FAQ

Answers to FAQs about: **Gas Steamers!**

by Russell L. Bean, CFSP

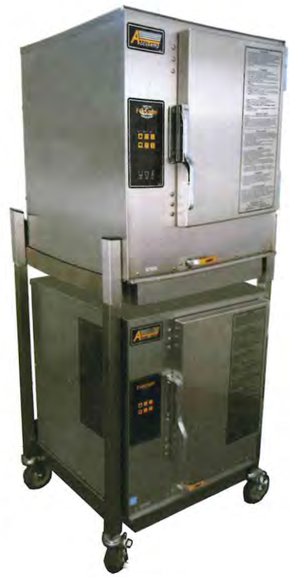
This month we will address the steamy issue of natural gas compartment steamers, be they pressure or pressureless, atmospheric and convection, connected or connectionless, with steam provided by a boilerless reservoir, steam generator or pressure boiler.

Q: What type and size steamers are available today?

A: Today there is a long list of gas steamer models, types and sizes available to foodservice operators. There are old school pressure steamers and the more widely used pressureless models that allow you to open the cooking compartment door at any time. That dominant pressureless category includes: pressure boiler base models; base cabinet models with one or two (pressureless) steam generators; countertop models with a pressureless steam generator, and so called boilerless models that make steam inside the cooking compartment. The new boilerless models can be either connected to water and drain lines or connectionless, requiring manual filling and emptying of the in-compartment reservoir.

Capacity per compartment varies from three, on up to twelve 2½-inch deep steamer pans, with two or three compartments served by the same boiler or steam generator. Some independent units can be stacked or racked to double pan capacity and provide backup unit redundancy.

With all these categories, subcategories and different manufacturer brand descriptions, the compartment steamer category can get confusing. Here is a Quick Guide that lists all the major subcategories, their operation pressure and available pan capacity.



ACCUTEMP Evolution Steamer

A Guide to Steamer Types	Pressureless	Convection Connectionless	Boilerless	Pressure/ Pressureless	Low Pressure	High Pressure
Other Names Used	Atmospheric			Convertible		Autoclave
Compartment Pressure	0 PSI	0 PSI	0 PSI	5-6 PSI or 0 PSI	5-6 PSI	15 PSI
Steam Generation Method	0 PSI steam generator(s) or pressure boiler (floor models)*	0 PSI in cooking compartment	0 PSI in cooking compartment	Pressure Boiler*	Pressure Boiler*	In sealed compartment
Countertop Models	Yes**	Yes**	Yes**	No	No	Yes**
Cabinet Models	Yes	None	None	Yes	Yes	None
Compartments Available	1 or 2	1	1 or 2, if stacked	2 or 3	1, 2, or 3	1 or 2, if stacked
Pans Per Compartment	3, 4, 5 or 12	4, 5 or 6	3, 4, 5 or 6	8	8	3

** Power take-off valve can deliver steam to an adjacent steam kettle*
*** Can also be stand mounted*

Q: Which type of steamer cooks faster?

A: Good question, but one with no simple or single answer. Back in the day, pressure steamers were considered faster than the then newer atmospheric convection steamers. In the 1980s, most convection steamers relied on manifolds or a few steam ports to bring steam into the cooking compartment from a cabinet base-mounted pressure boiler or adjacent steam generator on countertop models. Convection steamer manufacturers increased power input per pan: British Thermal Units per hour (BTU/hr.) or kilowatts per hour (kWh) to boost power, but beyond 3-kW (10,236 BTU) per pan, additional power and the pounds of steam are wasted.

Cooking speed is a function of power input, the efficiency of converting heat into steam, the pounds of steam generated per hour and the velocity or movement of steam within the compartment. Some manufacturers use fans or small blowers to increase steam movement (velocity) and reduce cook times.

Most steamers can make quick work of fresh or IQF frozen veggies and shrimp. Cooking speed will vary by pan count or load size, but cook times of five to eight minutes are common with products with lots of surface area. Longer cook time items including whole potatoes, whole lobster and reheating refried bean or mac-n-cheese will uncover performance differences in different models. Check out the Food Service Technology Center's Steamer Performance Reports for guidance on gas and electric model operating efficiency and production rates. [www.fishnick.com]

Q: How do pressure and pressureless steamers compare?

A: With improvements in atmospheric steamer reliability, cooking speed and pan capacity, the use of small compartment, high pressure (15 PSI) steamers and large compartment low pressure (5-6 PSI) steamers has declined steadily. Large single, double and triple compartment low pressure steamers are still sold by **Cleveland Range**, **Market Forge** and **Vulcan**, typically for use in large institutional kitchens. Boasting eight-pan capacity per deck or compartment, they can handle plenty of batch volume, but that chamber pressure is hard on delicate product and they don't do well with frozen product.

Because they build pressure in the cooking compartment, you can't open the door to check progress, add

seasoning or stir-it-up, unlike today's a la carte-friendly pressureless models. Pressureless steamers have even chipped away at their pan capacity advantage. The **Market Forge** Plus 12 is a single compartment convection steamer that can hold 12 steamer pans, and it can be stacked for up to 24-steam pan capacity.

Low pressure steamers have larger gas pressure boilers in their cabinet base, which are typically less susceptible, but not immune, to water quality issues; and like convection steamers with pressure boilers, they can be equipped with a power take-off and used to provide steam to an adjacent direct steam kettle. Manufacturers with a stake in pressure steamers have also developed convertible pressure-pressureless models that can go pressureless to handle frozen foods and delicate product, and then shift to pressure mode for big batch work.

EVERPURE® Kleensteam II™ Twin Scale Inhibition System

Q: What about water quality issues with steamers?

A: The downside to steamers has always been hard water problems and water-related service issues. Manufactures began by making them easier to delime and offered water treatment systems to address most water issues. But all "connected" steamers still required regular operator (or service provider) intervention to keep them steaming away.

EVERPURE® MRS-600HE-II High Efficiency Reverse Osmosis System

For operators that need pressure-boiler based steamers or prefer models with enclosed steam generators, water treatment is a must. Few North American water supplies meet manufacturer requirements so most manufacturers offer OEM water treatment systems sized to the needs of their steamer and combi oven models. **Market Forge** has taken this a bit further with their Eco-Tech Plus steamers which come with an integrated, base cabinet mounted water filtration system complete with a warning light system to remind operators when its time to change filters.

EVERPURE® Claris™ XXL Softening Filtration System

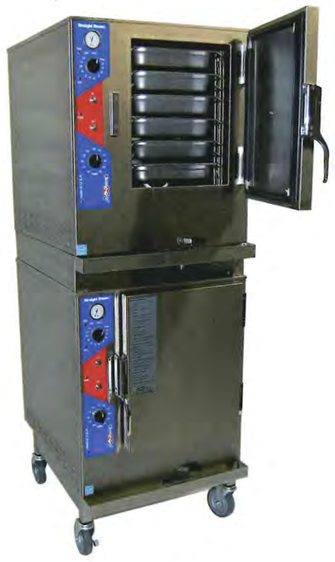
You can also go straight to the source and get water treatment recommendations from a reputable national and international water treatment provider such as **Everpure®**.

Q: What is a connectionless steamer?

A: The connectionless steamer moniker is a bit of a misnomer because all steamers require a power connection, be it electric, gas or both. The term arose when **AccuTemp** developed their vacuum-capable Steam-N-Hold™ that generates steam inside the cooking compartment and doesn't require a water or drain connection. While low temperature (150-200°F) steaming was interesting, eliminating the enclosed steam generator and those water and drain connections was revolutionary.

Going connectionless was a major boon to electric steamers that rely on emersion heating elements that lime up in their water bath, and become insulated by hard water deposits to the point of overheating and failure. Gas steamers have always been more forgiving when it comes to water deposits, but eventually, gas heat exchanger surfaces lime up and heat transfer suffers.

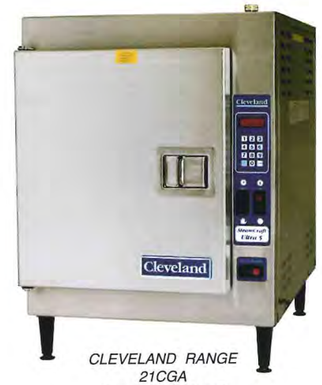
Today gas connectionless steamers are available from **AccuTemp Products Inc.**, **Market Forge Industries**, **Unified Brands-Groen** in their **Intek** Line. **AccuTemp**'s N6-SGL Series Evolution™ Models



AMERICAN COOK SYSTEMS Straight Steam™ SG-6 Steamer

are six pan units with a 60,000 BTU/hr. power burner, heating water from below the cooking compartment. Naturally, a natural gas or propane connection, plus electric power is needed, but no water line or drain connection need apply.

If you need even fewer connections for outdoor or remote site use, **Market Forge** has Polaris, a cart-mounted mobile propane-heated steamer. This cart-mounted steamer carries its own 30-pound propane tank and doesn't even need an electric connection, relying on millivolt gas components and a Piezo igniter.



CLEVELAND RANGE 21CGA SteamCraft Ultra 5

Q: What is a boilerless steamer?

A: Connectionless steamers solved water quality issues by making steam inside the cooking compartment. Two or three gallons of water are poured into the bottom of the steam compartment and heated from below by one or more burners to generate steam. At the end of the day, a manual valve is opened to drain any residual water.

Convection steamer manufacturers (and their customers) liked the simplicity and dependability of in-compartment steam generation. Manufacturers including **AccuTemp Products**, **Cleveland Range** and **Groen/Unified Brands** introduced connected models with in-compartment steam generation, which eliminated the need for manual water filling and the potential danger of emptying a pan of hot waste water at day's end. Boilerless models with drains are also better able to address starch buildup, foaming and nutrient issues that can hamper connectionless models that can't drain away these byproducts of the steaming process.

Today, gas boilerless steamer models are also available from **American Cook Systems** (Straight Steam), **Market Forge** (Sirius II) and **Southbend** (StratoSteam). While a bit more complex and utilities-dependent, boilerless steamers deliver most of the advantages of connectionless models.

Q: What are some key features to look for in a steamer?

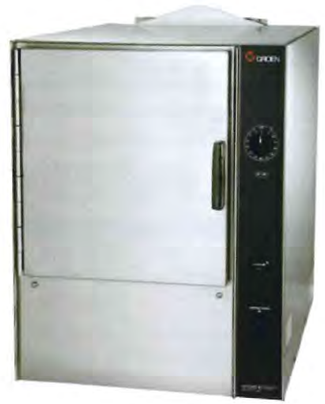
A: Steamer doors and their handles, latches and gaskets are key points of differentiation with category manufacturers. Some have an inner plate that secures a sheet gasket and some have a spring-loaded, floating inner panel that holds the gasket. All allow field-replacement of the door gasket and some allow reversing the gasket for extended life. Some latches are recessed, some allow hands-free opening and others have robust refrigerator-style hardware. They each have their advantages so do some door slamming and maybe check with your favorite service agent on their experience with each.

Steamer controls are fairly basic when compared to their combi (oven) cousins. A power switch, digital or electro-mechanical timer (usually 60 minutes) and some status lights for power-on, low water and ready-to-steam, are typical. Connected steamers automatically drain their steam generator or boiler when turned off. Connectionless models have a manual valve that is hand-opened to drain water from the cooking compartment at day's end. Steamers that have more advanced food

CLEVELAND RANGE 24CGA10 SteamCraft Ultra 10

holding capability usually have a compartment temperature gauge.

How steam is moved about the compartment and between pans is another point of brand differentiation. Steam inside pressure models doesn't move around much, relying on higher temperatures (up to 250°F) to accelerate cooking. Free-venting atmospheric models rely on natural expansion of steam and convection currents to move steam or channel steam through manifolds, chamber baffles or diameter-restricted ports to increase velocity. Some add a small blower wheel to get the job done.



GROEN
SmartSteam 100
Boilerless Steamer

Q: What's NEW in steamer designs?

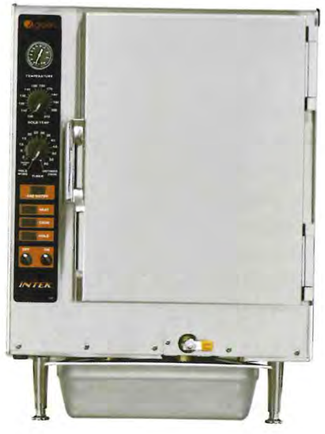
A: In 2010 **AccuTemp Products, Inc.** earned the Gas Foodservice Equipment Network (GFEN) Blue Flame Product-of-the-Year Award for development of their gas Evolution™ Boilerless Convection Steamer. Evolution has a finned heat transfer plate mounted above a stainless steel power-burner and attached to the cooking compartment bottom where water is converted into steam. A special flue exhaust gas deflector radiates additional heat back into that finned heat transfer plate. Evolution can be ordered as a connectionless steamer, designed for manual water fill and simple drain pan condensate collection or as a connected (boilerless) steamer with automatic water fill and a condensate drain.

American Cook Systems has entered the boilerless steamer category with Straight Steam™ , a six pan unit that produces steam in the cooking compartment using a bottom-mounted 65,000 BTU/hr. infrared heating system. Straight Steam uses the same rugged door and refrigeration-style handle and magnetic latch as **AccuTemp** and **Unified Brands** Intek Models.

Cleveland Range has introduced new SteamSaver™ Technology (SST) for their SteamChef™ boilerless convection steamer line. The SST package includes a new condensate collection and steam management system that retains heat in the cooking compartment longer and uses less cold water to cool condensate.

Market Forge has been working hard to reduce water usage and attendant energy costs with conventional steamers. Their Eco-Tech Plus™ Steamer and its patented water management system reduces usage to 15 gallons per hour, about 20 percent of conventional boiler base steamer usage. It creates steam on-demand, with burners that cycle on and off to conserve energy and water. Eco-Tech Plus Models also have an integrated water filtration system, with a warning light system to remind operators when its time to change filters.

A while back, **Vulcan** introduced PowerSteam™ gas boiler-base models that route compartment steam lines near the exhaust heat stack, superheating it to 235 degrees before it enters the cooking compartment. This design, plus a staged water fill that doesn't "kill the boil", ensures there is plenty of power for either their six or ten pan model.



GROEN
Intek Steamer

Q: What about steamer energy use and utility costs?

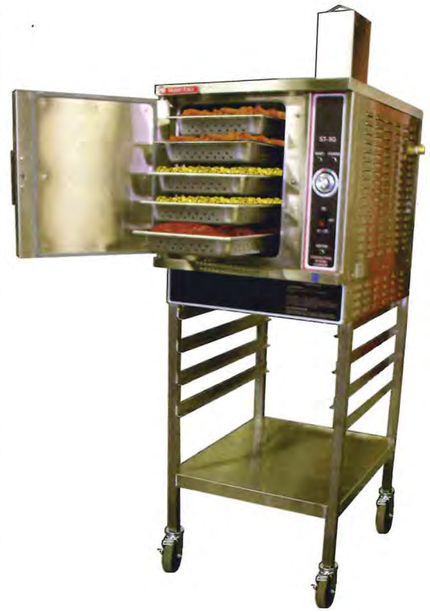
A: Back when pressure steamers were the only game in town, gas boilers were preferred over their expensive-to-power 24-48 kW electric equivalents. But the game changed with the introduction of small 3-pan countertop convection/pressureless/atmospheric models. The use of water emersion heating elements in small steam generators made electric models the only tabletop game in town, but one challenged by water-related service issues.

Fortunately, the development of smaller gas burner technology and strong customer demand for gas alternatives motivated the major steam manufacturers to develop and introduce gas-heated countertop steamers. The introduction of gas connectionless and boilerless convection steamers has further expanded availability and use of small gas steamers.

In most areas of the country, gas utility costs are less than the electric operating costs for equipment and models with equivalent capacity or production rates. Contact your local energy provider for a comparison of typical gas and electric steamer operating costs.

Gas steamers also offer installation advantages. In most commercial kitchens, significant gas load can be installed without the need to increase the size of the gas supply line. A typical gas steamer only requires a shutoff valve, approved gas appliance connector, and a low power 120-volt electrical connection to run any blower motor, electronic ignition and controls. Costly electrical panel upgrades and 208/240/480-volt power connections are not required when installing a gas steamer.

Today gas steamers are available in models and configurations offering a significant energy Demand Side Management (DSM) alternative for both operators and their local electric utility provider.



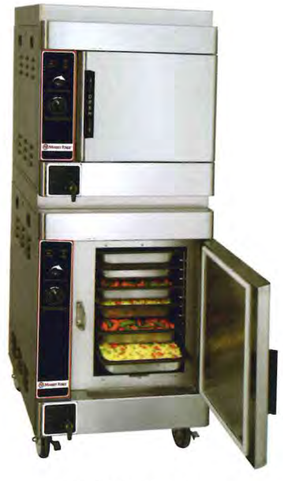
MARKET FORGE
Countertop Convection
Steam Cooker

Q: Are there any special specification or installation issues with steamers?

A: If you're talking pressure steamer or any connected convection steamer, you need to provide a suitable water supply and access to a drain. These plumbing connections need to be done correctly to avoid service problems and performance issues. Water line size, deliver pressure (PSI), deliver rate (gallons-per-minute), and minimum water quality standards are spelled out in manufacturer specification sheets and installation manuals.

If your water supply doesn't meet those minimum quality standards, you will need to treat the water with carbon filters, reverse osmosis (RO) filtration, phosphate systems, sodium zeolite (water softener) systems, or a combination of these treatment methods, depending on the water chemistry. Most steamer manufacturers sell water treatment systems. Local manufacturers' reps, dealers and service agencies have plenty of experience with area water issues and can provide assistance.

Drain connections must be free-venting (not hard piped), adequately sized and continuously pitched down to the nearest floor or wall drain. A bad drain connection can cause pressure to build in the compartment of a pressureless steamer and even pop open the door.



MARKET FORGE
Sirius II
Boilerless Convection Steamer

MARKET FORGE
ETP-10G Eco Tech Plus™
Atmospheric Steam Cooker

SOUTHBEND
Counter Steamers

VULCAN
C24GA6 & 10
Convection Steamers
Steam Cooker

All gas model steamers, including connectionless, must be installed under a Type I ventilation hood to capture combustion byproducts, heat and humidity.

Q: Have an equipment question?

A: Send your equipment question(s) to: Russell Bean at: russellbean@aol.com. We will try to answer your question in a future issue. Need an answer NOW…call one or more of the manufacturers mentioned in this article.

32nd Edition
FOODSERVICE GAS EQUIPMENT CATALOG
Manufacturers Guide to Compartment Steamers

ACCUTEMP	260/344-7726	accutemp.net
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