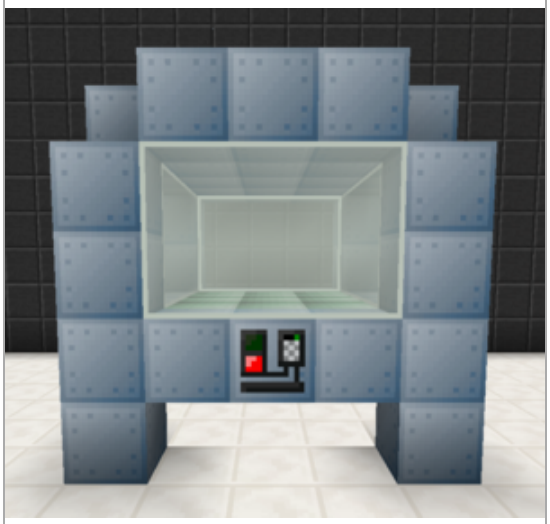
GT New Horizons

Dissolution Tank

The **Dissolution Tank** is an EV tier multiblock for diluting rare earth solutions with water or nitric acid at very specific ratios. The Dissolution Tank is used exclusively in the Monazite and Bastnasite lines, and often follows a Digester which breaks down raw ore into rare earth solutions. The ratio between input fluids, as shown in NEI, must be followed *exactly* or else the machine shuts down and voids a recipe's worth of ingredients. See the last section for two different ways to automate the Dissolution Tank with perfect accuracy and precision.

Dissolution Tank



Mod	GregTech
Type	Tile Entity
Relevant Quest	Dissolution Tank
Tier	EV
Size	5x5x5 (LxWxH)

Construction

The Dissolution Tank consists of borosilicate glass on each of its sides. No other type of glass is accepted, but the tier is irrelevant--use regular borosilicate glass instead of titanium reinforced. The interior of the structure is entirely mandatory air so nothing can be inside the machine. Multi-amp and laser energy hatches are NOT supported, but there can be any number of regular energy hatches to overclock the machine. The Multiblock Structure Hologram Projector can show/build the structure for the player.

Requires:

- 1 Dissolution Tank (controller)
- 0-42 Clean Stainless Steel Machine Casing
- 24 Borosilicate Glass Block
- 9 Heat Proof Machine Casing
- 1 Maintenance Hatch (any stainless steel casing)
- 1+ Energy Hatch (any stainless steel casing)
- 1+ Input Bus (any stainless steel casing)
- 1+ Input Hatch (any stainless steel casing)
- 1+ Output Bus (any stainless steel casing)
- 1+ Output Hatch (any stainless steel casing)

Wallsharing

Dissolution Tanks can wallshare each of their sides to save on casings, borosilicate glass, and buses/hatches. However, the machine is used exclusively in processing lines so it may not be very useful or practical to do that.

Usage

The Dissolution Tank requires very specific ratios of input fluids in order to run. Otherwise, the machine shuts down and voids a recipe's worth of ingredients. The room for error is less than 0.1% or 10L per 10,000L. The following table lists all the different recipes and their specific ratios, but this information is available in-game through NEI. The ratios do NOT apply to any solid ingredients (ie. saltpeter) meaning the input bus(es) can remain fully stocked.

Solute (Programmed Circuit)	Amount	Solvent	Amount		Ratio	Output
Muddy Monazite Rare Earth Solution (1)	1,000 L	Water	10,000 L		10:1	11,000 L
Muddy Monazite Rare Earth Solution (9)	9,000 L	Water	90,000 L		10:1	99,000 L
Muddy Samarium Rare Earth Solution (1)	1,000 L	Nitric Acid	1,000 L		1:1	2,000 L
Muddy Samarium Rare Earth Solution (9)	9,000 L	Nitric Acid	9,000 L		1:1	18,000 L
Samarium Rare Earth Mud (1)	1,000 L	Water	9,000 L		9:1	10,000 L
Samarium Rare Earth Mud (9)	9,000 L	Water	81,000 L		9:1	90,000 L
Conditioned Bastnasite Mud	1,000 L	Water	10,000 L		10:1	11,000 L

These ratios can (and should) be multiplied for batch crafting. For example, it is perfectly acceptable to have 20,000L of water and 2,000L of Conditioned Bastnasite Mud, or even 16,000L of water and 1,600L of Conditioned Bastnasite Mud. The code behind the Dissolution Tank simply divides the larger fluid amount by the ratio and compares the result to the smaller fluid amount.

Automation

There are numerous methods to automate the Dissolution Tank. Only two are discussed in detail here as they are the most prominent and easiest to implement with an AE2 auto-craft system. There are no significant prerequisites for any of the methods.

Method 1: GregTech

The core mechanic behind this approach is GregTech fluid regulators can output very specific amounts of fluid on a regular interval AND can be enabled/disabled with a machine controller cover. **Some of the numbers may vary depending on the exact recipe. Those shown here are for Muddy Monazite Rare Earth Solution (9) specifically.**

This approach is simple, compact, and easy to setup. The only downside is that it does not scale very well; the entire thing must be rebuilt for each Dissolution Tank even when running the same recipe for the same processing line--but one is usually enough anyway.

STEP 1

Place two input hatches and an input bus as shown in the image to the right. The input hatches must be large enough to hold at least a recipe's worth of fluid.

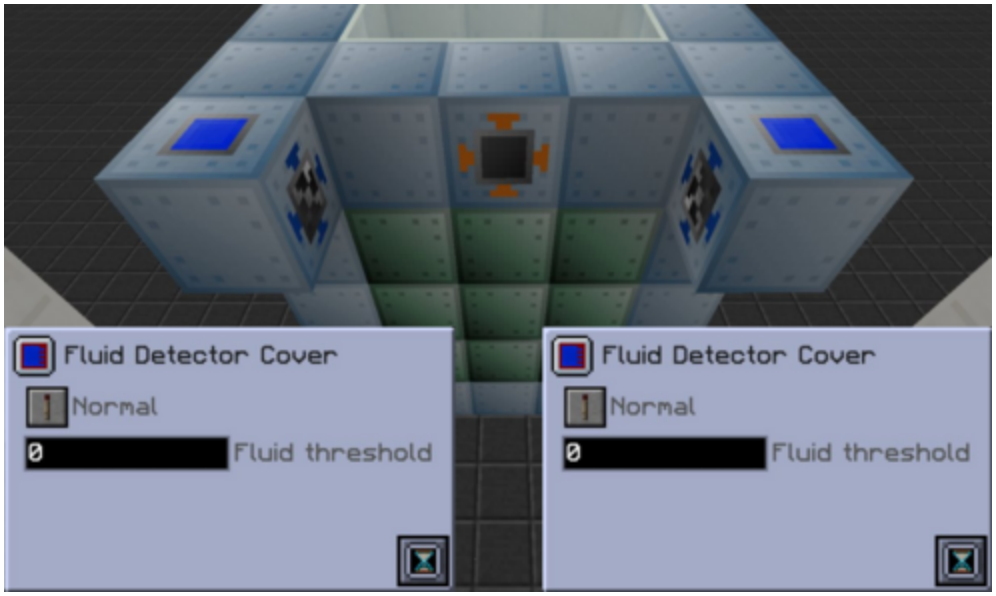
Place an IV fluid regulator on the side of both input hatches. Adjust their settings to import one (or more) recipe's worth of fluid per 20 ticks.

Also change their control behavior to USE MACHINE PROCESSING STATE which means they can be disabled with a machine controller cover.

STEP 2

Place a fluid detector cover on the side of both input hatches. Keep the default settings, but set the tick rate to 1 second for both.

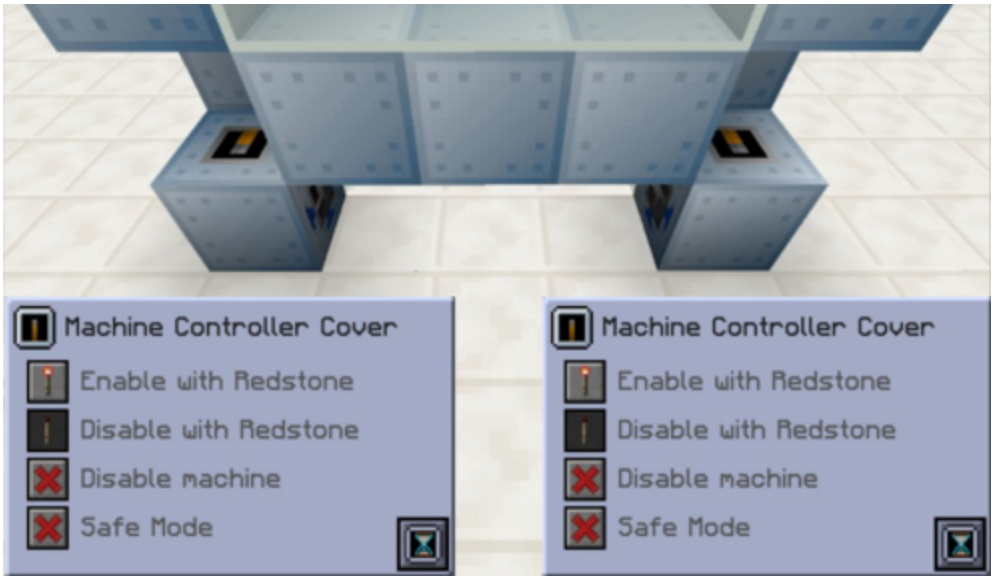
This will output a redstone signal when there is any fluid inside the input hatches.



STEP 3

Place a machine controller cover on the top of both input hatches. Adjust their settings to DISABLE WITH REDSTONE. Also set the tick rate to 1 second for both.

This will disable the fluid regulator when it receives a redstone signal from the fluid detector covers.



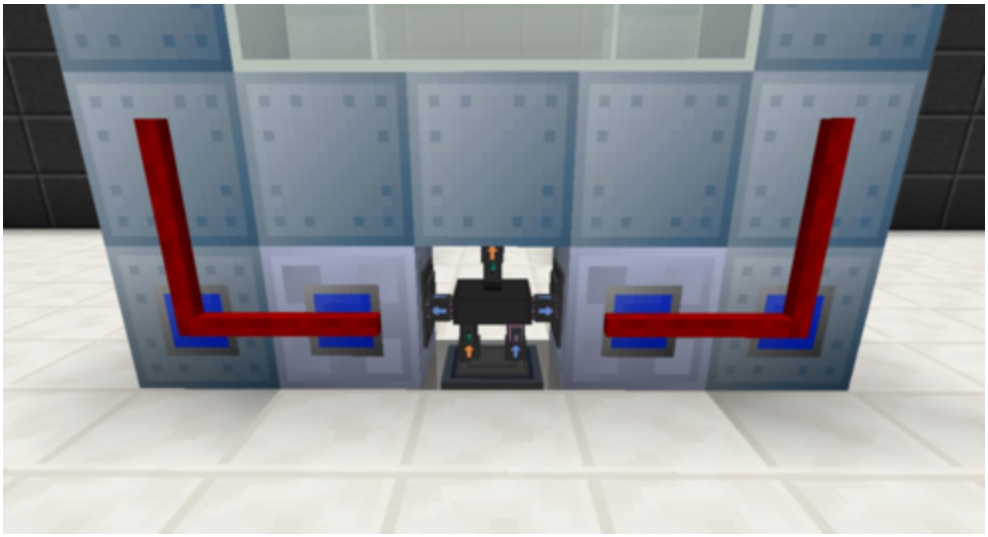
STEP 4

Place a fluid tank in front of both fluid regulators. The tanks must be large enough to hold at least a recipe worth's of fluid.

Place a fluid detector cover on the side of these tanks. Adjust their redstone behavior to INVERTED and set the fluid threshold to one (or more) recipe's worth of fluid. Also set the tick rate to 1 second.

This will output a redstone signal when the tank does NOT have enough fluid for a single recipe, preventing the fluid regulator from importing an incorrect amount of fluid.

STEP 5

Place red alloy wires on the side of the fluid detector covers and leading up to the machine controller cover. Supply the necessary ingredients in any manner. The example to the right uses a dual interface filtered to the two fluids and one solid. Conduits then push the ingredients to the tanks and input bus. A reservoir hatch can also be used for recipes with water as a solvent.	

Method 2: Applied Energistics

The core mechanic behind this approach is that a crafting request can specify exactly how much fluid should be pushed to the input hatch(es) at a time, and blocking mode prevents over-inserting fluids. **Some of the numbers may vary depending on the exact recipe. Those shown here are for Muddy Monazite Rare Earth Solution (9) specifically.**

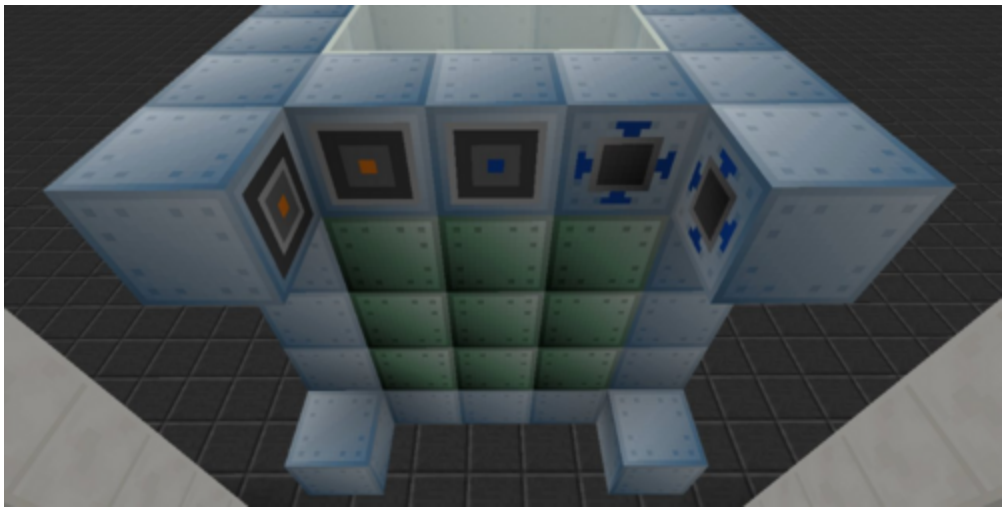
This approach is compact and scalable; the same setup can easily extend to multiple Dissolution Tanks. However, it requires some basic knowledge of subnetting and there is more idle power consumption.

STEP 1

Place all the necessary buses and hatches on the Dissolution Tank as shown in the image to the right.

From left to right: ME stocking input bus, ME output bus, ME output hatch, input hatch, input hatch. The two input hatches must be large enough to hold at least a recipe's worth of fluids.

Filter the stocking input bus to any solid input ingredients (saltpeter).

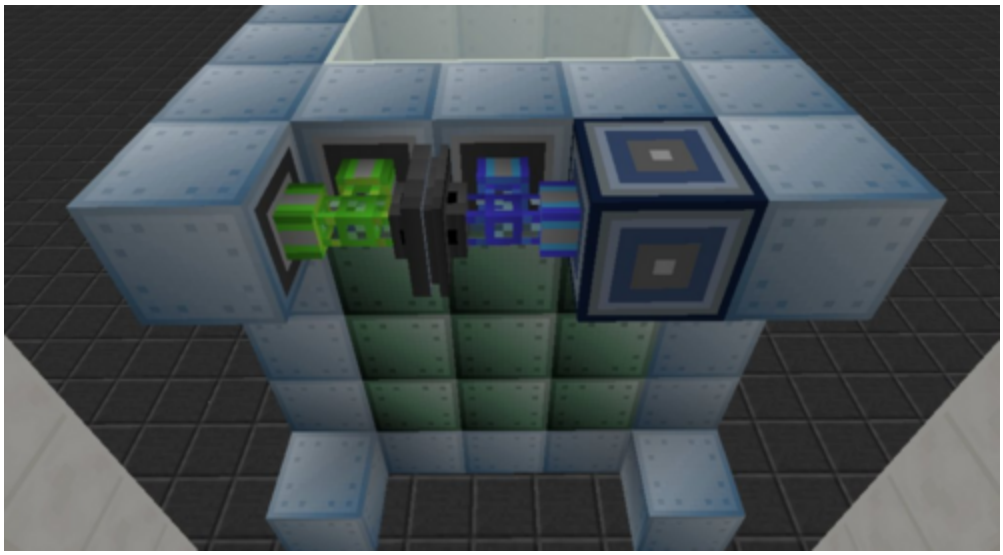


STEP 2

Place a full-block ME dual interface over the two input hatches and enable BLOCKING MODE.

Place another ME dual interface on the main network (green) facing directly into a fluid storage bus on the Dissolution Tank subnetwork (blue).

Set the fluid storage bus to INSERT ONLY and filtered to the output fluid. This will send the output fluid to the main network but through the subnetwork first.



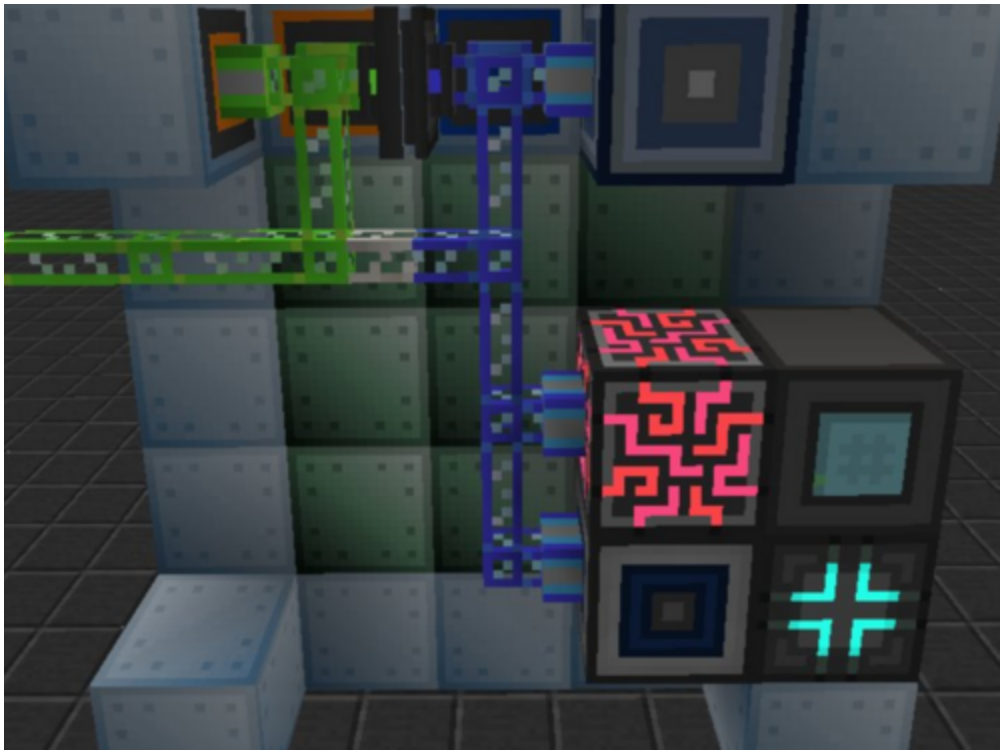
STEP 3

Build out the Dissolution Tank subnetwork (blue).

At a minimum, there needs to be an ME controller, level maintainer, fluid discretizer, and a crafting storage.

Power the subnetwork with a quartz fiber cable connecting to the main network (green).

This allows the Dissolution Tank subnetwork to make its own automatic crafting requests with fluids.



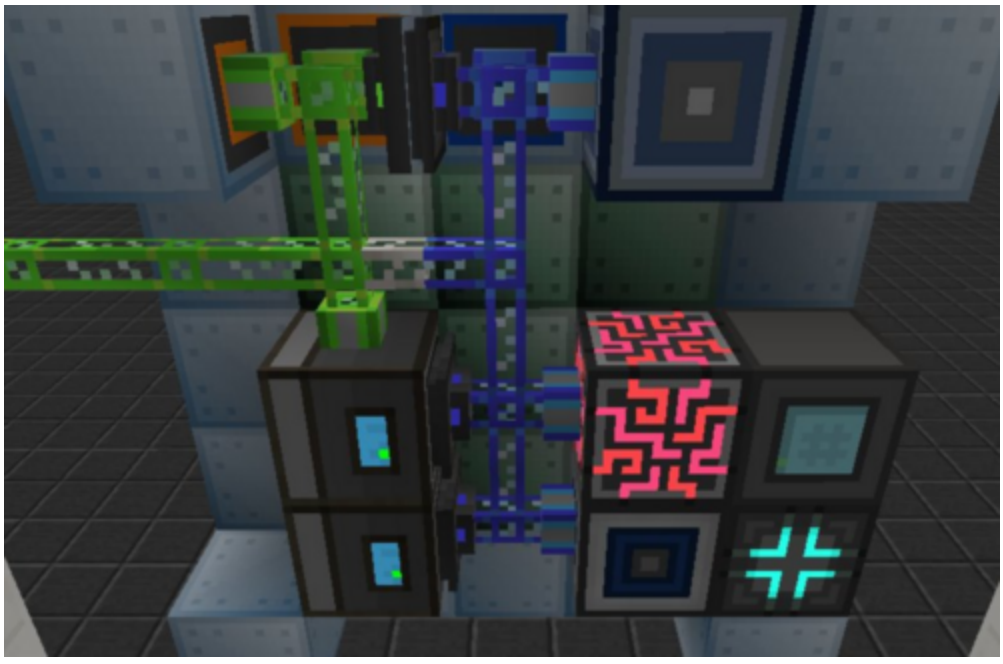
STEP 4

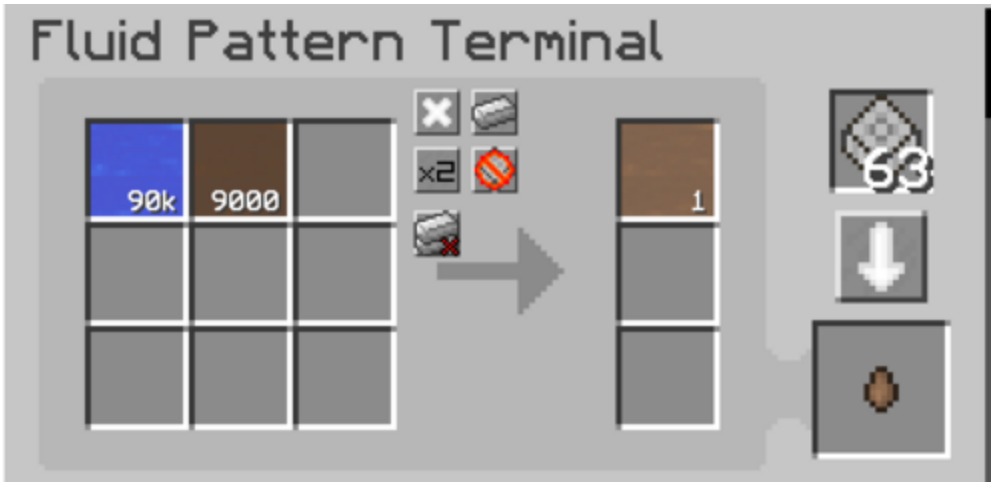
The fluid ingredients can be supplied to the subnetwork in a variety of different ways.

Here, there are two ME chests on the main network (green) with fluid cells partitioned to the necessary fluids, such as Muddy Monazite Rare Earth Solution.

The priority on these chests are then raised significantly so the main network prioritizes filling them first.

The Dissolution Tank then reads the fluids



with fluid storage buses set to EXTRACT ONLY.	
STEP 5	
Create a pattern involving ONLY the fluids from the recipe. In this example, 90k water and 9k Muddy Monazite Rare Earth Solution makes 1 Diluted Monazite Rare Earth Mud. Multiply this pattern if there is enough room in the input hatches and the Dissolution Tank is processing recipes faster than the subnetwork can make automatic crafting requests.	
STEP 6	
Lastly, create the automatic crafting request for the output fluid in the ME level maintainer. A drop MUST be used instead of the fluid itself. The amount is set to 16 to support up to 16 Dissolution Tanks running the same recipe at once, although only one is really necessary. The batch size can just stay at 1 regardless. Scaling this approach is as simple as adding more full-block ME dual interfaces and more crafting storages to the Dissolution Tank subnetwork.	

Other Methods

If neither of the above methods satisfy you then try using volumetric flasks, Steve's Factory Manager, or OpenComputers Microcontrollers! Again, there are many different methods to automate the Dissolution Tank. Good luck.
