

Mirt Stove

Ethiopia



Type

Injera baking stove suitable for households and institutions made of mortar (sand/cement mixture). Has a provision to accommodate cooking pot in addition to Injera baking plate (*mitad*).

Name

'Mirt', meaning 'best' in Amharic.

Fuel

Wood, twigs, leaves, branches, dung, agricultural residues, and biomass briquettes.

Firewood is expected to be chopped to small sizes of cross sectional area not more than 12cm² for convenience and good stove performance. All fuel types are expected to be air dried before use.

Country of origin / dissemination area

Ethiopia.

Mirt stove was originally developed in the early 1990s by the then Ethiopian Rural Energy Development and Promotion Centre (EREDPC). In 2005, GIZ ECO introduced a modified version of the stove in order to reduce production materials requirement whilst maintaining the stove's efficiency.

The stove is now being disseminated in all ECO intervention regions of Ethiopia (Addis Ababa, Amhara, Dire Dawa, Harari, Oromia, SNNPR and Tigray regions). More than 455,000 stoves had been commercially disseminated until September 2011.

Users

Urban, peri-urban and rural households use the Mirt stove. Also Injera sellers as well as institutions (e.g. hospitals, canteens, and restaurants) use the stove.

The stove is used in households to bake up to 30 injeras per baking session. In a typical household in Ethiopia, there are 2-3 baking sessions in a week. For institutional application the numbers of Injera baked per session is higher as well as the frequency of use.

General Description

Mirt stove is used for baking Injera. Injera is a pan cake like thin bread made of *teff* flour native to Ethiopia. With mirt stove it is also possible to cook or boil food while baking injera with no additional fuel.

Mirt is produced with mortar- a mixture of scoria (red ash) or pumice or river sand with cement.

The stove has six parts that are joined together. Four parts fit to make a cylindrical shaped enclosure (about 66cm in diameter and 24cm high) where the firewood is burned under a baking plate. Two other parts joined one atop the other and are fitted with the cylindrical enclosure from behind. These last two parts regulate the flow of smoke in the stove and provide a rest for the cooking pot.

The cylindrical enclosure has two openings. The first opening, which has a semi-elliptical shape, is at the lower front of the enclosure and is about 24cm wide and 11cm high. It is used as fuel and air inlet. The second is at the rear up, where the enclosure is fitted with the smoke regulating parts, as smoke outlet. This opening is of rectangular cross section and has a dimension of 19cm width and 7cm height.

The stove comes in two versions: the *classic* - with 6cm, and the *slim* - with 4cm of wall thicknesses of their respective parts. Depending on the thickness of the parts as well as the raw materials used, the total weight of mirt ranges 45kg - 65kg.

Stove dimensions (overall)

Cylindrical enclosure

Diameter: 64-70cm

Height: 22-24cm

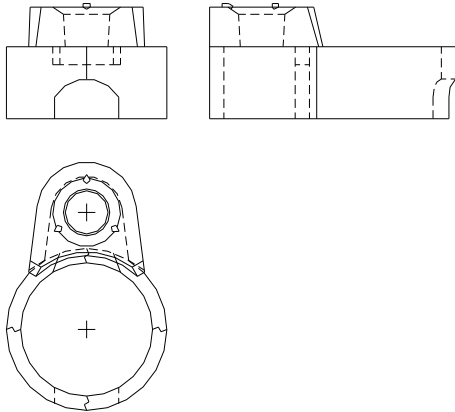
Fuel/air inlet: 24cmX11cm

Smoke outlet: 19cmX7cm

Rear parts: 32cm wide
26cm deep
35cm high

Lifespan

More than 5 years



Picture: MIRT Stove (drawing with hidden lines; front view, left side view, top view)

Materials used

Mirt stove requires only locally available raw materials such as scoria (or river sand or pumice) and cement which can be acquired in all project regions and almost everywhere in the country.

Efficiency

Several control cooking tests revealed a fuel saving of about 50% and kitchen carbon monoxide (CO) concentration reductions of about 90% compared with three-stone open fire.

Results from laboratory tests conducted by the EREDPC showed a range of 18-23 percentage heat utilization (PHU).

Production / Supply

More than 430 small-scale private mirt stove production enterprises have been established by ECO in over 251 districts in seven regions of Ethiopia. These enterprises have basic hand tools such as spade, trowel, sieve, etc as well as specialized facility such as mirt mould and wooden boards especially prepared for the production.

Mirt, produced using a standard mould, has already become a commodity in many places, thus market forces regulate the quality.

Price

Mirt stove costs between 70 and 150 ETB (3 and 6.25EUR). The stove payback period, given the current price of firewood, is estimated at three to six months.



Strengths and weaknesses

Positives

- + Works with all types of biomass fuel
- + Dual purpose (baking and cooking at the same time)
- + Easy to produce
- + Creates employment
- + Low emissions
- + Produced from locally available materials (cement and sand)

Negatives

- Heavy weight
- Big size

Available documents:

- Production manual
https://energypedia.info/index.php/File:Giz_Training_Manual_Mirt_stove_08_1211.pdf
- User guidelines
https://energypedia.info/index.php/File:GIZ_Mirt-User_Manual-Page1.jpg

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