

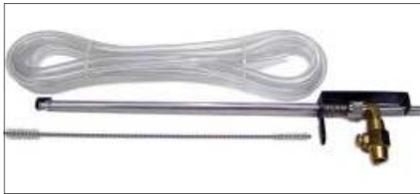
Better Bottling of Carbonated Beer from a Keg

If you keg your homebrew, there are no doubt times when you want to bottle all or part of a batch, for one reason or another. The two articles below will describe and review the newest homebrewer's bottling device on the market (the Blichmann Beer Gun), as well as an easy project to build an all-plastic beer case for use on bottling day, in conjunction with the Beer Gun or any other bottle filler. After bottling, you can use the plastic beer case for beer storage as well.

Review: Blichmann Beer Gun

By Steve Kranz

The Beer Gun from Blichmann Engineering has been on the market for a few years now. It allows you to quickly and easily purge your clean and sanitized bottles with CO₂, and then immediately fill them with cold, carbonated beer with virtually no foaming or loss of carbonation.



As a quick overview, the reason to fill bottles which are first flushed with CO₂ is to avoid the risk of oxidizing your beer. Oxidation leads to off-flavors and premature staling. It happens if fermented beer is exposed to oxygen in the brewing and bottling process, but it happens more quickly when the beer is splashed or agitated in the presence of oxygen, such as when you fill a bottle with a standard spring-valve homebrew bottle filler.

Commercial brewers fill bottles which have been purged of air using CO₂. They also fill them under "counter-pressure", which means the bottle is pressurized with CO₂ as it is filled. Doing this preserves the carbonation in the beer.



Homebrew shops have for years sold counter-pressure fillers. They are effective, but awkward for one person to use because the user has to turn multiple valves, and hold the filler's rubber stopper onto a bottle with some force in order to retain the pressure inside the bottle.

(Continued on page 3)

The All-Plastic Beer Case Project

By Steve Kranz

The All-Plastic Beer Case is designed to keep clean and sanitized beer bottles clean and sanitized until you are ready to fill them. It holds a full case of 24 12-ounce bottles, either upside down or right-side up, separated by indestructible corrugated plastic dividers. (I have also made a model of the same design, but with proper dimensions for use with 22-ounce bottles. This article will just describe the 12-ounce version.)



Many homebrewers use the familiar bottle "tree" where each sanitized bottle is placed upside down on a prong of the tree until it is ready to use. It's very handy and effective. But in my world, the All-Plastic Beer Case (APBC) is superior to the bottle tree:



1. Sanitized bottles will stay sanitized for much longer. By pouring just enough sanitizing solution into the APBC to barely cover the bottom, sanitized bottles which are stored upside-down will stay sealed off from possible air-borne contamination. Also, the lip of the bottles will stay sanitized until the bottle is filled and a cap is applied. This will let you, for example, clean and sanitize a bunch of bottles over the course of a few

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Club Hoppenings

New members, & membership benefits

Over the past nine months, we have had a relative “surge” in new memberships. That’s great for all of us, and we look forward to getting to know all of our new members. We used the opportunity to put in a new order of engraved and personalized club mugs. The club subsidized about \$4 of the cost of each new mug. If you missed out on this order and want new or replacement mugs, please let Steve Kranz know.

Also, we received another offer from Brew Your Own magazine for half-price one-year BYO subscriptions. The order has been submitted, so if you didn’t see that email or have a chance to participate, we hope they’ll do it again next year.

National Homebrewers’ Conference is 50% sold...order tickets now if you want to go!

This year’s NHC is June 16-18 in San Diego, CA. Once again, the Midnight Homebrewers’ League will be serving among the best homebrews there at Club Night. If you’ve never been to the NHC, it is something to see. More:

<http://www.ahaconference.org/>

2011 National Homebrew Competition around the corner

Mark your calendars: Entries to the National Homebrew Competition are due between March 21-30, and online registration will open some time in mid-February. For each entry you wish to submit, you need four (4) bottles...one for the first round, and three more if your beer advances to the Final Round which is judged at the National Homebrewers Conference in June. More:

<http://www.homebrewersassociation.org/pages/competitions/national-homebrew-competition>

Midnight @ the C.C. Farm Museum

The Midnight Homebrewers’ League is again planning a presence at two events held at the Carroll County Farm Museum in 2011:

May 21, club members will conduct homebrewing beer and mead demonstrations at Sustainable Maryland’s “Go Local” Fair. We have a few volunteers lined up already, but the more the merrier. Entry to the fair is free anyway, so c’mon out.

For the past few years, we have held a homebrewing exhibition at the Carroll County Fiddlers’ Convention. This year’s event is June 11, but we don’t yet know if we’ll be there because the event is no longer run by Farm Museum staff. Common Ground on the Hill took over management of the Fiddlers Convention, and as of this writing we have yet to hear back from them.

Mardi Gras tasting March 5

Michelle and Steve Kranz are hosting their annual New Orleans-themed tasting on Saturday, March 5. They promise excellent food, but the focus will be on **your homebrews!** Bring 4 bottles (or the equivalent) of each of your beers or meads, and bring your recipes to share. If you don’t have any homebrew to bring, just bring a unique micro-brew. \$5 per person tasting fee applies.

Club Brew 2011 @ Dog Brewing Co.!!

Looking forward to brewing a big batch again? We’ll compile and present the survey results shortly so that we can decide on a style. Then we need come up with a recipe, and nail down a brewing date with George.

Comments we received at Club Night, during the 2010 National Homebrewers Conference in Minneapolis, MN:

“This was the first beer I had when I came in, and it was so good, I want it to be the last beer I taste before I leave tonight.”

- Guest referring to Charlie Heaps’ Robust Porter

“Honey, did you make this? I’m going to kiss you.”

- Guest (female) referring to Gary Cress’ Ginger Mead

“You got everything right about this beer...it’s the best one in the house.”

- Guest referring to Steve Kranz’s Munich Helles

Midnight Homebrewers’ League

c/o Steve Kranz
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Then along came the Blichmann BeerGun. It is not a counter-pressure filler. But its design maximizes the preservation of CO₂ in the beer, while letting you fill bottles under CO₂ protection rather than the beer being exposed to air (oxygen).

The BeerGun connects to your keg's beer-out port with a 10-foot line of 3/16" I.D. tubing (supplied). This length of tubing puts high pressure on the beer in the line, effectively preventing the spontaneous loss of dissolved CO₂ which would lead to foaming. The BeerGun also requires its own connection to your CO₂ system, so that you can purge bottles with CO₂ immediately prior to filling them. This means you either need to have a multi-line gas manifold coming off your CO₂ tank, or you need to cut a "T" connector into your existing gas line, to add a line for the BeerGun.

Carbonate your kegged beer at about 12 lbs. Once the Gun is connected to beer and gas, turn down the CO₂ pressure on your keg and on the BeerGun line to 5 lbs. and bleed pressure from the keg down to that setting on your regulator. The filling operation is as simple as:

1. Insert the filler into a cold (see companion article), empty bottle;
2. Press the CO₂ button on the handle for a couple of seconds to flood the bottle with CO₂;
3. Pull the beer trigger to begin the flow of beer. The trigger opens the rubber shut-off valve at the tip of the filler.
4. When the bottle is full, let go of the trigger and pull the filler out of the bottle. This will create a perfect head-space in the bottle. If you wish, you can give the head space one final shot of CO₂ gas before capping the bottle.

After each bottle is filled, I put the Gun down into a sanitized 2-gallon bucket (the same one I put bottles in while filling...top photo), immediately apply a cap, then fill the next bottle. Some BeerGun owners like to fill a number of bottles at once (say, 6 or 12), then put the filler down and cap the bottles. While doing this might be an efficient use of time, I think it risks

a greater loss of CO₂ from the beer than if you fill-cap, fill-cap, etc.

Whether bottling with the BeerGun or any other apparatus, I always use oxygen-absorbing caps. Their liner contains a compound which absorbs oxygen when it gets wet, so any air that's in the head space when you apply a cap won't wind up contributing to oxidation issues later on. This helps particularly when you tend to age your bottled beers. The idea is to take every reasonable measure to prevent your beer from oxidizing, so why not use them? They're only marginally more expensive than plain caps, and in my opinion are worth the extra peace of mind.



The BeerGun is extremely simple to break down without tools for cleaning after use. The manufacturer recommends only hand-tightening the nut which holds the stainless steel nozzles to the handle. They also recommend taking the handle apart. But because no beer flows through the handle, I have not yet seen the need to clean it out or take it apart.



The manufacturer also recommends that you fill bottles which are already cold. This further reduces the chances of foaming and loss of CO₂. During my first bottling operation with the BeerGun, after I had filled most of my batch, I tested the difference between filling cold and warm bottles. There was a noticeable increase in the amount of foaming which occurs when you put cold beer into a warm bottle, no matter how low your dispensing gas pressure is. It happens more when the beer is over-carbonated, but it happens even with a normal carbonation level (12 lbs). But even if you can't chill your bottles prior to filling them, the foaming was still fairly minimal and easy to manage.



The BeerGun costs \$70 from any homebrew supply shop (and your club discount at Maryland Homebrew will bring it in for less than that). In addition to the Gun, you'll need a fitting to adapt the gas-in port to a 1/4" flare connector for the gas line. They sell them there, too. You will also need a length of gas line to go either to your manifold, or a "T" cut into your gas line. Make sure you give



yourself a long enough length of CO₂ hose so that you have plenty of slack to work with.



Brewers' Tips & Tricks

Easy-to-do ideas and hints to help you brew better, and easier, beers. Send your own tips & tricks to Steve Kranz for them to appear here.

Cleaner and Sanitizer Usage Chart

When making up cleaning or sanitizing solutions, you don't always need to make up a full 5 gallon batch. It's easy to use too much (wasteful) or too little (ineffective) when making a non-standard volume of solution, so I made up this expanded quick reference chart which you can cut out. It is sized to print six per sheet, on large (3.3 x 4 inch) shipping labels. Stick one onto all of your cleaner and sanitizer containers, or onto your toolbox, tote, or utility buckets. They also print very well on inkjet-printable glossy magnetic sheets, which you can cut out to stick on all of your beer fridges or other metal surfaces.

Each different product is color-coded, so just find the volume batch size you're making up, and go

over to the product columns, where you will see the correct amount broken down in tablespoons and teaspoons.

The first three products (StarSan, Iodophor, and SaniClean) are sanitizers. SaniClean is the "non-foaming" version of StarSan, and is great for

sanitizing bottles. For StarSan and Saniclean, I also included a column of fluid ounces because both of these products come in bottles with a calibrated measuring/dispense cup at the top of the bottle to make it easier to dispense just the right amount directly from the cup.

The manufacturers of P.B.W. and Cell-R-Mastr cleaners give you a range of amounts to use, depending on the

use (e.g. soaking vs. recirculating), and soil level. The amounts shown in the chart are the low end of the range, so for heavily soiled equipment or "cleaning in place" with recirculation, use up to twice the amount shown.

Star San				Iododophor		SaniClean			P.B.W. *		Cell-R-Mastr*		
Gals.	Tbs.	Oz.	Tsp.	Tbs.	Tsp.	Tbs.	Oz.	Tsp.	Tbs.	Tsp.	Tbs.	Tsp.	Gals.
0.25	.10	.05	.30	.15	.45	.17	.08	.50	.31	.9	.56	1.7	0.25
0.50	.20	.10	.60	.30	.90	.33	.17	1.0	.62	1.8	1.13	3.4	0.50
1.00	.40	.20	1.2	.60	1.8	.67	.33	2.0	1.23	3.7	2.25	6.75	1.00
1.50	.60	.30	1.8	.90	2.7	1.0	.50	3.0	1.9	5.5	3.4	10.1	1.50
2.00	.80	.40	2.4	1.2	3.6	1.3	.67	4.0	2.5	7.4	4.5	13.5	2.00
2.50	1.0	.50	3.0	1.5	4.5	1.7	.83	5.0	3.0	9.2	5.6	16.9	2.50
3.00	1.2	.60	3.6	1.8	5.4	2.0	1.0	6.0	3.7	11.0	6.8	20.3	3.00
3.50	1.4	.70	4.2	2.1	6.3	2.3	1.2	7.0	4.3	13.0	7.9	23.6	3.50
4.00	1.6	.80	4.8	2.4	7.2	2.7	1.3	8.0	4.9	14.8	9.0	27.0	4.00
4.50	1.8	.90	5.4	2.7	8.1	3.0	1.5	9.0	5.5	16.6	10.1	30.4	4.50
5.00	2.0	1.0	6.0	3.0	9.0	3.3	1.7	10.0	6.2	18.4	11.25	33.8	5.00

*PBW & Cell-R-Mastr = Use twice this amount for heavy soil or to recirculate

Moderate to heavy drinkers outlive teetotalers (for real!)

A paper on "Alcoholism: Clinical and Experimental Research" was picked up by [Time](#), which earlier had another surprising finding about teetotalers: [They tend to be more depressed than drinkers.](#)

The magazine reports:

Even after controlling for nearly all imaginable variables -- socioeconomic status, level of physical activity, number of close friends, quality of social support and so on -- the researchers (a six-member team led by psychologist Charles

Holahan of the University of Texas at Austin) found that over a 20-year period, mortality rates were highest for those who had never been drinkers, second-highest for heavy drinkers and lowest for moderate drinkers.

That last group is defined as those consuming three or fewer drinks per day. It all makes for a great rationalization exercise as you consider your fourth: "Well, I should stop at three, but then again if I push on it's better than if I'd never taken a sip..."

Pub Review: Mt. Airy Inn

1401 South Main Street
Mount Airy, MD 21771
(301) 829-1400

This restaurant stands in a shopping center parking lot in Mt. Airy. It's a family-friendly place inside, in a new (or newly-refurbished) building, kind of noisy and the seating is pretty close.

They have a respectably-sized menu including brick-oven pizzas, which we did not try. But overall, what we did order was a cut above. We started with a tasty order of crab balls. My Turkey Pretz sandwich was very good (for a turkey sandwich), particularly the bread which was made from pretzel dough. But I usually find turkey sandwiches pretty boring no matter what, so I'm not sure why I ordered that. The meatloaf, and fried chicken dinner entrees were both described as excellent by those who ordered them.

Service was prompt and chipper, with a friendly waitress who knew the beer list. Speaking of which (the list changes):

- Dogfish World Wide Stout
- Weyerbacher Winter Ale

- Raven Lager
- Stone Lucky Bastard
- Burton Baton
- Boulder Mojo (Nitro)
- Crispin Cider (over ice)
- Great Divide Espresso Oak Aged Yeti
- Weyerbacher Quad
- Heavy Seas Below Decks
- Tröegs Mad Elf
- Sam Adams Chocolate Bock
- Allagash Four
- Allagash White
- Bavik
- Petrus Gouden
- Brew Dog Hardcore
- Brew Dog Tactical Nuclear Penguin
- Brewer's Art Resurrection
- Brooklyn Black Ops
- Brooklyn Lager
- Dogfish Head Bitch's Brew
- Duchess De Bourgogne
- South Hampton Imperial Porter
- Flying Dog Raging Bitch
- Full Sail Session Black Full
- Sail Session Lager
- Koenig Pilsener
- Lammsbräu
- Lindeman's Framboise
- Mikkeller Beer Geek Breakfast
- N. Coast Old Stock Cellar Reserve
- Ommegang Hennepin
- Ommegang Three Philosophers

- Oskar Blues Dale's
- Oskar Blues Ten Fidy
- Oud Beersel
- Oude Geuzee
- Peak Organic Winter Session
- Rogue Dead Guy Ale
- Rogue John John Hazelnut
- Saison Dupont
- Sapporo
- Schneider Aventinus
- Schneider Weisse
- Skull Splitter
- Stillwater Stateside
- Stone Vertical Epic 2010
- Smuttynose IPA - "Finest Kind"
- Unibroue La Fin Du Monde
- Unibroue Trois Pistoles
- Van Diest Früli Strawberry Beer
- Weyerbacher Double Simcoe
- Weyerbacher Reserva

Instead of getting a whole beer, you can also order a flight of five 6-ounce pours of any draught beers in the house.

Yikes! All of that, right there in little ol' Mt. Airy. Given the excellent beer list, the solid food, and good, attentive service, the composite score is a 4.5 stars (or an A).

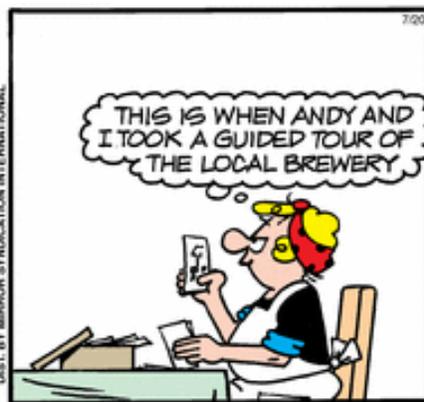


Best Practices:

Yeast Starters

White Labs recommends making a "starter" for their liquid yeast. It is a small wort which activates the yeast a day or two before brewing day, during which time the yeast take up oxygen, sugar and nutrients...and multiply. It's a must for high-gravity beers, lagers, or yeast that is past its "Best Before" date. But it's a good practice for every brew.

- To activate yeast (normal use): 1 pint (with ½ cup Dry Malt Extract)
- To revitalize yeast past its Best Before Date: 2 pints (with 1 cup DME)
- To brew a high-gravity beer: 2 pints (with 1 cup DME)
- To brew a lager beer, fermentation 50-55F: 4 pints (with 2 cups DME)



(Continued from page 1)

days so you don't have to do that chore all at once, and fill them several days later. Your bottles will stay sanitized and ready for filling. Bottle on *your* schedule, not your bottles' schedule.

2. If you bottle carbonated beer from kegs, bottle filler manufacturers including Blichmann Engineering (the BeerGun), recommend that cold, carbonated beer should be filled into bottles which are also cold. Your beer will retain more of its carbonation if the bottles are cold when you fill them. You can easily stack several APBCs full of clean and sanitized bottles in a refrigerator, or leave them outside in winter-time, to get them cold prior to filling.
3. The APBC can also be used for every-day storage of either full or empty beer bottles. It is virtually indestructible, easily cleaned, and stackable. It's molded-in handles will never tear away.
4. You can make one yourself in about an hour for \$25 or less.

To make one, you need:

- A "filing" type of plastic storage box from Staples or Office Depot, with internal dimensions of approximately 12" x 15" x 11" tall. I used an "8-gallon Flip-Top File Tote" from Staples. It has two hinged half-lids which join at the middle, and was about \$15. Boxes of the approximate same size without the hinged lid are available for a few bucks less. A file-storage box is preferable to most plastic storage totes (e.g. Rubbermaid), because the walls are vertical (straight) compared with the sloped sides of most storage totes.
- A 24" x 36" sheet of white corrugated plastic. This is used for the dividers. As the name suggests, the stuff looks just like corrugated cardboard, except that it's made from plastic. I think it has a half-life of 300 years. It is rigid and won't absorb liquids. Find it at Lowe's for \$10, where they sell yard signs.
- Scissors
- Utility knife
- Pencil/marker
- Optional: a straight edge like a builder's square or a yard-stick, will help you cut straight lines with your utility knife

I cut the dividers 5" tall, which is tall enough to keep the bottles standing upright when they are upside down. There are three long dividers about 15" long which go the length of the case, and five cross-members which are about 12" long. The five cross-members have slots cut into them and

sit on the bottom of the box. The three long dividers slide down into the slots to form the grid. In this way, the long dividers sit about 2.5" taller than the cross-members. I actually made it this way initially out of laziness because I did not want to cut corresponding slots in the long dividers.



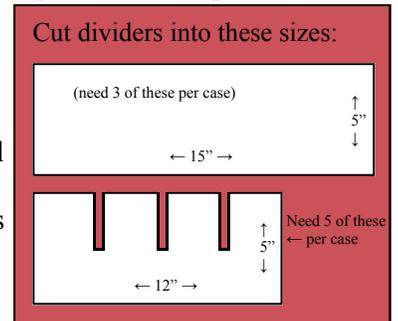
But the taller dividers offer better protection to upside-down bottles and keeps them from clinking together. You can cut slots into the long dividers if you want, so that they will slide all the way down onto the cross-members and all be the same height.

You want all of the dividers to have their corrugated ribs running vertically (up and down), rather than horizontally. This makes it easier to cut the slots in the cross-members, and also keeps any sanitizing solution in the bottom of the case from getting trapped in the ribs.



Cut your whole board down to 5" wide, 36" long strips. You'll have four 5" wide strips, and one strip left over that is 4" wide. I don't recommend cutting them narrower than 5" wide because when the bottles are upside down they will flop back and forth and hit each other, so just toss the excess 4" strip or use it for something else.

Then, cut two of the strips into three 12" pieces (you'll need 5, so you will have one to spare), and two of the strips into two 15" pieces (you'll need three, so you will have one to spare). Check each strip inside the box to make sure they are not a tight fit, and if necessary cut them down with scissors, one rib at a time.



Next, use scissors to cut the slots into the five cross-members. You will cut three slots which will create four rows in the finished grid. To make a slot you basically cut out one rib, about half the width of the divider (or

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Recipes: Westminster Abt 12

This recipe was compiled from different sources to try to replicate the “best beer in the world”, Westvleteren Abt 12, which cannot be legally purchased in the United States. The selected yeast, White Labs 530, is the Westmalle strain which is the same yeast used in Westvleteren beers. Pitch it at 68° and let it gradually rise into the 80°s. Also, pitch a lot of yeast...look at that starting gravity. You don’t want the yeast pooping out early on this baby.

Westminster Abt 12 - Extract

Ingredients for 10 Gallons (cut in half for 5 gallons):

- 17.5 lbs Light Malt Extract Syrup (EXTRACT)
- 2 lbs Cara-Munich Malt (STEEP)
- 1 lbs Aromatic Malt (STEEP)
- 14 oz Biscuit Malt (STEEP)
- 2 lbs Dark Candi Syrup (**not** Candi Sugar crystals)
- 2 lbs Sugar, white table (sucrose) (EXTRACT)
- 1.5 oz Northern Brewer 9.9% BOIL 60 minutes
- 1 oz Fuggles (Whole) 4% BOIL 30 minutes
- 2 oz Hallertauer (German) 2.5% FINISHING 5 min
- 2 pkg Servomyces (yeast nutrient)
- 2 tsp Irish Moss
- 4 pkg (yeah, 4) White Labs Abbey Ale WLP530

Boil Time: 120 minutes

Predicted OG: 1.093

Use **distilled** water for extract brewing for best results. Start with 13 gallons of water to yield 10.00 gallons to primary after a 2-hour boil. Boil as much of the wort volume as you can. Add hops per schedule. Chill to 68°, top off fermenter with additional cool, distilled water if necessary and pitch yeast.

Westminster Abt 12 - All-Grain

Ingredients for 10 gallons (cut in half for 5 gallons):

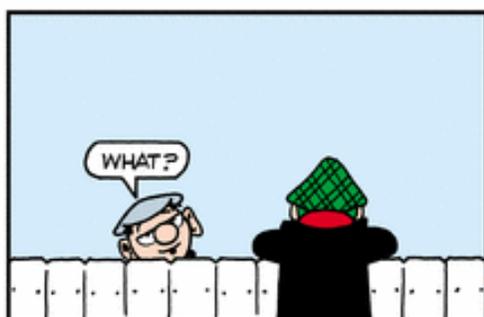
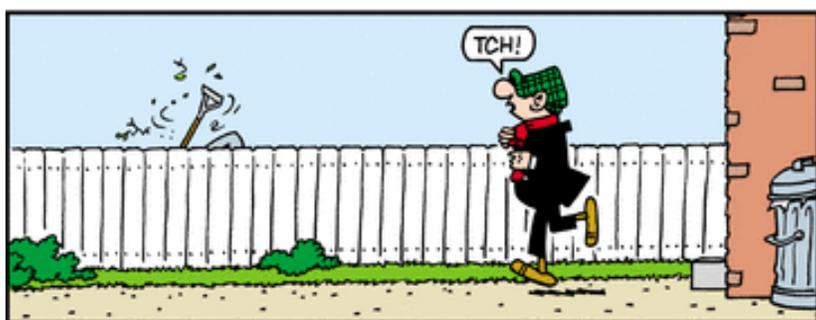
- 10 lbs Pilsner 2-row (MASH)
- 10 lbs Pale Ale Malt French (MASH)
- 2 lbs Cara-Munich Malt (MASH)
- 1 lbs Aromatic Malt (MASH)
- 14 oz Biscuit Malt (MASH)
- 3.3 lbs Light Malt Extract Syrup (EXTRACT)
- 2 lbs Dark Candi Syrup (**not** Candi Sugar crystals)
- 2 lbs Sugar, white table (sucrose) (EXTRACT)
- 1.5 oz Northern Brewer 9.9% BOIL 60 min
- 1 oz Fuggles (Whole) 4% BOIL 30 min
- 2 oz Hallertauer (German) 2.5% FINISHING 5 min
- 2 pkg Servomyces (yeast nutrient)
- 2 tsp Irish Moss
- 6 tsp 5.2 pH Stabilizer
- 4 pkg (yeah, 4) White Labs Abbey Ale WLP530

Boil Time: 120 minutes

Predicted OG: 1.093

Mashing Procedure: Efficiency: 75%

Mix 6 gallons of water at 163 F with grain to heat mash to 148 F. Add 5.2 pH Stabilizer. Mash for 1 hour. Sparge to obtain 14 gallons of wort. Dissolve sugars. Boil, add hops per schedule. Chill to 68° and pitch yeast.



Events Calendar

The calendar is subject to change, additions and deletions. The most current listings are available on our online Google calendar at http://home.comcast.net/~midnighthomebrewers/calendar_of_events.htm

For all tastings, a tasting fee of \$5 per person covers the host's costs. RSVP directly to the host, or as otherwise indicated. If you wish to host an event, contact Event Coordinator Debbie Lyons @ elyonsvw@comcast.net.

March

7 Mardi Gras Tasting hosted by Michelle & Steve Kranz. 7:00 P.M. RSVP 410-848-6695 or stevekranz@comcast.net

Convention at the Carroll County Farm Museum. Brewing demo and information. 8 AM - 5 PM

16-18 National Homebrewers' Conference in San Diego

April

30 Tasting hosted by Jan & Roger Miller. 4:00 P.M. RSVP 410-756-6130 or golfball14@hotmail.com

July

9 Brew-Ha-Ha hosted by Lindy & Neil Mezebish. RSVP 410-487-7112 or neil@mezebish.com

May

7 Big Brew 2011 hosted by Lydia and Gary Cress. RSVP 410-876-6605 or cressgary@ymail.com

August

OPEN Wanna host a tasting??

21 Go Local Fair (Sustainable Living MD) @ Carroll County Farm Museum. Homebrewing demo and information. 9 A.M. - 4 P.M.

September

17 - 18 Maryland Wine Festival

24 Maryland Microbrewery Festival

June

11 (Pending Confirmation) Deer Creek Fiddlers'

October

6 - 9 BrewCamp @ Granite Hill Campground

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about 2.5" long). I purposely made the two outer rows about one rib-width wider than the two inner rows. That's because the bottles fit more snugly together along the two outer rows because of slight narrowing of the box. So, making those outer rows just slightly wider gives the bottles more room to sit next to each other without being squeezed. The dimensions of your box may vary, so just play with it....and measure twice, cut once.

When I built the first box, I actually put 24 empty bottles in the box, put the 5 cross-members down into the bottom in between the bottles, and then placed the long dividers

into the case to see where the slots needed to be cut. Once the dividers are cut, you can use them as a template to mark where the rest of them should be cut.

When the long dividers are slid down into the slots of the cross-members, they fit snugly to form a nice, rigid grid.

You're done, so pour yourself a homebrew to celebrate the birth of your new All-Plastic Beer Case.

