



Liquid Nitrogen Dosing Capabilities

Cryotech International, a Division of Chart Inc., has been mastering liquid nitrogen dosing for over 25 years. Cryotech's dosing systems are used in both pressurization and inerting (N₂ flush) applications. As new packaging technology and products evolve, so has a demand for refined dosing results. Cryotech has met the challenge with innovation, strategic partnerships, and detailed application analysis.

Pressurization Applications

A dose of liquid nitrogen is delivered immediately before capping or seaming. The trapped liquid nitrogen quickly vaporizes, pressurizing the container. In hot fill applications, the nitrogen pressure counteracts the vacuum created when a hot product cools.

Inerting Applications

A dose of liquid nitrogen is introduced seconds before the seamer or capper. The small dose of liquid nitrogen gasifies, 700 times its volume, in the process. The large volume of gaseous nitrogen pushes the oxygen out of the container.



Partial List of Dosed Products

- Almond Butter
- Automobile Oil
- Bar Mixes
- Baby Formula
- Coffee
- Cooking Wine
- Energy Shots
- Flax Seed Oil
- Ice Cream
- Juices (Hot & Ambient Fill)
- Malt Beverages
- Mayonnaise
- Mustard
- Nuts
- Olive Oil
- Syrups
- Teas
- Trail Mix
- Vinegar
- Bottled Water
- Wine

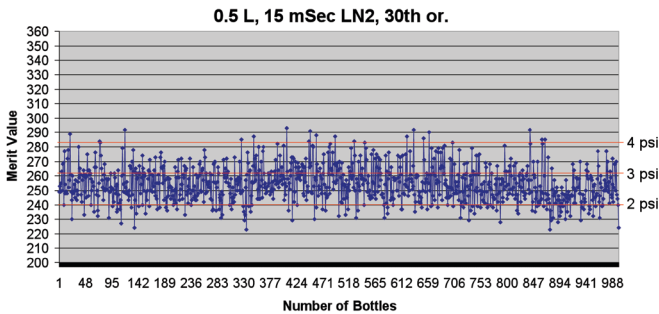
Cryotech Successes

- 2006 Dupont Packaging Innovation Award for our contribution to PET hot filling
- 2010 PAC Green Den Participant for our contribution to packaging sustainability efforts
- Approved liquid nitrogen dosing system vendor for major beverage companies

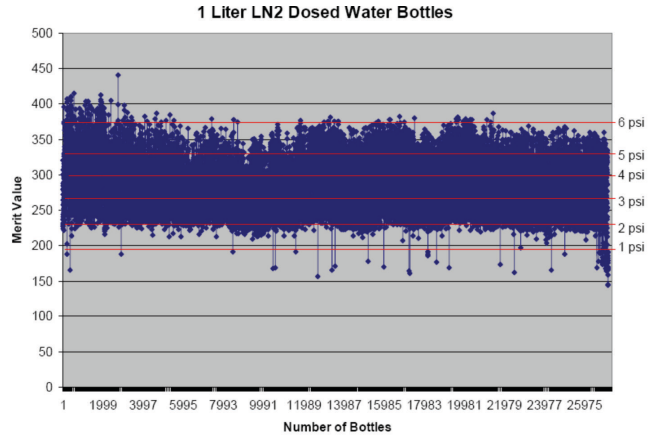
MicroDose Technology



Recently developed in response to the demand for tight pressure specifications on ultra light weight packaging. Utilizing various sensors to detect filling line speed, pocket detection, bottle presence, inputs independent of the filler, and electronic adjustments for fine tuning, 5 psi +/- 2 psi internal pressure is achievable.



Findings:
 Sample size 1,000
 99% - 2 to 4 psi
 56% - 3 psi



Findings:
 Sample size 27,000
 96.5% - 2 to 5 psi
 67% - 3 to 4 psi

SoftDose Technology

The SoftDose places or sprays the liquid nitrogen on the surface of the product rather than penetrating the product surface essentially eliminating any product splash and delivering consistent container pressure. Various options are available tailored to a specific product, package, or application.



Diverging Nozzle

- Narrow to wide mouth openings
- Discrete or continuous up to 600+ cpm



Regar Nozzle

- Wide mouth applications with minimal headspace
- Continuous dosing on high speed production lines



Ventelator Nozzle

- Moderate to high performance lines
- Narrow to wide mouth openings
- Discrete or continuous up to 600+ cpm



Hot Chute

- Horizontal extension for lines with limited space
- Narrow to wide mouth openings
- Discrete dosing for line speeds up to 400 cpm

