

To Spund or Not to Spund...

Spunding directly translates from German to English as
“bunging”

A method of natural carbonation that involves carefully
monitoring your present gravity and sealing off the tank
after the aggressive initial stages of fermentation have
finished

History

- The German Beer Purity Law (Reinheitsgebot) mandated that beers be produced with only 4 ingredients
 - (hops, barley, water, & at a later time yeast was added)
- The use of carbon dioxide from an external source is not one of the 4
 - Many purists stand by this principle
- Historic methods for carbonating included:
 - Kräusening
 - Recapture of CO₂ produced during fermentation
 - Spunding
 - **Bunging the fermentation to allow for the CO₂ produced during fermentation to naturally carbonate beer**

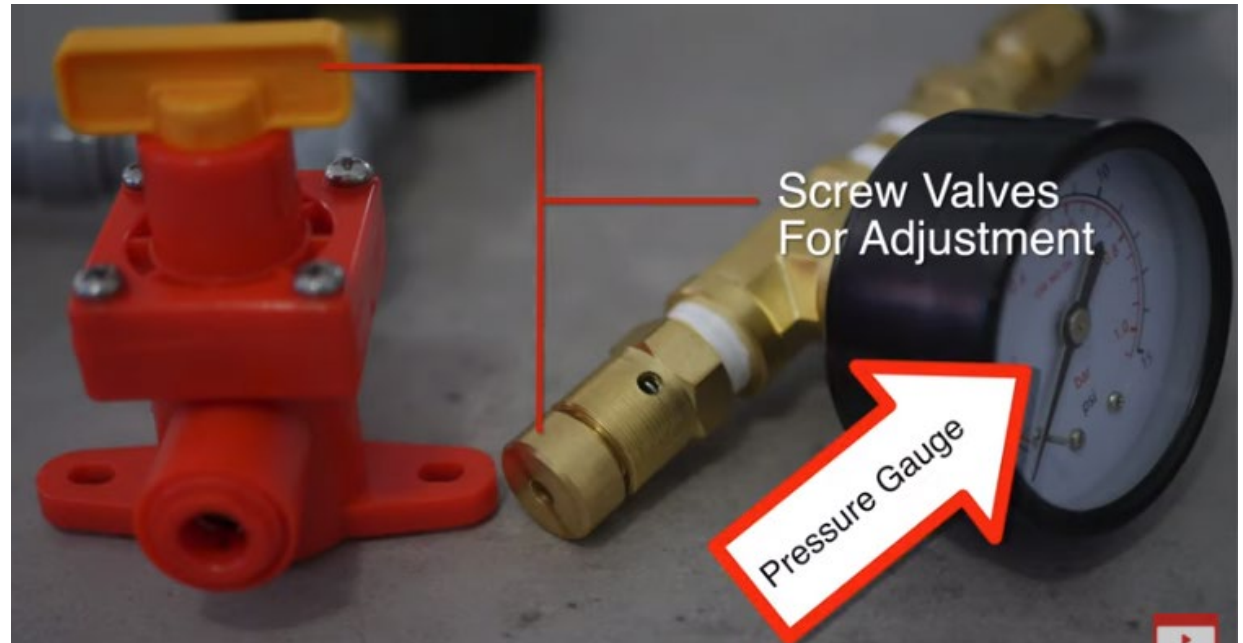
Modern homebrew application with a spunding valve:

- A device that allows you to dial in the desired level of pressure in a vessel (e.g. corny keg or pressurized fermentation vessel)
- Components include:
 - ball lock quick disconnects
 - pressure gauge
 - valve to allow pressure to escape that is higher than the set point as indicated on a set pressure gauge



How does a spunding valve work?

- Regulate pressure coming out of the vessel with screw valves
- Once set pressure level is reached, additional pressure is released by the system.

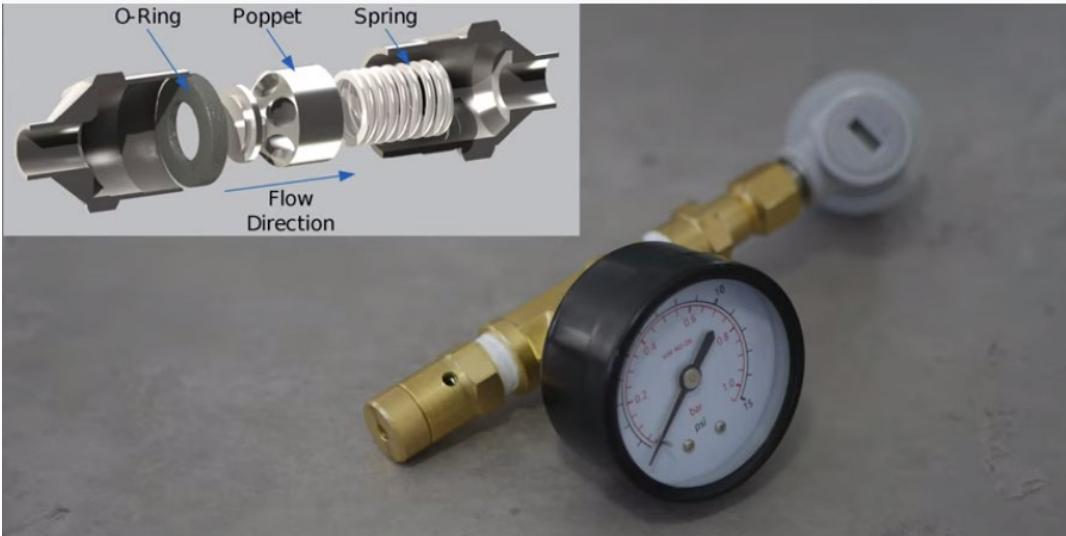


Types of Spunding Valves

Blowtie



Spring and Poppet



Common applications for spunding valves

- Priming beer as a bi-product of fermentation
- Fermentation under pressure - **SAFETY warning!**
 - Ensure your vessel can handle the pressure and your valve is functioning properly to off-gas excess pressure. **MONITOR closely!!!**
- Pressure closed loop transfer

Priming Beer with Natural CO2

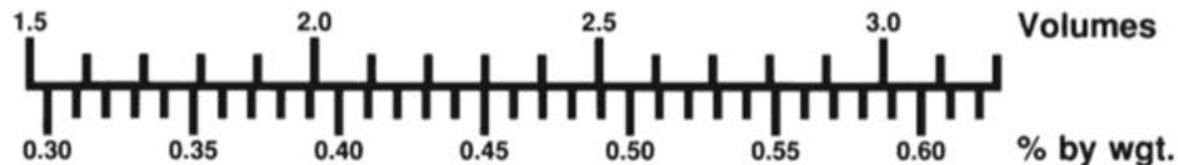
- It is important to know the terminal gravity of your beer
 - Achieved through knowing your process based on previous batches of beer
 - Fast Ferment test can be utilized
- Must transfer when fermentation begins to slow and there is enough active fermentation to complete carbonating the beer
- Recommend a transfer to your corny keg within 2-4 specific gravity points of terminal gravity
- Pressure remaining inside the vessel will build and carbonate the beer as fermentation is completed

GAUGE PRESSURE – POUNDS PER SQUARE INCH

°C	°F	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
0	32	2.15	2.27	2.38	2.48	2.59	2.70	2.80	2.90	3.00	3.11	3.21																															
.55	33	2.10	2.23	2.33	2.43	2.53	2.63	2.74	2.84	2.96	3.06	3.15	3.25																														
1.11	34	2.06	2.18	2.28	2.38	2.48	2.58	2.69	2.79	2.90	3.00	3.09	3.19																														
1.66	35	2.02	2.14	2.24	2.34	2.43	2.52	2.63	2.73	2.83	2.93	3.02	3.12	3.22																													
2.22	36	1.98	2.09	2.19	2.29	2.38	2.47	2.57	2.67	2.77	2.86	2.96	3.05	3.15	3.24																												
2.77	37	1.94	2.04	2.14	2.24	2.33	2.42	2.52	2.62	2.71	2.80	2.90	3.00	3.09	3.18	3.27																											
3.33	38	1.90	2.00	2.10	2.20	2.29	2.38	2.48	2.57	2.66	2.75	2.85	2.94	3.03	3.12	3.21																											
3.88	39	1.86	1.96	2.06	2.15	2.25	2.34	2.43	2.52	2.61	2.70	2.80	2.89	2.98	3.07	3.16	3.25																										
4.44	40	1.83	1.92	2.01	2.10	2.20	2.30	2.39	2.47	2.56	2.65	2.75	2.84	2.93	3.01	3.10	3.19	3.28																									
5.00	41	1.79	1.88	1.97	2.06	2.16	2.25	2.34	2.43	2.52	2.60	2.70	2.79	2.88	2.96	3.05	3.14	3.23																									
5.55	42	1.75	1.85	1.94	2.02	2.12	2.21	2.30	2.39	2.48	2.56	2.65	2.74	2.83	2.91	3.00	3.09	3.18	3.26																								
6.11	43	1.72	1.81	1.90	1.99	2.08	2.17	2.26	2.34	2.43	2.52	2.61	2.69	2.78	2.86	2.95	3.04	3.13	3.21																								
6.66	44	1.69	1.78	1.87	1.95	2.04	2.13	2.22	2.30	2.39	2.47	2.56	2.64	2.73	2.81	2.90	2.99	3.07	3.16	3.24	25	26	27	28	29																		
7.22	45	1.66	1.75	1.84	1.91	2.00	2.08	2.17	2.26	2.34	2.42	2.51	2.60	2.69	2.77	2.86	2.94	3.02	3.11	3.19																							
7.77	46	1.62	1.71	1.80	1.88	1.96	2.04	2.13	2.22	2.30	2.38	2.47	2.55	2.64	2.72	2.81	2.89	2.98	3.06	3.15	3.23																						
8.33	47	1.59	1.68	1.76	1.84	1.92	2.00	2.09	2.18	2.26	2.34	2.42	2.50	2.59	2.67	2.76	2.84	2.93	3.02	3.09	3.18																						
8.88	48	1.56	1.65	1.73	1.81	1.89	1.96	2.05	2.14	2.22	2.30	2.38	2.46	2.54	2.62	2.71	2.79	2.88	2.96	3.04	3.13																						
9.17	49	1.53	1.62	1.70	1.79	1.86	1.93	2.01	2.10	2.18	2.25	2.34	2.42	2.50	2.58	2.67	2.75	2.83	2.91	3.00	3.07	3.15			30	31	32	33	34														
10.0	50	1.50	1.59	1.66	1.74	1.82	1.90	1.98	2.06	2.14	2.21	2.30	2.38	2.46	2.54	2.62	2.70	2.78	2.86	2.94	3.02	3.10	3.17																				
10.55	51		1.57	1.64	1.71	1.79	1.87	1.95	2.02	2.10	2.18	2.26	2.34	2.42	2.49	2.57	2.65	2.74	2.82	2.90	2.97	3.05	3.13	3.19																			
11.11	52		1.54	1.61	1.68	1.76	1.84	1.92	1.99	2.06	2.14	2.22	2.30	2.38	2.45	2.53	2.61	2.68	2.76	2.84	2.92	3.00	3.06	3.13	3.22																		
11.66	53		1.51	1.59	1.66	1.74	1.81	1.89	1.96	2.03	2.10	2.18	2.26	2.34	2.41	2.49	2.57	2.64	2.71	2.79	2.86	2.94	3.01	3.09	3.16																		
12.22	54			1.56	1.63	1.71	1.78	1.86	1.93	2.00	2.07	2.15	2.22	2.30	2.37	2.45	2.52	2.59	2.66	2.74	2.81	2.89	2.96	3.04	3.10	3.17			35	36	37	38	39										
12.77	55			1.53	1.60	1.68	1.75	1.82	1.89	1.97	2.04	2.12	2.19	2.26	2.33	2.40	2.47	2.54	2.62	2.69	2.76	2.83	2.89	2.97	3.04	3.11	3.18																
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14.44	58				1.51	1.59	1.67	1.74	1.80	1.87	1.94	2.01	2.08	2.15	2.21	2.28	2.35	2.42	2.48	2.55	2.62	2.69	2.75	2.82	2.88	2.95	3.02	3.09	3.16														
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15.55	60						1.54	1.62	1.69	1.75	1.82	1.88	1.95	2.01	2.08	2.14	2.21	2.27	2.34	2.40	2.47	2.53	2.60	2.66	2.73	2.79	2.86	2.92	2.99	3.05	3.11	3.18											
16.11	61							1.51	1.59	1.66	1.72	1.79	1.85	1.91	1.97	2.04	2.10	2.17	2.23	2.30	2.36	2.43	2.49	2.56	2.62	2.69	2.75	2.81	2.87	2.94	3.00	3.06	3.14	3.19									
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**SOLUBILITY OF CARBON DIOXIDE IN BEER
PRESSURE-TEMPERATURE RELATIONSHIPS**

Results Expressed as Volumes CO₂
(0° C.-760mm.) Per Volume Beer



**CONVERSION SCALE
(Specific Gravity Beer-1.015)**

DATA TAKEN FROM
"Methods of Analysis"

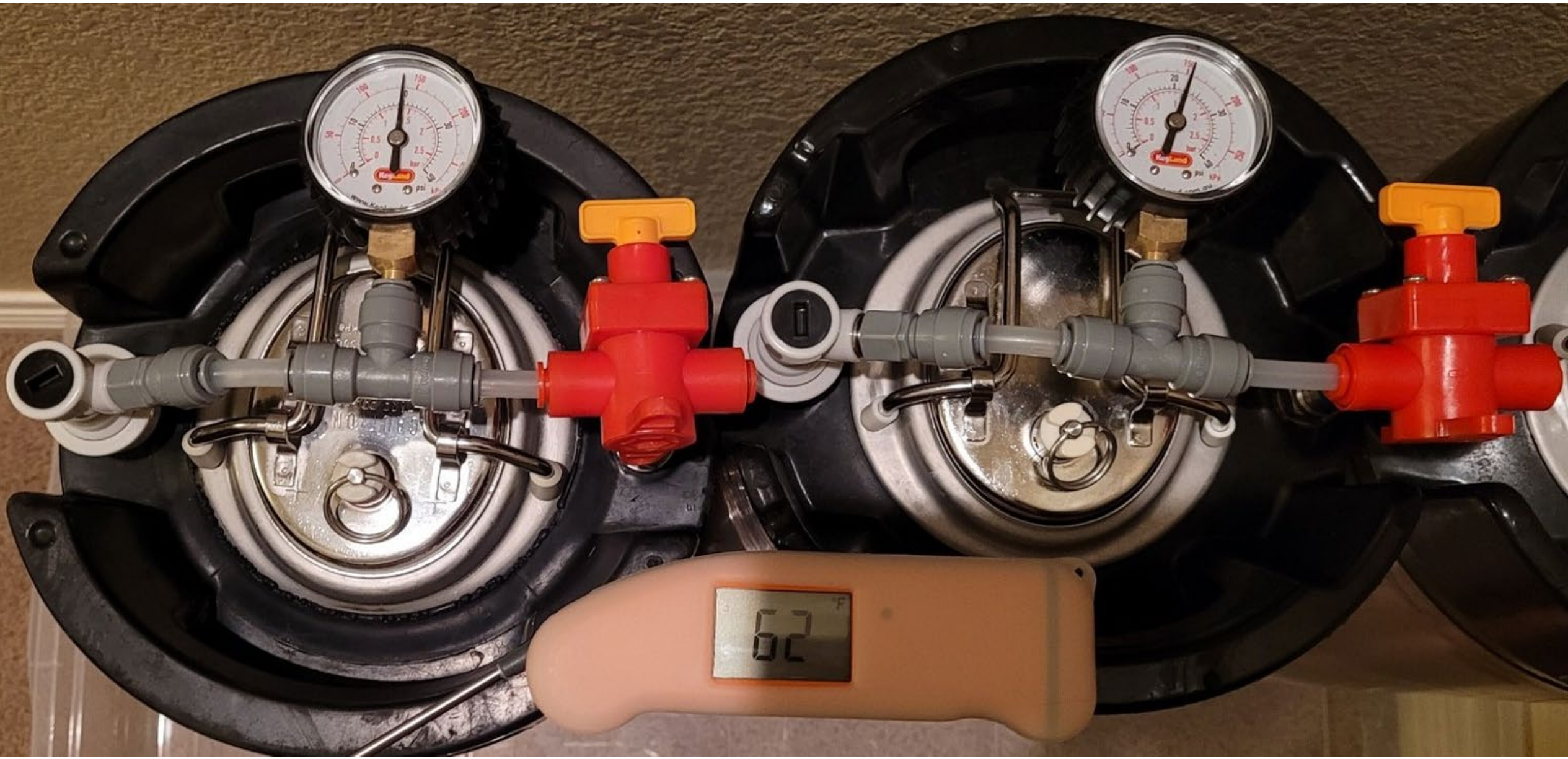
AMERICAN SOCIETY
OF BREWING CHEMISTS

5th Edition-1949

1 Volume of CO₂ = 1.969 g/L

COPIES AVAILABLE
FROM
ZAHM & NAGEL CO., INC.
210 VERMONT STREET
HOLLAND, NY 14080 USA







Benefits

- Save money by using what would otherwise be lost as a bi-product of fermentation
- Equipment costs for spunding valves are relatively low
- positive impact on beer by producing a finer carbonation
 - bubbles and / or mouthfeel generated by naturally carbonated beer are:
 - “soft”, “round,” “fine,” “bright,” “mousse like foam”, “creamy” and “consistent.”
 - preserving certain characteristics believed to be lost when force carbonating
- Spunding suppresses “pungent” characteristics
 - pressure can suppress the expression of volatile compounds that form esters, pressurized fermentation can suppress unwanted esters from certain yeasts, leading some advocates to proclaim that the technique can create clean “lager-like ales” in less time and at higher temperatures than it would take to brew an actual lager.
- Save time when factoring the end time that it takes to add back CO₂
- If your a Reinheitsgebot purist, you can check the box...

Cons

- Additional step to monitor in the fermentation process
- Must ensure transfer is completed prior to beer becoming fully attenuated
- May need equipment for kegging your beer
- Need a temperature controlled environment to achieve desired levels of CO₂

References:

Brulosophy <https://brulosophy.com/2018/02/26/carbonation-methods-pt-3-force-carbonation-vs-spunding-exbeeriment-results/>

Fast Ferment Test:

[http://braukaiser.com/wiki/index.php/Fast Ferment Test](http://braukaiser.com/wiki/index.php/Fast_Ferment_Test)

CO2 chart:

<https://www.zahmnagel.com/wp-content/uploads/2017/04/Zahm-Nagel-CO2-in-Beer-Chart.pdf>

David Heath Homebrew:

<https://www.youtube.com/watch?v=NLI-qmhhEnU>