube pieces that are welded to the internal funnel and 16 appropriate holes are needed to use a screw in each hole. In the external funnel piece a small rectangular steel piece with a hole is welded in the appropriate position. This particular detail is shown in Fig. 4 c). Fig 4. d) illustrates both pieces jointed.

To make the cavity in the main piece that is shown in Fig. 3a) it is necessary to do a parallelepiped piece, 24cm×22cm×3cm as illustrated in Fig 5. This piece also works as a spacer between the two funnel shape pieces. Two holes in this piece and also in the funnel shape pieces are required to enable the use of screws to joint the set.

Before jointing the funnel pieces (Fig. 7) a mesh must be put inside as illustrated in Fig 6. Fig. 8 illustrates the final process of filling the mold with the concrete mass.

To easy remove the internal piece of mold after drying it is recommended to weld a bar as illustrated in Fig. 9.

Each funnel piece of the main part of the cooker is composed of two halves: The dimensions of each half are represented in schema of Fig 10. The mold is recommended to be done in steel sheet with a thickness about 2 mm. Fig. 11 illustrates a possible arrangement of the four halves to be cut. In case of a folding machine is not available, the pieces A, B1, C1, C2 and B2 must be cut. Then they will be jointed by doing just some welding points.

To help the construction of both pieces two equal auxiliary pieces can be done to easy define the funnel shape. These two pieces can be done in cardboard or in other sheet material. The dimensions are given in Fig. 12.



a)

b)



c)

Fig. 4 – Mold of the main concrete piece



Fig. 5 – Mold piece for the cavity in the main piece

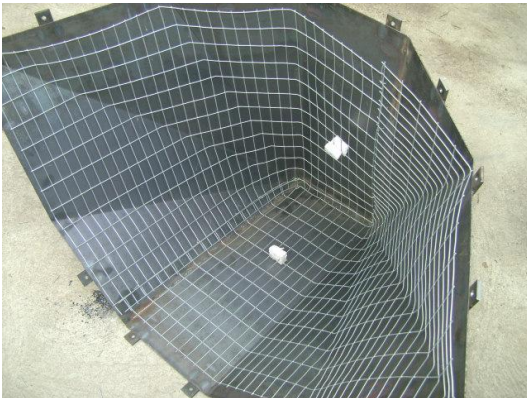


Fig. 6 – Mesh



Fig. 7 – Jointing the funnel pieces



Fig. 8 – Mold filled with concrete mass



Fig. 9 – Bar welded to the internal piece of the mold

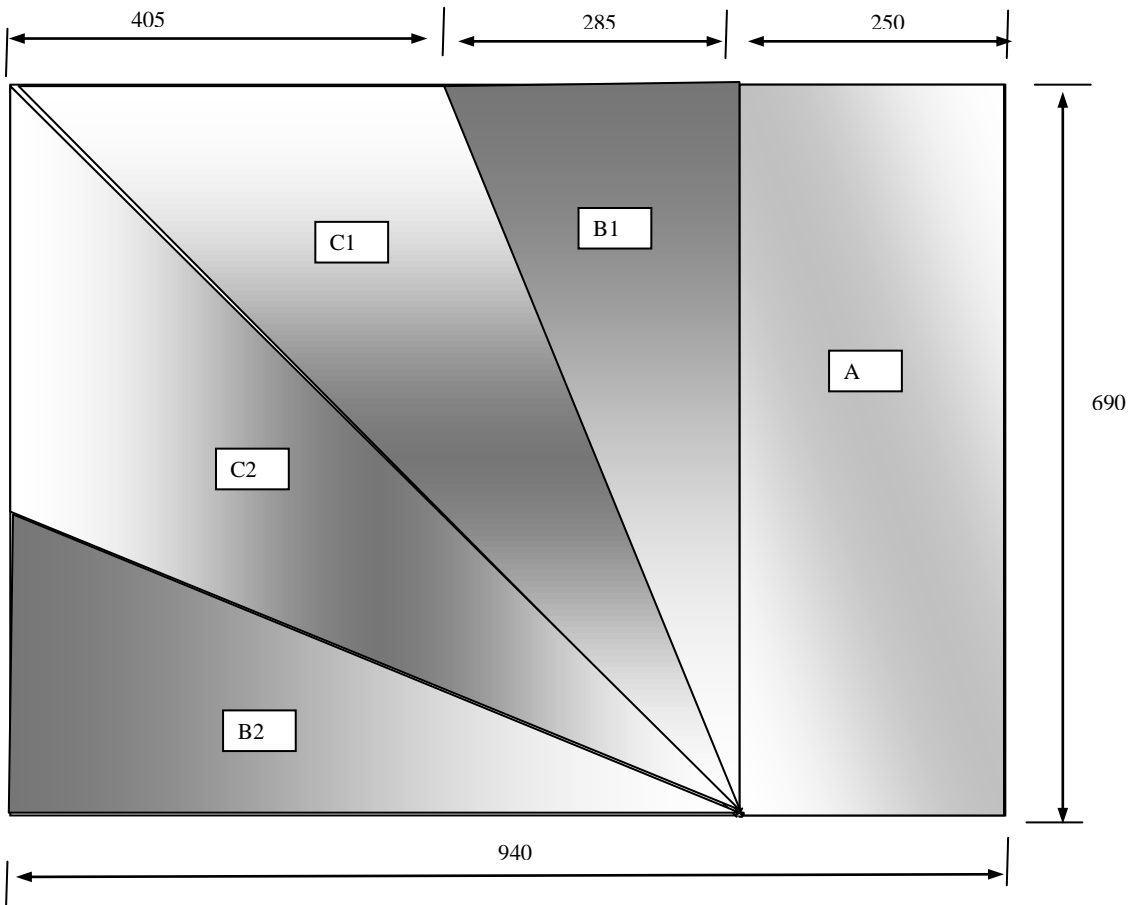


Fig 10- Dimensions (in mm) of one half of the funnel

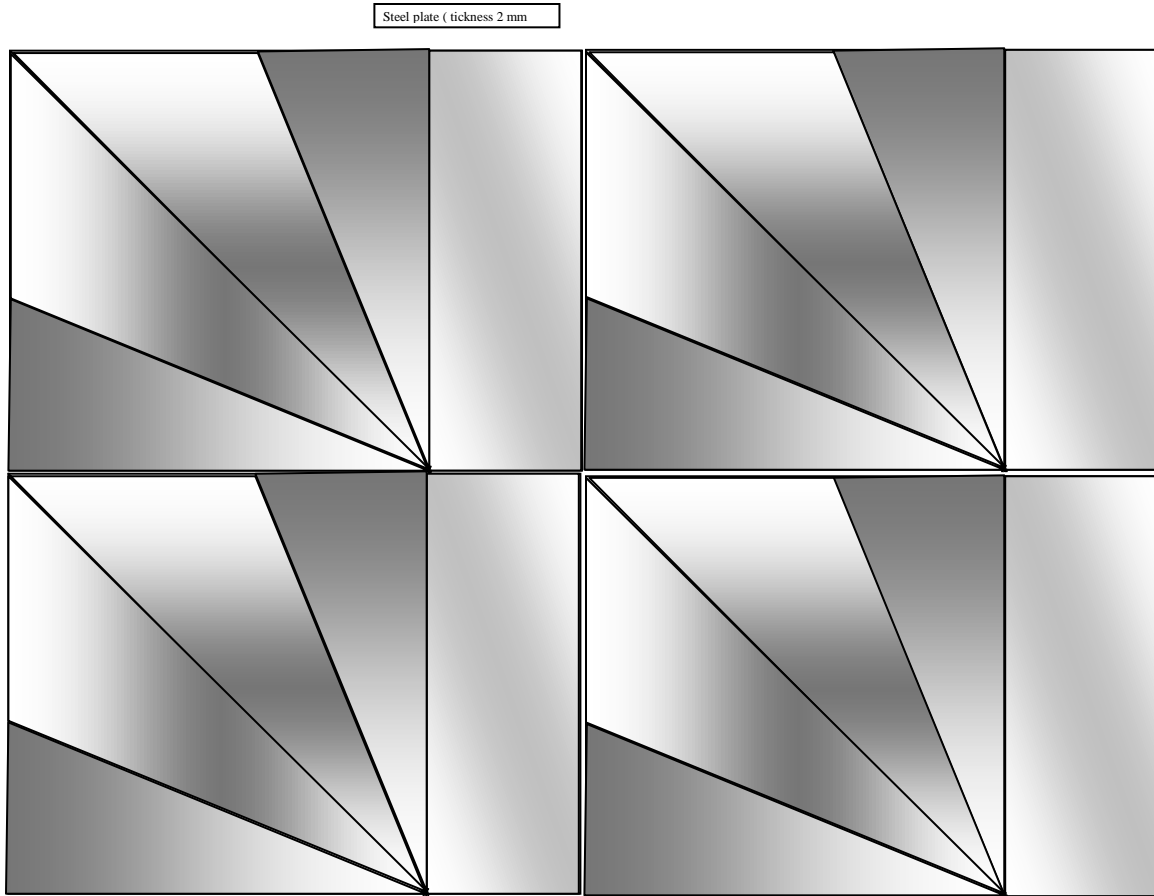


Fig 11- Arrangement of the 4 halves to be cut

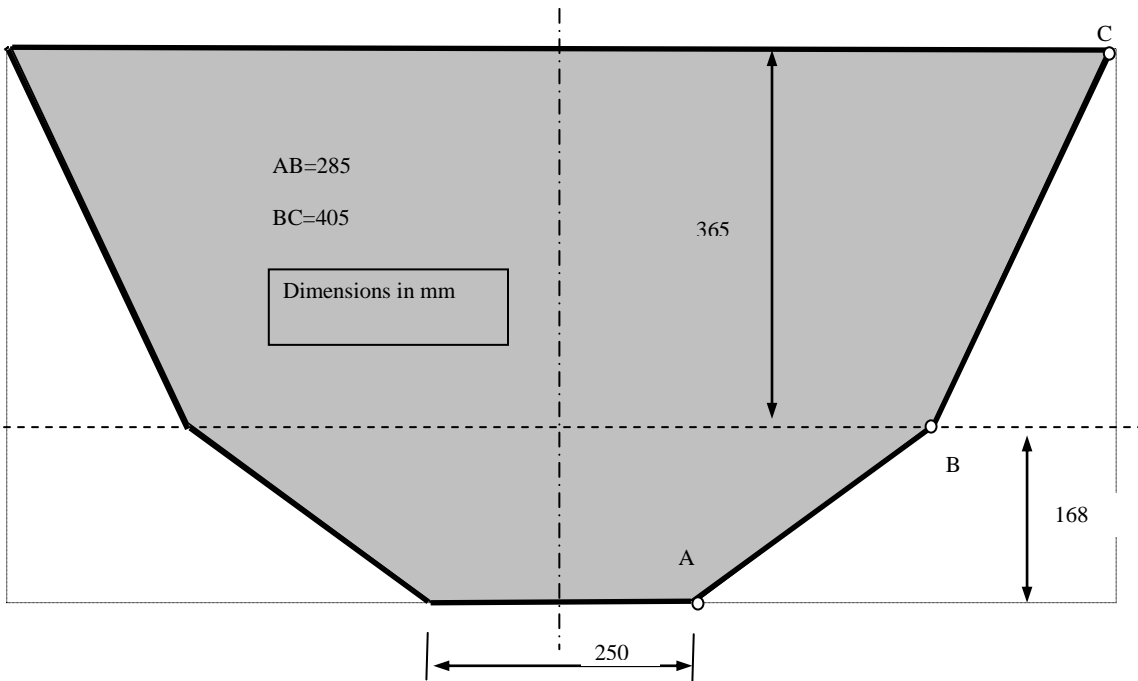


Fig 12- schema of the auxiliary pieces

## 2- Molds for the middle piece and basement piece

The mold for the basement piece is just a box with the dimension  $550\text{mm}\times 550\text{mm}\times 50\text{mm}$  as illustrated in Fig. 13. A mesh should be also used. A tube with four folded lags as illustrated in Fig 13 is required to work as the axis piece of rotation of the middle piece.

The mold for the middle piece is a box with the dimension  $460\text{mm}\times 240\text{mm}\times 145\text{mm}$  as illustrated in Fig. 13. The vertical walls of the box should be a little tilted just to enable an easy removing of the mold after drying. To make the step in the upper side of the piece a parallelepiped piece must be used. A vertical tube is required centered in the piece to get the cavity for the axis of the rotation. The tube of the basement must fit inside the tube of the middle piece.

Both molds illustrated in Fig 13 are done in polypropylene corrugate sheet, but it is recommended the use of steel sheet for large production.

The dimensions of the pieces are shown in Figs 14 and 15.



Fig 13- Molds for the basement and middle pieces



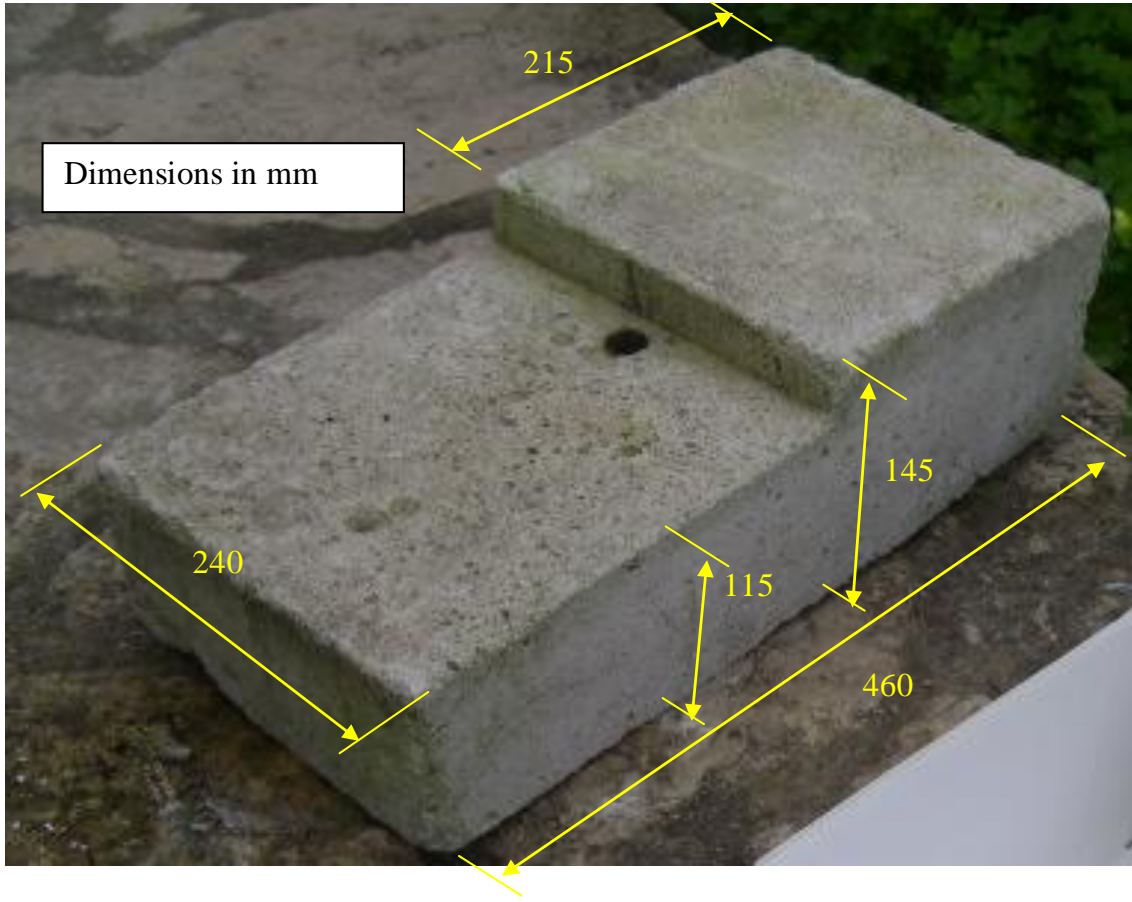
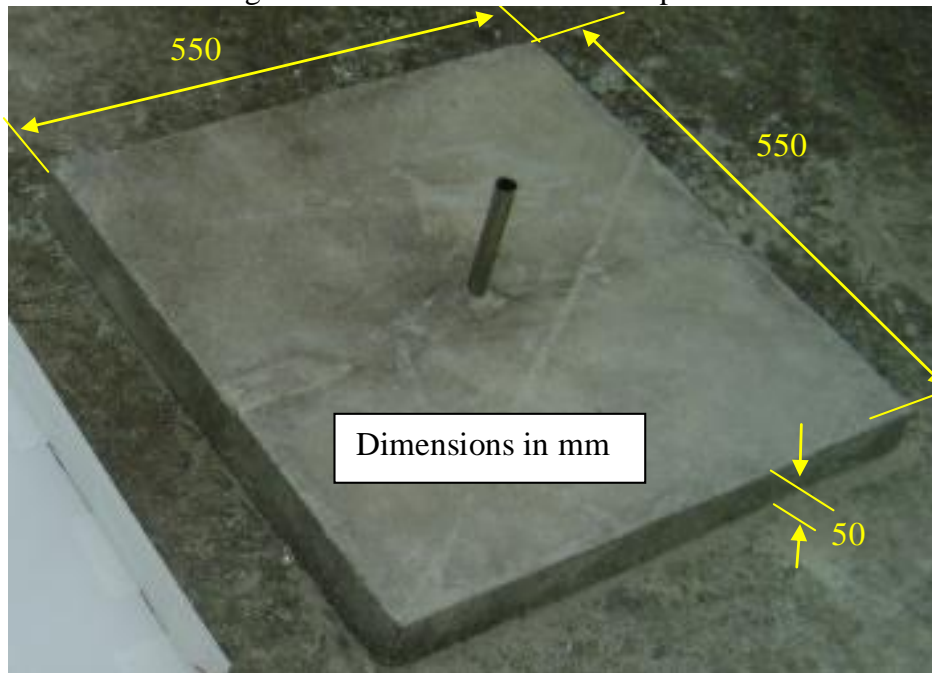


Fig 14- Dimensions of the middle piece



### 3- Glass mirrors

It is recommended to re-use glass mirrors in well conditions with a thickness of 3 mm. Each triangle and rectangle surfaces can be cover with one more pieces of glass mirror. It is not strictly necessary to use only one piece of mirror to each area element (triangle or rectangle). A small gap of 3 mm must be considered between adjacent glass mirrors. A rectangular glass mirror is also needed in the upper horizontal surface of the middle piece. A periphery gap of about 5 mm is recommended.. The used glue should be compatible with concrete and mirror.

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