

Quintessential Quality

Taking care of details

Michael J. Lewis

University of California Davis Extension

Davis CA.



GRAY MATTER JEFFREY P. KAHN

ANDERS NILSEN

How Beer Gave Us Civilization

Definitions of quality

Two broad categories:

Essential property or attribute

and so meeting specifications

Grade of excellence or fineness

and so high on a scale of judgment

And maybe an ill-defined third idea:

Special, apart, transcendent, superior.

Definitions of quality

Two broad categories:

Essential property or attribute **QC**

and so meeting specifications

Grade of excellence or fineness **QA**

and so high on a scale of judgment

And maybe an ill-defined third idea: **QQ**

Special, apart, transcendent, superior.

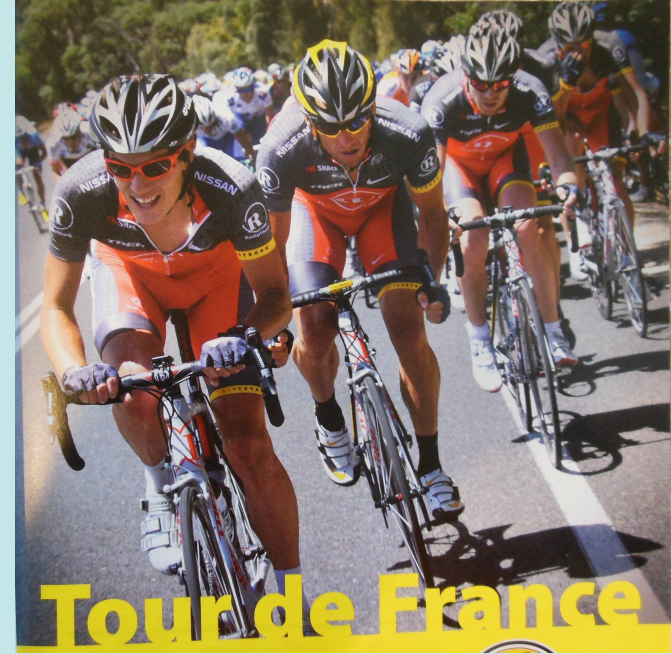
Quality

- **QC** = Quality Control
- Narrow focus.
- Product specifications.
- Go:no-go for product release
- Gatekeeper
- Analysis
- Chemistry



Quality

- **QA** = Quality Assurance
- Broader focus than QC
- Factors impinging on product
- Environment of production
- Overseer
- Inspection
- Architecture



Quality

- **QQ** = Quintessential Quality
- The broadest view
- The product in the world
- All aspects
- God-like!
- Religion/Philosophy



Some elements of **QQ**

- **Serving the drinking public**

QQ Sensitivity to customer needs and development





QQ Sensitivity to customer needs and development



On the ale trail

How do you get to the heart of the craft brew craze? Go taste at the source.

BY NINO PADOVA | PHOTOGRAPHS BY JAKE STANGEL

“YOU GUYS THIRSTY?” Before we can answer, a hand yanks the tap and fills two tasting cups with an orangey golden ale. I’d been warned about this. *Lagunitas pours heavy*, enough people told me that we made it our first stop. Sneak a quick tour, then get back on the road. That was the idea. But here we are, early on a Friday afternoon, two guys in cargo shorts and T-shirts far away from the frenzy of our daily lives. Yeah, we’re thirsty.

Counties, home to some of the most exciting beermaking on the planet. We’d slip through wine country’s back door to taste toasty lagers, mouth-puckering sours, stouts the color of crude oil, and the West’s signature brew, the hoppy India Pale Ale. Bud country this was not.

There was, of course, the matter of the car. My 2004 Toyota Corolla with its Cheerios-encrusted car seat wasn’t fit for the occasion. So we rented the biggest, loudest ride we could find, a bright orange

Cloverdale



Bear Republic Brewing

Healdsburg

101




Russian River Brewing

Santa Rosa

»» While craft brews are all the rage, I'm waiting for someone to stand up and say that some, if not many, are nearly undrinkable. Just because a beer comes from a quaint brewery doesn't mean it's good. Granted; there are phenomenal craft brews, but let's stop worshipping at the altar of micro-breweries without separating the wheat from the chaff. For me, sometimes a fresh, ice-cold bottle of Bud hits the spot like nothing else. —**RICK BIRLE, LAKE FOREST, CA**

QQ Sensitivity to customer needs and development



IBD **Brewer & Distiller**
INSTITUTE OF BREWING & DISTILLING VOLUME 9 • ISSUE 3 • MARCH 2013 **INTERNATIONAL**

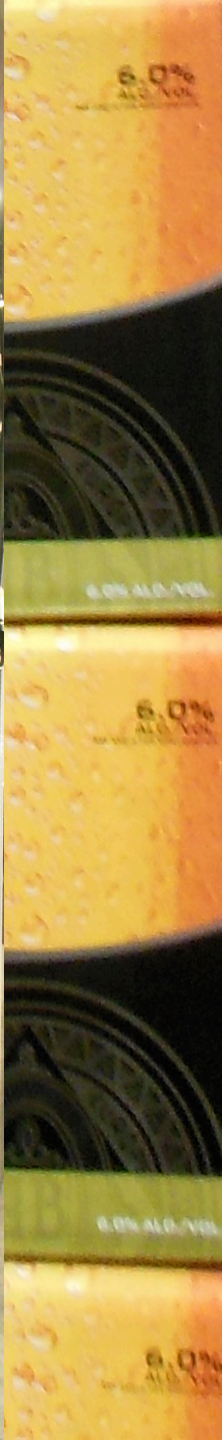
Scottish and English lagers

More and more UK micro brewers are dusting off their lager recipes and embracing the tastes of perhaps three quarters of the population who prefer paler more delicate beers. The Inveralmond Brewery in Perth has a 4.8%ABV Czech-style Sunburst Pilsner and is investing a six-figure sum to put in three more maturation vessels and its own kegging line.

South of the border in deepest Suffolk, St Peter's Brewery has launched an English Lager at 5.2%ABV and in its now famous oval bottles and 30L kegs.







FOR THE **HOMEBREWER & BEER LOVER**

zymurgy®

The Journal of the American Homebrewers Association®

IT'S ALL IN THE DETAILS:

Crafting a Quaffable Brew

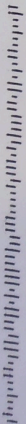


IT'S ALL IN THE DETAILS:

Crafting a Quaffable Brew

*****SCH 5-DIGIT 95616
 24949
 S307 P9

 90000206 LIFETIME
 MICHAEL LEWIS
 731 LAKE TERRACE CIRCLE
 DAVIS CA 95616-2749



19

BEERS
YOU
CAN
BREW

Grätzer:
A Polish
Tradition

YEAST
OFF
FLAVORS

Brewing
SMaSH
Beers

PLUS: CHARLIE'S ODE TO HOPS



A Publication of the American Homebrewers Association

www.HomebrewersAssociation.org

50 US / \$8.00 CAN

QQ Sensitivity to customer needs and development

Adventures & escapes to the extreme



QQ Listening to the murmurs

- Are we slicing the market too thin?
- Are there too many alike beers?
- Is there a new departure?
- Are there other drinkers to serve?
- What about a transition beer?
- Or a training beer?
- Should it be a lager?



QQ Lagers
offer plenty of
scope:

Flavorful

Delicious

Elegant

Smooth

Balanced



5-hl volume
House Brew

Some elements of QQ

- Serving the drinking public
- **Serving the product**

brewers association
**draught beer
quality manual**

QQ demands doing the best for consumers and the beer.

QQ demands excellent presentation in all ways

QQ requires the brewer to be present when the drinker drinks his beer

QQ responsibility does not end when the beer leaves the dock

Prepared by the
Technical Committee of
the Brewers Association
April 2009





QQ The glass is part of the pint





**IT'S A
CHALICE,
NOT A
GLASS.**



She is a thing of beauty

ALWAYS ENJOY RESPONSIBLY. ©2011 Anheuser-Busch, Inc. St. Louis, MO. Stella Artois® Beer, Imported by Import Brands Alliance, St. Louis, MO.



Heineken Launches New Bottle.

By Beth Greenfield, Shine Staff | Shine Food - Fri, Mar 8, 2013 3:10 PM EST



photo composite: Heineken





PREMIUM QUALITY

Chang

BEER

THAILAND'S NUMBER 1 BEER

IMPORTED

PRODUCT OF THAILAND

Some elements of QQ

- Serving the drinking public
- Serving the product
- **Serving the brewer**

**CRAFT BREWING
INSURANCE FOR
OVER 20 YEARS**

**MICROBREWERIES
AND BREWPUBS**

PROPERTY | GENERAL LIABILITY
WORKERS COMPENSATION | LIQUOR LIABILITY
AUTO | EQUIPMENT BREAKDOWN



Northampton MA 800.235.0355
www.breweryinsurance.com



QQ Remember the dark side!

- Unusual processing brings
- Unusual risks
- Are all the bases covered?
- Is everything under control?
- If it can go wrong
- It will go wrong
- Product integrity required.

QQ The dark side!

- **Bottles can gush or even explode**

QQ Product safety

The maximum pressure p able to accumulate in a closed bottle full of standard strength beer as a function of the CO_2 concentration c and the temperature t can be calculated as follows:

$$p = \frac{c}{\lambda} = \frac{c}{10 \cdot e^{(-10.738 + \frac{2618}{273+t})}}$$

Given a standard strength beer with a CO_2 concentration of 5.2 g/l, the equilibrium pressure for a temperature of 30 °C would be calculated as follows:

$$p = \frac{c}{\lambda} = \frac{5.2 \text{ g/l}}{10 \cdot e^{(-10.738 + \frac{2618}{273+30})}} = 4.2 \text{ bar abs.} = 3.2 \text{ bar g}$$

The obligation to monitor one's own products requires beverage packagers to recognize the possible dangers inherent in their products, and to be prepared to take the appropriate measures without hesitation to avert any danger, even if it means carrying out a costly product recall. In the

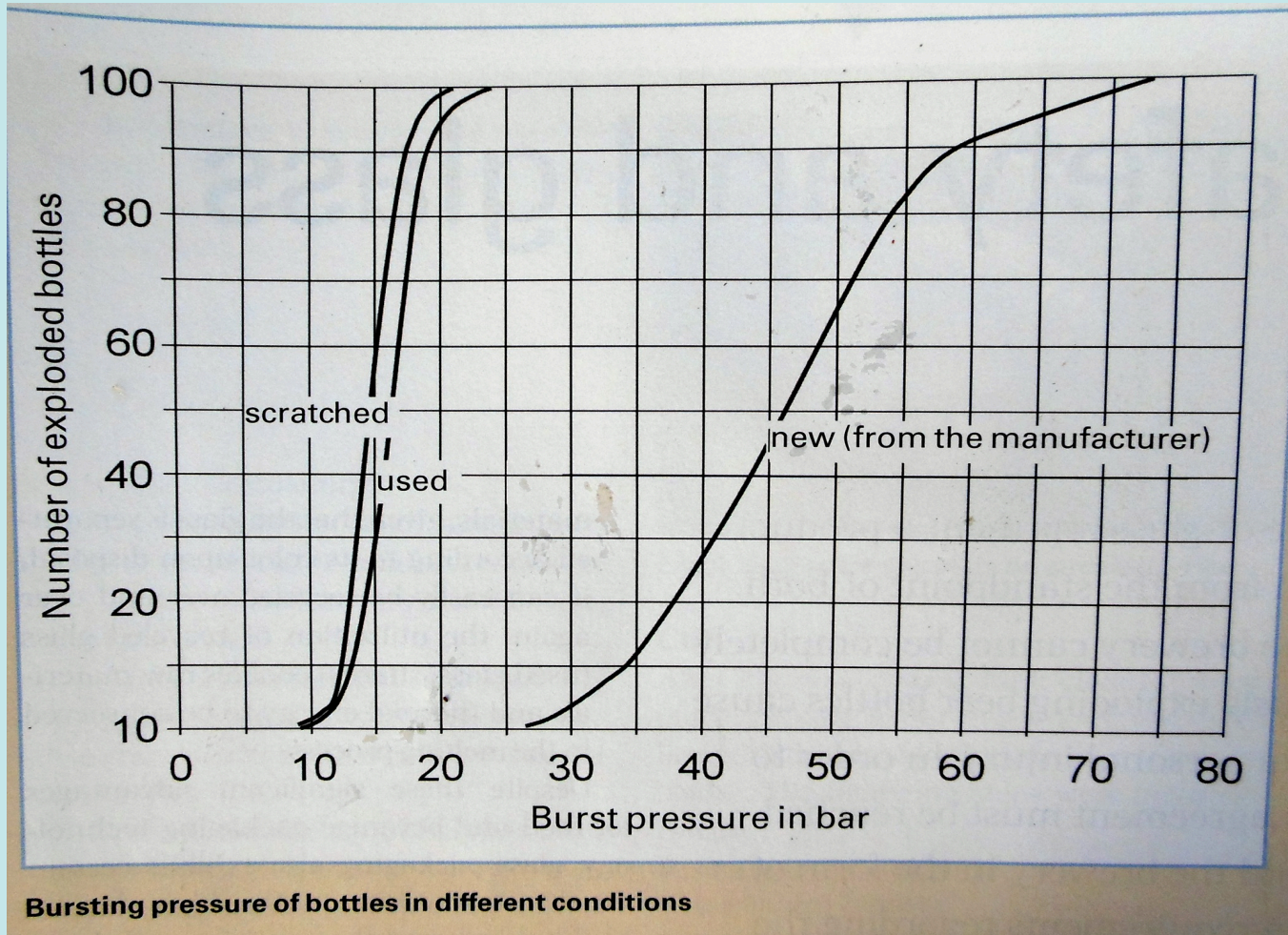
nology
ments
operati
Clai
a violat
pertain
try. It i
handle
they are
solutely
original
enter th
transfer
able. Su

A typ
gration
PET, wh
natural
centric
plasticize
or DINC
acid diiso

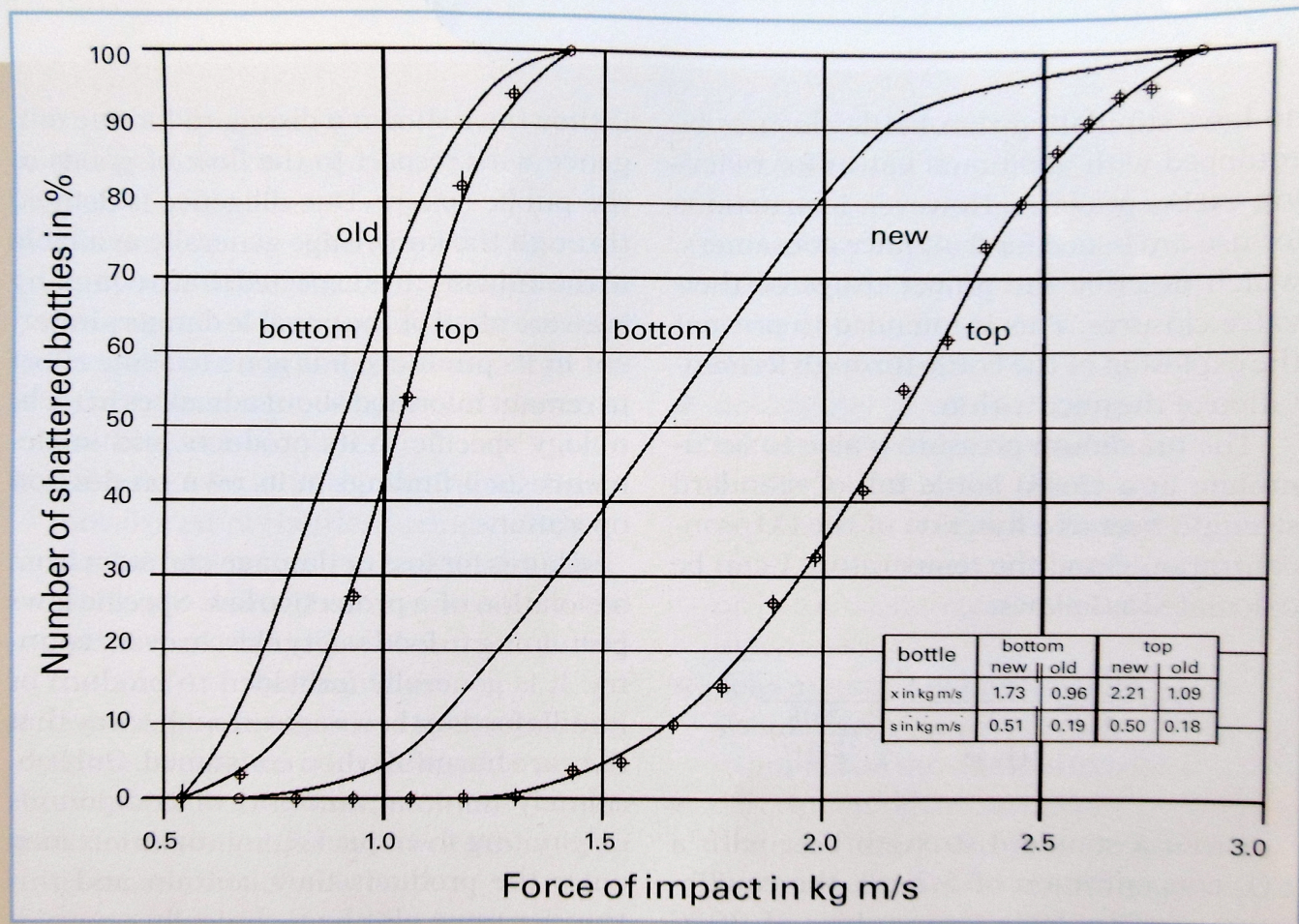
Calculating the pressure of ordinary beer in a bottle at ordinary temperature

= about 50 psig

QQ Product safety



QQ Product safety



Impact resistance of bottles

QQ Product safety

- Assure:
- Ferment out (attenuate) fully (lab value)
- Leave no residual fermentables or...
- Control/Avoid *adding* residual fermentables
- Control/Avoid yeast in the bottle (hold)
- Discard compromised bottles

QQ The dark side!

- Bottles can gush or even explode
- **Contaminated with microbes (sour)**
- **May have inclusions of any sort**
- **Beers may cause allergies (wheat)**

QQ Lightening the dark side

- Rigorous development of product SOPs
- Rigorous attention to detail
- Fully ferment out (attenuate) the beer
- Critical analyses
- Coding bottles, cans and kegs
- Keeping clear and complete records

Some elements of QQ

- Serving the drinking public
- Serving the product
- Serving the brewer
- **Serving the brewery**

QQ The dark side!

- Bottles can gush or even explode
- Contaminated with microbes (sour)
- May have inclusions of any sorts
- Beers may cause allergies
- **And cause intoxication (!!)**

QQ Reasonable sobriety



BIZARRO by Dan Piraro

BIZARROCOMICS.COM Facebook.com/BizarroComics

© Dan Piraro
3-20-13

© 2013 King Features

Nine dollars
for a beer?

Sorry, pal. It's
Crappy Hour.





QQ. Three pints of 6.5% ABV beer is equivalent to a whole bottle of full strength red wine.

Rough calculation:
 $(OG^* - PG^{**})/2 \times 5/4 = \%ABV$

*OG = °P of wort

**PG = °P of beer

5/4 converts %ABW to ABV

Then for example:

$$(15^{\circ}P - 5^{\circ}P)/2 = 5\% \text{ ABW} \\ = 6.25\% \text{ ABV}$$

QQ = Alcohol content of beer

Rule of thumb calculation

2.0665 grams of fermentable extract in wort yields:

1.000 gram or 1.267 ml of alcohol in finished beer

PG or Apparent Extract($^{\circ}$ P)** x 0.81 = Real Extract($^{\circ}$ P)

Density of alcohol is 0.789g/ml. **Then:**

OG $^{\circ}$ P of wort minus (PG $^{\circ}$ P of beer x 0.81)**

= % Extract fermented

% Extract/2.0665 = %ABW x 1/0.789 = %ABV

OR %Extract/2.0665 x 1.267 = %ABV

** Hydrometer reading in beer

QQ = Alcohol content of beer

Rule of thumb calculation

2.0665 grams of fermentable extract in wort yields:

1.000 gram or 1.267 ml of alcohol in finished beer

Apparent Extract(°P)** x 0.81 = Real Extract(°P)

Density of alcohol is 0.789g/ml. **Then:**

$$15^{\circ}\text{P}_{\text{wort}} - (5^{\circ}\text{P}^{**}_{\text{beer}} \times 0.81) = \%10.95 \text{ (}^{\circ}\text{P-fermented)}$$

$$\% 10.95/2.0665 = 5.3\% \text{ ABW} \times 1.00/0.789 = 6.7\% \text{ ABV}$$

$$\text{OR } \% 10.95/2.0665 \times 1.267 = 6.7\% \text{ ABV}$$

(compared to 6.25%ABV by rough calculation)

** Hydrometer reading of finished beer

LIBATIONS
Pump
Up the
(Alcohol)
Volume.

Cold-brewing is for wimps. Freeze-distilling makes beer as strong as vodka

BY SEAN GREGORY

THANKS TO A WAR BETWEEN European brewing companies, it's never been easier to catch a quick beer buzz. In November, BrewDog, a Scottish microbrewery, released a beer that set a new record by weighing in at 32% alcohol by volume (ABV)—more than six times as strong as familiar domestic brands like Budweiser. The beer, dubbed

Tactical Nuclear Penguin, is fermented at an ice cream factory at temperatures as low as -6°C (21°F) for 21 days. Because alcohol freezes at lower temperatures than water, BrewDog can increase its beers' alcohol concentration by freezing them and then removing excess water during the brewing process.

The drinking games ramped up in February when a German brewer, Schorsch-

bräu, released a Schorschbock that is 40% ABV—about the same as most vodkas. The BrewDog boys fired back a few weeks later with a beer called

corruption in modern politics can learn from this book what pikers we are, compared with our forebears, at such venality.

Okrent, the first public editor of the *New York Times* (and—disclaimer—an editorial adviser to Time Inc.), is the author of *Great*

High alcohol craze? eg Nuclear Penguin

Prohibition proved that if alcohol demoralized American society, outlawing alcohol was even worse



TASTE TEST

Tactical Nuclear Penguin and Sink the Bismarck! taste like hard alcohol

QUALITIES

Smoky, with a bitter, beery aftertaste. Plus an urge to cry



Caveat Drinker

See what it's like to sip freeze-distilled beer at time.com/brewdog

Don't chug it Tactical Nuclear Penguin, a 32%-alcohol-by-volume beer, comes with its own stopper



Stocking up Lines at a Detroit liquor store the day before the ban took effect

If you didn't know these were
beers and **alcoholic** you would
not easily know from the label







California
CONDÉ
ALE

CERTIFIED ORGANIC

5.8% Alcohol by vol.

FEELE RIVER BREWING COMPANY INC. •

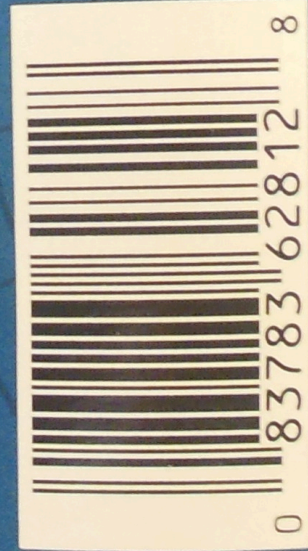


Certified Organic by CCOF • www.ccof.org

CA CRV DEP CT, DE, HI, IA, MA, ME, NY, OR, VT

*where the annual fall hop harvest is
no easy task: We get fresh hops from the
world and into our brew kettle.
North-by-South fusion of fresh
North American malts. Its
citrus, and fru*

ALC. 6.7% BY VOL.



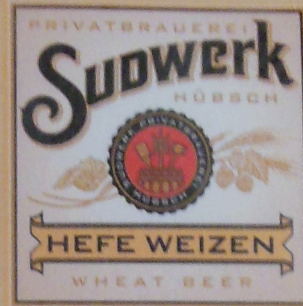
0 83783 62812 8

CT, IA, M
GOVERNMENT
SHOULD NOT
RISK OF BIRTH D
ABILITY TO DRIV

Award-winning Microbrews



Light in color but rich in character. Sudwerk's Pilsner is brewed with pale two-row malt and Hallertau and Tettnang hops of the highest caliber. Pale straw in color, malty, with an elegant bitterness and fragrant hop aroma.



Sudwerk Hefe Weizen is a truly authentic, unfiltered, Bavarian style wheat beer. This top fermenting yeast remains in the beer producing a distinctive aroma and flavor profile true to the style; spicy, slightly fruity, dry and refreshing.



An amber lager crafted with a blend of five specialty malts and the finest Bavarian hops. Rich, robust malt character and a long lingering finish. Reminiscent of beers produced by Munich's breweries for annual Oktoberfest celebrations.



Rich golden lager, complex and artfully balanced, reminiscent of Bavaria's most popular style — Munchener Helles. Crafted with three specialty malts and the highest quality Bavarian hops.



Rich golden lager, complex and artfully balanced, reminiscent of Bavaria's most popular style — Munchener Helles. Crafted with three specialty malts and the highest quality Bavarian hops.

Pub Choice: no %ABV stated

QQ = Reasonable sobriety

- Publish the alcohol content (%ABV)
- Is it high by regular beer standards?
- Serve it in smaller glasses
- Limit number of servings
- Publish Tel:numbers of cab services
- Train wait staff adequately
- **This will not stop folk getting drunk but may limit the brewer/brewery culpability.**



Some elements of **QQ**

- Serving the drinking public
- Serving the product
- Serving the brewer
- Serving the brewery
- **Serving the employees**

QQ Remember the dark side!

- Employee safety
- Breweries contain unusual risks
- Breweries contain many risks
- Is everything under control?
- If it can go wrong
- It will go wrong
- Employee protection required.

■ BREWERY SAFETY ISSUE ■

The New Brewer

VOL. 30 NO. 1 JANUARY/FEBRUARY 2013

THE JOURNAL OF THE BREWERS ASSOCIATION



128867 EMP 12812013
Michael Lewis
University Of California - Davis
731 Levee Terrace S16
Davis CA 95616 2749

PERIODICAL



Association of the Brewers Association
brewersAssociation.org



IS YOUR BREWERY

SAFE?

QQ Identify the risks

for example:

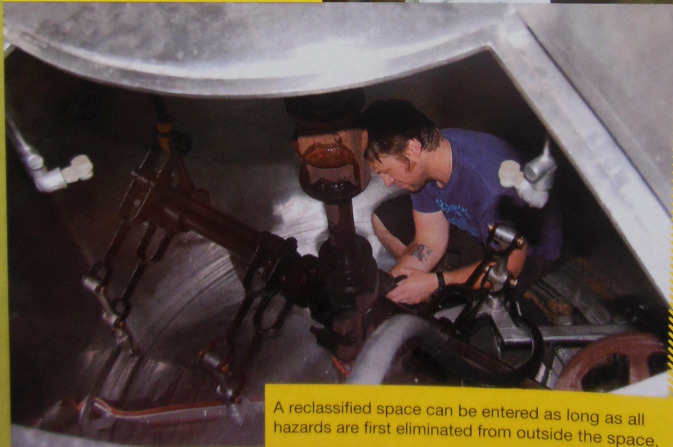
- Grain silos and inhaled dust
- Grain dust and explosions
- Boiling liquids and steam scalds
- Confined spaces and deadly gas
- Whirling machines and broken glass
- Caustic chemicals and fumes
- Slipping, dropping, tripping, falling, climbing.

558 gal

DANGER
CONFINED SPACE
ENTER BY
PERMIT ONLY



Even confined spaces that are never entered require signage.

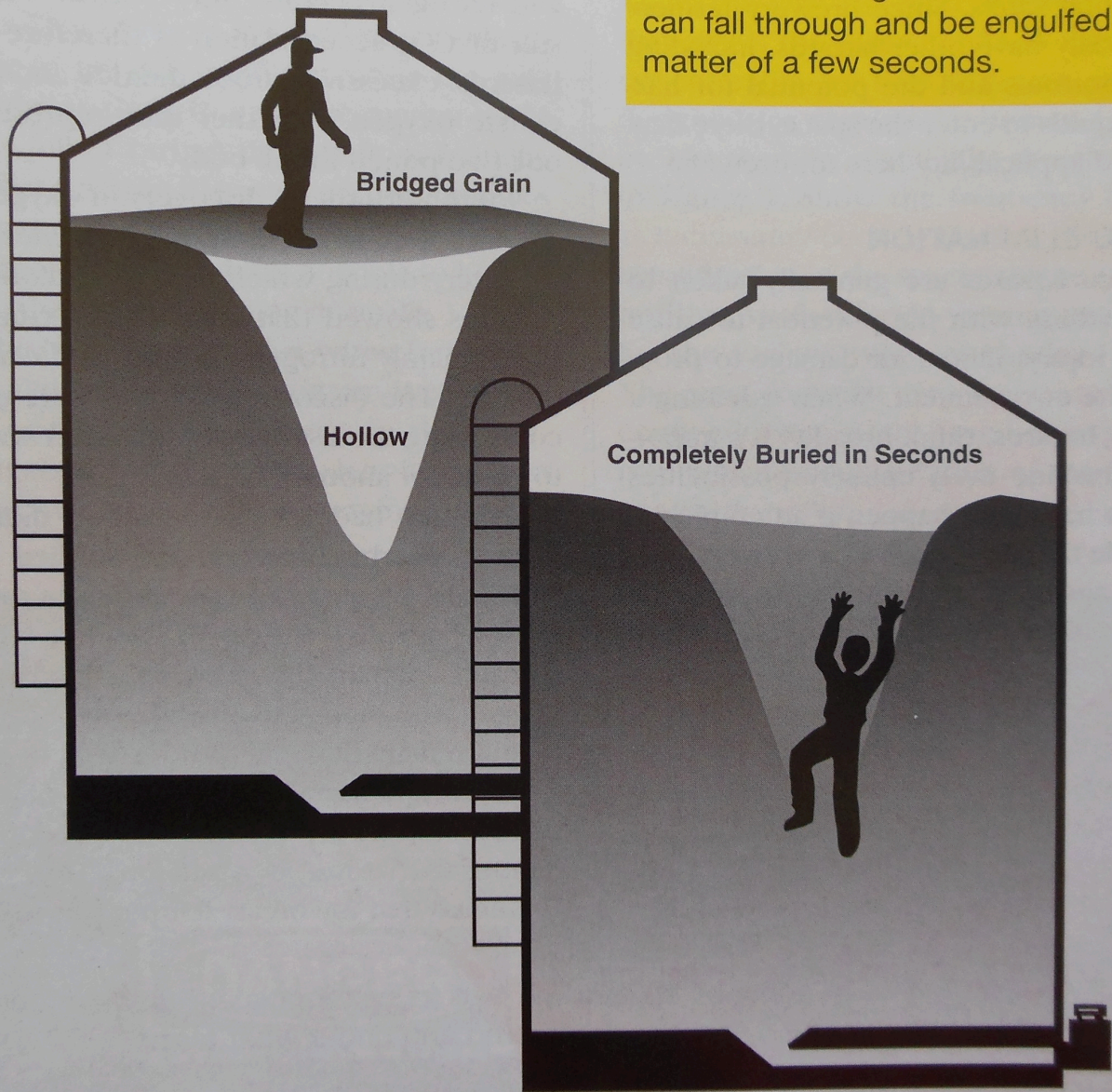


A reclassified space can be entered as long as all hazards are first eliminated from outside the space.

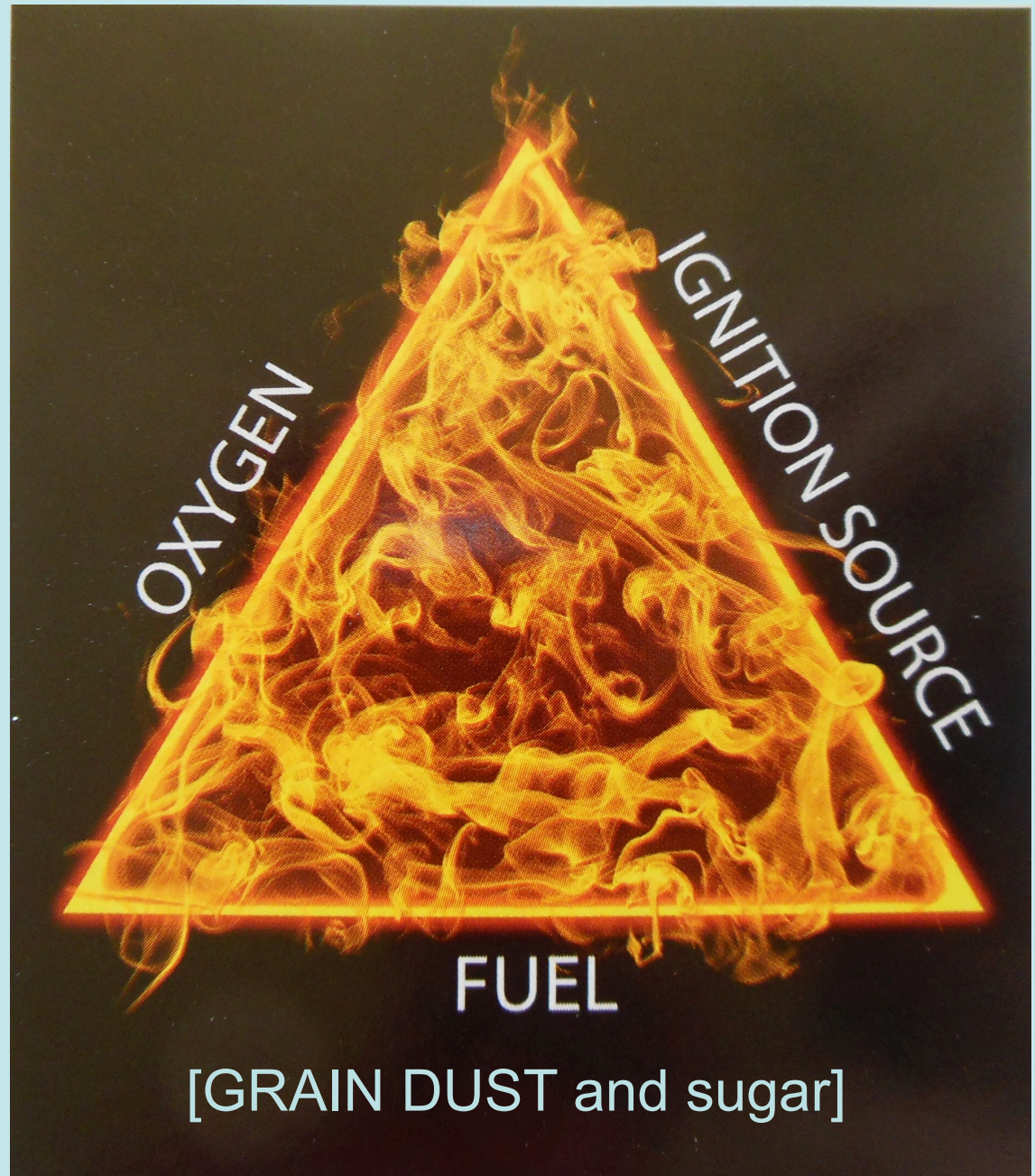
CONFINED SPACE SAFETY: GETTING IT RIGHT

Lock-out

A worker walking across bridged grain can fall through and be engulfed in a matter of a few seconds.



420-500 microns
50-100g/m³



QQ Employee safety

- **The general principle:**

Every worker has the right to earn a day's wage and to go home without injury

- **Management responsibility:**

To recognize and evaluate and minimize the hazards to which workers are exposed

- **Workers' responsibility:**

To know, understand and behave in accordance with company SOPs at all times

No brewery can be made risk free

QQ Employee Safety

- No brewery can be made risk free
- Observe and assess the hazard
- Minimize the hazard
- SOPs to deal with the hazard
- Training to overcome the hazard
- Behavior modification of workers
- Supervision, Inspection and tracking.
- Safety officer

QQ Requires taking care of details



Some elements of **QQ**

- **Serving the drinking public (products)**
- **Serving the product (glassware)**
- **Serving the brewer (product safety)**
- **Serving the brewery (sobriety)**
- **Serving the employees (safety)**
- **Serving the environment**
- **Serving the community**
- **Serving yourself**



Iechyd-da!! Cheers!!
Diolch! Thank you!



Sierra Nevada Brewpub
Ovila Double, Ovila Quadruple (750 ml) \$10.00
Imperial Smoked Porter (750 ml) \$10.00
Sierra 30th Anniversary, Our Brewer's Reserve Ale (750 ml) \$10.00
Sierra 30th Anniversary, Jack & Ken's Ale (750 ml) \$10.00
Northern Hemisphere Harvest Ale (24 fl. oz.) \$5.00
Purchase a reusable Growler for \$11.99.
Most selections are your Growler. pitcher price to fill

