EQUIPMENT GUIDE 20

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ENERGY STAR EQUIPMENT

Are You an Energy Star?

Developed by the United States government and Environmental Protection Agency (EPA) in 1992, the **ENERGY STAR** program has served as a way for businesses to voluntarily reduce energy consumption and increase energy efficiency. The program includes a vast selection of products in over 75 categories, serving a wide variety of buildings ranging from residential homes, schools and supermarkets to warehouses, senior care facilities and more.

The program uses a scale of 1–100 to assign an energy efficiency score and takes several factors into account including building size, weekly hours of operation and monthly energy consumption. To be considered for **ENERGY STAR** certification, a facility must achieve a minimum score of 75.

Along with providing a myriad of environmental and resource benefits, the **ENERGY STAR** program provides several advantages for end users as well. In addition to reducing energy consumption and increasing efficiency, consumers have saved over $400 billion in energy costs since the program's introduction. Not only that, certain tax rebates and other benefits can be received for businesses that use **ENERGY STAR**-rated equipment. Sales Representatives also have an opportunity for additional financial advantages by promoting **ENERGY STAR**-rated equipment.

Participating in the **ENERGY STAR** program is easy. Simply visit energystar.gov and use their online portfolio manager to help gauge your establishment's energy efficiency rating. Your local utility company may also be able to provide additional information.

Why wait? Be an **ENERGY STAR** today!

Did You Know?

The annual cost to operate a single gas (or electric) fryer is often more than the annual gas (or electric) bill of an average U.S. home!

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EQUIPMENT PRE-ORDER CHECKLIST

To ensure that all equipment orders are processed accurately and in a timely manner, we encourage you to review the checklist below with your customer to avoid any discrepancies or delays.

1. **Installation date and time:** Determine when the customer can/needs to take possession of the equipment.
2. **Primary on-site contact person:**
    - Name
    - Number
    - E-Mail
3. **Access into facility:**
    - Is the entrance door/delivery door large enough to accommodate the equipment?
    - Any tight turns/corners to consider?
    - Is there an elevator? If so, what are the dimensions? Max Weight Limit?
    - Will the delivery crew be required to ascend or descend any stairs?
    - Are there any counters to lift the equipment over?
    - Is there a loading dock at the location?
    - Are there any other delivery restrictions, i.e. max truck size, receiving hours, etc.
    - Working hours: Can the work be started at 6:00 a.m. and worked on during the day, or must it be done after hours?
4. **Dock/truck lift-gate requirements:** Discuss prior shipping the equipment if 3rd Party Carrier is used.
5. **Are the new and existing units "like for like"?**
6. **Are we required to haul away old equipment?**
    - If Yes, make customer aware of the fee.
7. **Required utilities:**
    - *Electrical:* Make sure that the voltage and phase of the equipment being delivered match that of the customer's existing equipment or facility.
    - *Gas:* Make sure that gas requirements of the equipment being delivered match that of the customer's existing equipment or facility. Is it natural gas, propane, etc? If the unit is not front manifold, be sure to include gas hoses.
    - *Plumbing:* If applicable, ensure that there is a water source close to the point of equipment installation, and make sure there is adequate water pressure for the equipment requirements.
    - *Drain Requirements:* If a piece of equipment requires a drain, make sure that a proper drain is in place, and is located where the new piece of equipment is to be installed. If you have to make a drainage connection, know ahead of time whether PVC or copper pipe is required.
    - *Hood Depth: I*f the equipment is going to be installed under a hood, make sure that the depth of the hood is adequate enough to properly accommodate the new piece of equipment.
8. **Check manufacturer's specifications sheet:** Check the manufacturer's specification sheet for any special installation requirements that are being recommended, or are required for proper installation.
9. **Completion of the warranty card:** Instruct customer to fill out the manufacturer's warranty card and ensure that it gets returned to the manufacturer immediately.
10. **Equipment demonstration and start-up:** If applicable, arrange a complete and thorough demonstration of the equipment for the customer with the local manufacturer's rep.
11. **Packing materials:** Ensure that all construction debris and packing materials are cleaned up after delivery is made.

BROILERS

Questions to Ask

1. What kind of broiler is needed?
- » Countertop – Placed on equipment stands or counters
- » Floor Standing – A standalone broiler with legs or casters
- » Upright – Applies heat from the top and is connected to an oven or storage base
- » Salamander – Mounted standalone broiler

2. How much space is available (height, width and depth)?

3. What type of fuel will be used?
- » Natural Gas
- » Propane
- » Electric

4. Questions for upright broilers:
- » Infrared or ceramic?
- » Infra-red double deck?
- » On legs or casters?
- » Standard oven or storage base?
- » Optional stainless steel main top or black?
- » Important note – upright broilers do not have a common front rail

5. Are legs or casters needed?

6. Are any other accessories or specific options needed?

7. Who will be responsible for installation?

Types of Broilers

Charbroilers:

- Charbroilers use grates that are placed above a heat source, heating up the metal grates (usually cast iron or steel) to create branding marks
  - » Radiants – V-shaped pieces of metal just above the burners to absorb and radiate heat from the burners up toward the cooking surface
    - Charbroilers with radiants are relatively easy to clean and maintain
  - » Lava Rocks – Porous rocks that achieve the same result as radiants, diffusing the heat evenly across the cooking surface
    - Lava rock charbroilers can impart richer flavors and aromas than radiant models because the stones absorb grease, which is then steadily vaporized to enhance flavor
- Grates create the cooking surface and have different options. The majority are cast iron and reversible, with one side designed for denser products such as steaks and burgers while the other is designed for more delicate products such as fish.
  - » Waffle grates – Leave unique grill marks on the product and ideal for cooking leaner meats such as chicken since the waffle texture doesn't drain grease to control flare-ups as well as standard grates.
  - » Floating rod – Built with individual rods that spin freely within the grate's frame. Floating rods are easier to clean and tend to last longer since the materials can expand and contract freely without developing the same weak points as rigid grates.
  - » Steel grates – Lighter and easier to clean than cast iron grates, allowing greater maintenance and ease of use. However, they do not heat as evenly or retain heat as well as cast iron models.
- Charbroilers can be mounted on a counter, worktable, equipment stand or refrigerated chef table

Types of Broilers

Upright Broilers:

- Also called “deck-type broilers,” these models are designed to conserve floor space while producing high food volumes in a shorter amount of time. They are ideal for the following locations:
  - » Restaurants with a higher hourly volume of steaks or burgers
  - » Banquet halls
  - » Hotel ballrooms
  - » Large-scale foodservice operations
- Certain models have multiple decks or cabinets for simultaneously cooking multiple items
- Large broiling areas that work by using heating elements placed above the broiling area to produce intense heat
  - » Heat from above is helpful in removing grease from the surface of meats, which then drains into removable grease pans placed below the broiling grid

Salamander Broilers:

- Use a concentrated blast of low to medium heat coming from above to finish food items within a narrow cavity
  - » While some models can be used for full roasting, salamanders are designed to supplement high-powered cooking units rather than large volume production and are best used for giving meat products a crisp finish, browning casseroles or caramelizing sugars.
- Usually wall-mounted or mounted on top of a range in a small footprint less than 48” wide

BROILERS

Types of Broilers (continued)

Cheesemelters:

- Specifically designed to melt cheeses on top of dishes or broil any plated food on a fixed rack
- Cheesemelters use direct, radiant heat that is blasted from above the cooling racks

Horizontal Broilers:

- Designed to cook whole chickens in large numbers
- Usually come with a built-in rotisserie to skewer whole chickens on a spit while being cooked over the heating elements
- Some models feature grate tops, which are usually round rods to prevent chicken from sticking

Vertical Broilers:

- Slowly roast meat suspended vertically on a spit in front of an infrared or coil burner
  - » Commonly used for gyro meat
  - » Open heat element, which covers approximately 180° of the meat's rotation

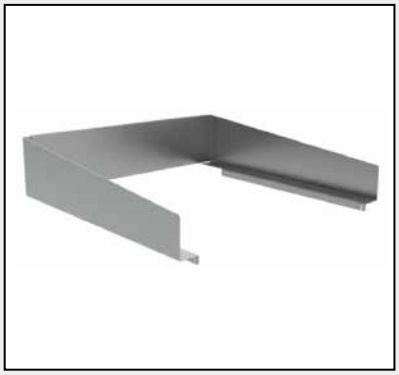
*Accessories and Options**

Note: Refer to specific model spec sheets for applicable accessories & options.

Plate Rail

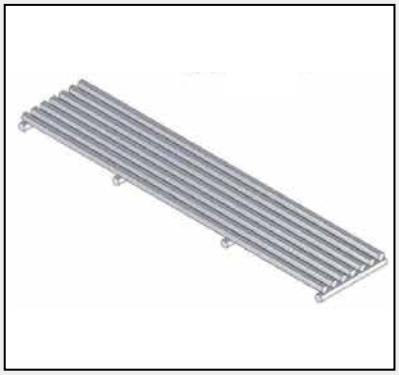
Condiment Rail

Cutting Board



Splasher Guard

Griddle Plate



Round Rod Grate

Wood Assist Smoker

Waffle Grate

Diamond Grate

*May vary by manufacturer

COMBINATION OVENS

Questions to Ask

1. Do you need a Gas or Electric unit?
- If a Gas unit is needed, Natural Gas or LP Gas (propane) must be specified:
  - » LP gas units can be identified by larger storage tanks outside the restaurant
  - » Natural or LP Gas units cook the same but are not interchangeable due to different types of gas used to power the burners
  - » Gas and most electric units will require a hood.
  - » Gas units will typically require one 120V connection per oven
  - » 208V–240V connections are available and considered a standard offering
- If an Electric unit is needed, Voltage must be specified:
  - » Common voltage is 208V–240V and three-phase power (certain models are available in one-phase but often breaker size requirements are larger than available at location)
  - » Electric units often require an electrician for installation as the ovens are hard wired with no cord or plug included
  - » Countertop combi ovens and mini combi ovens can be connected with cord and plug for 1 phase

2. Do you need a single or stacked combi unit?
- A single combi oven is typically offered in six different model sizes
- A stack is a combination of two units stacked vertically to better utilize hood space
  - » Not all models or configurations can be stacked; refer to a manufacturer's website for a full product listing
  - » Stacking allows for overall greater product throughput and greater menu versatility, with ability for two ovens to run at different temperatures and/or humidity settings simultaneously
  - » If stacked combi ovens are specified, always measure the height to ensure there are no clearance issues

3. Do you want standard or recessed doors?
- Standard doors feature a right-hinge swing to access the oven cavity
  - » Certain combi models may offer an optional left hinge swing
- Recessed doors allow the door to disappear on the right side of the oven cavity, increasing user mobility, providing space around the unit and improving safety

4. Does the end user's menu include certain key products that require a slower fan speed or air flow to ensure maximum product quality and consistency?
- Combi ovens with basic or simple controls typically offer two fan speeds
- Combi ovens with upgraded or deluxe controls typically offer five fan speeds
- Certain niche food groups can be sensitive to "standard" combi fan speed settings including light pastry products, cakes and batters, certain smoked products or potential garnishes and toppings.

5. What type of mounting hardware do you need?
- Most combi models come standard with adjustable-height feet
- Options include seismic-rated flanged feet or mobile base with casters

6. What is the water quality like at the location? Does it meet requirements for installation?
- Refer to manufacturers' specification sheets for combi water quality requirements, as each manufacturer is likely to have slight variations in water quality standards for operation
- Water filtration systems are recommended if local water quality is outside manufacturers specifications

7. How much space is available under the hood and/or next to the equipment?
- Each manufacturer specification lists the minimum clearance requirements for installation. This distance is determined during agency testing and is a function of the oven design. Clearance is dependent on the manufacturer and model. Certain models offer a zero clearance requirement, while many manufacturers recommend additional clearance on each side of the oven and 18" for serviceability

8. What type of ventilation will the combi oven be operating under?
- Permanent Hood:
  - » Gas combi ovens are almost always found under a permanent hood due to byproducts produced during gas combustion. In general, gas and electric combi ovens are specified to be under a hood for operation
- Integrated ventless or recirculation hood availability:
  - » Most manufacturers will also offer a ventless hood option installed on top of the combi oven, removing the need to operate under permanent hoods. This is commonly done for front of house applications, locations without ability to install duct work or where installation of a new hood is cost-prohibitive

9. What method of steam generation is preferred?
- Many chefs can't tell the difference between boiler-based (steam generator) and boilerless models since the difference mainly lies in the interior parts
  - » The boiler-based (steam generator) combi oven uses a tank adjacent to the oven cavity which boils large quantities of water to produce steam
  - » Boilerless combi ovens inject water onto a heated surface to flash steam inside the oven cavity and circulated by a fan. This option typically uses up to 80% less water and reduces the amount of maintenance required for boiler-based models

10. Do you want standard or deluxe controls?
- Standard controls are usually operated by multiple small buttons, with information such as temperature or time occasionally displayed on a small digital readout
- Deluxe controls are usually a single, larger touch screen that shows all combi functions

Types of Combination Ovens

Small-Sized Combi Oven (Mini Combi)

- Typically offered in a four-hotel-pan size capacity and ideal for front of house applications as well as primary cooking. Ventless options are also available for this size combi oven.

Full-Sized Table Top/Floor-Size Combi Oven

- Typically offered in four different sizes based on baking sheet pan capacity, although model availability varies by manufacturer. Per industry standards for combi naming, the first number indicates sheet pan capacity while the second number indicates the size of sheet pan (10 denotes a half-size sheet pan, 20 denotes a full-size sheet pan). For example, a 7-20 combi model holds seven full-size sheet pans
- The different models come in either gas or electric with simple or deluxe controls

Full-Sized Roll-In Combi Oven

- Roll-in models are generally offered in two different sizes and incorporate a removable plate or pan trolley to increase efficiency and productivity for high-volume cooking

COMBINATION OVENS

Oven Construction Facts

- Interior/Exterior – stainless steel construction for maximum protection against rust and corrosive cleaning agents
- Hand shower located on the unit for rinsing cavity, quenching vegetables, pot filler, etc.
- Dual water connection – treated and untreated water connection

Benefits of Combination Ovens

Combi ovens may come with higher initial costs but when compared to the cost of your overall equipment package, the purchase is worth the initial price. These versatile units make smart investments for the following reasons:

- Can be bought in place of individual steamers and convection ovens, lowering equipment costs and reducing your footprint
- Can be set at low temperatures to be used in place of proofers, holding cabinets and slow cookers. They also work well for roasting, steaming, sous vide, smoking, braising, baking, rethermalizing and oven frying
- Provide humidity balance, convection oven capabilities and steaming, as they combine hot air with heated steam. This provides food moisture control and increases product yield
- Highly accurate controls, allowing foods to be cooked at precise temperatures and steam levels, providing consistency and flexibility
- Great for cooking meats since the dry heat introduced into the chamber will do most of the cooking while the moisture from available steam helps prevent drying and shrinking, resulting in higher-quality meat dishes
- Excellent programming features that allow you to hard load or manually input recipes and cook modes for greater ease of use
- Maintain flavor and nutrients while simultaneously speeding up the cooking process

Tips and Maintenance

Cooking Tips:

- A combination oven, with use of superheated steam, cooks much faster than a traditional convection oven, requiring cooking time adjustment.
  - » Some ovens have higher BTUs and faster recovery time when the oven door is open.

Cleaning Tips:

- General cleaning of the stainless outside is to wipe down with a stainless steel cleaner and polish regularly. (See page 76)
  - » Most combi ovens may have both tablet and liquid clean option for automatic, self-cleaning. Liquid cleaning is more often used for heavy chicken applications or where handling of chemicals needs to be eliminated.
  - » Occasional use of a descaling solution is needed to keep stainless steel clean
  - » Use of a hand liquid spray and quick rinse are ideal when cleaning after smoking applications to remove odor

Service Tips:

- Combi ovens should have a regular preventative maintenance program to ensure year-round optimal performance
- Door gaskets and probes should be regularly checked for optimal sealing performance and food temperature accuracy

Humidity Control

Humidity levels are adjustable on combination ovens from 0% to 100% of possible absolute humidity at any chosen temperature, by increments as fine as 1%.

COOKING METHOD	TEMPERATURE (°F)	HUMIDITY (%)
Baking	325	10
Grilling	375	0
Roasting	275	30
Steaming	212	100
Proofing	90	70
Rethermalization	250	40
Low-Temp	250	50
Air Fry	400	10
Delta-T	250	50
Finishing	450	0
Poaching	185	100
Stewing	200	90
Defrosting	90	60

*Accessories and Options**

- **Automatic grease collection –** integrated tank and pump design extracts grease from the oven and transfers it to a jug adjacent to the oven. The mobile cart transports the full containers for safe emptying and reuse

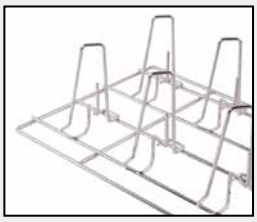
- **Smoking option –** adds menu versatility to combination ovens by smoking products in both hot and cold smoke applications

- **Ventilation hood –** ideal for use outside of a traditional hood where additional precautions are required

- **Grilling grate –** adds markings to proteins for increased aesthetics when cooking in a combi oven

- **Fry basket –** allows foods that are traditionally fried to be cooked in a combi oven without the need for fryer oil

- **Chicken racks –** accommodate various poultry weights and production volume needs



- **Door interlock –** allows the door to be locked during operation for added user safety or site security

*May vary by manufacturer

CONVECTION OVENS

Questions to Ask

1. Do you need a Gas or Electric unit?
- If a Gas unit is needed, Natural Gas or LP Gas (propane) must be specified:
  - » LP gas user can be identified by larger storage tanks outside the restaurant.
  - » Natural and LP Gas units cook the same but are not interchangeable.
  - » Gas units and most electric units will require a hood.
  - » Gas units will typically require one 120V connection per deck or cavity to power the convection oven fan motor and the controls.
- If an Electric unit is needed, Voltage must be specified (120V units are exempt):
  - » Common voltage for half and full size units is 208 or 240V and are available in one- or three-phase.
  - » Electric units often require an electrician for installation as the ovens are hard wired.
  - » Countertop convection ovens are usually for 120V; 208 or 240V are commonly supplied with a cord and plug.

2. Do you need a single-deck or double-deck unit?
- A single-deck oven has one cooking cavity while a double-deck oven consists of two single decks stacked vertically.
  - » Most full size ovens hold five pans per cavity
  - » Double-deck units are ideal for high-volume or multiple cooking temperature operations
- Always measure height for double-deck units to avoid clearance issues.

3. Do you want dependent or non-dependent doors?
- Dependent doors open together and are easier to work with when holding a pan.
- Non-dependent doors require you to manually open each door.

4. Do you want solid or glass doors?
- Most major brands come standard with glass doors. Solid doors could have additional costs.

5. Do you want a single speed or a two speed fan?
- Two-speed fans are ideal for low-speed ovens baking sensitive or light items.
- Most major brands come standard with a two-speed fan but confirm before ordering.

6. Do you want standard depth or bakery depth?
- Bakery-depth allows sheet pans to be inserted parallel or perpendicular in the cooking cavity.

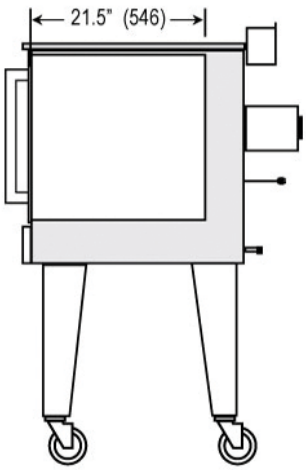
7. What are your BTU requirements?
- Batch cooking will have lower BTU requirements than a la carte cooking.

8. Do you need casters?
- Casters are highly recommended as they allow easier cleaning under the unit.

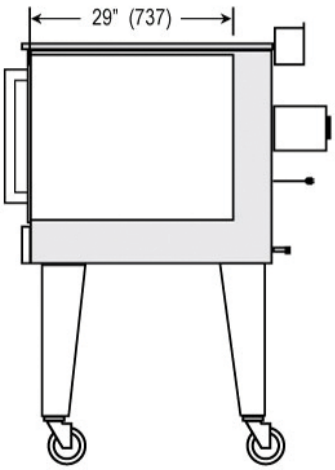
9. Do you want standard or digital controls?
- Standard controls are operated with mechanical dials rather than a digital interface.

Typical Convection Oven Depths

Standard Depth



Bakery Depth



Types of Convection Ovens

Single Deck/Cavity Oven

- Single cooking cavity controlled by one oven heat source and control
- Ideal for baking, roasting, and general cooking

Double Deck/Cavity Oven

- Double cooking cavity with independent controls allowing for two simultaneous cooking temperatures
- Ideal for high-volume locations
- Great for baking, roasting and general cooking
- Higher production volume with the same footprint as a single deck

Bakery-Depth Oven

- Deeper cavity; can be a single- or double-deck design
- Most common in bakeries or other baking-focused locations
- Allows for better air flow pattern, eliminating the need for pan rotation
- May require a deeper hood; occupies a larger space

Countertop Oven

- Convection oven usually used for smaller production volumes; ideal for baking as no hood is required
- Lower cost and faster cooking times than a standard oven
- Not recommended for grease-laden products

CONVECTION OVENS

Benefits of a Convection Oven

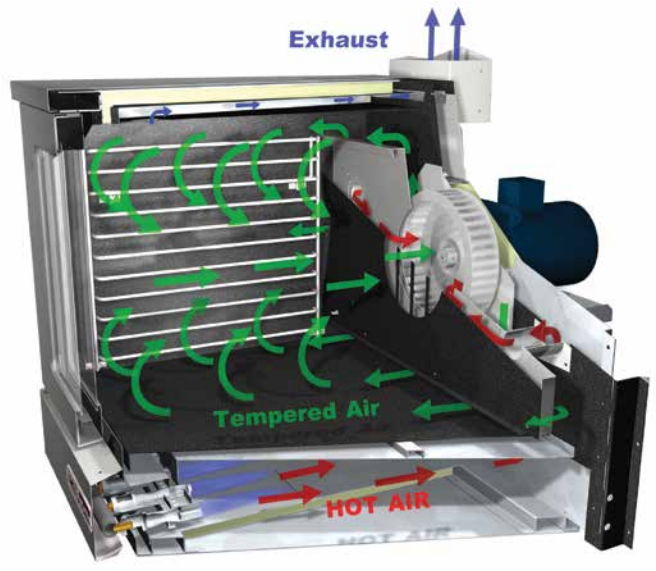
- Ability to reduce cooking time by up to 25% and cooking temperature up to 30% compared to standard radiant ovens
- Equipped with fan technology that actively circulates hot air in the oven around the food, creating a uniformly even temperature and cooking every surface with equal heat and increasing efficiency.
- Multi-functional capabilities including cooking, warming, roasting, re-thermalizing and baking
- Features all of the same cooking capabilities as a standard radiant oven with the added benefit of better flavor and texture results due to the reduced cook time and temperature

Safety Precautions

- Have proper safety equipment to avoid regulation violations and occupational hazards for employees
- Install any required hood or fire suppression system specified in the owner's manual
- Carefully review all codes and any other regulations specified by your local governing body

Importance of Convection Fans

- Available in one-speed, two-speed or intermittent to automatically switch direction upon opening of the oven door, affecting the browning of a product
- Fan settings will impact particular foods. Items such as muffins and flan need little or no fan usage to cook adequately, making two-speed options preferable. High, continuous speeds are ideal for roasts and other meats
- Reverse air systems with advanced instruments are also available. These provide increased precision and control, resulting in greater accuracy



Oven Construction Facts

- The most common exterior construction for ovens is stainless steel on the sides and top.
- The most common interior construction for full size ovens is porcelain-coated steel for easy cleaning. Others, like the counter top units, feature a stainless steel interior as standard.
- A direct-fired oven is designed so that the burner is fired directly into the process air stream to create heat. This is common for models that don't require combustion to be separated from the cooking area.
- An indirect-fired oven has a sealed burner with combustion being separate from the cooking area.

Tips and Maintenance

Cooking Tips:

- A convection oven cooks much faster than a conventional oven and the cook times will need to be adjusted.
  - » Baking in a standard depth oven may require the pan to be rotated for optimal results
  - » Some ovens have higher BTUs and faster recovery times when the oven door is open. Adjust your cook times accordingly.

Cleaning Tips:

- Wipe down with a stainless steel cleaner and polish regularly. (See page 76)
  - » If the oven has a porcelain coated interior, do not use heavy abrasive cleaning pads. Gently wipe the liner immediately after spills or use a soft pad with a mild cleaning chemical.
  - » Stainless steel oven liners require chemical cleaners for the cavity.
  - » Over time, glass doors will develop a film between the panels caused by grease. Never use sharp objects to clean them as it can cause unsightly damage that can obscure visibility. In addition, glass damage due to abuse is not covered by manufacturer warranties.

Service Tips:

- Door gaskets should be checked and calibrated regularly for optimal performance.
- Fans are sealed and permanently lubricated, so regular maintenance should not be necessary.
- Do not spray your oven with water. It can cause operational failure as well as void your warranty.

*Accessories and Options**

- **Casters –** different styles and sizes available depending on durability or height additions
- **Glass Doors –** glass and see-through
- **Solid Doors –** solid and not see-through
- **Voltage –** common voltage is 208V or 240V
- **Phase –** a wiring type exclusive to electric convection ovens that the amps are divided over. A three-phase divides the amp draw over multiple wires, allowing for smaller wiring used to power the oven. A single-phase caries all the amps needed over a single heavier wire to power the unit.
- **BTU = British Thermal Unit -** the common term used to determine the power of a cooking device. The higher the BTU the faster the cook and recovery time.
- **Fan Speed –** two-speed fans are the most common for convection ovens and ideal for baking or cooking proteins. Lower speed fans are ideal for cooking sensitive items such as flan.
- **Independent Doors –** each door can be opened separately or simultaneously.
- **Dependent Doors –** both doors operate on a pulley-style chain system and open together.
- **Standard Controls -** mechanical dial timers and rotary temperature selectors.
- **Digital Controls -** electric controller that allows for precise temperature and time selection.
- **Rack Options -** most common are five racks per cavity. Some manufactures offer oven racks that can be moved with a cart (trolley) to be used in blast chilling and higher volume applications.

*May vary by manufacturer

COOK AND HOLD OVENS

Questions to Ask

1. What type of food will be cooked?
- Cook and hold ovens are able to cook tender proteins as well as more delicate items such as sauces, butter, yogurt and cheesecake among other items.

2. What is your cooking capacity?
- Reference the manufacturer specification sheets to determine the pan type, oven capacity and load amount per cavity.
- Cook and hold ovens are stackable to increase capacity and save space with a vertical footprint. Some manufacturers provide kits that allow stacking with other cook and hold ovens and equipment.

3. What level of control is needed?
- Simplified designs feature basic dials or push-button controls. More complex systems contain features such as the ability to record HACCP data by cooking by probe.

4. Are there security concerns?
- Lock features are available and can be installed at the factory or on site.

5. Does your equipment need to be portable or stationary?
- Single-cavity cook and holds are usually under the counter or mounted under the counter while double-cavity cook and hold ovens are stand-alone units.
- Cook and hold ovens can be supplied with various caster sizes for easy mobility. Bumpers can also be added to prevent collision damage to walls and other equipment.

6. What voltage is available in your location?
- If you have a 120V one-phase, you will need to validate the amperage for the specific oven – this typically ranges from 20, 30 and 50 amp service.
- If you have a 208-240V one-phase, you will need to validate the amperage for the specific oven – this typically ranges from 20, 30 and 50 amp service.

7. Do you want to connect to water supply?
- While a water supply is not necessary, ovens that require water are recommended to be connected directly to a water source. Water reservoirs can be filled as well.

8. Does the product need to be visible during the cook cycle?
- Opening the door during operation can negatively impact the cooking and holding process. Glass doors allow you to see the product without any opening necessary.

Cabinet Sizes

Capacity
- Rated by how many standard-sized pans the cabinet can hold, ranging from three to as many as 18.

Full Height ▶
- At least 65" tall, this design is ideal for high-volume operations

1/2 Height ▼
- 36-41" high, making them ideal for use in smaller to low-volume operations

Undercounter ▼
- Less than 34" height, allowing it to easily fit under countertops in small kitchens

Types of Slides

Universal Slides

Fixed Wire Slides

Lip Load Slides:

Shelves

Benefits of Cook and Hold Ovens

- Reduces food costs
  - » Reduces the amount of protein shrink up to 20% compared to traditional convection ovens, allowing more product from the same cut to be served.
  - » Low-temperature cooking naturally tenderizes meat, allowing you to reduce protein costs without sacrificing flavor.
  - » Able to hold food at ideal temperatures, preventing unwanted drying or cooling during service.
- Reduce labor costs
  - » Overnight cooking capability helps reduce labor costs. Once cooking is complete, the oven will go automatically into a hold mode without the need for human monitoring.
- Reduce operating costs
  - » Cook and hold ovens are energy efficient and can operate at a cost of less than $2 per day.
  - » Do not require a hood, saving money on hood installation costs which can range from $2,000 to $4,000 per foot as well as up to $30 per day in energy costs for hood operation.
- Reduce the load of other cooking equipment
  - » The “set-and-forget” feature frees up labor for other tasks and reduces the burden on other cooking equipment during service while also allowing advanced preparation by cooking overnight and holding until peak service times.

Maintenance Tips

Cleaning Tips:

- Wipe down with a stainless steel cleaner and polish regularly.
- Descale water-based models with a descaling solution to keep stainless steel clean and prevent white scale buildup.

Service Tips:

- Have a regular preventative maintenance program to ensure optimal performance and service life.
- Door gaskets and probes should be regularly checked to maximize sealing and food temperature accuracy.

Accessories and Options*

- **Rib racks –** Ability to stack ribs
- **Wire shelving –** Allows you to place various size pans into the oven
- **Bumpers –** Ensures that the oven will not be damaged when moving
- **Exterior drip pans –** Can be added to collect liquid
- **Simple and deluxe controls**
- **Various caster sizes –** Small casters allow ovens to fit under counters, while larger casters allow you to transport oven over rough terrain
- **Door lock –** Ability to lock the door during operation for added safety and security

*May vary by manufacturer

DISH MACHINES

Questions to Ask

1. What type of food service operation are you?
2. What is your volume (meals per hour)?
3. How much space is available in your dishroom?
4. What type of dish machine is best for your application (see chart below)?

What is the best Dish Machine for your application?

	Glasswasher	Undercounter	Door Type	Rack Conveyor	Flight Type	Pot, Pan & Utensil Washer
Type of Foodservice						
Bars and Taverns	•	•	•			
Limited-Service Restaurant						
Quick Service	•	•	•			
Fast Casual	•	•	•			
Full-Service Restaurant						
Casual Dining		•	•			
Midscale			•	•		•
Fine Dining	•		•	•		•
Retail Hosts						
Supermarket Prepared Foods			•			•
Convenience Stores		•	•			
Hospitality/Lodging	•	•	•	•	•	•
Business & Industry		•	•	•	•	
Education						
K-12 Schools		•	•	•		•
Colleges/Universities				•	•	•

	Glasswasher	Undercounter	Door Type	Rack Conveyor	Flight Type	Pot, Pan & Utensil Washer
Type of Foodservice (continued)						
Healthcare						
Hospitals			•	•	•	•
Assisted Living/Skilled Nursing		•	•	•		
Government/Correctional				•	•	•
Contract/Catering		•	•			•
Volume (Meals per hour)						
Up to 50		•				
50 to 250		•	•			•
250 to 400			•	•		•
400 to 750				•		
750 to 1500				•	•	
1500 plus					•	
Dishroom Area/Space Available						
25" x 25"	•	•				
44" x 30"			•	•		
64" x 30"				•		•
9½' x 26'				•	•	•

Types of Dish Machines

Glasswashers

- Two common styles of Glasswashers: Door type and Rotary type
  - » Door type – Most common glasswasher, takes full glass racks
  - » Rotary type – Low temp models only and are better for fragile glassware
- Available in high temp and low temp
  - » Consider the regulations that are applicable to your location and type of business (See Pro and Cons of each on page 20)
- Small footprint designed to fit underneath the countertop in a bar setup
- Energy Star units available from most manufacturers

Door Type

Rotary Type

Undercounters

- Sanitize dishware by reaching high temperatures or using chemicals
- Rated by how many racks of dishes they can sanitize per hour – See "How to Properly Size a Dish Machine" on page 20
- Available in high temp and low temp (low temp need chemicals)
  - » Consider the regulations that are applicable to your location and type of business (See Pro and Cons of each on page 20)
- Small footprint designed to fit underneath counters
- Designed to operate quietly
- Energy Star units available from most manufacturers

Types of Dish Machines

Straight Line

Corner

Door Type

- Usually installed between two dish tables – one for incoming soiled dishes and another for outgoing clean dishes
- Most models can be converted for either a straight-through or corner set-up
- Booster heaters raise incoming water to the 180° F necessary to sanitize dishes without chemicals (optional)
- Available in standard or tall height
- Ventless models available from some manufacturers
- Energy Star units available from most manufacturers

Rack Conveyor

- Large footprint designed to handle high capacity quickly
- Ideal for washing a lot of different pieces of washware that need to be placed into separate racks
- Number of tanks depends on the conveyor's speed – Quicker the speed, the more tanks are needed to properly wash dishware
- Energy Star units available from most manufacturers

Flight Type

- Designed to have a continuous conveyor belt that runs through different washing zones
- Must built in a straight-line, so cannot be built into a corner
- Energy Star units available from most manufacturers

Pot, Pan & Utensil Washer

- Designed to accommodate large pieces of cookware and oversized tools like full-size sheet pans, stock pots, ladles, spoons, and spatulas
- Eliminate the need for presoaking or scrubbing scour pots and pans removing stubborn soils
- Booster heaters raise incoming water to the 180° F necessary to sanitize dishes without chemicals (optional)
- Energy Star units available from most manufacturers

Accessories and Options*

- **Drain Water Tempering Kit –** use when plumbing code calls for drain water to be less than 140° F. This kit blends cold water with drain water when needed to temper discharge water from the machine
- **Power Cord Kit –** NEMA (National Electrical Manufacturers Association) rated plug for easier installation – just make sure you are selecting the proper one for the correct voltage
- **6" Leg Extension –** base – helps meet code requirements for cleaning
- **17" Stainless Steel Stand –** stand with storage underneath to fit 2 rocks or chemicals
- **Water Hammer Arrestor Kit –** helps reduce water hammer spikes of pressure
- **Casters –** different styles and sizes available depending on durability or height additions
- **3/4" Pressure Regulator Valve –** reduces psi to the machine ; not required unless psi is 65 or higher
- **Splash Panel Kit –** designed for machines placed in a corner configuration
- **Seismic Feet With Holes –** feet designed to hold unit down during earthquakes
- **Flanged Feet For Weld Down –** feet designed to hold unit down in cruise or Navy industry
- **Single Point Electrical Connection Kit –** single point electrical connection for 3 phase machines only – field installed
- **Spray Hose Field Kit –** only available on front load models – provides hose to spray down machine
- **Table Limit Switch –** Stops conveyor when a rack hits it to prevent wear and tear to the system, highly recommended on all conveyor machines
- **Energy Recovery –** uses steam to preheat incoming cold water, sends water to booster
- **Blower Dryer –** needed when customer has a lot of plastics

*May vary by manufacturer

DISH MACHINES

How to Properly Size a Dish Machine

1. How many people are you serving during the busiest hour of operation?
2. On average, approximately how many total pieces of ware does each person have?

NUMBER OF PEOPLE
X
PIECES OF WARE PER PERSON
=
TOTAL AMOUNT OF WARE THAT NEEDS TO BE WASHED DURING THAT ONE HOUR PERIOD

High Temperature vs. Low Temperature

High Temperature, Hot Water Sanitization: The Facts

One of the most popular warewashing methods is known as "High Temperature, Hot Water" sanitization. However, like anything else in the foodservice industry, careful thought must be given to your warewashing approach in order to make the right decision. Here are a few things to keep in mind when considering whether high temp, hot water sanitization is right for you:

Pros:

- Best results
- Removes tough stains such as lipstick, oils and grease better than low temp
- No chemical or bleach sanitizer residue
- Less caustic – easier on your machine and items being washed
- Lower chemical costs

Cons:

- Additional costs
- Larger electrical and power requirements
- Door-type and larger machines require hoods for proper use

Low Temperature, Chemical Sanitization: The Facts

Another popular warewashing method is known as "Low Temperature, Chemical Sanitization." Just like high temp, hot water sanitization, it is important that you review the advantages and disadvantages. The pros and cons below can offer some guidance when choosing an approach to your warewashing:

Pros:

- Requires less power
- Lower purchase price as no booster heater is required
- Easier handling due to dishes being cooler to the touch

Cons:

- High chemical cost
- Stronger chemicals can limit the service life of your dishwasher and may leave residue as well as a "chemical smell"
- Can lead to less desirable results with tough stains like lipstick, proteins or fats
- Not recommended for stemware

Is Your Commercial Dishwasher Ready for an Upgrade?

With the advancements made in technology for some equipment categories, in particular with commercial dishwashers – replacing your machine before it is on its proverbial "last legs" might be a good idea. Here's a look at some of the latest improvements that will help you decide if an upgrade makes sense for your establishment:

Lean, Mean and Just As Clean
As recently as the past decade, conveyor-type and flight-type dish machines were using as much as 300 gallons of water during the final rinse cycle alone. Today, dishwashers are achieving the same result with just half or even a third of that amount. When added up over the course of a year, the resource and cost savings are substantial.

Efficient and Effective
In addition to saving water and energy, modern commercial dishwashers are fighting dirt and soil more efficiently as well. Wash arms and nozzles are better able to reach all areas of each dish while chemicals are being used in more efficient ways, reducing the need for detergents and rinse agents. Finally, more items such as large sheet pans can be run through the dishwasher, reducing the need for hand washing.

Better Speed
Another aspect of modern technological advancements in commercial dishwashers is the time being saved with machines running loads faster, allowing for more per hour. This saves not only water and electricity but also manpower that can then be freed up for other important tasks in the back of the house, which in turn can lead to greater overall job satisfaction among the staff.

DRAFT BEER DISPENSERS

Types of Dispensers

1. Direct Draw:
Dispensed from faucets located on or adjacent to the wall of walk-in coolers with kegs located inside the cooler

OR

2. Remote Draw:
Dispensed from kegs located in a remote refrigeration unit

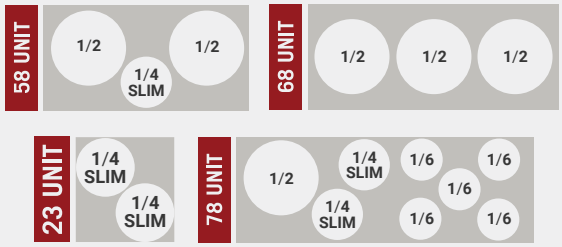
1. Direct Draw: Questions to Ask

Self-Contained Kegerator or Back-Bar Refrigeration

1. How many products does the customer intend to dispense and what are the potential keg sizes? (Account for back up kegs)

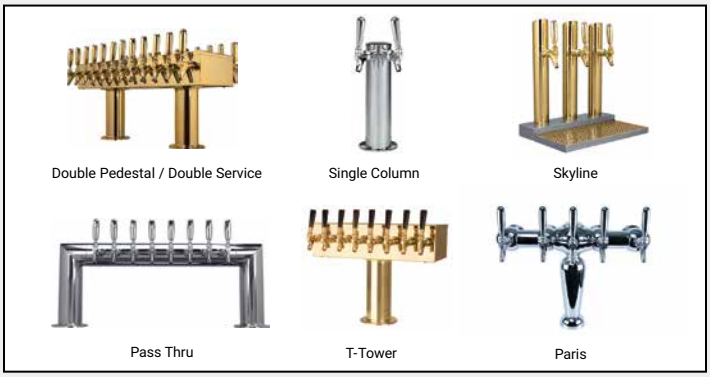
- Four possible keg sizes – 1/6 barrel, 1/4 slim barrel, 1/4 barrel, 1/2 barrel (shown below):

- Many cooler space options are available, based on barrel sizes being stored and dispensed (a few examples are shown below):



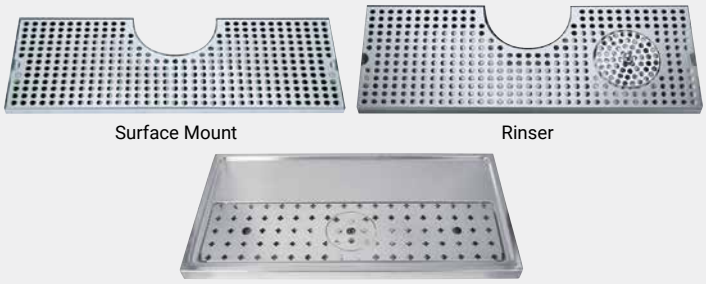
2. Will the dispensing towers provided with kegerators suffice or are alternative towers required?

- Higher cost and longer turnaround delivery time
- Available in numerous styles and finishes (a few examples are shown below):



3. Specify drip trays for back bar units and custom towers accordingly (examples shown below):

- Will they be stock or require customization?
- Are rinsers preferred? Will they be stand-alone or in the tray?



4. For beer styles dispensed with 100% CO2 content, will carbonation levels vary?

- Specify an adequate quantity of secondary regulators for maintaining multiple carbonation levels, as it will encourage resale and ensure optimal performance.

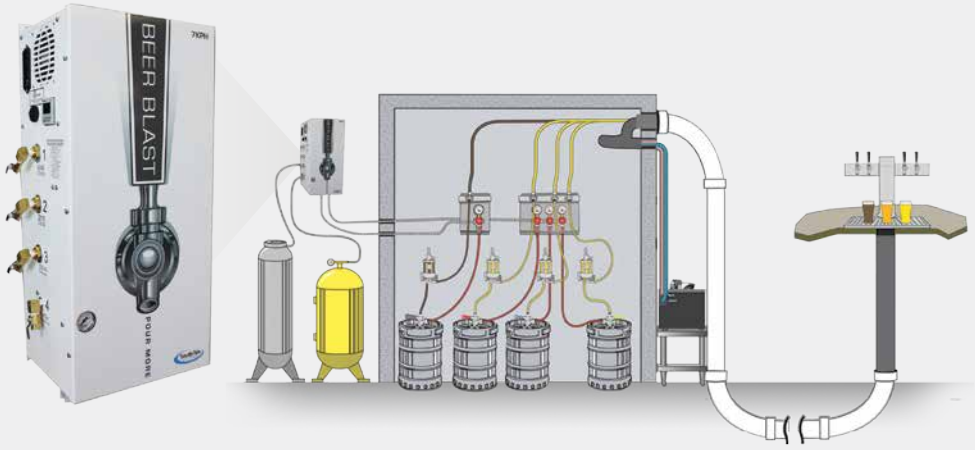
5. Will a nitrogenated beer be dispensed?

- Nitro stout style faucets must be specified
- Requires a gas mix of 25% CO2 / 75% nitrogen to ensure precise nitro presentation
- For gas mix ratio accuracy, gas blenders are recommended over pre-mixed cylinders (a few examples are shown below):

- CO2 and nitrogen sources are required for blenders
  - » Reduces gas cost compared to pre-mixed gas originating from cylinders
  - » +/- 2% accuracy for ratios from blender

2. Remote Draw: Questions to Ask

Dispensing Remotely from Walk-In Cooler



1. How many products (brands) does the customer intend to dispense and what are the potential keg sizes (account for back up kegs)?
- Will there be a dedicated keg for each faucet or will products be dispensed from a single keg to faucets in multiple locations?
- Allow 18" of wall space for each keg coupled. Keg racks or stackers are also an option

2. Will stock inventoried or custom dispensing towers be a consideration?
- Determine the quantity and select available finish & style for stock towers
- Higher cost and longer turnaround delivery time
- Available in numerous styles and finishes (see examples on page 22)

3. Specify drip trays for back bar units and custom towers accordingly (see examples on page 22)
- Will they be stock or require customization?
- Are rinsers preferred? Will they be stand-alone or in the tray?

4. Tower mounting considerations:
- For hanging and wall-mount towers, provisions must be made to allow access and space for installer to connect the tower to the trunk line
  - » Obstacles can increase installation costs

5. Regarding trunk line(s) routes, will there be one dispense tower location or multiple?
- Dedicated trunk line per tower from keg cooler is mandatory.
  - » Branch from one keg in cooler with "Y"s or manifolds. Specify shutoffs
  - » Determine regulator panel configurations required for keg in cooler
- What is the trunk line length from tower location(s), through facility and into entry point of keg cooler, along walls to the furthest keg station?
- Are tower location(s) on the same floor as keg coolers or at floors above or below?
- How will the trunk lines be routed and secured within facility?
  - » Will chases or conduits be specified for project? Who will be responsible for installation?
  - » Will trunk line be routed through facility secured with hangers?
    - ∘ Hangers should be present every two feet and a minimum of 2" wide
      - – Avoid trunk line sags
      - – Avoid laying on corners
    - ∘ Avoid extreme heat surroundings such as kitchen hoods
      - – Be aware of seasonal plenum heat situations
      - – Trunk line requires additional insulation wrap
      - – May increase glycol chiller size
      - – Trunk lines generally are not air plenum fire rated
      - – If mandated, wrap trunk lines with plenum-rated tape
      - – Install costs increase
    - ∘ Is the trunk line route to be in the wall prior to covering?
      - – Trunk lines must be protected to prevent penetration from hanging hardware (i.e. screws, nails, etc).
      - – Protection is the responsibility of the general contractor, not the installer
    - ∘ Will trunk lines be exposed to outside elements?
      - – Protect trunk lines with chases and additional insulation
      - – Installation costs can be higher
    - ∘ Final site surveys are required prior to installation to ensure accurate trunk line lengths, other measurements and installation costs

6. Where will glycol chillers be located?
- Avoid inaccessible areas or areas with extreme heat
  - » If permitted, chillers with water cooled

2. Remote Draw: Questions to Ask *(continued)*

Dispensing Remotely from Walk-In Cooler

condensers available for extreme-heat environments.

- Ideal locations are on a rack, table or shelf.
  - » Wall-mounted shelves require a satisfactory wall load rating
  - » Chillers require access for periodic maintenance
  - » Chillers not compatible with outdoor locations can be customized for an additional cost. Shelter and covers are recommended
- Specify the appropriate dedicated circuit for chiller locations
- Electrical and plumbing work are not included with system installation
- For redundancy with multiple tower locations, additional chiller pumps or chillers are recommended

7. For remote dispensing, gas blenders are recommended to allow higher mixed gas pressure to the keg for ales and lagers (see examples on page 22)

- Assures product consistency and encourages resale and dispense performance
- Gas mix (CO_2 / nitrogen) ratios from blender have a +/- 2% accuracy
- Low 100% CO_2 pressures are incapable of dispensing from remote distances
- More efficient than pre-mixed gas originating from cylinders
- CO_2 and nitrogen sources are required for blenders

8. Will nitrogenated beer be dispensed?

- Nitro stout style faucet(s) must be specified
- Requires a gas mix of 25% CO_2 / 75% nitrogen pressure for keg to ensure consistent and precise nitro presentation
- For gas mix ratio accuracy, dual gas blenders are recommended over pre-mixed cylinders
  - » Specify dual blender
    - 25% CO_2 / 75% nitrogen for nitro beers
    - 70% CO_2 / 30% nitrogen for ales and lagers
  - » Custom blends are available
- Quantity determines regulator panel configurations required for each keg
- Pressure quick-disconnects and "T"s are ideal for changing available blends to the keg

9. Does local code require monitoring or alarm systems for detecting harmful gas levels?

10. Are trunk line length(s) over 50'? If so, specify empty keg sensors (FOBs).

- ROI within weeks as they eliminate waste and loss of product associated with filling empty lines during keg changes
- One required per coupled keg (regardless of "Y"s).
- Pre-installation is available on regulator panels

Eight Key Elements

Optimizing Quality and Increasing Profits with your Remote Draw System

1. Keg storage temperature of 38˚F:

- Under 38°: impacts taste and impedes "head of foam" formation
- Over 38°: results in foamy beer and pouring profits down the drain

2. Gas blender:

- Optimizes quality and maximizes keg yield
- On-site blending of CO_2 and nitrogen is less expensive than pre-mixed gas cylinders

3. Secondary regulator panel:

- Different beer styles may require dedicated keg pressure settings
- Secondary regulator panels ensure the correct keg pressure is applied to each keg

4. Stainless steel contact:

- Improves service life and hygiene
- Ensures product integrity

5. Power pack:

- Never locate the power pack on top of the walk-in cooler. Place in a well-ventilated, easily-serviced area. Use FDA-approved glycol and periodically check glycol mix.

6. Trunkline:

- Moisture barrier wrap prevents condensation
- BarrierMaster Flavourlock Tubing™ maintains beer integrity and prevents flavor migration
- Black Diamond® outer jacket is 15% more thermally efficient and easy to install

7. Glassware conditioning:

- Glasses must be cleaned with beer-friendly detergents
- Glasses should not be cleaned in a low temperature dishwasher using off-the-shelf soaps
- Use a rinser before pouring, making it easier to pour the perfect pint
- Educate bar staff – a properly trained bartender will deliver increased profits

8. System cleaning and maintenance:

- Beer is a food product and to maintain draft beer quality, periodic cleaning and servicing is required every two weeks.
- A three-step cleaning process using a re circulating electric pump to create a turbulent flow.

Troubleshooting

The most common problem with draft beer is temperature. Draft beer is brewed to be stored and served at 38° F.

DIRECT DRAW: COMMON PROBLEMS

PROBLEM	THINGS TO CHECK	POSSIBLE SOLUTION
BEER FOAMING	Temperature (38º F)	Adjust temperature control or call qualified service person
	Kinked beer line	Change beer line
	Wrong size beer line (4 to 5 ft. of 3/16")	Change beer line
	Applied pressure too high (12 to 15 lbs)	Adjust CO_2 regulator to brewer's specification
	Applied pressure too low (12 to 15 lbs)	Adjust CO_2 regulator to brewer's specification
	Coupler washers bad	Replace coupler washers
	Faucet washers bad	Replace faucet washers
	System dirty	Clean system or call customer's line cleaning service
	CO_2 leaks	Check fittings, clamps, shutoffs and regulators; replace if necessary
NO BEER AT FAUCET	Empty CO_2 bottle	Replace with full CO_2 bottle
	Regulator shutoff closed	Open shutoff
	Keg empty	Replace with full keg
	Check ball in coupler stuck	Free check ball
	Line/faucet dirty	Clean line/faucet

REMOTE DRAW: COMMON PROBLEMS

PROBLEM	THINGS TO CHECK	POSSIBLE SOLUTION
BEER FOAMING	Check temperature at faucet (38º F); temperature too cold	Adjust glycol bath temperature (29º F to 32º F)
	Check temperature at faucet (38º F); temperature too cold	Inform customer they need a qualified serviceman to adjust cooler temperature
	Check temperature at faucet (38º F); temperature too warm	Adjust glycol bath temperature (29º F to 32º F)
	Check temperature at faucet (38º F); temperature too warm	Inform customer they need a qualified serviceman to adjust cooler temperature
	Wrong gas (glycol systems usually require a mixed gas blender)	Change to mixed gas blender; increase target pressure
	Glycol pump functioning (check return line)	Inform customer needs qualified serviceman to adjust glycol chiller
	Gas regulators set wrong	Inform customer to contact installer
	Coupler washers faulty	Replace coupler washers
	Faucet washers faulty	Replace faucet washers
	System dirty	Clean system or call customer's line cleaning service
	Power pack is clogged	Clean condenser fins
NO BEER AT FAUCET	Empty gas bottle	Replace with full gas bottle
	Regulator shutoff closed	Open air shutoff
	Keg empty	Replace with full keg
	Check ball in coupler stuck	Free check ball
	Line/faucet dirty	Clean system or call customer's line cleaning service
	FOB Detector	Reset FOB Detector

FOOD PROCESSORS

Questions to Ask

1. What is the primary application?
- Vegetable preparation machine
  - » Slicing – tomatoes, cucumbers and lettuce
  - » Dicing – potatoes and peppers
  - » Grating – cheese
  - » Julienne – zucchini and squash
- Cutter bowl – bowl with an S-blade for several applications (listed below). Can have smooth, serrated or course serrated blades
  - » Salad dressings
  - » Custom butter products (i.e. cilantro, garlic, etc)
  - » Chopped or mixed proteins (i.e. ham, chicken, etc)
  - » Emulsions (aioli and mayo)
  - » Prepping of fresh dough and batters
  - » Spreads and hummus
- Combination food processor
  - » Applies both functions of a vegetable prep and cutter bowl machine

2. What is your estimated output?
- Number of meals per service
- Practical output per hour

3. What power rating do you need?
- Higher horsepower motors are capable of powering through more food and thicker mixes for longer periods of time without overheating, allowing higher processed food volumes
- The RPM (rotations per minute) measures how many times the blade rotates around the shaft in one minute
  - » Higher RPM – Works faster but could have trouble maintaining RPMs for hard ingredients or thick mixes at lower horsepower ratings
  - » Lower RPM – Produces more torque to help cut denser product

Types of Food Processors

Batch or Bowl Type

- Most common type of food processor ideal for mincing, whipping and pureeing
- Bowl is designed to collect the food as it's processed
- Comes with a variety of attachments designed to fit within the bowl and perform various functions:
  - » Slice
  - » Dice
  - » Shred
  - » Chop
  - » Knead
- Plastic or stainless steel bowls available
  - » Plastic – greater transparency
  - » Stainless Steel – more durable

Continuous Feed

- Similar to batch bowl processors but dispense food into a separate container
- Ideal for high food volumes on a daily basis
- Ability to handle bulk slicing, dicing and shredding
- Not as versatile as batch bowl

Types of Food Processors

Combination

- Features both a bowl unit and an external dispenser that can be easily switched depending on the task

How to Clean a Food Processor

1. **Take the food processor apart.** Remove the top, followed by the pusher unit, then take out the blade and take the bowl off the motor. Set the blade aside for special care.
2. **Wash the blade** first, immediately after use. This will help maintain its sharpness while preventing food particles from drying inside the crevices or tube attached to the blade. Gently scrub the with a mild soap and a pad, then dry with a dry dish towel to prevent rust.
3. **Wash the removable parts** in warm water with a mild dish soap. Do not scrub the parts of the processor with abrasive cleaners or pads. Alternatively, the removable parts other than metal blades can be washed in the dishwasher on the top rack.
4. Using a damp cloth, **wipe down the base and motor area.** Do not submerge or pour water over the unit. Use mild dish soap or a baking soda paste to remove tough stains.
5. **Fully dry and assemble the processor** then store. If you use your food processor on a regular basis, store it on a countertop or in another easily accessible location.

Tips:

- If your processor harbors unwanted odors, combine a 1:1 ratio of baking soda and water. Pour into the processor bowl for 10 to 15 minutes, then rinse thoroughly.
- Nylon brushes can help clean blades with less risk of cuts. Small wire brushes are ideal for cleaning tubes.
- Dry all components thoroughly to prevent bacteria growth or damage.

Accessories and Options*

- **Casters –** different styles and sizes available depending on durability or height additions
- **Blade –** sharp S-blade ideal for purees and fine mincing
- **Dough blade –** blunt edge for kneading dough
- **Bowl –** variety of bowl sizes available to accommodate large and small tasks
  Tip: consider buying an extra bowl to make longer preparations easier (less cleaning throughout)
- **Pusher –** small, cylindrical tubes that help safely push products through the feed tube
- **Slicing Disc –** efficient and easy way to cut products into equally sliced portions
- **Julienne Disc –** creates fine, matchstick-style cuts in seconds – ideal for garnishes, crudites, salads and more
- **Grating Disc –** helps grate multiple pounds of product quickly
- **Shredding Disc –** quickly cuts your vegetables into long, thin strands in seconds – some can be reversible, offering medium or fine shred on either side
- **Dicing Disc –** consistently dices vegetables
- **French Fry Disc –** used for homemade French fries
- **Discharge Plate –** helps easily collect and remove food from the cutter bowl
- **Pulping Disc –** extracts pulp from fruits and vegetables to create freshly made compote, preserves, coulis and more
- **Whipping Disc –** accelerates time needed to whip butter, cream and more

*May vary by manufacturer

FRYERS

Questions to Ask

1. Do you need a gas or electric unit?
- The choice of electric or gas for your fryer depends primarily on your access and the relative costs of each power supply in your location. Contact your local utility provider for accurate pricing.
- If a gas unit is needed, natural gas or LP gas must be specified
- Voltage must be specified for electric units
  - » Common voltage for commercial fryers is 208V or 240V
- Hoods are required for all gas units and most electric units

2. Is the customer located 2,000 feet above sea level or higher?
- Most equipment is calibrated to sea-level altitudes so knowing the customer's elevation is important. As a general rule, fryer temperatures should be decreased by 3˚F for every 1,000 feet above sea level

3. What type of food will be fried?
- Freezer-to-fryer type products or fresh cut fries can typically be cooked in any fryer (smaller cold zone is ok). Fryers between 35 and 50 lbs with a gas open pot are recommended for this type of cooking.
- Breaded chicken or fish require a cold zone and a gas tube-type 50-lb fryer, 60-lb fryer or 75-lb fryer are recommended
- Flat-bottom fryers are highly recommended for items such as tortilla chips, brads, funnel cakes or fresh fish filets

4. How many fryers are needed?
- Fryer quantity is usually based on the different products being fried and available kitchen space. For example, fresh fish will need its own fryer due to flavor transfer
  - » Standard fryers typically range from 40-50 lbs in capacity and are 16" left to right
  - » Larger fryers typically range from 60-90 lbs capacity and are 20" left to right
  - » Menu items that contain gluten or popular allergens will need their own fryers
- Split-tank fryers are ideal for small menu items to keep products separated

5. How much product will you be frying per hour?
- Most fryer manufacturers use standard frozen French fries to calculate the amount produced per hour
  - » Cooking temperature is usually 350˚F
  - » A fryer's capacity denotes how much oil the tank will hold
    - 35-lb to 40-lb fryers will cook 50-60 lbs of French fries per hour
    - 50-lb fryers will produce up to 70 lbs of French fries per hour
    - 60-lb to 75-lb fryers will produce up to 100 lbs of French fries per hour

Types of Fryers

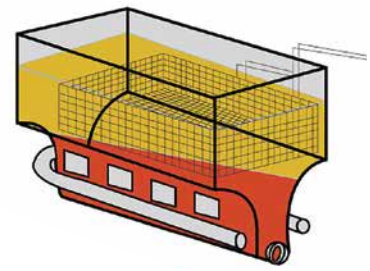
1. Countertop Fryers:
Countertop fryers are best for smaller kitchens or restaurants that do not have a fry-heavy menu. These units are often used over refrigerator and freezer bases for point-of-use cooking, which eliminates the need to walk to full-sized refrigerators. In some cases, they can hold the same amount of food inside the frypot, use less oil and take up less space. Additionally, smaller electric countertop fryers can be unplugged and moved around the kitchen easily.

2. Ventless Fryers:
Can be beneficial for kitchens without hoods. The built-in hood on the equipment removes harmful gases and fumes without the need for a hood and helps comply with necessary codes.

Types of Fryers

3. Stand-Alone Fryers:

Stand-alone fryers are the most common in the industry and are ideal for kitchens that have a menu that primarily features fried foods. They are also capable of daily use due to their durability, ease of use and simple maintenance. Additionally, fryers come in a variety of deep fryer sizes and configurations (from freestanding to battery). Below, you'll find a description of the four most common styles of stand-alone fryers.



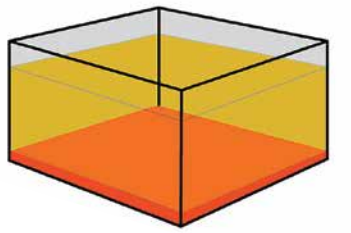
- **Gas Open Pot:**
  - » Great for high-volume frying and have their components on the outside of the frypot rather than inside. This allows for easier cleaning and is best for low-sediment items and frozen foods. The tank shape features a "V" in the bottom, creating a small cold zone for sediment and allowing more oil to be used for frying.

Pros:

- » Lack of tubes or burners inside the tank allow for easy cleaning
- » Small cold zone allows more use of oil in vat

Cons:

- » Heating elements outside of pot reduce energy efficiency
- » Cold zone holds less sediment



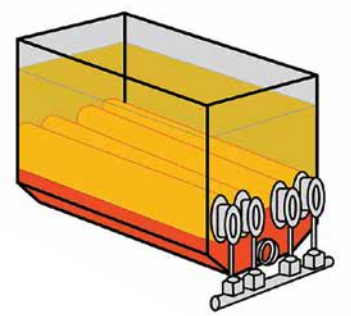
- **Gas Flat Bottom:**
  - » Ideal for foods with wet batter or dough, flat bottom fryers allow foods to sink and rise as they cook. Heating elements are positioned beneath the frypot, allowing the entire surface to transfer heat. This design completely eliminates the cold zone.

Pros:

- » Wet battered foods sink in oil and rise while cooking
- » Foods float rather than sticking to bottom
- » Available in electric and gas models

Cons:

- » Sediment can create burnt taste in oil due to lack of a cold zone
- » Require frequent maintenance and filtration



- **Gas Tube:**
  - » Ideal for frying foods that produce a lot of sediment, such as freshly breaded fish or chicken. The cold zone is located at the bottom of the tank and also helps extend oil life.

Pros:

- » Submerged tubes distribute heat evenly and make for an energy efficient unit
- » Ability to fry high sediment menu items coupled with oil savings due to cold zone makes this a versatile option
- » Large cold zone helps prolong oil life

Cons:

- » Tubes in vat make cleaning difficult
- » 20% of oil rests in cold zone

- **Electric Fryer:**
  - » Similar in design to tube type fryers, these fryers have electric heating elements submerged into the oil. Because heating elements are submerged, it causes faster recovery and high energy efficiency than its gas counterparts.

Pros:

- » Energy efficient
- » Easy to clean due to lift-out burners (select models)
- » Countertop models available
- » Elements submerged directly in oil create fast temperature recovery

Cons:

- » Can be expensive
- » Can be difficult to clean stationary burners

Oil Filtration

Whether your fryer is the workhorse of your kitchen or only cranked up a few times per week, taking care of your oil is key for peak performance. Filtering oil and keeping your fryer clean is imperative to maintaining flavor quality in your food. Depending on your operation, oil may only need filtering daily, though some kitchens require more.

Filtering prevents food particles from burning and ruining your oil as well as help extend its lifespan, saving your operation money in the long run. Regular oil filtering and replacement are critical to the quality of your food. To determine your oil's health and whether it needs changing, monitor its color. Typically, newer oil is clear with a yellowish tint. Once it gets darker or loses its transparency, filtering is needed. In some, more advanced commercial fryers, there are automatic oil detection and testing components that trigger a notification when maintenance is required. To preserve your oil's integrity, cover the fryer vats.

Proper personal protective equipment (PPE) is always recommended for cleaning and filtering when using a filter cone. It's important to note that filtering needs to be performed while the oil is still hot to avoid coagulation. When manually removing oil, connect a drain valve extension and slowly open to avoid the risk of burns.

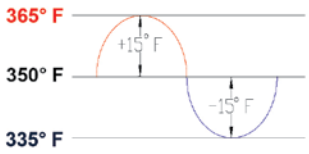
Once you've emptied the fryer, follow the below steps to clean the frypot:

1. Find the thermostat probes within the frypot. Be mindful of their locations and be gentle when cleaning around them as they can be fragile.
2. Scrub any leftover sediment and debris with a fryer brush.
3. Close the valve and then cover the burner tubes or elements with hot water. Do not completely fill the frypot and add preferred cleaning agent to water.
4. Set thermostat to 200°F and boil for 15 to 20 minutes.
5. Turn off the thermostat and allow water to drain into a container or directly into a drain.
6. Thoroughly rinse the frypot with hot water.
7. Replace the oil and cover the tank.

Types of Fryer Controls

✓ **Millivolt Controls:**

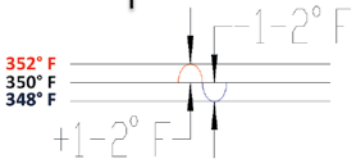
- Snap action requiring no external electricity



➢Slower Recovery
➢Less Cook Consistency
➢No Melt Cycles

✓ **Solid State Knob Controls: Analog**

- Temperatures knob control – behind the door or on front.
- 200°F to 390°F
- Faster Recovery than Millivolt Systems
- Electronic Ignition
- Requires A/C power 120V
- Melt Modes



✓ **Digital and Computer Controls**

- Digital Time and Temperature
- Melt Modes
- Countdown Timers
- Compensating Cook Time
- Auto Boil-Out Mode
- Programmable Product Keys with Product Names Displayed
- USB Interface with Laptop

➢ Quick Recovery
➢ More Precise Cooking
➢ Includes Melt Cycles

Tips and Maintenance

Fryers are one of the most heavily used pieces of equipment in commercial kitchens and will naturally require more maintenance. The average life span on a heavy-duty fryer ranges from seven to ten years. The below tips for regular cleaning and proper maintenance will help prolong your fryer's lifespan and optimize its performance:

- Address oil leaks in the tank or well early as they can be a fire hazard as well as limit operational efficiency.
- Be mindful of the time it takes for oil to get to ready temperature. If you've noticed it's taking longer than usual or you're having problems maintaining a temperature during regular use, call a certified technician for servicing.
- Avoid cooking at extremely high temperatures. Prolonged high temperatures can compromise the integrity of the fryer and oil.
- Minimize exposure to water when possible. This will help prevent rust and reduce the risk of breakdown.
- Periodically check thermostats to ensure they're working properly. High-limit sensors are designed to shut down the fryer if temperature exceeds 400°F, so readings need to be correct. Malfunctions with both the thermostat and sensor can create a fire hazard.
- Change the fryer oil at least once weekly
- Maintain an ideal frying temperature of between 325°F and 350°F
- Refrain from overfilling the fryer and basket with food
- Filter the oil regularly (refer to the manufacturer's instructions for your fryer and/or filtering machine for proper filtering procedures)
- Calibrate the fryer based on the manufacturer's recommendation

Fryer Fun Facts

- Fryers are the most economical and profitable appliance in the commercial kitchen (capital cost, menu price, speed operation, etc.)
- The average American eats 29 pounds of French Fries per year
- 80 – 85% of all fryers are gas (natural. & LP) utility in U.S.
- Fryers are often the most misused, abused, neglected, and disrespected appliance in the commercial kitchen
- Fried food tastes great and is irresistible!

*Accessories and Options**

- **Stainless Steel Backing**
- **Programmable Controls –** Allows end user to add recipes to your fryer's database and cook with the push of a button with pre-programmed temperatures and cook times
- **Automatic Top-Off System –** Minimizes the need for oil to be frequently topped off, as it is automatically added to the frypot for consistent levels
- **Basket Lifts –** Automatically lift baskets from oil when the timer has stopped, allowing operators to produce consistent product each time and minimizes waste due to user error
- **Dump Station –** Helps the chef to prepare food ahead of time by giving them a place to safely hold the items and keep them warm and crisp
- **Built-In Filtration System –** Makes the oil filtering process easier and can feature oil reclamation options as well as a filter flush hose
- **Fryer Cleaning Tolls, Powder, Paper Skimmer, FAT VAT for oil removal**
- **Casters –** Helps to move the fryer for easy cleaning
- **Side Splashes –** Prevents fryer oil from splashing onto other equipment and allows the fryer the option to be positioned in more than one spot

*May vary by manufacturer

GRIDDLES

Questions to Ask

1. What is the plate type?
- Steel
- Chrome
- Grooved
- Rapid Recovery™ (Exclusive to Vulcan)

2. How much space is available (height, width and depth)?
- Griddle plate depths range from 20″ to 30″ (measured from the front of the griddle plate to the back)
- Griddle width is the side-to-side measurement
- Flat-top griddle widths are commonly sized in 12″ increments and range from 24″ to 72″ wide

3. Where will the griddle be placed?
- Countertop – Can be placed in a cooking line with minimal space on top of equipment stand or chef base
- Range – Can be fitted on top or as part of a full range

4. What fuel type will be used?
- Natural Gas
- Propane
- Electric

5. What type of controls or thermostat will be used?
- Manual Gas Valve
  - » Temperature is manually controlled by the operator
- Modulating thermostatic controls
  - » Maintains temperature accuracy within 30-40° of set temperature
- Mechanical Snap-Action Thermostat Valve
  - » Thermostatically controlled temperatures within 10-15° of set temperature
- Electrical Snap-Action Thermostat + Solenoid Valve
  - » Thermostatically controlled temperatures within 10-15° of set temperature (requires 120V)
- Solid State Temperature Controller With Probe
  - » Thermostatically controlled temperatures within 5° of set temperature (requires 120V)

6. What type of heat source will be used?
- Gas Atmospheric
- Gas Infrared
- Electric Element
- Induction

7. Is a medium duty or heavy duty model required?
- Medium Duty
  - » Thinner plates suited for breakfast cafes and partial day serving routines
  - » Gas: 18,000 to 60,000 BTUs depending on the product
  - » Electric: 3.4 kW to 10 kW
- Heavy Duty
  - » Thick plates designed for all-day and 24-hour applications
  - » Gas: 56,000 to 180,000 BTUs depending on the product
  - » Electric: 8.0 kW to 24 kW

Griddle Plate Options

Steel (Grooved plate available as option):
- Industry standard and most common plate type
- Great durability
- Most labor intensive to clean and may require special cleaners
- Great for proteins, sandwiches and vegetables
- Emits the most heat into the kitchen

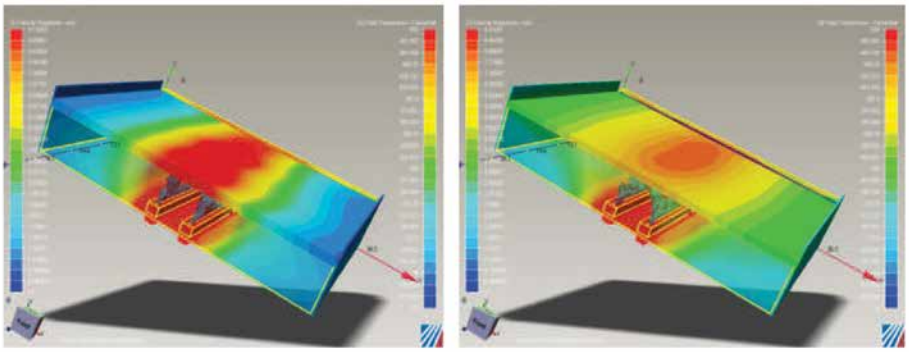
Griddle Plate Options

Chrome (Grooved plate available as option):

- Ideal for display cooking concepts; very presentable even after use
- Excellent food release properties
- Limits food flavor transfer
- Easy to clean (special polish and razor scraper are required)
- Great for proteins and vegetables as well as delicate products such as eggs and fish
- Emits the least amount of heat into the kitchen

Rapid Recovery™ Composite (Grooved plate not available as option):

- Exclusive to Vulcan
- Combines an aluminum core interior with a 304 stainless steel exterior; very durable
- Transfers heat five times faster than traditional steel plates
- Even heating across surface
- Easiest to clean
- Great for high volume applications or cooking burgers and other proteins
- Emits less heat than steel in kitchen



Standard 1" Steel Plate **18 mm Composite Plate**

Material is exclusive to Vulcan

VULCAN WOLF

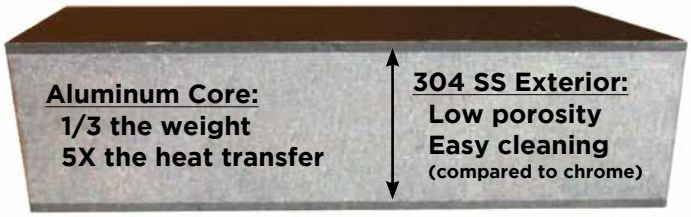
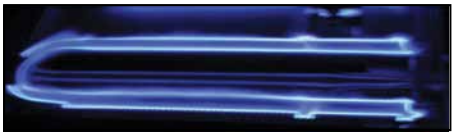


Plate Thickness (Range anywhere from 3/8" to 1-1/2" based on model):

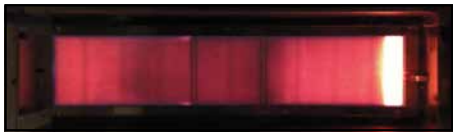
- Thin Plate – 3/8" to 3/4"
  - » Transfers heat and reaches desired temperatures quickly
  - » Requires less energy to reach desired temperature
  - » Distributes heat less evenly than a thick plate
  - » More cost-effective
- Thick Plate – 1" to 1-1/2"
  - » Retains heat longer than thin plates, allowing faster recovery
  - » More even heat distribution
  - » Less temperature fluctuation
  - » Requires more energy to reach desired temperature

GRIDDLES

Griddle Heat Source Options



Atmospheric Burners:
- Traditional standard gas burner; economical



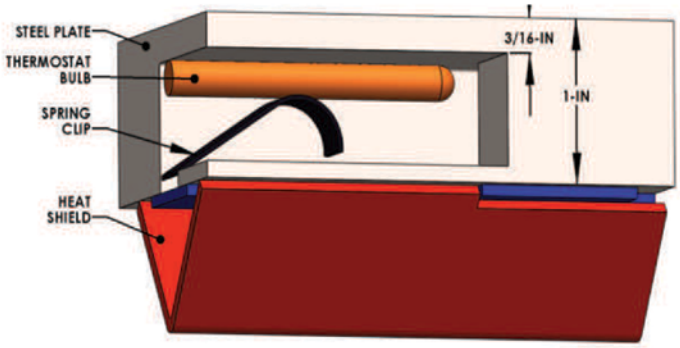
IRX™ Infrared Burners:
- Newer to the industry; more efficient
- Transfers heat more evenly and quickly across the griddle plate surface than atmospheric burners
- Facilitates faster recovery resulting in more consistent cook times and greater throughput (50+ lbs/hr)
- Reduces gas usage by12-20%

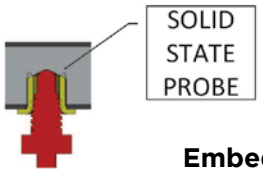
Electric Element:
- All electric models

Induction:
- Relatively new to the market and use induction elements to generate heat directly in and across the griddle plate so they heat up very quickly, greatly speeding up cooking times

Benefits of Electric Griddles
- Often cheaper than gas
- Often available where gas isn't
- Seen as safer to operate than gas
- Generally provides lower long-term operating costs due to their energy efficiency

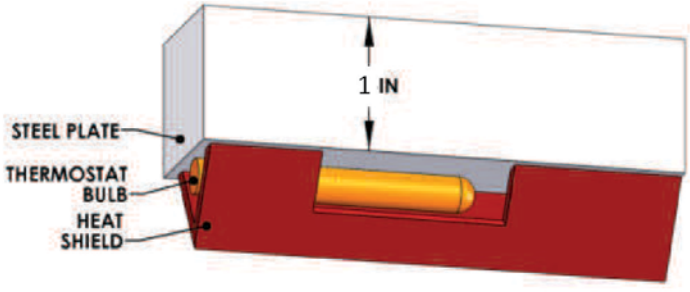
Embedded vs. Bottom-Mounted Thermostats





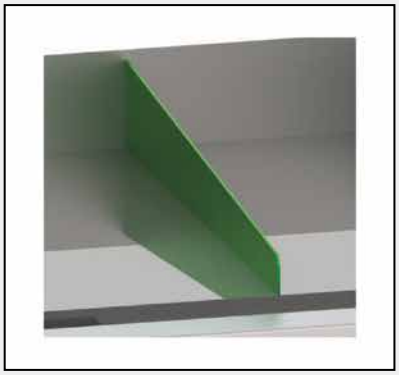
Embedded Thermostats offer the most sensitive thermostat response and ensure the fastest recovery and tightest temperature control.

Surface-Mounted Thermostats are NOT as sensitive to temperature change as the embedded design. A thicker plate can further reduce sensitivity.



*Accessories and Options**

Note: Refer to specific model spec sheets for applicable accessories & options.



Welded Plate Divider

Full Griddle Grooving

Partial Griddle Grooving (Right or Left Side)

Electric Spark Ignition System (gas units only)

Condiment Rail (Condiment Pans not included)

Plate Rail

Cutting Board

Rear Grease Trough

Clamshell

*May vary by manufacturer

HOODS

Questions to Ask

1. What type of kitchen does your customer have?
- Commercial kitchens are designed for high-volume operations and require Commercial Kitchen Ventilation (CKV)

2. What type and volume of food will be cooked?
- Vegetables can utilize a more simplified system, while fatty meats require a more complex ventilation system to limit the accumulation of smoke, grease and other food emissions

3. What is the layout of the customer's kitchen?
- Where are the walls, doors and windows located?

4. What are the sizes and types of appliances being used in the kitchen?

5. What is the building's overall HVAC design?
- Consult the mechanical engineer if the overall HVAC design is unknown

6. What type of building is your customer located in?
- Building codes vary by location and will determine the minimum level of kitchen ventilation needed
- Schools with catered or "heat and serve" food may only need a simpler system while restaurants located in multi-tenant buildings, doing "display cooking" or charbroiling proteins such as steaks with solid fuel will require a more complex ventilation system

7. What type of cooking equipment and surface temperatures (see Temperature chart on page 39)?
- Light and Medium Duty (400-450°F) – Ovens, cheesemelters, rethermalizers, griddles, fryers, tilting skillets, braising pans, rotisseries, conveyor ovens, steam-jacketed kettles and compartment steamers
- Heavy Duty (600°F) – Open-burner ranges, under-fired broilers, salamander broilers, chain broilers and woke ranges
- Extra-Heavy Duty (700°F) – Solid fuel appliances (wood, charcoal and mesquite)

8. What climate is the customer operating in?
- Depending on the customer's geographic location, seasonal heating and cooling needs will vary.
- Follow the recommended CFM per ton capacity to maximize your hood's performance (see Climate Zones map on page 39)

Basic Hood Information

What is an Exhaust Hood?

A hood is an open-bottom box constructed of sheet metal located above cooking appliances and is designed to capture and contain the heat and missions produced by the cooking process. This promotes cleanliness in the kitchen while also reducing the risk of fires and smoke inhalation.

Hood Types

Type I – Used when effluents include grease and smoke. These hoods must be listed as well as contain grease filters and fire suppression systems.

Type II – These hoods are used primarily two different applications – condensate and "heat and fume." Condensate hoods are typically used in high-moisture appliances such as dishwashers while "heat and fume" hoods are utilized for cooking equipment that does not produce grease or smoke emissions.

Hood Styles
- Canopy
- Sloped Canopy
- Backshelf
- Wall Island
- V-Bank Island

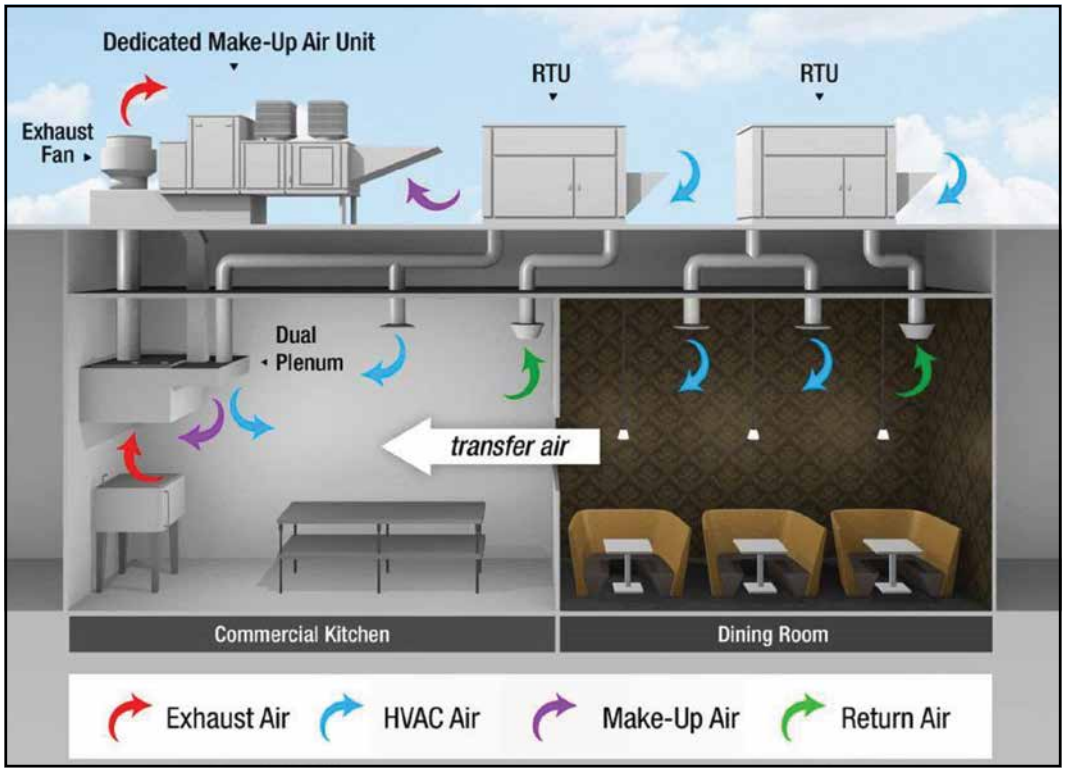
Note: Canopy and Backshelf hoods are the two most common styles. Canopy designs cooking equipment located against walls while backshelf models cover counter-height equipment.

Basic Hood Information

How Does A Hood Work?

While most operators can identify the primary function of an exhaust hood, it is equally important to get a strong understanding of the different hood types, styles and components. Having this knowledge is important for everyone in order to determine which hood is right for the customer and how to maximize the hood's performance and service life after installation.

Note: The diagram below demonstrates the basic function of each hood component and how airflow is directed through the system.



Hood Length and Overhang

- Minimum overall hood length should be the combined width of all other appliances in the cooking line, the space between each appliance and the code-mandated side overhangs
- One-piece hoods are available up to 16′ in length. If a hood longer than 16′ is required, multiple sections can be specified but each section must be mounted separately and include their own duct and fan
- 18″ front and side overhangs are recommended for upright, open flame and solid fuel broilers
- Two exhaust riser collars are recommended for hoods longer than 12′

Note: Use the table below to determine the proper hood size.

EQUIPMENT	FRONT OVERHANG	SIDE OVERHANG
Charbroiler	18" to 24"	12"
Fryer or Griddle	12"	6" to 12"
Conveyor	12"	12" past conveyor
Convection Oven	24"	6"
Upright Broiler	18" to 24"	12"
Solid Fuel	24"	24"
Woks	24"	24"
Conveyor Dishwasher	12"	24" inlet and discharge

HOODS

Hood Components

Grease Filter: Devices required in Type I hoods that prevent flames from penetrating into the ducting above the hood

Fire Suppression System: Designed to detect and extinguish flames with a suppressing agent. These are required for equipment that produces grease-laden vapors and must be tested and comply with UL Standard 300

Pollution Control Unit (PCU): A device located in the duct run between the hood and exhaust fan to reduce smoke, odors and other emissions. They are typically installed when mandated by local building codes

Exhaust Fan: The driving force of the ventilation system, located on a rooftop or a sidewall and are designed to keep air circulating properly in order to minimize excess smoke accumulation

Electrical Control Panel (ECP): A high-voltage panel that controls the exhaust and makeup air fans as well as any other optional components such as self-cleaning systems, remote monitoring and diagnostics

Makeup Air Unit (MUA): Keeps the building's airflow properly balanced by replacing the exhausted air expelled from the hood and exhaust fan, known as "makeup air." For maximum efficiency, heating and cooling of dedicated makeup air is delivered at or near the exhaust hood, with the unit typically activating between 55°F and 85°F. Makeup Air units are also typically offered in several different designs:

- **Front Face Discharge** units move makeup air outward through louvers or perforations in the front face sheet metal, sometimes at a downward angle
- **Air Curtain** designs typically introduce makeup air in a downward direction at the front edge of the hood, inward from the louvers or both
- **Back Wall Supply** units convey a portion of the makeup air downward through a plenum located in the back of the hood, then discharged downward behind appliances or forward toward appliances. This design is a popular choice when space is limited
- **Perforated Supply Plenum (PSP)** units are located on the perimeters of the hood on the upper outside front of a wall canopy hood. They direct makeup air downward through two layers of perforated metal to promote downward laminar air flow

Exhaust Ducting: Round, square or rectangular metal conduits designed to channel cooking effluents from exhaust hoods to exhaust fans. These must be cleaned periodically, typically every six months. They are available in two options:

- **Factory-built sections** couple together with strong, leak-tight joints
- **Fabricated in-place ducting** sections are welded together at the jobsite

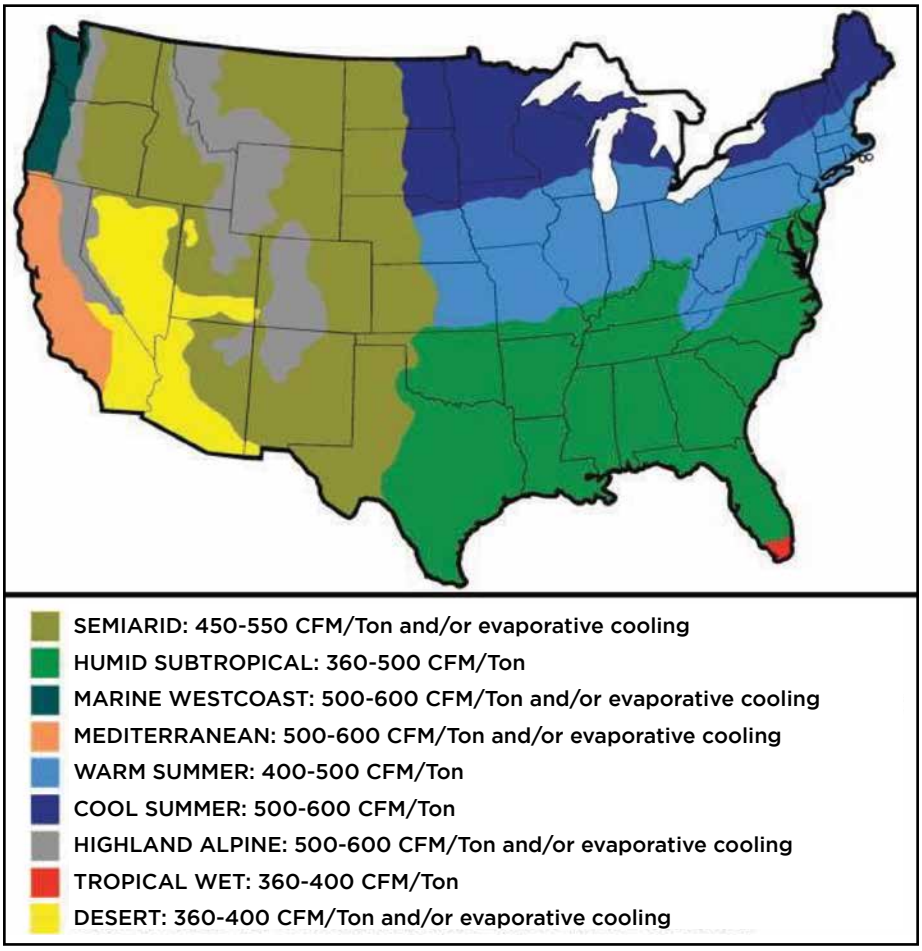
Best Practices

- Hoods should be properly sized in order to reduce exhaust flows at maximum cooking rates
- Group appliances by duty, use direct-drive, variable-speed fans with demand control and install end panels to maximize exhaust flow
- Increase overhang for heavy duty appliances and single-island hoods
- Use the best available grease filters for maximum grease removal
- Install pollution control units to reduce smoke and odors
- Use dedicated makeup air supply units with partially tempered air discharged close to the hood face
- Direct-fired gas heating for dedicated makeup air is recommended when local codes allow
- Use a Direct Outside Air System (DOAS) in high-humidity areas
- Install only listed hoods, ducting and fans as well as an electronic detection fire suppression system when using solid fuel sources

Temperatures of Common Appliance Equipment

Light Duty Equipment (400 to 450°F)	Medium Duty Equipment (400-to 450°F)	Heavy Duty Equipment (600°F)	Extra-Heavy Duty Equipment (700°F)
• Ovens • Cheesemelters • Rethermalizers • Steam-Jacketed Kettles • Compartment Steamers	• Griddles • Fryers • Pasta Cookers • Tilting Skillets • Braising Pans • Rotisseries • Conveyor (Pizza) Ovens	• Open-Burner Ranges • Electric/Gas Under-Fired Broilers • Salamander (Upright) Broilers • Chain Broilers • Wok Ranges	Appliances using solid fuel (wood, charcoal, briquettes and mesquite) to provide all or part of the heat source

U.S. Climate Zones: An Key Consideration in Sizing Equipment



ICE MACHINES

Questions to Ask

1. What is the maximum width available?
- This will determine space available and size option for your customer

2. What condenser type is preferred?
- Air Cooled – Easy to install with lower install costs but require proper ventilation
- Water Cooled – Not dependent on air temperature; uses more water
- Remote Condenser – Exhaust vents outside and away from customers and employees; less heat introduced to work area

3. What is the business type and purpose of the ice machine? This will help determine ice production and style needed
- Restaurant
  - » Dining
  - » Cocktail
  - » Blended Drinks
  - » Salad Bar/Food Display
- Lodging
  - » Guest Ice
  - » Restaurant
  - » Cocktail
  - » Catering
- Convenience Store
  - » Beverage
  - » Bagged Ice
- Healthcare
  - » Cafeteria
  - » In-room
  - » Employee Areas
- Schools
  - » Self-service
  - » Full-service
- Supermarket
  - » Seafood Display
  - » Produce Display
- Office/Industry
  - » Employee
  - » Cafeteria

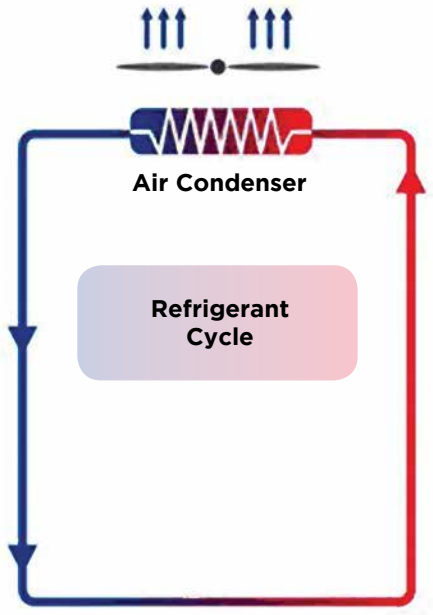
4. How many pounds of ice are needed?
- See sizing guide on page 43

5. Are you interested in an Energy Star-rated ice machine?

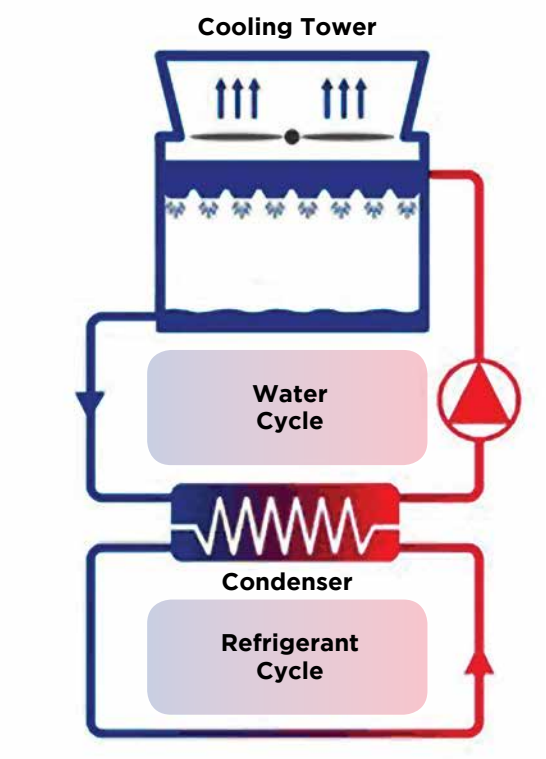
6. What type of ice is needed?
- Full Cube
- Half Cube
- Nugget
- Flake
- Gourmet

Types of Ice Machines

Air Cooled - Modular:
- Uses fans to blow cooler ambient air across the coils through which the system's refrigerant runs, a process that cools fluid enough to allow it to cool the evaporator plate
- Undercounter models will draw air in and push it out through a grill on the lower part of the front of the machine
- Modular or head units typically complete that process on the left or right side of the box; some have a grill for that purpose located in front
- Advantages
  - » Easier installation
  - » Cost-effective
- Disadvantages
  - » Heat and noise of condenser is held in area with the ice maker
  - » Requires adequate breathing and ventilation space
  - » Undercounter units can draw floor dust into refrigeration system while modular units must cool using hotter air higher up



Types of Ice Machines

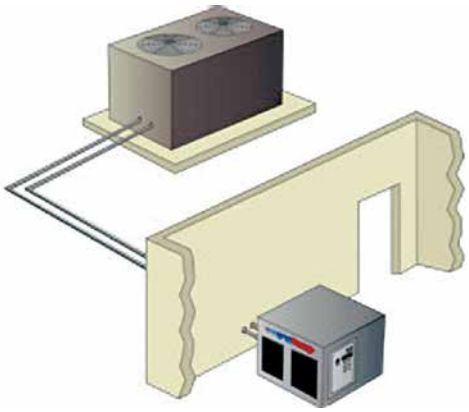


Water Cooled - Modular:

- Uses flowing water to cool the condenser coils and the refrigerant inside
  - » With a cooling tower, water circulates through a trough around the condenser coils, drawing the heat out of the refrigerant through the metal before circling through the tower and running through its own coils, cooling through the exposure to the outside air before being recirculated through the system.
  - » Without a cooling tower, two separate water lines are needed, with one running continuously to cool the coils. These models are illegal in some states due to their excessive water consumption and high utility costs
- Advantages
  - » Not impacted by high temperatures
  - » Produces less heat and noise in ice-making area
  - » Uses slightly less electricity
- Disadvantages
  - » Extremely high water consumption if a cooling tower is not used
  - » Cooling water line needs to be filtered and will require frequent cartridge changes without a cooling tower
  - » Illegal in some areas because of high water consumption

Remote Condensing

- An air-cooled unit with a remote condenser placed outside the machine in a different location
  - » This eliminates the need for sufficient airflow and space within the room as air intake occurs on the roof or side of the building
- Better maintains your ice production and decreases energy costs, although initial costs are higher
- Advantages
  - » Reduced heat and noise within the facility
  - » Can be fairly efficient in areas with cooler climates
  - » Several ice makers can be run off one rack system
- Disadvantages
  - » Higher component and installation costs
  - » Lengthy refrigerant lines increase the risk of malfunction

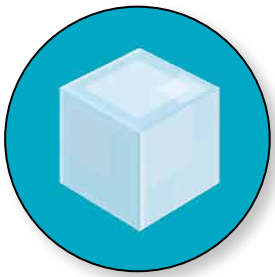


Air Cooled or Remote?

Environmental Conditions	Air Cooled	Remote
Indoor Space Restricted		✓
Poor Ventilation		✓
Indoor Air Temp High		✓
Outdoor Air Temp High	✓	
Water Supply Limited *(High sewage cost or sewage limited)*	✓	✓
Seeking Low Installation Cost	✓	
Indoor Air Conditioning Capacity Limited		✓
High Water Costs	✓	✓
Noise Level is a Concern		✓

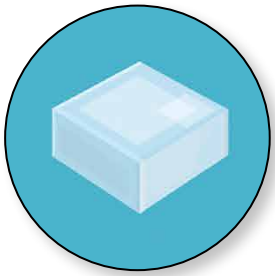
ICE MACHINES

Types of Ice



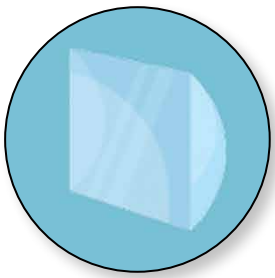
Full Cube

- Popular traditional style of ice due to low production costs and high liquid displacement
- Large surface area lengthens melt time
- Also called “Dice Ice”
- Ideal for use in restaurants, bars, hotels, educational institutions or outdoor facilities



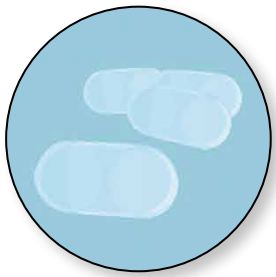
Half Cube

- Keeps drinks cold for a long period of time with reduced beverage dilution
- Small size allows for higher ice volume and liquid displacement
- Ideal for use in restaurants and bars



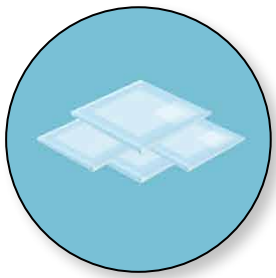
Crescent Cube

- Only available from Hoshizaki
- Clear ice due to the evaporator design reducing mineral content
- Hard ice with longer melt time,and lower beverage dilution while keeping beverages cold longer
- Ideal for use in restaurants, bars, hotels, educational institutions or outdoor facilities



Nugget

- Commonly known as “Sonic Ice” but is also called “pearl,” “chewblet” and “crushed”
- Chewable shape absorbs drink flavor while still maintaining a decent melt time
- Softer texture
- Ideal for use in restaurants, healthcare facilities and educational institutions



Flake

- Light and fluffy ice with a very short melt time
- Most commonly used in sno-cones
- Not ideal for drinks but is capable of cooling other food items down very quickly
- Great for chilled displays
- Ideal for grocery stores, seafood markets, smoothie shops, sno-cone stands and healthcare facilities

Gourmet

- Differs between manufacturers – can be top hat-shaped, octagonal or genuine cubes
- Made for upscale applications and fit with specific drinks
- Ideal for bars, restaurants and catered events

Sizing Guide

General Rule: 2.5 lbs of ice per customer per day

Type of Facility	Average Ice Usage per Customer per Day
Restaurants	2 lbs
School and University Cafeterias	1.5 lbs
Hospital Cafeterias	1 lb per person and 10 lbs per bed
Bars and Cocktail Lounges	3 lbs
Hotels	5 lbs

Maintenance Tips

- Water accounts for 80% of ice machine failures
- Schedule preventative maintenance appointments at least twice per year, more if rapid mineral scale buildup is present
- Preventative maintenance steps:
  - » De-scale the water system
  - » Sanitize the water system and storage area
  - » Clean the air filter and condenser (greasy and dusty environments require more frequent air filter cleaning)
- To clean dirt from coil fins:
  - » Switch the unit off
  - » Spray on coil cleaner
  - » Rinse thoroughly
- Straighten fins with a fine comb

*Accessories and Options**

- **Ice Bin –** Most bins fit multiple ice machine applications
- **Drain Pump Assembly –** Removes drain water from icemaker in areas without direct drainage access
- **Tamper Proof Kit –** Ideal for correctional facilities or other institutions requiring security

*May vary by manufacturer

MICROWAVE OVENS

Questions to Ask

1. What food items will be used in the microwave oven?
- Determine if the microwave will be used primarily for cooking, reheating, melting or defrosting. This will help to determine the recommended wattage
  - » Higher wattage microwaves reheat more effectively
  - » Some menu items may require faster speed (more power), higher capacity (batches) and greater functionality (better controller to handle a wider range of items using presets)
- Many locations use microwaves as a supplemental rather than primary device for cooking
- A microwave between 1,000 and 2,000 watts microwave is adequate when speed isn't a primary factor or usage will be limited

2. How many times per day does your customer anticipate the microwave oven will be used?
- 50-100 uses per day (light duty)
- 100-250 uses per day (medium duty)
- More than 250 uses per day (heavy duty)

3. What is your available power?
- Lower wattage ovens can use a standard 120 volt receptacle
- Higher wattage ovens require a higher rated connection and power availability

4. Where will installation take place? Are there any space constraints?
- Controls are located at the top, side or bottom of a microwave. Be sure they won't be obstructed

5. What cavity size is required?
- Cavity sizes can range from 0.3 cubic feet to 1.6 cubic feet
- Will single or family-size portions be cooked?
- What is the product pack size? This information is important to ensure that cooking and reheating won't require standard pack sizes to be broken up unless desired
- The tools your customer already uses should be factored in when determining cavity size.

6. What type of pan or insert pan will be used?
- Smaller cooking cavities bring higher microwave energy concentrations, resulting in more efficient heating

7. How fast will items need to be cooked or reheated?
- Wattage is important. Be sure to familiarize yourself with all aspects
- 2000 watt microwaves cook approximately 1.5 times faster than 1000 watt microwaves.

8. Will frozen, semi-frozen or thawed items be placed in the microwave oven?
- Multi-stage cooking is recommended for frozen items
  - » Multi-stage has the ability to program a 'staged' recipe and break up cook times into 'time and power level' stages.
- Defrosting frozen items first can result in more even heating and fewer "hot spots"
- Stages can also be beneficial for non-frozen items by providing more even heating during the initial stage followed by a higher-powered "finishing"

9. Will vegetables, seafood or shellfish be cooked or steamed?
- If yes, microwaves higher than 1700 watts are recommended due to their steaming capabilities.

10. Are solid or glass doors preferred?
- Solid doors are more visually appealing for front of the house applications while glass doors allow greater visibility during cooking or heating in the back of the house

11. Will browning, toasting, crisping, grilling, finishing or baking be required?
- If yes, a high speed combination oven is recommended

12. Does your customer make frequent menu changes or offer "limited time only" specials?
- If yes, choose an oven that is easy to program or has a companion programming application.

13. Is the establishment part of a multi-unit or national chain?
- If yes, an oven with USB capability will allow for easier uploads and menu item updates across all locations

14. How many different menu items will be used in the microwave oven?
- For larger varieties, ovens with multiple program and preset capacities are recommended

15. Will the oven be located in an area near airborne grease or flour and yeast?
- If yes, ovens with removable filters are highly recommended

16. Is your customer concerned with warranty coverage?
- If yes, then specify a higher wattage oven, as they typically have longer and more encompassing warranties

Types of Microwave Ovens

Microwave Ovens

- **Light duty ovens:**
  - » 1000 W
  - » Useful for very light duty applications such as in cafeterias or convenience stores

- **Light to medium duty ovens:**
  - » 1000 to 1200 W
  - » .08 to 1.2 cubic ft
  - » Dial or touch pad
    - Dials often have limited functionality such as no stages, presets or power levels (100% power only)
    - Touch pads often ship with time-based presets with each number corresponding with a certain amount of time at 100% power level
    - Touch pads that are programmable allow the user to set the pre-set to a time and power setting

- **Medium to heavy duty ovens:**
  - » 1400 to 3500 W
  - » 0.6 to 1.6 cubic feet
  - » Touch pad or touch screen
  - » Touch screens are not available in microwave-only platforms; high-speed combination ovens are recommended for operators requesting a touch-pad interface

High-Speed Combination Ovens

- Differentiated by the number of cooking technologies available
- Available in a wide range of cavity sizes and power combinations
- Feature microwave capability along with additional cooking technology in most models (such as convection or impingement or IR - see below)
  - » Usually begin at 1000 watts with 1200, 1400, 1900, 2000 and 2200 watt versions also available
  - » Be sure to differentiate between output and input when determining the wattage being delivered in the cavity
- Other heating sources and technology also have a wattage rating (this is important to specify based on the traffic or volume expected)
  - » Higher wattage impingement means faster toasting and the ability to keep up during peak times
- **Microwave/Convection:**
  - » Baking and toasting
  - » Moderate speed, up to ten times faster
  - » Ideal for table service, cafeteria-style service or line-up service (cafés, QSRs, deli/bake shops, fast-casual locations, convenience stores, etc)
- **Microwave/Convection/Impingement:**
  - » Ideal for baking, toasting, grilling (with grill plate), crisping, cheese melting and browning
  - » High speed, up to 20 times faster
  - » Ideal choice for table service, cafeteria-style service, line-up service or drive-through (QSRs, sub/sandwich shops, cafes, convenience stores, fast-casual locations, etc)

- **Microwave/Convection/Impingement/Infrared:**
  - » Ideal for baking, toasting, grilling (with grill plate), crisping, cheese melting and browning (sandwiches, paninis (with panini press accessory), baked pastas, pizza, seafood, grilled meats (with cook plate), vegetables (baked/steamed), etc)
  - » Higher speed and capacity - up to 20 times faster
  - » Excellent choice for QSRs, sub and sandwich shops, cafés, convenience stores and fast casual locations
- **Standard and inverter microwave:**
  - » Standard microwaves cook at 100% power in half the time when set to 50% power
  - » An inverter microwave allows for the power to be 'dialed back' so the oven actually reduces the wattage output in the cavity when cooking at reduced power
  - » A 1200 watt inverter oven set to 50% power effectively outputs 600 watts for 100% of the time of the cook cycle

MICROWAVE OVENS

Microwave Oven Construction Facts

- Combination of all stainless exterior (such as in higher quality ovens) to a stainless front with painted 'box' to plastic
- Interiors can be all stainless or painted metal
- Bottom trays can be metal, ceramic or borosilicate (i.e. Pyrex)
- Most commercial microwaves do not use a turntable because they are less clean and not as effective at evenly distributing microwaves across the cavity and food, using an antenna or a "stirrer" to achieve this distribution (some cheaper microwaves do not use an antenna - these are known as "dump feeds" and are notorious for hot spots and inconsistent results)

Tips and Maintenance

Cooking Tips:

- Microwaves cook by causing friction in water molecules to generate heat
- Semi-frozen food cooks better than frozen food
- For multi-stage cooking ,start with low power and gradually increase the power level in subsequent stages
- Without an inverter, 50% power means 100% power for 50% of the time selected. 25% power means 100% power for 25% of the time selected
- Microwaves are a superior way to steam vegetables while preserving nutritional integrity
- Higher wattage microwave ovens cook better than lower wattage
- Flat foods cook better than cubed foods unless a higher quality microwave with a top and bottom energy feed is used
- Foods with high fat and salt content cook faster and reach higher temperatures

Cleaning Tips:

- Exterior surfaces can be cleaned with soap and water and or stainless steel cleaner
- Interior surfaces should be cleaned regularly to prevent premature cavity deterioration and maximize the microwave's service life
- NEVER run a microwave while empty
- Defrost at low power settings and increase power once food is thawed
- For high speed combination ovens, install non-stick liners or pre-treat the oven and reduce the amount of 'baked on' food soil
- Clean often to avoid food soils arcing, which can eventually penetrate the steel and leave holes in the oven
- Clean filters regularly to keep the oven components cool and extend their service life

Service Tips:

- As the oven ages, the door gaskets should be checked and the oven may need to be recalibrated to ensure continued optimal performance
- The fans are sealed and permanently lubricated so no regular maintenance is needed
- Using water is not recommended as it can cause operational failure and void the microwave's warranty

Microwave Wattage Comparison

OVEN WATTAGE	800	1000	1200	1800	2100	2200	2700	3000
COOKING TIME (minutes)	:30	:25	:20	:12	:10	:10	:08	:07
	1:00	:52	:45	:27	:21	:20	:17	:16
	1:30	1:14	1:00	:39	:32	:30	:25	:24
	2:00	1:39	1:20	:52	:42	:40	:35	:34
	5:00	4:03	3:10	2:40	2:00	1:50	1:45	1:30
	10:00	8:15	6:40	4:00	3:12	3:00	2:30	2:23

Example:
If **1 baked potato** can be cooked in a **1000** watt microwave oven in **4:03**, the throughput per hour at that rate would be **13 baked potatoes**.

A **1200** watt oven would yield **17 baked potatoes** per hour.
An **1800** watt oven would yield **20 baked potatoes** per hour.
A **2200** watt oven would yield **28 baked potatoes** per hour.
A **3000** watt oven would yield **33 baked potatoes** per hour.

*Accessories and Options**

- **Shelves -** for use inside the microwave to increase the load capacity
- **Shelf Rails -** the OnCue (AOC) offers unique rails, shelf and steam pan kit to help reheat food while maintaining moisture and steam. Shelf also allows for two containers or food items to be loaded simultaneously.
- **Cavity Liners -** these are non-stick and make the cleaning of speed ovens much easier
- **Braille -** for visually impaired crew members
- **Menu Card Holder -** can be mounted to the front door of select platforms (AOC, RC)
- **Stacking Kit -** most ovens are stackable without a kit required – for those that aren't a stacking kit is available
- **Microwave-Safe Cooking Vessels -** Microwave-safe dishes allow microwaves to pass through without heating the container; excellent for steam and moisture-dependent dishes
- **Steamer Insets -** microwaves over 1700 watts convert water to steam (steam pan inserts help maximize this effect)

*May vary by manufacturer

MIXERS

Questions to Ask

1. What product types and volumes will be mixed?

2. Will other products be mixed in addition to dough?

- If yes, then a planetary mixer is needed.
  - **»** i. Gather as much information about products, volumes, mix speeds, mix times, batches per day and facility type before forwarding to a factory representative for determining mixer sizes.
- If no and the customer is mixing only dough, a planetary or spiral mixer are both viable options.
  - **»** Determine the weight of flour and water in recipes, mix speeds, mix times and number of batches per day before relaying this information to a factory representative for determining which mixer type and size (spiral or planetary) should be quoted (Note: Both types are typically presented as options as spiral and planetary mixers operate differently and produce different results).

3. Refer the customer to a factory representative for questions about other attachment options for vegetables, cheese, meat and other food items.

Note: Do not rely on model numbers when quoting for mixer replacement.

Types of Mixers

Planetary Mixer

These are the most common and versatile mixers, featuring various agitators (depending on application) that are installed on the mixer shaft and rotate around the bowl similar to the rotation of planets around the sun. They are available in many different sizes, ranging from 5-quart to 140-quart, with 20-quart and 60-quart being the most common. Mixers between 5 and 20 quarts are typically countertop or bench-style while mixers between 30 and 140 quarts are floor style mixers. Batch sizes will vary based on application (consult the manufacturers capacity chart).

Spiral Mixer

These mixers feature a dough hook which rotates in one position and does not move around the bowl, which itself rotates to bring product to the dough hook. Spiral Mixers are used exclusively for dough and ideal for items such as bagels, Neapolitan pizza and artisan bread. They are not recommended for customers looking for a more versatile option.

Tips and Maintenance

1. Check the transmission oil level, which should be halfway up the site glass. Refills are usually not needed unless there is a leak.
2. Lubricate bowl slide rails as needed with manufacturer-recommended lubricant.
3. Apply a coat of mineral oil to the planetary shaft if the user is experiencing difficulty putting agitators on or off.

*Accessories and Options**

- **Attachment Hub –** Most planetary mixers will have an attachment hub located on the front of the mixer that will accept a #5, #12, or #22 attachment for a variety of functions:
  - » **Vegetable Slicer/Plate Holder Housing:** For slicing vegetables or shredding cheese and other products. Once the housing is purchased, housing components will be needed.
    - Plates and plate holders for the housing are needed for shredding and grating. The plates can be purchased in shredder hole sizes ranging from 3/32" to 1/2". Grater plates are also available.
    - Adjustable slicing plates are needed for slicing products and can be adjusted through a hole in the bottom of the housing after the adjustable knife is installed. Slice thickness can be adjusted up to 1/2".
  - » **Meat Grinder:** Allows chopping or grinding proteins. There are many plate sizes available ranging from 1/16" to 3/4". Stuffing horns are also available for grinding products like sausage for casings.

- **Dough Hooks –** Primarily used to mix dough and can be purchased in ED- or J-type depending on your customer's preference. ED-type hooks are curved to negate dough climbing up the hook and are more commonly used than J-type hooks.

- **Whips –** Also called a "whisk," these are used to incorporate air into products such as whipped cream or meringue.

- **Flat Beater –** Also called a "paddle," these are used for general mixing of products such as batter or mashed potatoes.

- **Bowl Scrapers –** Can be installed and will scrape the side of the bowl to turn product back into the agitator.

- **Pastry Knives –** Used to cut butter for items such as croissants.

- **Bowl Trucks:** Used to roll bowls across the kitchen.
- **Mixer Table with Undershelf:** For tabletop mixers
- **Seismic Plates:** Plates that mount to the bottom of the legs and are then bolted to the floor to keep the mixer from falling over in the case of a seismic disturbance.

*May vary by manufacturer

Questions to Ask

1. Do you need a gas or electric unit?

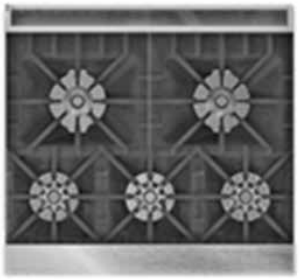
- If a Gas unit is needed, natural gas or LP gas must be specified
  - » Some LP units must have the burner BTUs de-rated
  - » Most units can be ordered with a specific gas type
  - » Some units are field convertible between natural gas and LP gas
  - » Some units are available with special gas mixes for export such as butane mix or town gas
- If an electric unit is needed, the voltage must be specified
  - » Standard voltages available are 208, 240, and 480 V
  - » 208 and 240 V units will come wired for one or three-phase
    - ○ Most phases are field convertible
  - » Some units are available with export voltages such as 220 or 380 V
  - » Electric units often require an electrician for installation as the ovens are hard wired to a circuit breaker, having no cord or plug supplied with the oven
- Gas units and most electric units will require a hood
  - » Hood requirements are usually based on grease laden vapor emissions and local code requirements
- Some gas units may require electrical connections if certain accessories are specified
  - » Spark ignition and convection ovens are the two most common reasons a gas range may require an electrical connection on a gas unit
    - ○ The 120 V connection powers the ignition module in a spark unit or the convection oven fan motor and the controls in the convection model

2. Do I need a heavy or medium duty restaurant range?

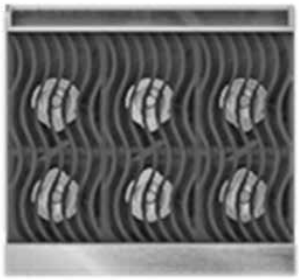
- Heavy duty
  - » Typically constructed with heavier gauge steel and possess a fully welded frame
  - » Operate with higher burner and oven BTU ratings
    - ○ Burner BTUs range between 32,000 and 40,000 BTUs
  - » HD ranges have more stainless steel throughout the product construction
    - ○ This usually includes the outer body construction as well as the burner box, crumb tray and in some cases the oven cavity
  - » Offer more top configuration options than restaurant ranges
  - » Usually installed in battery-connected lineups and cooking suites which are custom built to specification. Lineups can be gassed together up to ten feet long
  - » Typically have steel knobs instead of plastic
  - » Can be more expensive than medium duty restaurant ranges
- Medium duty
  - » Typically constructed with thinner gauge steel and possess a screwed or riveted frame
  - » Operate with lower BTUs than HD
    - ○ Open top burners range from 28,000 to 30,000 BTUs
  - » Typically have a stainless steel exterior skin with an aluminized interior
  - » Top configurations are usually limited to open tops, griddles and charbroilers
  - » MD ranges are usually stand-alone units, limited to a max of 72"

1. TOPS

Open-Top Burners
- Use a pot or pan on a burner grate over an exposed flame for cooking
- Burner grate types:
  - » Usually sized 12" x 12" or 18" x 12"
  - » Sometimes rear grates are deeper to accommodate larger stock pots or sauté pans
  - » Most ranges have grate systems that allow you to easily slide pots across the top. However, establishments using smaller sauté pans may encounter difficulty with the pan tilting on some grate configurations
  - » Smaller burner and grate configurations (i.e. 12") are ideal for sautéing in small vessels
  - » Optional **S-Grates** are usually available
    - – S-grates allow easier movement of pots or pans across the full cooking area
  - » Optional step-up burners are usually available
    - – Step-up burners allow the rear burners to be raised up four to six inches above the front burners, allowing better handle accessibility for sauté pans on the rear burner



Open-Top Burner



S-Grate

Charbroilers
- Usually sized from 18" to 48" wide

Hot Tops (even hot tops)
- Usually sized from 12" or 18" wide

French Tops (graduated hot tops, radial fin tops)
- Usually 18" wide or 36" wide

Griddles
- Usually sized from 12" to 72" wide
- Available in both manual and thermostatic versions
  - » Manual griddle is a manual valve (open/closed). The operator is the one who controls the amount of heat applied to the griddle plate
  - » Thermostatically controlled griddles have an internal valve. This allows the plate to be set to a specific temperature

Plancha Griddles
- Raised griddle with heat concentrated in one spot (for example, 600° to 700° F at the front of the griddle and 300° to 500° F at the back of griddle (high polished searing plates)
- Usually available in 18", 24" or 36" wide units

Range Configurations

2. BASES

No Base

- Modular units sit on four inch-high legs
- Equipment is usually set on a counter or refrigerated base
- Allows for easy replacement if equipment breaks down
  - » Ensure the stand has a marine lip or edge when the unit is placed on counter or refrigerated base. The marine lip and edge prevent the equipment from falling off the counter or base, reducing the risk of injury to the operator

Standard Oven

- Typically range from 150° F to 550° F
- Usually come standard with one shelf with additional racks available for purchase as accessories
- User-friendly burner and control system

Finishing Oven

- Standard oven with higher oven temperature capabilities, typically going up to 650° F
- Oven bottom usually incorporates a 1/2" hearth plate
- Also known as a lobster oven, chefs base or high mass oven

Convection Oven

- Temps usually range from 150° to 550° F
- Usually considered to cook quicker and more evenly than standard ovens as heat is distributed around the cavity via the blower motor
- Contains more sensitive components and fail faster
- Usually comes standard with one shelf with additional racks available for purchase as accessories

Cabinet Bases

- Allows for storage of pots and pans.
- Usually come standard with one shelf, additional interior shelving available for purchase as accessories.

Refrigerator or Freezer Bases

- Allows the operator to have product right at point of use in lieu of an oven base, eliminating back and forth from the walk in or freezer
- Usually sized 36" to 110" long
- Available in remote, self-contained systems
- Glycol systems are also available for some models

Tips and Maintenance

- Convection ovens cook much faster than conventional ovens and the cook times will need to be adjusted
  - » Some ovens have higher BTUs and faster recovery when the oven door is open and cook times may need to be adjusted

Cleaning Tips:

- Wipe down stainless steel exteriors with soap and water and a stainless-steel cleaner and polish regularly
- Clean the oven and oven doors daily
- Clean exterior finishes with a mild solution of soap or grease-dissolving cleaner. To remove discoloration, use a nonabrasive cleaner
- Always rub with the grain of the metal. Stainless steel areas of the range can be polished by using a soft dry cloth. If needed, add stainless steel polish to the soft cloth
- When scraping off heavy deposits of grease or oil from stainless steel equipment, never use ordinary steel scrapers. Particles of ordinary steel may become embedded in or lodge on the surface of the stainless steel, causing rust, unsightly stains and possible contamination. If it is necessary to scrape, use stainless steel, wood, plastic or rubber tools
- Cast iron:
  - » Seasoning is a very important first step when using cast iron. Unlike synthetically-coated cookware, cast iron can continuously be seasoned to restore its cooking surface
  - » Clean cast iron plates with a mild soap and water solution
  - » Do not dump water on the cast iron, use a wet rag and rise until the soap has been removed
  - » Clean thoroughly and dry with a clean, water-absorbent towel
  - » Season plates lightly with liquid vegetable or spray-type cooking oil immediately after drying
- Griddle:
  - » Clean the griddle regularly to maximize service life and optimize performance
  - » To produce evenly cooked, perfectly browned griddle products, keep the griddle plate clean and free of carbonized grease. Carbonized grease on the surface hinders the transfer of heat from the griddle surface to the food, resulting in spotty browning and loss of cooking efficiency as well as a highly unappetizing appearance

Service Tips:

- Always disconnect the electrical power to the machine and follow all lockout and tagout procedures
- All moving parts must be checked for wear and lubricated. Contact your local authorized servicer for assistance
- Motors in convection ranges are permanently lubricated and require no additional maintenance
- Do not use water or hose down the range as it may damage vital components and void the warranty

Accessories and Options*

- **Legs or Casters –**
  - Standard six inch-high casters with a front locking mechanism to prevent movement
  - Adjustable casters for up and down movement, which allows matching to other equipment with different heights within one to two inches
  - Flanged or seismic feet allow for anchoring to floor to prevent movement
- **BTU = British Thermal Unit -** the common term used to determine the power of a cooking device.
  - A common misconception is that higher BTUs means faster recovery or cooking time. This is not true. The entire burner assembly (burner grate, burner head, aeration bowl and BTU) determines the burner's efficiency and cooking performance.
- **Oven racks**
- **Regulators -**
  - Sized 3/4", 1", or 1-1/4".
  - Set for either natural or propane
- **Oven interior -**
  - Stainless or porcelain
- **Front top ledge -**
  - Condiment rail
  - Towel bar
  - Cutting board
  - Deeper depth (for aid in plating right on rail)
  - Lengths: for overlapping multiple units, creating a seamless look and feel while preventing food and grease migration between units
- **Back risers -**
  - Different heights: 6" (Stub), 10", 17", 22", 34"
  - Shelving: single shelf, double set of shelves, solid shelf and "flow thru" shelf
  - Lengths: for overlapping multiple units, creating a seamless look and feel while preventing food and grease migration between units

*May vary by manufacturer

REFRIGERATION, REACH-IN

Questions to Ask

1. Do you need a Refrigerator (33°F - 40°F) or freezer (-10°F - 0°F)?

2. Do you need an upright or undercounter unit?

3. How much storage? How many sections?

- A typical section makes up approximately 20 cubic feet of the overall capacity, so a one-section will hold between 20-30 cubic feet while a two section will hold between 40-50 cubic feet.

4. For undercounter units, do you want door units or drawer units?

- For door units, do you want solid or glass doors?

5. What are the dimensions of where the unit will be placed?

- Will there be height issues?
- Will there be width issues?
- Can you get the unit in the location?
- Always measure the door width to make sure the unit(s) can fit inside the building!

6. Does the customer want the unit to be on casters or legs?

7. Do you want the compressor top mounted or bottom mounted?

8. Does the customer need additional shelves?

9. Do you prefer left or right hinged doors (open on right side or vice versa)?

10. Refrigeration units need a dedicated circuit to operate!

11. Who is doing the installation?

Types of Upright Refrigerators/Freezers

Reach-In Refrigerator/Freezer

- About 83" high with casters
- Select desired number of sections; Each section makes up about 20 cubic feet of the overall capacity
- Solid doors or glass doors
- Full doors or split doors
- Select hinge side

Sizing Guide:

1 Door: approx. 27" wide and 20–25 cu. ft.

2 Door or 3 Section: approx. 40"–57" wide and 35–45 cu. ft.

3 Door or more than 3 Sections: approx. 78"–83" wide and 72–79 cu. ft.

Refrigerated/Frozen Merchandiser

- Glass doors or open air
- Signage on top
- Security covers

Sizing Guide:

Available in various odd sizes and are best sized by the space they will be fitting into since their primary use is to display product.

Pass-Thru Refrigerator/Freezer

- Opens on both sides

Sizing Guide:

1 Door: approx. 27" wide and 20–25 cu. ft.

2 Door or 3 Section: approx. 40"–57" wide and 35–45 cu. ft.

3 Door or more than 3 Sections: approx. 78"–83" wide and 72–79 cu. ft.

Roll-In Refrigerator/Freezer

- Roll full racks inside of unit

Sizing Guide:

1 Door: approx. 27" wide and 20–25 cu. ft.

2 Door or 3 Section: approx. 40"–57" wide and 35–45 cu. ft.

3 Door or more than 3 Sections: approx. 78"–83" wide and 72–79 cu. ft.

Types of Horizontal Refrigerators/Freezers

Refrigerated Prep Table

- About 32-36" high with refrigerated open top or open condiment rail, and refrigerated doors or drawers below
- Sandwich top: cutting board depth approx. 12"
- Mega top: cutting board depth approx. 8½"
- Pizza prep: cutting board depth approx. 20"

Sizing Guide:

1 Door: approx. 27" wide and 6½–7½ cu. ft.
2 Door: approx. 36–46" wide and 8½–9½ cu. ft.
3 Door: approx. 72"–93" wide and 18–22 cu. ft.

Bar Refrigeration

- Made to fit under the counter and out of the way in a commercial bar setting
- Refrigerated Back Bar Cabinet: Solid, pass-thru, or glass doors
- Bottle Coolers: Slide top
- Direct Draw Refrigerator: Holds kegs of beers for draft beer

Sizing Guide:

Widths below do not reflect the true inside dimensions. Use width for sizing per space, then refer to the "product capacity" (i.e. ½ keg or 30 six-packs)

1 Door: approx. 24"–36" width*
2 Door: approx. 36"–60" width*
3 Door: approx. 72"–95" width*
*Side mount compressor size can result in a much larger width.

Worktop

- Solid surface with no condiment rails; refrigerated doors or drawers below

Sizing Guide:

1 Door: approx. 27" wide and 6½–7½ cu. ft.
2 Door: approx. 36–46" wide and 8½–9½ cu. ft.
3 Door: approx. 72"–93" wide and 18–22 cu. ft.

Equipment Stand/Chef Base

- 21" high; allows countertop cooking equipment to be placed on top; refrigerated drawers below

Sizing Guide:

1 Door: approx. 27" wide and 6½–7½ cu. ft.
2 Door: approx. 36–46" wide and 8½–9½ cu. ft.
3 Door: approx. 72"–93" wide and 18–22 cu. ft.

*Accessories and Options**

- **Casters –** different styles and sizes available depending on durability or height additions
- **Additional Shelves –** shelves for inside the unit
- **Door/Drawer Options –** many companies allow you to customize your configuration
- **Pass Trough –** add a door on the back side
- **Glass Doors –** doors have the option to be glass see thru
- **Flat Lift-Over Covers –** covers for condiment rails
- **Overshelves –** exterior shelving above unit for more storage space
- **Cutting Boards –** composite or polyethylene
- **Tray Pan Slides –** install slides to easily hold bun/hotel pans
- **Foot Pedals –** used to open doors in busy kitchens
- **Door Reversal Kits –** allow you to reverse door hinge in the field
- **Thermometer –** digital thermostats available to show precise temperature
- **Removable Gaskets –** ideal for easy replacement if damaged

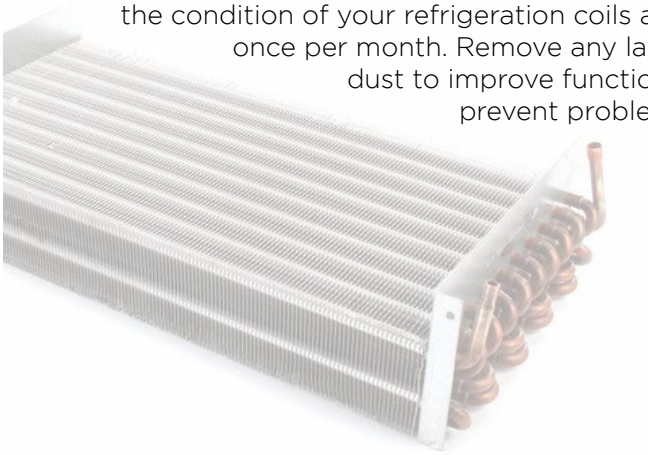
*May vary by manufacturer

REFRIGERATION, REACH-IN

Cleaning your Refrigerator's Condenser Coils

Regularly cleaning refrigerator coils is one of the most effective ways to prevent breakdowns of commercial refrigeration equipment. These coils keep your refrigerators and freezers functioning well by releasing heat. When they get covered in dust and grime, the coils can't do their job, causing heat build up that can damage wiring, motors and compressors.

While you may have a maintenance contractor regularly inspecting and deep cleaning your equipment about twice per year, you should inspect the condition of your refrigeration coils at least once per month. Remove any layers of dust to improve function and prevent problems.



Follow the steps below to clean refrigerator coils:

- **Unplug** your refrigerator
- **Locate** your refrigerator condenser coils (most likely behind a grate at the front top or bottom, or at the back of the unit)
- Remove the grate and use a stiff brush to gently **remove** dust from the coils and fan
- Use a **vacuum** to remove dust as you brush it from the coils
- **Vacuum the floor** under the unit and adjacent area
- **Clean** the grill cover plate
- **Reattach** the grate and plug your refrigerator back in

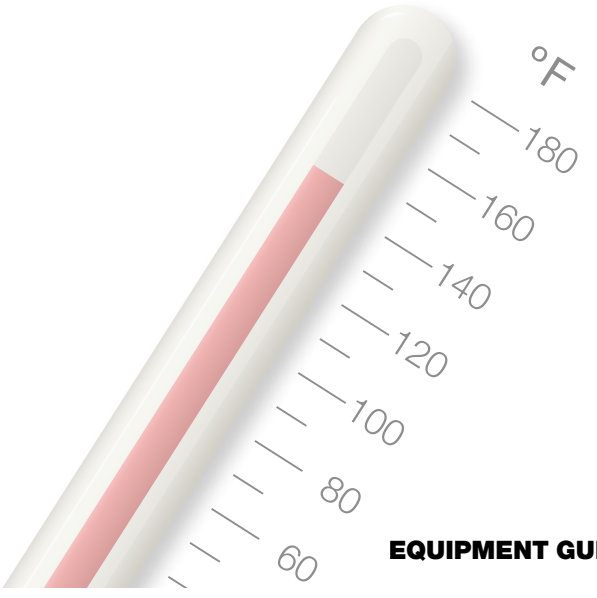
Proper Temperatures for Commercial Refrigeration

The temperature at which foods are stored can affect their appearance, taste, nutrient content and safety. The average temperature operating range for commercial refrigeration units is generally between 36˚F and 45˚F.

Storing foods at temperatures lower than 36˚F increases the risk of freezing. Storing them at temperatures higher than 45˚F increases the risk of spoilage.

The United States Food and Drug Administration (FDA) mandates that refrigerated products must be kept at 41˚F or lower. For commercial refrigeration, the ideal food storage temperature is 38˚F.

- **Reach-In Refrigerators** +35˚F to +38˚F
- **Reach-In Freezers** +5˚F to -10˚F
- **Ice Cream Freezers** -10˚F to -20˚F



Top Mount vs. Bottom Mount

Top Mount Refrigerator
Condensers are located at the top of these units and ideal for dry storage areas where the risk of ingredient spillage is higher and floor dust is more prominent.

Pros:

- Condenser fans don't accumulate dust or debris from the floor
- Heat from the system does not rise right into the commercial cooler, resulting in more efficient operation
- No need for refrigerant lines to be built into the back of the box, allowing for greater accessibility and cold storage space
- Optimal inside space and lower top shelves for easier use

Cons:

- Not well-suited for cooking line applications because they can draw in grease-laden steam and clog condenser coils
- Decreased efficiency
- Harder to access for cleaning and service

Bottom Mount Refrigerator
Condensers are located at the bottom of the unit. Ideal for hot areas and cooking line applications

Pros:

- Low risk of overheating
- No ladders or supports are needed to service and clean the compressor
- Main operating components of the refrigerator or freezer are away from the rising grease-laden steam, reducing clogging and increasing operational efficiency
- No need to stop operation to access items stored at the bottom of the cooler interior

Cons:

- Operates near the floor, which can pull in dust, debris or spilled ingredients, trapping them in the coils.
- Heat from the system can rise into the cabinet and make refrigeration less efficient
- Decreased cold storage space
- Increased cost due to additional insulation and longer refrigerant line requirements

REFRIGERATION, WALK-IN

Questions to Ask

1. Are you looking for a cooler, freezer or combo unit? (Note: All temperatures Fahrenheit.)
- Cooler standard temperature is 35°
- Freezer standard temperature is -10°
- Keg coolers range between 32°-35°
- Red wine coolers range between 50°-55°
- White wine coolers range between 45°-50°

2. What type of evaporator do you need?
- Evaporators are often referred to as "coils." These are mounted inside the unit and blow the air to cool the unit.
  - » Low Profile – The most commonly used evaporator; typically mounts to one wall and blows towards the opposite wall.
  - » Center Mount – This is a thinner evaporator; mounts to the middle of the box and blows air in both directions.

3. Do you want a self-contained refrigeration unit or a split remote system?
- Self-Contained – Typically the most cost-effective option and ideal for smaller boxes under 12' long. Includes a condenser and evaporator as one unit and needs a 3' clearance over top of the unit for proper breathing.
- Split Remote System – Most common and efficient option and requires the condenser be outside the unit. Be sure to confirm if the condenser will be mounted on the roof of the building or on a pad next to the unit on the ground.

4. Will the unit be located indoors or outdoors?

5. Is a floor needed?
- If so, what will be moving around inside (i.e. hand carts, dollies, pallet jacks, etc.)?
- Consult the factory to help determine the best floor type for your application, as they vary by manufacturer.

6. Will there be a product load or will the unit be for holding only?

7. Will you need a ramp on the unit?

8. What are the overall dimensions of the unit?
- Walk-ins can come in exact measurements or nominal sizes. Nominal sizes are standard lengths, widths and heights and are typically the most cost-effective option.

9. What interior metal finish do you want?
- Stucco Galvalume – most common and best resistance to corrosion
- Stucco Galvanized—brighter finish than galvalume but at an increased cost
- Smooth White – moderate price increase; helps to brighten the interior
- Stucco White – best option for ceilings and walls inside cooler/freeze-reflects the most light
- Stainless Steel – most expensive option; typically used in high-end jobs
- Stucco Black – rarely used on interior but common in retail operations; hides dirt

10. What exterior metal finish do you want?
- Same options as interior are available

11. What type of door do you want?
- Swing door – right or left hinged
- Slider – can be both manual or electric

12. Do you want kick plates on the door for extra protection on the bottom 36" of the door leaf?

13. Do you want a window in the door?

14. Do you want a light mounted at the door?

*Accessories and Options**

- **Loading Ramp –** can be internal or external and used for boxes that require a floor
- **Lights –** available in both LED and fluorescent options
- **Thermometers –** available in digital or analog and usually mounts on the door frame
- **Strip Curtains –** plastic strips that hang down from the top of the door to keep cold air inside the unit
- **Vinyl Swing Door –** same function as a strip curtain but in the form of a side-swinging door
- **Door Alarm –** alerts the restaurant that a walk-in door is ajar
- **Temperature Alarm –** alerts the operator that the box is out of operating temperature
- **Wainscoting –** aluminum diamond tread that is mounted to the wall panels to protect from damage caused by rolling carts and pallet jacks
- **Bumper Rail –** hard plastic half-circles that are mounted to the exterior walls of the unit to add protection from rolling cars
- **Vertical Closures –** trim that covers the gap between the walk-in and restaurant wall
- **Ceiling Closures –** trim that covers the top of the walk-in to the restaurant ceiling
- **Door Heater –** a heated cable that runs around the perimeter of the doorframe to keep ice from forming and is only needed in freezers

*May vary by manufacturer

Types of Walk-In Construction

Hard Nose

- Provides more strength and longer, taller panel capabilities
- Hard-nose panels have a maximum height of 25′ without needing extra steel support for ceilings or tall walls, but are more expensive than soft nose units

Soft Nose

- The most cost-effective method for standard nominal size boxes
- The most widely used construction method in the United States

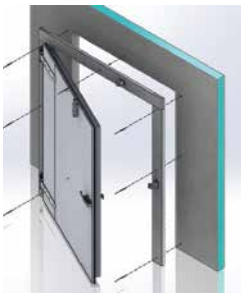
Polystyrene Construction

- The least expensive but weakest construction method
- The metal is glued to the foam, making strength and longevity difficult to achieve

Hybrid Construction

- Some, but not all manufacturers, offer a mix of both hard and soft nose panels to provide the benefits of both
- Hard nose panels are used in the floors and doors where strength is in the highest demand while soft nose panels are used in the walls and ceilings to keep costs low

Types of Walk-In Door Configurations



Swing Doors

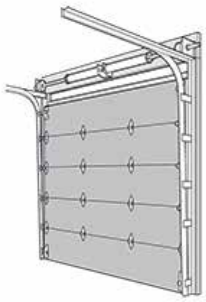
- May be used in new construction, retrofit and remodel applications
- Typically used in restaurants, grocery stores, processing plants, convenience stores and kitchens.
- Compatible with all manufacturers of cold storage systems.
- Cooler and freezer configurations are available with a variety of frame options.

Single Sliding Doors

- Available in sizes up to 12′ H x 12′ W.
- Common applications include medium density walk-through traffic and pallet jack or lift truck traffic.
- Overhead track features a horizontal travel designed to force the door tight against the gaskets for an air-tight seal.

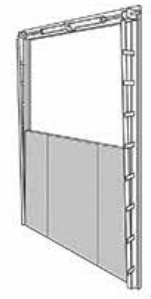
Bi-Part Sliding Doors

- Available in sizes up to 12′ H x 12′ W.
- Typical applications include high traffic environments in processing plants, busy interior doorways in cold storage facilities, exterior docks with heavy lift truck activity and areas where pallet jack or walk-through traffic exists.
- Heavy duty track, rollers and hanger bar are available on large doorway installations.



Standard/High Lift Doors

- Can be specified for openings up to 12′ H x 12′ W.
- For use on loading docks, aisleways, obstructed areas or wherever directional slide clearance and ceiling height is limited.
- Seals between sectional panels provide the same insulating characteristics as solid doors.
- Freezer models include heat cables between all outer edges and between sections.



Full Lift Doors

- Can be specified for openings up to 12′ H x 12′ W.
- Consists of a single rigid panel for use in similar applications as the standard or high lift doors where ceiling clearances permit a vertical track.
- Freezer models include a heat cable around the full perimeter of the door panel.

Questions to Ask

1. What are you storing on your shelving?

- Heavy or bulky items: Shelving should be sturdy to handle static loads and routine loading of heavy items.
  - » Dunnage Racks: Typically manage total stacked weight of 2000 lbs or more.
  - » Short vs. long shelves: Short shelves usually have higher weight capacity than longer shelves
  - » Stationary vs. mobile: Mobile weight capacity is dictated by caster weight bearing
    - o *Not all plastic mat shelving is suitable for use with casters - check your manufacturer's requirements.*
- Smaller items: May be organized in containers or sorted using dividers and ledges.
- Polycarbonate food boxes: Recommended for use with chrome, stainless or plastic mat shelving.

2. What is your environment?

- Dry storage: Chrome shelving
  - » Ideal for dedicated spaces not near kitchen splash zones. Stored items are generally non-perishable but may include produce that does not require refrigeration.
  - » NSF listed shelving for dry environments is required.
- Wet storage: Plastic or stainless steel shelving
  - » Walk-in cooler: Subject to moisture, spills and leaks. Corrosion-resistant shelving that is NSF-listed for all environments is required.
  - » Freezer: Corrosion-resistant shelving that is NSF-listed for all environments is required.
  - » Dishwashing area: Drying Racks allow safe air drying of pots, pans, trays, cutting boards and utensils. Corrosion-resistant shelving that is NSF-listed for all environments is required.

Factor the geography:

- Is the facility near a large body of water?
  - » If yes, corrosion-resistant shelving is highly recommended.
- Is the kitchen or storage unit exposed to outside elements?
  - » If yes, corrosion-resistant shelving is highly recommended.

3. Does the customer need stationary or mobile shelving?

- Is space limited?
  - » Keep aisles large enough for employees to move. Mobile shelving units can be pushed together or apart to save space.
- Determine if supplies need to be loaded and stored in separate locations.
- How often will this unit be moved for transport purposes?
  - » An idle storage unit versus a re-stocking cart being moved throughout the day will be easier to move with a handle.
- Is the area cleaned frequently?
  - » Mobile units are recommended for use in walk-in coolers that are cleaned weekly or monthly.
  - » Mobile shelf units allow easier cleaning and sanitization of floors, walls and other important surfaces.
- Will the customer want to convert from stationary to mobile shelving in the future?
  - » If yes, choose a shelving style that is conversion-capable. See manufacturer's user guidelines.

4. Is the shelving located in a walk-in cooler or freezer?

- For small coolers and freezers: Perimeter shelving is recommended as it is stationary and linked together for open corners and easy access.
- For large coolers and freezers: Larger walk-ins offer more flexibility for configuration. A combination of stationary shelving, mobile shelving and track shelving can optimize the available space. See a few examples of walk-in cooler shapes for configuration ideas.
- Where are the doors located? These generally determine the size and direction of the aisle.
- Are there obstacles? Account for ramps, lighting, condensers and plumbing. These will affect the depth and height of some units.
- What is the available floor space? Walk-in cooler sizes are typically measured from outside edge to outside edge, so it is important to know the actual size and insulation thickness of the walk-in (most have 4" thick insulation). Actual sizes may be less than nominal sizes. Confirm if coving is included along the walls as this will also factor into the available floor space.

5. Is it in a general space?

- Note the presence of wall coving, utilities, pillars, doorways and windows - these will impact configuration.
- Mobile units should be used in front of utility boxes for easy access.

6. What type of shelving configuration is needed?

- Stationary: A freestanding unit with four posts or a connected series of units that share posts.
- Mobile:
  - » Mobile shelving that is fitted with casters and occasionally moved for cleaning. Typical load-bearing capabilities are 600–900 lbs based on the caster style or shelving limitations. Not all shelving on casters is equal. Some plastic options require special shelves for mobility while others are not capable of being fitted with casters.
  - » If a true transport cart is required to move through a facility, use a mobile shelving system that is designed for adverse conditions. Typically, wire shelving or hybrid polymer/metal systems are ideal.
  - » For heavy duty transport, aluminum-sleeve wire shelving mounted to a dolly base with 6" or large casters is recommended.

Questions to Ask

  - » For carts that are loaded onto trucks and transported to a nearby facility, wire shelving with aluminum split sleeves mounted to a dolly base is required at a minimum.
- Track Shelving:
  - » Enables more shelving units to occupy limited floor space. Shelving is configured with rigid casters that allow the units to roll from side to side along a guide track. When the units are moved, an aisle opens up for supply access.
  - » Overhead track shelving is the most popular style, as it assures floors are clutter-free and easy to clean.
  - » Floor track systems (guide rails along the floor) are also available.
- Wall mount shelving:
  - » Ideal for creating storage space over stainless steel prep tables, sinks, and other work areas, wall-mount shelving will allow you to keep dishes, pots and pans, spices, and other important prep tools organized
  - » Typically used above workstations and doorways.
  - » Can be configured as a single unit or connected in a run.
  - » Features a fixed-bracket single shelf.
  - » Designed with post-style wall mounts; allow for more than one shelf tier.
- Wall-mount track system:
  - » This is the most flexible design and a popular option for areas above pot sinks and prep tables, as it allows for combinations of shelves and wall grids with baskets, hooks and special shelves. Shelves and grids can be mounted along the entire track. It also allows storage to be configured around wall obstacles.
- Undercounter shelving: This type of shelving is configured on short posts along with dividers, ledges and bins to keep condiments within reach behind service counters or display items in front of service counters.

7. Do they have specialty storage needs?

- Dunnage: Dunnage racks are ideal for keeping heavy bulk ingredients like flour or sugar off the floor and are available in a variety of materials such as aluminum and polymer as well as in stationary and mobile models.
- Security: Security shelving is preferred when protecting valuables or safeguarding high-end items.
- Wine Shelving: This type of shelving is an easy and inexpensive option for storing wine bottles. Wine racks are designed to hold bottles at optimal angles to maintain quality and allow air circulation through the racks to consistently preserve cool temperatures.

Types of Shelving (by Material)

1. Metal/Wire Shelving:

Typically the most economical shelving options are chromate, chrome-plated and epoxy-coated wire. Wire racks can withstand contact from very hot pans.

Chrome (i.e., Nickel chrome)

- Chrome-plated wire shelving units are ideal for dry storage or heated environments including stockrooms, warehouses, garages and retail applications.
- Designed to increase visibility and ventilation, chrome wire shelves may come with a clear epoxy coating as well, although can be prone to rusting after prolonged use in humid environments. Many of these units are NSF Listed.

Chromate (Zinc)

- Most economical dry storage finish with the look of chrome.

SHELVING

Types of Shelving (by Material)

1. Metal/Wire (continued):

Cooler Grade Epoxy

- Ideal for humid environments such as in walk-in coolers or dishwashing spaces.
- Some epoxy variants can contain antimicrobial elements, which are specifically helpful in wet environments due to the ability to inhibit mold, mildew, fungus and bacteria growth.
- Must be NSF-listed for all environments. This specific shelving is often green or gray and consists of an epoxy coating over a zinc substrate.
- Most black epoxy shelving is not suitable for wet environments and might be NSF-listed for dry environments only. These shelves do NOT have a protective zinc substrate under the surface epoxy.

Stainless Steel

- Stainless steel is durable, corrosion-resistant and adaptable to nearly any type of environment as well as a high-quality option to suit any area, purpose or industry from food storage in walk-in coolers to retail use to warehouse storage.

Solid Steel

- Allows any size or type of item to be stored on them without the risk of slipping through rails or spilling onto below items. Solid steel shelves are also easy to clean and maintain, as dust and grime don't get trapped in between the wires.

2. Plastic Mat Shelving:

Shelving with removable plastic shelf mats is ideal for walk-in coolers, freezers, dish rooms and other wet areas.

Plastic Mat

- Primary benefits:
  - » Shelf mats lift off for easy cleaning by hand or in a dish machine.
  - » The durable polymer shelf mat protects the shelf from damage caused by abrasive pans and containers.
  - » Longer lasting than regular wire shelving and does not rust.
- Construction types:
  - » All-plastic shelving with built-in shelf corner and one-piece shelf frames with removable plastic shelf mats (pre-installed) along with one-piece wedges; rigid to handle stationary, mobile and track shelving.
  - » Hybrid plastic/metal shelving with one-piece shelf frames and removable plastic shelf mats (pre-installed) as well as one-piece wedges; rigid to handle stationary, mobile, overhead track shelving and floor track shelving.
  - » Ladder-style systems comprised of loose shelf beams, uprights with cross braces, removable plastic shelf mats and wedges assembled from loose components. These vary in capability from stationary to stationary, mobile and floor track shelving configurations.
- Shelf mat styles (vary by manufacturer and product):
  - » Grid Vented: A great option for any type of cold storage application
    - Promote air circulation through the unit for maximum product shelf life.
    - Offer greater visibility when trying to identify inventory.
  - » Solid Sectioned Mats
    - Can provide a basic barrier to dust and dirt on the bottom tier.
    - Do not offer a complete liquid barrier due to sectioned design.
  - » One-Piece Solid Mat
    - Best leak and spill protection.

Shelving Tips

Safely storing food in a walk-in cooler:

- Fresh produce and prepared foods should be stored on the top shelves
- Raw, thawing, or marinating meats and poultry should be kept on bottom shelves below fresh produce and away from prepared and cooked food
- Bottom shelves should be at least six inches off the ground for cleaning and to prevent contamination with dirt
- No food products should be stored on the floor

Note: Fruits and produce can be damaged if stored too close to the cooler's fans. Many produce items can be damaged if stored in a cooler including bananas, tomatoes and basil leaves

Meeting your state's health code regulations:

- Place items on shelves to allow for proper airflow and circulation; do not overload units or block vents
- Organize similar products together (i.e. dairy with other dairy products, produce with other produce, etc.) for easier location
- Properly wrap foods and label each with the date prepared or received
- Always refrigerate perishable foods within two hours
- Keep all prepared foods in sealed containers or cover with aluminum foil or plastic wrap
- Follow the FIFO inventory management rule: First In, First Out.
- Habitually check for spoiled foods and discard food after seven calendar days
- Ensure your walk-in's thermometer is accurate to within 2°F
- Store food at least six inches above the floor to prevent contamination
- Store uncooked meat, fish and poultry on bottom shelves to avoid juices from leaking on other items
- Eliminate bacterial hazards by maintaining stable and safe internal temperatures at or below 38 – 40°F
- Regularly monitor and log internal equipment temperatures
- Routinely wipe down shelves and mop walk-in cooler floors

Organization Tips

1. Use colored label holders for food safety:

Green Produce **Brown** Cooked Meat **White** Dairy **Blue** Fish

Red Raw Meat **Yellow** Poultry **Grey** Other

2. Rods and tabs, ledges and dividers can help contain and organize supplies and help from smaller items from falling off the shelf.

Accessories and Options*

- **Casters -** Available in a variety of different diameters and can be made of several different materials. Their main purpose is to turn your stationary shelving unit into a more versatile mobile shelving unit. Check with your manufacture to see what they offer for different environments. *Tip: zinc-plated and chrome-plated are not recommended for walk-ins.*
- **Label Holders:** Great for organization and efficiency. Clearly labeling ingredients and other stored foods is the key to maintaining a functional storage area.
- **Storage Basket:** Wire shelf storage baskets attach directly to a shelving unit and are a great place to store cooking utensils, extra restaurant equipment parts and more.
- **Ledges:** Wire shelf ledges ensure product stability and are great for keeping items from falling off the shelf. They are also stackable to create more height.
- **S-Hooks:** S-hooks eliminate the need to purchase a large number of shelf posts and allow for a continuous run of shelving as well as easier access to corner storage areas.
- **Enclosures:** Shelving grid enclosure panels allow you to alter your office supply room, pantry or other storage area to accommodate your needs. They can also be added to the sides or backs of shelving units to prevent falling.
- **Drying Racks:** Drying racks efficiently sort and hold pots, pans and trays to prevent wet nesting.

*May vary by manufacturer

SINKS

Questions to Ask

1. Do you need a deep-drawn bowl or fabricated bowl?

- Deep–drawn bowls:
  - » formed from a single sheet of Deep Drawn Quality (DDQ) steel. Because of the higher grade of steel, deep-drawn sinks are more expensive than fabricated sinks
  - » feature large, 3" radius corners that make the bowls easier to clean
  - » sinks require a 2" space between each bowl
  - » are not available in custom sizes
- Fabricated bowls:
  - » welded together at the seams and polished
  - » have smaller 3/4" radius corners (fully NSF)
  - » sinks do not require space between bowls, providing a space-saving solution
  - » available in custom sizes

2. What gauge sink will you be using?

- Stainless steel comes in a variety of thicknesses, or gauges. It is important to find out the sink's primary purpose and how heavy the usage will be. All gauges are NSF but heavier gauge sinks are preferable due to their greater durability.
  - » 14-gauge is the heaviest gauge sink and the most expensive because of the stronger material
  - » 16-gauge is the middle tier level and suitable for many applications
  - » 18-gauge is the thinnest gauge offered for sinks. While they are NSF, cost-effectiveness is the primary benefit

3. What size sink do you need?

- There are many options for sink sizes, with function and location being primary factors for consideration. Standard sinks range from as small as 20" to as large as 162" overall.

Types of Sinks

Drop-In and Undermount Sinks

Like Hand Sinks, drop-in and undermount sinks are common in foodservice environments when adequate wall space is not available for hand sinks. They can also be purchased in different sizes and configurations.

Multi-Wash Sinks

There are certain environments, such as busy kitchens, in which there may be multiple individuals needing to wash their hands at the same time. In these situations, users may choose to order multiple hand washing sinks. Another solution is a multi-wash sink. These sinks have one large bowl with multiple (usually hands-free) faucets. Standard configurations range from two to six faucets per bowl. This allows multiple users to wash their hands at the same time.

Mop Sinks

Mop sinks provide employees a contained unit for dirty mop water. They help to ensure an environment stays clean and safe by promoting regular and effective mop usage. They come in a variety of configurations:

- Standard mop sinks are typically 16"x 20" or 20" x 28" with a depth of 6' or 12'. Large and custom sizes are also usually available and can be purchased with side splashes or back splashes, though these are not standard features.
- Drop-front mop sinks - full mop buckets can become heavy, leading to difficulty lifting the mop bucket over the sink for emptying. Drop-front mop sinks feature a notch in the front so operators do not need to lift the bucket as high.
- Flush-mount mop sinks are similar to drop-front models but are mounted into the floor and covered with a steel grate, completely eliminating the need for lifting (NOTE: these sinks are ideal for new construction since they need to be mounted into the floor).

Hand Sinks

In most territories, staff are not allowed to wash their hands in warewashing sinks, food prep sinks and service sinks, making hand sinks a necessity. Unlike compartment sinks, there is not as much bowl size variety (most bowls are 10" x 14" x 5") and gauge (most hand sinks are 20ga.). However, there are still several different styles and configurations available:

- Side-splash units – These are becoming more common throughout the industry to reduce unnecessary splashing and are available with a side splash on one or both sides
- Space-saver units – Sometimes space is tight in a kitchen. You still need to comply with local health codes, but may not have the space for a standard size hand sink. Space-saver sinks are a great option for this situation. With a bowl size of 9"x 9" x 5", these sinks have a smaller footprint
- Hands-free solutions – In certain applications such as healthcare, preventing the spread of harmful germs is extremely important. Hands-free faucets eliminate the need to touch anything when washing hands. Popular hands-free solutions include knee and foot pedal operated faucets as well as electronic hands-free faucets
- ADA-compliant hand sinks – ADA (Americans with Disabilities Act) guidelines require hand sinks be manufactured to a different specification than other hand sinks. They require the sink bowl to be tapered and the drain to be pushed towards the back. This allows individuals in wheelchairs to safely and comfortably position themselves underneath the sink to wash their hands

- Built-in soap and towel dispensers – health codes require hand soap as well as an adequate way to dry off at every sink. Because of this, many people turn to "all in one" hand sinks that include built-in soap and towel dispensers. They are a great way to meet health codes while maximizing space

These are just a few examples of available configurations. Hand sinks can also be modified or customized to meet specific criteria when required

Fabricated Bowl

Deep Drawn Bowl

Compartment Sinks

- Standard compartment sinks range from one to four bowls. Standard bowl sizes range from 15" x 15" to 20" x 28" (check with the manufacturer for full range of sizes). Decisions should factor in local health codes, sink usage and operator preferences
- All standard sinks can be purchased with drainboards, which provide an additional space for cleaning and drying and can be placed on one or both sides. Drainboards are pitched toward the sink bowl so all excess water is properly removed.
- Sometimes you will be required to fit certain sink specs into a small space. As a result, you will not always be able to use a "standard" size

Additional Information

- Be mindful of the environment for your sink. If the sink is being used outdoors or an area with excess moisture in the air, make sure the sink is using stainless steel legs instead of galvanized steel
- It is possible to upsell the customer with not only a better sink (gauge, leg type, etc.) but also with added accessories by asking a few simple questions. Here are some popular compartment sink accessories:
  - » Side-splash unit - can be welded or bolted on and are required by some health codes but also useful if the sink is going to be placed next to food prep area
  - » Additional drainboard - if the operator requires more work space than the standard drainboard offers, larger, custom-sized drainboards can be built
  - » Overshelves and undershelves - if nearby storage is required, adding an overshelf or undershelf is an option. Custom sizes, multiple tiers and added accessories like pot racks are available.
  - » Welded setup - if the sink is going to be used frequently, a fully welded assembly is recommended. Here, the entire understructure will be all welded for added stability.

Stainless Steel Sink Maintenance Tips

It is important to remember that stainless steel is stainless, not stain-proof. Improper cleaning and maintenance can cause rust and corrosion. Follow the below tips and best practices to maximize the durability and lifespan of your sink:

- Only use stainless steel and plastic pads for stain removal. NEVER use steel wool
- Detergents containing chlorine derivatives can cause stainless steel to pit and eventually corrode. Be sure to take the following steps for detergent use:
  - » Rinse the sink bowl thoroughly after and remove all traces of cleansing agents
  - » Do not allow residue after sterilization process to remain in bowl. Flush thoroughly
  - » Use chlorinated detergents ONLY as directed by the manufacturer. Excessive dosages can be harmful
- Never leave dirty rags or other foreign matter in sink bowl overnight
- High-chlorine detergents are not recommended for stainless steel sink bowls

The Three-Sink Method

Wash, **rinse** and **sanitize** are the basic steps that serve as the foundation of what is known as the "three-sink method" of manual dish washing, with three-compartment sinks having been designed for this exact process. While the concept has been around for quite some time, there are still some important things to remember:

Before You Begin

Proper dish cleaning first requires a designated area for dishes to be washed. It is also important to note that while three-compartment sinks can be used to wash wiping cloths, clean produce and thaw food, it should not be used for washing hands or as a mop sink. Each sink bay should also be completely emptied and cleaned every four hours.

1. Wash

Washing dishes makes them visibly clean but doesn't necessarily eliminate all harmful pathogens invisible to the naked eye, so it's only the first step. Fill your wash bay with a solution of water and at least one of the following: soap, detergent, acid or alkaline cleaner, degreaser or an abrasive cleaner. Your water's minimum temperature should be between 95 and 120˚ F.

2. Rinse

The second bay in your sink should be dedicated to **rinsing**. Use clean water that is at least 120 degrees Fahrenheit in order to remove any cleaning agents from the wash bay. Drain the water when it becomes too soapy and replace it with fresh water.

3. Sanitize

Sanitizing is the third and arguably most important step because it ensures that all harmful microorganisms are eliminated. **Chemical sanitizing** kills bacteria through the use of dissolvable tablets or chlorine solutions, with sanitation taking between seven and 30 seconds. **Hot water sanitization** uses water at or above 171˚ F to kill all microorganisms on dishes. This method requires your sanitizing sink bay to have a sink heater installed.

Dry

Once the manual cycle is complete, you will need to **dry** your dishes. They should always be air dried and never dried with a towel. A self-draining drainboard must be used in order to prevent water accumulation. Your drainboard should also be large enough to accommodate all of your clean items.

Related DON Branded Cleaning Chemicals

Pink Dish™ Pot & Pan Detergent
1J213
2/1 gal bottles

Frisk™ Plus Pot & Pan Detergent
1J188
2/1 gal bottles

Sanni-Shine™ Quaternary Sanitizer
1J463
2/1 gal bottles

SLICERS

Questions to Ask

1. Is your customer bulk slicing or slicing to order?
- Automatic slicers are recommended for bulk slicing
- Manual slicers are recommended when slicing to order.

2. How many hours per day does your customer intend to use their slicer?
- The amount of slicer operation time per day will determine whether they need a light, medium or heavy duty slicer.
  - » Light Duty – 30 minutes to one hour per day of meat slicing with little to no cheese slicing
  - » Medium Duty – two to six hours of meat slicing per day with light to moderate cheese slicing
  - » Heavy Duty – all-day meat and cheese slicing

3. How much cheese does your customer intend to slice?
- Cheese is one of the hardest items to slice and will also help to determine whether your customer needs a light, medium or heavy duty slicer.
- Typically, slicers with 1/2 HP motors have enough power to push through cheese without warming it, eliminating any melting risk.

4. What is the largest product that will be sliced?
- Slicer capacities vary by blade sizes:
  - » 9" slicers will slice a 6" round product
  - » 10" slicers will slice a 7" round product
  - » 12" slicers will slice an 8" round product (most popular)
  - » 14" slicers will slice a 10" round product

5. Will vegetables be sliced? If so, what kind?
- Fences are recommended for smaller items such as pepperoni or cucumbers.
  - » Fences are accessories fastened to the carriage and hold narrow products against the side guard to stabilize them during slicing for improved consistency.
- A vegetable hopper is suggested for bulk slicing produce such as tomatoes or onions.
  - » Vegetable hoppers allow the operator to fill a large cylinder fastened to the carriage with product for bulk vegetable slicing. Items can be arranged for cross-sectional or non-uniform cuts.

6. Will you be slicing frozen or semi-frozen meat?
- Frozen and semi-frozen meat slicing requires a serrated knife which cannot be sharpened with a traditional blade sharpener.

Types of Slicers

Gravity-Feed Slicer

- Designed so the carriage meets the knife at a downward angle, allowing gravity to help guide product into the blade.
- Available in both manual and automatic models, most gravity-feed slicers feature multiple speeds to improve performance as well as carriage stroke length options.
- Ideal for slicing small products that require a fence.

Vertical Slicer

- Commonly known as "fly wheel" slicers, designed so the product meets the blade at a perpendicular 90° angle.
- Typically used for prosciutto and other artisan meats because of their ability to reduce the amount of heat generated during operation, which protects the integrity of the cut.
- Available in both manual and automatic models.

Tips and Maintenance

1. Only use mineral oil for lubricating slicer parts.
- Vegetable oil and cooking sprays rapidly become sticky and can damage parts.

2. Put several drops of oil on the rod holding the end weight to prevent the end weight from binding as it travels down the slide rod. This should be done on a daily basis to help keep slices consistent and improve the glide of the carriage. Some manufacturers offer self-wicking oiling processes for added convenience.

3. Put several drops of oil on the carriage rail underneath the slicer on a semi-annual basis to ensure a smooth glide of the carriage and help reduce or prevent operator fatigue in manual mode.

4. Clean the sharpening stones regularly with hot soapy water and a stiff bristled brush as dirty stones will not sharpen well. Blades must be cleaned thoroughly before sharpening or the stones will become coated with food fats and reduce their slicing and cleaning capabilities.

5. Sharpening should be done approximately every three weeks or when excessive scraps are present.

6. Apply moderate pressure for no longer than 10 to 15 seconds when sharpening.

*Accessories and Options**

- **Slicer Covers –** ideal for establishments that do not use slicers on a daily basis
- **Slaw Tray –** can be used to catch bulk product for easy transport to another location in the kitchen
- **Vegetable Hoppers –** great for uniform cross cuts of round vegetables; can also be used to slice or shred lettuce and cabbage quickly
- **Food Fence –** holds small-diameter products such as pepperoni or cucumbers in place while slicing
- **Knife Removal Tool –** used for easy blade removal when cleaning; also provides greater access to the ring guard and slicer housing
- **Removable Carriage -** allows product carriage removal for cleaning, eliminating the need for tilting
- **Correctional Package –** most slicer parts are not removable; ideal for correctional institutions
- **Frozen Knife –** serrated knife that can slice through frozen products
- **Meat Room Application –** water-repellent application for slicers used in meat rooms within a temperature-controlled environment
- **Stainless Steel Knife –** rust-proof blades that can also improve slice quality and overall yield

*May vary by manufacturer

STEAMERS

Questions to Ask

1. Is a gas or electric steamer needed?
- If gas, please specify LP or natural gas
- If electric, please specify voltage

2. How much product will be held per hour per day?
- A 2-1/2" deep pan will hold between 8-11 pounds of product
- Most Steamers come in three-, five- and ten-pan capacity

3. Which cooking method will be used?
- A la Carte - in and out of the steamer throughout the day
- Batch-style - product is inserted and removed simultaneously. This is the most common method used in the market

4. What type of footprint has been requested?
- Counter top unit or floor model?

5. What type of product will be steamed?
- Boilerless steamers are not recommended for seafood

6. Are there power or energy saving concerns?
- A generator or boiler unit will use 35-45 gallons of water per cavity per hour These units have very fast recovery times and will keep up anywhere
  - » Ideal for military bases, prisons and high volume restaurants
- An Energy Star steamer will use less than ten gallons of water per cavity per hour. The recovery times will not be as fast as a generator or boiler unit.
  - » Ideal for schools and nursing homes

Types of Steamers

Pressure Steamers

- Feature well-sealed cabinets that undergo a rise in pressure when they're filled with steam. The increased pressure causes temperatures to rise above 212° F, leading to faster cook times
- Advantages:
  - » Faster cook times than equivalent convection steamers
  - » Good for preparing large batches of food such as those in cafeterias, universities and hospitals
  - » Works especially well with tough or starchy foods such as potatoes and meat
- Disadvantages:
  - » Higher initial costs than equivalent convection steamers
  - » Larger and less user-friendly
  - » Increased risk of flavor transfer between food batches
  - » Increased difficulty cooking delicate foods such as vegetables
  - » Cannot be opened to check cooking progress during operation

Convection Steamers

- Circulate steam at normal pressure by convection with a fan, making it ideal for steaming, poaching, thawing, stewing, reheating and par-cooking. They are far more flexible and forgiving, making overcooking nearly impossible
- Advantages:
  - » Lower cooking temperature better preserves more of the nutrients, moisture and texture of the food
  - » No flavor transfer
  - » Can be opened during operation to check cooking progress, allowing greater adaptability
  - » Lower initial costs
- Disadvantages:
  - » Longer cook times

Single, shown with pans

Stacked

Single, on stand

Sources of Steam

1. **Direct Steam –** Equipment is hooked up to the building's existing steam supply
   - Cost-effective choice for facilities with a readily available steam supply
   - Can also use steam from a standalone steam generator
   - Not recommended for facilities without a steam supply or a steam generator
2. **Steam Generator –** Some commercial steamers will use an internal steam generator to produce the steam
   - Less risk of limescale buildup compared to boiler-based steamers
   - Easy cleaning and maintenance
   - Lower output and slower recovery than models with a boiler
3. **Boiler –** May be built right into the cabinet or rest on top of a boiler base on some models to provide steam for the unit
   - Great for high-volume operations
   - Can steam large amounts of food with fast recovery time between batches
   - Require consistent maintenance and de-liming to maintain optimal efficiency and performance
4. **Boilerless –** Produces steam by heating water in a compartment or by spraying water onto a heated plate
   - Great for smaller, low-volume operations
   - Lower maintenance and utility costs
   - Longer cook times than steamers with a boiler
   - Compact, connectionless models are available for manual filling and are a great choice if water or drain connections are not readily available

Tips and Maintenance

1. Certain parts may require replacement after prolonged use:
   - Change water filters as needed (typically every five months but this will vary with use)
   - If steam or condensate is leaking around the door:
     - » Check the door gasket for cracks or splits and replace if necessary
     - » Leave the door open and allow steamer to dry when not in operation in order to prevent premature gasket failure
   - Drain isn't draining properly
     - » Check the cooking chamber for blockage
2. Other possible performance issues:
   - The steam generator doesn't fill with water
     - » Check to make sure steamer is on
     - » Check to make sure water supply is connected
     - » Is the switch depressed?
     - » Check for low water pressure
     - » Has the steamer been de-limed?
   - No steam
     - » Is the steamer on?
     - » Is water supply connected?
     - » Is the steamer door open?
     - » Has the steam generator been de-limed?
3. Daily Cleaning:
   - Turn off the power when not in use
   - Remove the pan and racks and place them in the dishwasher for cleaning
   - Wash the interior with clean water
   - Clean gaskets with warm water, then dry
   - Do not apply oils
   - Clean the drain opening and remove all solids near the drain to prevent clogging
   - Leave the steamer door slightly open when not in use
   - Avoid using corrosive cleaning agents
   - Never spray water directly into the controls; this will void the warranty and cause possible control failure
4. Monthly maintenance:
   - It is highly recommended to de-lime the steamer at least once per month (more if necessary)
   - An authorized service agent should clean and adjust the unit for maximum performance every six months

Size Options

Countertop models:

- Connectionless: No water or drain line / Electric-steamers only / Energy Star
- Boilerless: Electric or gas / Energy Star
- Generator

Floor models:

- Boilerless steamer stacked with stand
- Generator
- Generator Energy Star unit
- Boiler base units

Where can different models be used?

- Batch steam cooking: All models above
  - » Countertop models: Connectionless steamers / Electric / No water or drain line / Energy Star
  - » Boilerless: Energy Star
  - » Floor models: Generator Energy Star steamer
- A la Carte steam cooking: Only select steamers can be used for A la Carte steam cooking. Contact the manufacturer for details

TOASTERS

Questions to Ask

1. Do you need a radiant toaster or a contact toaster?
- Radiant toasters use infrared elements to dry bread products out, absorbing the heat of the toaster with color and caramelization occurring near the end. Most residential toasters are a radiant style with the two most common types being pop-up and conveyor style.
- Contact toasters are most common for hamburger buns and Texas toast and feature a hot surface where the bread is pre-buttered and contacts the hot surface. This provides a sealed surface to better support condiments like ketchup and mayonnaise.

2. Is this for a self-serve application?
- Pop-up toasters tend to be more intuitive and user-friendly, though with longer cycle times and lower overall capacity than a conveyor toaster
- Conveyor toasters can also be simple to operate and some feature control covers to reduce the likelihood of excessive user input

3. How many slices need to be prepared per hour?
- A 120-volt pop-up toaster can produce approximately 200 slices of lightly toasted white bread. More difficult bread types like English muffins or darker toast shades can cause the capacity to go down
- A conveyor toaster can produce much higher amounts per hour

4. How critical is the single order time?
- A 120-volt pop-up toaster will take a little over a minute to produce two to three slices of lightly toasted white bread after being warmed. First orders on a cold pop-up toaster will require approximately two minutes
- Conveyor toasters have much shorter cycle times after warming

5. What voltage is available?
- Higher power can produce more toast faster. Go for the highest wattage/voltage your customers business can support. In the United States, a 15-amp circuit can handle up to 1800 watts.
- Ask if there is any other load on that circuit in order to prevent tripping local circuit breakers

Types of Toasters

Pop-Up

- Will this be used in the front or back of the house?
  - » Would your customer prefer a shiny and decorative or institutional finish? Some pop-ups are now available in different colors to blend in with front of the house décor
- Is single-sided toasting a requirement or a preferred option?
  - » Some pop-ups allow for single-sided toasting, although it will slow the speed and limit the production. Customers should be notified capabilities decrease when these elements are switched off
- Does the customer have the proper voltage and receptacle?
- Is the crumb tray easy to remove and clean?
- What is the warranty and how is it administered?
  - » Some pop-up toasters feature a one-year replacement warranty and are easy to execute. Others require transportation to a service center, which could cause delays to allow for commuting
- How many are needed?
  - » Due to their time and capacity limitations, it is not uncommon to see two or more units. Commercial UL pop-ups tend to be more expensive than residential-grade, although they are still less expensive than most conveyor toasters. Residential-grade equipment can violate agreements within a customer's commercial business insurance and violate local building codes

Conveyor

- Will this be used in the front or back of the house?
  - » Would your customer prefer a decorative or institutional-looking finish? Some conveyors have more colors and designs for customer view areas. Models used in the front of the house may do better with a quieter motor type or power save mode which shuts the conveyor off during slower periods
- Is this a self-service area?
  - » How friendly is the user interface?
  - » Is a control cover or lock available to reduce/restrict user input?
- Does the customer have the proper voltage and receptacle?
  - » Conveyor toasters come in a variety of wattages and voltages, 208V and 240V, which are the most common commercial voltages. 220V is a residential or export voltage and rarely found in a commercial setting
- What is the warranty and how is it administered?
  - » Some Conveyor toasters feature a one-year on-site parts and labor warranty while others require transportation to a service center which may cause delays to allow for commuting.

Types of Toasters

Contact

- Heat is transferred by directly touching the toasting bread to a hot element, such as a platen
  - » Often used to toast buns, saving space on the flat-top
  - » Dual-sided platens provide toasting on both sides of the product, increasing total volume capabilities
  - » Vertical toaster that saves counter space
  - » Easy to clean

Extra Toaster Considerations

- If toasting one type of bread, a simple toaster with very few adjustments is recommended
- If toasting a variety of different products, a toaster with greater adjustability is ideal
  - » Example - raisin bread will toast faster and require less heat intensity than sourdough bread and having a toaster with more adjustments for each is a worthwhile investment
- Is the opening height suitable for all bread types?
- Very fresh bread can be moist. The best toast comes from dry bread
- Toasting is a three-step process – drying, heating and carmelizing
  - » Will your customer be willing to allow their breads to air out before toasting?
    - If so – a simple toaster is recommended
    - If not – a toaster with the ability to adjust heat levels is ideal
- Artisan style breads may do better in the toaster with greater adjustability
- Moist products can stick to a very hot conveyor and potentially cause malfunctions. Being able to lower the heat intensity will mitigate this risk, although it may add a few seconds to the through-put time
- Generally, heat intensity affects toast color – while conveyor time affects the internal temperature of the finished product
- Keep the fan opening clean
  - » The majority of equipment failures can be avoided with regular maintenance, especially cleaning. Toasters emit a lot of heat and inhibited air circulation can cause fried heating elements
- Space considerations
  - » Failure to provide the right amount of clearance for your toaster can drastically reduce its lifespan. Be sure to provide adequate space around the unit to ensure optimal air flow

How to Safely Clean and Remove Crumbs from a Toaster

Keeping the toaster clean is important for the overall performance and safety of the unit. The below best practices will help maximize your toaster's performance and lifespan:

- Switch off the unit, unplug it and make sure it's cool prior to cleaning
- Wipe down the outside of the toaster daily with a damp cloth
- Use small brushes to clean hard-to-reach spaces
- Remove the crumb tray, empty loose crumbs and then wipe the tray clean and dry before replacing
- Do not turn toasters upside down or shake them to remove crumbs. This can damage the internal components and further lodge crumbs inside of the toaster

Common Toaster Failures

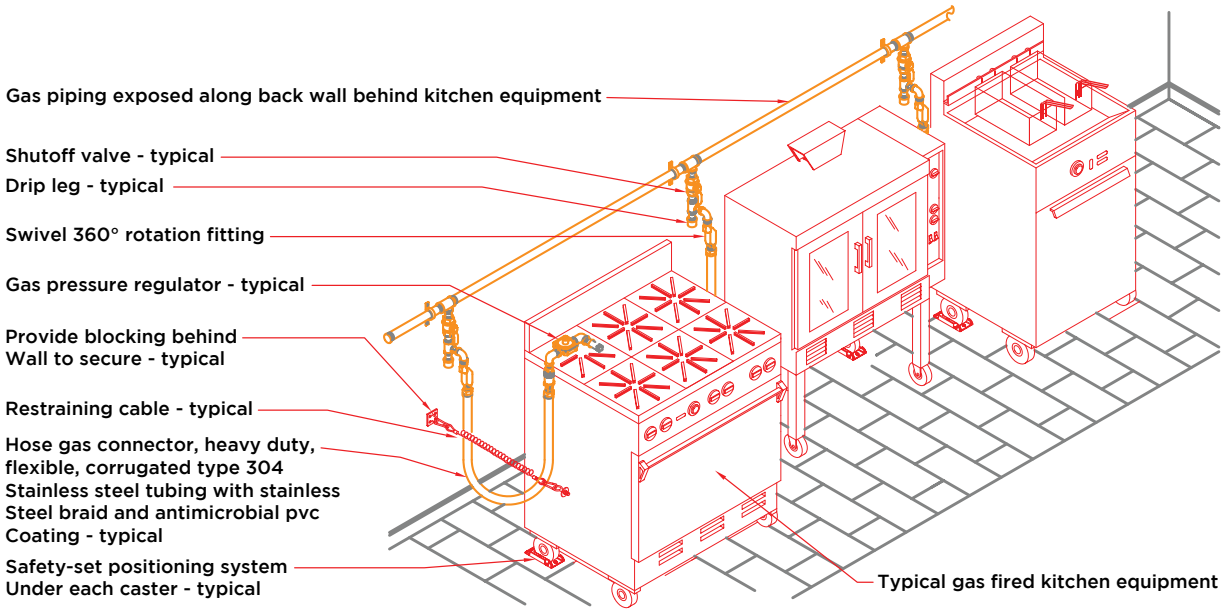
- Damage to electrical wires
  - » Toasters work by reaching high temperatures very quickly. Over time, that extreme temperature variance can affect the electrical wires in your machine, causing them to short or crack
- Connection to the terminal block
  - » Regular intermittent connections are prevalent in toasters, which can increase the risk of electrical component failure

GAS CONNECTIONS

Why Are Gas Connectors Important?

Gas is the lifeblood for many kitchen appliances such as ovens and ranges, bringing the necessary fuel needed for the controlled flame used in order to provide the proper amount of heat needed for cooking and warming. Gas connectors are an often overlooked but nonetheless crucial part of ensuring efficient and safe operation, as they are a safe way to channel the flow of gas from the source to the appliance while minimizing the risk of potentially harmful leaks. Equally important is knowing which type of gas connector to use and understanding their operation. The checklist below will help you decide which gas connector is right for your establishment and how to minimize any hazardous risks.

Commercial Kitchen Gas Piping Requirements



Gas Appliance Safety Checklist

Kitchen Safety and Cleanliness Principles

- Appliances must be cleaned
- Appliances must be able to be moved
- Appliances need flexible connectors
- Flexible gas connectors must be durable
- Connectors should be certified by NSF International

Flexible Appliance Connectors

- Lengths shall not exceed 6 feet
- Connectors shall be located in the same room as the appliance
- Connectors shall enter a motor-operated appliance with a protected knockout opening
- Listed and labeled connectors shall be in accordance with the manufacturer's installation instructions
- Listed and labeled quick-disconnect devices shall be used with listed and labeled appliance connectors
- Listed and labeled appliance connectors shall comply with ANSI Z21 69 and be listed for use with foodservice equipment having casters, or equipment that otherwise is subject to movement for cleaning, and other large movable equipment

Gas Equipment Connection Compliancy

- Utilize a commercial-grade flexible gas connector for all commercial foodservice gas-fired cooking equipment
- Don't use residential-grade flexible connectors in commercial kitchens
- Ensure that the gas connector is installed in a U shape
- Don't hard-pipe the appliance to the gas supply line
- Use a restraining cable for all flexible commercial-grade gas connector installations
- The restraining cable must be connected at all times except when the cable and gas connector are disconnected for cleaning

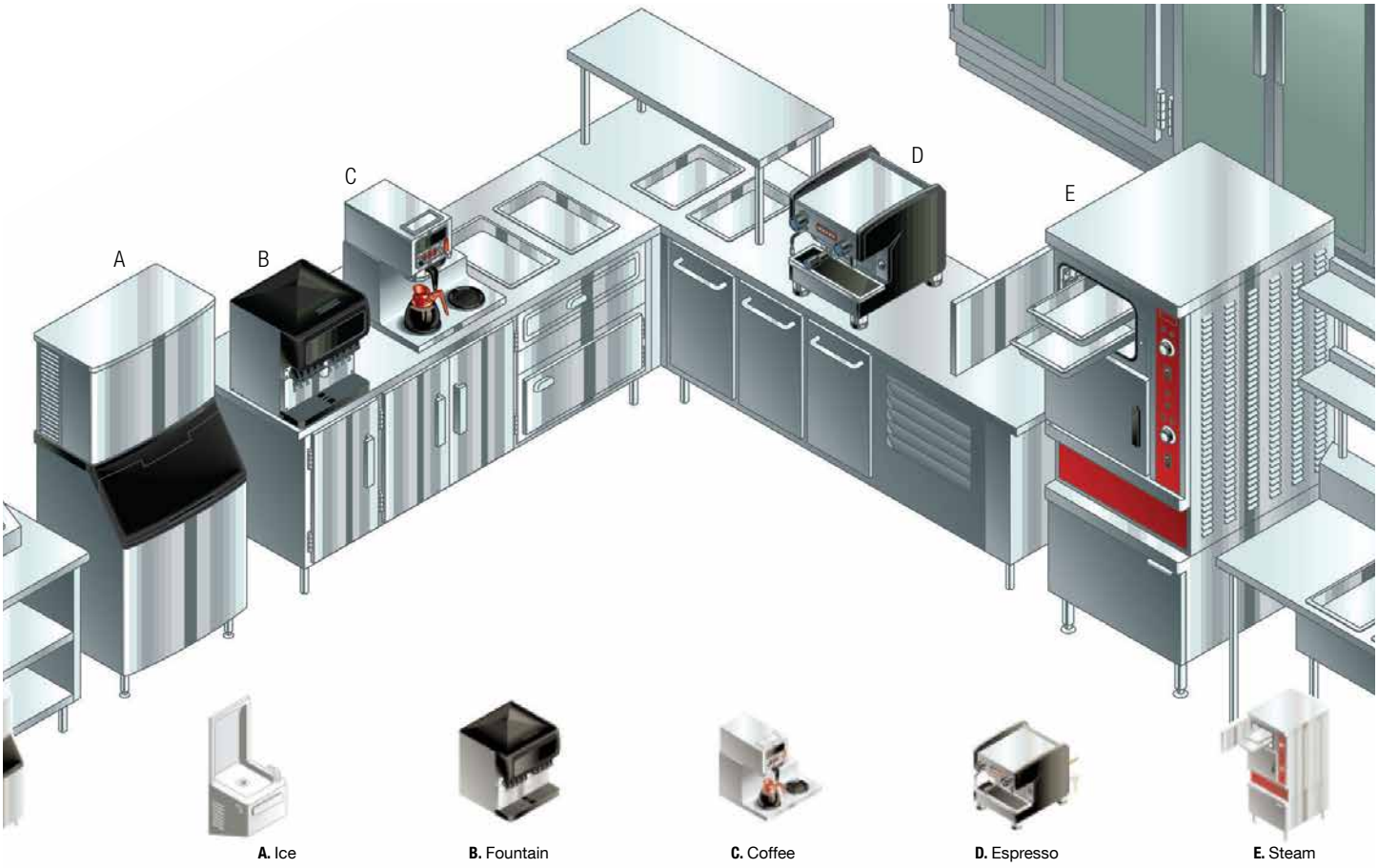
Gas Connector Installation Items

- Ensure that the gas supply and all appliance control knobs are turned off before making connections
- The connector must not be concealed within or run through any wall, floor, or partition
- Connectors shall not come into contact with surfaces at temperatures in excess of 230°F, sharp edges, or wiring
- The final assembly shall be tested for leaks
- An accessible manual shutoff valve must be installed at the outlet of the gas supply piping system upstream of the connector
- Connectors are for use only on piping systems having a fuel gas pressure of 0 5 psi or less
- Each piece of equipment must have its own shutoff valve

WATER FILTRATION

Why Is Water Filtration Important?

Water filtering systems are a critical investment in any food service enterprise. Water purification systems block mineral deposits, scale, sediment, cysts, and other contaminants from entering the water line and equipment. This helps prevent odor and chlorine taste in your ice and beverages. Blocking these substances not only helps with water sanitation, but keeps equipment running smoothly. Machines with mineral buildup will run less efficiently and break down sooner, which means you lose money. In fact, poor quality feed water will actually void the warranty on most ice machines. Water filtering systems require ongoing maintenance. Change all your water filters at least twice a year to avoid breakdowns. In short, spending a few hundred dollars on a filter system now will save you several thousand dollars in the future!



A. Ice

B. Fountain

C. Coffee

D. Espresso

E. Steam

Types of Water Filters

Carbon Filter Systems:

- Carbon, a porous material, absorbs impurities as water passes through these point-of-entry systems

Reverse Osmosis Systems:

Often used in conjunction with carbon filters, these systems push water through a semi-permeable membrane to act as an extremely fine filter.

Ultraviolet Light Systems:

- These units disinfect water by killing micro-organisms with ultraviolet radiation and are often used as a pre-treatment option or a polishing step in the filtration process

CLEANING/DON BRANDED CHEMICALS

Clean, Protect and Restore

Protect your investment in ovens, fryers, steam tables, counters, coolers and refrigerators.

Use these three simple and convenient DON brand products to clean, protect and restore all of your kitchen and food preparation equipment. Daily cleaning and maintaining will:

- **Keep the equipment and your kitchen looking brand new**
- **Improve cooking performance food consistency**
- **Prolong equipment life and reduce overall costs**

Clean Daily

Mr. D™ Cookline Cleaner
1J978
6/32 oz bottles

- Remove baked-on carbonized soils from griddles, ovens, fryers and stoves. Clean food prep surfaces and improve the taste and consistency of your food while extending the life of your equipment, giving you a maximum return on your investment. Foam-to-gel technology allows Mr. D cookline cleaner to cling to vertical surfaces and evenly spread without 'flashing off' griddles and grill surfaces. Daily use is recommended

Super Jet Solv
1J313
6/32 oz spray bottles

- Fast, easy and effective. Simply spray on and wipe away grease, oils and finger marks from all surfaces. Use anytime and anywhere grease, food and oil are found.

Polish and Protect

Hy-Shine Stainless Steel Polish
1J982
6/32 oz spray bottles

- Clean and polish in a single step while restoring equipment to a "like new" appearance quickly and easily. Spray on a cloth, wipe the surface and then polish dry. The water-based formula will not smear or leave an oily film and resists finger marking to make cleaning even easier

GLOSSARY

Antenna/Stirrer – Distributes microwaves around the cavity for even heating

ASTM – American Society for Testing and Materials

Attachment Hub – Standardized hub for non-mixing attachments such as grinders, slicers, graters and shredders for meats, cheeses, fruits or vegetables.

Battery - Sold as a single unit, this series of fryers (typically two or more) share their power source (gas or electric connection) and a filtration system

Belt-Driven Variable Sheaves – Two sheaves that expand and collapse as the operator changes speed, which changes belt characteristics and loses RPM consistency over time.

Boil-out – A popular method used to clean a commercial fryer by boiling water and cleaning solution in an empty frypot

Bowl Guard – Wire frame enclosure around the top of the bowl

Bowl Lift – Raises the bowl to the operating position or lowers it for removal or loading ingredients; can be manual or electronic.

Burner – The component of a gas fryer that produces heat

Carriage – The part of the slicer that holds unsliced product

Cold zone – The area that receives food particles or sediment that fall from food items. The cold zone can be found at the bottom of frypots below the burners or in a designated designed area. Contrary to what the name suggests, the oil is still hot but not hot enough to burn sediment and taint the oil. Shapes and sizes of cold zones can vary based on fryer type

CSA – Canadian Standards Association

End Weight – Weight placed behind product to help guide it into the knife

ETL – Intertek Testing Laboratory

Flue - Located towards the back of a fryer, the flue is where excess heat and fumes are released from the equipment and travel up to the exhaust hood. Flues are only found on gas fryers

Frypot – Typically referred to as a "tank" or "vat," the frypot holds the oil and is where the foods are fried

Geared Transmission – Transmission in which the motor is coupled directly to a series of gears that raise and lower the speed of the planetary mixer

IMC – International Mechanical Codes

Indexing Knob – Controls slice thickness; also called a slice thickness knob

Ingredient Chute – Temporary or permanent chute attached to bowl guard for incorporating ingredients during mixing without opening the bowl guard.

Magnetron – Generates microwaves

Meat grip – Toothed or tined grip on top of or behind the product to keep it stabilized for slice consistency; weighted meat grips for heavier applications are also available from some manufacturers

Mixer Shaft – Portion of mixer where the agitator is installed

NFPA – National Fire Protection Association

NSF – National Sanitation Foundation. (www.nsf.org). All shelving that is used in the Commercial Foodservice industry must have this listing. Shelving for walk-ins and freezers must have an NSF listing for all environments. Shelving for dry storage must at least have an NSF listing for dry environments.

Power Levels – All non-inverter microwave ovens always operate at 100%.

- When a power percentage is selected, the microwave cooks at 100% for that percentage of time. Examples:
  - » One-minute cook cycle at 50% = full power in evenly spaced intervals for half the total cook time (one minute)
  - » Two-minute cook cycle at 25% = full power in evenly spaced intervals for one-quarter of the total cook time (two minutes)
  - » Note: microwaves that use an inverter adjust the actual power when a percentage is selected(i.e. one-minute cook cycle at 50% = half the power for the full cook time or a 1000 watt microwave would cook at 500 watts if 50% is selected, etc)

Recovery – Refers to the length of time required for the oil temperature to rise back to a set temperature after frozen or cold foods have been inserted

Sediment - Small remnants or crumbs that fall from food items cooking in a fryer; most common in breading

Slide Rod – Attached to carriage as a means to guide the meat grip and end weight towards the blade

Split Sleeve vs. Wedge – Split Sleeve is two pieces and Wedge is one piece. Both function to hold a shelf on a post or upright.

Stage Cooking – A cook cycle that uses different power levels at various stages of the cooking process (i.e. ACP microwaves feature four-stage cooking, meaning four different 'time and power' sequences can be programmed into a single cook cycle, such as 20 seconds at 25% for the first stage, ten seconds at 50% for the second stage, etc)

UL – Underwriters Laboratory

Uprights – Vertical posts with cross braces connecting them together.

Variable Frequency AC motor – Motor which utilizes a variable frequency drive (VFD) to raise and lower the voltage frequency, allowing speed changes while the motor is running.

Wattage – Amount of power used to heat food during the cook cycle

Wet Nesting – Stacking or nesting wet items such as wet pans, trays or cutting boards. This can lead to negative inspection results.

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