

Minimum Needs for a Stove Factory

Due to differing prices and availability of equipment and materials, differing cultural and geographic circumstances, and differing estimated production capacities, StoveTeam cannot accurately estimate the cost of setting up or running a stove factory outside of Central America. Setting up a complete stove factory requires a significant amount of equipment. *To reduce the cost of transport, a factory should ideally be located close to a source of clay and/or a tile manufacturer. Although metal parts can be produced at the factory, to reduce factory setup costs, the metal parts of the stove construction process can be done by other local shops. However, it will be necessary to ensure the capability, quality and reliability of outside work. Even if the metal work is contracted out, there are still minimal equipment needs to make the stove body and assemble the stove. The location and condition of the factory site will determine what is additionally needed. Determining if a stove factory is viable in your area will require research on local prices of materials and equipment, costs of externally produced parts (tiles and perhaps metal parts), and costs associated with the location and conditions of the potential factory site.*

Some general information

One mold can be used to produce *one* stove a day. Additional molds will be needed. These can usually be made by a skilled metal worker. Check with local metal workers and see if they are capable of making a mold like this (see pictures at end). It will require a stick welder, chop saw, and sheet metal roller. Some shops may have to have other places do the rolling.

There are 4 metal parts to the stove: a pot support, a large flat grill, a grate, and a pot skirt. These can also be made by a local metal shop that has a chop saw, metal shear, and stick welder. However, different size metals are used for each, so make sure the metal is available.

Each stove needs three 12x12" *pieces of* fired clay tile. For the stove to work well, about 20% of the clay mixture for the tile should be made up of organic material (rice husks, chopped straw, or even pumice). Check to see that there is a local tile maker who can do this.

The tile must be *either molded or* cut to the correct sizes and shapes. This will require a minimum of *one* tile saw. We typically use *three*. As there are 3 different cuts, each saw is set to a different cut. The tile saws do not need to be industrial quality *as* the fired tiles are not as dense and hard as ceramic tile.

Disseminating information about the stove, demonstrating the stove, taking orders and collecting money, maintaining production quality and *quantity* are all serious issues that must be managed well. It is very difficult to do this with a non-paid, volunteer approach, even if production is limited. Where we have set up factories, we try to ensure the capability of producing at least 400 stoves a month. Given these concerns, we have chosen the model of setting someone up in the stove-making business.

The following is a list of what is needed to produce the stoves and possible cost-saving options.

Physical Requirements for Factory	
bathroom	This may be optional depending on local custom
running water	Necessary
120 and 240V electricity	Needed only if metal parts are constructed at the factory
covered & lockable storage for tools & office space	Factory tools must be secured each night. If metal work is done outside of factory, tools could probably be taken home each night. Office space can be on-site or off.
large covered work area	Needed for rainy days and protection from sun
covered area for finished stoves	Can be outside under plastic
covered area for raw materials-- pumice for insulation, tiles, cement, and all metal	Can be outside under plastic
uncovered area for storing & sifting of pumice	If pumice is not a locally available, the insulation inside the stove can be done with a mixture of cement, clay and rice husks or chopped straw. However these must be kept dry
uncovered area for curing of cement parts	Can be outside under plastic
security	The need for fencing or other security measures for the factory depend on local conditions
Factory Equipment for making stove (not metal parts)	
wood pallets for stove storage	Completed stoves should not rest on wet ground or get wet
work tables and benches	Necessary
sheet plastic for covering stoves	Necessary unless sufficiently large work area is covered
tile saw	Necessary
cement mixer	Useful but not necessary
concrete vibrator	Useful but not necessary
wheelbarrows	Necessary
Shovels and trowels	Necessary
water hose and buckets	Necessary
vice grips or clamps -5 per mold	It is possible to build these into the mold itself so would not be necessary
wire brushes , hand snips, large rasps for shaping tiles, regular and ball peen hammers, work gloves	Necessary
assorted screwdrivers , tape measures	Useful but not necessary
3'x5' screen boxes for screening pumice	Necessary unless pumice not used for insulation
molds for stove body measurements for cutting tile	Sample provided by <i>StoveTeam International</i> , additional molds made locally: measurements provide by STI

Materials for making stove (not metal parts)	
Pumice and clay	Necessary, although organic material can be used in place of pumice in the tile and insulation
cement	Necessary
wire mesh (hardware cloth)	Necessary
tiles for combustion chamber	Necessary
tile saw blades	Necessary
Equipment for making metal stove parts	
plasma cutter & compressor	Necessary
stick welder	Necessary
welding helmet, apron, gloves safety goggles	Necessary
vise	Necessary
bench grinder	Necessary
angle grinder	Necessary
heavy duty chop saw	Necessary
metal shears	Necessary
drill and drill bits	Necessary
several size squares	Necessary
measurements for cutting metal parts and jigs for welding pot supports, grill, metal band poured in the stove and jigs for bending grate and grill handles	Necessary. Jigs can be made locally or sample will be provided by ST
Materials for making metal stove parts	
1/4"rod	Necessary
3/4" x3/4" angle iron	Necessary
2mm thick sheet metal	Necessary
1mm thick sheet metal	Necessary
1/2"x 1/8" flat bar	Necessary
welding rod	Necessary
chop saw blades	Necessary
Operational Expenses that will vary	
Rent, electricity & water, phone & internet	Need and expenses will vary
gas/vehicle for transporting stoves	Probably best <i>contracted</i> out
promotional travel expenses (meals, lodging)	
Taxes—payroll and on sale of stoves	