STI Workshop:
System Component Approvals

For Shop Fab Tank Components

Jerry Schollmeyer, National Sales Manager
Morrison Bros. Co

February 27-28, 2024

26th California Unified Program Annual Training Conference
February 26 – 29, 2024

HISTORY | MORRISON BROS. CO.

- Founded in Dubuque, Iowa in 1855
- Leader in AST products
- Produce more than 1,200 different products
- Include equipment for ASTs, USTs, service stations, environmental applications and tank trucks.
- Employ approximately 130 people in Dubuque & Maquoketa, Iowa locations.

Morrison Bros. Co. Corporate Headquarters

MORRISON BROS. CO.

TANKS | SHOP-FABRICATED TANKS

Shop-fabricated tanks are small enough to be produced in a tank shop and delivered to the site.

- Atmospheric Pressure Tanks—0-1 PSI operating pressure.
- Vertical Tank: The shell height shall not be more than 50 feet and shall not exceed 60,000 gallons.
- Horizontal Tank: The length of the tank shall not be greater than 6 times its diameter. Tank diameters exceeding 144 inches shall not exceed 72 feet in length.

CALIFORNIA AIR RESOURCES BOARD

Vapor Recovery Certification Procedure

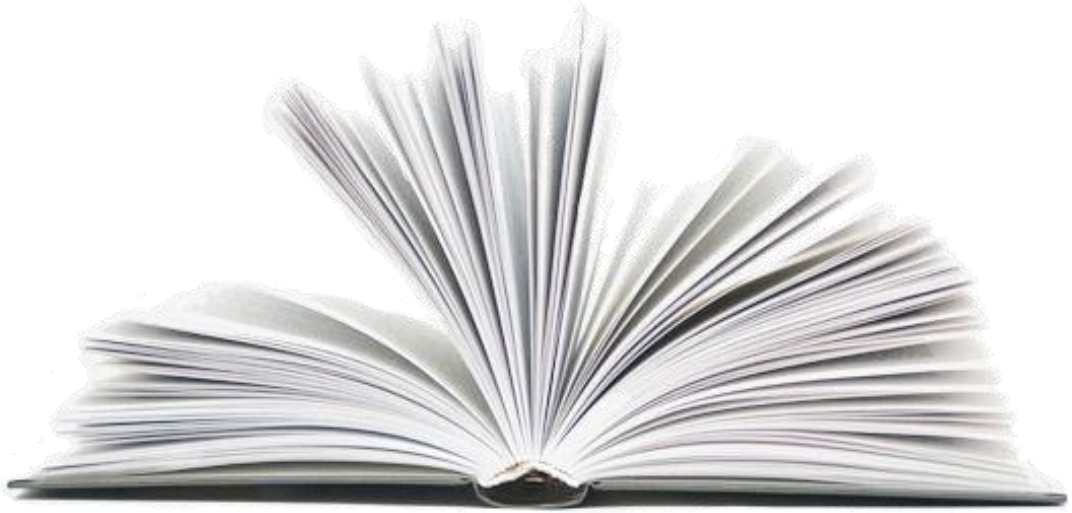
CP - 206

Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities Using Aboveground Storage Tanks

Adopted: May 2, 2008
Amended: January 9, 2013
Amended: May 27, 2014
Amended: November 9, 2015
Amended: June 4, 2019
Amended: July 25, 2019

CP-206

86 Page **C**ertification **P**rocedure For
Vapor Recovery Systems at Gasoline Dispensing Facilities
Using Aboveground Tanks



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PRE APPLICATION PROCESS | CARB, E.V.R.

Generate a complete list of products we plan to include in our EVR application

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PREAPPLICATION PROCESS | CARB, EVR

EVR Approved
244OM

EVR Approved
244OF

EVR Approved
244O

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 9095 Series Overfill Prevention Valves

9095AA3300

9095AA0200

9095C-3200 AVEVR

9095X-6200
(2")

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 419 Aluminum Drop Tubes

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 516 Series Tank Top Spill Container

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 927 & 928 Dry Disconnect Adaptors and Couplers

927 (2″)

928 (2″)

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 735DC Dust Caps

735DC (4")

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 323 Vapor Recovery Adaptor and 323C Cap

323

323C

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 305GSP Gauge Stick Cap & Adaptor

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 818 & 918 Clock Gauges

818

918

MORRISON BROS. CO.

PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 305 Adaptors, 305XP Tanks Monitor Caps & 305XPA Cap & Adaptor Kits

305 (2")

305XP (2")

305 (4")

305XP (4")

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PRE APPLICATION PROCESS | CARB, E.V.R.

Morrison 539 Diffuser

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12. APPLICATION PROCESS

All of the information specified in the following subsections shall be submitted to the Executive Officer for an application to be evaluated.

The applicant for certification shall identify, in the preliminary application, the standard(s) or specification(s) with which the system or component complies, and demonstrate that the proposed system or component meets the primary performance standard(s) or specification(s) required by Sections 3 through 10 of this Procedure. For the preliminary application, the applicant shall have performed tests for all applicable performance specifications and standards. Engineering reports of successful test results for all these tests must be included in the preliminary application.

Pre-Application Actions

- Review the performance criteria for all component products on the list
- Perform bench tests on applicable equipment
- Secure a local test site with sufficient fuel input and output
- Contract an installer to remove the equipment from the system and install the new Morrison equipment
- Install data monitoring equipment at our local test site

PRE APPLICATION PROCESS | CARB, E.V.R.

- Morrison staff would visit the Dubuque-based test site on a regular basis
- Not all testing equipment was commercially available. Morrison designed and manufactured some of our own testing equipment
- Evaluate the data from our monitoring system
- Make final design changes to the equipment design if necessary
- Proceed to CARB with our official application

What Information was included in the application?

- A complete Equipment List
- Engineering drawings for each component
- Installation, Maintenance & Compliance Standards & Specifications
- Product warranty statement
- Proof of financial responsibility

Test Site Information

- Location of the site must be located within 100 miles of CARB Sacramento offices
- Must have a minimum fuel throughput of 1500 gallons per month for each month and a minimum of 9,000 gallons for the 6-month test period
- A matrix of 30 different non-ORVR vehicles may be used. This means multiple types of vehicles should be fueling during the test. (Not a fleet of one type of vehicle.)

Test Site Information

- Morrison system test was conducted at a location with a 12,000-gallon Fireguard tank produced by Modern Welding.
- A certified installer was contracted by Morrison
- Contractor tested and documented the results of the tank system prior to making any changes.
- Contractor removed the original equipment then installed the new Morrison equipment on the test site tank.
- Electronic data monitoring equipment was installed on the system to monitor the system in accordance with CP 206
- Conduct a final system test in accordance with CP 206
- Nearly ready for site lockdown and CARB Test to begin

APPLICATION PROCESS | CARB, E.V.R.

Due to regulatory requirements imposed by other California agencies, applicants must obtain letters from those agencies allowing us to install non-approved equipment on a functioning fueling system at a specified location in California for the purpose of conducting the test.

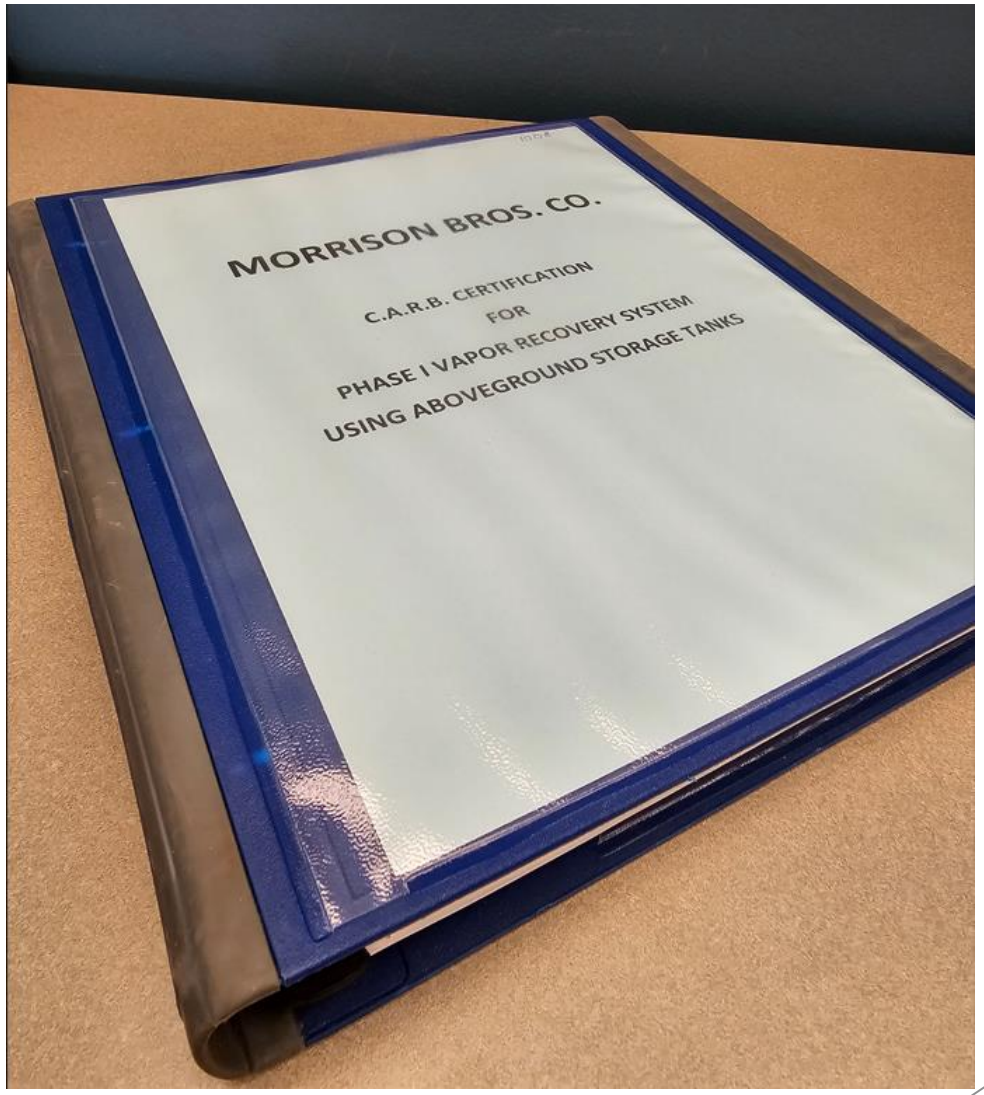
- The Division of Industrial Relations, Occupational Safety & Health (DOSH)
- The Office of Forestry & Fire Protection, Office of State Fire Marshall (SFM)
- Department of Food & Agriculture, Division of Measurement Standards (DMS)

APPLICATION PROCESS | CARB, E.V.R.

Estimated Timeline for the Certification Application Process

Action	Time	Determination	CARB Response
Preliminary Application Filed	60 days	Acceptable	Preliminary Application Accepted Test Site Approval Granted
Preliminary Application Filed	60 days	Unacceptable	Preliminary Application Returned with Notification of Deficiencies
Application Resubmitted	30 days	Acceptable	Preliminary Re-Application Accepted Test site Approved
Application Resubmitted	30 days	Unacceptable	Initial Re-Application Returned with Notation of Deficiencies
Final Application Complete	120 days	Acceptable	Executive Officer Issues Certification Executive Order
Final Application Complete	120 days	Unacceptable	Executive Officer Denies Certification

APPLICATION PROCESS | CARB, E.V.R.



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TEST SITE | CARB, E.V.R.

MORRISON BROS. CO.

TEST SITE | CARB, E.V.R.

MORRISON BROS. CO.

Once the site is secured, CARB Technicians can conduct tests and inspections at any time without notice. No equipment can be altered or switched out.

Standing Loss Control Test

- Standing loss tests all components as a system. After successfully meeting emission factor requirements, these components are certified together as a system
- CARB technicians top off the tank with off with nitrogen and the system gauge is monitored for loss.

TEST SITE | CARB, E.V.R.

Test site failure and redesign

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Efficiency Test

- Morrison is responsible for making arrangements and scheduling this test with CARB technicians
- Plan and schedule a fuel delivery with the specified amount of fuel
- Communicate with site manager as this test interrupts vehicle fueling for the duration of the test
- This tests measures the vapors entering the tank and the vapors returning to the tank truck. Any difference is lost out the vent or via connections.

Warranty

MORRISON BROS. CO. WARRANTY CARD

All Morrison products are thoroughly tested before shipment and only material found to be defective in manufacture will be repaired or replaced. Claims must be made within one year from the date of installation, and Morrison Bros. Co. will not allow claims for labor or consequential damage resulting from purchase, installation or misapplication of the product.

TO BE FILLED OUT BY INSTALLER/MAINTENANCE PERSON

Installation Date: _____

Installation Company: Name _____

Address _____

City _____ State _____ Zip _____

Business At Installation Site: Name _____

Address _____

City _____ State _____ Zip _____

Morrison Product(s) I.D Numbers _____

_____

_____

This card must be returned to manufacturer for warranty to be honored.

WARRANTY-100 PP Rev. B

OTHER COMPLIANCE | CARB, E.V.R.

MORRISON BROS. CO.

Welcome to Morrison Bros. Co.'s online CARB Certification Portal.

Using our online CARB Certification process, you will be provided with the tools needed to complete your certification requirements online. There is no cost to register and complete this exam.

HOW IT WORKS

INSTALLER CERTIFICATION EXAM PROCESS

We've made CARB Installer Certification quick and simple.
Easy as 1, 2, 3. Follow the steps below.

TRAINING VIDEOS

FIG. 818/918
CLOCK GAUGE
EVR

1

Study for test.

Follow the information and instructions provided in the Installer/Contractor Training Plan.

This document will guide you through the certification process and the recommended study materials.

RESOURCES ►

2

Register or login.

Registration is required to proceed to the exam portal.

If you are a new user - Register Now. If you've already taken the exam and need to re-certify, you can login with the username and password you have already setup.

3

Take exam.

To take the exam, Login below for Existing Users or Register Now for New Users.

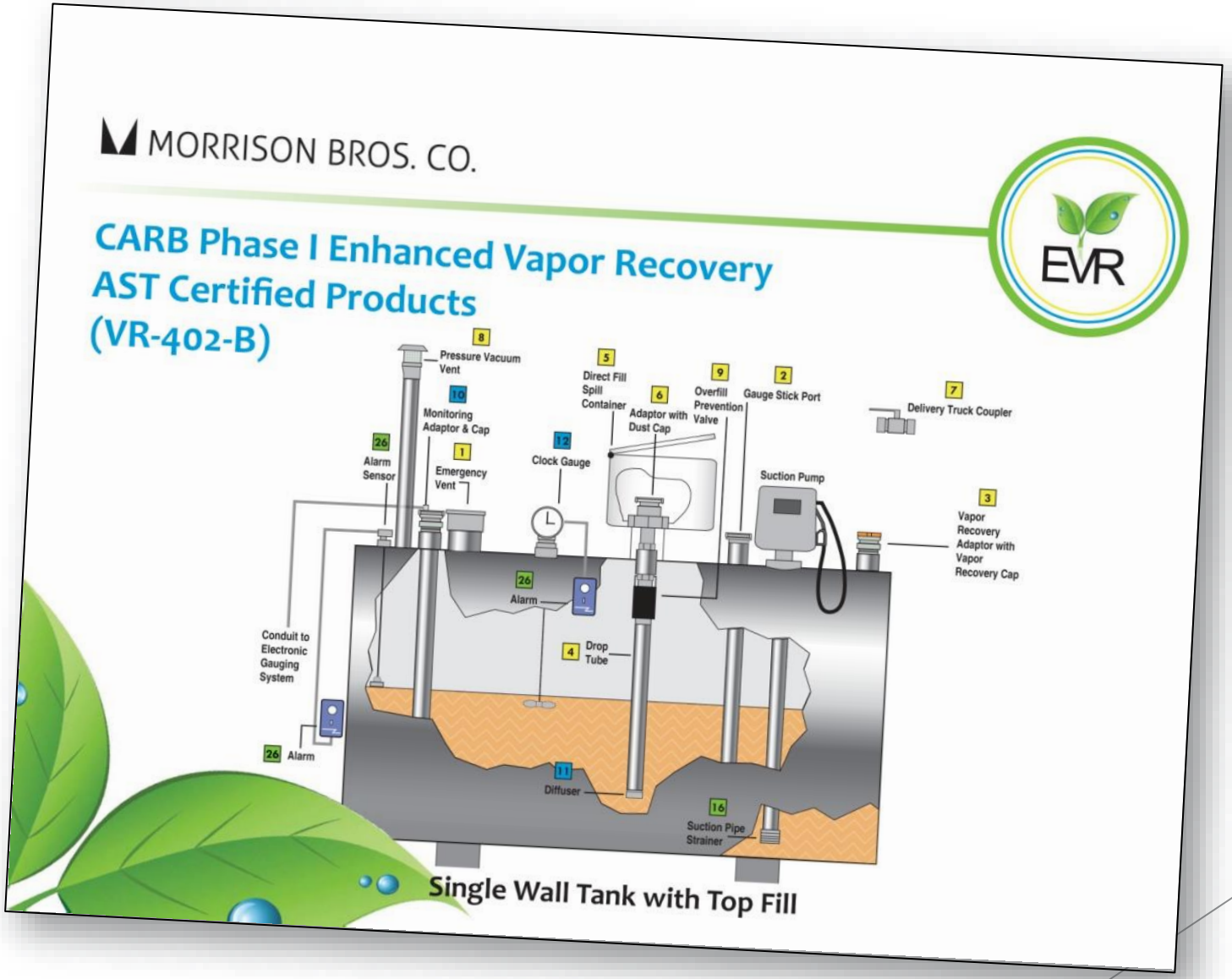
A certificate will be sent to your email address after you pass the exam. Two laminated wallet-size certificates will be sent to your mailing address.

TAKE THE EXAM ►

POST TEST | CARB, E.V.R.

Once the testing was completed, the documentation was submitted to CARB for a 60-day review. (the 60 day review took much longer than 60 days) Several agencies completed a review and ultimately signed off and finally executive order EO 402 was issued.

MARKETING DOCUMENTS | CARB, E.V.R.



MARKETING DOCUMENTS | CARB, E.V.R.

EVR Certified Required Products

1. Emergency Vents
2. Caps & Adaptors
3. Vapor Caps & Adaptors
4. Drop Tubes
5. Tank Top Spill Buckets
6. Dry Disconnect adaptors/caps
7. Dry Disconnect Couplers
8. Pressure Vacuum Vents
9. Overfill Preventions Valves

ADDITIONAL REQUIREMENTS | CARB, E.V.R.

EVR Certified Optional Products

10. Tanks Monitor Cap & Adaptors
11. Diffusers
12. Gauges
13. Extractor Connections
14. Bushings

DOCUMENTATION FILES | CARB, E.V.R.

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REVISIONS | CARB, E.V.R.

VR-402 Revision G (signed November 8, 2023)

- VR402 - G Legal Language
- VR-402-G Exhibits:
  - Exhibit 1 Equipment List
  - Exhibit 2 Installation, Maintenance, and Compliance Standards and Specifications
  - Exhibit 3 Manufacturing Performance Standards and Specifications
  - Exhibit 4 Manufacturer Warranty
  - Exhibit 5 Alternate Phase I EVR Installation Configurations for Existing Aboveground Storage Tank
  - Exhibit 6 Determination of Static Pressure Performance of Vapor Recovery Systems at Gasoline Dispensing Facilities with Aboveground Storage Tanks
- VR-402-G Installation, Operation, and Maintenance Manual (IOM) for the Morrison Brothers Phase I System

Questions?

UL/ULC UL 2583| EMERGENCY VENTING

ULC Standards
Normes ULC

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ANSI/CAN/UL/ULC 2583| EMERGENCY VENTING

- UL 2583 Began As An Outline In January of 2015
- UL2583 Became A Standard For Safety On December 8, 2021
- Joint Canada-United States National Standard
- Fuel Tanks Accessories For Flammable & Combustible Liquids

ANSI/CAN/UL/ULC 2583| EMERGENCY VENTING

ULC 661

STANDARD FOR OVERFILL PROTECTION DEVICES FOR FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE TANKS

ULC 663

STANDARD FOR SPILL CONTAINMENT DEVICES FOR FLAMMABLE AND COMBUSTIBLE LIQUID ABOVEGROUND STORAGE TANKS

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REQUIREMENTS | UL ULC UL 2583

The requirements in 2583 cover mechanical type accessories that are typically intended for attachment to storage tanks or connecting pipe for flammable and combustible liquids in commercial (public) or private (fleet) automotive fueling station and similar storage or dispensing applications and are designed to provide automatic safety or operational functions.

LISTING PROCESS | UL ULC UL 2583

Our process for obtaining a UL Listing for Emergency Vents

- Is there a market demand or a requirement for a product to warrant a UL Listing?
- Will we sell more of a product if it is UL Listed?
- Is there a financial payback?

LISTING PROCESS | UL ULC UL 2583

Evaluate all aspects of the UL requirement to ensure our vent will meet the requirements and pass the tests.

- Functionality requirements
- Construction requirements
- Performance requirements
- Vent exposure and compatibility
- Pressure relief and flow

LISTING PROCESS | UL ULC UL 2583

- Prepare documentation and apply to UL for a quote for Morrison Emergency Vents
- Quote was accepted and the project schedule was established

LISTING PROCESS | UL ULC UL 2583

Most testing is conducted at UL located in Northbrook, IL.

When Possible, our engineers were present to witness testing.

UL Listing for Emergency Vents

Emergency Vent Assembly and Abuse test

- Vent is held at an angle and dropped 4 feet
- The landing area is a target area made of concrete

If the vent is damaged but the damage is not visible, the test results in failure (simulates shipping damage).

If the damage to the vent is visible, then the shipper or receiver can see the damage and get a replacement avoiding the installation of a damaged unit.

UL Listing for Emergency Vents

Emergency Vent Exposure and Compatibility test

- Submit elastomers such as O-rings and gasket components used in the vent construction to UL for testing
- If multiple suppliers of elastomers are used, submit samples from each supplier

UL will place elastomers in a closed chamber with all fuels included in the test for 120 days. Elastomers will be evaluated for pass and fail based on changes to physical properties.

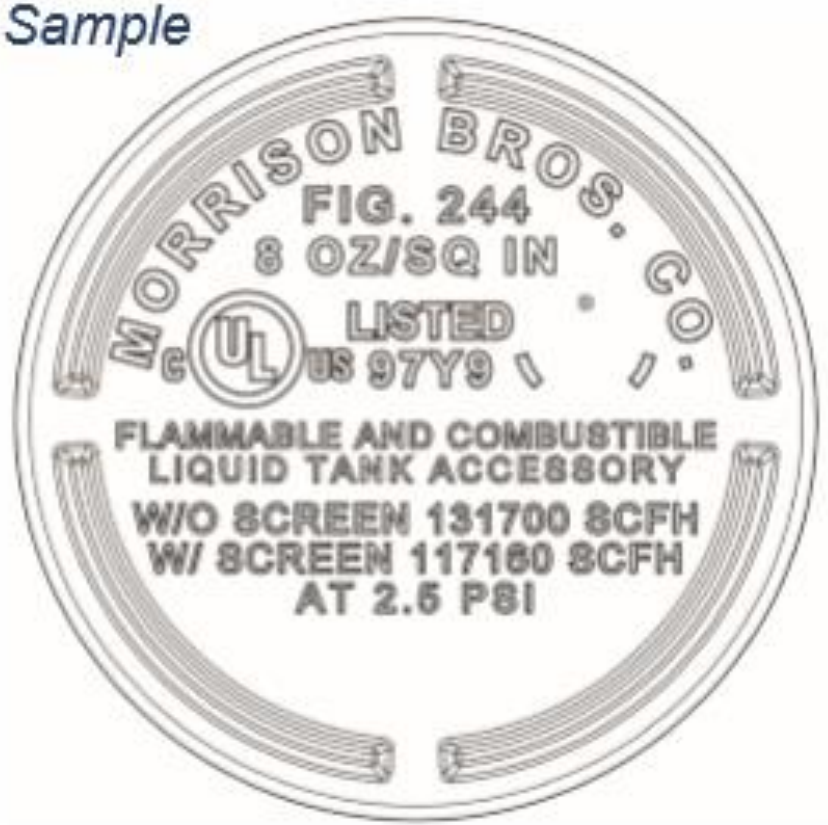
UL Listing for Emergency Vents

Emergency Vent Flow and Opening Pressure

- UL does not have a jet propulsion lab to conduct air flow test on larger vents
- Morrison researched and located a test facility with the required capabilities to perform and document flow tests
- Make arrangements to conduct the flow and cracking pressure tests on multiple size vents. (We offer 2 inch, 3 inch, 4 inch, 6 inch, 8 inch and 10 inch size vents)
- Schedule our engineering staff to be present for the tests
- A member of UL's engineering team must be present for these tests

LISTING PROCESS | EMERGENCY VENTING

244 Emergency Vent Cover Sample
Previous UL Listing



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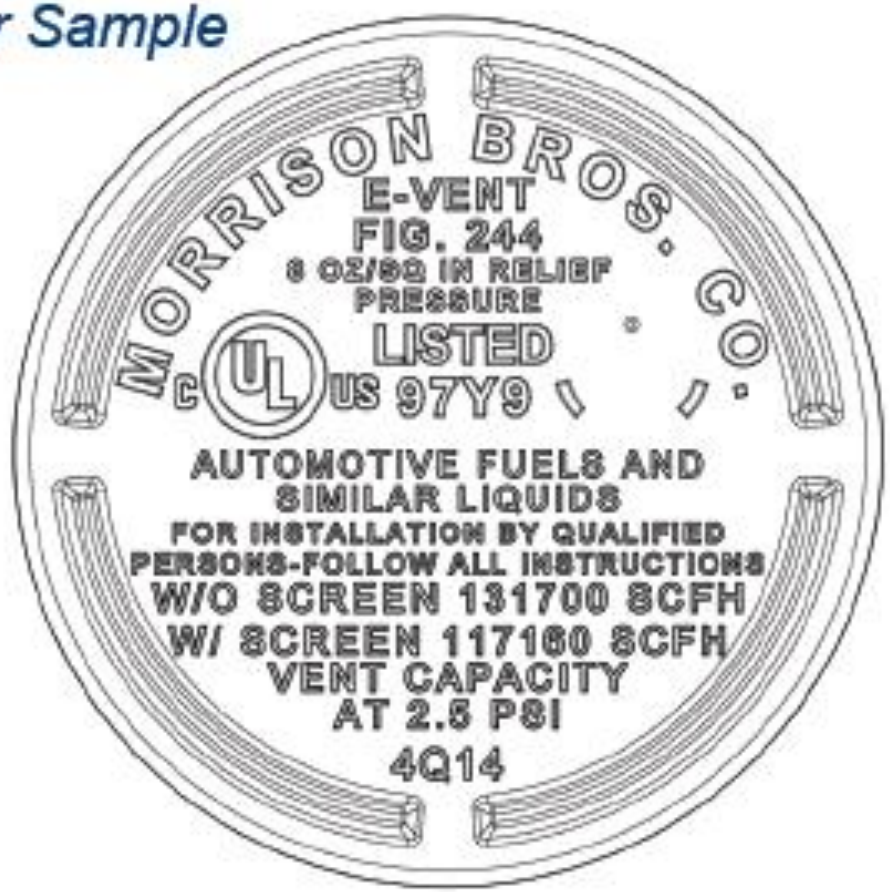
LISTING PROCESS | EMERGENCY VENTING

244 Emergency Vent Cover Sample
New UL 2583 Listing



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Product Labeling

- 8 oz per sq. in. covers
- 16 oz per sq. in. covers
- 7 sizes
- 14 cover patterns must be updated

4” vent

6” vent (2440)

10” vent (2440F)

LISTED PRODUCTS | SPILL CONTAINERS/FILL BOXES

517

518 (4")

516 (4")

MORRISON BROS. CO.

LISTED PRODUCTS | SPILL CONTAINERS/FILL BOXES

515
(pedestal mount)

Fig. 715
(flanged top connection)

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LISTED PRODUCTS | OVERFILL PREVENTION VALVES

ULC LISTED

MORRISON BROS. CO.

LISTED PRODUCTS | OVERFILL PREVENTION VALVES

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LISTED PRODUCTS | ANTI-SYPHON

LISTED PRODUCTS| FLAME ARRESTERS

LISTED PRODUCTS | LEVEL ALARMS

LISTED PRODUCTS | SYSTEM INTERFACE

918AC

**UL/cUL913 Listing for ordinary location with Hazardous Location intrinsically safe input circuits for Class I, Div 1 Group D, Florida DEP EQ-834.*

LISTED PRODUCTS | LEVEL GAUGES

c UL us LISTED

1218C

1218S

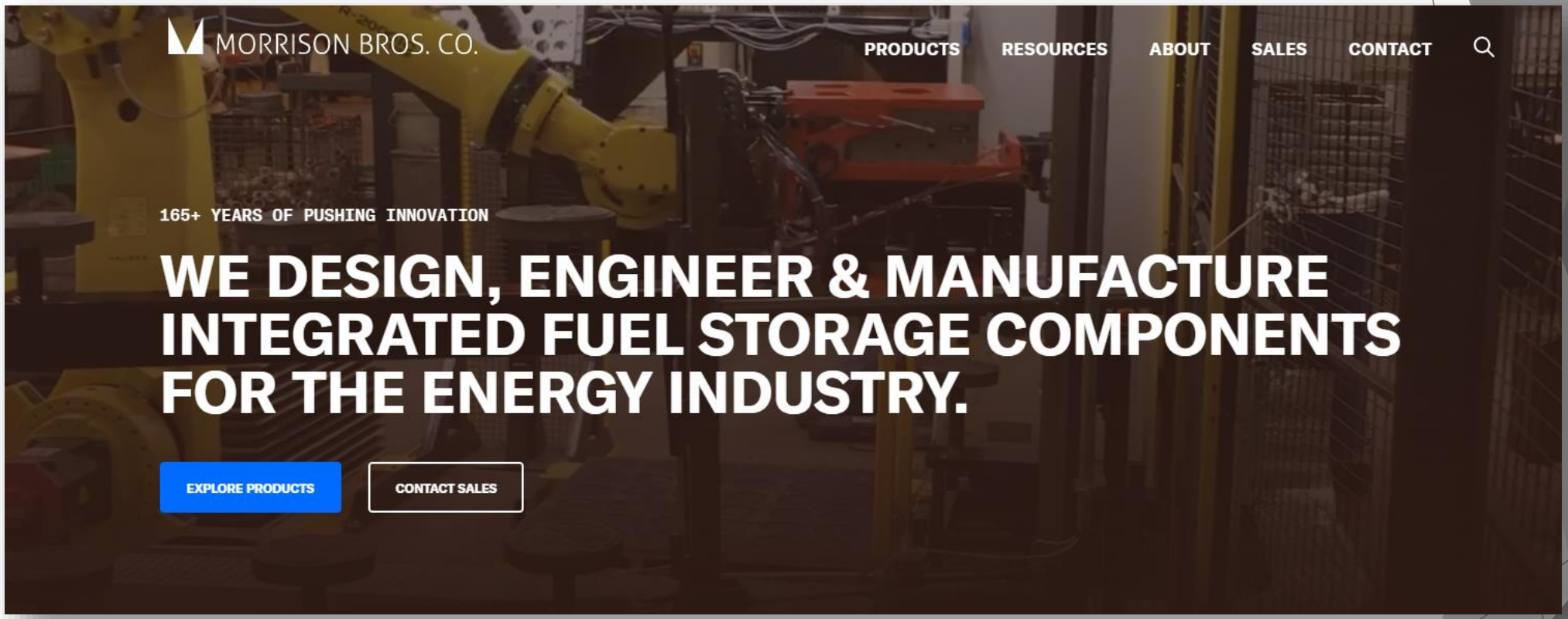
LISTING PROCESS | UL LISTED PRODUCTS

Ongoing

- Each product listing has an annual UL fee associated with it.
- Each manufacturing plant where a product or component is manufactured is subject to quarterly inspections
- Each inspection is subject to an inspection fee
- In some cases component suppliers are inspected at our expense

Questions?

INFORMATION | WEBSITE



Thank you!

- Jerry Schollmeyer
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- jschollmeyer@morbros.com
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MORRISON BROS. CO.