



Hydrovection Cooking Guide

Tips and tricks for getting the most from your Hydrovection oven





Your NEW Hydrovection oven is a versatile, easy to use tool that will help you produce better food with less time and effort. As with any new equipment, a little orientation at the outset can save frustration and trouble later. Blodgett authorizes a trained service agent to inspect all new installations at no cost to you. If you have not had a startup inspection, please call the Blodgett Service Department at 800-331-5842. You will be given the number of your local service company so you can schedule a startup at a convenient time.

This guide is organized in three sections:

- A general explanation of how each mode works and when to use it;
- Special tips and techniques on preparing items using the unique properties of your combi/oven steamer;
- Time and temperature tables with typical products and how to cook them.

Your comments and suggestions for improving this guide are always welcome. Please feel free to contact us at 800-331-5842 for service assistance, cooking advice, availability of accessories or general questions.

Enjoy your BLODGETT Hydrovection !

HYDRO MODE

When to use the Hydro Mode

The Hydro Mode is ideal for most high-protein, center-of-the-plate items: roasted meats, baked poultry and baked fish. It does an excellent job on casserole type dishes such as lasagna, baked macaroni and meatloaf which must be cooked to a safe internal temperature without overcooking the exterior. Braising meats such as spare ribs, corned beef or pot roast is easily done in Hydro Mode at temperatures of 225-250°F/105-120°C. Breads, rolls and other yeast-raised products will exhibit greater "oven-spring" when baked in the Hydro Mode. Specialty breads such as French bread, soft pretzels and bagels are also possible.

How the Hydro Mode Works

The Hydro Mode combines the effects of both moisture and hot air convection for improved yields, shorter cooking times and juicier products. It will reduce, but not eliminate, browning (caramelization is a function of temperature, increasing at higher temperature settings). Because foods cooked in the Hydro Mode are not drying out as they would in a typical convection oven, they brown more slowly, allowing the heat to reach the interior of the product before the outside becomes scorched or dried out. As the steam produced in Hydro Mode condenses on the food surface, it efficiently transfers its heat to the food, resulting in shorter average cooking times than in a similar dry oven.

The Hydro Mode gives priority to the hot air thermostat setting. The oven bakes and roasts in a similar manner to the familiar convection oven, but adds moisture intermittently throughout the cooking process.

The moisture production is automatic and is thermostatically controlled to produce the optimum humidity for the baking or roasting temperature selected (the ideal relative humidity at a given temperature is predetermined: too little moisture would allow excess shrinkage, while too much would waste energy as the oven struggles to maintain the hot air temperature setting). Your Hydrovection produces moisture and hot air alternately during the cooking cycle for energy conservation; both moisture and hot air are present in the cooking cavity simultaneously for optimal food preparation.

Tips for Cooking in the Hydro Mode

The Hydro Mode uses hot air in the same manner as a convection oven; recipes adapted for convection ovens translate well to Hydro cooking. Recipes developed for static ovens without moving air will typically require a temperature reduction of 25-50°F/14-28°C. Because moisture transfers heat more efficiently than dry air, you will generally experience shorter cooking times in the Hydro Mode than in a comparable convection oven. A 10-15% reduction in cooking time is common, although actual results will vary widely by product and original cooking technique. Lowering the temperature beyond the initial adaptation for convection oven cooking and keeping the original baking and roasting times will optimize yields. Most operators will choose a combination of slightly faster cooking times and slightly higher yields. The choice of which to optimize is yours.

Shallow pans are recommended for best results. Both the moisture and convected hot air transfer heat to the food's surface. Increasing the food surface area relative to

its volume (i.e., multiple shallow pans instead of a few deep pans) will give the fastest cooking times and most even cooking. Covering the food with film and/or foil will defeat the convection effect, and is not necessary to prevent scorching or drying because of the moisture present during Hydro cooking. The moisture remains dry at temperatures above approximately 275°F/135°C, and will not appear as condensate on the door.

If additional browning is desired after the food is almost fully cooked, switch to hot air and increase the temperature for the last few minutes until the desired color is achieved.

Rethermalizing in Hydro Mode

Rethermalization is the process of bringing fully cooked, chilled food from storage temperature to safe serving temperature without loss of quality. Hydro Mode lends itself to reheating food without the typical drying and overbrowning. Foods to be rethermalized should be in shallow pans with the product distributed in an even thickness. Temperatures between 250-300°F/120-150°C are typically used for rethermalization.

»»» HOT AIR MODE

When to use the Hot Air Mode

The Hot Air Mode is best suited to those items that require a dry cooking environment or rapid browning. Most bakery items (cookies, cakes, muffins, etc.) will be cooked in the Hot Air Mode, although many yeast-leavened products (breads and rolls, croissants, Danish pastries) will yield excellent results in Hydro Mode as well. The Hot Air Mode can be used to pre-brown meats for braising or to intensify the final browning of roasts that have been completed in Hydro Mode.

How the Hot Air Mode Works

The Hot Air Mode operates exactly like the familiar convection oven. When adapting recipes written for static ovens (e.g., deck ovens or restaurant-range type ovens), you will generally need to reduce temperatures 25-50°F/14-28°C. Moving (convected) hot air transfers heat to your food more efficiently than static air, allowing you to cook at lower temperatures.

Set the thermostat to the desired temperature and allow the oven to fully preheat before beginning to cook.

Tips for Cooking in the Hot Air Mode

Because your unit is cooking with convected hot air, maximizing the exposed surface area of the food to be cooked will yield the best results. Covering the pans with film and/or foil, using deep pans or crowding the pans too close together without room for air circulation will slow down the cooking process considerably and may result in uneven cooking.

Cakes may be baked using pan inserts for greater volume and square corners. Use specialized pans (e.g., muffin tins) as necessary.

If you observe over-browning around the edges of the product with a light or undercooked center area, the temperature may be set too high for that product. Undercooked interiors with a burnt or overdone surface are also an indication that the temperature is too high.



Basic Times & Temperatures

Although there is a detailed cooking guide in this manual, most foods can be prepared using a very simple approach. Casseroles (e.g., lasagna, baked macaroni, etc.) and medium-sized roasts can be cooked in Hydro Mode at 300°F/150°C. Foods to be crisped (breaded foods, chicken pieces with skin, etc.) do well in Hydro Mode at 375°F/190°C. Most baked goods perform well at 300-325°F/150-165°C in Hot Air Mode. Cook vegetables, rice and shellfish in Hydro Mode.

Frozen Pizza

Pizza tends to overbrown in convection ovens without ever getting a good bottom crust. Bake frozen pizza at 350°F/175°C in Hydro Mode to reduce scorching the toppings. Use perforated sheet pans or sprinkle coarse cornmeal on solid pans to prevent a soggy bottom crust.

"Mock Stir Fry" Dishes

Several variations of this dish are possible by varying the meat, poultry or fish used, as well as changing the sauces. A low-fat stir fry, fajitas or Italian beef are just a few possibilities.

Teriyaki Chicken (beef, pork or shrimp) is easily prepared by mixing canned sliced mushrooms, julienne sweet peppers (use green, red and yellow for great color), julienne Spanish onions and thin sliced boneless, skinless chicken breast with dark, thick teriyaki sauce. Optionally add sliced bamboo shoots or water chestnuts. Mix all well to coat with teriyaki sauce. Spread in a shallow

layer on sheet pans and cook in Hydro Mode at 375°F/ 190°C for 10-15 minutes or until done. Vegetables should still be firm. Meat, poultry or shrimp should be fully cooked with dark highlights on the edges of meat and vegetables. Serve over steamed rice.

"Southern stir fry" is a good variation: replace the teriyaki with thick barbeque sauce and omit the oriental vegetables. Use beef, pork or chicken and serve over red beans and rice.

For quick fajita filling, omit the mushrooms and oriental vegetables, and use fajita sauce in place of teriyaki. Serve with wheat tortillas.

Italian beef is quickly prepared by omitting the oriental vegetables, adding chunks of fresh tomatoes and using creamy Italian salad dressing in place of the teriyaki. Serve over fettucini or in a hero sandwich. Sliced Italian sausage also works well in this preparation.



SPECIAL TIPS & TECHNIQUES

Bagels

Bagels can be produced in the Hydrovection by preheating the oven to 350°F/177°C in Hydro Mode. Quickly load the proofed bagels on sheet pans into the oven. Bake in Hydro mode with 100% moisture for 2 minutes, then switch to hot air for a total combined time of 10-13 minutes. Dough formulations vary widely, so you'll need to experiment with exact times and temperatures.

Breaded Products

For best results, place breaded products on screens or wire racks on sheet pans so bottoms brown and crisp properly (perforated sheet pans also help). Bake in Hydro Mode at 400°F/204°C. If breading does not brown but looks white and dry (or simply burns), spray product with pan release next time before cooking. Some fat is necessary for proper browning. Most prepared and frozen breaded products have sufficient fats in the breading to brown properly without any additions, but a few will require help.

Mock "Rotisserie" Chicken

Rotisserie cooking produces juicy, attractive whole chickens, but it's slow and a mess to clean up afterwards. A good substitute, with similar flavor and appearance, can be achieved by roasting whole birds (prepared with your favorite marinade or rub) upright on wire racks in Hydro Mode at 375°F/190°C. A special rack is available for this application to help hold the birds upright. A 2-1/2 - 3 lb/1-1.5 kilo bird will cook in roughly 35 minutes. Cleanup is simple with the standard spray hose and washing procedure.

Rethermalizing Bagged Products (Sous Vide)

Many operators are using "cook chill" systems or purchasing fully cooked products in heat resistant bags. These products can be reheated in the bag (check for maximum heat tolerance), but you will generally see better results by removing the product from the bag and reheating in shallow pans in Hydro mode. The bags protect the product but also act as insulators, significantly slowing down the reheating of the product. Rethermalizing in steam mode may result in condensate on the product changing the consistency. Rethermalizing in Hydro mode between 250-275°F/120-135°C will minimize condensation and allow rapid reheating.

Low-fat "Oven Fried" Chicken

Dredge skinless chicken pieces in seasoned flour, dip in lightly beaten egg whites and coat with bread crumbs that have been moistened with salad oil. Bake at 375°F/190°C on wire racks. Chicken may be cooked on sheet pans, but will not brown well on bottom. Do not omit oil from bread crumbs completely or they will not brown properly.



Some Common Baking Problems & What Causes Them

Muffins have a tendency to lean to one side because of the air currents in a convection oven. You may either need to adjust the fan reversal or begin with low fan and finish with high fan.

Light batters for cakes that blow to one side or exhibit severe rippling can be handled in the same manner as the muffins.

Over-browning around the pan's edges is generally an indication the temperature is too high for that product or load (increasing the load in an oven will change the air flow, which sometimes causes overbrowning). Try reducing the temperature 25°F/14°C, spread the load more evenly in the oven, or bake in smaller batches.

The top shelf browns faster than the others. Air is circulated around a baffle at the back of the oven (the fan draws air in from the center). Freshly reheated air from the top of the baffle hits the top pan first. Radiant heat from the top of the oven also contributes to faster browning on the top shelf. This is also typical of convection ovens. Either allow more space between the top of the oven and the uppermost pan or remove the top pan earlier than the others.

Muffins are too dark, gummy on the inside, do not rise properly, or "explode" halfway through baking. Muffins are chemically leavened with baking powder and baking soda. If there is too little heat, the leavening agents do not react and the muffins do not rise properly. Longer baking times will produce a muffin with a dry, overbrowned exterior and a gummy interior, or exhibit "exploding" when the heat finally reaches the interior. The rising interior splits open the fully set exterior and the muffin explodes. Use a lower temperature to allow the muffins to come up to temperature more gently. Then finish with a hotter temperature halfway through to promote browning without drying out.



BAKED GOODS

Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|--|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| <u>PIES & CAKES & DESSERTS</u> | | | | | | | |
| Chocolate Sheet Cake | 1 | Hot Air | 325F | 12 min | 0% | Low | Closed |
| | 2 | Hot Air | 325F | 4 min | 0% | Low | Open |
| White Sheet Cake | 1 | Hot Air | 325F | 14 min | 0% | High | Closed |
| 8" Layer Cake | 1 | Hot Air | 325F | 10 min | 0% | Low | Closed |
| | 2 | Hot Air | 325F | 15 min | 0% | Low | Open |
| Brownies (half sheet pan) | 1 | Hot Air | 325F | 10 min | 0% | Low | Closed |
| | 2 | Hot Air | 325F | 15 min | 0% | Low | Open |
| Brownies (full sheet pan) | 1 | Hot Air | 325F | 10 min | 0% | Low | Closed |
| | 2 | Hot Air | 325F | 25 min | 0% | Low | Open |
| Custard | 1 | Hydro | 170F | 40 min | 100% | Low | Closed |
| Puff Pastry | 1 | Hot Air | 325F | 15 min | 0% | Low | Closed |
| Pie | 1 | Hydro | 350F | 20 min | 20% | Low | Closed |
| Cheesecake | 1 | Hot Air | 275F | 40 min | 0% | Low | Closed |
| <u>COOKIES</u> | | | | | | | |
| Sugar | 1 | Hot Air | 350F | 12 min | 0% | Low | Closed |
| Chocolate Chip | 1 | Hot Air | 325F | 12 min | 0% | High | Open |
| Peanut Butter | 1 | Hot Air | 325F | 15 min | 0% | Low | Closed |



Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|-------------------------|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| BREADS AND ROLLS | | | | | | | |
| White Rolls | 1 | Hot Air | 350F | 15 min | 0% | High | Open |
| Wheat Rolls | 1 | Hydro | 325F | 2 min | 30% | Low | Closed |
| | 2 | Hot Air | 325F | 15 min | 0% | Low | Closed |
| Dinner Rolls | 1 | Hot Air | 350F | 6 min | 0% | High | Closed |
| | 2 | Hot Air | 350F | 6 min | 0% | High | Open |
| | 3 | Hot Air | 325F | 3 min | 0% | Low | Open |
| Wheat Bread | 1 | Hot Air | 350F | 20 min | 0% | High | Closed |
| | 2 | Hot Air | 350F | 15 min | 0% | High | Open |
| French Bread | 1 | Hydro | 350F | 1 min | 100% | Low | Closed |
| | 2 | Hot Air | 350F | 15 min | 0% | High | Closed |
| | 3 | Hot Air | 350F | 5 min | 0% | High | Open |
| Muffins | 1 | Hot Air | 350F | 7 min | 0% | Low | Closed |
| | 2 | Hot Air | 350F | 7 min | 0% | Low | Open |
| | 3 | Hot Air | 350F | 6 min | 0% | High | Open |
| Croissants | 1 | Hot Air | 350F | 15 min | 0% | Low | Closed |



POULTRY & BEEF

Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|--|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| <u>POULTRY</u> | | | | | | | |
| 3.5 lb Whole Chicken* | 1 | Hydro | 350F | 165F | 30% | High | Closed |
| 3.5 lb Whole Chicken | 1 | Hydro | 350F | 45 min | 30% | Low | Closed |
| Baked Chicken | 1 | Hydro | 350F | 25 min | 30% | High | Closed |
| Chicken Cordon Bleu | 1 | Hydro | 350F | 20 min | 30% | High | Closed |
| Turkey | 1 | Hydro | 325F | 45 min | 30% | Low | Closed |
| Whole Chicken on Rack | 1 | Hydro | 350F | 45 min | 40% | Low | Closed |
| 1/2 Chicken | 1 | Hydro | 350F | 25 min | 40% | Low | Closed |
| <i>*This recipe uses the core probe with a hold temperature of 165F.</i> | | | | | | | |
| <u>BEEF</u> | | | | | | | |
| Hamburger | 1 | Hydro | 400F | 10 min | 30% | High | Closed |
| Hot Dogs | 1 | Hydro | 121F | 10 min | 100% | Low | Closed |
| Roast Beef | 1 | Hot Air | 275F | 90 min | 0% | Low | Closed |
| Prime Rib | 1 | Hot Air | 275F | 90 min | 0% | Low | Closed |
| Meat Loaf | 1 | Hydro | 325F | 40 min | 30% | Low | Closed |

SEAFOOD & CASSEROLES



Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|--------------------------|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| <u>SEAFOOD</u> | | | | | | | |
| Baked Sole (1 hotel pan) | 1 | Hydro | 350F | 10 min | 30% | Low | Closed |
| Breaded Fish | 1 | Hydro | 350F | 10 min | 30% | Low | Closed |
| Shrimp | 1 | Hydro | 121F | 10 min | 100% | Low | Closed |
| Salmon | 1 | Hydro | 212F | 10 min | 100% | Low | Closed |
| Orange Roughy | 1 | Hydro | 300F | 8 min | 40% | Low | Closed |
| <u>CASSEROLES</u> | | | | | | | |
| Frozen Macaroni & Cheese | 1 | Hydro | 300F | 4 min | 100% | High | Closed |
| | 2 | Hot Air | 300F | 21 min | 30% | High | Closed |
| | 3 | Hot Air | 350F | 15 min | 30% | High | Open |
| Fresh Macaroni & Cheese | 1 | Hot Air | 300F | 25 min | 0% | High | Open |
| Frozen Lasagna | 1 | Hydro | 300F | 30 min | 30% | High | Closed |
| | 2 | Hydro | 350F | 5 min | 30% | High | Open |
| | 3 | Hydro | 350F | 25 min | 30% | High | Open |
| Lasagna | 1 | Hydro | 350F | 15 min | 100% | Low | Closed |
| | 2 | Hydro | 350F | 5 min | 30% | High | Open |
| | 3 | Hot Air | 300F | 2 min | 0% | High | Open |
| Casserole | 1 | Hydro | 350F | 30 min | 30% | Low | Closed |



VEGETABLES

Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|-------------------|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| Baked Potato | 1 | Hydro | 420F | 4 min | 100% | High | Closed |
| | 2 | Hydro | 425F | 6 min | 30% | High | Closed |
| | 3 | Hydro | 400F | 30 min | 30% | High | Closed |
| Roasted Potato | 1 | Hydro | 375F | 30 min | 30% | High | Closed |
| | 2 | Hydro | 400F | 10 min | 30% | High | Open |
| Hash Browns | 1 | Hydro | 400F | 10 min | 30% | High | Closed |
| | 2 | Hot Air | 425F | 5 min | 0% | High | Open |
| Baked Beans | 1 | Hydro | 300F | 20 min | 40% | High | Closed |
| | 2 | Hot Air | 275F | 3 min | 0% | Low | Open |
| Frozen Vegetables | 1 | Hydro | 225F | 12 min | 100% | High | Closed |
| | 2 | Hot Air | 212F | 2 min | 0% | High | Open |
| Corn on the Cob | 1 | Hydro | 225F | 12 min | 100% | High | Closed |
| | 2 | Hot Air | 212F | 2 min | 0% | High | Open |
| Carrots | 1 | Hydro | 225F | 12 min | 100% | High | Closed |
| | 2 | Hot Air | 212F | 2 min | 0% | High | Open |
| Broccoli | 1 | Hydro | 225F | 12 min | 100% | High | Closed |
| | 2 | Hot Air | 212F | 2 min | 0% | High | Open |
| Green Beans | 1 | Hydro | 225F | 12 min | 100% | High | Closed |
| | 2 | Hot Air | 212F | 2 min | 0% | High | Open |



Time & Temperature Recommendations

(All times and temperatures are estimates and should be verified in actual practice. Starting temperature of food, pan size/fullness and opening oven during cooking will affect cooking times.)

| <u>Menu Item</u> | <u>Stage</u> | <u>Mode</u> | <u>Temp</u> | <u>Time</u> | <u>% Humidity</u> | <u>Fan Speed</u> | <u>Vent Position</u> |
|------------------|--------------|-------------|-------------|-------------|-------------------|------------------|----------------------|
| Chicken Patty | 1 | Hydro | 350F | 15 min | 30% | High | Closed |
| Frozen Pizza | 1 | Hydro | 350F | 12 min | 30% | High | Closed |
| French Fries | 1 | Hydro | 450F | 1 min | 30% | High | Closed |
| | 2 | Hot Air | 450F | 11 min | 0% | High | Open |
| | 3 | Hot Air | 450F | 3 min | 0% | High | Open |
| Chicken Nuggets | 1 | Hydro | 400F | 2 min | 30% | High | Closed |
| | 2 | Hydro | 400F | 7 min | 30% | High | Open |
| | 3 | Hot Air | 425F | 2 min | 0% | Turbo | Open |
| Grilled Cheese | 1 | Hydro | 350F | 3 min | 30% | High | Closed |
| | 2 | Hydro | 350F | 3 min | 30% | High | Open |
| Tamales | 1 | Hydro | 212F | 30 min | 100% | High | Closed |