

## Tech 3 Production: Hybrid Tech – Changing Fortunes

With the arrival of the Apocrypha expansion in March 2009, the producers of New Eden were left salivating at the arrival of a whole new level of technology previously unseen in the entire known universe. Hybrid Technology.

At the heart of this new technological marvel was the mysterious appearance of wormholes across the entire New Eden cluster. With it came the arrival of thousands of previously unexplored systems, ripe with new enemies, new materials and new challenges. Designers immediately went to work producing ways to adapt this new technology to existing ship designs, creating the mysterious strategic cruiser, a hull designed to be able to adapt to a multitude of situational roles depending on the inclusion of Subsystems.

This guide covers the ins and outs of producing the newly discovered 'Tech 3' (or Hybrid Tech as it is become commonly known) equipment.

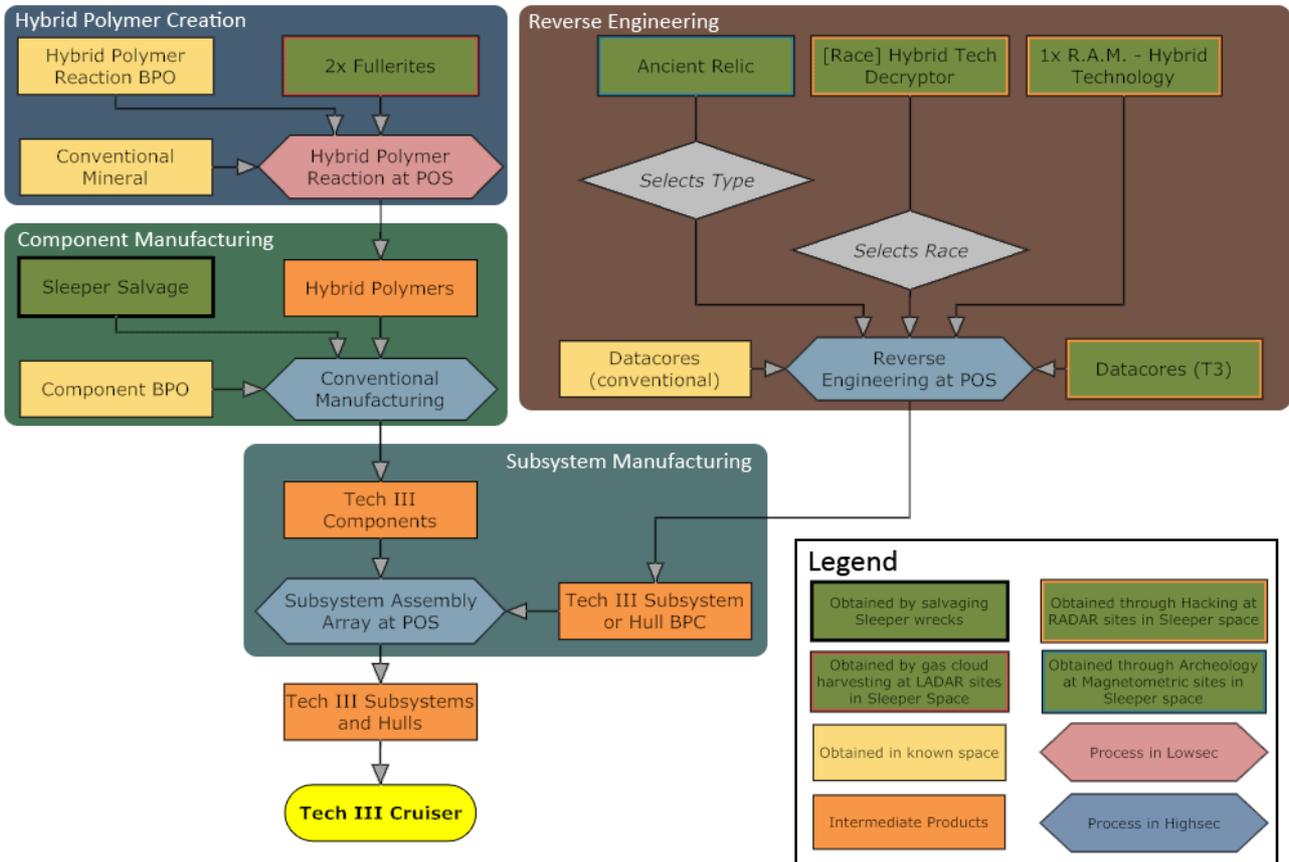
At the heart of managing the supply chain for Tech 3, exploration plays a key role. Almost all of the raw materials used are sourced from Wormhole space, so unless you intend to buy all materials from the market from other suppliers, a good grounding in the skills relating to probing and exploration are paramount. Whilst this guide does not cover the intricacies of the exploration system, be sure to spend a little time reviewing this before considering embarking on a career of Tech 3 production due to the amount of time you will most likely spend in the unknown reaches of wormhole space (W-Space as it is commonly referred to.)

There are 4 stages involved with Tech 3 production, which are as follows:

- 1) Production of Hybrid Polymers
- 2) Production of Hybrid Construction Components
- 3) Reverse Engineering of Ancient Relics
- 4) Final Production of the Hull or Subsystem.

A fellow Eve capsuleer, Tareen Kashaar, has produced a flowchart, which I have been graciously given permission to use, and this details each of these production steps as an overview.

### Tech 3 Production by Tareen Kashaar



## Hybrid Polymers

The first step along the Tech 3 production chain involves the sourcing of fullerenes from Gas Clouds in W-Space and subsequently processing them using standard asteroid minerals into Hybrid Polymers.

In order to gather the gas itself, the main skill you need is Gas Cloud Harvesting, which is only available directly from the Pirate factions out in the wilds of null security (0.0) space. Fortunately many brave (or some would say, foolhardy) pilots regularly travel out to these inhospitable locations and – for a premium of course – sell the book on the more commonly travelled markets. Each level in the skill allows you to simultaneously use 1 more harvester, up to a maximum of 5 of course, with the benefit if you are training up to level 5, you have the option of using the newly introduced Tech 2 gas harvester, which allows for a 50% increase in your harvesting quantities (the amount of gas harvested per cycle doubles, but the cycle time increases producing a 50% quantity increase in the same time frame.)

The fullerenes required for Tech 3 production are found within the gas clouds from LADAR sites within W-Space. They are named by various 'C number' designations, with 3 different types appearing in each of the different classifications of wormhole space (the highsec access equivalent, the lowsec access equivalent, and the 0.0 access equivalent – though note that the entrances to wormholes are randomised a little, and the most difficult sites can occasionally be accessed through highsec wormholes... and of course remember that in wormhole space, everything is considered as 0.0 rules, so you can be tracked and killed potentially by anyone)

The act of gas harvesting itself runs very similar to that of asteroid mining – you simply get in range of the cloud, activate the module and wait for it to complete its cycle, where the resulting material is deposited in your hold. The various gasses are ranked based on their size – the easier to access gasses are only 1m3 each, the medium ones are 4m3 each, and the hardest to find ones are 10m3 each. With the gas harvesters having a 'mining' amount of 10m3 or 20m3 each cycle (Tech 1 or Tech 2) this determines the amount of gas you can gather in any given time. As mentioned previously, the Gas Cloud Harvesting skill itself allows you to access up to 5 simultaneous gas harvester modules, which also alters the amount of gas that can be gathered in any given amount of time.

With the gas collected safely in your hold, you then need to convert it to Hybrid Polymers via a reactor (which is very similar to the production of Tech 2 minerals from Moon Minerals as covered in last issue) which can only be done in a lowsec POS (anchoring of the module is restricted to 0.3 or lower security space as with all reactors.)

This involves mixing 2 of the types of Gas along with 1 type of 'standard' asteroid mineral via a newly released 'Polymer Reactor Array' which is available in the known markets. In addition to this, a new polymer reaction is required to actually cause the process to go, which is available from Core Complexion Inc. or Chemal Tech stations throughout the known universe.

The material inputs required, and the output that is produced is detailed in the following table:

	Base Minerals						Fullerites								Output Units		
	Trit	Pye	Mex	Iso	Nocx	Zyd	Mega	C50	C60	C70	C28	C32	C72	C84		C540	C320
C3-FTM Acid							80							100	100		2
Carbon-86 Epoxy Resin						30						100				100	8
Fullerene Intercalated Graphite			600						100	100							120
Fulleriferrocene	1000							200	100								1000
Graphene Nanoribbons					400						100	100					30
Lanthanum Metallofullerene					200					100				100			60
Methanofullerene				300						100			100				80
PPD Fullerene Fibers		800						300	100								250
Scandium Metallofullerene						25					100		100				40

The Polymer reactor requires less than half of the CPU and Powergrid of a complex reactor (the one used for the Tech 2 complex materials) so with a suitable tower, it is possible to fit this into a medium sized POS (for instance, a Caldari Tower) to reduce the running costs of the POS, and unlike with a Biochemical Reactor (which specifically runs at half speed when mounted in a medium POS) this particular module is not limited by the type of POS it is mounted in, as long as the Powergrid and CPU requirements can be met.

## Hybrid Components

The next step along the Tech 3 production route is to generate the Hybrid Components which utilise both Sleeper Salvage and the previously produced Hybrid Polymers.

Sleeper salvage is gathered in a similar way to standard salvage – by using a salvager module on the wrecks of destroyed sleepers that inhabit W-Space. Whilst this guide will not cover tactics to use against the sleepers to kill them easier and/or faster (I'll leave the joys of discovery to you) it is good to know what the specific things you get when you kill them off are used for.

Note that 4 items (Ancient Coordinates Database, Neural Network Analyzer, Sleeper Data Library and Sleeper Drone AI Nexus) are classed as Trade Goods and are not used in the manufacturing process, but are instead used as 'bounties' as many of the NPC corporations have buy orders up for the parts at very generous rates. Much as 'Overseers Personal Effects' from known space combat sites are sold back for lumps of cash, these are the direct way to convert your time in wormhole space into cash – however of course, these may not be the most valuable items that you can gather.

Whilst the production of Tech 3 components is very similar to standard Tech 1/Tech 2 production (a BPO/BPC is used in a standard factory line or component assembly array in a POS) much like Tech 2 production, additional skills are needed to produce the item. These are not wormhole specific, but rather Industry to level 5, Electromagnetic Physics to level 2, and up to 1 additional skill (some components only need those 2 skills) which is either Mechanical Engineering, High Energy Physics, Graviton Physics or Plasma Physics. Mechanical Engineering is used the most of these, as it is used in 4 components, whereas the others are only used in 1 component each. Note that much like Electromagnetic Physics, these additional skills need to be trained to level 2.

The blueprint originals for the Hybrid components are available from the standard NPC corporations (specifically Core Complexion Inc. and Chemal Tech – much as the reactions) but at the time of writing, there appears to be no way to affect the material requirements of the blueprints. When the blueprint is used in a manufacturing operation, there is no entry within the waste column of the 'final acceptance' screen, and upon carrying out ME research on the blueprint, the material quantity does not reduce, even though the 'waste factor' that is identified as having a base 10% as with most other blueprints does reduce as appropriate on the blueprint itself. On the plus side of this, ME research would have very little impact on these components due to the low quantities of materials used in each of the blueprints, so there is very little gain that could have been made. PE research applies as normal, but the production time for these items is relatively small (10 minutes each at PE0) so the time savings are minuscule at best.

Below is a table identifying the material requirements for the different components along with the skills required to manufacture the items in addition to Industry 5 and Electromagnetic Physics 2.

	Polymers										Salvage										Skill 2				
	C3-FTM Acid	Carbon-86 Epoxy Resin	Fullerene Intercalated Graphite	Fulleroferrrocene	Graphene Nanoribbons	Lanthanum Metallofullerene	Methanofullerene	PPD Fullerene Fibers	Scandium Metallofullerene	Catstian Temporal Coordinator	Central System Controller	Defensive Control Node	Electromechanical Hull Sheeting	Emergent Combat Analyzer	Emergent Combat Intelligence	Fused Nanomechanical Engines	Heuristic Selfassemblers	Jump Drive Control Nexus	Melted Nanoribbons	Modified Fluid Router		Neurovisual Input Matrix	Powdered C-540 Graphite	Resonance Calibration Matrix	Thermoelectric Catalysts
Electromechanical Interface Nexus					5	10	10		1			5					1								Mech Eng
Emergent Neurovisual Interface	5					5				1	1													1	Mech Eng
Fullerene Intercalated Sheets			2	30				5											2	5	2	4			
Fulleroferrrocene Power Conduits		4		25			15	10				5							4	4	3				
Metallofullerene Plating				15				4				5													
Nanowire Composites				10				2				3							3						Hi En Phys
Neurovisual Output Analyzer		10		50					10			10							4	4		4			
Optimized Nano-engines					5	10		10							1				3		1				Mech Eng
Reconfigured Subspace Calibrator				10	5	10						5							3		1	1			Grav Phys
Reinforced Metallofullerene Alloys			10		5				10			5				1			3		1				Plasma Phys
Warfare Computation Core			10		5				10			5	1						3		1				Mech Eng

Note that the colour of the different salvage types determines the relative rarity of them. The orange background coloured parts are available from every type of spawn, the blue background coloured parts are a little less available, and the white coloured parts (which are represented by the 'pyramid shaped' salvage components in game) are rarer still. Note that there have been reports that due to the variance in quality of wormhole space sites, most of these parts are available in most locations, though the blue coloured items tend to be more available on the cruiser sized spawns, and the white ones on the battleship sized spawns. It can be seen from the table however that these blue and white parts are not very commonly needed (only 1 of each used per component across the entire range) which reflects their reduced availability.

It should also be noted that the white coloured (pyramid type) components are only used in the Emergent Neurovisual Interface component, which is only used in the production of Hulls (more on that later in the final assembly part of the article) so only 1 set is needed to build a complete Tech 3 Strategic Cruiser. A similar factor applies for the Blue coloured parts, as the 5 of those correspond to one used in each of the 5 subsystems (engineering, electronics, defence, offence and propulsion) – but note that as the entire point of a Strategic cruiser is to mix and match different Subsystem types, there may be many more of these produced for each hull that is produced.

## **Reverse Engineering**

Reverse engineering is the process by which the final blueprints are created to allow for the final assembly of components, and in general is the most involved part of the Tech 3 production system.

Several new skills are introduced to this process, the first of which is Reverse Engineering. This requires prerequisite skills of Science level 5, Metallurgy level 4, and Research level 5.

Each of the subsystems each have a speciality skill as well, in the form of:  
Defensive Subsystem Technology (which requires Nanite Engineering level 4)  
Electrical Subsystem Technology (requiring Electronic Engineering level 4)  
Engineering Subsystem Technology (requiring High Energy Physics level 4)  
Propulsion Subsystem Technology (requiring Graviton Physics level 4)  
Offensive Subsystem Technology (requiring High Energy Physics level 4)

One word of advice though – don't get these Subsystem skills confused with the ones required to actually fly the strategic cruiser. They are only rank 1 skills, whereas these ones used for the construction elements are rank 5 skills, and as such will take a lot longer to train up. Although note that these aren't lost if you die whilst in a strategic cruiser like the rank 1 ones are. On top of the subsystem skills, several of the pre-Apocrypha science skills are used as well in this process, which will be described a little later.

Reverse engineering relies on the Hacking (RADAR) and Archaeology (Magnetometric) type exploration sites found within W-Space. The hacking sites provide the new type datacores required for the reverse engineering process, as well as the tools required for completing the process, namely 'R.A.M. - Hybrid Technology' and Hybrid Decryptors, which are used to determine the racial type of equipment that is produced at the end of the Reverse engineering operation. Archaeology sites give access to Ancient Relics, which come in 6 different types (Hull sections, Armor Nanobots, Electromechanical Component, Power Core, Thruster Sections and Weapon Subroutines) in 3 different quality levels (Intact, Malfunctioning and Wrecked) which are used to determine the type of blueprint that is produced, and the base chance of success in the reverse engineering process.

And yes folks, you heard me correctly - Reverse engineering is yet another random chance process, much in the same way as Invention is used for Tech 2 production. Except of course, as can be expected, Tech 3 adds another layer of complexity.

Reverse engineering requires each of the appropriate skills at level 1 as a minimum - Reverse engineering level 1, as well as the appropriate subsystem technology skill at level 1 for the different subsystem relics, and the additional skills based on the relic type: Armor Nanobot requires Hydromagnetic Physics. Electromechanical Components require Electronic Engineering, Power Cores require Quantum Physics, Thruster Sections require Rocket Science, and Weapon Subroutines require Plasma Physics.

Hull sections are a special case as they do not have a specific type Tech 3 datacore/skill required to produce them, and instead need Mechanical Engineering, Plasma Physics and Reverse engineering all at level 1. Note that these skills can be seen on the 'Bills of Materials' tab within the Ancient Relic itself if you look at its 'show info' screen.

It is surmised (although of course CCP would likely never commit to confirming it) that raising the skills beyond level 1 would improve the chance of success with the reverse engineering research operation. In fact it is very likely that a lot of the science skills would be up to level 4 at least as they are required as prerequisites for the subsystem technology skills themselves.

Once the skills are taken care of, the next task is to gather the materials. Each operation requires 3 of each of the 2 appropriate datacores (either W-Space type or standard type) based on the required skills on the Relic, one relic of any quality level (it is thought that the higher quality relics provide a higher success

chance, but figures are not available), and a 'R.A.M. - Hybrid Technology.' You will also need a Hybrid Tech Decryptor which comes in four types (one for each race) - this is used to determine the racial type output of the blueprint. All of these items are consumed upon carrying out the operation.

Finally, and perhaps the greatest change to this system over Invention is that you need to carry out this operation at a POS (or for those lucky people who have access to a Caldari Research Outpost in 0.0, this can be used as well.) A new module has been seeded on the market called an Experimental Laboratory. There is no security restriction on where this can be mounted (i.e. it can be fitted to a High Sec POS) but in itself, it only provides 'Reverse Engineering' slot types and nothing else, so it is a very specialised piece of equipment, but please remember that a module that is offline does not consume any POS resources so it can be turned on and off at whim when a reverse engineering operation is required. There are no publicly available reverse engineering slots in highsec/lowsec space (whilst 0.0 outposts could potentially be publicly accessible, it's very unlikely.)

The output of the Reverse Engineering operation is not as simple as with Invention, there is no yes/no boolean output. In fact, there are several stages of success ranging from a partial return of datacores or other consumables, and no blueprint to receiving a blueprint copy itself. At the time of writing there have only been 3 run 0 ME/PE blueprints recorded, and it is unknown if there is a rare chance to receive a higher success or lower success and have the ME/PE values modified as well as the number of runs, but after several weeks these have not appeared, so it is unlikely.

One other important note - when you are reverse engineering subsystem parts to create the appropriate subsystem blueprints, the blueprint that you will receive upon a success is randomly generated; there are several different types of each subsystem available.

### **At last... almost there**

The final stage of Tech 3 production involves the final assembly of the Tech 3 components into the Hull and Subsystems themselves. Again, this system is not as straight forward as it has been in the past Tech levels manufacture, and needs a POS module/Outpost factory line. The POS module required is known as a Subsystem Assembly Array, which can be set up anywhere as long as the power and CPU requirements are met, or if you have access to it, an Amarrian Factory Outpost can also be used. As well this issue over where the job can actually be ran, there is also an extensive list of skills to acquire before assembly can begin.

All of the Tech 3 blueprints (both the Hull and Subsystems) need Cruiser Construction skill – for hulls this is needed to level 5, whereas for subsystems it is needed to level 4 (you also need to keep in mind its prerequisite, Frigate Construction 4) as well as the appropriate Racial Starship skill, again for the Hull blueprint needs to be at level 5, whereas for the Subsystem blueprints, needs to be trained to level 4. The Hull blueprint needs Industry to level 5 (though this is not needed for the Subsystems) but each of the Subsystems all need Jury Rigging to level 5 to manufacture (note that this is likely to be the bottleneck to new Tech 3 producers as it is a relatively long skill to train, about 17-20 days or thereabouts from start to finish, and prior to this, it has not been required train it to such a high a level so many people will not have trained it.)

On top of that, there are specific skills required for each type of blueprint: Hulls require Mechanical Engineering 4. Each of the subsystems require their own Subsystem Technology skill to level 1 along with another stand alone skill: Defensive Subsystems require Electromagnetic Physics level 4; Electronic Subsystems require Electronic Engineering 4; Engineering subsystems require Mechanical Engineering 4; Offensive Subsystems require Plasma Physics 4; and finally, Propulsion Subsystems require Graviton Physics 4.

The complete list of components required for each subsystem (and the total needed therefore for a complete Strategic Cruiser) are indicated in the table below. Note that the quantities of components for each of the racial types of blueprint, and in the case of subsystems, the actual specific type of subsystem blueprint itself does not change. Its nice that at least it makes the logistics somewhat easier to organise compared to the absolute chaos and multitude of components involved in getting to this stage in the process.

	Hulls	Defensive Systems	Electronics Systems	Engineering Systems	Offensive Systems	Propulsion Systems	Total
Electromechanical Interface Nexus			1				1
Emergent Neurovisual Interface	1						1
Fullerene Intercalated Sheets	9	1	1	1	1	1	14
Fulleroferrrocene Power Conduits	2		1	1	1	1	6
Metallofullerene Plating	17	1	1	1	1	1	22
Nanowire Composites	22	1	1	1		1	26
Neurovisual Output Analyzer	1	1			1		3
Optimized Nano-engines				1			1
Reconfigured Subspace Calibrator						1	1
Reinforced Metallofullerene Alloys		1					1
Warfare Computation Core					1		1
R.A.M. Starship Tech (95% dam)	15						15

After the skill requirements are met, it is simply a factor of collecting the required hybrid components together (and in the case of the hull blueprint, some units of R.A.M. - Starship Tech) and setting the operation away within the Subsystem Assembly Array. After the manufacturing operation has completed, the process is therefore finished; you will be left with all the parts needed to successfully complete the final assembly of a Tech 3 Strategic Cruiser (and ultimately, a big juicy target) for your trouble.

I guess its easy when you see it written down over a few pages... now go out there and start filling the galaxy with them.