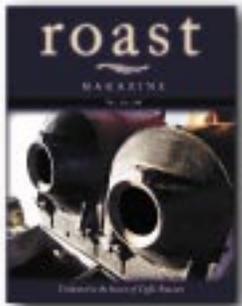


## ARTICLE REPRINT



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**TITLE** Setting Up a One-Roaster Plant: Creating your own production facility

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THE DECISION TO SET UP a production roasting facility is usually made in response to market demand. Perhaps you're coming from a retail store where you're roasting smaller quantities of coffee for walk-in customers and now you've landed some bigger accounts. Perhaps your locality has started to view on-site storefront roasting as a problem due to a changing neighborhood, a nuisance fire or roasting emissions. Or you may just want to shift your niche—from dealing directly with retail to wholesale roasting.

For any of these reasons, setting up a production facility can be the next step to growing your roasting business, and a one-roaster plant can be the perfect solution to your needs. With a capacity of up to 500 pounds per batch and up to four batches per hour, a one-roaster facility is large enough to meet most growing roasters' demands (up to several million pounds per year) while being a manageable step with the proper planning and preparation.

The single most important fact about setting up a production plant is that planning it up front will save time, money and headaches in the long run. The four major areas of consideration in setting up a new plant are budget, time, equipment and space. Knowing who you are and what you are trying to do as a company will be critical in defining your equipment and space needs. There are services available to help you with this definition process, including equipment manufacturers, consultants, and/or plant layout specialists. Your budget will determine whether your growth will be accomplished all at once or incrementally.

The following questions will give you an overview of the planning process. These questions purposely start with equipment needs and move to space requirements. This is because experience has taught us that it is more economical to inventory the pieces of

equipment you need to place in a space and note dimensions or spatial requirements for each piece, and then look for a building space that meets your needs. (Of course, it's possible that you could have a space first and then figure out how to fit the equipment in it, but committing to a space before you know you can fit everything in it can become more expensive if the equipment doesn't easily fit.)



### Question #1: What type of coffee business are you growing?

Before setting up a production facility, it's important to define your immediate goals. Will your business focus on whole bean, ground, flavored or a combination of these coffees? How much green bean and how many types will you be storing? Are you delivering or shipping roasted coffee daily, weekly or in some other

time frame? The answers to these questions will help to determine equipment needs (Figure 1) and space requirements and will have a direct impact on the project budget.

### Question #2: What type of roasting equipment should you consider?

A one-roaster plant is typically a batch-type facility with a 90- to 250-kilo (160–500 pound) roaster that can do one to four bags of coffee per batch. The two principle roasting technologies on the market are drum and fluidized bed, and a number of good roasters offer these technologies. Starting with the technology that you already know and like—the one that has gotten you where you are—means

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**FIGURE 1**  
**ONE-ROASTER PLANT EQUIPMENT REQUIREMENTS**

FOR WHOLE-BEAN ROASTING	FOR GROUND COFFEE	FOR FLAVORED COFFEE
Green bean storage	All of "Whole-Bean Roasting" (except transfer mechanisms do not have to be as gentle because breakage is not a concern)	All of "Whole-Bean Roasting"
Roaster		
Cooler		
Destoner		
Pollution control		
Gentle transfer mechanisms between pieces of equipment (so as not to break beans)	Grinder	If flavored coffee is ground also, all of "Ground Coffee" too
Blending area (if combining beans into custom blends)	Dedicated packaging equipment (if also doing whole bean, because changeover time from one to the other can be a consideration)	Dedicated packaging equipment (can be even more important here so that non-flavored varieties don't end up accidentally flavored)
Packaging equipment		
Finished product storage/warehousing		Ribbon blender and/or centrifugal mixer

a shorter learning curve and a seamless transition when growing to the next level.

If you are roasting coffee, regardless of whether you're offering whole bean, ground or flavored, you will need a roaster, cooler, destoner and pollution control. It is always best to stick with the roaster manufacturer's recommendations when selecting and combining these pieces of equipment. Using a spreadsheet to compare information on various packages can help you make an educated choice about the best dollar value for your needs.

**Question #3: New or used?**

Whether to buy new or used equipment is always a question, and the answer is new equipment is usually desirable if you can afford it. First and foremost, new equipment is guaranteed. It is in top condition, it is state-of-the-art, and it comes with manufacturer's support in the form of manuals, wiring diagrams, instructions and replacement parts.

Buying used equipment can be a viable option for incremental growth. But it can also be like buying an uncertified used car—will it include all the components you're expecting, and will they be in working order when they arrive? Moving used equipment and correcting unexpected deficiencies (missing equipment, non-

working components and mismatched equipment) can end up being nearly as expensive as buying new. Also, particularly with dated technologies, you may not have access to manufacturer's support such as manuals, wiring diagrams, instructions and replacement parts.

Before you buy used equipment, watch it in operation if possible, know your seller and/or check references, and get a second opinion on exactly what it will take to make the equipment operational in your particular facility. In the used equipment world as in the used car world, if the deal sounds too good to be true, it probably is, so buyer beware.

**Question #4: What about pollution control?**

Pollution control is an important consideration in this day and age. I recommend addressing it up front, even if it doesn't seem to be an immediate issue with your location, because eventually it will become one. As hard as it is for coffee lovers to believe, just one complaint about the aroma of coffee in the air, even in an industrial area, can lead to expensive repercussions in terms of time, money and public relations.

The type of pollution control device needs to be matched to your roaster and will probably be some sort of afterburner/thermal control. These are easier and less expensive to install and integrate when first setting up a plant than to retrofit later (although that can certainly be done). Addressing the issue up front also shows a sense of responsibility, which can win points down the road.

**Question #5: What other equipment do you need?**

Again, some of this depends on your business focus, but all roasting plants will need to address conveying and storage (before and after packaging) and packaging. Whole-bean suppliers will need to opt for gentler conveying mechanisms, so as not to damage product. Ground and/or flavored coffee purveyors will need to factor in additional equipment, such as grinders, ribbon blenders and centrifugal mixers.

The keys to successful equipment planning are defining your process flow goals and keeping the individual pieces of equipment that implement the flow in balance with each other in terms of their capacities. For example, it doesn't usually make sense to pair a single roaster that produces up to 500 pounds of coffee per batch with a packaging machine that handles 10,000 pounds per hour. While it

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may sound like you're anticipating growth to do so, you either won't have enough product to keep the packaging machine running in an efficient way, or you will need to buy more bin space to store enough roasted coffee to operate the packaging machine efficiently.

Storage space before packaging will depend on your packaging schedule. If you're storing only for hours or days, you can probably skip pricey, big bins and opt instead for mobile plastic or metal totes or fabric bulk sacks (bulk bags). Totes tend to be more expensive and take up more space than bulk bags, which can be folded up when not in use. On the other hand, bulk bags need to be replaced more often.

After-packing storage (warehousing) can just be shelving. The amount required is also estimated, this time based on delivery schedules. The key question is how much packed coffee do you need to store and for how long?

The packaging process again is a function of what you're selling—whole-bean, ground, pillow-pouch square-bottom bag. Packing whole-bean coffee can still be most economical with a weigh scale and hand bagger. For ground coffee, a single tube machine will form, fill and seal, and degassing of ground coffee can be accomplished in the totes or bulk sacks. Dedicated packaging equipment can become a consideration when your product line features more than one product, such as whole-bean, and/or ground, and/or flavored coffees, as the changeover between types can be time-consuming and labor-intensive as you work to remove all residue of the other type to prevent cross-contamination.

In addition, ground coffee suppliers moving into a production mode will eventually want to step up from a plate mill to a roll mill to support business growth. When you get to the higher production end of a one-roaster plant and consider a larger grinder, you should also consider an exchange head program with the manufacturer, in which a worn grinder head is swapped out for a sharpened one as required.

### Question #6: What is your ideal building?

The old adage of "location, location, location" is true even in coffee. Make sure that the building you choose is in an industrially friendly location, or you may have to move again sooner than you'd planned. In addition to emissions, you need to factor in traffic, parking and hours of operation—all of which can become issues with neighbors, particularly in neighborhoods that are being reborn with new or updated housing. For ease of your operations, good highway access is a plus, and a loading dock is an important feature.

Also, be sure to factor into your budget the ingress and egress from the building. If your equipment will not fit through existing doors, loading docks, stairwells or elevators, there will be additional expense to break it down and reassemble it.

### Question #7: What type of floor space do you need?

When determining the floor space requirements for a one-roaster plant, you need to factor in the following areas and/or pieces of equipment and allot floor space based on equipment size and/or amount of green and finished bean requiring storage at one time:

- Green bean receiving and storage
- Roaster/cooler/destoner/pollution control
- Roasted storage
- Blending area
- Flavoring area (if applicable)
- Grinder (if applicable)
- Packaging machine(s)
- Packed storage
- Shipping
- Transfer mechanisms between all of the above
- Office space

If you can, allow room for your short-term and long-term growth requirements. For example, you may want to start production roasting by offering roasted whole-bean and ground coffee, even though down the road you'd like to introduce flavored beans.

It might help you postpone a subsequent move if you can afford a little extra floor space with future goals in mind. From the beginning, leave aisle space for moving product (this can be anything from a tote or a bulk sack to a fork truck carrying a skid of green). In addition, you will need access around the equipment for maintenance.

### Question #8: Have you thought vertically?

An often overlooked but very significant factor in building selection is ceiling height, with 25 to 45 feet being optimum. A high ceiling

means fewer pieces of conveying equipment and lower energy costs as you let gravity work for you. One vertical conveying system with well-planned distribution, for example, can feed several pieces of equipment (blending, storage, flavoring, grinding and packaging).

Vertical space can also allow for future growth—codes, construction and landlord permitting—with opportunities for mezzanines which can become platforms for production, storage and office space.

Finally, from an installation and maintenance perspective, a high ceiling permits access, which can help to minimize costs.

### Question #9: What about utilities?

Utilities can kill you—or they can at least kill your budget. Be sure that the building you’re considering has enough gas/oil/propane, electric, water and drainage to meet the combined requirements of the equipment you’re installing. More than one roasting plant has added to a budget by boosting gas pressure or changing electric service to meet equipment needs.

### Question #10: Did you remember roof penetrations?

Before signing anything, be sure that codes and landlords permit roof penetrations for the stacks required by the roaster, cooler, destoner and pollution control. You should always have roof penetrations performed by qualified roofers to be sure that stacks and flashings are correctly installed, which will help to prevent problems down the road.



### Question #11: How will you place and install equipment?

Equipment placement and installation involves rigging, material handling and re-assembling, and it is more economically accomplished when the site is ready. This might sound obvious ahead of time, but it is easy to get caught between honoring leases, meeting production demands and dealing with site issues. You may be up against a move deadline and have a loading dock in the new facility that isn’t finished or a parking lot that’s a sea of mud, or utilities that aren’t available but are necessary to operate the power tools required to assemble the equipment.

An experienced project manager can be a worthwhile investment so that you can run the business you have while the new location is coming together.

Actual placing and assembling of equipment involves the following:

- planning space allocation
- placing larger pieces of equipment in the desired locations (roaster, cooler, destoner, pollution control, elevator or conveyor [if applicable], grinder [if applicable], packaging machine [if applicable])
- re-assembling equipment pieces that have arrived partially assembled for shipping purposes
- connecting pieces of equipment and running process piping as required
- running vent piping to meet roof penetrations
- hooking up utilities
- performing start-up to be sure that everything has been integrated correctly and is functioning properly (and fine-tuning it if it isn’t).

The amount of time it takes to set up a new roasting plant depends on planning, coordination and budget. Help and advice are available along the way from manufacturers, plant layout and installation specialists, and project managers. Once the building is ready and the equipment is on site, you can be roasting in a couple of weeks.



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