OPERATING AND MAINTENANCE TIPS

Natural gas foodservice equipment

CenterPoint® Energy

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Introduction

In the last several years, we have seen improvements in natural gas-fired commercial cooking equipment. Greater efficiency and performance give you, the end-use customer, an opportunity to increase your profits. But, to enjoy all the savings and convenience this equipment offers, it is important to use and maintain it properly.

This booklet is designed to be a working document, one that you keep handy for reference in or near your kitchen. It includes descriptions of major categories of natural gas commercial cooking equipment and tips for their efficient use. There are basic, everyday energy-saving principles, maintenance practices and operational tips that will help you get the most value from your natural gas equipment.

There is also space for you to make notes about each type of equipment.

HACCP food safety standards

Hazard Analysis and Critical Control Points (HACCP) system, the concept of "preventing a problem before it occurs," is becoming the international norm for food safety. Certain key steps within food preparation processes are critical to the safety of the final product. They can be identified by conducting a systematic hazard analysis for the food and its preparation process. These critical points and their successful management are the basis of the HACCP approach. Whereas previous systems relied on spot-checking, this system provides controls for specific critical points.

There are seven steps to a HACCP system:

1. Assess the hazards
2. Identify critical control points
3. Set up control procedures and standards for critical control points
4. Monitor the critical control points
5. Take the proper corrective actions
6. Establish effective record keeping
7. Verify the system is working

A well-run HACCP system can control each critical point to eliminate hazards.

CONTENTS

BASICS

NOTES:

Natural gas equipment basics

Benefits of natural gas cooking equipment

There are several reasons why the best chefs, as well as most foodservice operators, prefer natural gas cooking equipment, including:

- Instant on/off and precise heat control
- Reliability and easy, inexpensive maintenance
- High quality results
- Easy to clean
- 1/3 carbon footprint of electricity, natural gas is the cleanest burning fossil fuel

And, natural gas gives you more for your energy dollars. When used properly, new natural gas cooking equipment can save 50 percent or more in operating costs over electric.

Installation of natural gas equipment

Quick connect-disconnect couplings with heavy-duty flexible hoses allow commercial cooking equipment to be mounted on casters. This adds portability, increased flexibility and improved sanitation and safety for commercial kitchens. In a matter of seconds, the natural gas source can be shut off and disconnected and the equipment moved for cleaning. It's easy to reconnect when the equipment is back in place.

The use of a flexible gas connector with a quick disconnect coupling is required for the installation of equipment on casters by the ANSI Z21.69 Standard. In addition to the gas connector, a restraining cable and manual shut-off are required. Be sure to use heavy duty, locking casters for safety and easy moving.

If pressure regulators are not included on the equipment, they should be added when it is installed.

Ventilation of foodservice equipment

Code states that all commercial cooking equipment and dish machines that produce smoke, fumes, grease-laden vapors, steam or condensate must be ventilated and exhausted. This includes both natural gas-fired and electric equipment.

Follow National Fire Protection Standards. For local codes, check with the Environmental Health Department. Follow proper ventilation procedures and keep filters and hoods clean. These measures will help ensure the safe, efficient operation of your cooking equipment.

Three methods of heat transfer

1. Conduction

2. Convection

3. Radiation

Types of ranges

There are two types of ranges, heavy-duty and restaurant style. Restaurant ranges typically vary from 24" to 72" in length and from 30" to 36" in depth. Heavy duty ranges vary in width from 32" to 36" in length and are usually 42" in depth.

Top variations for both types include: open burners; graduated heat or hot tops; even heat or uniform hot tops; fry and griddle tops; and candy stove burners. Range ovens can be conventional or convection.

Open burner range

An open burner range is a versatile and adaptable basic in all kitchens. Open burners have 15,000 to 40,000 Btu of input per burner. A visible heat source allows you to make instant and accurate flame adjustments.

Hot top range or French top range

A hot top range has a flat, solid 1/4" to 3/4" cast iron or steel top. Operators may choose between two burner configurations: concentric for sautéing in an à la carte line; or straight line for boiling, stewing or simmering in a production kitchen.

Griddle top

These units have a 1/2" to 1" rolled steel top with splash guard sides and drip drawer, with burners every 12".

Tips for efficient use of range tops

- When using open top burners, regulate flame to be 1" less in diameter than the pan. Use this flame to start foods cooking quickly; reduce flame to simmer foods. Too high a flame wastes gas. Adjust the flame to fit the pan and the cooking requirements.
- Use flat bottom pots to absorb more heat, with tight-fitting lids to keep in heat.
- Allow only 10 to 15 minutes preheat time on solid tops.
- Plan cooking to make full use of the top, grouping pots and pans to get maximum use.
- Use open-top burners for quick and small cooking jobs rather than heating a large piece of equipment.
- Turn off burners when not in use.

Care

- On an open top range, after top grids are entirely cooled, scrape off encrusted matter and soak in water and a good grease solvent. Clean clogged burner ports with stiff wire or pipe cleaner.
- On a closed top range, after top plates have cooled, rub vigorously with steel wool. Remove any cooked food lodged under burners, lids, rings or plates. Never pour water over range top. Turn burner valve handles gently. Keep them greased with special high temperature valve grease.
- Use sealing strips on range batteries. The strips snap on easily and make a positive seal between adjoining ranges, keeping the range sides free of spilled food.
- Always follow the manufacturer's cleaning and maintenance instructions.

RANGES

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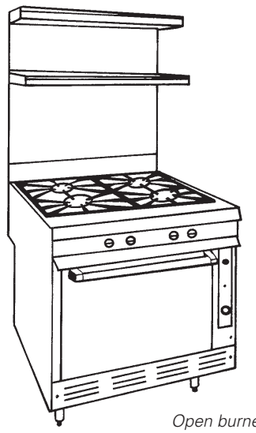
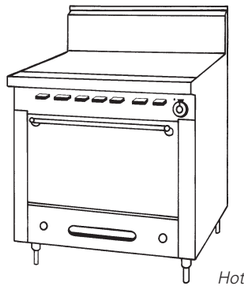


Open burner range



Hot top range

OVENS

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Types of ovens

Deck ovens – bake/roast and pizza

These are high production gas ovens. For baking and roasting, pans of food are placed on the hearth. In a pizza deck oven, the pizza is placed directly on the stone or metal deck hearth. Usually two or more decks are stacked to provide greater capacity and versatility in the same floor space. Deck heights vary to accommodate special cooking needs: Pizza deck, 6" to 7"; bake deck, 7" to 8", roast deck, 12" to 20". Pizza deck ovens have a high Btu input and higher temperature controls.

Revolving oven

Revolving ovens are high production pieces that use a Ferris wheel-type assembly to rotate trays within the oven cavity. Trays revolve on pivot mounts attached to two wheels that rotate; food, which is on pans, is loaded on the trays as they pass the opening. These ovens are typically built on site and are sized according to the number of pans they will hold when fully loaded.

Rack oven

Product is placed on sheet pans which are loaded on mobile racks. The loaded racks are then rolled into the oven. A rotation system is activated when doors close, providing fast cook times and even browning. After cooking is complete, the racks are rolled out and moved to an unloading station. These ovens are available in a variety of sizes and capacities to suit more applications. They are capable of producing thousands of identical products or many diverse menu items quickly in the same cooking oven cavity. Steam injection is a nice option, especially for bread products.

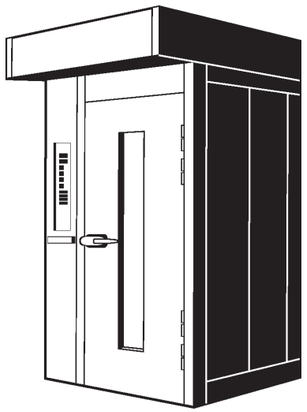
Conveyor ovens

Conveyor ovens move food products through a heated chamber at a constant speed; a high-speed fan distributes heat.

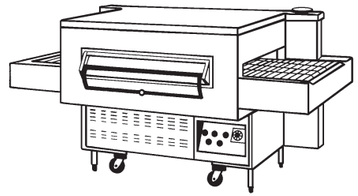
Because of intense temperatures, conveyor ovens generally will bake, reheat and finish food products two to four times faster than conventional ovens. Once you have determined proper temperature and conveyor speed settings, you can expect consistent cooking results with no undercooking or overcooking and minimal waste. Because heat zones and conveyor speed can be controlled, they're ideal for custom jobs such as browning cheese on entrées, or on French onion soup; as well as baking the perfect pizza.

When testing the oven with a new food item, lower the conventional oven recipe cooking time by one-half and the cooking temperature by 25°. Adjust time, temperature and distribution plates until the proper color and degree of doneness are reached.

Conveyor ovens save space too. Up to three decks can be stacked, or you can link them in tandem.



Rack oven



Conveyor oven

Convection oven
The convection oven is ideal for baking, roasting and broiling. Convection ovens save energy by cooking at lower temperatures for 1/4 to 1/3 less time than conventional ovens. A fan inside the oven moves heated air around the oven interior for rapid defrosting, reheating, roasting and baking. Lower temperatures approximately 50° for recipes written for a conventional or deck oven; up to 100° for yeast products. If the product cooks or browns too quickly around the edges, lower the temperature.

Tips for efficient use of ovens

- When installing, be sure that the oven is level front to back and side to side to allow for even baking.
- Preheat to exact temperature, for only the amount of time recommended by the manufacturer.
- Fill oven to capacity to reduce operating costs. With large ovens, plan baking and roasting so you won't have to bring the oven to full heat more than once or twice a day.
- Use slow roasting to reduce meat shrinkage and save gas. The results will be more attractive and tastier food.
- Use a meat thermometer for accuracy.
- When using a convection oven, cook with the fan on at all times. Use the right kind of pan for the job, with proper airflow around pans.
- Use temperature guides and timers to avoid unnecessarily opening oven doors.
- Don't use two ovens when one will do.
- Turn oven off when not in use.

Care

- Be sure doors close tightly so no heat escapes. Guard against broken door hinges and cracks that allow heat to escape by carefully cleaning all crumbs and encrusted matter from around opening.
- Ovens last longer and operate at maximum efficiency when regularly cleaned.
- Encrusted bottoms and linings destroy sheet metal. Remove boilovers and spillovers promptly before material has time to carbonize.
- Wait until oven is cool and then wipe bottoms and linings with damp cloth.
- Never throw water on oven decks to cool them.
- Don't slam or stand on oven doors.
- Avoid getting caustic cleaning compounds on thermostat tube.
- Always follow the manufacturer's cleaning and maintenance instructions.

Convection oven

OVENS

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STEAM EQUIPMENT

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Types of steam equipment

Steam cooking is extremely fast and efficient. There are two main types of steamers: compartment, either atmospheric or pressure; and kettles, either fully or partially jacketed which can be mounted on the floor, wall or counter.

In compartment steamers, food is cooked in steam table pans, either solid or perforated. With a kettle, the food is placed directly into the kettle for cooking. The quality of water going into any steam equipment should be tested and treated accordingly.

Compartment steamers

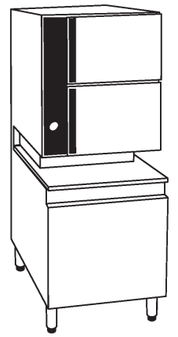
Pressureless /atmospheric steamer
Compartment steamers are available in either boiler, boilerless, or connectionless models. Steam that is provided by a boiler can be part of the steam unit (self-contained), shared with other equipment, or come from a central boiler (direct steam). Because it provides a constant exchange of fresh steam, there is no transfer of flavors so dissimilar foods such as seafood and rice can be cooked at the same time. It is also ideal for frozen products and on-line cooking. Cooking is done at zero pressure (i.e. the term pressureless) and therefore the door can be opened at any time during the cooking cycle.

Pressure steamer
Steam in this unit is pressurized, usually from five to 15 psi. For each pound of pressure, the temperature will rise 3° above 212 F. These steamers must be depressurized and the steam allowed to escape before opening the door. They are ideal for large production cooking such as commissaries, schools, health care or prep lines.

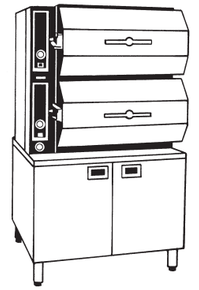
Boilerless/connectionless
Compartment steamers are also available in boilerless models or connectionless. The boilerless units produce steam when water comes in contact with heat exchanger tubes. Some models incorporate gas heated steam generating reservoirs and some use infrared burners. Connectionless units are boilerless with no water connection. Water is manually placed into the steamers and removed at the end of the day. These units are ideal for locations where water hook up is unavailable or too costly. The advantage of both units is that there is no boiler to maintain.

Steam-jacketed kettles

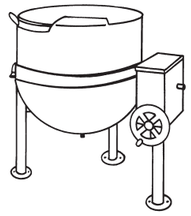
A steam-jacketed kettle is a pot within a pot, with steam trapped in the space between the walls. Kettles are either fully jacketed (walled) or partially jacketed (walled). They are available in either floor, wall or counter mounted. Tilting kettles are available and called trunion. Steam is supplied from a self-contained boiler or from a shared or remote source. A major benefit of the steam jacketed kettle is that it cooks extremely fast without scorching or hot spots. Kettles are ideal for soups, sauces, pie fillings, poultry, vegetables, meat fillings, stews,



Pressureless steamer



Pressure steamer



Steam jacketed kettle

gravies, boiling bagels, pastas, rice, reheating pouch prepared food and cook chill casings. Anything that is normally cooked on the stove top can be done faster, better and using much less energy.

Tips for efficient use of steamers

- Use 1", 2" or 4" perforated pans for most foods and preheat steam equipment for 10 minutes.
- Cook full loads whenever possible.
- Use pressureless steamers for frozen and fresh products.
- Use only as much liquid as necessary in steam-jacketed kettles.

Care

- Keep compartments and kettle valves free of accumulated food.
- Clean and wipe out all compartments daily. Remove shelves, supports and screens and wash in dish machine.
- Clean and wipe gaskets regularly and keep an extra gasket on hand for easy replacement.
- Test and treat water as necessary, to prevent mineral deposits in boilers which lowers the efficiency of the unit.
- To clean a kettle, close drain and fill with hot water and detergent above the soil level; turn steamer on low and use brush for cleaning. Drain, rinse, and wipe dry.
- Always follow manufacturer's cleaning, de-liming and boiler maintenance instructions.

This large, floor mounted steam-jacketed kettle cooks food quickly without hot spots or scorching. Anything normally cooked via stovetop can be done better, faster and with less energy using steam.

STEAM EQUIPMENT

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COMBI OVENS

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Combi ovens

The combi oven is like having three units in one footprint: a pressureless steamer, convection oven and convection oven with steam injection. You can choose the cooking method that meets your cooking needs rather than scheduling around the limitations of the equipment. Use the convection oven for baking, roasting and broiling; pressureless steam for vegetables, eggs, seafood and gentle reheating. Apply benefits of both convection and steam cooking in the combi mode for crusty breads, juicy meats, poultry, fish and baked dishes.

Programmable recipes and self-cleaning options add more value by providing consistent, high-quality products and reducing labor.

Tips for efficient use of combi ovens

- Combi ovens allow for multi-step programming. For example: Set the convection mode to 450 F to quickly brown a turkey for 10 minutes, then drop the temperature to 300 F and use the combi mode for 50 minutes to complete cooking. Once an operator perfects a recipe, it can be saved for future use.
- Combi cooking will require adjustments to normal procedures. A general rule is to reduce the cooking temperature 50° from your conventional cooking temperature and check your food in half the normal time. By keeping notes on the procedures, you will soon know what combination of time and temperature works best to produce the desired results.
- For greatest efficiency, load oven to capacity whenever possible.
- Preheat the oven for five to eight minutes and turn off as soon as cooking is complete.
- To change from the convection or combi mode to steam mode, reduce the oven cavity temperature by opening the door and turning on the fan for five to ten minutes.
- Do not cover foods, because covering inhibits the cooking process.

Care

To maintain operating efficiency and extend the life of your natural gas combi oven:

- Many manufacturers offer a self-cleaning cycle and most have a water spray arm for easier cleaning.
- De-lime boiler units regularly to keep the steam boiler and generator free of mineral deposits. How often you de-lime will depend on your oven usage and how hard your water is.
- Wipe up spills in the cavity daily.
- Use the steam mode to loosen oven soil.
- Always follow manufacturer's cleaning and maintenance instructions.

The Foodservice Learning Center features the latest in energy-efficient foodservice equipment being used today.

Types of griddles

Griddles are usually made of flat steel or chromium-coated steel, with a grooved or smooth surface. Plated tops require a lower operating temperature. Surface edges are raised or have gutters and a drain hole leading to a catch trough or pan. Griddles are under-fired by rows of controlled gas burners. Thermostatic controls allow best control during use. Some models save even more with infrared burners, which shorten preheating and recovery times.

Smooth surface griddle
This griddle is a flat 3/4" to 1" thick plate and operates at lower temperatures than charbroilers, normally between 300 to 350 F. Steam heated griddles are available with no hot and cold spots.

Grooved griddle
A grooved griddle has a slightly sloping top with raised ridges. The ridges give steaks and fish the markings of a charbroiler without the smoke or flare-ups.

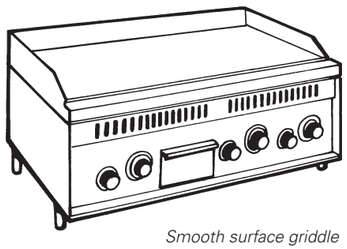
Clam shell
These two-sided griddles speed cook time by cooking both sides at the same time.

Tips for efficient use of griddles

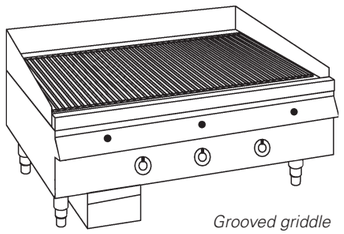
- Never overheat a griddle in the interest of speed. It wastes gas and results in an unsatisfactory product. Only heavy griddling requires burner on full heat. For light griddling, use a low or medium flame.
- During slack periods, turn down the burners. For best results, select a griddle with thermostats.
- Preheat for only 10 to 15 minutes.
- Turn controls down or off on unused portions of griddle.

Care

- Remove accumulated carbonized coating on surface. Wipe frequently with heavy grease absorbent cloth; clean surface while still warm, following manufacturer's instructions.
- Use spatula or metal scraper to keep surface free of food particles; be careful not to scratch.
- Coat entire surface with a thin layer of cooking oil to season.
- Empty and wash grease receptacle daily, more often if heavily used.
- Always follow manufacturer's cleaning and maintenance instructions.



Smooth surface griddle



Grooved griddle

GRIDDLES

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BROILERS

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Types of broilers

Broiling is cooking by direct heat transfer. Broilers come in floor or counter sizes, and space-saving salamander style.

Overfired broilers

Upright
In this overfired broiler, heat from gas-fired ceramic infrared burners or metal radiant burners is radiated downward onto a cooking grid. The grid retains heat and gives food cosmetic markings. It can be raised or lowered and rolled in or out. Infrared burners cook much faster than standard radiant burners. The upright broiler is typically found in high-volume steak houses.

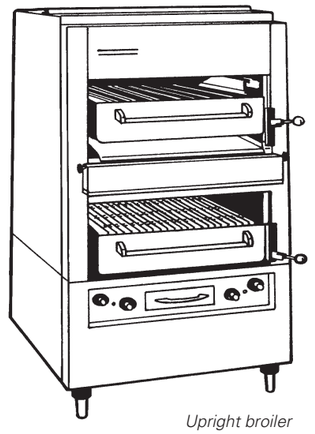
Salamander broiler
If your space is limited and/or your production needs are small, consider the space-saving salamander broiler. It is simply a smaller version of an upright overfired broiler; it is usually mounted over a range. The salamander broiler is typically used for browning individual servings, broiling a small amount of meat or seafood entrees, as well as melting cheese.

Cheesemelter
Cheesemelters do several small but important jobs, such as final heating or finishing off food items. They are not designed to broil meat. Most use infrared burners and are mounted on a wall or over a range.

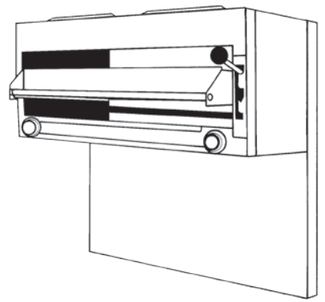
Underfired broilers

Charbroiler
Charbroilers are underfired with burners that heat ceramic or volcanic briquettes or radiants that then radiate heat upward to stationary cooking grids. The grid produces cosmetic markings on the food. Melting fat drips on the briquettes or radiants and burns, giving foods a char flavor and aroma that is associated with charbroiling.

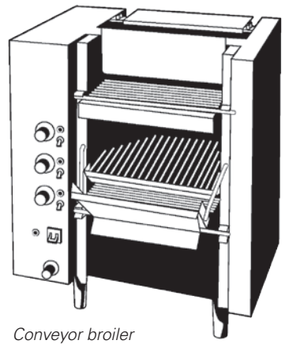
Conveyor broiler
Conveyor broilers are designed to deliver consistent, high volume, automated food preparation. Found in fast food chains, universities, theme parks and sports stadiums, these broilers are capable of simultaneously cooking the top and bottom of food products. Using one to four metal conveyer belts, each belt's speed is individually regulated to produce the best possible cooking results. Food is placed directly on the conveyer, and requires minimum handling and no turning.



Upright broiler



Salamander broiler



Conveyor broiler

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Tips for efficient use of broilers

- Because gas broilers heat very quickly (90 seconds to 5 minutes), turn the flame low between broiling jobs.
- During slack periods, turn off the broiler.
- Infrared broilers preheat quickly and can be turned off after each use.
- Operate just part of a multiple burner unit during slow periods to save gas; use the full broiler only when the work load is heavy.
- Check the flame. It should be clear with a distinct inner cone. Flames should never be flat or strike directly on refractor elements but should just wipe the surfaces. Excessive smoking may be caused by faulty burner operation.

Care

- Empty grease pan and thoroughly wash and dry.
- Remove grids and scrub them with a soft wire brush in detergent and water in the pot sink.
- Wash drip shields and broiler exterior with detergent and hot water. For stainless steel finish, rinse well with a solution of 1/4 cup vinegar to 1 quart water; dry.
- Clean spilled food from burner ports with stiff wire brush if necessary.
- Scrape the inside panels of the salamander or cheesemelter with a long-handled scraper and wipe with a coarse cloth soaked in detergent and hot water. Do not use abrasives or caustics.
- Wipe exterior of unit with a cloth dampened in detergent and hot water. Wipe off with fresh hot water.
- Always follow manufacturer's cleaning and maintenance instructions.

A perfectly broiled Tomahawk ribeye is shown after being prepared in a natural gas infrared upright broiler at the Pittsburgh Blue restaurant.

BROILERS

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FRYERS

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Types of fryers

There are three types of fryers: general purpose, pressure and specialty such as donut, bakery and chicken or fish fryers. Some models use infrared burners, advanced heat exchangers and or special baffle systems for greater efficiency and faster preheat and cook times. Some fryers offer computerized control devices for temperature and time, automatic basket lifts and optional built-in filter systems.

General purpose fryer
In a general purpose fryer, burners running through tubes or underneath the unit heat a vat or multiple cooking vats. Heat recovery systems are available in some models with baffles and heat exchangers. Baskets of food are submerged in shortening heated from 300 to 350 F. Foods are often coated with batter or breaded to lock in moisture and preserve texture.

Pressure fryer
A pressure fryer has an airtight kettle that traps steam from the product and increases the pressure inside the fry pot.

In an open fryer, food never heats higher than 212 F internally, regardless of shortening temperature. In a pressure fryer, the temperature increases 3° for each pound of pressure.

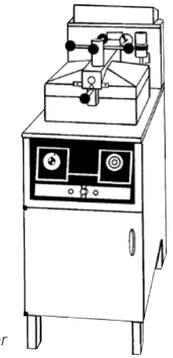
These are designed for volume production. Because of the pressure, they can operate at lower temperatures, thereby prolonging shortening life.

Tips for efficient use of fryers

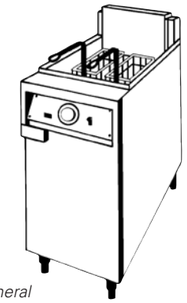
- Before lighting burners, fill with liquid or solid shortening around tubes or in a fryer pot to melt fat at low temperature. Some fryers have melt cycle controls.
- In high-speed fryers, temperatures ranging from 325 to 350 F are ideal for most types of fried foods.
- Smoking fat usually means the temperature is too high or the fat is broken down.
- Filter the fat regularly to avoid transfer of flavors.
- Remove as much moisture as possible from fresh food products before frying.
- Avoid frying salted foods, and never salt or coat (i.e. breading, flouring, etc.) directly over the fryer.
- Set thermostat at desired temperature and limit preheat time to 5 to 10 minutes.
- Do not allow the temperature to exceed 360 F. When using several fryers, turn off those not needed during slack periods.

Care

- Remove accumulated crumbs from fryer pot
- Filter shortening regularly
- Always follow manufacturer's cleaning and maintenance instructions



Pressure fryer



General purpose fryer

Tilting braising pans

This versatile, high-production piece of equipment serves many cooking needs. Use it to braise, sauté, stew, boil, simmer, steam, pan fry, grill, roast, proof dough or, as a bain marie to hold foods hot. Its thermostatic controls allows it to maintain constant cooking temperatures and, with the cover, help keep your kitchen cooler and save energy.

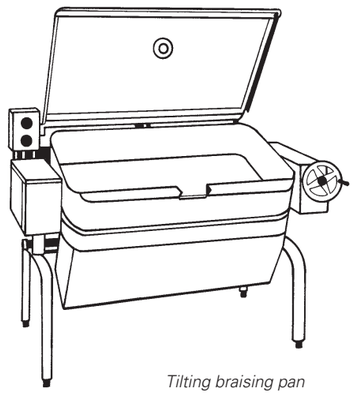
Because food can be transferred directly from the tilting pan to serving pan with perfect control, there is no ladling and heavy lifting. The tilting pan can reduce total cooking time by up to 25 percent.

Tips for efficient use of tilting braising pans

- Always preheat and allow to cycle for most satisfactory results.
- When using for oven-type roasting, reduce time from 1/2 to 1/3 of that called for in a standard oven. Set at 200 F for simmering or for milk-based products to prevent scorching.
- Prepare two different products at the same time by putting them into two containers inside the pan.
- Steam converter kits are available.
- For most efficient use, have a water line and drain as part of the installation.

Care

- Clean with mild detergent and brush after each use. Presoak if necessary.
- Water, waste and scraps are easily removed into a receiving pan for disposal.
- Always follow manufacturer's cleaning and maintenance instructions.



Tilting braising pan

TILTING BRAISING PANS

NOTES:

BBQ/ ROTISSERIE OVENS

NOTES:

BBQ/Rotisserie ovens

Dependable and energy-efficient gas rotisserie ovens offer a unique opportunity to simultaneously cook and display a variety of foods. The constant turning and even heat exposure preserves moisture. This cooking method, when combined with your signature sauce or seasoning, will bring customers back again and again.

Some natural gas rotisserie ovens use an energy efficient infrared burner, which penetrates quickly into the product to avoid dryness, yet ensures a thoroughly cooked product. Some units have a second radiant burner, which is adjustable for show and also melts the fatty layer beneath the skin of meat products, allowing the products to self-baste.

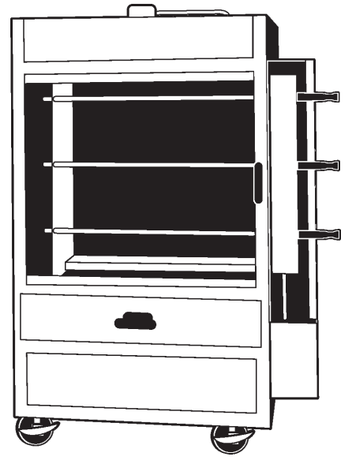
Rotisserie ovens come in a variety of sizes, from small, counter-size units to floor models. Models are usually sized according to the number of chickens that can be accommodated at one time. Spits typically rotate horizontally, but vertical spit rotisseries are available and are a great option, as they allow different foods to be cooked at the same time.

Tips for efficient use of rotisserie ovens

- Before selecting a unit, first determine whether your primary cooking needs are for continuous cooking or batch cooking. If you cook with the batch method, your rotisserie oven should use drums or baskets, versus spits. You must completely cook each batch before adding more product to the drum or basket.
- Never place raw product with semi-cooked product, because of the risk of salmonella. Always use proper handling techniques.
- Insert a probe thermometer into the thickest part of the meat to be sure food is fully cooked.
- Using a marinade or dry rub on most meats adds moisture and flavor. However, a sugar or citrus marinade may cause chicken or other meats to burn. If this happens, simply lower the cooking temperature for these items.

Care

- Be careful not to get commercial-grade oven cleaner on the burners.
- Cleaning the oven windows is easier when the unit is slightly warm. You may need to spray cleaner several times, let the cleaner sit for awhile, then wipe off.
- The water pan is removable and should be checked frequently.
- Clean daily, or possibly more often, depending on use.
- Always follow manufacturer's cleaning and maintenance instructions.



BBQ/Rotisserie oven

Dish machines

You can have cleaner dishes, at a lower cost. Clean-burning, natural gas machines can reduce your water usage and operating costs to make a significant difference in your bottom line. You'll have more profit, and sparkling, bacteria-free dishes without the cost of added chemicals.

Gas dish machines raise the temperature of the main hot water supply, which is normally 110 to 120 F, to 160 F for the wash cycle. This cuts your energy use and reduces your operating costs. There are three types of natural gas dish machines: door, conveyor and flight. All use one of two sanitizing processes: low temperature, chemical rinse with 140 F rinse water, or high temperature machines that require 180 F rinse water.

Natural gas, high-temperature dish machines are available in three styles:

- Immersion tube gas burner system
- A system that uses a single gas heat source for both the wash and rinse cycle
- A system that uses a gas infrared burner designed for heating water for the wash cycle
- Heat recovery systems are also available for increased energy and water savings

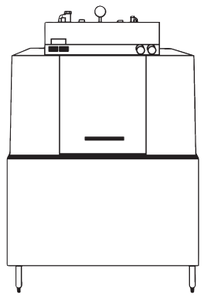
Tips for efficient use of dish machines

- Fill wash tank and turn on booster heater, if used, just long enough before washing to reach required wash and rinse temperatures.
- For safety and efficient drying, be sure warewashing area is well-lit and well-ventilated.
- Wash full loads when possible.
- Turn off machine when not in use.
- For safety and efficient drying, be sure warewashing is well-lit and well-ventilated.

Care

To maintain operating efficiency and extend the life of your dish machine:

- Thoroughly clean interior and exterior daily.
- Always follow manufacturer's cleaning and maintenance instructions.



Dish machine

WAREWASHING EQUIPMENT

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Booster water heaters

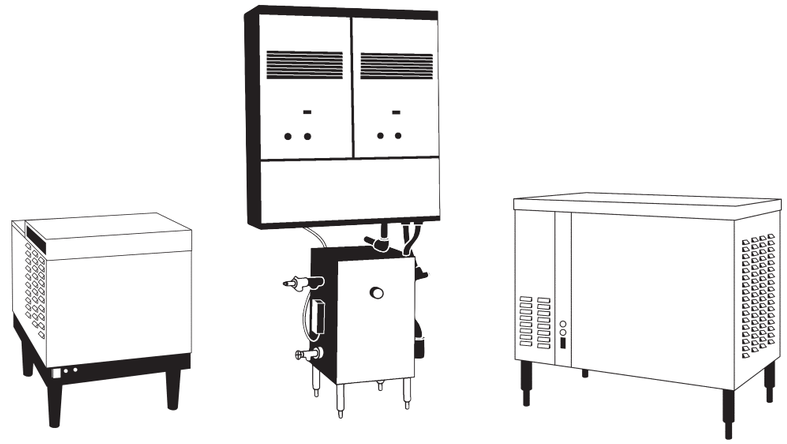
Gas booster water heaters help control operating expenses and assure the constant high temperature (180 F) water you need for final sanitizing with high temperature dish machines. They can be remotely located or at the dish machine. This higher temperature virtually eliminates unsightly spots and water marks; it leaves dishware sparkling clean and bacteria-free, without added chemicals, so it's a much better choice environmentally. With the high temperatures, your dry time is shortened. Natural gas boosters also lower peak electric demand to your facility, which adds to their cost effectiveness.

Tips for efficient use of booster water heaters

- Be sure water heaters are properly sized for your needs and water is maintained at the proper temperature.
- Do not let hot water run continuously when not in use, and promptly repair leaky faucets. Slowly running or dripping hot water wastes energy.

Care

- At least once a month, drain water from the drain on the bottom of the heater until the water runs clean.
- Clean sediment trays if the water heater has them.
- Always follow manufacturer's cleaning and maintenance instructions.



Booster water heaters

Specialty gas equipment

Other available options are designed to meet your needs for equipment flexibility or specialty ethnic foods.

Gas connector

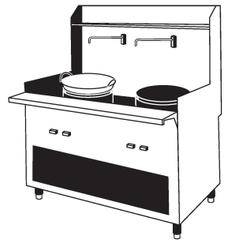
Flexible gas connectors and quick-disconnect couplings allow design versatility as well as improved sanitation and safety for commercial kitchens. Equipment can be easily disconnected and moved for easy cleaning or reconfiguration. A flexible gas connector with a quick-disconnect coupling is required for the installation of equipment on casters by the ANSI Z21.69 Standard. In addition, a restraining cable and manual shut-off are required.

Stock pot range

This is the ideal choice for large-volume food preparation. Gas stock pot ranges are flexible – use them for from-scratch preparation, simmering and reheating. These ranges are most often used for candy making.

Wok

The gas-fired wok provides concentrated, intense heat. Woks are available with two and three-ring burners or jet burners, with convenient valve location and built-in water faucet and drain gutter for easy clean-up.

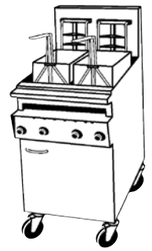


Rice cooker

The gas rice cooker is a space-saving countertop piece that provides fast cooking in an enclosed pot. It is thermostatically controlled, making it easier for you to produce perfect rice every time.

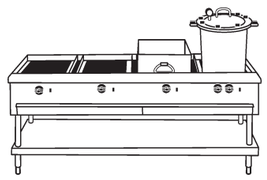
Pasta cooker

Pasta cookers resemble a deep fat fryer, but they cook with hot water instead of oil. Gas pasta cookers provide a complete, self-contained work center for preparing pasta. They have two sections, one for cooking and warming, and one for rinsing and holding. Options include automatic fill and basket lifts, starch skimmers, integrated timers and faucets.



Taco range

This single, convenient gas-fired unit is designed to handle all the Mexican specialties you need to produce. Special high-speed burners provide just the right firepower for pressure-cooked beans and rice. Large loop burners accommodate heavy aluminum pans that recess securely to keep them firmly in place for preparing meats, refried beans and rice.



SPECIALTY GAS EQUIPMENT

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GLOSSARY

NOTES:

Glossary

À la carte: Menu items prepared upon order, with separate prices.

Bain marie: A hot water bath used to keep sauces and soups hot. Also referred to as a steam table.

British thermal unit (Btu): The quantity of heat that must be added to one pound of water to raise its temperature 1° from 58.5 to 59.5 F under standard pressure of 30" mercury.

Carmelization: The technique of browning food very quickly over high heat.

Conduction: Food is cooked by direct contact with a heat transfer medium such as a range, griddle or braising pan.

Convection: An enveloping process in which heat circulated by a high-capacity fan strips cold air away from food, allowing heat to transfer into the product. The heat transfers by motion. Found in steamers and ovens.

Infrared: A type of burner consisting of a drilled ceramic surface through which air and gas flow, producing a blanket of flame. Shorter preheat and cook times are energy-saving benefits of infrared.

Production kitchen: A central kitchen in a large hotel, hospital, school system or banquet facility.

Proof: A continuation of the process of yeast fermentation, which increases the volume of shaped dough in preparation for baking. Proofing temperatures are generally higher than fermentation temperatures.

Radiant: A source that emits heat.

Radiation: A cooking process in which heat is generated from an independent source onto a grid surface. The radiant heat source and the grid do the cooking, although the primary purpose of the grid is cosmetic marking on the food.

Rethermalize: To reheat prepared frozen foods or pre-plated entrées for serving.

Sauté: To lightly fry food in oil in a shallow, open pan.

During a staff training at the Foodservice Learning Center, a student checks on the browning of chicken.

Additional resources

- **ENERGY STAR®** www.energystar.com
- **Foodservice Technology Center (FTSC)** www.fishnick.com
- **Gas Foodservice Equipment Network (GFEN)** www.gfen.com
- **National Sanitation Foundation International (NSF)** www.nsf.org
- **North American Association of Food Equipment Manufacturers (NAFEM)** www.nafem.org

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