



doucette industries, inc.

**Refrigeration Application  
Specialists**



## **CO2 Evaporators**

**For the Beverage Bottling Industry**

**Reduces operating costs while preventing  
beverage contamination.**

# The Doucette CO2 Vaporizer™ Offers These Exclusive Benefits

- Protects Beverage from Contamination
- Endorsed by the FDA and USDA for food protection
- Eliminates CO2 heating expenses
- Applicable to ALL Brands of Refrigeration Equipment
- Works with Ammonia & Freon refrigerants
- Compact and Ready to Install

The Doucette Industries CO2 Vaporizer™ marks a major advancement in refrigeration heat recovery technology by using waste heat energy from the refrigeration system to vaporize CO2 practically and simply. The heat exchanger operates like an auxiliary condenser, and is installed in the refrigeration compressor discharge line.

Designed specifically for the beverage bottling industry, this proven technology eliminates the need for an auxiliary steam or electric CO2 heating system. The compact Doucette CO2 Vaporizer™ converts the liquid CO2 to a gas for the bottling operation, saving considerably on expensive fossil fuels. It also protects your bottling operation from heat exchanger failure and beverage cross contamination.

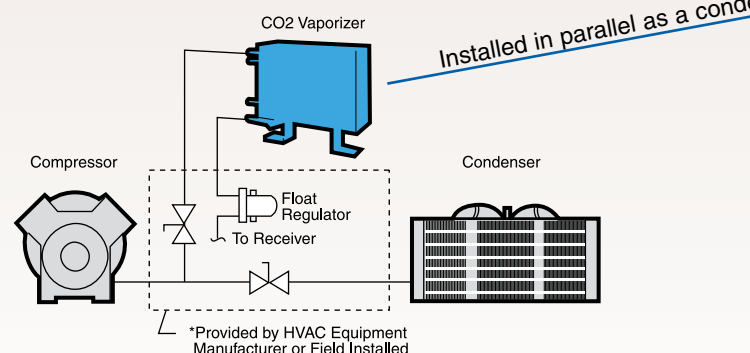
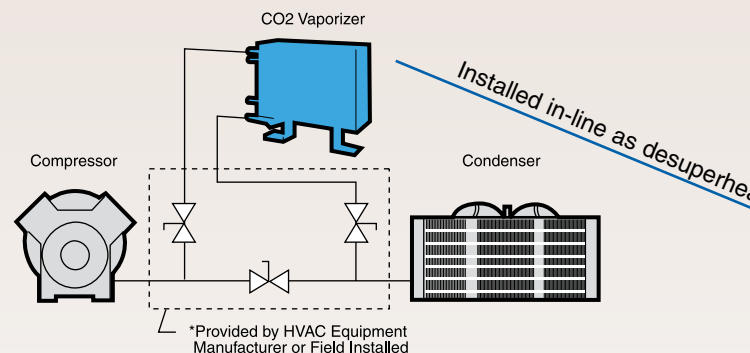
## How the CO2 Vaporizer™ works

The Doucette CO2 Vaporizer is a special purpose refrigeration desuperheater/condenser that uses a tube-in-tube counterflow design, making heat transfer highly efficient and cost effective. Bulk CO2 that is stored at -10°F must be heated to between 50°F and 70°F for the bottling process. Traditional methods of CO2 vaporization require either electric heaters or steam heat for this operation. Electric heaters are expensive to operate, and steam heaters require full-time boiler operation that is inconvenient and costly. Additionally, single wall heat exchangers can cause serious liability and contamination problems if a heat exchanger develops a leak or problem.

Replacing your conventional vaporization equipment with a Doucette CO2 Vaporizer eliminates these costs, problems and risks. The CO2 Vaporizer utilizes the hot refrigerant condensing temperatures (75°F to 110°F latent energy) and superheat temperatures (150°F to 200°F) to vaporize the CO2 for bottling use. Constructed for low refrigerant pressure drop and to have negligible effect on the system, the CO2 Vaporizer installs with minimal piping and controls. Operation is trouble free and requires no maintenance.



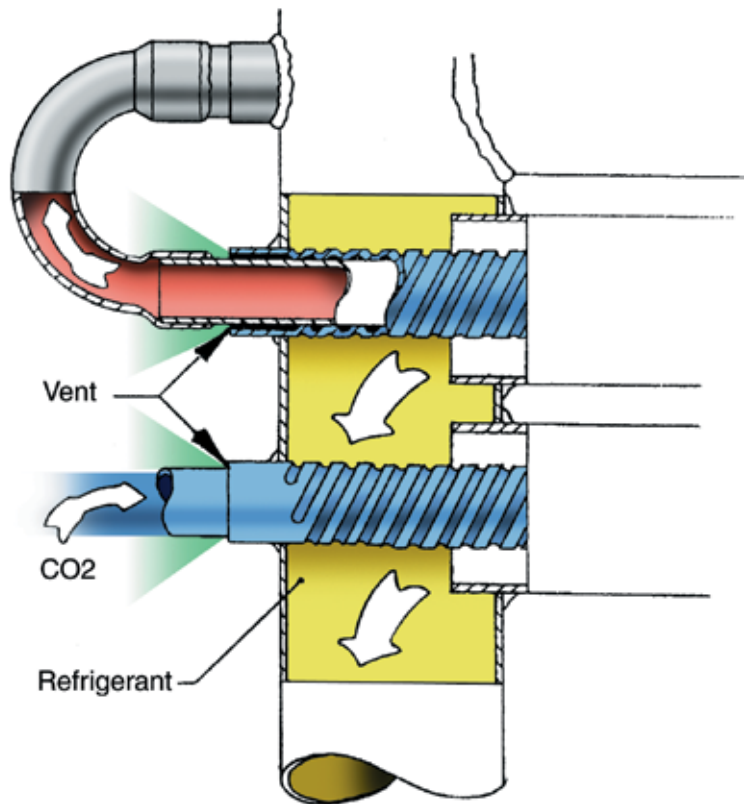
## Applicable to All Brands of Refrigeration Equipment and Refrigerant Types



## Vented Double Wall for Safety



The Vaporizer's heat exchanger tubes are designed with patented vented double-wall stainless steel construction for an added measure of safety and reliability. The double-wall system prevents contamination of the beverage from the refrigeration circuit. Each vaporizer tube is fluted such that a vent path is created between the outer and inner tube. If a tube leak should ever occur, the gas vents to the atmosphere for easy detection. This double protection system is endorsed by the FDA and USDA for food protection, and is a major reason why many bottlers have switched to using Doucette CO2 Vaporizers.



*The CO2 Vaporizer's Desuperheater/Condenser design integrates with any brand of refrigeration system including Vilter, Frick, Sullair, Dunham-Bush, York, and Carrier. And it accommodates Ammonia and all Freons including R-22 and R-404a refrigerants. Doucette units can be easily specified based on your existing refrigeration system design parameters and the CO2 lb./hr. use rate of your plant.*

*The CO2 Vaporizer installs conveniently into a refrigeration system's existing refrigerant piping. In a **Desuperheater configuration**, the unit is **installed in-line** with the compressor discharge refrigerant piping in series with the existing condensers. When used as a **condenser**, the unit is **installed in parallel** with the existing system condensers.*

*The compact design of Doucette's CO2 Vaporizer permits mounting in practically any location, and the unit comes with frame and brackets. An optional indoor/outdoor insulated cabinet is available if needed.*

## Enhanced Reliability with "Free-Floating" Tube Construction

A CO2 vaporizing system is subject to thermal shock created by the extreme temperature range between the CO2 and refrigerant. The temperature difference can vary from -10°F to 220°F creating thermal expansion and contraction of the tubing material. This thermal shock can work harden the tubing of the heat exchanger, leading to premature failure. Unlike single wall plate and shell/tube heat exchangers, the Doucette vaporizer eliminates these concerns through patented tube design that mechanically "free-floats", allowing the inner tubes to expand and contract as needed.



# Complete Payback in Two Years or Less

Beverage bottlers using a Doucette CO2 Vaporizer typically realize a payback period of 2 years or less through reduced energy costs. By using the waste condensing heat energy that is normally produced and expelled by your refrigeration system, the CO2 Vaporizer eliminates the energy costs of operating electric or steam type vaporizers. And the larger your bottling operation, the greater the return on your investment. Additional savings can be realized from lower operating head pressure on the refrigeration system.

## Typical operational savings for a bottling plant using 1000 and 5000 pounds of CO2 per hour.

	1000 lb./hr.	5000 lb./hr.
<b>BTUH required</b>	<b>142,000 btuh</b>	<b>710,000 btuh</b>
<b>Electric Cost Reduction (1)</b>	<b>\$6500/yr.</b>	<b>\$32,400/yr.</b>
<b>Gas/Oil Cost Reduction (2)</b>	<b>\$2640/yr.</b>	<b>\$13,200/yr</b>

UL Listing Pending

(1) 40 hours per week operation at 7.5 cents / kw

(2) 40 hours per week operation at \$1 / gal. oil or 65 cents / ccf gas

## CO2 Vaporizer Physical Data

dii Model Number	CO2 #/hr 250 psi CO2 181.1 psi NH3	Heat Transfer BTUH	Length	Width	Height	Refrig. In/Out BW	CO2 N.P.T.	Shipping Weight (lbs.)
NSY 5	322	46,875	47	3	31-5/16	1/.75	1/2	100
NSY 10	643	93,750	55-3/4	7-1/4	31-1/16	1/.75	3/4	200
NSY 15	965	140,625	55-3/4	10-1/2	31-1/16	1.25/.75	1	300
NSY 20	1287	187,500	55-3/4	13-3/4	31-1/16	1.5/.75	1-1/4	400
NSY 25	1609	234,375	55-3/4	17	31-1/16	1.5/.75	1-1/4	500
NSY 30	1930	281,250	55-3/4	20-1/4	31-1/16	1.5/.75	1-1/2	600
NSY 35	2252	328,125	55-3/4	23-1/2	31-1/16	1.5/.75	1-1/2	700
NSY 40	2574	375,000	55-3/4	26-3/4	31-1/16	2.0/.75	2	800
NSY 45	2896	421,875	55-3/4	30	31-1/16	2.0/.75	2	900
NSY 50	3217	468,750	55-3/4	33-1/4	31-1/16	2.0/.75	2	1000
NSY 55	3539	515,625	55-3/4	36-1/2	31-1/16	2.0/1.0	2	1100
NSY 60	3861	562,500	55-3/4	39-3/4	31-1/16	2.0/1.0	2	1200
NSY 65	4182	609,375	55-3/4	43	31-1/16	2.5/1.0	2	1300
NSY 70	4504	656,250	55-3/4	46-1/4	31-1/16	2.5/1.0	2	1400
NSY 75	4826	703,125	55-3/4	49-1/2	31-1/16	2.5/1.0	2	1500
NSY 80	5148	750,000	56-3/4	52-3/4	31-1/16	3/1.25	2-1/2	1600
NSY 85	5469	796,875	56-3/4	56	31-1/16	3/1.25	2-1/2	1700
NSY 90	5791	843,750	56-3/4	59-1/4	31-1/16	3/1.25	2-1/2	1800
NSY 95	6113	890,625	56-3/4	62-1/2	31-1/16	3/1.25	2-1/2	1900
NSY 100	6434	937,500	56-3/4	65-3/4	31-1/16	3/1.25	2-1/2	2000

NOTE: Controls are not included.



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