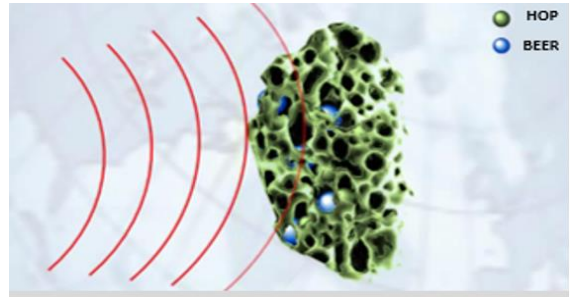


BREWERY HOP EXTRACTION TECHNOLOGY

Use ShockWaves to produce beers with:

- 30%-50% less bittering hops
- 30%-50% less dry hopping
- Increased hopping speed
- Increased hop utilization
- Minimized protein damage
- More finished beer with less beer soaked hop waste
- Extracted other flavours like fruits, spices and coffee



The ShockWave Xtractor™ Using Patented SPR™ Controlled Cavitation Technology

ShockWave Xtractor™		Typical 5,000 barrels/year Brewery:	US\$
Brewery Capacity:	barrels/year	5,000	
Hop Usage	pounds/barrel	1	
Average hop cost	\$ / pound	15	
Total Hop cost	\$/year	75,000	
Hop Reduction	%	30	
Hop Savings	\$/year	\$22,500	
Beer Yield Increase	%	3 - 6	
Beer Yield Increase	barrels/ year	150 - 300	
Est wholesale price per barrel	\$	150	
Beer Yield Savings	\$/year	\$22,500 to \$45,000	
Other ingredients saving			Variable
Faster production			Variable
Total Expected Gains			\$45,000 to \$67,500 (plus variable)
SPR™ ShockWave Xtractor™ Unit			
For 5,000 barrel Brewery, Cost / Unit			\$30,000 - \$35,000
Payback period			Less than 1 year



(Image courtesy of Anchor Brewing)

The ShockWave Xtractor™ is a patented technology from Hydro Dynamics, Inc. that uses the pressure fluctuations of cavitation to extract more flavour from hops and other ingredients. This increased extraction helps breweries use less hops and still get the same flavour. The technology is especially beneficial in dry hopping of beers such as IPA's. The Xtractor™ can offer both hop savings as well as Increased beer yield by discarding less hop solids trapping perfectly good beer. Brewers can also potentially realize dramatically decreased dry hopping time allowing for increased production without the need for new fermenters. Xtractors are installed in many breweries both in the USA and internationally.



(Image courtesy of Cabarrus Brewing)

Hydro Dynamics, Inc.
 Harnessing the Power of Cavitation



www.hydrodynamics.com