

GT New Horizons

Steam Age

The **Steam Age** is heavily dependent on Bronze, an alloy of Tin and Copper. You should already have made some to have gotten this far, but if not the dust can be mixed in a crafting table after using a mortar to grind down copper and tin ingots into their dust forms, then smelted in any Furnace. While some other early alloys can also be made this way, a Mixer will be needed for higher tier stuff later on, and Mixers also sometimes give a better ratio of return. Another option is the Alloy Smelter, which can make Bronze Ingots directly from one tin and three copper ingots. Make plenty of bronze as multiple stacks are needed to build your first basic infrastructure.

Goals

- Boilers
- Steam Machines
- Bricked Blast Furnace
- Nether

Steam

The machines in this era use **steam** as energy. Steam is produced by boilers that combine heat and water, and is used to power machines at a rate of 2 Steam:1 EU. The amount of steam needed is determined by the recipe. Adding water to a dry but heated boiler will cause an explosion. Coal and Solar Boilers are otherwise immune to rain and fire.



Hover over pipes to see a tooltip.

Steam is hot. Wooden pipes can't handle steam - they'll leak, and eventually blow up, catching fire to nearby blocks. Don't touch uncovered pipes filled with steam or stand near the vents of steam machines; these cause contact damage. Wooden pipes can be used for transporting water to the boilers, but steam needs metal pipes with a higher Heat Limit. Luckily all that bronze you just made will do nicely.

GregTech uses a different method of measuring fluids than most mods.

- 1mB = 1 Liter or 1L
- 1 bucket = 1000 Liter = 1 cubic meter = 1 block worth of fluid
- There are 20 ticks (/t) in a second (/s), so when 6mB/t or 6L/t is mentioned, it equates to 120Liters/s or 120L/s



Do *not* use wooden pipes for steam!

Boilers



Simple Boiler setup picture



Water Tank, Coal Boilers and machines



Solar boilers, with Railcraft Tank as buffer



Coal Boilers, using Water Tank's auto-output.

All boilers need water. They use fuel to produce steam - except the simple solar boiler, which needs access to the sky and resetting every few hours instead. Different boilers have different production rates and generally use more fuel the more advanced they are. For most GT boilers 1L of water equals 160L of steam.

Non-solar boiler sides can be used for both steam or water. The bottom side only accepts water and the top only outputs steam - these are the recommended faces to use since it avoids the possibility of getting water or steam in the wrong pipe. A steady water supply, such as a Water Tank, must be provided to boilers to avoid explosions. If a boiler is allowed to heat up dry or runs out of water while heated, and water is then added to the hot boiler it will explode, potentially taking out other nearby machines.

If you have extra resources, build an Iron Tank (Railcraft) and use it as a steam buffer between the Boilers and machines. Until you have an Iron Tank, you can use a line of Large or Huge Bronze Fluid Pipe between the boiler(s) and machines to buffer steam instead. A buffer is helpful because many steam machines consume power faster than you're able to generate it with only one or two boilers.

There are also Multiblock Boilers available in higher tiers. For information on other power producing options see [here](#).

Coal Boilers

Small Coal Boiler is your first boiler. It will accept all kinds of coal as fuel (not compressed blocks), and will produce 6L/t of steam and 20 Pollution/s while heated. When the boiler is fully heated one piece of charcoal will last for 360 seconds. During the heating process one charcoal lasts 96 seconds. Upgrades to the **High Pressure Coal Boiler**, which burns fuel twice as fast but produces 15L/t of steam while heated, and 30 pollution/s.

Solar Boilers

Solar boilers use no fuel; instead they must have a clear view of the sky to heat up, producing up to 6L/t. Solars can be placed under glass and other non-solid blocks without issues, but will not function if covered by water. Solar output begins to diminish after running for more than 3.5 hours cumulative of real time. Wrench and replace solar boilers to reset them, or supply distilled water. Distilled water is only economical much later when it can be produced cheaply. Unlike other boilers, solars will only send steam through its square marked side; default side for this is the back side, but it can be rotated to any side face with the wrench. **High Pressure Solar Boilers** are the upgraded version of this block, outputting three times as much steam and never shutting down fully even when calcified. After 3.5 hours their output will be the same as a simple solar and remain that way until reset.

High Pressure Lava Boiler

This is the most efficient single block Boiler. It uses lava as fuel and produces 30L/t of steam while heated and 20 pollution/s. One bucket of lava equals to 200,000L of steam at full heat. The downside is the difficulty of collecting or creating lava to run it, and the 15 steel crafting cost. The Lava Boiler creates 300L of steam from 1L of water, twice as much as most boilers.

Railcraft Boilers

Railcraft also offers a set of multiblock boilers that produce steam with solid or liquid fuels.

Steam Machines



simple setup of steam machines



more advanced setup of steam machines

Configuration

All Steam Machines will have an exhaust side; default side for this is the back side. (The square you see on the machines in the picture above is the exhaust) The Machine will exhaust steam every time it has completed an operation. If the Exhaust is blocked the machine will not be able to complete its operation. You can change the side of this exhaust with a GT Wrench. Standing near this exhaust may harm you.

Energy and Steam Machine Usages

Steam Machines only works with recipes that requires 32EU/t or less. The steam/t which Steam Machines drain is double the EU/t for low pressure steam machines, and quadruple the EU/t for high pressure steam machines. However, the crafting time is doubled in low pressure steam machines, so total steam usage in L in both cases is four times the total EU usage in the LV recipe.

Alloy Smelter

The Alloy Smelter is used to combine two kinds of materials together to create a new material. It can be used to produce bronze with less loss compared to crafting bronze dust with your hands, and also to make your first rubber bars. It will use up to 32L/t of steam in a low pressure Alloy Smelter, depending on the recipe.

Compressor

The Compressor is used to compress items; for example ingots into blocks, nuggets into ingots. For most use cases in this age, it will use at most 4L/t of steam in a low pressure Compressor, and take 30 seconds to compress a single item, resulting in a total steam cost of 2400L of steam.

Extractor

The Extractor will use 4L/t of steam for most recipes in the Steam Age, and extract a single item in 30 seconds, resulting in a total cost of 2400L of steam, except for sugar beet extraction: 8L/t, 12.8 seconds, 2048L of steam. It's required for your first rubber.

Forge Hammer

The Forge Hammer can be used to crush ores. It can also be used instead of the Hammer (GT Tool) to create plates and other items. It is more efficient than using the hand hammer, creating 2 plates with 3 ingots. Most recipes actually process quite fast. It will use up to 32L/t of steam for most recipes.

Furnace

The Furnace can be used like a vanilla Furnace, using steam instead of Coal to power it. The low pressure version uses 8L/t of steam and smelts one item every 12.8 seconds, resulting in a total steam cost of 2048L steam. Also smelting iron nuggets yields wrought iron nuggets which has 1.5x more durability than normal iron.

Macerator

The Macerator is used to double the yield of ores. It uses 4L/t of steam for most recipes, macerating one item every 40 seconds, resulting in a total steam cost of 3200L per operation.

High Pressure Steam Machines

These machines are upgraded versions of the other steam machines. They will drain steam twice as fast as their basic counterparts, but work at double speed. This means the total steam consumption remains the same but it will be consumed at a faster rate. You will probably need better pipes to keep up with the increased steam rate demands. These machines are still less efficient than LV machines, since Steam machines have an inherent 50% steam efficiency in comparison to LV Steam Turbines' 85% efficiency. Even still, the Forge Hammer, Extractor, Compressor, as well as the steam multiblocks (Steam Oven and Steam Grinder), are likely to remain relevant for several tiers yet to come.

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