

## Installation of the kitchen stove

Our first task was to clean the firebricks, which had been used to build another prototype stove in June 2011, and still had fireclay stuck to them. Not all the bricks could be used because some broke while being cleaned.

For this reason, we had to use another type of brick, (25x12x3), using two of them to replace each of the firebricks (22x11x6). We decided to use the original firebricks in the space that where the fire would be as these bricks are more suitable for high temperatures. At the rear, where there is only support for the drum and rocket system, we used other bricks made from baked clay.

The base, which was set on top of a previously prepared pallet, was prepared first. A total of 34 of the 22x11x6 bricks were used with 26 of the 25x12x3 bricks in the rear and 21 of the 22x11x6 bricks in the front. This base was built a little larger than needed to ensure the barrel was well supported.

Next, the second layer of bricks was added, making sure they overlapped properly. Here 6 of the 22x11x6 bricks were used for the burner and 30 of the 25x12x3 bricks for the back section.

For the third layer, 6 bricks (22x11x6) were used for the burner and 24 (25x12x3) for the back section. In the picture you can see how the base has been made longer than needed to prevent subsequent problems with the drum space.

The next step was to mix the perlite plaster with water and use it to cement between the bricks in the burner as this part must not leak smoke or heat. At first it was planned to use beach sand with mud but it was later decided to use different material as beach sand containing salt is not recommended.

The final stage was the fourth layer of bricks, with 6 bricks (22x11x6) used for the burner plus another 10 of the 25x12x3 bricks.

As can be seen in the picture above, plaster was also used at the back because it will also channel hot air and needs to be maintained throughout the rocket circuit.

The circuit was continued with the tower of the rocket system. This is the conduit through which heat rises and comes into contact with the metal of the drum. The "tower" is completed with five layers

After completing the five layers the tower was covered with the metal drum, thus closing the circuit which is vital for the oven. The part of the duct that would allow warm air to escape making way for cold air to enter is closed off.

The drum that accumulates the heat was then covered in bricks (25x12x3) which were cut to fit together.

As the covering of the drum reached the second layer it was intended to install two ducts that would allow the stove to be used in both summer and winter but no tools were available to cut the drum and chimney. In the end it was decided to test the long duct which will be used for cooking and heating in winter. The brick covering was continued until the end of the drum was reached. A plate was placed at the front.

Everything was well sealed with plaster and the fire was lit. A lid was placed at the front to improve combustion.



After the process was complete, and the temperature and carbon dioxide levels had been measured, a number of conclusions were drawn:

If firebricks are not used throughout the construction, as was done at Igartubeitti, the stove will not retain all the heat possible. Furthermore, the metal sheet allows heat to escape instead of being retained. To overcome this, Karmelo Bizkarra advised making a hole in the bricks to fit the pan which would then be in direct contact with fire, making the most the available heat.

Furthermore, maintenance and cleaning of the circuit is very important, and it was recommended to leave a loose brick on one side, giving access to the circuit and allowing ash to be pushed towards the burner, which is easier to clean.