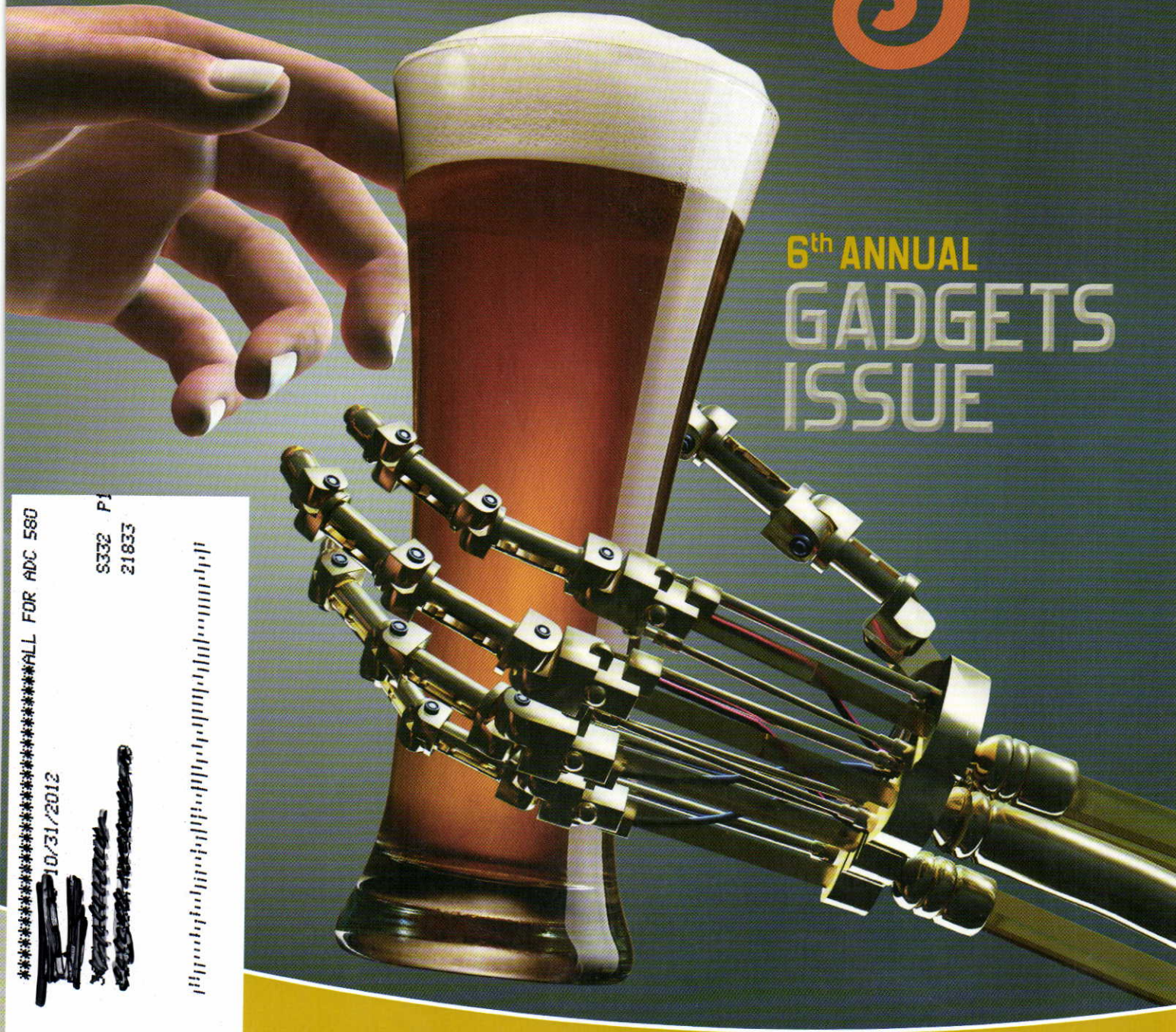



FOR THE **HOMEBREWER & BEER LOVER**

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The Journal of the American Homebrewers Association®



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GADGETS
ISSUE

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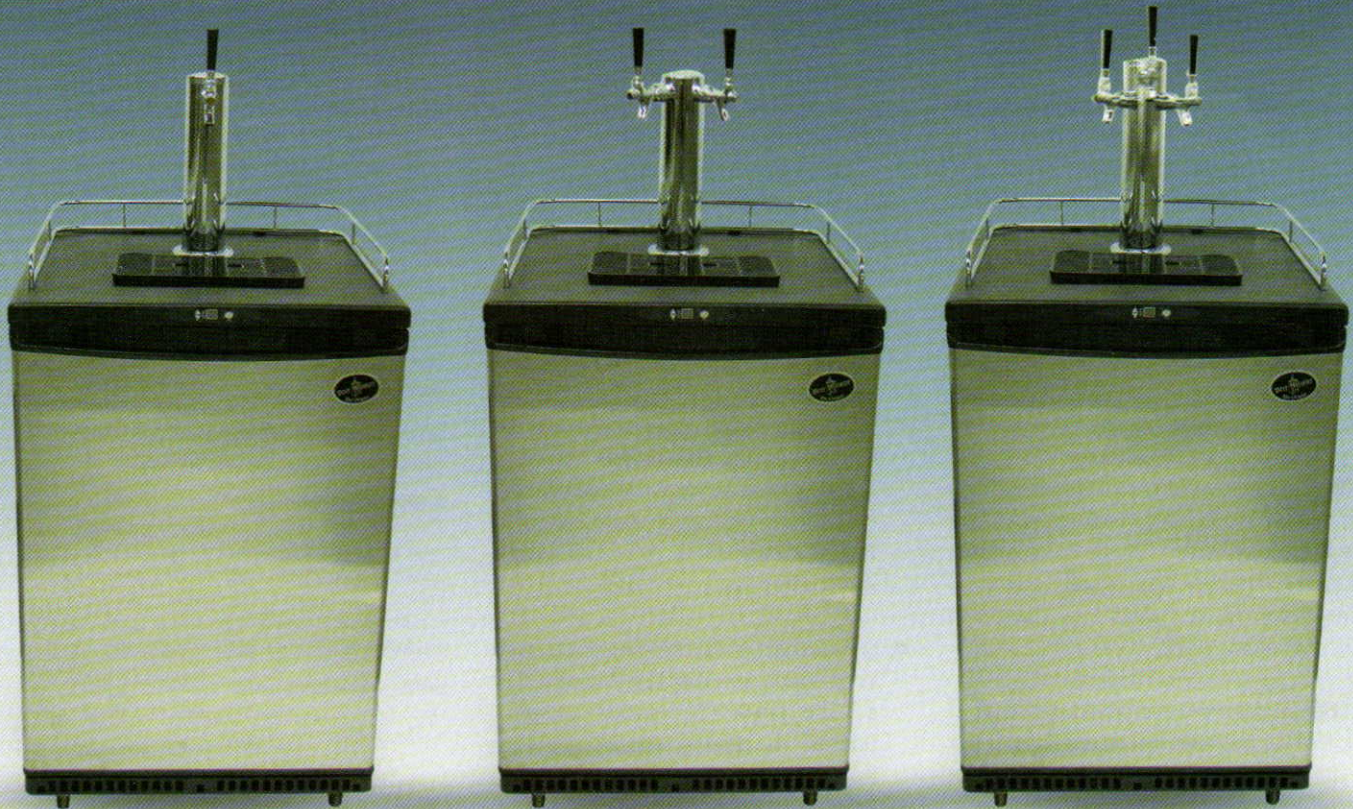
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by Jill Redding

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A Homebrewed GABF

Another Great American Beer Festival, another great chance for homebrewers to shine on the big stage.

As per usual, the first medals given out at the GABF awards ceremony on October 1 at the Colorado Convention Center in Denver were to homebrewers. The sixth annual GABF Pro-Am had 86 entries, with American Homebrewers Association member Tom Gardner of Denver winning the gold medal with C. B. & Potts Restaurant and Brewery in Westminster, Colo. for “Before Capone,” a Classic American Pilsner.

“Having my own beer at the GABF is amazing in itself,” said Gardner, who said his brew day with C.B. & Potts brewer Dennis O’Harrow was equally amazing. “They even let me clean out the mash tun,” he joked.

All 86 entries were available for tasting in the festival hall over the three days of the GABF. For more on the winners and their medal-winning recipes, see the Winners Circle on page 47.

Earlier in the day, homebrewers were again in the spotlight as Boston Beer announced the winners of its annual Samuel Adams LongShot competition. “This is our way of reminding everyone of the importance of homebrewing for the vitality, creativity, and energy it has brought to the brewing industry,” said Boston Beer founder Jim Koch.

Texas resident Corey Martin’s “A Dark Night in Munich” Munich dunkel and Illinois resident Joe Formanek’s “Five Crown Imperial Stout” beat out nearly 1,000 competing homebrews to earn spots in the LongShot Variety Six-Pack that will be available nationwide in February. Martin and Formanek are both AHA members.

“I’ve been brewing imperial stouts for 15 years, so I’ve been tweaking it every year,” said Formanek. “I’m so excited about this—it’s such a dream.”

Aside from the Pro-Am, LongShot competition, and the myriad professional craft brewers who got their start as homebrewers, there were plenty of other homebrew connections at the GABF:

- Homebrew Chef Sean Paxton presented The Great American Beer & Food Pairing Challenge, pitting Bend Brewing’s Tonya Cornett against Cambridge Brewing’s Will Meyers to literally race around the festival hall to find the perfect beers to pair with Paxton’s mushroom stew and pumpkin “beeramisu.”

- The GABF’s homebrewing roots were very much on display, including in a “The GABF Turns 30” presentation in the Brewers Studio Pavilion that included AHA founder Charlie Papazian, Koch, and Sierra Nevada founder Ken Grossman. Papazian said the first GABF in 1982 sprung out of the 1981 Homebrewers Conference, where “the seeds were planted.”

“Homebrewing is the foundation of what this festival is, and it’s the future,” said Papazian.

Koch agreed. “Homebrewing is the roots of the craft brewing movement. I read **Zymurgy** every [issue] and I always learn something.”

Cheers to shining the spotlight on talented homebrewers again in 2012!

Jill Redding is editor-in-chief of Zymurgy.



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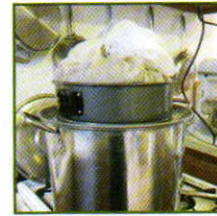
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To read this special, online-only feature, go to the [Zymurgy page on HomebrewersAssociation.org](http://Zymurgy.page.on.HomebrewersAssociation.org).

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>> GET THERE!

BEER WEEKS AROUND

The phenomenon of Beer Week continues to sweep across the U.S., with new ones popping up every year and established ones getting bigger and better. Beer Weeks showcase local beer as well as local food, with dinners, tastings, meet-the-brewer nights, special releases, special events, and festivals.

For the months of January and February, there are several beer weeks planned, including San Francisco (February 10-19); Arizona (February 18-25); and Sacramento (February 24-March 4). More than 45 different Beer Weeks in all are currently listed on CraftBeer.com, and others are undoubtedly in planning. (And, at press time, some Beer Weeks scheduled for early 2012 had not listed their dates yet.)

And, don't forget to plan ahead for the Mother of All Beer Weeks: American Craft Beer Week, set for May 14-20 in 2012.



**January 5-7
Big Beers, Belgians and
Barleywines Festival**

Vail, CO
bigbeersfestival.com

**January 14-21
Kalamazoo Beer Week**

Kalamazoo, MI
kalamazoobeerweek.com

**January 20-21
Great Alaska Beer & Barley
Wine Festival**

Anchorage, AK
<http://auroraproductions.net>

**January 28
Atlanta Cask Ale Tasting**

Atlanta, GA
classiccitbrew.com/acat.html

**February 10-19
San Francisco Beer Week**

sfbeerweek.org

**February 18-25
AZ Beer Week**

arizonabeerweek.com

**February 24-March 4
Sacramento Beer Week**

sacramentobeerweek.com

For more craft brewing events, go to www.craftbeer.com.

>> BEER QUOTE

“There’s not a textbook on how to pair beer with food, nor should there be.”

—Homebrew Chef Sean Paxton at the Great American Beer Festival®



>> If you've had a beer you just have to tell the world about, send your description, in 150 words or fewer, to jill@brewersassociation.org.

>> YOU'VE GOTTA DRINK THIS

RAGTIME BITTER AMERICAN
Atlantic Beach, Fla.

This hoppy yet balanced IPA delights all the senses. Its clear, light copper color topped with a full, fine blanket of foam gives no hint as to the delightful hop aroma from days of dry-hopping that hits your nose as you begin to tilt it back. Although the 65 bitterness units arrive as the first flavor on the palate, it is soon rounded out by an ample amount of malt. It finishes crisply astringent and earthy with a wonderful balance and slow hop fade. This one is not for beginners. Brewer Scott Bannester has created a masterpiece with his Bitter American. Occasionally to the delight of many loyal patrons, he serves it cask conditioned. Pure perfection! Wish he would bottle it or sell growlers, as once you've had it, nothing else will suffice.

Reviewed by Jackie Moss, Philadelphia, Pa.

>> BREW NEWS

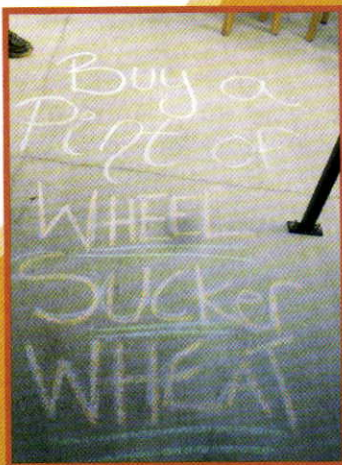
CRAFT BREWERIES GIVE BACK IN A BIG WAY

It's no secret that craft breweries help support their local communities in various ways, donating time, meeting spaces, money, and beer, and organizing events such as fundraisers and blood drives. Hundreds of craft breweries again rose to the occasion in 2011, including:

- Stone Brewing crushed fundraising records set in previous years by raising \$240,000 at its two-day 15th Anniversary Celebration and Invitational Beer Festival in August. The funds were distributed to several local charities including Surfrider Foundation, Boys & Girls Club of San Marcos, Palomar Family YMCA, Fight ALD, CSUSM Foundation, Escondido Kiwanis Club, and IMA North County.
- SweetWater Brewing Company, along with Upper Chattahoochee Riverkeeper, challenged Atlantans to help save one of Georgia's most important natural resources, the Chattahoochee River.

From Memorial Day until July 4, to raise money and awareness for the cause, participating retailers sold paper fish and "Save the Hooch" T-shirts. Retailers, bars, and restaurants joined in, and on August 13 at Canoe, a sold-out crowd of supporters came together on the banks of the river to watch SweetWater reveal a check for \$93,000.

- Brewers from four breweries—Avery Brewing, Oskar Blues, Ska Brewing, and Sierra Nevada—once again banded together for the third annual Tour of BoulDurango, a five-day, 470-mile bike ride from Boulder to Durango, Colo. over six mountain passes. The ride raises money for local charities with special events along the route. Proceeds from Wheelsucker Wheat, a collaboration beer brewed by Ska and Avery, went to the La Plata County (Durango) Safe Roads Coalition. "It's another fun way to hang out with fellow brewers while trying to make a positive difference in our communities," said Adam Avery.



Artwork and photos © 2011 Toons4Biz.com, San Francisco Beer Week, SweetWater Brewing Co., Oskar Blues Brewing Co., and BottleMark



>> GREAT PRODUCT: CUSTOM BOTTLE CAPS

BOTTLEMARK DIGITAL BOTTLE CAPS

J. Cameron Cooper had a problem: too many beers. As an enthusiastic homebrewer, he experimented with so many batches at once that soon his fridge overflowed with unlabeled mystery brews. The solution? "Custom bottle caps," Cooper said. "They make it easy to identify what's inside. Problem was, I couldn't find any!"

In the age of digital printing, bottle caps are still printed the old-fashioned way. Using giant machinery and customized plates, packaging plants personalize bottle caps in a process called offset lithography. The technique creates a durable, high-contrast cap but is only economical in large runs. All bottle cap producers require minimum orders (usually a whopping half a million), and designs typically max out at five colors since the machines can only handle five plates in a row.

At this rate, most craft breweries can't afford specific caps for all their brews; they usually compromise with a one-cap-fits-all model. Homebrewers are simply out of luck under this production model. For years, they have tried to work around the problem by placing stickers on caps or even just using a Sharpie to label a cap. But Cooper decided it was high time to bring digital printing to bottle caps—and custom caps to the people.

This past summer, BottleMark opened its online doors to the public. Thanks to the company's digital printing process, BottleMark promises no minimum orders and no color limits. Even photos print in vibrant detail and at the same cost as a two-color cap. The caps are fully lined, industry standard, waterproof, and bottle ready. "We've even got this online design tool, where customers can upload their design and preview it on a cap," said Cooper. "We're kind of like Cafe Press but for bottle caps!"

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By Gary Glass



GABF Has Its Roots in Homebrewing

As I write this issue's "From the Glass" column, the 2011 Great American Beer Festival® (GABF) is fresh on my mind. This year's GABF marked the 30th anniversary of this ultimate celebration of American beer.

I'm sure not all AHA members are aware that the original GABF, held in 1982, was launched by a still very young American Homebrewers Association (the AHA was founded December 7, 1978). Not long after, the AHA added the Institute for Brewing Studies and became the Association of Brewers, but it is worth remembering that the longest running beer festival in the United States was started by a homebrewing organization. For those of you who were fortunate enough to be at the 2011 festival, you had an opportunity to see the 5,000-square-foot 1982 Pavilion—the same in size as the inaugural GABF—which was completely dwarfed by the 290,000-square-foot hall that housed the 2011 Festival.

The GABF still reflects its homebrewing roots in many ways. Some long-time AHA members showed up to this year's GABF as pros for the first time. Rick Garvin, a regular at the AHA National Homebrewers Conference, took home two medals from his first GABF as a partner in the recently opened Mad Fox Brewing Co. in Falls Church, Va. AHA member and GABF judge Lyle Brown enjoyed his first GABF as a professional brewer, having taken on the head brewer role at Battlefield Brewing Co in Fredericksburg, Va. There were many others with similar stories.

This year's festival included the 6th annual GABF Pro-Am Competition, which drew a record 86 entries. Pro-Am entries are commercially-brewed recipes from



The first Great American Beer Festival in 1982 was started by the American Homebrewers Association.



The Pro-Am booth was a popular spot at this year's GABF, with all 86 entries available for tasting during the festival.

award-winning AHA members submitted by Brewers Association-member breweries. All of the beers are served over the course of the four sessions of the festival at the GABF Pro-Am Booth. AHA Project Coordinator Janis Gross organized the volunteer pourers for the GABF Pro-Am Booth, all of whom were AHA members—not a bad gig for a volunteer, as those Pro-Am entries are always some of the best and most intriguing beers available at the GABF. To see the award winners and their recipes, go to Winners Circle on page 47.

Lately, I have been working with AHA Governing Committee chair Chris P. Frey on House Bill 4061. The bill would allow Michigan homebrewers to bring homebrew into breweries, brewpubs, restaurants, and other businesses with licenses for selling alcohol for “on-premises” consumption, for homebrew club meetings and homebrew competitions. This is the second year that Michigan Rep. Doug Geiss, a homebrewer, has sponsored this bill. Last year’s bill died early due to objections from the Michigan Liquor Control Commission (LCC). This year,

the bill sailed through a House committee vote, a full House vote, and a Senate committee vote, before being stalled by the LCC, which at that point determined that it could not support the bill without an amendment to include additional language regarding insurance coverage for the venues hosting homebrew events. I’m happy to report that the bill was amended, was passed by both the House and the Senate, and was signed into law by Gov. Rick Snyder on November 10.

I am also working with the Wisconsin Homebrewers Alliance, a group representing several Wisconsin homebrew clubs and homebrew supply shops, on a homebrewer rights bill. The Alliance hopes to get a bill filed that would allow for homebrew to be served outside the home where it is brewed. In a situation strikingly similar to the scenario we saw in 2010 in Oregon, the Wisconsin Department of Revenue determined that a long-standing tradition of serving homebrew at a Racine, Wis. beer festival was not technically legal. That determination could have a profound effect on a wide range of homebrewer activities and events in the state. A separate bill, AB 290, has been filed on behalf of the state’s homebrew supply retailers to allow shops to brew and serve homebrew for educational purposes.

Also in the legislative mix are Ohio, where some homebrew transport issues have surfaced, and of course Alabama and Mississippi, the only two remaining states where homebrewing is outright illegal. Hopefully, 2012 will be the year to end illegal brewing in the U.S.

I have always been a strong proponent of supporting your local homebrew supply shop. Nothing against online retailers—I do make some of my homebrew purchases online—but I recognize that local shops are critical to the survival of our beloved hobby. The local shop is where the majority of new homebrewers get their start, either by walking into the store, or by receiving a locally purchased beginner kit as a gift. New homebrewers are critical to keeping those businesses open and providing a new pool of potential members to the nation’s homebrew clubs and the AHA. In addition, the more

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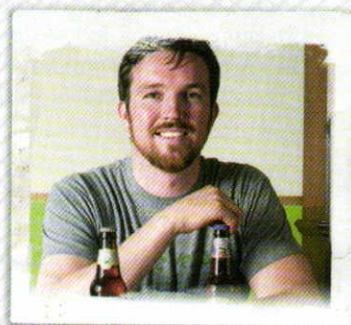
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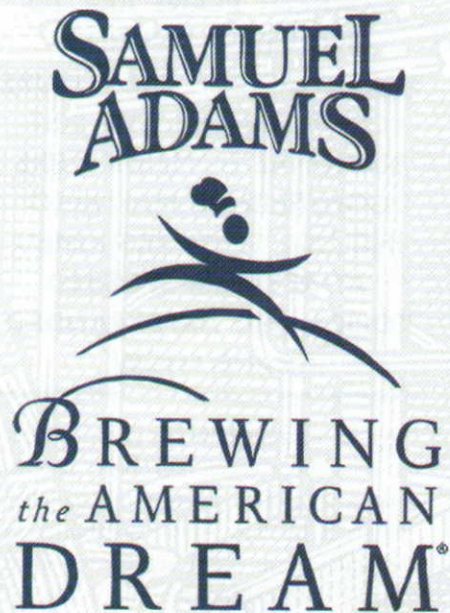


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homebrewers there are, the wider an array of ingredients and equipment that will be available for all of us.

Recently, the AHA has started looking into how the organization can better support homebrew retailers. During a meeting of the AHA Governing Committee (GC) at the 2010 National Homebrewers Conference in Minneapolis, the GC created a new Retailers Subcommittee, led by GC vice chair Jake Keeler, to address issues relevant to homebrew supply shops. At the following conference, the Retailer Subcommittee organized a Retailers Roundtable, where homebrew industry participants could discuss their business interests. Current plans are to include a Retailer Roundtable in all future conferences. The 2012 National Homebrewers Conference may also include seminars aimed at retailer-specific topics and an expanded trade show. Recently, the AHA added a Retailer board, moderated by GC member Chris Graham, to the popular AHA Forum on HomebrewersAssociation.org. The new board provides a venue for business owners and employees to talk shop.

CURRENT PLANS ARE TO INCLUDE A RETAILER ROUNDTABLE IN ALL FUTURE CONFERENCES. THE 2012 NATIONAL HOMEBREWERS CONFERENCE MAY ALSO INCLUDE SEMINARS AIMED AT RETAILER-SPECIFIC TOPICS AND AN EXPANDED TRADE SHOW.

Have an idea on how the AHA can better serve your local homebrew shop? I encourage you to contact the members of the AHA Governing Committee or the staff of the AHA with your ideas. Contact information for all of the GC members and the staff is available on HomebrewersAssociation.org.

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.

Brewing in the Backcountry



Brew equipment and ingredients

Dear *Zymurgy*,

Every summer for the past six years my brother, four best friends, and I have gone on a backpacking trip to our secret spot in Tuolumne County, Calif. To put it simply, we are not roughing it. Each pack weighs at least 100 pounds and contains almost entirely alcohol, beer, frozen meat, canned goods, and cooking gear. Every year without fail we have managed to surpass the prior year in terms of gourmet cooking, campsite luxuries, and daytime adventures, but this year was the year of beer.

Already having hiked in 22 canned craft beers (thank you 21st Amendment and Maui Brewing Co.), three homebrews, two Sierra Nevada 30th Anniversary ales, and a Flemish Sour Red ale, I felt we almost had enough beer for our four-day stay, but could really use some fresh session-type ale to get us through the hot August afternoons. There was no way I was going to carry any more beer on our six-mile up-and-down trek into the forest, so there was only one option—brew a batch of quick beer in the woods with my backpacking stove and some DME.

After brewing a delicious all-grain American Wheat ale a few months prior, I decided to scale down the recipe to yield



about 2.5-3 percent alcohol and of course use DME instead of all-grain, although a small amount of steeping grains was used to provide some legitimate grain flavor. Armed with a sanitized 3-gallon BPA-free plastic jug, 2-gallon kettle, backpacking stove, and my ingredients, I dropped my pack upon arrival at the campsite and began brewing, knowing that the more time I could give my already rushed yeast, the better.

Heating 1.5 gallons of water proved to be about the upper limit of my stove, but it got the job done and soon enough I was mixing DME into boiling water, adding my bittering hops, and making sure it didn't boil over and put my flame out. At 45 minutes into the boil, I added my finishing hops, steeped the grain for 10 minutes after knockout, and carefully poured my 1 gallon of wort into the plastic fer-



Pouring into fermenter



Cooling

menter. I wrote the recipe for 2 gallons, so after bringing another gallon of water to a boil, I poured that into the fermenter.

Into the river it went, along with a Nalgene full of some of the boiled water to cool down to rehydration temperature for my dry ale yeast. With the yeast rehydrated and wort somewhere around 75 degrees, I inoculated the beer right before dinner, shook the crap out of it, and wrapped it in a black garbage bag for light protection. Using a crevasse of a large rock as a fermentation cellar, I dug a hole, placed my jug inside, and covered

the whole thing with a mound of sand. With how hot the sand gets during the day, I knew that it would stay warm for most of the night, and when I got up in the middle of the night to check on it, my thermometer said the sand surrounding the jug was at 76° F.

When I awoke in the morning, the airlock was chugging, krausen was high, and the beer seemed happy. Over the next two days, I would make a tent around the beer with my sleeping bag and pad to shade it from the sun, and pour cold water on the sand around the fermenter to keep it cool

during the day. On the night of the third day, the beer went back into the river to cool and settle while I eagerly waited to try the backcountry brew. As carefully as I could, the beer was poured off the yeast cake into Mason jars, water bottles, and plastic cups made out of cut-off plastic bottles. With a hazy golden color, mild bitterness, and dry drinkability, the Tuolumne Wheat session ale went down the hatch of this jubilant brewer with astonishment that it had actually worked, and produced a beer that was not only drinkable, but enjoyable. Throughout the day, we would pass around a bottle, sometimes adding a slice of lemon to freshen it with a kick of citrus, and saved one bottle for a nightcap at the campfire to commemorate the awesome trip.

Jeff Klatt
Los Altos, Calif.

Pumpkin Picking

Dear *Zymurgy*,
In response to John Slotterback's letter ("Fall Seasonals in July?" September/October 2011), while most people associate pumpkins with fall, they do actually start to ripen much earlier in the season.

I live in Southeast Tennessee. Here, I plant earlier and harvest longer. I have had ripe pumpkins since July! I planted two pumpkin plants and harvested 37 pumpkins from my own front yard. With those, hubby made several batches of ale.

I understand John's point of having seasonal beers in-season, but the idea of being able to have my Christmas in July is appealing to me. One of the great things about pumpkins in particular is that they keep a long time. I can pick one in July and, if hubby does not steal it for a pie or an ale, I'll still have some when I plant the next garden in spring.


Karon Adams

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by Professor Surfeit



The Art and Science of Tapping Beer

Dear Professor,

I've been priming my kegs with corn sugar because I feel it yields finer, lacier bubbles. However, it seems the widely used "standard" of 0.33 cup corn sugar doesn't provide quite enough carbonation. The beer becomes flat quickly or is flat right out of the tap. I've found that 0.75 cup corn sugar (the amount regularly used for bottling) suffices without any over-carbonation. Is something wrong with my beer? Am I under-pitching yeast? Maybe I'm not reaching my target final gravities?

Milan J. Bull
Stamford, Ct.

My man Milan,

I get wonderfully great foam and bubbles with corn sugar priming as well, but I have to believe that I'd get the same quality if I used unfermented all-malt wort. It's a convenience thing for me that offers super good results—at least in my homebrewery.

Now about getting the right amount of carbonation into your glass from the keg. This is quite a complex science and there are many factors that determine foam and carbonation quality in the final glass. The most comprehensive and best guide for educating yourself on draft beer systems is the Brewers Association's Draught Beer Quality Manual. Visit draughtquality.org and download it for free, or you can order a hard copy through BrewersAssociation.org from the Publications drop-down menu.

A long explanation, made short, is that the resulting carbonation in your glass will depend on what temperature the beer is, the diameter and length of your beer hose, the amount of pressure at which you're serving the beer, the quality of the gas you use

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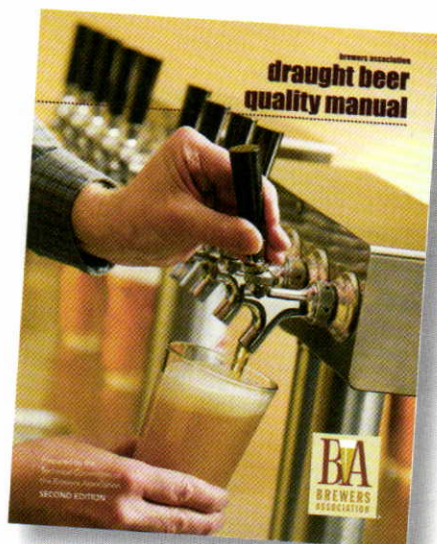
to push the beer out, the temperature and cleanliness of the glass, and whether your beer lines are clean. That's a lot of stuff to keep track of.

For beers that remain on line at a given pressure, the initial amount of priming sugar isn't super important, because even if the beer

is underprimed in keg, when you put CO₂ pressure onto the keg, the carbonation of the beer will equilibrate with beer temperature and gas pressure applied.

Don't forget to open the spigot tap wide open every time you serve.

All tapped out,
The Professor, Hb.D.



Alpha & Beta: War of Words Revisited

Dear Professor,

I read with interest the discussion about the relative activities of alpha- and beta-amylase with respect to the production of fermentable (simple) sugars and non-fermentable sugars from starch during mashing (Dear Professor, January/February 2011). In short, I would recommend John Palmer's updated *How to Brew* for an accurate technical discussion of saccharification by starch-degrading enzymes including alpha- and beta-amylase in layman's terms.

In your comments, you are correct that alpha-amylase is more heat stable than beta-amylase. However, the discussion misses three other important players: starch, limit dextrinase, and mash thickness. Starch, the substrate for these enzymes, is important because it is gelatinized at temperatures >60° C (140° F, barley starch), a temperature below which the production of yeast fermentable sugars is very slow. Limit dextrinase is important, in that it is the only enzyme that will cleave limit dextrins, thus potentially reducing wort/beer body. It has a similar temperature tolerance to beta-amylase. Finally, mash thickness is important as the starch-degrading enzymes will persist in the mash at higher temperatures for longer with thicker mashes. Of course, grist fineness is also a factor in mash thickness—a finer grist results in increased enzyme persistence.

For the homebrewer and commercial brewer alike, the production of fermentable sugars from starch is a "team game." As such, the optimal temperature for starch degradation to fermentable sugars is 65° C (149° F). This is the compromise temperature between efficient starch gelatinization while at the same time enabling reasonable persistence of the starch-degrading enzymes. This is particularly so for beta-amylase, the primary enzyme producing the main fermentable sugar maltose. Maltose typically comprises 60-70 percent of fermentable sugars in sweet wort. Although most starch degradation will occur in the first 10-15 minutes of mashing in a 3:1 water/grist mash, significant amounts of fermentable sugars will be produced for up to 60 minutes, as beta-amylase and limit dextrinase, in particular, are progressively inactivated. At temperatures over 70° C (158° F, "saccharification rest") and to a reducing extent up to ~75° C (167° F), alpha-amylase will continue to degrade starch, potentially producing dextrins that may increase beer body but also a small amount of fermentable sugars.

In other words, the degradation of starch to fermentable sugars and dextrins/limit dextrins is a dynamic process, with each of the "team player" contributions governed by a number of mashing param-

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eters. An understanding of the dynamics of mashing enables brewers to produce a range of wort fermentabilities (alcohol potential) and potential beer bodies by judicious choice of mash parameters and malt quality (levels of starch-degrading enzymes). Mashing in at 65° C (149° F) for longer times (e.g. 60 minutes) with relatively thick mashes will provide wort with increased alcohol potential, potentially at the expense of beer body. Conversely, mashes with relatively short durations in the 62.5-67.5° C (144-153° F) temperature range will result in lower alcohol potential and increased beer body. Time, temperature, mash thickness, and malt enzyme levels are the key parameters in controlling resultant wort fermentability and beer body.

Note, I have been researching malt starch-degrading enzymes, initially beta-amylase, since 1992. It was only once a more holistic approach to this study was taken after 2000—that is the study of all starch-degrading enzymes with respect to starch gelatinization temperatures—that basic science observations and brewers' practical experiences could be properly reconciled.

Dr. Evan Evans
School of Plant Science
University of Tasmania, Hobart, Australia

Dear Dr. Evans,
It appears that in summary we are in agreement. It is the details you provide that are not discussed in my response. I don't think what I say contradicts you. Your technical expertise is far greater than mine and of most homebrewers. And you also have a unique perspective from down under the globe... but then again if we flipped our view of the world, I'd be down under and you'd be up over. Thanks for your explanatory note.

Not as good at diving in as you are,
The Professor, Hb.D.

Hey homebrewers! If you have a brewing-related question for Professor Surfeit, send it to "Dear Professor," PO Box 1679, Boulder CO 80306-1679; fax 303-447-2825; or e-mail professor@brewersassociation.org.



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by Amahl Turczyn Scheppach

Dark Lagers



The three dark lager subcategories seem to represent dark brown to black colored versions of light lager styles. Each bears a fairly close resemblance to its lighter counterpart, with the notable exception of color.

For example, the first subcategory, dark American lager, is a sort of catch-all subcategory for generally low-alcohol, low flavor beers that just happen to have dark color added. Like modern premium American lagers, they are defined more by what they aren't: little to no hop character,

little to no malt character, medium-low to no roast grain aroma or flavor, no diacetyl, but lots of carbonation and perhaps a little fruitiness. Caramel flavor and perhaps aroma may also be present as a result of the darkening agent, which is often caramel syrup. Adjuncts like corn and rice along with six-row barley may be used, and coloring agents may be added in lieu of actual dark or roasted malts. Original gravity is 1.044 to 1.056, final gravity is 1.008 to 1.012, with 8-20 IBUs. Alcohol generally ranges from 3.5 to 5.1 percent abv.



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Dark Lagers

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Munich dunkel gets much more specific, as the name would suggest, and most examples display a much higher degree of beer character and complexity. Like its counterpart Munich helles, malt plays a prominent role here. Traditional examples achieve a very full malt expression via decoction mashing, with the resulting Maillard reactions adding to malt depth and complexity. The grain bill also contributes to maltiness, with many dunkels using a large proportion of high-kilned Munich malt—up to 100 percent may be used, although most modern versions contain no more than 40 percent. Pils malt may also constitute part of the grain bill, usually in the 40 to 60 percent range, as can specialty malts like medium to

dark caramel malts (5 to 15 percent), and even a touch (5 percent or less) of black or roast malts.

Bready aromas and flavors dominate, with other malt-related complexities possible, like toffee, caramel, chocolate, nuts, and toast. Fruitiness may be acceptable in dark American lager, but not in Munich dunkel. Again like helles, there can be quite a bit of malt sweetness present, but the beer should always be balanced enough for easy drinking. Stylistically, Munich lager should fall somewhere between a schwarzbier (though not as roasty) and a bock (though not as intensely malty). A bit of noble hop character may be present in the aroma and flavor. Moderately carbonate

Tara's Slam Dunkel (Munich Dunkel)

This recipe is based on "Tara's Slam Dunkel," the gold medal recipe by Shekar and Paula Nimkar for BJCP Category 4 in the 2010 National Homebrew Competition (NHC). NHC gold medal recipes are included in the September/October issue of *Zymurgy*, and can be found online in the AHA's Homebrewopedia (wiki.homebrewersassociation.org).

INGREDIENTS

for 5.25 U.S. gallons (20 liters)

- 2.0 lb (907 g) Coopers Light Dry Malt Extract
 - 6.0 lb (2.7 kg) Munich Amber Liquid Malt Extract (or 4.8 lb [2.2 kg] Munich Dry Malt Extract)
 - 0.25 lb (113 g) Chocolate Malt (350° L)
 - 1.0 oz (28 g) Hallertau (or similar) hops, 4.0% a.a. (45 min)
 - 0.5 oz (14 g) Hallertau (or similar) hops, 4.0% a.a. (15 min)
 - 4 packages Wyeast 2206 Bavarian Lager yeast, or 4 vials White Labs WLP920 Old Bavarian Lager yeast, or 20 g Fermentis Saflager S-23
- Coopers Brewery Carbonation Drops for bottling

DIRECTIONS

Steep grains in 2 gallons (7.6 liters) of cool water, heat to 170° F (77° C), strain and sparge with 2/3 gallons (2.5 liters) hot water. Stir in malt extract and bring to a boil. After 15 minutes, add the bittering hops and boil for 30 minutes. Add the second hop addition and boil for another 15 minutes. Shut off heat, and cool the wort. Pour the wort into a clean and sterilized fermenter with enough cold water to make 5.25 gallons (20 liters). Aerate and pitch yeast when temperature drops to 50° F (10° C). Ferment at 50° F (10° C) for two to four weeks or until fermentation is complete. Age in secondary fermenter for two to four weeks at 38° F (3° C). Prime with Coopers Brewery carbonation drops at bottling (at room temperature).

Original Specific Gravity: 1.060

Final Specific Gravity: 1.014

IBU: 14

ABV: 6.2%

water helps promote malt flavors. Slight to no alcohol warmth. Original gravity is 1.048 to 1.056, final gravity is 1.010 to 1.016, with 18-28 IBUs.

Schwarzbier could be described as a black counterpart to Pilsner, with the same lightness of body and dry finish, but without the emphasis on hops. It can be very black and opaque, clear black with reddish highlights, or more of a very dark brown color. Its emphasis is on smooth, black malt grain flavors, without the overt roastiness found in stout. Bittersweet chocolate and coffee flavors are more the goal. While some sweetness is encouraged for balance, schwarzbier should have a dry finish without astringency or bitterness.

The use of lager yeast helps promote smoothness in aroma, flavor, and finish. Light to moderate noble hop character is allowed, but dark grains should play the most significant role in the finishing dryness. Pilsner malt should be the base malt, with Munich malt making up 20 to 30 percent, and a small amount (1 to 2 percent) of black patent malt or chocolate malt for color and flavor. Dehusked Weyermann Carafa® malt or debittered Belgian chocolate malt are great choices here. The Carafa line includes I at a color rating of 300 to 375° L, II at 375-450° L, and III at 450-488° L. Any of these will work, but the darker versions tend to introduce a sharper, roastier grain flavor, so adjust accordingly.

Caramel malt should be used with caution, as it can push body and sweetness too far—less than 10 percent of the total grain bill can be added, however. Hops should be noble, low alpha varieties, and a long, cool fermentation with extended lagering will really encourage the smoothness essential to this style. Original gravity is 1.046 to 1.052, final gravity is 1.010 to 1.016, with 22-32 IBUs.

Amahl Turczyn Scheppach is a former craft brewer and associate editor for Zymurgy, and now brews at home in Lafayette, Colo.



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10 HOMEBREW GADGETS

By *Zymurgy* readers

The *Zymurgy* Gadgets issue is an annual celebration of the innovativeness and creativity of homebrewers. If a piece of equipment isn't working for them, they'll often tweak it, build something on their own from scratch, or find an innovative homebrewing-related use for common kitchen (or other) appliances. As we do each year, we asked *Zymurgy* readers to submit their homemade homebrewing contraptions for the 6th annual Gadgets issue, and here's what they've been working on.



TEMPERATURE CONTROL CHAMBER

My gadget is a custom liquid-based temperature control chamber for a 5- or 6-gallon carboy built out of a 10-gallon water cooler, old computers, computer cooling equipment, and custom electronics. The heart of the system is a copper heat-sink/fan assembly taken from a scrap computer along with a peltier device and water block/pump assembly purchased on eBay that are used for computer processor cooling. The temperature is maintained with a temp control module also purchased on eBay. The power for the system comes from two computer power supplies, one of which has been slightly modified.

The custom electronics provide the mechanism to interface the temperature control module to the pump, fan, and peltier to heat or cool the liquid. I also designed several extras into the circuitry such as allowing the fan to run for an adjustable duration after the system shuts off to get rid of as much waste heat/cold as possible. In addition, I also designed in min/max temperature limits for safety, which will completely shut off the system if one of the limits is reached. I currently have the limits set at around 2.2° C (36° F) for the low limit and 60° C (140° F) for the upper limit. This allows me to lager with the unit as well as heat up cleaning solution such as PBW for when I have blow-overs and get yeast/beer in the coolant. Using this unit has allowed me to maintain fermentation temperature to within 0.3° C of my target temperature and has drastically improved the quality of my beer.

TIM DELLINGER / Frederick, Md.



“BEANIE” BRAID

For the past couple of years, I've been brewing with a piddly little hose braid in my cooler. Enter to my rescue fellow club member Richard “Beanie” Webster. To avoid turning into a retired couch lump, Beanie constantly invents new gadgets. (See my March/April 2010 *Zymurgy* article “Smoke ‘Em If You’ve Got ‘Em” to see Beanie’s malt smoking apparatus.) To find new bits and bobs, Beanie scours the local salvage yards.

Not long ago, while picking through piles of detritus, he stumbled on a coil of mil-spec electrical cable surrounded by a beautiful braid. This was thick stuff—an inch in diameter. With a few tools, he stripped the covering and left the cable rotting in the yard. Thanks to its light weight, he walked away with a massive length of braid and unique thumbscrew clamps for a song.

Back in the Beanie lab, he cut the braid into usable loops and swirls for his and the club’s giant mash tuns. He had enough left over to make them for club members. For me, he rigged a loop fit for the omnipresent 72-quart Coleman Extreme (in Denny Conn-approved Blue) cooler. Not just a simple rig, the braid actually clamps on short pieces of pipe that slip-fit into elbows, which in turn slip-fit a tee. The all-copper slip system makes it possible to pull the braid, disassemble, clean, and reassemble for use as a circular boil filter.

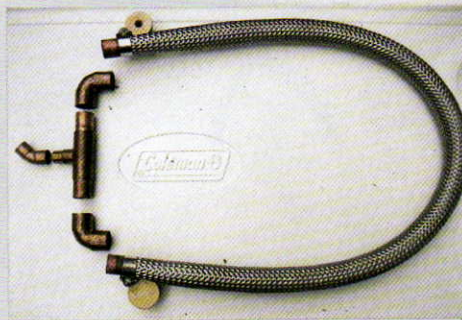
My only addition to the rig was a copper 45-degree street ell to angle down to the port that sits below the cooler floor in a drain channel. Truth be told, that idea came from Kent “Brewgver” Fletcher. (I’m mechanically hopeless.)

How’s it work? Like a peaches and honey dream and smoother than a Dynaflo transmission. It screams, too. My first brew day with the Beanie Braid, I got caught off guard when my lauter drained three times faster than my old busted braid. I poured a beer and had my leisure time cut short when my pump suddenly whined and spun dry.

Sadly, Beanie’s initial source of the braid seems to have dried up, but he’s keeping an eye out because this thing is worth it!

DREW BEECHUM / Pasadena, Calif.

2

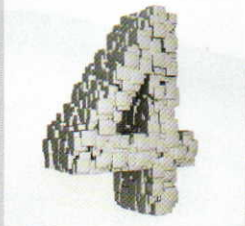


3

CUSTOM MASH PADDLES

I wanted to show you the custom mash paddles I've been making for members of my homebrew club, Barley Legal Homebrewers of South Jersey. They've become so popular that I started to sell them in my local homebrew store, BYOB in Haddon Heights, N.J. and on Etsy.com. They're made from 100-percent maple wood and have no finish or oils that can leach into your wort. This is how you Mash-In-Style!

RON RADIL / Glassboro, N.J.



DISHWASHER KEG AND CARBOY CLEANER

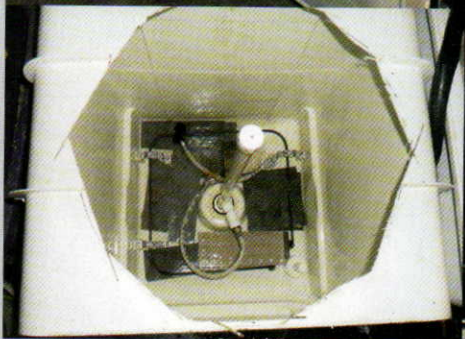
This is a dishwasher adapted to clean corny kegs and carboys. It runs through a rinse, hot clean, hot clean with PBW, and then rinse to remove PBW. To build it, the spray arm was removed and a PVC reducer was attached to the pump with plumbers epoxy. A shim added to the float switch allows higher water level, and ceramic tiles raise the water to the element for heating. Small holes were drilled up and around the pipe to help with even cleaning, and a hole positioned to shoot water at the detergent tray ensures cleaner is mixed into solution. It is wired and plumbed as a normal dishwasher installation.



The ball lock disconnects attach to the corny and push through to clean without the need to pull the dip tube or disassemble the posts.

Material costs were around \$60, less if you can find a dishwasher with drain hose and water connections already. The air dry setting should be selected, as heated dry will not work properly with the top cut off. To run, attach disconnects to keg and invert over pipe, add cleaner to tray, and set to normal wash cycle. When running, the water is heated to over 140° F (60° C) by the element and, combined with the high pressure wash, leaves vessels perfectly clean.

STERLING HOOTEN / Vancouver, Wash.



5

CHEST FREEZER CONDENSATION CONTROL

to a "shallow" Chinese food container (white) that has many 1/16" holes drilled in the bottom, and this sits in a deeper Chinese food container (black). I put a shallow layer of ice melt (calcium chloride-based ice melt is a desiccant) in the freezer, which then liquefies and drips down through the small holes into the black Chinese food container. You just need to pour out the black container periodically and re-layer the ice melt. Thick layers of ice melt will not work because it will form a "shell" and no liquid will drop down.

Like many homebrewers, I converted a chest freezer into a fermentation chamber/kegerator, and it has condensation problems. Instead of buying buckets of DampRid that need to be thrown out, I made my own using Chinese food containers and ice melt. It consists of a Chinese food plastic lid with 3/8" holes drilled in it, which attaches



ROBERT FOSTER / Brooklyn, N.Y.

BEER FRIDGE FAUCET COVER

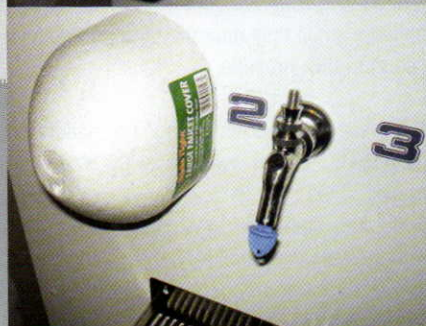
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I noticed that condensation formed on the faucets of the beer fridge and wondered about cool-loss. The idea was to offer some insulation when not in use, maybe saving energy and keeping bugs from the taps. Also, I know a lot of beer fridges are kept in garages and thought it might be a way to prevent freezing at the taps.

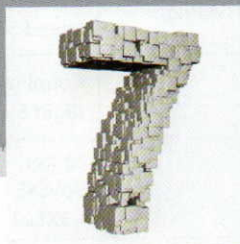


I used Styrofoam outside faucet covers, the kind that helps prevent freezing in the winter. I first had to make sure that the cover would fit over the faucets. Then I removed the soft-foam ring around the cover. I used a glue gun to attach magnetic strips. I cut the magnetic strips to fit around the base of the faucet cover. I first tried to hot-glove the magnetic strips to the soft-foam and found that didn't work very well. I also would recommend against using the rubber cords that come with the cover to attach it to the faucet; that could cause the taps to open, pouring beer out!



The nice thing about using magnetic strips is that you can store the covers on another magnetic part of the fridge when not in use.

KIRK BIGGER / Charlottesville, Va.



HOP-SQUASHER

I have what I call my HOP-Squasher (Hop Optimizing Press) for serving freshly hopped beer. It is simply a French press coffee carafe that I use for serving beer with hop additions. I just pour a carafe full of my favorite beer and add a teaspoon or so of hop pellets or a few whole hop cones and insert the press screen, making sure that the vents are in the "closed" position, and stick in the fridge for a few minutes. When I'm ready to pour, I twist to the "open" position and very slowly depress the plunger to clear the hop debris and pour a great tasting pint of uniquely hopped beer. It's nothing fancy, but it is cheap and fun and allows you to play around with a lot of different hop and beer combinations.

COURTNEY TYVAND / Ooltewah, Tenn.



8

LAB MIXER STIR PLATE

My first stir plate, a modified computer fan, burned out. I had high hopes for the second one, which had a pulse width modulated (PWM) speed controller. But one of my issues was the magnetic stir bar—is it rotating or off to the side flailing around? The starter is opaque, so you can't see the bottom. Did it start up too fast and

get thrown to the side? Shouldn't there be a vortex? How much heat is the stir plate adding? These issues bugged me.

The next drawback was the 2-liter Erlenmeyer flask. If you boil wort in it, you're bound to have a nasty boil over—Fermcap-S does help with this. I've also scorched my starter wort many times. To resolve this issue, I started boiling water in the flask to sterilize it, and boiling the starter wort in a separate 12-quart kettle. There is a low level chance of contamination or hot side aeration while pouring the wort into the flask depending on whether you transfer hot or cold.

My initial thought for a stir plate replacement was to make an orbital shaker, like you find at your local hardware store for mixing paint, but with a much gentler rocking motion. I eventually settled on a "lab mixer" design, involving a variable speed motor, a shaft and propeller, and a sturdy base with vertical and horizontal adjustments.

The main components of the system are the motor and speed controller.



Radio Shack	Project Box	\$4.99
Grainger	Control, DC Speed 5JJ56	\$68.60
	Coupling, Rigid Steel	\$6.69
	Motor, 90VDC, TENV - 3XE22	\$131.55

The motor selection took quite a bit of time. I tried a 93 rpm gear motor, but it was too slow to be effective.

"WATCHING MY YEAST START OFF WITH SHORT LAG TIMES AND FINISH QUICKLY WITH HIGH ATTENUATION RATES IS A GREAT REWARD"

The 3XE22 is rated for continuous duty, totally enclosed, not ventilated, permanent magnet DC motor with a 5/16" shaft diameter. (Note that motor manufacturers consider eight hours continuous duty.) Also, these are not brushless motors—brush and commutator maintenance will be required over time.

The speed controller is a Dart 15DV1A controller, which handles 120V input and provides 90V DC output. It has a 25:1 speed rating, 1/50 to 1/3 HP, 2 amps maximum current.

Now it was time to get a shaft for the mixer. A cheap fiberglass rod from Home Depot fit the bill (orange driveway marker). When cutting the rod to size, watch out for splinters! Next, I drilled a small hole near the bottom. Two lock ties form the "propeller."

The base is made from square perforated steel bars, bolted together with 8" corner braces. The 1" x 3' and 1- 1/4" x 3' (cut) perforated steel bars give vertical and horizontal telescoping ability. I added adjustable feet and rubber stoppers to guard the sharp edges. All told, the stand was half the price of the entire project. It is sturdy and multipurpose, though, so if I want to use the system as a mash mixer or to whirlpool the wort in the kettle, I can (and have already done so!)

I'm using a 3-gallon glass carboy to mix a 2-liter starter. An air pump creates positive air pressure inside the container (keeps the airborne bugs out). A starter of 3 or 4 liters is well within the capacity.

After the research, cost, and work, I'm convinced that buying multiple packets or tubes of yeast is probably the best bet for most homebrewers. You can buy a lot of pitches for the cost of stir plates, flasks, oxygen, aeration stones, air pumps and, in my case, building a lab mixer. But watching my yeast start off with short lag times and finish quickly with high attenuation rates is a great reward.

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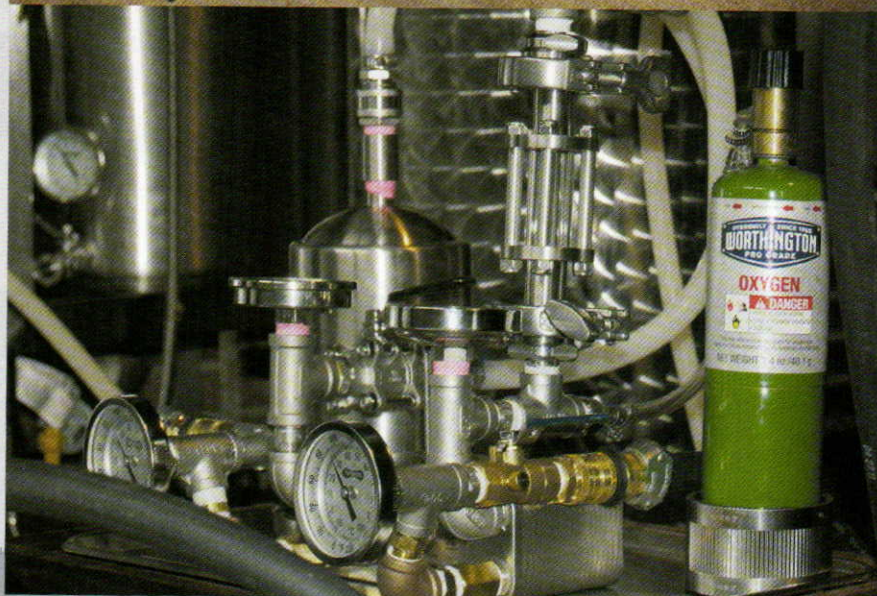
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ÜBER CHILLER



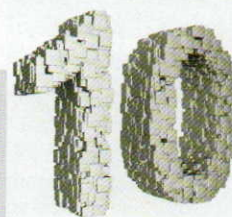
With temperatures in the 100s and tap water registering 84° F (29° C), cooling wort to 68° F (20° C) is daunting at best, so I created the Über Chiller. I filled a 40-gallon rain barrel with ice water. A 1-horsepower irrigation pump sucks the water from the barrel and pumps it through a heat exchanger. The flow is reduced via a ball lock valve to 5 gallons per minute as measured by a water flow meter. Two dial thermometers measure the temperature of the water entering and exiting the heat exchanger. The wort is then pumped from the boil kettle through a hop rocket, into the heat exchanger. Two more dial thermometers measure the temperature of the wort entering and exiting the heat exchanger. A ball lock valve controls the flow of the wort, and therefore also controls the temperature of the wort as it exits the heat exchanger. As the wort leaves the heat exchanger, oxygen is added at the proper level as measured by an oxygen flow meter. The wort then goes into the fermenter. I can cool 18 gallons of wort from boiling to 68° F (20° C) in a little less than 10 minutes, even on the hottest Carolina summer days. Plus it looks cool. It pretty much took an unlimited budget and an understanding wife to build this thing.

PHIL MOORE / Columbia, S.C.



HOMEMADE HOPBACK

I had wanted to homebrew a hopback IPA for a while, but could never get into the price tag. When I finally decided to just build my own, I was pleasantly surprised; instantaneous hop aroma! If you're looking for a cheap yet elegantly simple DIY hopback, this is it.



Let's talk design criteria. My kettle sits roughly 3 feet off the ground, which allows me to simply drain the wort directly into a keg or carboy. My first desire was to add the hopback into my system without changing the established flow. Second, it had to be sturdy; if it can be tipped, dropped, or bumped into, I guarantee that it would be (no glass). Third, I wanted something that could be fixed or mounted. For simplicity's sake, I figured it would be best to just plug the device into the Polysulfone Quick Disconnect outlet of my kettle. Next, I thought it would be nice to just

Homemade Hopback continued on next page>>



10



gravity flow the wort (5 gallons) through about 3 ounces of hops at a time, before draining out the bottom and into the fermenter.

So I set out to scrap something together and here's what I found:

1. (1) Stainless Airtight Flip-top Storage Canister - 2 quarts
2. (1) Gold Coffee Filter - No. 4 Cone type, dishwasher safe, stainless weave
3. (1) Stainless Coupler, which I cut into two pieces, because that's what I had. Otherwise, (2) stainless NPT nuts can be found at the hardware store.
4. (4) Washers - I used (2) high temp O-rings and (2) garden hose washers
5. (1) Female Polysulfone Quick Disconnect
6. (1) Male Polysulfone Quick Disconnect (Note: NPT to barbed fittings could be substituted if you didn't want to spend the money on disconnects.)

Buy your coffee filter first; that way you can make sure that it will fit snugly into the canister. Fit the upright coffee filter into the upright canister. Using a step-bit, drill into the bottom of the canister. Make an appropriately sized hole for your chosen fitting (disconnect) and center it between the bottom of the cone filter and the canister wall. Next, drill a hole as high as possible into the side of the container, drilling perpendicular to the swing of the lid. Install the inlet and outlet quick-disconnects for your hopback.

To use, first place the filter into the bottom of your canister and sanitize both. Add the desired amount of hops into the filter (I've used 2-3 ounces) and close the lid. When you've finished the boil, run the wort through the hopback. If you use a pump, you may decide to circulate the wort through the hopback more than once. Your container may not seal perfectly at first; don't fret. Simply throttle back your kettle valve so that the wort runs just below the lid seal; the hops will remain submerged in the wort. With hot wort flowing through, I had to tweak the swing-lock fitting a bit to get mine to maintain a seal. Improvise as necessary.

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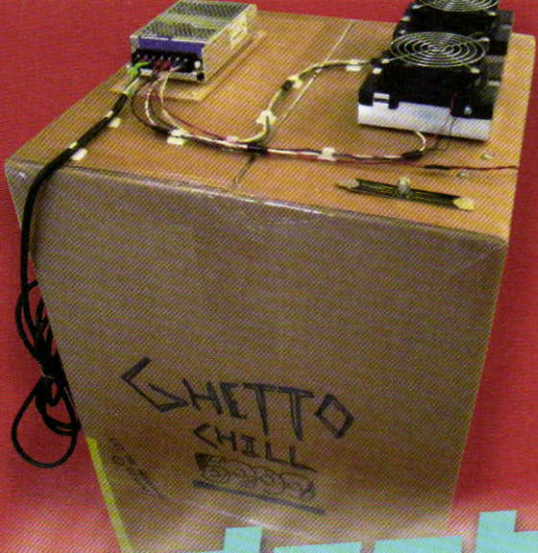
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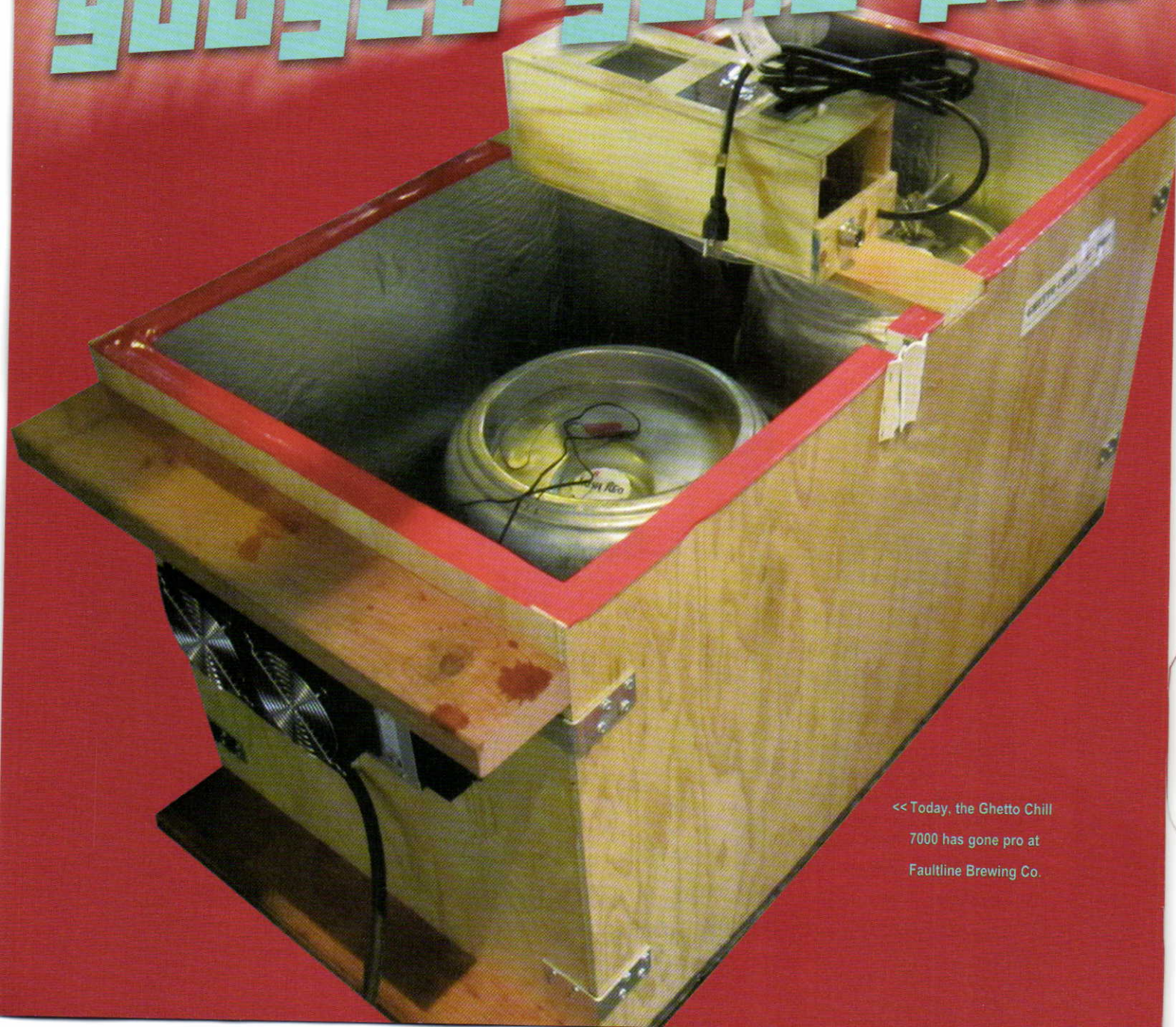
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<< Jon Koerber's Ghetto
Chill 5000 debuted in the
January/February 2011
issue of Zymurgy.

gadget gone pro



<< Today, the Ghetto Chill
7000 has gone pro at
Faultline Brewing Co.

the ghetto chill 7000

by jon hoerber

Many Zymurgy readers will remember the January/February 2011 “Gadgets” issue, where my cardboard and foam fermentation gadget, the Ghetto Chill 5000, was unleashed upon the unsuspecting homebrewing community.

The gadget sparked a lot of interest from homebrewers, professional brewers, and even commercial businesses wanting to reproduce and market my gadget.

One of the pro brewers who contacted me was Peter Catizone, master brewer at Faultline Brewing Company in Sunnyvale, Calif. Peter told me, “I had been looking for a way to deal with our problem of the summer heat here in Sunnyvale affecting

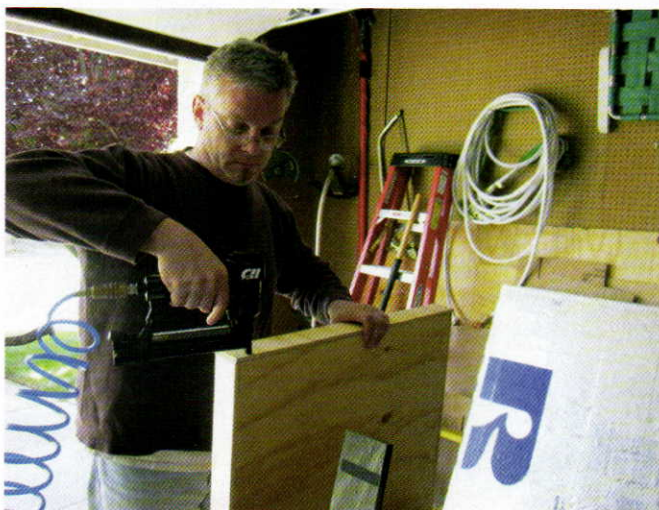
the temperature and quality of our special cask conditioned ales, but didn’t have a solution. I was tired of dumping the last few gallons of beer that was getting funky from the heat, and the Ghetto Chill 5000 was just the right catalyst to get us started with a solution.”

Peter’s cask ales are served from 15-gallon Golden Gate kegs that are gravity tapped and sit on the floor of the Faultline brewhouse without the benefit of glycol chilling that the remainder of their beers benefit from.

After our initial discussion, I drove from my home in San Ramon to Sunnyvale to meet with Peter and better understand

I was tired of dumping the last few gallons of beer that was getting funky from the heat, and the Ghetto Chill 5000 was just the right catalyst to get us started with a solution.

>> Peter Catizone, master brewer at Faultline Brewing Co.



the problem. Peter later related, “I had originally just hoped to find out where Jon sourced the thermoelectric chillers, and where to get the rest of the parts. But Jon just took the ball and ran with it and put together a whole project plan, and with the help of his neighbor Tom Warren, came up with a solution that was 15 times more powerful than the Ghetto Chill 5000 but still thousands of dollars less than a commercial chiller or refrigeration unit would have cost the brewery.”

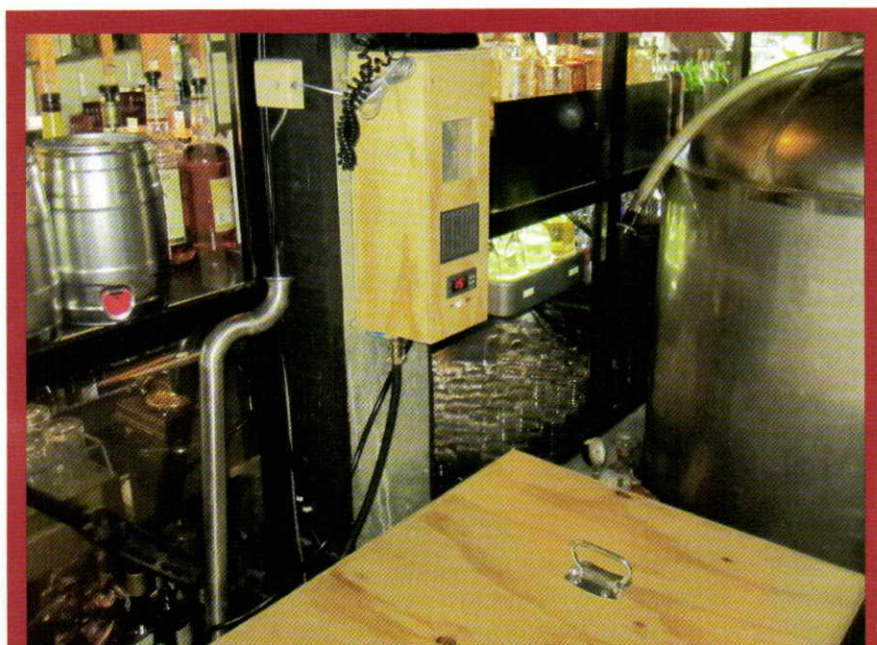
Within three months, the Ghetto Chill 7000 pro was born. The GC7K is huge compared to the 5-gallon capacity of the Ghetto Chill 5000, but was still compact enough to fit into the tight spaces of Faultline’s brewing room. Where the

GC5K uses two 12V 2.7amp thermoelectric chillers, the GC7K uses a huge 190W 8amp Supercool peltier system with a 240W 20amp power supply. Cardboard was also not an option in the wet environment of a busy brewhouse, so the GC7K takes advantage of waterproofed and insulated plywood with massive gaskets for insulation to provide the most efficient system possible to keep 30 gallons of cask conditioned-ales at a perfect 54° F (12 ° C) serving temperature at all times.

The system itself has a separate temperature controller and power supply tethered to the end of a chemical resistant power/sensor cord “snake” using industrial stainless circular locking pin connectors. This keeps the power supply away from spray-

ing water and caustic chemicals while keeping everything dry and cool. The TEC chiller unit is mounted to one end of the chiller box with beveled block protectors above and below to make it easy for the staff to change out kegs by simply tilting the box up on one end without fear of damaging the TEC’s fans or sensitive cooling fins. The entire top of the chiller can also be removed via two stainless handles for easy access to the kegs for connection of the gas and beer lines once the kegs are in place.

Peter and I spent several weeks talking through and tweaking the final designs—while enjoying the great beers he produces for Faultline—before starting the build for the GC7K. We even went as far as to



PREVIOUS PAGE:

(LEFT) The author building the Ghetto Chill 7000. (RIGHT) Faultline brewer Peter Catizone with the finished product.

THIS PAGE:

(TOP LEFT) The GC7K temperature controller and power supply. (BOTTOM LEFT) Waterproofed and insulated plywood was used instead of cardboard. (BOTTOM RIGHT) An interior view of the cold box.



Photos courtesy of Jon Koerber

build a full-scale mock-up out of cardboard just to make sure the system would fit into the tight quarters of their brewery and to visually work out anything we didn't consider in our design ("measure twice, cut once," as woodworkers say). The extra time spent with the mock-up was invaluable in working out kinks with the available space in the brewhouse as well as placement of the power supply, cords, sensor, and chiller unit.

Once the project was complete, we did run into an issue with the system working *too* well and actually freezing up on us with accumulated ice, but we feel that was mainly due to air leakage from the chiller box not flush to the floor, causing the TEC to run without pause for days on end, when normal operation would have the TEC cycle on and off during its regular usage. But as a whole, the GC7K is working like a champ and has paid for itself in protecting the quality of Faultline's cask ales.

This was such a fun and rewarding project. I got to meet and become friends with one of our great local master brewers and also solve a problem a fellow brewer was having, which in itself is the greatest reward of the whole project.

Peter wrote to me in an email recently, "I think thermoelectric cooling definitely has a future with homebrewing for cooling fermentations and for cool aging. We are pioneering its use in our brewpub for cask ale cellaring. While there are still some issues to work out, I think commercial production could definitely be a prospect for the future."

I look forward to coming up with new and more efficient cooling systems for fermentation in the future. I even have plans underway for my very own Ghetto Chill 9000 for fermenting all of my lager beers with the same technologies used for Faultline Brewing Company.

Jon Koerber is an avid homebrewer, gadget guy, and member-at-large of the Mad Zymurgists brew club located in the Tri-Valley of the San Francisco East Bay. For questions or comments, contact him at jon@koerber.com.

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A stylized city skyline is depicted against a dark, textured background. The buildings are represented by black rectangular shapes of varying heights. Several windows are shown as small yellow squares with a textured, bubbly appearance, suggesting a glowing or fiery effect. The skyline is positioned in the upper half of the cover.

URBAN

Brewing

By Mary Jzell



Big Ideas for Small Spaces

Ah, the challenges of urban homebrewing—tiny kitchens, miniature stoves, uncontrollable room temperatures, lack of storage space. Those of you living in houses in rural and suburban areas don't know how good you've got it. Garages, backyards, basements, closets, a living space over 500 square feet—those are pipe dreams for most of us living in big cities. Unfortunately, I've met quite a few people who gave up homebrewing when they moved to an urban area because they simply couldn't figure out how to fit it into their new, smaller space. And I know many more craft beer lovers who want to begin homebrewing, but can't figure out how to manage it in the space they have (and not drive their roommates mad).

I'm lucky to have a shared backyard (and tolerant neighbors) at my Brooklyn walk-up, but I move indoors when the outside temps drop below 40 degrees or it's raining—which is a significant amount of the year here. Besides, hauling all of my brewing equipment up and down two flights of stairs every time I want to brew is a drag, so sometimes brewing on my stove is the best option regardless of the weather. So let's talk about how to make brewing all-grain beer in a typical city apartment possible and even easy.

My biggest adaptation has been to move from a standard all-grain multi-cooler system to a brew-in-a-bag (BIAB) system. Not only does it take some maneu-

vering to temporarily construct a tiered system on brew day, but also storing coolers takes a lot of space. The BIAB system merely requires a brew pot. This saves space, shortens brewing time by eliminating sparging, and simplifies cleanup. My second best move has been to decrease my brew sizes to 3 gallons (11.3 liters).

3-GALLON BIAB

Brewing a 3-gallon batch using the BIAB method is an incredibly manageable process on my vintage toy-sized stovetop. Here are the basics of a 3-gallon BIAB:

1. Procure a 5-6 gallon (19-23 liter) brewpot. A 6-gallon is ideal, but a 5-gallon stainless steel is adequate.



Bald Belgian Blonde

A basic Belgian-style blonde that is a perfect palette for adding herbs, spices, fruit, and other interesting ingredients.

INGREDIENTS

for 3 U.S. gallons (11.3 liters)

3.5 lb	(1.6 kg) Belgian Pilsner malt
1.5 lb	(.68 kg) two-row base malt
0.5 lb	(227 g) jaggery sugar
0.5 oz	(14 g) Hallertauer 5% a.a. pellet hops (90 min)
0.25 oz	(7 g) Hallertauer 5% a.a. pellet hops (15 min)
	Belgian Ale Yeast (Wyeast 1388 or White Labs WLP570)

Original Gravity: 1.049
(70% efficiency)

IBU: 19

DIRECTIONS

Use BIAB method. Mash in 4.5 gallons (17 liters) of water at 150° F (65.5° C) for 70 minutes. Ferment at 68° F (20° C).

Note: This beer is meant to be experimented with—add your choice of herbs and spices at the end of boil and/or fruit in secondary. I've used elderflower and long pepper at the end of the boil. I also love this beer with dried organic apricots added in secondary along with ½ cup of 100-percent apricot nectar. I've also added dregs from "American Wild" beers (example: Jolly Pumpkin Luciernaga) in secondary as well to add some funk to the beer.

Extract version: Substitute 2.5 lb (1.1 kg) liquid Pilsner malt extract for the Pilsner malt and 1.0 lb (454 g) extra pale liquid malt extract for the two-row. Add malt extracts and sugar to strike water and bring to a boil. Proceed with the recipe as written.

Rye the Heck Not?

INGREDIENTS

for 3 U.S. gallons (11.3 liters)

5.0 lb	(2.25 kg) Rye Malt
0.25 oz	(7 g) Northern brewer 9% a.a. pellet hops (60 min)
0.25 oz	(7 g) Hallertauer 3.5% a.a. pellet hops (15 min)
	Wyeast 1007 German Ale or WLP036. A clean American Ale yeast, such as Wyeast 1056 or WLP001, would also work.

Original Gravity: 1.035
(70% efficiency)

IBU: 19

DIRECTIONS

Use BIAB method. Mash in 4.5 gallons (17 liters) of water at 122° F (50° C) for 30 minutes. Raise temperature to 154° F (68° C) for 70 minutes. Ferment at 58° F (14° C).

Note: I have also made a 100-percent smoked wheat beer (a Grätzer) using the BIAB method. I smoked the wheat malt over cherrywood and fermented with an American ale yeast.

Extract version: Difficult since pure rye malt extract is unavailable. You might try substituting 3.0 lb (1.4 kg) rye malt syrup for the malt, but this is a blend of rye, two-row, and crystal malts. You might also try substituting 3.0 lb (1.4 kg) of liquid wheat malt extract, but it won't have the same rye character. Add malt extract to strike water, bring to a boil, and proceed with the recipe as written.

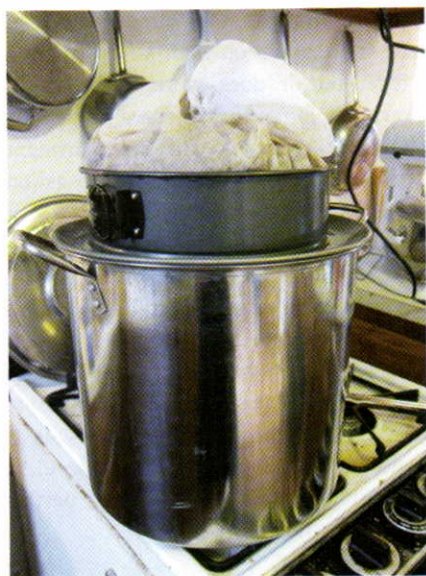
This is where living in an urban environment is an advantage—large cities have an abundance of restaurant supply stores. Shop around—you might find a used 6-gallon stainless steel pot for a steal. Sticking to a smaller batch size means you can also use your brew pot to cook in—and large objects need multiple uses in order to justify the storage space in a small apartment.

2. Find a bag to brew in. I'm lucky enough to have a sewing machine, so I made mine. Some BIAB brewers use a paint strainer bag, but I recommend seeking out a seamstress and bartering homebrew for a little sewing action. The craft movement is thriving in urban areas and there are plenty of people with sewing machines who would love to swap their services for some of your tasty fermented creations. The bag needs to be big enough to fit your brew pot in with a fine enough mesh to allow your wort out but keep your grain in. A drawstring is ideal, and you'll need a bungee cord large enough to fit around the diameter of your pot. You'll also need a vegetable strainer or colander to keep your bag off the bottom of your pot.
3. Order a bucket heater online. These handy tools are apparently designed to heat plastic drinking buckets for livestock. I wouldn't know anything about that use, but I can tell you that when combined with my stovetop's dinky gas flame, the bucket heater brings my water to strike temperature in no time. And though the instructions claim they're only to be used for water, I am finally able to get my wort to a full boil (in a quarter of the time). I can't officially recommend using it in your wort, but for strike water it is brilliant. These immersion heaters are not toys, so make sure you read the directions and follow them. If you're handy, the January/February 2008 issue of *Zymurgy* has instructions to make your own heatstick.
4. You'll need to have your grains ground very fine, much finer than for a standard brew, so ask your brew shop to tighten up when they crush your grain. I typically start with 16-18 quarts of water for a 3-gallon batch, which gives a much looser mash than standard.

Heat your water to strike temperature, turn off/remove your heat sources, drop your colander in, secure your brew bag with the bungee cord, then sprinkle and gently stir your grain in (be careful of dough balls with such finely ground grain). Check to make sure you're at temp, put the lid on, wrap that sucker up with towels, and relax for 30 minutes. Stir, check temp again (you can hit it with a little heat if you need to), rewrap and chill out for 40 more minutes. Once your 70 min-



After submerging the grain bag, turn off the heat and wrap the brew pot in towels.



A pizza pan and the ring from a springform pan help with draining the brewing bag.

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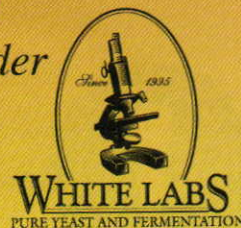
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utes are up, hit your pot with enough heat to bring it to mash-out temperature. Now the fun begins.

5. Unhook the bungee cord, gather the brew bag up and lift it out of the pot. Go slow so you don't slosh everywhere. I stand on a stool when I do this so I get more leverage, but I'm on the short side. The next part is optional, but convenient. I place a perforated pizza pan slightly larger than my brewpot's diameter on top. The ring from a springform pan goes on the pizza pan

and I place my grain-filled brewbag in the ring to drain—this takes a load off my arms. I already had these items, but they're pretty inexpensive at restaurant supply stores. A large colander would also work.

6. Once your bag has drained, remove it and the pans and fish the colander out of the brewpot with your brew spoon. Now you're ready to boil—there is no need to sparge with BIAB. Proceed as for a normal brew. One more thing—I recommend adding Fermcap at the

beginning of boil to prevent boil-overs, a necessity for working in a more compact pot.

There are a few potential downsides. A 5-gallon (19-liter) pot is not large enough for the amount of grain it takes to make a high-gravity beer. You could potentially do a partial-mash, but I haven't explored this yet. You can, of course, add sugar, which I'll get to in a bit. You also might be slightly less efficient than your cooler-using friends. However, my batch efficiencies are averaging around 75 percent at this point and are often higher. On the flip side, one of my favorite pros about BIAB is the ability to make 100-percent wheat or rye beers. With a much looser mash and no sparge, a traditional Grätzer is a piece of cake (once you find someone to smoke the wheat for you, of course).

FERMENTING AND BEYOND

You're finished with the brewing part; now on to the fermentation. I am a huge proponent of 3-gallon BetterBottle carboys. They are lightweight and skinny enough to tuck in a corner—and you'll never have to worry about breaking a carboy again. They're also the perfect size to fit in a bottling bucket. Add water and some ice and you've got an easy way to control your fermentation temperatures without jacking up your window air conditioner in the summer or turning off your radiator and opening your windows in the winter. This will take more attention than a fermentation fridge, but it does work with careful oversight. Bitter and Esters, a homebrew shop in Brooklyn, sells an apartment brewing kit that contains a 3.5-gallon (13.25-liter) pail—the perfect size to fit in a cube-shaped top-opening cooler. Add a couple frozen 2-liter bottles of water and you've got a mini-fermentation fridge. The cooler is extra equipment, but can double as a portable 3-gallon keg dispenser with a few adjustments (see the sidebar for suggested websites to assist with this). This setup is also ideal for portaging your beer to friends' parties via public transportation.

I recently downsized my couch to make enough room for a kegerator. I chose a 5-cubic-foot freezer, which fits perfectly

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By Matt Allen

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at the end of my new loveseat (an ottoman allows me to stretch my legs out and tucks pretty neatly against the wall). With a collar added, my new kegerator can hold three 3-gallon kegs, a 5-gallon keg, and a 10-pound CO₂ tank. I've sacrificed volume for variety, as in my brewing, but the novelty of having beer on tap in my small apartment is worth it.

Now let's talk about a significant plus of brewing in an urban environment—the availability of interesting ingredients. There is an amazing array of potential edibles in the Mexican, Polish, and Indian bodegas in my neighborhood alone. And even more are available after a short subway ride. I use jaggery or piloncillo sugar in most of my high-gravity Belgian beers, and the variety of herbs and spices is astounding at some of the Middle Eastern specialty stores. I also love Chinatown for fruit, and the green markets have a wide variety of vegetables, fruit, and lovely local honey. I am always on the lookout for unusual and interesting ingredients to brew with. I've also been playing around with other fermented beverages lately. One-gallon batches of short mead, lacto-fermented ginger ales, and vegetable wines are a lot of fun, delicious, and take up minimal space. There's a whole world of fermented beverages to explore out there!

There are some fantastic resources on the web that cover the BIAB method in-depth, and even more on building small kegerators and portable keg dispensing coolers (see the sidebar for suggested sites and forum postings). Recipes and techniques for other fermented beverages can be found online as well. I highly recommend Randy Mosher's *Radical Brewing* for inspiration on choosing and using unusual brewing ingredients.

With a few adaptations, you too can brew all-grain beer in your city apartment. The challenges we urban brewers face just make the reward of drinking our own well-crafted homebrew that much sweeter.

Mary Izett is an Ale Street News columnist, mylifeoncraft.com proprietor, and New York City Degustation Advisory Team co-founder in Brooklyn, N.Y. 

Urban Brewing Resources

BREW IN A BAG (BIAB)

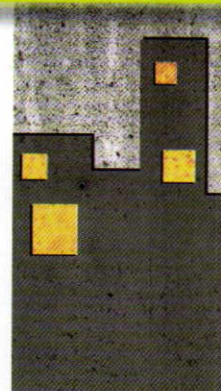
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SCAN TO FIND A SUPPLIER



EXTRACT REVISITED: AN ALL-GRAIN HOMEBREWER GOES ROGUE

By Mark Pasquinelli

I'm a dedicated all-grain homebrewer, but what does a homebrewer do when circumstances beyond his or her control make all-grain brewing impossible? I normally brew on the back porch and move my operation inside the garage during inclement weather. But the past winter was long and persistent, just cold enough to make things miserable—and keep my outside water lines frozen. No water to cool my wort meant no homebrewing. I've tried cooling my wort in a snow bank; it takes hours—and even with the kettle covered, the possibility of bacterial contamination occurring during that long chill-down worries me.

Brewing all-grain in the kitchen wasn't an option, either. I'd tried that before. My wife's kitchen is a sacred place. After several all-grain sessions, it was only by the grace of God that we were still married. Maybe she cut me some slack because we were newlyweds, but I wasn't about to risk it again. Meanwhile, there was no break in sight for the weather, and my precious homebrew reserves were dwindling daily. I was going to have to buy craft beer—like a normal person.

Out of boredom, I logged on to an episode of Brewing TV. Perhaps I could homebrew vicariously through Chip, Dawson, and Keeler. The episode was taped at Keeler's home in Minnesota, in the dead of winter. He was also out of homebrew—and he was brewing with extract.

HOP ON THE BUS, GUS

Like many homebrewers, I began with extract and moved to all-grain, but I don't consider myself to be an all-grain homebrew snob. I've enjoyed many extract beers made by fellow homebrewers. However, I never considered extract to be a solution for my dilemma. If you brew with all-grain, you don't go back. Or do you? I had my precious principles, but I didn't have any homebrew.

The thought of brewing with extract also left a bad taste in my mouth. Literally. My

first extract brews were less than stellar to put it politely, and my move to all-grain was more out of desperation than a natural progression.

I began to ponder a more likely cause for those first mediocre homebrews: maybe they weren't so great because I wasn't the greatest homebrewer in 1995. I know so much more now about homebrewing—proper technique, sanitation, and fermentation. Maybe I was the culprit. To paraphrase the famous Pogo comic, "I have met the enemy and he is me."

Maybe it was time to put aside my petty prejudices and misconceptions, and hop aboard the extract bus.

Aside from using extract for my yeast starters, I haven't paid much attention to it for close to a dozen years. I needed to get up to speed, so I searched a few homebrew supply websites. What a surprise! Many of the names were still the same: Muntons, Briess, Coopers, and Alexander's. But the extract landscape had changed since those distant days of the 1990s. Previously, extract was available in generic light, amber, or dark flavors—in dry or liquid, hopped or unhopped form. A 50/50 mixture of wheat and pale malt was the only specialty base malt. Now, in addition to wheat, new extracts—Pilsener, Munich, Rye, and Organic—roamed the homebrewing plain. Non-gluten Sorghum extract was even available for those afflicted with celiac disease. There were so many choices, so many possibilities.

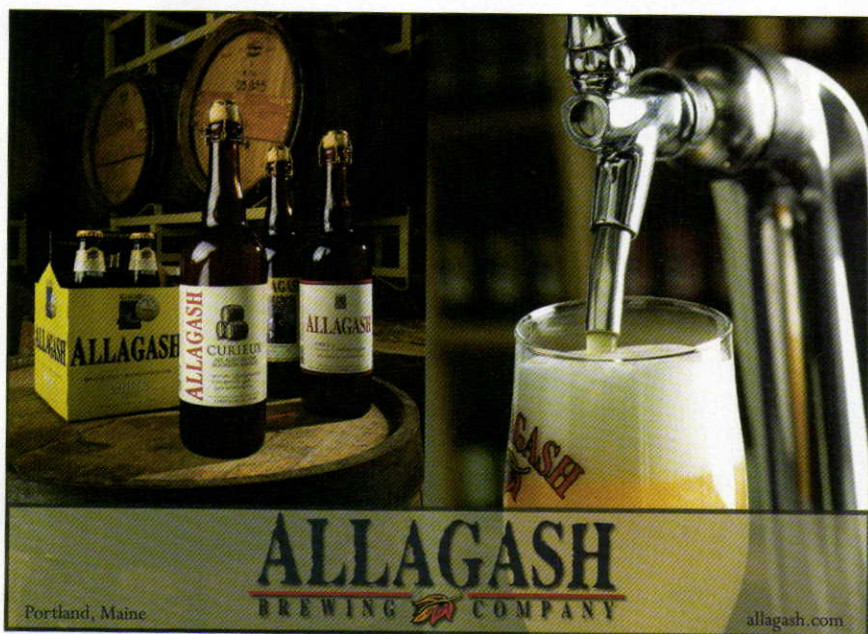
DECIDING WHAT TO BREW

I decided to brew three styles, each using different combinations of extract. This would give me a representative picture of the variety and quality that extracts now have to offer. For better control of my project, I opted to design my own recipes rather than purchase kits, even though there are some great ones on the market. I just had to decide what styles to brew.

High gravity beers from extract are expensive and would be inappropriate because of aging requirements. Besides, I was out of beer; I wanted to brew something I could drink soon, "a good drinkin' beer." Because of the lower hop utilization due to partial boils, overly hoppy homebrews weren't practical choices either, even though I love hops.

But there was a hoppy alternative: English pale ale. I'd been craving ESB. This style combines maltness balanced by the floral spiciness of East Kent Goldings hops for a sublimely drinkable beer. The ingredients—extract, crystal, hops, and yeast—were simple, which would showcase the quality of the extract malt.

With an English-style beer on the agenda, I could see my theme taking shape:





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GOLDINGS SPECIAL BITTER

EXTRACT RECIPE

1. Aerating the porter.
2. The key to any great beer:
lots of healthy yeast.
3. Ingredients for the dubbel.



INGREDIENTS

for 5 U.S. gallons (19 liters)

5.50 lb	(2.5 kg) Muntons plain extra light DME
8.0 oz	(227 g) Crystal 80L
1.75 oz	(50 g) East Kent Goldings, 4.5% a.a. (60 min)
0.50 oz	(14 g) East Kent Goldings, 4.5% a.a. (5 min)
0.50 oz	(14 g) East Kent Goldings, 4.5% a.a. (0 min)
0.50 oz	(14 g) East Kent Goldings, 4.5% a.a. (dry hop, 7 days)
	Wyeast 1968 ESB Yeast (1500 ml starter)

Original Gravity: 1.050

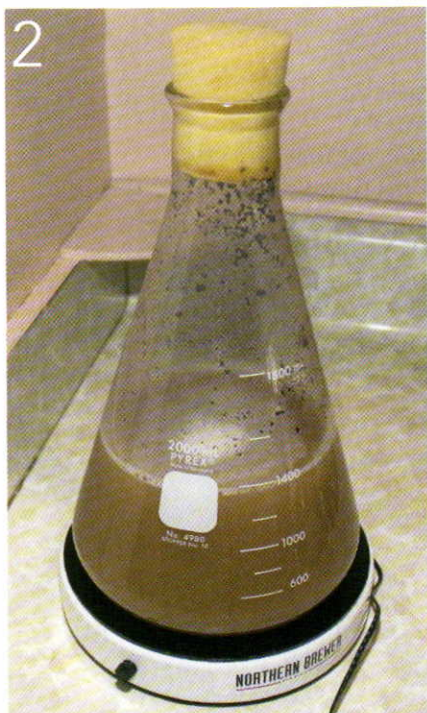
Final Gravity: 1.014

SRM: 8.9

IBU: 25

DIRECTIONS

Steep Crystal in 3.5 gallons of water for 30 minutes at 155 °F (68 °C). Add extract and boil for 60 minutes. Chill, rack the wort into 2 gallons of chilled water in the carboy, and ferment to completion at 65-68 °F (18-20 °C). Dry hop for one week. Keg at 2.0 volumes of CO₂ or bottle condition with 3.0 oz (85 g) corn sugar.





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HEY PORTER

EXTRACT RECIPE

INGREDIENTS

for 5 U.S. gallons (19 liters)

- 5.0 lb** (2.3 kg) Muntons plain extra light DME
 - 1.25 lb** (0.6 kg) Northern Brewer Munich LME
 - 12.0 oz** (340 g) Chocolate Wheat
 - 12.0 oz** (340 g) Crystal 80L
 - 6.0 oz** (170 g) Roasted Barley
 - 6.0 oz** (170 g) Black Patent
 - 0.75 oz** (22 g) Columbus, 12.0% a.a. (60 min)
 - 0.50 oz** (14 g) Simcoe, 12.2% a.a. (15 min)
 - 0.40 oz** (11g) Simcoe, 12.2% a.a. (5 min)
- Safale US-05/ White Labs WLP001/ Wyeast 1056

Original Gravity: 1.064

Final Gravity: 1.015

SRM: 47

IBU: 34

DIRECTIONS

Steep specialty grains in 3.5 gallons of water for 30 minutes at 155 °F (68 °C). Add extracts and boil 60 minutes. Chill, rack the wort into 2 gallons of chilled water in the carboy, and ferment to completion at 68-70 °F (20-21 °C). Keg at 2.0- 2.5 volumes of CO₂ or bottle carbonate with 3.5 oz (100 g) corn sugar



Photo © Nate Hudson

DUBIOUS DUBBEL

EXTRACT RECIPE

INGREDIENTS

for 5 U.S. gallons (19 liters)

- 6.0 lb** (2.7 kg) Northern Brewer Pilsen LME
 - 1.5 lb** (0.7 kg) Northern Brewer Munich LME
 - 12.0 oz** (340 g) D2 Dark Candi Syrup
 - 12.0 oz** (340 g) CaraMunich®
 - 12.0 oz** (340 g) Aromatic
 - 6.0 oz** (170 g) Special B
 - 0.75 oz** (21 g) Styrian Goldings, 4.6% a.a. (60 min)
 - 1.0 oz** (28 g) Saaz, 4.0% a.a. (15 min)
- White Labs WLP500 or Wyeast 1214 Trappist Ale Yeast (2 L starter)

SRM: 18

IBU: 13

Original Gravity: 1.069

Final Gravity: 1.016

DIRECTIONS

Steep grains in 3.5 gallons of water at 155 °F (68 °C) for 30 minutes. Add extracts and candi syrup. Boil for 60 minutes. Chill, rack the wort into 2 gallons of chilled water in the carboy, and ferment to completion at 68-70 °F (20-21 °C). Keg at 2.5 volumes of CO₂ or bottle carbonate with 4.4 oz (125 g) corn sugar.

extract goes worldwide. My next choice needed to be an American-style beer, something dark that would chase away the dead-of-winter doldrums. That left one more country to represent, one more style to brew. I wanted to go all-in for the finale, and put specialty extracts to the test. The third choice had to be something Belgian, so I chose a dubbel, one of my favorite styles. My lineup was set.

BREWING LIKE IT'S 1999

To the best of my recollection, I hadn't made an extract homebrew since 1999. I must confess that I had to check the procedure just to be sure: steep specialty grains, add extract, and boil. It sounded simple enough. I couldn't imagine why I'd encountered problems before. I did have the advantage of better equipment now, but I shunned my 40-quart brewpot with a ball valve in favor of a plain 20-quart stock pot. This was back to basics—back in time, as I had brewed in 1999.

I probably could have fit at least 4 gallons of wort into the stock pot, but I was worried that my stove wouldn't have enough

oomph to achieve a decent boil. I compromised by boiling 3.5 gallons of wort and diluting it with 2 gallons of chilled water in the carboy. My guesstimate, amazingly, was right on. I hit my target gravity for the first beer, with the correct volume of 5 gallons. Satisfied with this method, I used the same regimen for the other two homebrews.

GOLDINGS SPECIAL BITTER

Since the bitter was the simplest recipe, I decided to brew it first to reacquaint myself with the process. I steeped some Crystal 80L for 20 minutes at 155° F (68° C) to provide color and sweetness to balance the hop bitterness. I was careful not to wring out the grain sock like a manic Mr. Whipple, as I did in the past. I added my extract—Muntons plain extra light DME, a highly fermentable English extract—and brought the wort to a boil. The Muntons DME was a natural first choice because I use it for yeast starters and always have it on hand. I did need restraint for the hop additions, because unlike their American counterparts, English pale ales don't have a large late-hop character.

My yeast of choice was Wyeast 1968 ESB. WLP002 English Ale yeast, which I use for my fruit and pumpkin beers, was another contender. However, I find that the Wyeast ferments drier than its White Labs counterpart. I added it as a 1500 ml starter and fermented at 65-68 °F (18-20 °C), being sure to leave the beer on the yeast long enough for the recommended diacetyl rest.

I was pleased with my first extract—and my first attempt at English Pale Ale. My bitter's color was crystal-clear straw, owing to the outstanding flocculation of the Wyeast 1968. The Muntons DME provided more-than-adequate maltiness, with plenty of backbone to balance the hops. I was also impressed with the long-lasting head and beautiful lacing on the glass as I emptied it. I've heard homebrewers say this isn't possible with an extract beer. Another myth debunked.

My session lasted less than three hours, about half the time of an all-grain session. I looked around the kitchen; it was relatively intact. Unlike past homebrewing sessions, there was no Hazmat team crash-

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ing through my door, yellow police tape, or circling TV station choppers. "That was easy," I said to myself, although I was sure I had forgotten something. I was ready for my second extract challenge.

ROBUST PORTER

My initial choice to represent an American craft beer was stout, but my wife played her veto card and chose robust porter. Happy wife; happy life. Porter it was.

Although I've only been brewing porter for a few years, no other homebrew in my repertoire has undergone a more dra-

matic metamorphosis. My first porters were tasty, but tame and tentative—with no roasted character. Those early recipes didn't include two of porter's essential dark grains: roasted barley and black patent. At the time, I believed roasted barley belonged in the domain of stouts, and a bad experience with overusing black patent resulted in a 10-year moratorium on that grain. However, two of my favorite porters, Great Lakes Edmund Fitzgerald and Bell's Porter, both use one or both of those very grains. So I cautiously began to add them, upping the quantities with each recipe.

I steeped the roasted barley and black patent with a portion of Crystal 80L and chocolate wheat as I had done with the ESB. My fermentables were a combination of dry and liquid extracts. I used Muntons DME again, but supplemented it with liquid Munich malt, which provides the essential breadiness to help balance the roasted flavors.

Like the specialty grains, the hop schedule on my porters has also grown more assertive, weighing in at nearly 50 IBUs. I used Columbus hops for bittering and added my wife's favorite, Simcoe, for flavor and aroma.

Since this is an American-style homebrew, it requires an American yeast. I chose SafaleUS-05, my standard yeast for American pale ale. Of course, White Labs WLP001 or Wyeast 1056 would work equally well.

Since this was my wife's idea, I let her name the beer. She chose Hey Porter in honor of her patron saint, Johnny Cash. This homebrew was jet black, rich, and roasty—with subtle notes of coffee and chocolate. I think the Man in Black would have approved.

DUBBEL

I have previously written about Belgian dubbel and stated that the style didn't lend itself to extract brewing because of its complex grain bill. At best, I said, it should be a gateway for extract brewers to enter into all-grain via partial mashes. Well, if I'm going to make a liar out of someone, it might as well be me.

Dubbel is one of my favorite styles. Unlike many Belgian brews, it's not overly alcoholic, making it very drinkable. This drinkability is enhanced by its overall dryness and a slightly sweet finish from the specialty malts. This beer is a test of any homebrewer's mettle, either all-grain or extract.

The specialty malts used were the same as in my all-grain recipe: Caramunich, Aromatic, and the essential Special B for dark fruit flavor. The grains were steeped, and extract was added. I used all liquid extracts, Pilsen and Munich,



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for the final homebrew in the series. I also added Belgian dark candi syrup to provide more fermentables and enhance the caramelized, dark fruit flavors.

The hop regimen included Styrian Goldings for bittering and Saaz for flavor. As with most Belgian beers, I kept the bittering low, around 20 IBUs.

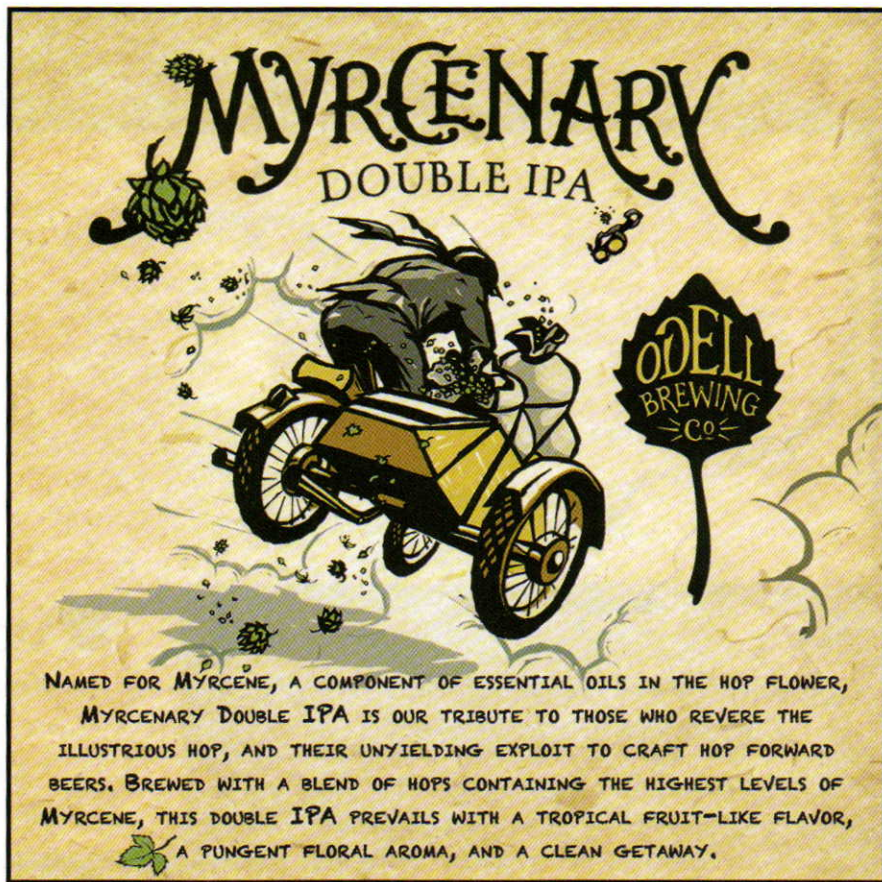
I fermented with a 2-liter starter of White Labs WLP500 Trappist Ale yeast, although its equivalent, Wyeast 1214, would work equally well. This is my standard Belgian yeast. I prefer it over WLP530 or Wyeast 3787 because it's slightly fruitier. However, that said, the fruitiness found in Belgian beers is something that's restrained, a subtlety. Don't make the mistake of fermenting at a high temperature. Try to keep fermentation in the 68-70 °F (20-21 °C) range to keep the fruity flavors in balance and avoid fusel alcohols.

The extract dubbel was among the best Belgians I've made—a brilliant ruby red color with a thick head; dry, yet sweet; subtle fruitiness; and spicy phenols from the Belgian yeast. I named this beer Dubious Dubbel because I had doubts about it. Being wrong never tasted so good.

After homebrewing my first extracts since the turn of the century, I've come to an inescapable conclusion; they're good, really good—almost indistinguishable from all-grain. All-grain homebrewers should have no qualms about making them. Besides, a well-rounded all-grain homebrewer should be equally versed in extracts.

So this year, I'm ready for you, Mother Nature. Bring on your worst. The weather will never stop me from homebrewing again.

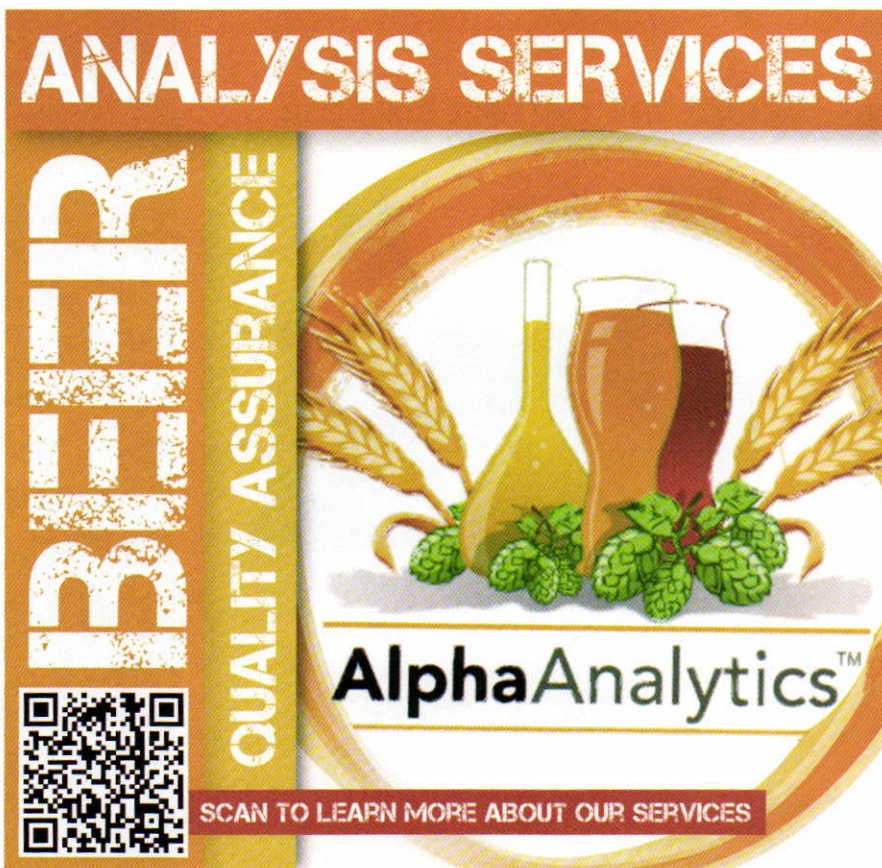
Mark Pasquinelli resides in Elysburg, Pa. with his wife and four cats. He's a member of the PA-Alerts Home Brew Club and has been homebrewing since 1995. He likes to brew pale ale, pumpkin ale, and an imperial stout with hallucinogenic qualities.



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by Amahl Turczyn Scheppach

2011 GABF Pro-Am Competition

The sixth annual Great American Beer Festival Pro-Am Competition featured award-winning homebrew recipes from AHA-sanctioned competitions held on or after January 1, 2010. Winning homebrew recipes are selected by participating craft breweries to be scaled up to a commercial-sized batch and entered at the GABF for judging. Craft breweries get the benefit of the homebrewer's creativity, and the homebrewer gets to see his or her recipe recreated in a professional environment, then put on tap at the GABF Pro-Am booth for the 49,000 attendees to sample.

While judged separately from the regular GABF entries, winners are still awarded gold, silver, and bronze medals, with both the craft brewery and homebrewer (who must be an AHA member) receiving a medal. In 2011, 86 beers were judged in the Pro-Am competition, the most ever.

This year, the top award went to Tom Gardner's Classic American Pilsner "Before Capone," brewed with Dennis O'Harrow at the C.B. & Potts Restaurant & Brewery in Westminster, Colo. The silver went to Travis Grimm's schwarzbier "Schwarzherz," brewed at Uinta Brewing Company in Salt Lake City, Utah. And the bronze went to Ted Manahan's "Fossil Creek Kriek," brewed at Dry Dock Brewing in Aurora, Colo.

Gold Medal: Before Capone

Tom Gardner claims, "It's all my wife Melissa's fault." The couple moved to Denver in the summer of 1989 when

Tom Gardner (left) and pro brewer Dennis O'Harrow at C.B. & Potts.

Before Capone [Classic American Pilsner]

TOM GARDNER, GOLD MEDAL, GABF PRO-AM 2011

INGREDIENTS

for 11 U.S. gallons (41.6 liters)

18.67 lb	(8.47 kg) Canada six-row lager malt
4.67 lb	(2.12 kg) flaked corn
2.2 oz	(62 g) Tettnanger pellet hops, 4.2% a.a. (FWH)
2.75 oz	(78 g) Tettnanger pellet hops, 4.2% a.a. (60 min)
1.1 oz	(31 g) Tettnanger plug hops, 4.2% a.a. (0 min)
	Wyeast 2035 American Lager yeast

Original Gravity: 1.056

SRM (est): 5.4

IBU: 34

Brewhouse Efficiency: 75%

Boil Time: 90 minutes

DIRECTIONS

Mash in at 122° F (50° C) and hold for a 20 minute protein rest. Raise to 144° F (62.2° C) and hold for 30 minutes, then raise temperature to 158° F (70° C) and hold for another 30 minutes. Mash out at 168° F (75.5° C) for 15 minutes and sparge. Ferment at 50° F (10° C) for two weeks with an appropriate sized starter.

Mini-mash version: Substitute 10.5 lb (4.8 kg) pale liquid malt extract for 14 lb (6.4 kg) six-row. Mash 4.67 lb (2.12 kg) six-row with 4.67 lb (2.12 kg) flaked corn per the recipe mash schedule in enough water to have an oatmeal-like consistency. Sparge. Add malt extract and full water volume, bring to a boil, and proceed with recipe as stated.





AHA SPECIAL EVENTS

Visit the Events section of HomebrewersAssociation.org for more information.

February 26

AHA Rally at Saint Arnold Brewing Co.
Houston, TX

March 10

AHA Rally at Stone Brewing World Bistro & Gardens, Escondido, CA

March 19-28

AHA National Homebrew Competition Entry Deadlines

March 30-April 22

AHA National Homebrew Competition First Round Judging

May 5

AHA Big Brew: A Celebration of National Homebrew Day

June 21-23

AHA National Homebrewers Conference
Seattle, WA

June 21

AHA National Homebrew Competition Final Round, Seattle, WA

there were only a half-dozen breweries in Colorado. "We went to the GABF and I think there were 21 breweries," he remembers. "But it was enough for us to find a new love for beer." Gardner made his first batch of homebrew on January 1, 1990 with a kit he'd received from his wife as a birthday present. "I found the old brew log and saw that I bottled it after only four or five days. Being the first brew, I had to sample it every day to check on it." Unimpressed, he abandoned the project, but found the last six-pack and discovered that a month or two in the bottle makes all the difference. From then on, he "learned to brew early and brew often."

Melissa receives a lot of direct benefits from Gardner's hobby, and he keeps her happy by brewing her favorite styles. "Not only do I bring her a beer while she mows the lawn, I make her whatever kind of beer she wants," he jokes. "And not surprisingly, it is usually a lawn-

mower beer." Cream ales are also popular with his wife, so that's what he brews—Gardner's had plenty of experience tinkering with corn adjunct beers. "I have tried different grains, American six-row, two-row or German pilsner, but always with 20-25 percent flaked maize. And different hops, but always German noble hops. Sometimes I split the wort into a CAP and a cream ale or just compare different yeasts." Both ale and lager versions have done very well in homebrew competitions over the years. In fact, the CAP and cream ale went to the 2011 National Homebrew Competition finals.

Gardner won Best of Show at the Keg Ran Out Club's (KROC) annual competition last year, and sure enough, the name of the winning beer was "Melissa's Favorite." The victory qualified him for the Pro-Am competition.

Gardner's experience brewing with



AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

For complete calendar, competition and judging information go to www.HomebrewersAssociation.org/pages/competitions



January 6

Big Beers, Belgians & Barleywines Homebrew Competition
Vail, CO. Entry Deadline: 12/15/2011.
www.bigbeersfestival.com

January 14

18th Annual Boneyard Brew-Off
Urbana, IL. Entry Deadline: 1/9/2012.
www.buzzbrewclub.org

January 14

Wizard of SAAZ V
Akron, OH. Entry Deadline: 12/28/2011.
saazakron.com/WoS

January 21

Doug King Memorial Homebrew Competition
Woodland Hills, CA. Entry Deadline: 1/12/2012.

January 28

Upper Mississippi Mash-Out
St. Paul, MN. Entry Deadline: 1/14/2012.
www.mashout.org

January 28

2012 Winter Brewing Competition
Chicago, IL. Entry Deadline: 1/13/2012.
brewcamp.com/squarekegs/register

January 29

Homebrew Alley 6
Brooklyn, NY. Entry Deadline: 1/20/2012.
www.homebrewalley.org

February 4

GEBL IPA Bracket Challenge
Everett, WA. Entry Deadline: 1/31/2012.
www.gebl.org

February 4

14th Annual Domras Cup Mead Competition
Savannah, GA. Entry Deadline: 1/25/2012.
www.savannahbrewers.com

February 4

Winter Beer Dabbler 2012
St. Paul, MN. Entry Deadline: 1/27/2012

February 11

KLCC Microbrew Festival Homebrew Competition
Eugene, OR. Entry Deadline: 2/3/2012.
www.brewabeer.com/KLCC_2012.html

February 11

Cincinnati Winter Beerfest American Ale Competition
Cincinnati, OH. Entry Deadline: 2/4/2012.
www.maltinfusers.org

February 11

The Great Northern Brew-Ha-Ha!
Duluth, MN. Entry Deadline: 1/30/2012. www.northernalestars.org/greatnorthernbrewhaha.html

February 17

Kansas City Bier Meisters 29th Annual Homebrew Competition
Overland Park, KS. Entry Deadline: 2/10/2012.
www.kcbiermeisters.org/comp

February 18

Bluff City Brewers & Connoisseurs Homebrew Extravaganza
Memphis, TN. Entry Deadline: 1/28/2012.
www.memphisbrews.com

February 18

2012 Midwinter Homebrew Competition
Milwaukee, WI. midwinterhbc.beerbarons.org

February 18

AHA Club-Only Competition, Dark Lagers
Batavia, IL. Entry Deadline: 2/10/2012.
www.homebrewersassociation.org/pages/competitions/club-only-competitions

February 25

Best Florida Beer Homebrew Championships
Tampa, FL. www.dunedinbrewersguild.com

February 25

2012 Boston Homebrew Competition
Medford, MA. Entry Deadline: 2/11/2012.
www.wort.org

February 25

Reggale & Dredhop Homebrew Competition
Boulder, CO. Entry Deadline: 2/11/2012.
www.hopbarley.org/content/dredhop



Gold medal winner Tom Gardner poses with Charlie Papazian at the GABF awards ceremony.

Schwarzherz Black Lager

TRAVIS GRIMM, SILVER MEDAL, GABF PRO-AM 2011

INGREDIENTS

for 5 U.S. gallons (18.93 liters)

5.6 lb	(2.55 kg) German pils malt
2.6 lb	(1.16 kg) 10° L Munich malt
12.0 oz	(340 g) Carafa Special II malt
4.0 oz	(113 g) CaraMunich II malt
4.0 oz	(113 g) CaraHell or CaraPils malt
1.0 oz	(28 g) Tettnang hops, 4.5% a.a. (60 min)
1.0 oz	(28 g) Hallertau Mittelfruh hops, 2.7% a.a. (30 min)
1.0 oz	(28 g) Hallertau Mittelfruh hops, 2.7% a.a. (15 min)
1	Whirlfloc tablet (15 min)
	WLP833 German Bock Lager or WLP830 German Lager

O.G.: 1.051

F.G.: 1.012

SRM: 26

IBU: 28

Brewhouse Efficiency: 75-80%

Boil time: 75 minutes

DIRECTIONS

Mash at 152° F (66.6° C) for 60 minutes. Collect first runnings and sparge with 170° F (76.66° C) water to collect 6.75 gallons (25.6 L) wort. Ferment at 50° F (10° C) for two weeks. Lager at 35 to 40° F (1.6 to 4.4° C) for one month.

Extract version: Substitute 4.2 lb (1.9 kg) liquid Pilsner malt extract for the Pils malt and 1.95 lb (885 g) liquid Munich malt extract for the Munich malt. Steep the remaining grains in 158 °F (70 °C) strike water for 30 minutes, remove, then add malt extracts, bring to a boil, and proceed with the recipe as stated.



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O'Harrow at C.B. & Potts was memorable. "He had everything ready to go when I got there. He gets all the credit for making the transition from a homebrew-sized recipe up to seven barrels. He is a great guy and an awesome brewer. He taught me a lot about brewery safety, cleanliness, and sanitation. I mashed-in and stirred, sparged, lautered, boiled, and

then transferred it to the fermenter. Of course he even let me clean out the mash tun!" O'Harrow fermented the CAP with a German lager yeast and timed the brew to be at its peak for the GABF.

Gardner also learned that Denver area craft brewers are a tight-knit group, and homebrewing is often where they get their

start. "Dennis, Bill Eye (the head brewer at Dry Dock), and I were in the same homebrew club, The Unfermentables, 20 years ago. Small world! And Bill got a third in the 2011 GABF Pro-Am with Ted Manahan."

Gardner was justifiably excited about his win, but was gracious in victory. "Many thanks to the AHA and BA for sponsoring the GABF Pro-Am. It was great to have my own beer being served on the GABF floor, and to then win a gold medal at the GABF was beyond fantastic. And I would like to thank my homebrew club The Foam on the Range. And to top it all off, as a buddy said, "Who wins with a Pilsner?"

Fossil Creek Kriek

TED MANAHAN, BRONZE MEDAL, GABF PRO-AM 2011

BASE BEER 1: DUNKELWEIZEN

Brewed September 2008, racked into New Belgium Brewing La Folie Barrel October 2008, racked out of barrel May 2009

INGREDIENTS

for 10 U.S. gallons (37.85 liters)

10.0 lb	(4.54 kg) dark wheat malt
10.0 lb	(4.54 kg) dark Munich malt
0.5 lb	(227 g) chocolate malt
10.0 oz	(284 g) pale malt
1 T.	yeast carbonate
	Wyeast 3068 (plus whatever bacteria and yeast live in the barrel)

Original Gravity: 1.053 (70% efficiency)

BASE BEER 2: BIOHAZARD 2008

Brewed September 2008, racked into barrel October 2008, racked out of barrel November 2009

INGREDIENTS

for 14 U.S. gallons (53 liters)

15.0 lb	(6.8 kg) Pilsner malt
10.0 lb	(4.54 kg) white wheat
1.0 lb	(454 g) pale dry malt extract
8.0 oz	(227 g) brown sugar
1 tsp	gypsum
1 tsp	chalk
1 tsp	CaCl ₂
4.25 oz	(120 g) two-year-old low-alpha homegrown Tettnanger hops

Wyeast Roeselare 3763

O.G: 1.050 (70% efficiency)

DIRECTIONS

"This vintage of Fossil Creek Kriek was created as a 50/50 blend of two sour beers and a lot of cherries. It was bottled September 2010. Several members of The Liquid Poets homebrew club brewed a dunkelweizen to the same recipe, and aged it eight months in a 55-gallon barrel at the New Belgium Brewing Company. A portion of this was blended with a standard pale sour beer called Biohazard Ale that was fermented in a glass primary for a month and aged for a year in my barrel in my basement. Blend equal amounts of these two beers, and rack onto 7 lb (3.18 kg) Nanking cherries and 3 lb (1.36 kg) pie cherries. Age two months on cherries, then rack off the cherries and let settle for a month before bottling."

Extract version: For beer 1, substitute 7 lb (3.2 kg) liquid wheat malt extract for the wheat malt and 7 lb (3.2 kg) liquid Munich malt extract for the Munich malt. Omit the pale malt. Steep the chocolate malt in 158 °F (70 °C) strike water for 30 minutes, remove, then add malt extracts, bring to a boil, and proceed with the recipe as stated.

For beer 2, substitute 17.5 lb (7.9 kg) liquid wheat malt extract (wheat blend) for the Pilsner and wheat malts. Add all extracts and sugars to strike water, bring to boil, and proceed with recipe as stated.

Silver Medal: Schwarzherz

Travis Grimm has been brewing for three years, and made the transition to all-grain after the first six months. He prefers to keep his setup basic, using an Igloo mash tun set up for 5-gallon batches. Recently, though, he built a 50-foot whirlpool immersion chiller and added a March pump for the chilling, which he found to be a great improvement over the previous system. Grimm doesn't use any special tricks or techniques, but does read a lot to help understand the brewing and fermentation process better. "I do think the one thing that greatly improved my beer was buying an old fridge and temperature control unit to control my fermentations," he mentioned. "I think this is crucial to making great beers."

Although he says it's difficult to pick a favorite style, he tends to brew a lot of German lagers and British ales. More exotic styles have begun to pique his interest, however. "I have recently taken quite a liking to sour ales, started by a tasting of Russian River Supplication at a ZZHOPS homebrew club meeting."

Grimm formulated his silver medal-winning schwarzbier recipe by reviewing several recipes online and in books. He comments, "There was a surprising lack of background information and style write-ups for schwarzbier. I basically tried to keep it balanced, clean, and not very roasty." Schwarzherz won bronze at the 2010 Beehive Brewoff in Utah, which



KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

March 2011

22nd Annual Reggale & Dredhop Homebrew Competition, 272 entries—*Adam Glaser, Fort Collins, CO.*

May 2011

Goblets of Gold V – Mead-Only Competition, 33 entries—*Alida Dunning, Homer, AK.*

June 2011

15th Annual Celtic Brew-Off, 270 entries—*Kerry Martin, Austin, TX.*

July 2011

Snake River Brewing-Teton County Fair Homebrew Competition, 20 entries—*Stephen Melanson, Jackson, WY.*

August 2011

2011 Oregon State Fair Homebrew Competition, 219 entries—*David Swisher, Jefferson, OR.*

L.A. County Fair Home Brew Competition, 199 entries—*Dan McGirr, Chino, CA.*

Beer Quest X-Periment-Ale, 18 entries—*Sloane Peterson, Lincoln, NE.*

Alaska State Fair Spirited Beverages, 35 entries—*Andrew Rawls, Anchorage, AK.*

23rd Annual New Mexico State Fair, Pro-Am Competition, 368 entries—*Mick Coker, Albuquerque, NM.*

2011 ACO Brewfest, 20 entries—*Neill Burt, Denver, CO.*

NSWABC 2011, 328 entries—*Joe Valente, Sydney, NSW, AU.*

Tennessee Valley Homebrewers (TVH)/TN Valley Fair Homebruin Cup, 65 entries—*Dennis Collins, Knoxville, TN.*

Eastern Idaho State Fair, 157 entries—*Steve Docktor, Meridian, ID.*

Fine Home Brew Competition, 8 entries—*Eric Bush & others, John Day, OR.*

Intervarsity Beer Brewing Competition 2011, 29 entries—*University of Pretoria, Pretoria, Gauteng, ZA.*

Puyallup Fair Amateur Beer Competition, 84 entries—*Richard Cockrell, Sumner, WA.*

September 2011

Competencia Amateur - Copa Cerveza, 100 entries—*Jorge Ringenbach, Mexico, D.F.*

Summer Suds of Savannah, 271 entries—*Lucas Kluz, Jacksonville, FL.*

Coconino County Fair Homebrew Competition, 25 entries—*Mike Kearsley, Flagstaff, AZ.*

Flying Bike Founders Fly-PA Competition, 35 entries—*Mike Kilpatrick, Seattle, WA.*

Santa Cruz Fair Homebrew Competition, 127 entries—*Chris Scianni, Santa Cruz, CA.*

DRAFT Beerfest, 211 entries—*Mark Pavlik, Latrobe, PA.*

The Great Frederick Fair, 131 entries—*Brian Gruner, Damascus, MD.*

Tulare County Fair Homebrew Competition, 48 entries—*Richard Gleason Jr., Visalia, CA.*

Queensland Amateur Brewing Championships 2011, 263 entries—*Liam Ahern, Brisbane, QLD, AU.*

State Amateur Brewers Show of South Australia, 257 entries—*Mark Rasheed, Adelaide, SA, AU.*

Washington Mead & Cider Cup, 25 entries—*Roger Key, Everett, WA.*

Celestial Meads Equinox Mead Competition, 41 entries—*Breck Tostevin, Anchorage, AK.*

River City Roundup/Douglas County Fair, 90 entries—*Tom Malowski, Omaha, NE.*

Castle Hill & Hills District Agricultural Home Brewing Championship, 213 entries—*Merv Cadwallader, Sydney, NSW, AU.*

DAI Oktoberfest Home Brew Contest, 74 entries—*Jeff McElfresh, Dayton, OH.*

Muse Cup, 52 entries—*Gordon Pencis, Aurora, CO.*

Southern Vermont Homebrew Festival, 110 entries—*Jeremy Fitchett, Hoosick Falls, NY.*

ACT Amateur Brewing Championship 2011, 208 entries—*Keenan Fahy, Canberra, ACT, AU.*

Southern Oregon Amateur Beer & Wine Competition, 150 entries—*Steve Terilli, Medford, OR.*

Maryland Microbrewery Festival Homebrew Competition, 39 entries—*Keith Lipford, Jake Cowperthwaite, Dave Hershey, & Phil Tansill, Baltimore, MD.*

McHale's Monthly Mashout - September, 6 entries—*Rob Harris, Soddy Daisy, TN.*

Byggvir's Big Beer Cup, 155 entries—*Brett Glenna & Pete Waska, Lakeville, MN.*

Son of Brewzilla 2011, 382 entries—*Larry Reuter, Akron, OH.*

Malt Madness, 601 entries—*David Barber, Orwigsburg, PA.*

Pacific Brewers Cup, 283 entries—*James Hilbing, Kurt Rump, & Mike Truman, Redondo Beach, CA.*

The Cajun Classic, 68 entries—*Jeff Pieper, Bossier City, LA.*

October 2011

Oaktoberfest, 41 entries—*Arlyn Johns, Oakland, CA.*

Fresh Hop Ale Festival, 42 entries—*Patrick Smith, Yakima, WA.*

Three Rivers Throwdown II, 20 entries—*Dave Roarty, Murrysville, PA.*

Townsend Fall Fest Annual Homebrewing Contest, 29 entries—*John Rumney, Cascade, MT.*

4th Annual Final Gravity Strong Beer Competition, 96 entries—*Jash Myers, Decatur, GA.*

2011 Napa Homebrewers Classic, 40 entries—*Cameron Day, Napa, CA.*

National Organic Brewing Challenge, 53 entries—*Bernard Ducat II, Broad Brook, CT.*

West Coast Brewers - Belgian/French, 9 entries—*Michael Connor, Perth, WA, AU.*

Commander SAAZ Interplanetary Homebrew Blastoff, 549 entries—*Chris Bible, Knoxville, TN.*

2011 Arizona Society of Homebrewers Oktoberfest Competition, 318 entries—*Scott Brady, Phoenix, AZ.*

Barley Legal 2, 101 entries—*Jamie Klarman & Phil Bayle, Phoenix, MD.*

CAMRA/Van Brewers Harvest Challenge, 14 entries—*Don Farion, Vancouver, BC, CA.*

Schleswig Wine & Bier Contest, 50 entries—*Peter VanderMeer, Le Mars, IA.*

Umpqua Valley Brew Fest, 51 entries—*Jeff Clarke & Steve Ferrell, Grants Pass, OR.*

Valhalla - The Meading of Life VII, 64 entries—*Mike Manning, Allentown, PA.*

Piedmont Brewer's Cup, 266 entries—*Matt Everngam, Preston, MD.*

5th Annual Virginia Beer Blitz, 269 entries—*Mark Pavlik, Latrobe, PA.*

2011 SNAFU Memorial Homebrew Competition, 122 entries—*Jon Antonson, Las Vegas, NV.*

Oktoberbest Zinzinnati, 263 entries—*Scott LaFollette, Cincinnati, OH.*

The Big Muddy Monster Brew Fest, 95 entries—*Rodney Murray, St. Robert, MO.*

Arkansas State Fair Homebrew Competition, 125 entries—*Rory Bradley, Little Rock, AR.*

Southeast Alaska Autumn Pour, 62 entries—*Michael Lamonica, Juneau, AK.*

McHale's Monthly Mashout - October, 11 entries—*Robert Miller, Atlanta, GA.*

AHA Club-Only Competition, Specialty/ Experimental/Historical Beers, 49 entries—*Matt Sager, Walnut Creek, CA.*

6th New England Regional Homebrew Competition, 530 entries—*Brian & Christopher Sprague, Portland, ME.*

November 2011

Music City Brew Off, 325 entries—*Marc Powell, Alpharetta, GA.*

Novembeerfest 2011, 247 entries—*Colin Lenfesty, Seattle, WA.*

qualified him for the GABF Pro-Am.

“Working with the brewers at Uinta Brewing to make this beer was a fantastic experience. They let me get in the mix in all stages, throwing grain to mashing and lautering to graining out and cleaning out the whirlpool after chilling and aeration were complete. I even came out to help with the filtration. All the folks out at Uinta are fantastic to work with—even though brew day started at 4 a.m. on a Saturday.” But despite the daunting work hours of a brewer, Grimm laughed, “By the end, I was ready to consider a career change to brewing!”

Bronze Medal: Fossil Creek Kriek

Ted Manahan has been brewing for an impressive 35 years, starting when he was in high school. “Homebrewing beer was legalized in 1978, but I was brewing a couple years before that!” he said. For more than 15 years, he has focused on Belgian-style “wild” or sour beers. “Most years I brew a kriek, using pie cherries and

a blend of new and old base beer. Over time, this process has produced three Best of Show awards and numerous first-place medals for Category 17 Sour Ale.”

The 2010 vintage, for example, won Best of Show at the 2011 Big Beers, Belgians, and Barleywines festival in Vail, Colo. It was made with a 50/50 blend of two base beers: a Liquid Poets homebrew club-project dunkelweizen aged in a New Belgium La Folie barrel, and a standard wheat-based lambic wort aged one year in a 50-liter barrel in Manahan’s basement. Due to the nature of lambic brewing, the exact bacterial formulation is something only the barrel knows for sure. “For both base beers, the precise mix of ‘bugs’ is unknown due to the extended period over which the barrels have been used! I added 7 pounds of Nanking cherries and 3 pounds of pie cherries to five gallons of the blend, let it age for two months, and bottled.”

Scaling this sort of beer to a commercial size at a craft brewery was not without



Gardner cleans out the mash tun at C.B. & Potts.

challenges. Manahan said, “In brewing the Pro-Am version of this beer with Dry Dock Brewing, our main concern was time. It takes a long time for complex flavor profiles to emerge with ‘wild’ beers, and we only had six months. Fortunately Dry Dock makes a sour wit beer, which was a good replacement for the pale base beer. We brewed a dunkelweizen, inoculating it with a ‘secret sauce’ of *Saccharomyces*, *Lactobacillus*, *Pediococcus*, *Brettanomyces*, and perhaps other microbes. We added cherry puree in the barrel. The flavors produced were pleasant, but it would have been nice to have had a year to allow the beer to fully mature.” Hopefully they saved some for later evaluation!

Manahan was grateful to have the expertise of the Dry Dock brewers to add to his own.

“Working with Bill Eye and his team was a great experience. They were willing to take a chance with a beer style that is very difficult to produce commercially, especially given our time constraints. Our blending session was especially fun, sampling different blends and looking for the ratio that most closely resembled the homebrewed kriek!”

Amahl Turczyn Scheppach is a former craft brewer and associate editor for *Zymurgy*, and now brews at home in Lafayette, Colo.

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By Will Trice

The Thermodynamics of Immersion Chillers

Wort chillers are marvelous things. They shorten the brewing day, satisfy the need for yet another brewing gadget, and may even improve your beer.

Immersion chillers are a popular form of these devices due to their ease of construction and use. Coil up some conductive tubing, add some hose fittings to each end, turn on the water, and drop the chiller into your wort. Shazam! You're chillin'. But what factors influence the performance of your immersion chiller? To understand that, we'll discuss some of the mathematics of thermodynamics, so grab a homebrew and settle in.

In addition to his descriptions of calculus, gravitation, and optics, Isaac Newton also dabbled in heat transfer. Applied to convective systems (where heat transfer is facilitated by fluid motion—like an immersion chiller in a pot of wort), Newton's Law of Cooling can be expressed as:

$$q = UA\Delta T \quad (1)$$

Where:

q = rate of heat transfer (BTU/sec)

U = heat transfer coefficient (BTU/sec-ft²-°F)

A = surface area of chiller (ft²)

ΔT = average difference in temperature (°F)

Applying Newton's Law between the cold coolant water in the chiller and the hot wort tells us that the rate of heat transfer between the two fluids is proportional to the surface area of the chiller and the average difference in temperature between the coolant and the wort.

Naturally, the temperature difference between the wort and the coolant water

is larger where the water enters the chiller than at the exit of the chiller. Since the temperature of the water as it flows through the chiller asymptotically approaches the temperature of the wort, the average of the temperature differences between wort and water at the chiller's entrance and exit does not actually represent the average temperature difference along the chiller coil (although this can be used for rough estimation). Then what is the correct value to use for ΔT ? If we assume that a drop of water entering the chiller experiences the same wort temperature all along the chiller, then the average temperature of the water over the length of the chiller is given by the log mean temperature difference (LMTD), which is:

$$LMTD_c = \frac{t_f - t_i}{\ln\left(\frac{T - t_i}{T - t_f}\right)} \quad (2)$$

Where:

$LMTD_c$ = log mean temperature difference for constant wort temperature (°F)

t_i = initial coolant water temperature at the entrance of the chiller (°F)

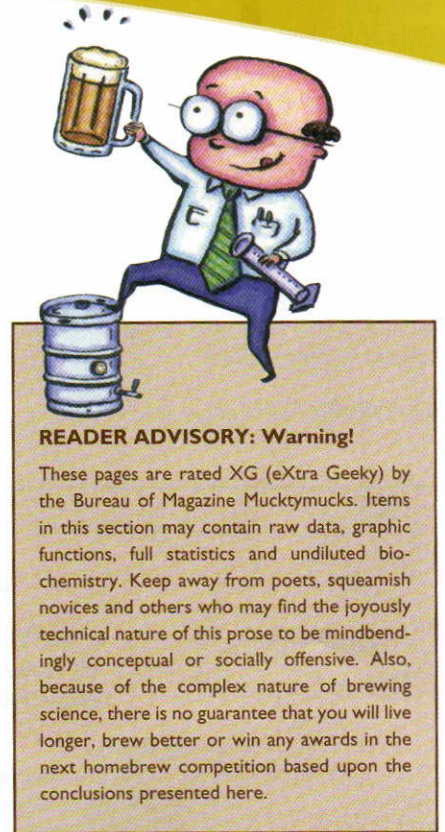
t_f = final coolant water temperature at the exit of the chiller (°F)

T = wort temperature (°F)

Combining equations 1 and 2, at any point in time the rate of heat transfer from the wort to the chiller is

$$q = UA(LMTD_c) \quad (3)$$

Of course, the water flowing through the chiller is carrying off the heat of the wort. Shut off the water, and you shut off the heat flow. If you start trickling water through the chiller, heat flow starts again as cool water enters. As you increase the water flow, more heat is removed from



READER ADVISORY: Warning!

These pages are rated XG (eXtra Geeky) by the Bureau of Magazine Muckymucks. Items in this section may contain raw data, graphic functions, full statistics and undiluted biochemistry. Keep away from poets, squeamish novices and others who may find the joyously technical nature of this prose to be mindbendingly conceptual or socially offensive. Also, because of the complex nature of brewing science, there is no guarantee that you will live longer, brew better or win any awards in the next homebrew competition based upon the conclusions presented here.

the wort. In fact, the rate of heat flow is also proportional to the mass flow rate of the water, and the temperature difference of the water between the entrance and exit of the chiller:

$$q = \dot{m}c(t_f - t_i) \quad (4)$$

Where:

\dot{m} = mass flow rate (expressed here as weight flow rate) of coolant (lb/sec)

c = specific heat of coolant = ~1 BTU/lb-°F for water

Given all this, how long will it take to chill a batch of wort with a given chiller? Obviously, the temperature difference between the wort and the chiller water gets smaller as the wort cools, slowing down the rate of heat transfer. The temperature of the wort asymptotically approaches the entrance temperature of the water over time. To figure out how much time, we first need the expression for the amount of heat that needs to be removed from the wort which is given by:

$$Q = MC(T_i - T_f) \quad (5)$$

Where:

Q= heat (BTU)

M=mass (expressed here as weight) of wort (lb)

C=specific heat of wort⁵ = ~0.94 BTU/lb-°F

T_i = initial wort temperature (°F)

T_f = final wort temperature (°F)

Since the derivative with respect to time of Q is the rate of heat transfer, q, we can combine equations 2, 3, 4, and 5 into a single differential equation for the wort temperature that when integrated with respect to time yields:²

$$Q = \dot{m}c\theta(LMTD_n)(1 - e^{-U_A/\dot{m}c}) \quad (6)$$

Where:

θ = time to chill the wort from T_i to T_f (sec)

LMTD_n = log mean temperature difference for nonconstant wort temperature (°F)

Since the temperature of the wort is not constant over time, the LMTD changes from that in equation 2 and is expressed in terms of the temperature of the water entering the chiller as:

$$LMTD_n = \frac{T_i - T_f}{\ln\left(\frac{T_i - t_i}{T_f - t_i}\right)} \quad (7)$$

What is equation 6 telling us? It tells us that to minimize the amount of time spent chilling your wort, you want to do three things:

1) *Maximize the water flow rate through the chiller.* Keep your faucet or hose wide open through the whole process. To reduce water consumption, you can reuse the wastewater for cleanup or for watering your lawn. And don't worry that the water exiting the chiller isn't as hot as you would expect when you're running full blast. Note that the water exit temperature has dropped out of equations 6 and 7. It's just not important to the total time spent chilling.

2) *Minimize the water temperature.* If your tap water is too warm to cool effectively, you may want to use a pre-chiller, or you may want to recirculate ice water through the chiller instead of just running straight from the tap.

3) *Maximize the chiller surface area.* Longer, wider tubing will cool faster as long as it all fits beneath the surface of the wort.

Getting to Know U

You may have noticed that I glossed over U, the heat transfer coefficient. In order to derive equation 6, we must treat U as a constant, but in reality U varies with temperature. However, it has been shown that if the heat transfer coefficient for a system varies linearly with temperature, it can be considered constant. The coefficient U for an immersion chiller is in fact pretty linear with respect to temperature and is evaluated at the average film temperature between the chiller and the wort given by:

$$T_{film} = \frac{2t_i + LMTD_n}{2} \quad (8)$$

Where:

T_{film} = average film temperature (°F)

So how do we figure out the value of U? The overall heat transfer coefficient for an immersion chiller is actually composed of three components: the heat transfer coefficient from the wort to the chiller wall, the coefficient governing heat transfer across the wall, and the coefficient of heat

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TABLE 1: RESULTS OF CHILLER EXPERIMENTS. The 1/4" experiment used coolant water running at 1.5 gpm; all other experiments used 2.5 gpm. Coolant water was 68° F in all cases. The heat transfer coefficient and the predicted time to get to chill water from 200° F to 80° F were estimated using the equations presented here.

Chiller Configuration	Estimated U (BTU/sec-ft ² - °F)	Final Temp (°F)	Predicted Time (min:sec)	Actual Time (min:sec)
1/4" o.d., 22' submerged, no agitation	0.05	80	28:30	29:55
3/8" o.d., 22' submerged, no agitation	0.046	81	20:24	20:54
3/8" o.d., 23.5' submerged, no agitation	0.046	79	19:17	20:30
3/8" o.d., 23.5' submerged, chiller swirled around kettle at ~½ rev/sec	0.14	80	8:26	8:01
3/8" o.d., 23.5' submerged, down draft recirculation		80		10:20
3/8" o.d., 23.5' submerged, whirlpool recirculation		80		14:25

transfer between the wall and the cooling water¹. However, the limiting heat transfer coefficient through the immersion chiller is between the wort and the chiller wall, so we can safely ignore the other two coefficients.

Unfortunately, heat transfer coefficients can only be derived analytically in simple, ideal cases. However, many researchers have developed empirical correlations for computing coefficients for various situations. These correlations are derived for specific circumstances, so when they are extended to work in the general case, the computed heat transfer coefficient can be off by as much as 25 percent. Nevertheless, they provide a useful tool when designing a heat exchanger, in this case our immersion chiller. We'll look at two of these correlations, one for natural convection where the wort is not agitated, and one for forced convection for the case when we move the wort (or the chiller) around the kettle.

Let's say that you're taking the easiest approach to using an immersion chiller, and you're just going to drop the chiller in the pot and have a homebrew. No stirring, no whirlpooling, just waiting for the chiller to do its thing. In this case, the chiller will cool the wort through natural convection. A handy correlation for determining U in this case is:⁵

$$U = \frac{K}{d} \left(R\rho^2 d^3 \frac{LMTD_n}{\mu} \right)^{\frac{1}{4}} \quad (9)$$

Where:

K = empirically derived constant

d = outside diameter of chiller tubing (ft)

R = empirically derived constant

ρ = wort density¹ = ~62 lb/ft³ for water

FIGURE 1. CHILLING TIME BY FLOW RATE AND TUBING DIAMETER. This figure provides the estimated time to chill 5 gallons of 13 °P wort from 200° F to 80° F using 70° F coolant water with a 25-foot (submerged) chiller with the tubing size and flow rate indicated.

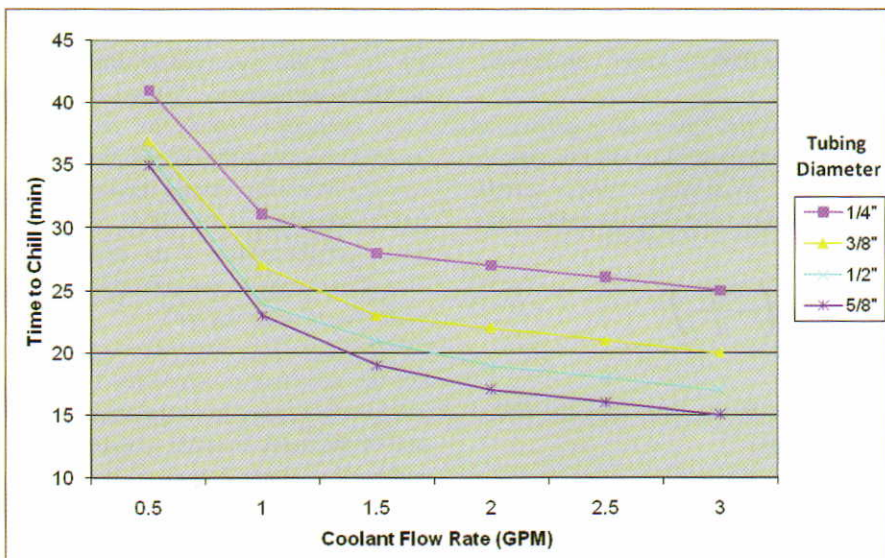
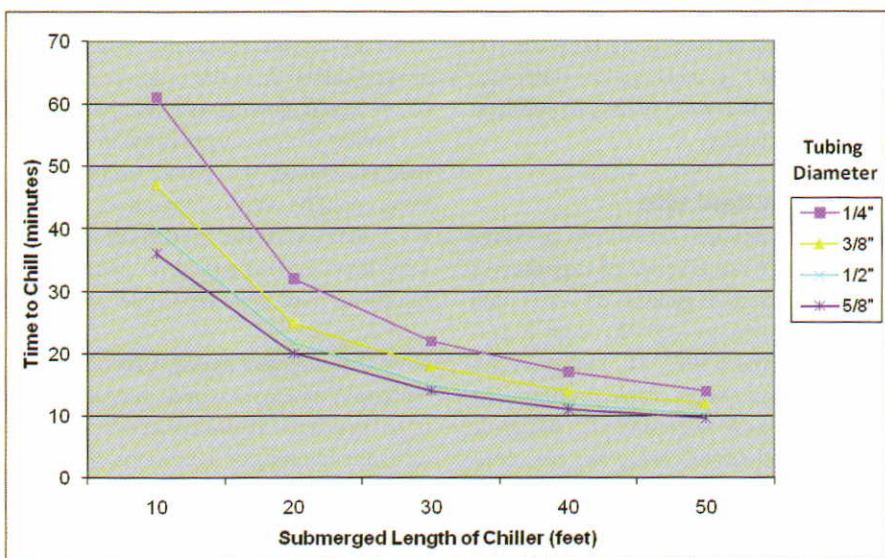


FIGURE 2. CHILLING TIME BY LENGTH AND TUBING DIAMETER. This figure provides the estimated time to chill 5 gallons of 13 °P wort from 200° F to 80° F using 70° F coolant water flowing at 2.5 gpm with a chiller sized as indicated.



(for wort multiply this by the specific gravity)

μ = wort dynamic viscosity^{1,6} = .000514 lb/ft-sec at 90° F for water, and ~0.0012 lb/ft-sec for a 13 °P wort at 90° F

In equation 9, $K = 5.3 \times 10^{-5}$ and $R = 52$. The dynamic viscosity of the wort, μ , varies with temperature (and specific gravity), but can be evaluated at the average film temperature given in equation 8.

Natural convection works, but as the wort cools, it forms a boundary layer around the chiller coil, inhibiting cooling. Agitating the wort, either by stirring or recirculating with a pump, will break up that boundary layer and decrease your chilling time through forced convection.

I often swirl the chiller through the hot wort to speed up cooling. In this case, to compute U , you'll want to use a correlation for wort moving over the chiller coils:

$$U = \frac{K\mu^{\frac{1}{3}}}{d} \left(\frac{vd\rho}{\mu} \right)^{0.466} \quad (10)$$

Where:

v = velocity of the wort over the chiller coils (ft/sec)

In equation 10, $K = 0.00147$ and μ is again evaluated at the average film temperature.

Looking at equation 10, you can see that the faster you move the wort (larger v), the larger the heat transfer coefficient will be. And equation 6 tells us that a larger U means that we're chilling faster. If you look at Table 1, you can see the difference that moving the wort makes in the heat transfer coefficient.

Chillers in Real Life

Enough equations—let's look at some actual data. I ran a series of experiments where I boiled 5 gallons of water and chilled it down to ~80° F using a 1/4" o.d. chiller and a 3/8" o.d. chiller in different configurations. Table 1 shows the results of these experiments alongside the predicted results using the equations presented here.

As expected, the larger 3/8" chiller cooled

the boiled water faster than the 1/4" chiller. However, the difference was larger than originally predicted. My garden hose puts out 2.5 gallons per minute (gpm) when I have the faucet opened wide. With the 3/8" chiller attached to the hose, the flow rate remained constant at 2.5 gpm. Even after I attached an output hose and a lawn sprinkler to the chiller, the flow rate hung in there at 2.5 gpm. In contrast, when I attached the 1/4" chiller to the garden hose, the flow rate was reduced to 1.5 gpm due to the much larger flow resistance of the 1/4" tubing. The lower flow rate accounts for the large difference in performance.

Also note that getting the wort moving (or, in this case, water) dramatically improves performance. I used three different methods to agitate the water in the kettle while using the 3/8" chiller. First I swirled the chiller around the kettle constantly, counting the number of revolutions over the course of the experiment. This allowed me to estimate the velocity of the "wort" over the coils.

For the next two experiments, I recirculated the hot water from the spigot in the side of the kettle through a March pump and back at about 2 gpm. In both cases, hot water reentered the kettle just under the surface and on the opposite side from the spigot. In the "down draft" experiment, the hot water reentered from a hose pointed straight down into the kettle. In the "whirlpool" experiment, the return hose was directed parallel to the surface of the water and tangent to the side of the kettle so that the reentering water swirled around the kettle in the opposite direction of the water flowing around the coils of the chiller. To my surprise, the down draft method chilled the liquid in the kettle faster than the whirlpool method. Swirling the chiller cooled the contents of the kettle faster than either method of recirculating, but it was a lot more labor intensive.

Now that we have shown that our mathematical framework works, we can extend it to see how performance varies with different chiller configurations. Figure 1 shows how the time it takes to cool a batch of wort changes with flow rate for chillers with differing tube diameters.

Notice how in all cases, larger tubing and faster flow rates reduce the chilling time. Figure 2 is similar to Figure 1, except this time the length of the chiller varies instead of the flow rate. Again, larger, longer tubing (more surface area) chills wort faster. When designing your immersion chiller, you can use these figures to assist you in determining the length and diameter of the tubing you'll use.

So, what have we learned here? When using an immersion chiller, keep your coolant water cold and moving fast, use the largest chiller that's practical for your situation and budget (at least 3/8" o.d. tubing will significantly reduce flow resistance inside the chiller), and move the wort around at least a little. Following this simple advice will shorten your brew day and get you to pitching temperature before any unwanted bugs invade. ☘

Will Trice homebrews outdoors in his Aurora, Colo. backyard. He has produced Will's Swill off and on for 18 years, occasionally creating something palatable. He recently discovered that he is a rain god and can produce precipitation by merely setting up his brewstand. ☘

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1. Holman, J. P. *Heat Transfer*. McGraw-Hill, 1963.
2. Wahl, Robert and Max Henius. *American Handy Book of the Brewing, Malting and Auxillary Trades*. Wahl and Henius, 1902.
3. Bowman, R. A., et al. "Mean Temperature Difference in Design." *Transactions of the A.S.M.E.*, May 1940, 283-294.
4. Kern, Donald Q. *Process Heat Transfer*. McGraw-Hill, 1965.
5. Both correlations presented here have been adapted respectively from correlations for free convection from horizontal cylinders and liquids flowing normal to cylinders. The constants K and R incorporate physical properties of water expressed as variables in the original correlations found in [1].
6. Hansen, Bob. "Practical Application of Lauter Tun Theory." Presentation, MBAA Midwest Technical Conference, Madison, Wis., September 2008.

One way beer judges check their palates is by using commercial “calibration beers”—classic versions of the style they represent. Zymurgy has assembled a panel of four judges who have attained the rank of Grand Master in the Beer Judge Certification Program. Each issue, they score two widely available commercial beers (or meads or ciders) using the BJCP scoresheet. We invite you to download your own scoresheets at www.bjcp.org, pick up a bottle of each of the beverages and judge along with them in our Commercial Calibration.

Our judges were sent two very different beer styles for this issue to give their palates a workout.

Fresh off a gold medal for Ordinary or Special Bitter at the Great American Beer Festival was DBA (Double Barrel Ale) from Firestone Walker Brewing Co. in Paso Robles, Calif.

“It’s a wonderful old-world English bitter recipe with a true session ale drinkability,” said Firestone Walker brewmaster Matt Brynildson, who won Mid-Size Brewing Company Brewer of the Year for the second time at the 2011 GABF.

The recipe uses Maris Otter pale malt and English crystal malts sourced from Crisp Malting in the UK, along with East Kent Golding and Styrian Golding hops.

DBA is aged in Firestone Walker’s own Burton Union-style system of oak barrels.



“Firestone Walker revived this old-world technology and put its own twist on the Union concept, patenting the Firestone Union in 1996,” said Brynildson. “We are the only brewery in the U.S. and one of two in the world practicing this art. The Union is a perfect way to ferment top-cropping ales in oak barrels.”

DBA checks in at 5 percent abv, and judge Beth Zangari declared it “an excellent session ale.”

Next up, we were able to snag a few bottles of a fresh release of Upland Brewing Co.’s Kiwi Lambic. Upland, based in Bloomington, Ind., makes eight styles of fruited sour ale: strawberry, raspberry, peach, cherry, blackberry, blueberry, kiwi, and persimmon. It also produces Dantalion Dark Wild Ale, a sour ale that is spiced rather than fruited. Batches are released just a few times a year and are highly sought after.

In 2006, Upland head brewer Caleb Staton obtained four white oak barrels previously used for red wine, and decided to experiment to see if he could make a sour ale more like what he imagined the lambics of centuries past to be, while at the same adding his own unique twists to



The original Burton Union system (left) was invented in the 1830s. The Firestone Union (above) was patented in 1996.

the style. Upland follows traditional lambic brewing procedures in order to make its version as authentic as possible.

“The aging, bugs, and fruit have yielded a complex lambic that is refreshing and intriguing,” said judge David Houseman.

OUR EXPERT PANEL includes David Houseman, a Grand Master IV judge and competition director for the BJCP from Chester Springs, Pa.; Beth Zangari, a Grand Master level judge from Placerville, Calif. and founding member of Hangtown Association of Zymurgy Enthusiasts (H.A.Z.E.); Scott Bickham, a Grand Master II judge from Corning, N.Y., who has been exam director or associate exam director for the BJCP since 1995; and Gordon Strong, a Grand Master V judge, principal author of the 2004 BJCP Style Guidelines and president of the BJCP board who lives in Beavercreek, Ohio.

ON THE WEB

Upland Brewing Co.
www.uplandbeer.com

Firestone Walker Brewing Co.
www.firestonebeer.com

BJCP Style Guidelines
www.bjcp.org

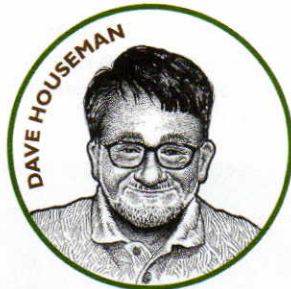
Commercial Calibration
www.HomebrewersAssociation.org/pages/zymurgy/commercial-calibration
(Note: This is a Members Only area of the website)





Firestone Walker DBA—Firestone Walker Brewing Co., Paso Robles, Calif.
BJCP Category: 8B Special/Best Bitter

THE JUDGES' SCORES FOR FIRESTONE WALKER DBA



Aroma: Medium caramel and low bready/grainy pale malt aroma. Low, earthy hop aroma. No diacetyl. No DMS. Moderate fermentation fruity esters. No evident alcohol aroma. Very clean, English Bitter aroma with low vanilla notes as the beer warms. (10/12)

Appearance: Brilliant clarity. Light copper color. Dense, light tan head with very good retention. Well-conditioned with light carbonation. Very pretty and inviting beer. (3/3)

Flavor: Malty with both caramel notes and a drying roasted malt finish. Complex toasted, woody character. Hop bitterness is firm. Earthy hop flavor is low. Finish is dry. Balanced with lingering bitterness. No diacetyl. No DMS. Low fruity fermentation esters. Low alcohol presence in flavor. I don't perceive barrel age character other than some tannins in the aftertaste. (17/20)

Mouthfeel: Medium-light to medium body. Lingering dryness, bitterness in mouthfeel. Medium low alcohol warming. Rough edges to mouthfeel from tannins. Not quite as smooth as the best examples of style. (4/5)

Overall Impression: Nicely balanced Special Bitter that one could easily drink by the pint. Alcohol a little on the high side for the style—really in the ESB/Pale Ale range. Toasted, caramel malt character is very intriguing—not just the usual pale malt and caramel Bitter. Barrel aging not evident other than some tannins in flavor and mouthfeel. Still quite drinkable and great for that Ploughman's lunch, meat pie, or fish and chips. (8/10)

Total Score: (42/50)

Aroma: Strong bready, lightly grainy malt with earthy herbal hop aroma; a bit of rosy alcohol with strong ripe plum esters, otherwise clean with no diacetyl. Notes of caramel emerge as the sample sits. (8/12)

Appearance: Medium golden amber with brilliant clarity. Rocky off-white foam forms with a few large bubbles. Head falls to thin layer that persists to the end, and laces on sides of the glass. (3/3)

Flavor: Malt is rich and bready at first, with toast and a little caramel emerging as the sample warms. Moderately strong herbal earthy hop flavor with pronounced bitterness that skews the balance. Mild sun-ripened plum esters are present midway through the finish, and complement the caramel notes. Bitterness gives way to lightly sweet, toasty maltiness but lingers long into the somewhat dry finish. No diacetyl; rather the esters provide character and complexity, particularly as the beer warms. (16/20)

Mouthfeel: Medium bodied with a bit softish carbonation. Creamy textured with a crisp, clean finish. Not astringent, just crisp. (5/5)

Overall Impression: Moderately complex and quite quaffable. The full bready and lightly caramel malt support a rather assertive hop character that is flavorful with a pleasing lingering bitterness. Finishes crisp and clean, leaving the palate ready and waiting for another sip. An excellent session ale. (8/10)

Total Score: (40/50)

Aroma: Slight graininess/huskininess up front, with a hint of woody notes that may have come from the barrel aging. Toasted and caramel notes from the malt are low-medium in intensity. I also get an earthiness that may be from aging in wood rather than from English hops. Medium fruitiness from pear and apple esters. (10/12)

Appearance: Copper color with a white head that has very good retention and tightly beaded bubbles. Brilliant clarity speaks to a well-conditioned beer. (3/3)

Flavor: The soft malt backbone comes through early and stays late, permeating in the background as other flavor components emerge. Pleasant toasted notes, with hints of toffee and caramel. Moderately high hop bitterness—more than most British examples, but not out of place in a West Coast interpretation of this style. I pick up some oak and vanilla notes that speak to the aging process. Light fruit esters and some alcohol notes add to the complexity. (18/20)

Mouthfeel: Alcoholic warmth is more evident than in most examples of the style, and there are some lingering tannins that are not a huge distraction, but would be more appropriate in the wood-aged category. (4/5)

Overall Impression: This is a well-balanced beer with a solid malt backbone, a moderately bitter finish, and complexity from the fermentation and wood-aging. As noted above, it would perhaps be more appropriate in the wood-aged category, but it is still an excellent example of the base English pale ale style. This is one case where I think a little flexibility in scoring is warranted since the style was traditionally aged in wood. (9/10)

Total Score: (44/50)

Aroma: Earthy, woody, floral hops—moderately strong. Bready malt in background with light fruit. Faint alcohol notes—a bit strong. Hops dominate nose, but there is plenty of interesting complexity. Some fresh, lightly grassy hop notes develop. Hops stay prominent over time. Light sulfur notes. (10/12)

Appearance: Beautiful amber color. Crystal clear. Moderate-sized ivory-colored head, retained well. Effervescent—unusual. (3/3)

Flavor: Balanced malt and hop flavors with bitterness asserting itself in the finish and lingering into the aftertaste. The hops have a woody, earthy flavor. Dry-ish finish but rather full. Lightly fruity. Moderate flinty, sulfury flavors—water? Yeast? Generally clean and well-fermented. Bready malt typical for UK beers, nice. As it warms, toffee and light caramel flavors develop—tasty. (16/20)

Mouthfeel: Medium body with a creamy aspect, almost as if from a nitro pour. High carbonation is unusual for a UK style beer. Some astringency apparent in aftertaste. Comes off as rather heavy for the style, and a touch big/warming. (3/5)

Overall Impression: A substantial beer. Fresh but rather big for the style with a heavy mouthfeel (creamy and tannin notes) and high carbonation. Alcohol a touch forward. Great hop and malt flavors. Has a Burton-like mineral flavor with sulfur prominent. Very English, just a bit big and overcarbonated for the style. I would have scored this maybe 3 points higher as a strong bitter. (7/10)

Total Score: (39/50)



THE JUDGES' SCORES FOR UPLAND KIWI LAMBIC



Aroma: Moderately high fruity aroma, not necessarily associated with kiwi. Some lactic and acetic acids and medium to low horsey-barnyard notes from Brettanomyces. Alcohol noticeable. Some earthy, woody character, perhaps from aging on oak. No hop aroma—OK. Malt aroma doesn't stand out beyond the acidity and Brett. Kiwi is not as distinguishable as other fruits such as raspberry and strawberry. (9/12)

Appearance: High effervescence with head that dissipated altogether very quickly. Very hazy, verging on cloudy. While haze is expected from a wheat-based ale, this is over the top. Orange color—almost like orange juice—OK but the cloudiness makes this appear darker than it would otherwise. (1/3)

Flavor: Intense lactic and acetic sourness with high fruitiness of pears, apples, and of course kiwi. Malt character is low, overwhelmed by the acidity. No hop flavor—OK. Low hop bitterness—OK. Slight diacetyl—OK. No DMS. Fruitiness turns into buttery, pear/peach-like notes as the beer warms. Some Brettanomyces but less than aroma. There's a hint of coconut, often an oxidation byproduct. Dry finish. This beer reminds me of Sour Patch candy. (16/20)

Mouthfeel: Medium-light body. Smooth mouthfeel with some rough edges due to acidity. Moderate alcohol warming. (4/5)

Overall Impression: An interesting interpretation of lambic style. Kiwi isn't as distinctive as other fruit; however the fruitiness is very evident. The aging, bugs, and fruit have yielded a complex lambic that is refreshing and intriguing. The sourness is a bit heavy and could be better balanced with additional Brett and wheat character. (7/10).

Total Score: (37/50)

Aroma: Sharp, tart acidity is strong up front, with Bartlett pear, extremely ripe peach esters, and fruit; light notes of ripe strawberry with a hint of vanilla in the background. No hop aroma. Grainy graham malt is subdued in the background. A bit of earthy, horsey-ness is present as well. (8/12)

Appearance: Pale yellow and hazy; an off-white foam rises to two-thirds of the glass and persists as a moussy layer to the end. (3/3)

Flavor: Fruit acidity dominates overall flavor initially, with pronounced tartness; graham and bready malt in the back; a hint of cinnamon emerges midway, then fades. No hop flavor; the fruit acidity replaces hop character. Fruit presents with mix of ripe pear, ripe peach, and strawberry, all characteristic of a ripe kiwi fruit. Comes across all fruit and tart, but hints of vanilla hang in the finish, giving evidence of the oak. (15/20)

Mouthfeel: Medium light bodied with soft carbonation, and a sharp, mouthwatering acidity like that of tartaric acid, which lingers long after the finish. A bit of alcohol warmth intensifies the sensation. (4/5)

Overall Impression: The intensity of the tartness masks the fruit character a bit, so that it comes across more like not-quite-ripe strawberry than distinctly kiwi fruit. The combination is unexpected. The oak character is rather subdued, dominated by the fruit acidity. When paired with brie and toasted almonds, the malt comes forward to balance. This lovely beer seems meant for serving with food. (7/10)

Total Score: (37/50)

Aroma: The initial aroma has the leathery, corky, and musty notes produced by the Brettanomyces yeast found in many traditional lambics. Some sourness, but it has more of a citrus character than lactic. A hint of soft earthiness from the kiwi. (9/12)

Appearance: Quite hazy, even for a lambic, although this might have improved with a little cellaring to let the beer settle down after shipping. The amber color is appropriate and would probably not be modified by the kiwi. Low head retention is acceptable. (2/3)

Flavor: The initial burst of sourness was a little unexpected given the fairly modest aroma. Acetic acid dominates the lactic acid, lending a pungent character and lingering sourness to the finish. Light wheat malt character in the background, but the balance is on the fermentation components. The kiwis are a bit overwhelmed and are not detectable in the flavor. Low to moderate earthy notes, but a little more complexity from the Brettanomyces would be welcome. The finish is on the dry side, but within the range expected for a lambic. (15/20)

Mouthfeel: The carbonation is low, OK for this style. Some tannins and a mouth-puckering sourness linger long after the beer is swallowed. There is a lingering, burning harshness from the acetic acid. (3/5)

Overall Impression: A good interpretation of the lambic style, though it's not quite as polished as the classic examples from Belgium. There are some of the traditional flavor and aroma components, but the balance is tilted a little too strongly toward acetic acid. This overwhelms some of the more subtle flavor components, such as the interesting woody and earthy notes that are in the aroma. (7/10)

Total Score: (36/50)

Aroma: Pungent: acidic, oaky, and estery. Definite lambic character—has some Brett funk and a touch of acetic. The fruit component grows as it warms. Not readily identifiable as kiwi but more than just yeast. (10/12)

Appearance: Tall, frothy, head; settled quickly; off-white in color. Medium yellow color. Hazy/cloudy—unattractive. (2/3)

Flavor: Strongly acidic flavor, moderate fruit—again, not really getting kiwi. Low bitterness. Light vinegar finish. Light oak flavor. Fruit flavor grows as it warms, and is sort of peach-like. Kiwi is hard to pinpoint. Interesting Brett complexity. Fruit gives a bit of body and flavor that tempers the acidity slightly in the finish. (16/20)

Mouthfeel: Moderately-high carbonation—could be higher. Medium body—kind of heavy. Very tart. Some oaky astringency. (3/5)

Overall Impression: Nice complexity in the acidity but the fruit gets a bit buried. Hard to identify kiwi as such. Definitely has fruit. Oak is balanced; nice job not overdoing it. A touch vinegary. Aggressive sourness—a bit easier to take when warm. Body seems heavy and carbonation could be higher. Nice job for an American beer. Better as it warms. (8/10)

Total Score: (39/50)



Rosemary Pale Ale



For beer recipes, I take much inspiration from beers I've actually tasted around the world. This homebrew recipe resulted from an exceptional taste experience at the Brewers Association's SAVOR event a few years ago in Washington, D.C. A rosemary-infused IPA, called Rosemary Swamp Fox IPA, exposed itself to me. Actually the brewmaster himself poured me a glass of "you gotta try this, Charlie." At first I thought I was experiencing a new hop character in the aroma and flavor, but instead it was the delicate character of fresh rosemary.

John Pinkerton, owner and brewmaster of the Moon River Brewing Company in Savannah, Ga., found inspiration while walking by rosemary plants in his garden one morning on the way to work. Well, maybe it wasn't on the way to work, but it makes for a better story. John tinkered with the amount in his brewhouse. I have tinkered with the amount in my homebrewery and in my mind. This recipe is a transformation of sorts, calling for a light touch of rosemary while exploring the direction of an "Oat IPA."

Overdoing the rosemary will, well, make your beer taste more like rosemary. That's not necessarily a bad thing, but not what

Delirium Oat Rosemary Pale Ale

ALL GRAIN RECIPE

INGREDIENTS

for 5.5 U.S. gallons (21 liters)

- 8.0 lb** (3.6 kg) Maris Otter pale malt
 - 1.0 lb** (454 g) English crystal malt (10 L)
 - 1.0 lb** (454 g) quick oatmeal/ quick oats
 - 8.0 oz** (225 g) Belgian aromatic malt
 - 1.75 lb** (795 g) agave extract syrup
 - 0.25 oz** (7 g) Amarillo hops, 9.5% a.a. (2.4 HBU/66 MBU) (60 min)
 - 0.25 oz** (7 g) Columbus hops, 14.5% a.a. (3.6 HBU/101 MBU) (30 min)
 - 0.25 oz** (7 g) Simcoe hops, 14% a.a. (3.5 HBU/98 MBU) (30 min)
 - 0.5 oz** (14 g) Cascade hops 5% a.a. (2.5 HBU/70 MBU) (30 min)
 - 0.25 oz** (7 g) Amarillo hops (10 min)
 - 0.25 oz** (7 g) Columbus hops (10 min)
 - 0.5 oz** (14 g) Simcoe hops (10 min)
 - 0.5 oz** (14 g) fresh cut stem-end rosemary, dry "herbing"
 - 0.25 oz** (7 g) Nelson B Sauvignon hop pellets (dry hop)
 - 0.25 oz** (7 g) Citra hop pellets (dry hop)
 - 0.25 oz** (7 g) Columbus hop pellets (dry hop)
 - 0.25 tsp** (1 g) powdered Irish moss
- Your favorite ale yeast (I use White Labs Cry Havoc)
- 0.75 cup** (175 ml) corn sugar (priming bottles) or 0.33 cup (80ml) corn sugar for keging

- Target Original Gravity:** 1.063 (16 B)
- Target Extraction Efficiency:** 79%
- Approximate Final Gravity:** 1.016 (4 B)
- IBU's:** about 44
- Approximate color:** 11 SRM (22 EBC)
- Alcohol:** 6.5% by volume

DIRECTIONS

A step infusion mash is employed to mash the grains. Add 9.5 quarts (9 liters) of 140° F (60° C) water to the crushed grain (but not the oatmeal and 1 cup of pale malt), stir, stabilize, and hold the temperature at 132° F (53° C) for 30 minutes. Add quick oatmeal and 1 cup crushed pale malt to 6.25 quarts (4.5 liters) of water and bring to a boil. When malt mash has finished its 30 minute rest, add the boiling hot "oatmeal" water to the mash and add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Raise temperature to 167° F (75° C), laut and sparge with 3.5 gallons (13.5 liters) of 170° F (77° C) water. Collect about 5.5 gallons (21 liters) of runoff. Add 60-minute hops and agave syrup and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 30 minutes remain, add the 30-minute hops. When 10 minutes remain, add the 10-minute hops and Irish moss. After a total wort boil of 60 minutes, turn off the heat and place the pot (with cover on) in a running cold-water bath for 30 minutes. Continue to chill in the immersion or use other methods to chill your wort. Strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5.5 gallons (21 liters) with additional cold water if necessary. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets and rosemary for dry hopping. If you have the capability "cellar" the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

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Delirium Oat Rosemary Pale Ale

MASH/EXTRACT RECIPE

INGREDIENTS

for 5.5 U.S. gallons (21 liters)

- 5.5 lb** (2.5 kg) very light malt extract syrup or 4.4 lb (2 kg) very light DRIED malt extract
 - 1.0 lb** (454 g) English crystal malt (10 L)
 - 8.0 oz** (225 g) quick oatmeal/quick oats
 - 8.0 oz** (225 g) Belgian aromatic malt
 - 1.75 lb** (795 g) agave extract syrup
 - 0.75 oz** (21 g) Amarillo hops 9.5% a.a. (7.1 HBU/200 MBU) (60 min)
 - 0.25 oz** (7 g) Columbus hops 14.5% a.a. (3.6 HBU/101 MBU) (30 min)
 - 0.25 oz** (7 g) Simcoe hops 14% a.a. (3.5 HBU/98 MBU) (30 min)
 - 0.5 oz** (14 g) Cascade hops 5% a.a. (2.5 HBU/70 MBU) (30 min)
 - 0.25 oz** (7 g) Amarillo hops (10 min)
 - 0.25 oz** (7 g) Columbus hops (10 min)
 - 0.5 oz** (14 g) Simcoe hops (10 min)
 - 0.5 oz** (14 g) fresh cut rosemary, dry "herbing"
 - 0.25 oz** (7 g) Nelson B Sauvignon hop pellets (dry hop)
 - 0.25 oz** (7 g) Citra hop pellets (dry hop)
 - 0.25 oz** (7 g) Columbus hop pellets (dry hop)
 - 0.25 tsp** (1 g) powdered Irish moss
- Your favorite ale yeast (I use White Labs Cry Havoc)
- 0.75 cup** (175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for keging

Target Original Gravity: 1.063 (16 B)
Target Extraction Efficiency: 79%
Approximate Final Gravity: 1.016 (4 B)
IBU's: about 44
Approximate color: 11 SRM (22 EBC)
Alcohol: 6.5% by volume

DIRECTIONS

Heat 2 quarts (2 liters) water to 172° F (77.5° C) and add crushed grains and quick oats to the water. Stir well to distribute heat. Temperature should stabilize at about 155° F (68° C). Wrap a towel around the pot and set aside for about 45 minutes. Have a homebrew.

After 45 minutes, add heat to the mini-mash and raise the temperature to 167° F (75° C). Pass the liquid and grains into a strainer and rinse with 170° F (77° C) water. Discard the grains.

Add more water to the sweet extract you have just produced, bringing the volume up to about 2.5 gallons (9.5 liters). Add malt extract, agave syrup, and 60 minute hops and bring to a boil.

The total boil time will be 60 minutes. When 30 minutes remain, add the 30-minute hops. When 10 minutes remain, add the 10-minute hops and Irish moss. After a total wort boil of 60 minutes, turn off the heat. Immerse the covered pot of wort in a cold water bath and

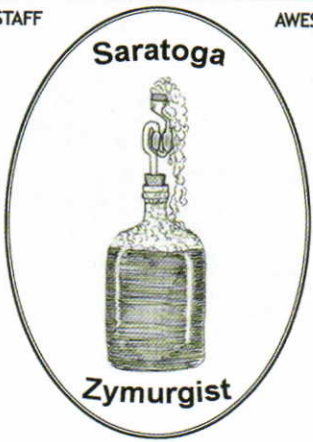
let sit for 15-30 minutes or the time it takes to have a couple of homebrews.

Strain out and sparge hops and direct the hot wort into a sanitized fermenter to which 2.5 gallons (9.5 liters) of cold water has been added. If necessary add cold water to achieve a 5.5-gallon (21-liter) batch size. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets and rosemary for dry hopping. If you have the capability "cellar" the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

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I'm aiming for. The goal is a definitive hint of rosemary that might be mistaken for an exotic hop character. With "oatmeal" I'm expecting a hazy brew while exploring the mouthfeel and nuances that oats might create in a pale ale. More body and mouthfeel? Perhaps, but then why am I using quite fermentable agave syrup in the recipe to lighten the body and add a touch of caramel character? Maybe it's because I'm delirious? The IPA got converted in my mind from Moon River's hoppy IPA to a hop flavored/aromatic pale ale.

So there you have it. It's a simple story for an exotic brew (or is it an exotic story that should have been a simple brew?). Delirium Oat Rosemary Pale Ale will pair well with sessions of beer enjoyment and conversation or, as you might imagine, some great culinary adventures.

Let's cut the shuck and jive and get on with the recipe.

Charlie Papazian is founder of the American Homebrewers Association and author of *The Complete Joy of Homebrewing*.

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Annual Brew-a-Thon Campout

Camping out in the middle of December? While some of our northern brothers and sisters are cooling their kettles in snow banks, down here in Florida it's the perfect time of year to be outside, with temperatures in the 70s, clear skies, and most of the mosquitoes hibernating. What could be more fun than brewing beer by firelight at the campground?

The Tampa Bay Brewing Enthusiasts Enjoying Real Suds (BEERS) started our third annual marathon brewing session at 9 p.m. on December 17, 2010 at the Sertoma Youth Ranch near Dade City, Fla., and had continuous tag-team brewing sessions until after 10 p.m. the following night. By the time we had finished, more than 13 people had brewed over 85 gallons of 12 different styles using 11 different brewing systems. From using simple extract gear with buckets and screens to a shiny 20-gallon brewing sculpture, we took turns making beer for over 24 hours. Burners were going continuously and of course beer flowed for the duration. Homebrew and commercial Christmas beers were served from the taps on the side of our custom beer trailer.



A communal "stone soup" beer was made with each participating brewer adding a secret ingredient of his or her choice. It turned out to be a kind of smoky, hoppy amber ale spiced with sassafras root.



I brought my cold smoker and smoked both malt and hops over pecan wood for anyone interested in adding a little smoke flavor to his or her beer. Geoff Hall made his now (nearly) famous Toasted Marshmallow Stout, throwing several pounds of flaming marshmallows fresh off the campfire into the boiling wort.

The party continued into Saturday evening with a cook-out of ribs, chicken, and pork purchased with club funds, and entertainment from our own club band, Hot Karl and the Shrimpers—none of whom is Karl, a shrimper, or hot for that matter. They do have fun, though, and it's nice to be able to mosey just a few feet from the festivities to the campsite for some R&R under the southern stars. One of the campers set up a video screen between two oak trees and showed interesting if not unusual videos throughout the night.

Another highlight of the 2010 Brew-A-Thon was a visit from the Mikkeller brewers who were in town from Denmark to make a collaborative batch with our local Tampa brewery, Cigar City. They were

impressed with the idea of camping in December and even considered joining us in 2011.

Tampa Bay BEERS sponsors and organizes the Best Florida Beer Championships (BFBC) in February each year with the help of our sister club, the Dunedin Brewers Guild. This Brew-a-Thon helps get us into the spirit of brewing after the long, hot Florida summer. Bags of malt are donated by our local homebrew supply stores, Southern Brewing Supply, Booth's, and Bootleggers. The club offers to pay the entry fee for any beer brewed at the campout into the upcoming BFBC competition.

By the time you read this, the fourth annual Brew-a-Thon Campout will be in the books. It's a fun weekend and a nice way for us to get to know our fellow brewers in a relaxed, outdoor setting—even if it is in the middle of December.

Jeff Gladish is an award-winning homebrewer and a member of the Tampa Bay BEERS homebrew club. 🍷

It was exciting to collaborate on creating an entirely new style of beer, a champagne-like beer that uses only the traditional ingredients and brewing process.

Jim Koch

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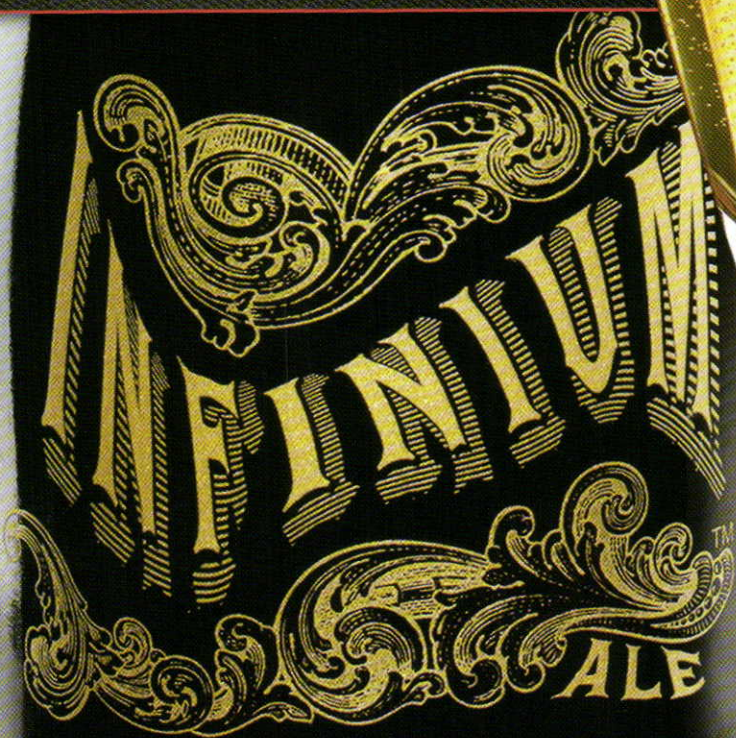
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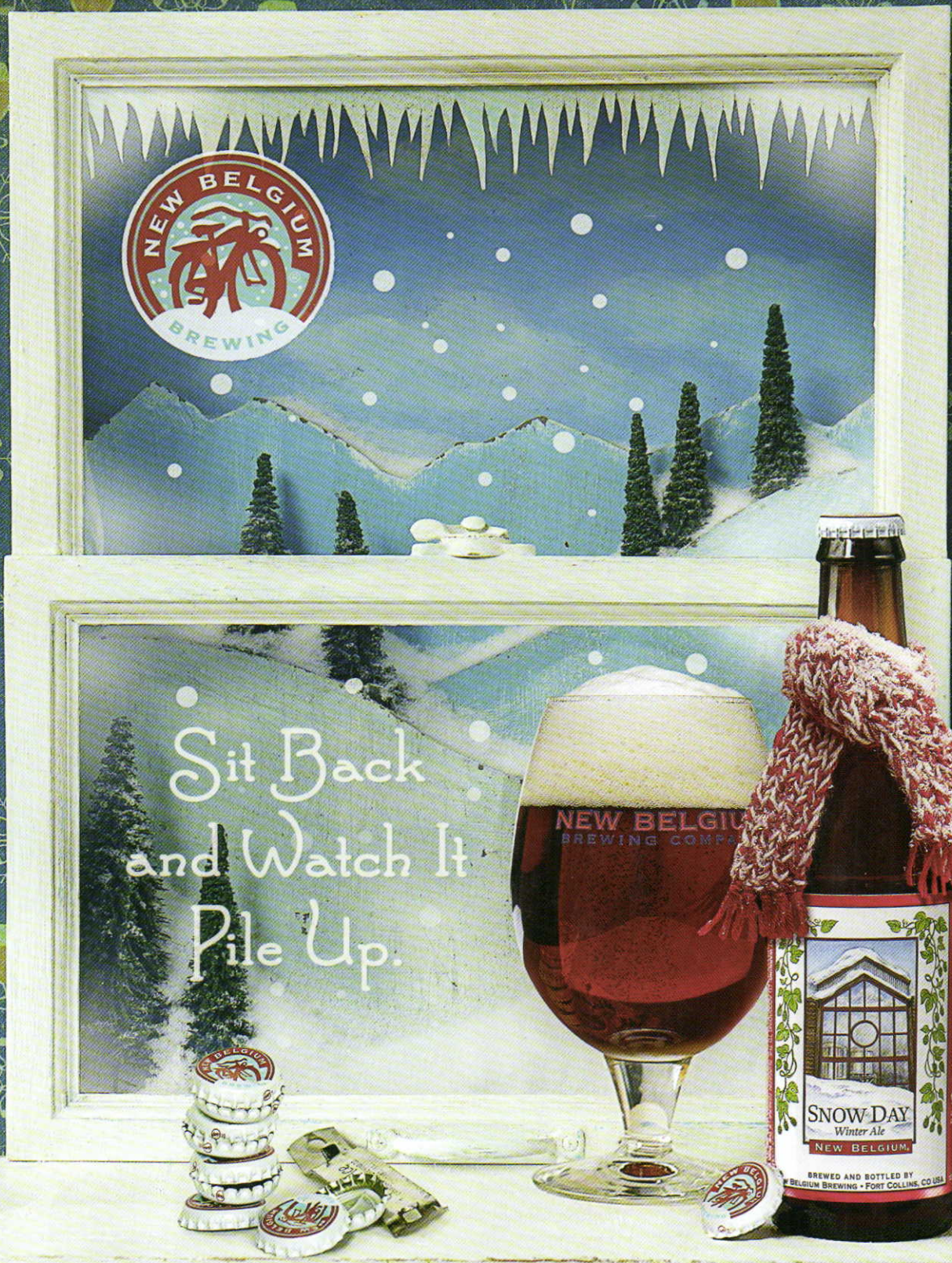
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