Science and Industry Guide for EVE Online
I. INTRODUCTION

1. To get things started...

Just to make it very clear from the beginning: this guide does not cover in any way, shape, or form, R&D agents.

This guide was written by GC13. Don’t go trying to steal it and post it as your own. If you want to post this guide on your site, then feel free to.

However, e-mail GC13 to tell him you’re doing it (make sure to include “Science and Industry Guide” in the subject). Not only can he then verify that you are giving him credit for his work, but he can also e-mail you every time the guide is updated (nothing annoys GC13 more than out of date copies of guides floating around the internet).

If you have any questions, corrections, then e-mail GC13 (again, make sure to include “Science and Industry Guide” in the subject). All ISK donations can be sent to the character GC13 (he’ll jump up and down with joy if he gets anything worthwhile) in-game.

2. Version history

02-23-2006: v0.92. Added the first data about Tech 2 research and production. Various clarifications.

02-03-2006: v0.91. Added information on obtaining blueprints, and a general section on using them. Added Deliver to the list of terminology.

01-25-2006: v0.9. Guide is put up, basically comPEete but lacking information about Tech2 production.

3. Terminology

First off, some simPEe terminology that will be used throughout the guide:

**BPO**: Blueprint original. Can be improved with research, and never runs out of licensed production runs.

**BPC**: Blueprint copy. Cannot be improved with research, and has a limited number of production runs.

**Licensed production runs**: How many more times a blueprint can be used to produce an item.

**Lab slot**: Any assembly line used for Material Research, Time Efficiency Research, or Copying.

**Factory slot**: An assembly line used for Manufacturing.

**ME**: Material Level. Increased by performing Material Research.

**PE**: Productivity Level. Increased by performing Time Efficiency Research.

**Run**: A single usage of a blueprint, be it increasing the ME or PE by 1, copying it once, or making one run’s worth of items (usually one, but can be one hundred for ammunition) with it.

**Job**: What gets submitted to the assembly lines. Consists of a certain number of runs, ranging from one and going to as many runs as you can comPEete in thirty days (the time limit for a job). A job cannot be cancelled once you accept the quote the installation gives you, so be very careful.

**Deliver**: Finishing a job. When a job is finished, the blueprint and finished goods are still nowhere to be found until you go to the Jobs tab of the Science and Industry interface, find the “Ready” job, and deliver it. This will PEace the blueprint and the goods in your hangar at the station you installed the job at (or, in the case of a job using your corporation’s blueprint, will put the blueprint back where it started and will PEace the goods where you told it to put them).
4. The anatomy of a blueprint

Attributes:

**Manufacturing Time**: The amount of time it would take somebody with level 0 in the Industry skill to build one run with this blueprint. Goes blank if any Time Efficiency Research has been done on the blueprint.

**Manufacturing Time (You)**: How long it would take you, with your current Industry skill level and all the Time Efficiency Research already done on the blueprint, to build one run with this blueprint.

**Material Level**: How many levels of Material Research that have been done on this blueprint.

**Wastage Factor**: The extra minerals it takes to make items with this blueprint, expressed as a proportion of what a perfect build would require.

**Research Material Time**: How long it would take someone with level 0 in the Metallurgy skill to perform one level of Material Research on this blueprint.

**Research Material Time (You)**: How long it would take you, with your current Metallurgy skill level, to perform one level of Material Research on this blueprint.

**Research Copy Time**: How long it would take someone with level 0 in the Science skill to make a blueprint copy from this blueprint with the maximum number of allowed licensed production runs.

**Research Copy Time (You Per Single Copy)**: How long it would take you, with your current Science skill, to make a blueprint copy, per production run in the job you have installed.

**Produces**: What you get when you perform a single run of this item in Manufacturing. Expressed as “Item name [number of items]”. Most items only give one item per run, but most ammunition give one hundred.

**Copy**: Whether or not this item is a blueprint copy. Blueprint copies cannot be used in lab slots.

**Research Productivity Time**: How long it would take someone with level 0 in the Research skill to perform one level of Time Efficiency Research on this blueprint.

**Research Productivity Time (You)**: How long it would take you, with your current Research skill level, to perform one level of Time Efficiency Research on this blueprint.

**Productivity Level**: How many levels of Time Efficiency Research that have been done on this blueprint.

**Licensed Production Runs Remaining**: How many more runs of Manufacturing this blueprint can be used for. Says “infinite” for BPOs and a few very, very old BPCs.

Bill of Materials:

**Skills**: Lists any skills you need to perform either manufacturing or research (specific to the tab) on this blueprint. Tech 1 stuff does not have any skill requirements, while Tech 2 requires level 5 in the job-specific skill (Research for Time Efficiency Research, for instance, or Industry for Manufacturing) as well as certain skill levels in R&D skills applicable to that blueprint.

**Materials**: Lists what it takes to perform one run of manufacturing or research (again, specific to the tab) on this blueprint (note that only tech level 2 blueprints need any materials to be researched). Unless you have Production Efficiency 5, it will display two values: “You” and “Perfect” here. The “You” value shows what it would take you to make a single run with the blueprint, while the “Perfect” value shows what somebody with Production Efficiency 5 needs. Note that this value’s name refers to your skills, and not the Material Level of the blueprint.

Tech 2 production will require R.Dbs for research and copying, R.A.M.s for manufacturing, and various consumer goods for both. Various components are used in constructing T2 ships, and Morphite and various reactions (produced at starbases with moon materials) can also be used to manufacture any T2 stuff.
5. **Obtaining a blueprint**

The easiest and most common way to get a blueprint is to buy the un-researched BPO off of the market. You can easily get any tech level 1 blueprint this way, and there is an unlimited stock of them. Certain blueprints are not sold by NPCs in certain regions, so the blueprint may be marked up by a PEayer reseller depending on where you are. A good way to be safe is to buy the blueprints for ships in a region belonging to that ship's race (buy Caldari blueprints in Lonetrek or The Forge, for example).

You can get BPCs for special ships (such as the Worm or the Caldari Navy Raven to name two) from agent offers (for the faction navy ships), or from doing certain comPEexes (for the pirate faction ships like the Worm).

There is also the possibility of buying off of escrow. Usually you'll just find short-run BPCs for ships (and sometimes ammo), but it's worth a shot if you want to make yourself or a friend a ship, but don't want to buy the BPO for it.

Finally, there is a trading channel for blueprints.

In order to obtain a tech level 2 BPO, you need to participate in the BPO lottery. I won't go into any sort of detail here, as there is an excellent guide to this (and the R&D agents which facilitate it) in the guides sticky thread in the Missions forum. Still, let it suffice to say that a very limited quantity of tech level 2 BPOs are distributed via this lottery, meaning they are very expensive to purchase (the only way to get them is in the lottery, or to buy them from people who won the lottery).

6. **Using your blueprints**

As with most things in Eve, right-clicking on your blueprints opens many doors. Right-clicking on any blueprint gives you the option to initiate any job with the blueprint. Once you choose the kind of job you want to start, it will then ask you to choose which assembly line you want to use. If the installation you want to use is at a station, you need to choose an installation at the same station the blueprint is in. If the installation is at a starbase, you can choose any starbase in the same solar system as the blueprint, so long as you are allowed to use that starbase.

It doesn't matter if you are using the blueprint while it's in your Items window at a space station, in your Assets window, or in the Science and Industry window: you need to right-click the blueprint to do anything with it.

It is also worth noting that after you submit a job, the server has marked down when the job will finish, and improving your skills (such as Industry for a manufacturing job) will not affect the time to finish that job.
II. NAVIGATING THE INTERFACE

The Science and Industry window has a lot of people confused, but at its heart it is very simple and intuitive. This interface is used to review what research and manufacturing jobs you have done, are currently doing, or are finished and waiting to be delivered.

**TAB 1: Jobs**

Here you have a few filtering options. The default should be on the “show less options” choice, which allows you to sort by the kind of Activity the job is, the State the job is in, and the Owner of the job. Selecting “show more options” opens up the ability to sort by the Creator, the Range, and the From/To dates.

These options give you great power in sifting through your past and current projects.

Activity allows you to choose whether you want to search for projects in Manufacturing, Material Research, Time Efficiency Research, Copying, or All activities.

State allows you to choose between Pending, In Progress, Ready, Delivered, or Any Active state. Pending projects are still in the queue, and work has not started on them yet. Projects that are In Progress are just what they say they are. Projects that are Ready are finished, and waiting for you to Deliver the blueprint and/or product. The Delivered option will show all projects that you have completed, and serve as a useful history tool.

Owner allows you to sort between jobs that are being done by you for you (“Me”), and by you for your corporation (“My Corporation”). Any job you start using a blueprint you use that is being stored at one of your corporation’s hangars will end up here.

Range allows you to choose whether you want to see jobs from the current station, solar system, constellation, or region.

From Date and To Date don’t seem to work at the moment.

**TAB 2: Blueprints**

For those with the Scientific Networking and Supply Chain Management skills, this is where the investment in those skills pays off. When you first open up the Blueprints tab, you are greeted with a list of the stations in the region that you have blueprints at. The bar for each station shows the usual information about a station (system, planet, moon, name) along with how many blueprints you have there and how many jumps away it is.

Expand a station to be greeted by a full list of all of your blueprints there. It shows their picture, gives the item name, tells what group (Frigate Blueprint, Missile Blueprint, etc...) the blueprint is in, whether or not the blueprint is a copy, its Material Level and Productivity Level (ME and PE), and (if the blueprint is a copy) how many runs are remaining on the copy.

The bottom of the screen tells you how many manufacturing and research jobs you can have active at any given time, as well as the range on your remote manufacturing and researching (“limited to stations” or “limited to 5 jumps” for instance).

You can start any job on any blueprint here by right-clicking on it just as you would at a station and choosing the kind of job you want to start. From there, it will prompt you to pick an installation (more information on that at the Installations tab), how many runs you want the job to go for, and allow you to change the input and output hangars.

Note that any blueprint that has not been used (copying, research, or manufacturing) cannot be “seen” by this tab, so they cannot be used remotely until you have been at the same station as the blueprint, right-clicked on it and chosen an activity to use it for, and gotten the game to try to send you to the quote screen. Note that this means it works just fine even if you choose an installation in a different system (which will make the blueprint viewable by this tab, but cannot start a job); all that matters is that it try to generate a quote.

Also note that you can do the same thing by locating your blueprint via the assets window, and right-clicking on it from there.

**TAB 3: Corp Blueprints**

This tab functions exactly like tab 2, except it shows blueprints in hangars rented by your corporation. Any jobs you start up from this tab (or, to be more precise, any jobs started up when the blueprint is in a corporate hangar) will show up under “My Corporation” for the “Owner” sorting option.
**TAB 4: Installations**

When you want to use a blueprint, you will inevitably be sent here to select the assembly line you want to use for the job you have chosen to perform.

Here you will find two of the same options that you also found on Tab 1, and some new ones. The Activity and Range options are the same as they were before. You can use the Location option to indicate whether you only want assembly lines located in stations, in assembly arrays, or either. You can select whether you want the assembly line to be Public, Personal, or belonging to your corporation. Finally, you can choose what Production Category and Production Group you want to be able to build. A Production Category is something broad, like Ships, while a Production Group is more specific, like Cruisers. All stations can Manufacture almost everything you could want, so simply selecting "All" will suffice for now (they can't produce everything, however; you need special facilities to manufacture things such as Titans, for instance).

After you have queried the database for a list of installations meeting your specification, you can select a station with the assembly lines on them in the top table, and a list of the assembly lines at that installation will appear in the table in the lower portion of the window. You can sort the assembly lines by time until the slot’s queue is empty (basically, this is how long it would take a job installed in that slot to even get started), install cost (the base fee you pay regardless of how long you are using the slot for), hourly rate, time multiPEier, and material multiPEier. At any given installation, the fees and multiPEiers should all be the same. Also, all stations should have a 1.0 time and material multiPEier. Starbase structures have bonuses here, and will show up as a number below 1.0. A 0.9 time multiPEier, for instance, means it only takes 90% as long to do the same job.

The three research options only require that the slot be able to make Blueprints, so you can filter out all the Manufacturing lines but show all three kinds of Research assembly lines by choosing “All activities” along with the “Manufacture and Research” Production category and the “Blueprints” production group.

You can only use a blueprint in an installation on the same space station the blueprint is located at (or, in the case of a starbase installation, at a starbase in the same system that the blueprint is located in a space station).
III. RESEARCH

1. Introduction to research

What is research, exactly? It does not really produce anything itself, yet is very valuable for those who do the production. Research is the fine, fine art of making it quicker, cheaper, and easier to manufacture the goods that the manufacturers (of which you may be one) build. Every blueprint benefits from being researched, and important blueprints can be heavily researched, then copied and distributed to corporation members and allies. All you need for this is one skill (Science), and an assembly line of the appropriate type. Are you interested? Then read on.

There are three ways you can use a lab slot on a blueprint: Material Research, Time Efficiency Research, and Copying. The first two improve a blueprint, while the last duplicates it.

*Material Research
Improves the Material Level of a blueprint, making it cost fewer minerals to build with.

*Time Efficiency Research
Improves the Productivity Level of a blueprint, decreasing the amount of time it takes to make an item.

*Copying
Duplicates a blueprint, leaving you with the original you copied, and a copy with a limited number of runs, and a Material Level and a Productivity Level equal to those of the original.

2. Vital skills

While you only need a single skill at level one (the generic “Science” skill) to operate a lab slot, there is a variety of skills that makes your research faster and easier, or lets you use more lab slots simultaneously.

Science (Rank 1)
5% reduction in time it takes to copy a blueprint per level.

*No prerequisites.

You need Science at level 1 to use any lab slots at all, though it does not give any bonus to maximum research jobs after that. Any dedicated researcher will want to raise it to level 4, as that is a prerequisite for Metallurgy.

Metallurgy (Rank 3)
5% reduction in time needed to conduct Material Research per level.

Requires Science to be at level 4.

A very important skill considering the importance of Material Research. It is highly recommended to take this to level 4 or 5.

Research (Rank 1)
5% reduction in time it takes to conduct Time Efficiency Research per level.

Requires Science to be at level 3.

Not as important as Metallurgy, given the lower level of importance placed on Time Efficiency Research. Still, if a researcher plans on performing Time Efficiency Research, then taking Research to at least level 3 is recommended.

Laboratory Operation (Rank 1) and Advanced Laboratory Operation (Rank 8)
Both allow the operation of one extra lab slot per level.

Laboratory Operation requires Science to be at level 3.
Advanced Laboratory Operation requires Science to be at level 3 and Laboratory Operation to be at level 5.

Very important for a researcher. Laboratory Operation at level 4 should be enough for the needs of most researchers, but busy ones always have the option to advance it to level 5 and take a few levels of Advanced Laboratory Operation.

Scientific Networking (Rank 3)
Allows the operation of lab slots from ranges greater than just the station you are currently in. At level 1, the range is any lab in the same solar system as you. At level 2, the range changes to any lab within five jumps of your present location. After that, the range continues to double until at level 5 you can operate any lab in the region.

Science needs to be at level 3 and Laboratory Operation needs to be at level 4.

This is a skill with a non-essential function, and a hefty 6.75 million ISK price tag. Still, it can be very convenient, as it allows you to locate all of your blueprints at a station in low-security space (with lower lab fees and shorter queues), where you can research them remotely and then make copies to take from the station if you need to manufacture with the blueprint.
**3. Material Research**

Most of the research performed on blueprints is Material Research (which is why almost all Material Research assembly lines, even those in the depths of low-security space, have a queue at all times). Quite simply, Material Research makes a blueprint cheaper to build with. Every blueprint has a "wastage factor" which increases the mineral cost to manufacture items with it beyond the mineral cost listed on the eve-online.com item database (which lists the perfect mineral requirements). For almost all blueprints, the base wastage factor is equal to 0.1, meaning that it takes 10% extra minerals to manufacture the item (note that some blueprints have a base wastage factor of 0.05).

Material Research decreases the wastage factor. The formula for the reduction means that your returns decline quickly. First, the formula for determining the blueprint’s wastage factor:

\[
\text{Wastage factor} = \frac{\text{Base Wastage Factor}}{(1 + \text{ME})}
\]

This means at a Material Level of one, you’ve already cut the wastage factor in half. By the time you are up to 4 ME, your wastage factor is only 0.02. Once you get up to 9, it’s only 0.01. Note that in order to halve the wastage factor again, you need to double the current ME and add one.

For instance at a ME of 9, you are only wasting 1% of the perfect mineral requirements. To only be wasting 0.5% of the perfect mineral requirements, you need to add another 9+1 to the ME, for a final ME of 19. The math here holds true, since 10% / (19+1) = 0.5%.

Note that those first nine levels of Material Research saved you an average of 9% / 9 levels = 1% per level. Those next ten levels (on their own) only saved you another 0.5%, divided by ten, for a total of 0.05% per level (or: 1% of what your first level of Material Research saved). These declining returns mean that after researching the first few levels on a blueprint and drastically lowering your mineral costs, you are left researching several levels (very easily twenty or more) to make one run of the blueprint cost one less unit of tritanium to build. Just be aware of this when deciding how long to research your blueprints.

In addition to the rapidly declining gains, there is a very finite amount of good that any amount of research you can do. Why research the ME to 100 when the blueprint is perfect (no more minerals can be saved) at a ME of 21?

To find the ME of a blueprint past which there is no gain to be had from doing Material Research, go to the Item Database on the official web site and look at the mineral requirements. These are the amount of minerals it takes to make an item with Production Efficiency 5, and a blueprint with a perfect ME. Take that number, divide by 5, and round down. That is the highest level that Material Research can have any effect on the blueprint’s waste material usage.

\[
\text{Max ME} = \left(\frac{\text{Highest required mineral at perfect build}}{5}\right) \text{ (round down)}
\]

For instance, to make one run of Small Lead Charge S takes 106 tritanium, 1 mexallon, and 2 isogen. 106 / 5 = 21.2. Rounded down, that equals 21: that blueprint’s perfect level of material efficiency.

**4. Time Efficiency Research**

Time Efficiency Research is often neglected. For instance, many of the blueprint copies you find on escrow have a ME above 20, yet their PE is still zero. It is also very easy to find an open assembly line for Time Efficiency Research (though in high-security space it will still be expensive, since the costs for all lab slots are the same) at any time and any PEace you choose. This is a bonus you should take advantage of: Time Efficiency Research works exactly like Material Research, except it reduces the time to manufacture (though its level for “perfection” would be different). Also, the “base time wastage factor” for all blueprints is 0.25, meaning each blueprint takes 125% as long to manufacture with as it theoretically should.

\[
\text{Time Wastage Factor} = \frac{0.25}{(1 + \text{PE})}
\]

Since the Productivity Level formula is the same as the Material Level formula (except with a different Base Wastage Factor), the declining returns are exactly the same: in order to halve the time wastage factor again, you need to double the current PE and add one.

**5. Copying**

When you copy a blueprint, you choose how many copies you want to make, and how many licensed runs you want to make. The end result when you deliver the job will of course be equal to the number you put into the "copies" box, and each of them will show as having a number of "licensed production runs remaining" equal to the number you put in the "licensed runs" box.

Unlike a blueprint original, which can be used any amount of times (they always show "Infinite" for "licensed production runs remaining"), a blueprint copy becomes useless when it has no production runs left. Also, a blueprint copy cannot be put into a lab slot, so you can neither improve its ME and PE, nor can you copy it.

While this limits BPCPs, it also makes them very valuable. You can copy blueprints and give the BPCPs to lower-level members of your corporation so that they can build with them, and you do not need to worry about them running off with a valuable BPO. Also, copying and selling ship blueprints on escrow is very popular (as escrow is flooded with these at any given time).
IV. MANUFACTURING

1. Introduction to Manufacturing

Manufacturing itself is rather straight-forward. You acquire a blueprint, whether it is a copy or an original, get the minerals needed to make the items you want to build, and then get a manufacturing assembly line to make the stuff with.

A problem that a lot of new to manufacturing seem to have is a very bad one for their finances: they are under the illusion that any minerals they mine themselves rather than buy off of the market are free. This is not the case, however; those minerals “cost” you what you could have sold them on the market for. Whether you’re making the items for your own use, for a friend or a corporation member, or to sell, this doesn’t change at all. When manufacturing, always check the prices in the region to see if it is cheaper for you to buy from someone else (and if they are close enough to you to be convenient, given the price gap).

2. Vital Skills

Like Research, only a single skill is needed to use a factory slot (the Industry skill). Still, there are other skills that make an manufacturer’s life easier, most important among them being Production Efficiency.

Production Efficiency (Rank 3)

4% reduction per level for material costs for manufacturing.

Requires Industry to be at level 3.

No matter how hard you look, you cannot find a more important skill for manufacturing to get to level 5 than Production Efficiency. Taking this from level 0 to level 5 means you can make 125% the product with the same amount of materials as you made before, and makes manufacturing much more profitable. Try to have this at level 4 at the very least before you do any major manufacturing.

Industry (Rank 1)

4% reduction in manufacturing time per level.

*No skill requirements

You need Industry at level one to be able to use a factory slot, though advancing it beyond one does not give any further bonus to the amount of factory slots you can operate at once. Aside from using it as a prerequisite for more important skills, there are no pressing reasons to raise Industry. Still, the time saved by increasing Industry can be helpful, and it’s only a rank 1 skill.

Mass Production (Rank 2) and Advanced Mass Production (Rank 8)

Both allow the operation of one extra factory slot per level.

Mass Production requires Industry to be at level 3.
Advanced Mass Production requires Industry to be at level 3 and Mass Production to be at level 5.

Like Laboratory Operation is for a researcher, Mass Production is important for the manufacturer. It is up to the individual manufacturer to decide how many factory slots they need to be able to use at once.

Supply Chain Management (Rank 3)

Allows the operation of factory slots from ranges greater than just the station you are currently in. At level 1, the range is any factory in the same solar system as you. At level 2, the range changes to any factory within five jumps of your present location. After that, the range continues to double until at level 5 you can operate any factory in the region.

Industry needs to be at level 3 and Mass Production needs to be at level 4.

Just like Scientific Networking, this skill is an expensive convenience. While it is not a requirement, it can save a manufacturer from having to do a lot of flying if their main manufacturing area is not close to their main area of operations.