

Multi-Purpose Nanomachines, Type 39

Initially developed for use with the [Star Army Fabrication Chamber, Type 39](#) by [Kage Yaichiro](#) in [YE 39](#), the Type 39 Nanomachines are intended for both [Star Army of Yamatai](#) and civilian use. They are used typically for fabrication or deconstruction, though they can also be used for a wide array of other purposes. These nanomachines are not capable of manipulating the nucleus of an atom or its components, but are capable of manipulating chemical bonds as well as an atom's electrons and can thus synthesize molecules or sort matter into pure states. They can also create more of themselves if the proper (common) materials exist should they be destroyed or disassembled. Nanomachines also have protections to prevent a colony from going out of control or from being used in ways not permitted.

About the Multi-Purpose Nanomachines, Type 39

Not to be confused with the smaller femtomachines of the [Nodal System](#), the nanomachines are explicitly meant for the manipulation of materials at the atomic and molecular level through the manipulation of chemical bonds and electrons. This can also be used to manipulate the number of electrons in certain cases for ionization. The result is that while they cannot always convert one form of matter into another (they cannot alter the nucleus of an atom), they can purify or rearrange existing matter. Other systems can be used to overcome this nucleus adjustment limitation such as drawing from aether plasma or fusion reactors. The nanites accomplish the manipulation of electrons and chemical bonds with the guidance of a computer system that directs them based on telemetry the nanomachines provide. The nanomachines are also able to replicate, though with certain restrictions.

Uses

Because of their versatility, the nanomachines can be used for various purposes. They can be used to:

- create objects or equipment from trash or raw materials
- sort trash or debris into its constituent elements
- isolate irradiated material for processing and disposal elsewhere
- process edible material that might otherwise be thrown out
- process some materials into edible materials
- process and/or purify water
- process waste
- produce medicines
- hunt cancers or illnesses via injection to support the immune system
- supplement various bodily functions or be installed in cybernetic organs
- act as an automated self-destruct system for sensitive military technologies

Unlike with the nodal system, the nanomachines are typically recalled or disassembled from the end product, allowing for safe consumption. Of course, consuming a few nanomachines will not be harmful, especially given the security measures in place.

Consumables

It is indeed possible to create or purify consumables like Air, Food, Water, and Medicine with this system. It is preferred to grow food, of course, but the prevalence of the atoms found in most foods makes it simple enough to synthesize. The most common atoms are Carbon (C), Hydrogen (H), Oxygen (O), and Nitrogen (N) in food, with some instances of Calcium (Ca), Chloride (Chlorine Ion Cl⁻), Phosphorous (P), Sulfur (S), and Sodium (Na). These are easily found materials for rearranging even if an Aether or Fusion system isn't present to provide them. Medicines are potentially more tricky depending on the rarity of atoms employed within their molecules, but are still possible to synthesize.

In many cases it is possible to get many of the atoms required simply scrubbing recycled air, processing waste, and filtering out growth in water stores, perhaps with the occasional resupply. Colonies on the ground can easily meet their needs by tossing in dirt, water and ideally plant life. Fusion and Aether Reactors, which can alter the nucleus of an atom and create matter respectively, can be employed to create the needed nuclei and matter outright and overcome the nanomachines' limitations of atomic editing.

All this being said, there are downsides. The more complex a meal or item is, the more time it takes to construct. The computer system controlling the production of food may also not be as skilled a cook as a sentient being. The resultant food will have consistent taste and texture, but the system employed must have sufficient programming to synthesize a decent meal properly. When coding for the sake of nutrition and volume over pleasure, time-saving measures may be employed. Molecules that influence taste but are not relevant to health might also be omitted in favor of speed in mass production. An extreme may just instead favor making a [Star Army Emergency Ration Pill](#). As such, normally cooked food still has its place, and the state of a synthesized meal depends on the programming and which is favored; is the system geared toward speed, volume, and efficiency, or is it geared toward valuing taste and texture to maintain morale?

Restrictions

These nanomachines function best either in zero-gravity with vacuum or in a liquid medium. As such, dedicated areas such as the [Star Army Fabrication Chamber, Type 39](#) or a ship's [Standard Star Army Fabrication Area](#) are needed to allow them to function to their utmost. If dedicated to a singular purpose and pre-coded for it, however, they may function within atmosphere or gravity for a limited period such as if delivered in a spray or an injection. It should also be noted that nanomachines are incapable of processing [Zesuaium](#) due to its requirement of being in a plasma state to form or work. These temperatures would destroy the nanomachines. They can, however, build things around Zesuaium or in gaps to create composites. Other materials that possess exotic prerequisites may also be difficult or impossible to process.

Security and Protections

To avoid a “grey goo” scenario or abuse, there are a number of security protections on the

nanomachines. They will only function in the medium in which the specific colony is coded to function in; such as in vacuum, a liquid medium, or in atmosphere in rare cases. Otherwise, they will self-terminate after a set time. The colony has a hard-coded maximum size at any given time for a specific application, and will not grow beyond this size regardless of the orders given by the computer system attached to them.

Each nanomachine's program is stored in three places, and if a nanomachine develops an error, it will self-correct based on the two intact instances of code. If nanomachines come into contact with other nanomachines that have different programming, they will attempt to exterminate each other. Not only is this an added tier of error protection, but it makes it impossible to pool nanomachines from different colonies together. The only case where this will not happen is when the nanomachines are explicitly creating a "subordinate" colony for another purpose related to the object they are constructing; which is something that is only possible for [Star Army of Yamatai](#) vessels (with explicit approval from a serving officer, medic, or technician with the authority to do so), organizations the [Yamatai Star Empire](#) grants the authority to, or [Kage Yaichiro](#) and his own internal research.

There are also certain complex molecules that civilian-assigned nanomachines will not produce regardless of orders, such as certain prerequisites for military-exclusive explosives, viruses or other bio-weapons, hemosynthetic technology, etc. These limitations are designed to be non-obvious in what they are preventing, to avoid "reverse engineering" based on this data even if it is somehow obtained without the nanomachine self-destructing. As a result, some items that are "close enough to" but not actually these technologies might also not be replicable. If the data within a nanomachine is accessed illegally, or an attempt to do so is detected, it will self-terminate.

OOO Notes

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<https://starmy.com/roleplay-forum/index.php?threads/star-army-fabrication-chamber-type-39-supplemental-submissions.60160/#post-364006>

Products & Items Database	
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