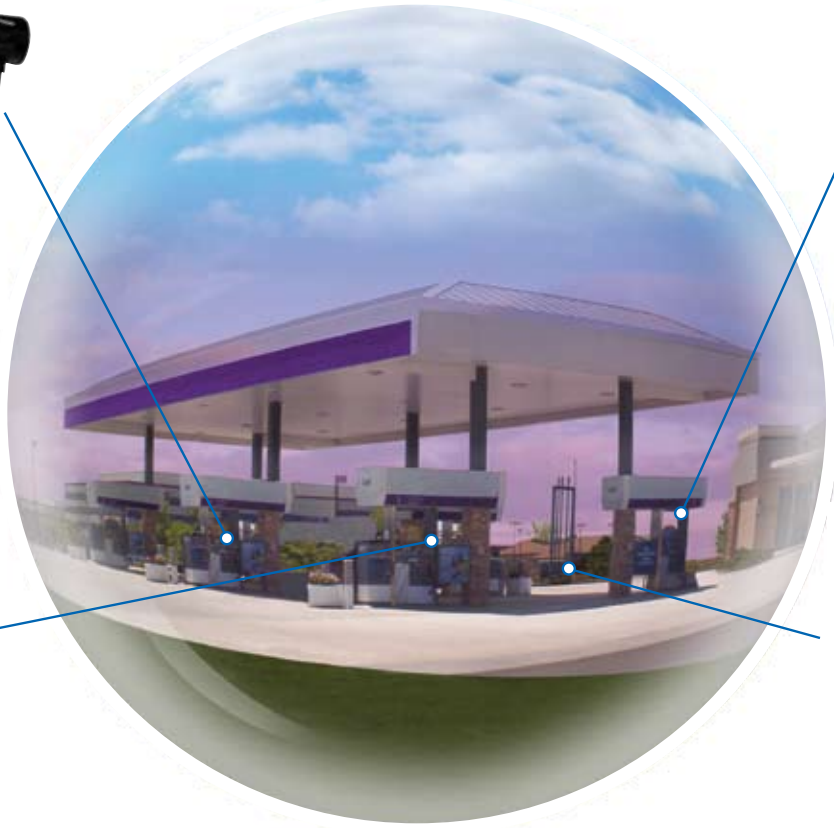
The VST ENVIRO-LOC™ Total System Solution

Simple Solutions for Enhanced Vapor Recovery (EVR)

ENVIRO-LOC™
EVR Balance
Dripless/Spitless
Fuel Nozzles

ENVIRO-LOC™
EVR Balance
Safety Breakaways



ENVIRO-LOC™
EVR Balance
Fuel Hoses

ENVIRO-LOC™ ECS
EVR Membrane Processor

The EVR Total System Product Line Exceeds All CARB EVR Requirements

CARB EVR Requirement	EVR Requirement Begins	VST EVR Total System
Phase I compatibility	2001	✓
Phase II & ORVR compatibility	2001	✓
Nozzle liquid retention (≤ 100 ml/1,000 gal.	2005	✓
Nozzle spitting (≤ 1.0 ml/refueling)	2005	✓
Nozzle spillage (≤ .24 lb/1,000 gal)	2005	✓
Dripless nozzle (≤ 3 drop/refueling)	2005	✓
In-station diagnostics (ISD)	2005	✓
CARB EVR certification	2005	Sealed

VST

Vapor Systems Technologies, Inc

Enhanced Vapor Recovery (EVR) Made Simple

For more than five years the California Air Resources Board (CARB), in conjunction with the industry, has been working on a complete overhaul of Stage II vapor recovery requirements in an effort to achieve higher efficiencies. To synthesize the CARB regulations into lay terms, VST has broken down Enhanced Vapor Recovery (EVR) into five basic categories:

I. Vapor Collection & Control of Transfer Emissions

Transfer emissions or efficiency of the vapor recovery system is the sum of all of the vapor losses accumulated during vehicle refueling, added to the fugitive emissions associated with the Underground Storage Tank (UST) over pressurization. Based on VST's actual 50-car pretests, and over two years of UST pressurization data, our system efficiency exceeded 98%.

II. ORVR Compatibility

Onboard Refueling Vapor Recovery (ORVR) systems on vehicles and their compatibility/effect on Stage II systems is another critical aspect of EVR requirements. CARB requires that the system must meet the above specifications with ORVR market penetrations approaching 80%. VST's products meet and exceed these required standards.

III. Control of Liquid Losses Accumulated during Vehicle Refueling

CARB has developed a number of nozzle test procedures to quantify the liquid losses accumulated during vehicle refueling. Based on VST's 1,500 field tests utilizing CARB's test procedures, ENVIRO-LOC™ nozzles surpassed CARB's stringent specifications by more than 90%. The results are categorized in the table below.

IV. In-Station Diagnostics (ISD)

In Station Diagnostics (ISD) continuously monitors:

A. The performance of vehicle vapor collection by measuring the Air to Liquid Ratio (A/L) to determine if the system is working properly.

B. Tank pressures to assure that fugitive emissions are kept to a minimum.

V. UST Pressure Management & Evaporative Emissions Control

VST's ENVIRO-LOC™ Emission Control System (ECS) Membrane Processor monitors and manages the UST system pressure. The ECS unit automatically controls UST system pressures to a narrow pressure range that reduces the pressure to a vacuum. High positive pressures are quite common in uncontrolled systems and are a major source of emissions from system leakage and from P/V valve activation. Simply attach the VST ENVIRO-LOC™ ECS to existing vent pipes for total control and recovery of evaporative emissions.

Payback Calculation: Evaporative emissions (losses) of an uncontrolled UST system = 90 to 135 gallons/month

Nozzle Category	CARB EVR Requirement	VST Test Results
A. Liquid Retention	≤ 100 ml. per 1,000 gallons dispensed	≤ 8.74 ml. per 1,000 gallons dispensed
B. Spillage	≤ 0.24 ml. per 1,000 gallons dispensed	≤ 0.022 ml. per 1,000 gallons dispensed
C. Spitting	≤ 1.0 ml. per refueling	Zero
D. Drops per refueling	≤ 3 drops per refueling*	≤ 0.79 drops per refueling
Total Liquid Losses	Approximately 0.60 lbs. per 1,000 gal. dispensed	Approximately 0.044 lbs. per 1,000 gal. dispensed

* Included in Spillage totals

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