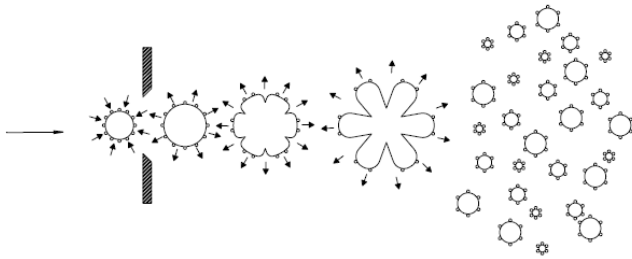


Water Drop Deformation and Fragmentation due to ultra fast /sudden decompression



The ratio of a fluid's decrease in volume as a result of increase in pressure is given by its bulk modulus of elasticity. The bulk modulus for hydrocarbon-based fluids (vegetable oils) is approximately 250,000 PSI, (17,240 bar) which results in a volume change of around 0.4% 0.5% per 1,000 PSI (70 bar).

The compression of vegetable oils results in storage of energy, similar to the potential energy stored in a compressed spring. Like a compressed spring, compressed fluid has the ability to do work. If decompression is sudden, the stored energy dissipates instantaneously. This sudden release of energy accelerates the fluid, which does work on water droplets and eventually atomize them.

C/D-Jet- Atomization

- Booster pump increases pressure in bulk liquid in turn decreasing water droplets volume
- Discharge occurs through restricted, "sharp-knife-like orifice" that lead to sudden reduction in pressure and explosive decompression
- Sudden decompression bursts water droplets into extremely small droplets due to high speed droplet deformation and expansion, resulting from atomization

Comprehensive Manufacturing Capabilities



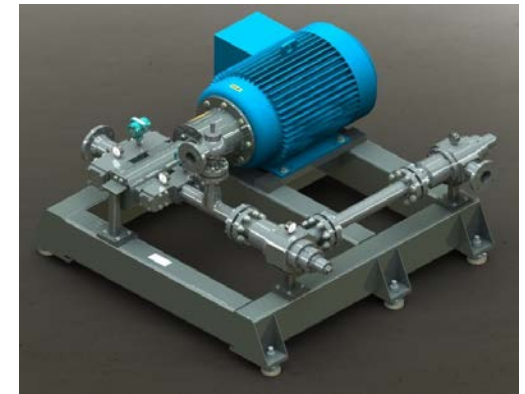
C/D-Jet-Atomization System Characteristics

- Small footprint
- Robust and durable
- Anti-clogging design
 - ✓ clean-in-place (CIP) not necessary
- Adjustable capacity (50 – 100%)
 - ✓ without energy inefficient recycle loop
- No erosion
- Energy efficient
- No Gas pockets in soap stock (crucial for yield)



Applying ultra shear force through
Controlled Flow Atomization
(Patent Pending)

C/D-Jet-Atomization Applications for Vegetable Oil



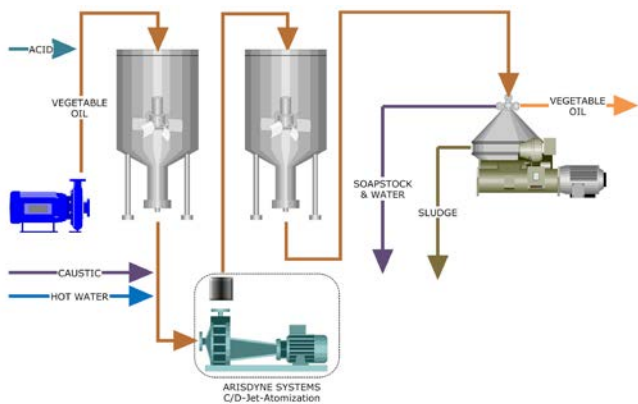
Contact

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www.arisdyne.com

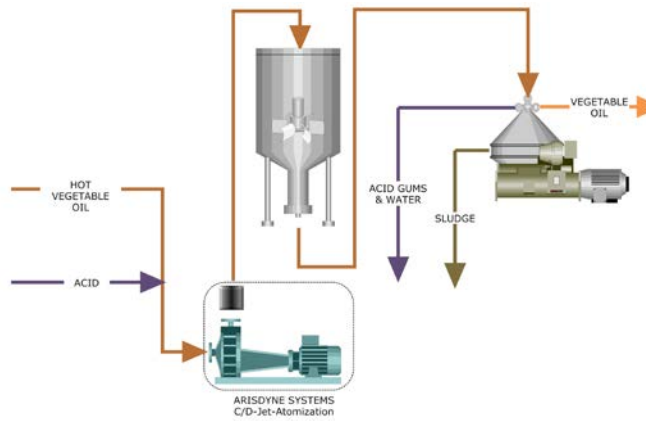
Collaboration Partners:

- Crown Iron Works
- Ken Carlson, RBD Technologies
- Ian Purtle, Glenmore Consulting

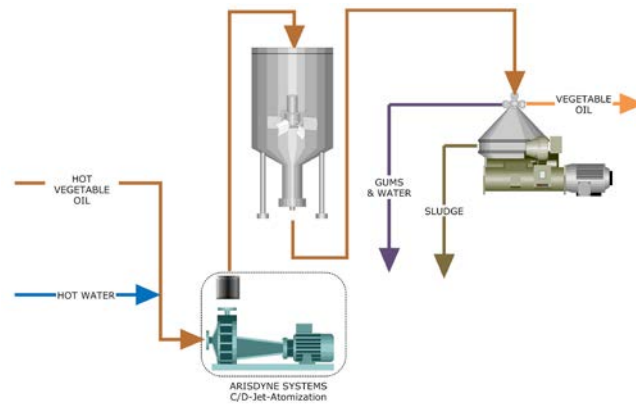
Special Degumming / Neutralization



Acid Degumming



Water Degumming

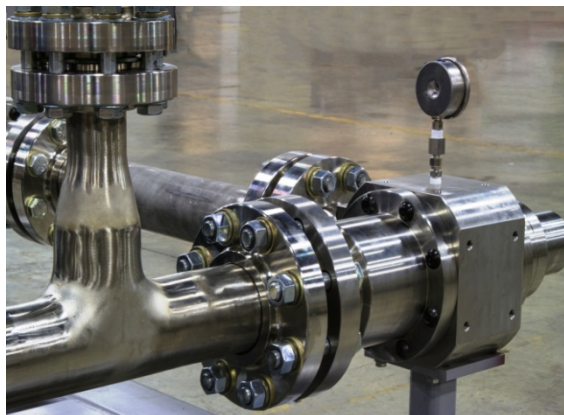


Anticipated Improvements

- Improved Oil yield
- Reduced caustic usage
- Reduced acid consumption
- Reduced silica usage
- Increased filter cycle times

	Acid Consumption [%]	Acid Reduction [%]	Caustic Consumption [%]	Caustic Reduction [%]	ppmP	%FFA
control	0.1	0	1.3	0	<10	<0.05
case 1	0.05	-50	0.97	-25	<10	<0.05
case 2	0.02	-80	0.68	-48	<10	<0.05

Adjustable C/D-J-A Chamber; Optimum Performance at Variable Capacities



Efficient Adjustable Capacity

Model	capacity [mt/h]	power [kW]
CM 600	6 - 12	15 - 35
CM 1500	12 - 30	35 - 80
CM 1800	20 - 40	55 - 110
CM 2400	25 - 50	75 - 150
CM 3200	35 - 70	100 - 200
CM 4800	50 - 100	160 - 320

Dimensions: 2 m x 2 m x 1.2 m