UST COMPONENTS 101
March 22, 2023

PLUS!

W-C_3

Gerrit Kovach , San Bernardino County Fire Department

Brenda Puepke, Puepke Consulting

DISCLAIMERS/UPDATES

- **This is not everything that is out there.**
- **All parts here are broken/useless/trash (Not Donations).**
- **We welcome comments and improvements (Even as we go along today).**
- **Presentation will likely growing and improving.**
- **I am by far the expert, BUT, we have a lot of great UST Elders here.**
- **GLOVES for handling any parts please.**

DISCLAIMERS/UPDATES

- **Updates from the 2021 Presentation including fixes.**
- **We don’t have everything…. YET.**
- **Presentation is designed to be very open and we want hands on.**
- **MOST of the photos are from the field. A LOT more this year!**
- **ALL of the videos are from the field.**
- **New field guide and other useful documents provided. Including the Waterboard Construction Monitoring Guide. We will look at them. I did not do the piping guides.**

Agenda/Goal

- To Assist with Identification of UST Components (*WHAT IS THIS?*)
- Simple Understanding of UST Components and what they look like to better understand the UST System.
  - Underground Storage Tanks
  - Monitoring Systems and Sensors
  - Some Underground Dispenser Containments (UDCs)
  - Spill Buckets/Overfill (Not Today)
  - Sensor Case Studies. A tale of a new inspector.

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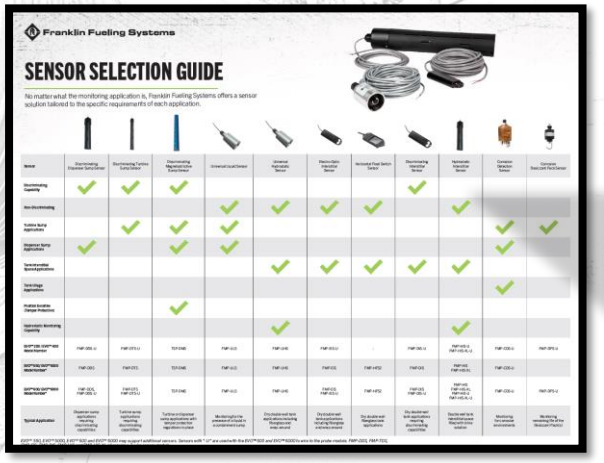
Agenda/Goal

- Introduction of a Monitoring System Field Guides.
- Other current Guides (Piping, Manufacturer).
- Waterboard Construction/Monitoring Guide
- Manufacturer Online Guides and Resources
- Open forum at the end (Around 4:00 pm)



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Agenda/Goal

- What this presentation includes:
  - TANK, SYSTEMS, CERTS, BREAKS
  - THE COLLECTION
  - Field Guides and Resources
  - More photos and updates from the 2021 Presentation.
  - Where did all this stuff and all these photos come from?

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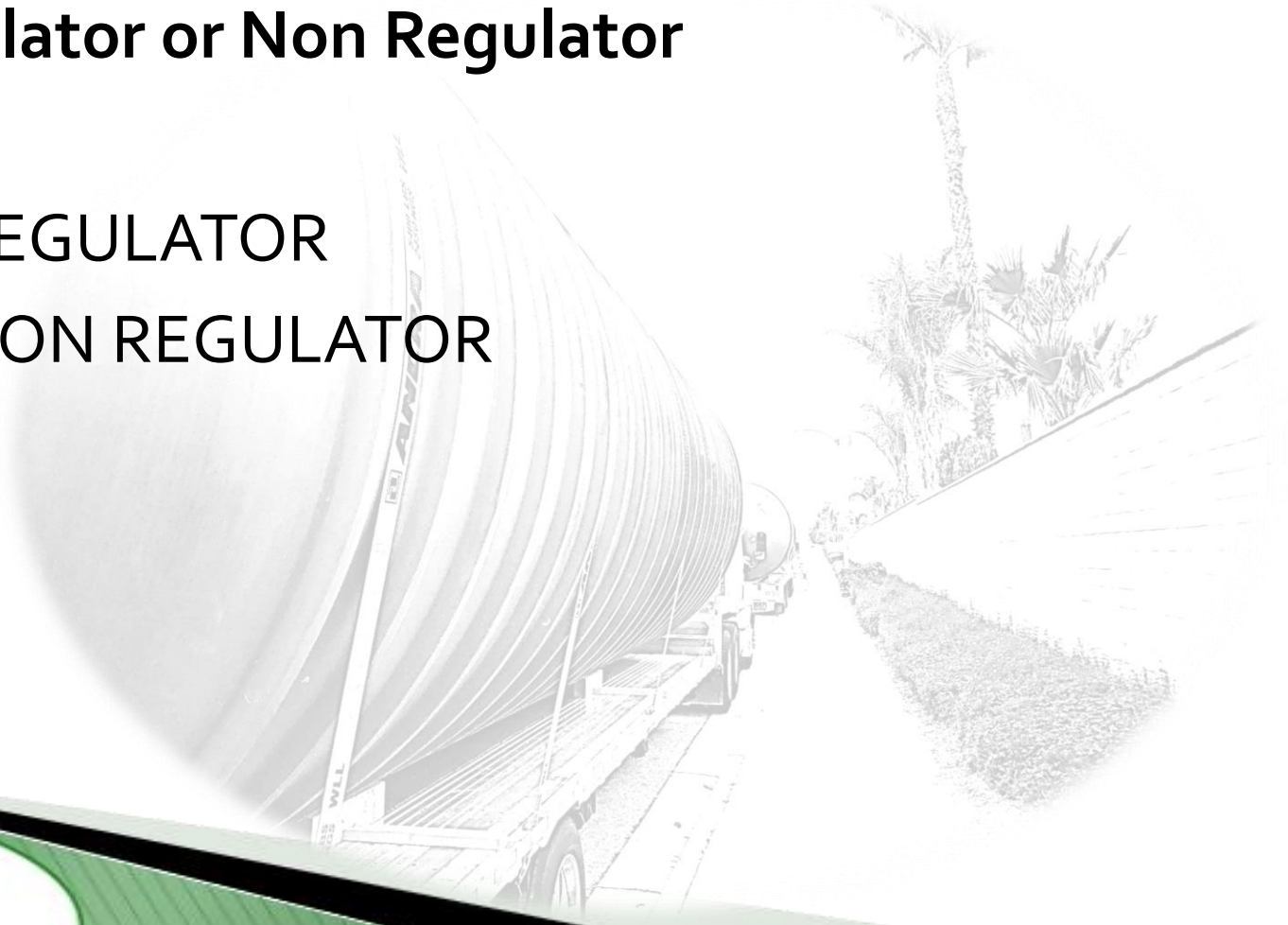
Agenda/Goal

- What this presentation isn't:
  - UST 101
  - Plan Check / Construction Guide
  - CERS Monitoring Plan Verification.
  - Overfill and Spill Buckets
  - Violation Classification
  - Ordinances or Fire Code
- BREAK
  - Post Break Sensor Scenario.
  - What is this?
  - What's Wrong with this Picture?
  - Questions and Answers and Hand's On.

Participant Experience

Regulator or Non Regulator

A. REGULATOR
B. NON REGULATOR



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Participant Experience

Years of UST- Inspection Experience

A. Less than 2
B. 2 to 5
C. 5 to 10
D. 10+

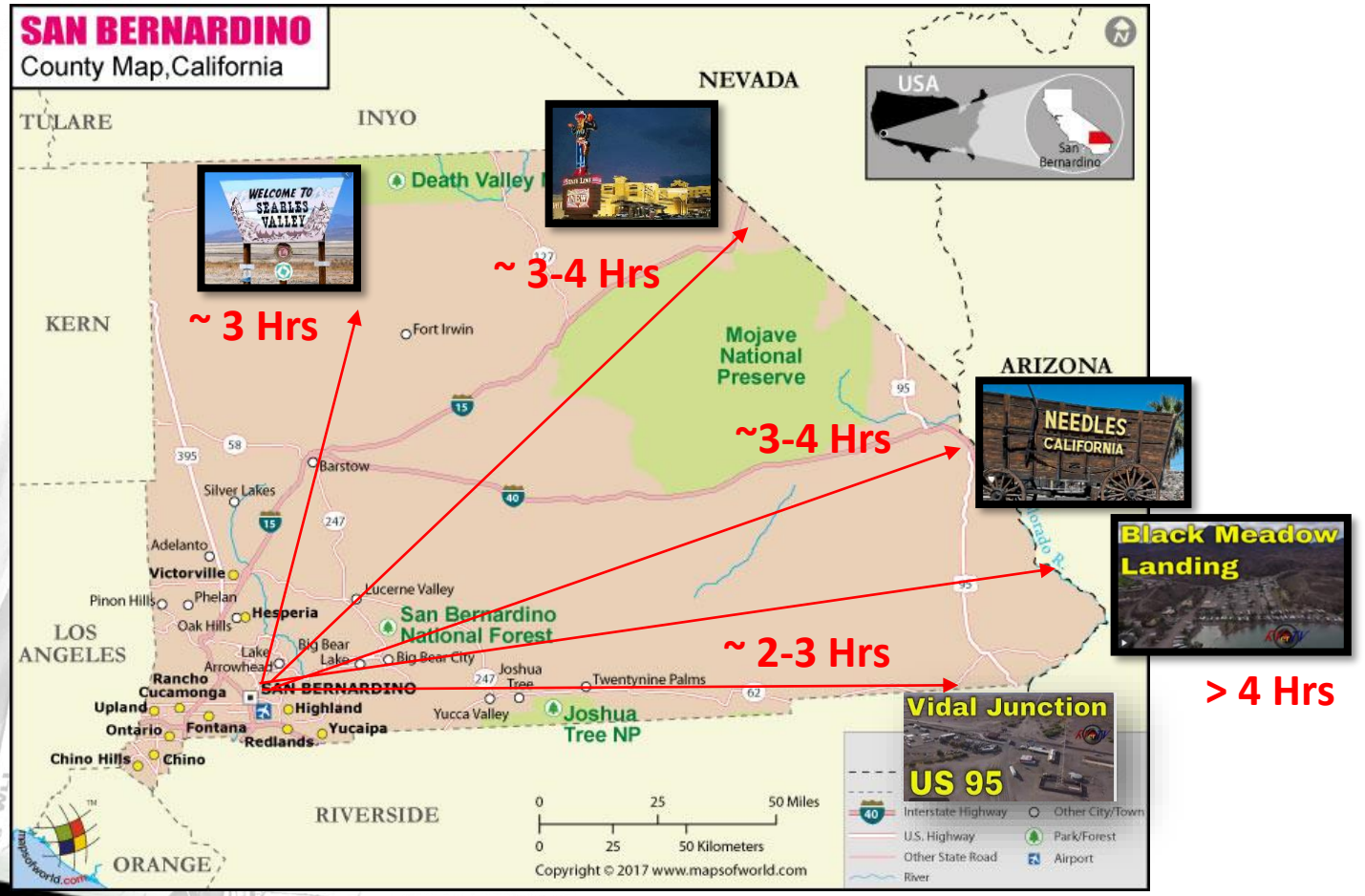
Participant Experience

Years of UST- Plan Check experience (Review or Submission Side)

A. Less than 2
B. 2 to 5
C. 5 to 10
D. 10+

San Bernardino County

- Largest County in the US
- Border 5 other CUPAs
- Extend to AZ and NV
- 20,105 Square Miles
- LA is 4,753 Sq. Mi.
- OC is 791 Square Miles
- Very diverse geography



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San Bernardino County

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San Bernardino County

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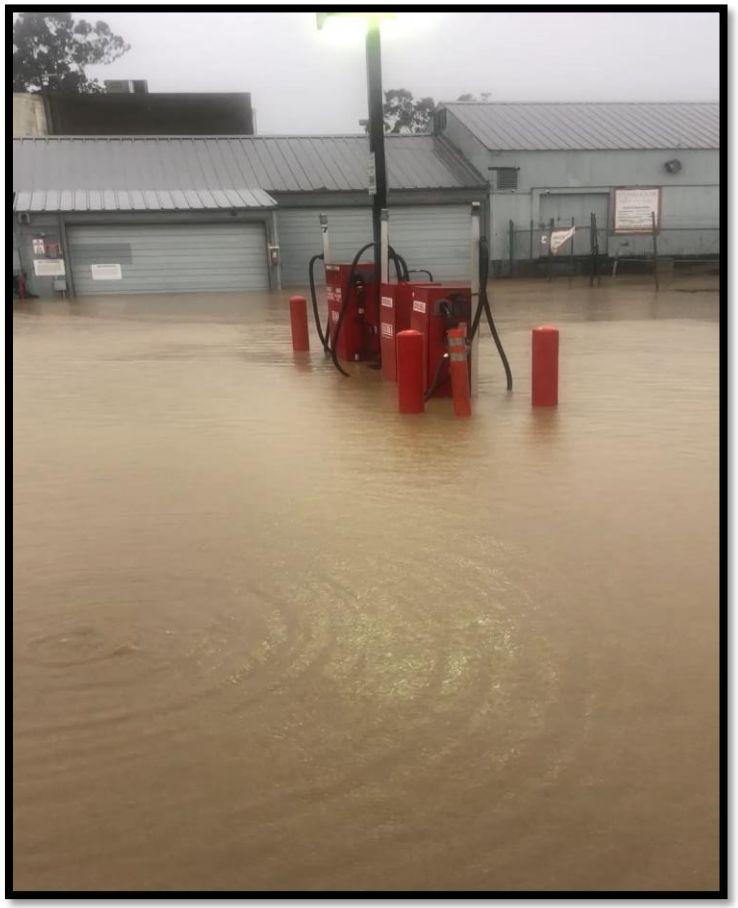
USTs and Extreme Weather (Pretty Much All CUPAs)



San Bernardino County

- **Total UST Sites:** 840
- **Abandoned USTS:** 67 (23 sites)
- **Single Wall USTs: 37** (13 sites)

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San Bernardino County

- **New Installs/Construction (2022): 27**
- **Plan Checks/Permits 2022: 429**
- **Removals 2022:** 10

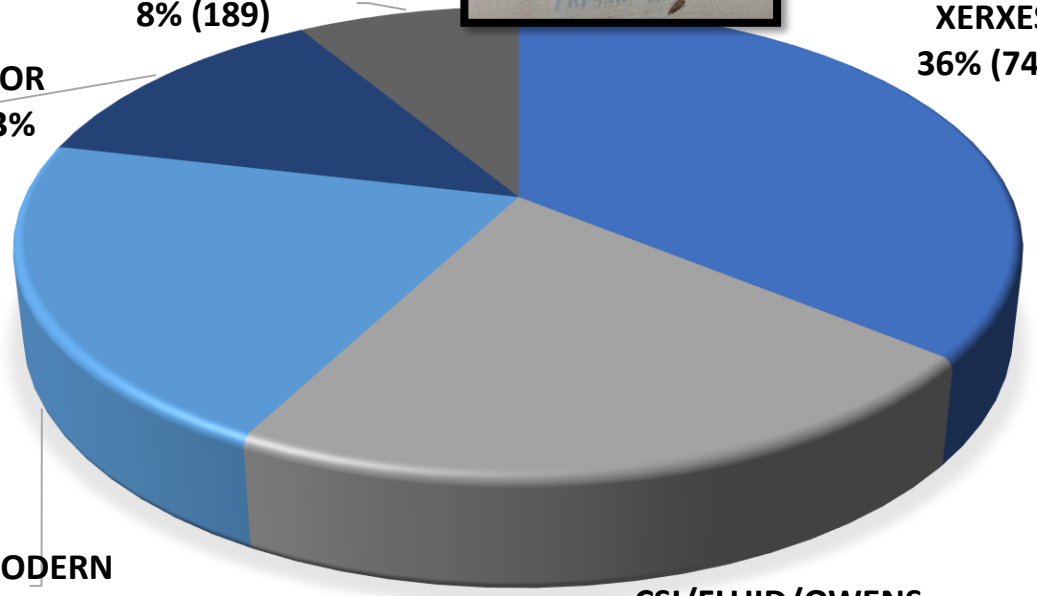
UST Sizes (For Reference)

10,000 Gallon Xerxes UST (Cute Right?)

UST Sizes (For Reference)

40,000 Gallon Containment Solutions

USTs in San Bernardino



UST Certifications

DO I NEED A CERTIFCATION and/or

LICENSE FOR THIS/TO DO THIS?

Veeder Root Level 2/3/4	05/27/2022	05/27/2024
Veeder Root Level I	10/14/2020	
Veeder-Root Vapor Products (Formerly ISD and PMC)	09/08/2022	09/08/2024
VST - Hanging Hardware Installation	10/27/2022	10/27/2024
Western Fiberglass Cuff Boot Training	07/28/2022	07/28/2024
Xerxes UST Installation Training Seminar	09/02/2021	09/02/2024

YUP! – Sure do! – Absolutely! – You have to ask?

Bravo Systems	02/12/2021	02/12/2024
CA Weights & Measures Service Agent	07/01/2022	07/01/2027
CNI Manufacturing - EVR System Installation	09/15/2022	09/15/2024
Containment Solutions Tank and DW Sump Installation	01/06/2023	01/06/2025
Emco Wheaton Phase I and Phase II EVR	06/29/2022	06/29/2024
Franklin DC400 Dispensing Cutoff (formerly Beaudre	07/23/2021	07/23/2023
Franklin Flexible Connectors (Formerly Flex-ing)	07/16/2021	07/16/2023
Franklin Fueling Defender Spill Buckets	07/16/2021	07/16/2023
Franklin Fueling Overfill Prevention	07/16/2021	07/16/2023
Franklin Fueling Phase I - VR-101 (Formerly Phil Tite)	07/16/2021	07/16/2023
Franklin Submersible Pumps/Forecourt Specialist	07/16/2021	07/16/2023
Franklin XP Series Piping (fomerly APT)	07/27/2022	07/27/2024
Healy Systems, Inc. Stage II Vapor Recovery	07/16/2021	07/16/2023
Hose Master Installer Training	02/12/2021	02/12/2023
ICC California UST Service Technician	10/13/2021	10/13/2023
ICC Vapor Recovery System Installation and Repair	10/13/2021	10/13/2023
ICC Vapor Recovery System Testing and Repair	02/02/2021	02/02/2023
Icon Containment Solutions Certified Installer	02/12/2021	02/12/2023
INCON Level 1 - FMS Installation (EVO)	01/03/2022	01/03/2024
INCON Level 2 - FMS Programming	01/03/2022	01/03/2024
INCON Level 4 - Franklin Sump Test System	10/27/2022	10/27/2024
Jomar Valves & Fittings	03/25/2021	03/25/2024
Modern Welding Tank Installation	06/21/2022	06/21/2025
Morrison Brothers VR-402 (Phase I EVR for ASTs)	07/16/2022	07/16/2023
NOV FiberGlass Systems Piping (Formerly AO Smith)	11/04/2022	11/04/2025
OPW EVR Phase I - AST	05/20/2021	05/20/2023
OPW EVR Phase I - UST	05/20/2021	05/20/2023
OPW Fueling Containment Systems - FlexWorks	12/01/2021	12/01/2023
PEI RP1200 Testing/Verification of UST Equipment	11/03/2018	
Red Jacket MLLD Training Course	08/23/2022	08/23/2024
Red Jacket Product	08/25/2022	08/25/2024
Ronan Authorized Service Contractor	07/29/2022	07/29/2024
SCAQMD Periodic Inspector - Non-DO	11/30/2012	
SDAPCD Compliance Assistance Class	03/01/2013	
SJVAQMD GDF Testing Certification	06/30/2021	06/30/2023
Vaporless LDT-890 Leak Detector Tester	10/27/2022	10/27/2024
Vaporless Mechanical LLD Installer	10/27/2022	10/27/2024

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UST Certifications

Testing/Construction of USTs require:

- CSLB license
- Manufacturer's certification(s)
- ICC UST Service Technician certification
- ICC UST Installer/Retrofitter
- **Common Sense…**

UST Common Sense….?

USTs: LET'S TALK TANKS!

TANKS! The Main Component in a UST System

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Xerxes


ZCL | XERXES
making a lasting difference
Certificate of Completion
Presented to
SHANE BARBAO
For successful completion of
ZCL | Xerxes Underground Storage
Tank Installation Training Seminar

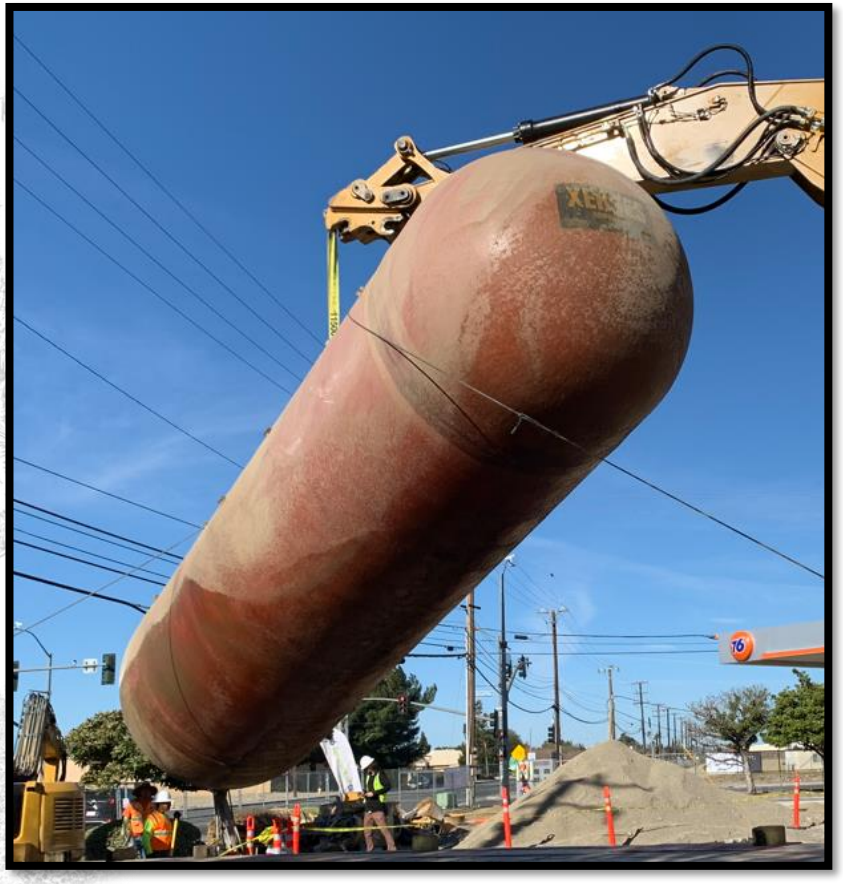

ZCL | XERXES

Xerxes Clues

- **CLUE:** Dark Red with Ribbing
- **Primary Containment:** *Fiberglass*
- **Secondary Containment:** *Fiberglass*
- **Annular:** Hydrostatic (New), Dry Wrap Around Sensor (Older)

Xerxes Clues

- Some older Xerxes will have no Ribs.
- 1987 Xerxes UST.



Modern Welding

CERTIFICATE
OF
ACHIEVEMENT

modern

THIS CERTIFIES THAT

KANIZ RHAMAN

IS AWARDED THIS CERTIFICATE FOR SUCCESSFULLY COMPLETING THE MODERN WELDING TANK INSTALLERS INSTRUCTION TEST

AWARDED THIS 6TH DAY OF December, A.D., 20 18

Robert A Bartlett

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Modern Welding

- **CLUES:** Smooth Red; Flat Ends; Straight Drop Annular Sensor (420, 430, Other)
- **Primary:** Steel
- **Secondary:** Fiberglass Jacketed/Clad
- **Annular:** Dry or Vacuum (VPH)
- **Most Common:** Glasteel II

Modern Welding

- **Up to 60,000 Gallon Capacity**

Containment Solutions (CSI)

Containment Solutions Inc (CSI)

- **CLUES:** Cream Colored/Ribbed
- **Primary Containment***: Fiberglass*
- **Secondary Containment:** *Fiberglass*
- **Annular:** Dry or Hydrostatic
- Older may also have hydrostatic interstitials.

Before CSI there was…

- **Fluid Containment**
- **Owens Corning**
- **CLUES:** Cream colored, may or may not have ribs may not be as pronounced
- **Primary:** *Fiberglass*
- **Secondary:** *Fiberglass*
- More likely to have manway cover.
- Some may have a wet annular.

Owens Corning

- Tanks prior to July 1990 not tested for compatibility with fuel containing E10 0r greater.
- No longer manufactured, but CSI may be contacted to inspect and possible repair older tanks.
- Recent Issue with Leaks in SBC.
- Multiple “Repair” permits issued to Sessions. All but one is Owens.

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Owens Corning – What we want to see!

Joor


PLASTEEL
COMPOSITE


PLASTEEL ®
COMPOSITE
DOUBLE - WALL
ESCONDIDO CA

Joor

- **JOOR:** No Longer Manufactured
- **CLUE:** Smooth. Dark Blue
- **Primary Containment*:*** Steel
- **Secondary Containment:** Fiberglass
- **Annular:** Dry.

Total Containment

- **Tanks:** Steel UST and Plastic Secondary
- **CLUE:** Cream Colored
- **Annular:** Dry and narrow and subject to failure at bottom on old tanks
- No Longer Manufactured

Total Containment

- **Tanks:** Steel/Plastic with Steel Mesh
- **CLUE:** Cream Colored
- **Annular:** Dry and narrow and subject to failure at bottom on old tanks
- No Longer Manufactured

StiP3

- **CLUE:** Smooth. Darker Blue/Charcoal Ish
- **Primary Containment*:*** Steel
- **Secondary Containment:** Steel
- **Annular:** Dry Interstitial.

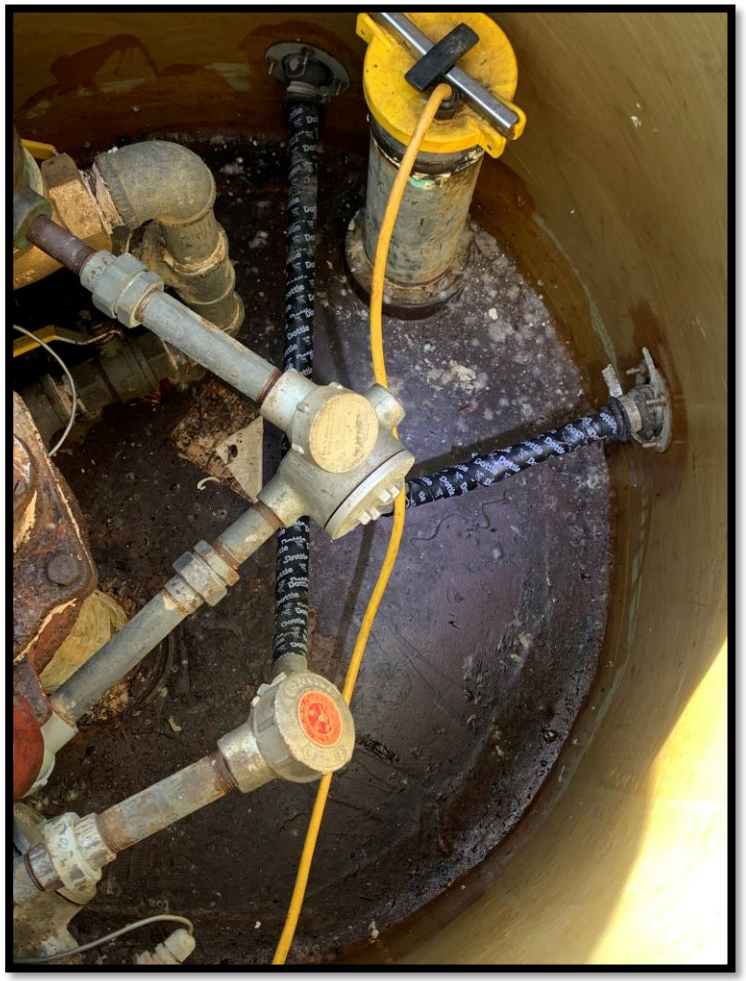
Corrosion Protection

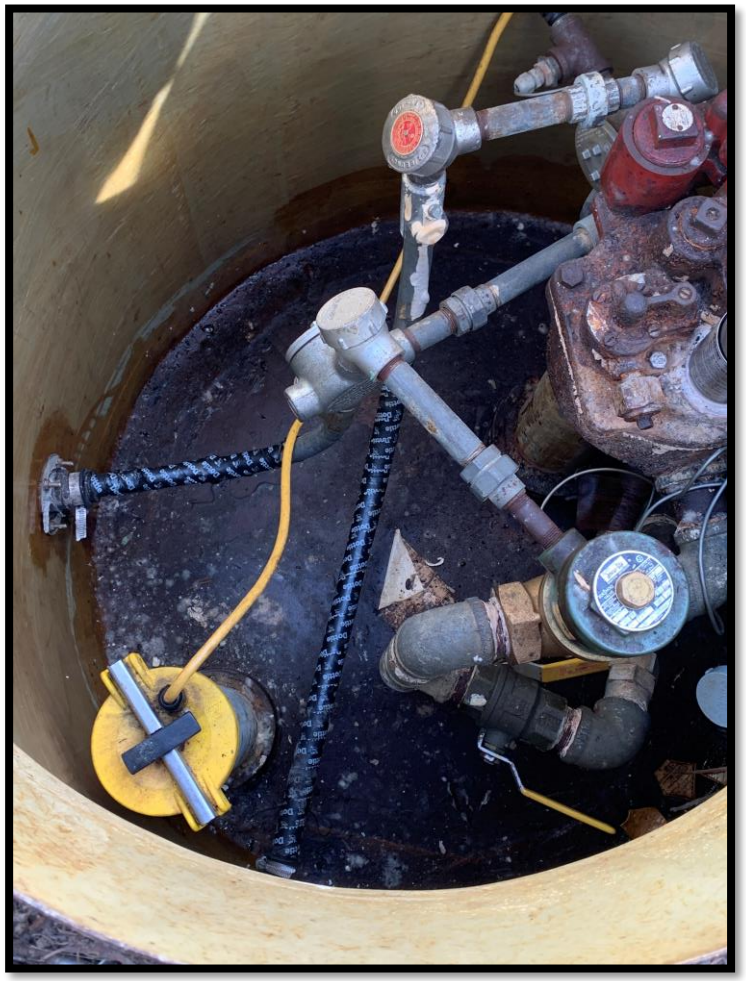
Yes **Sacrificial Anode**
No **Impressed Current**
No **Isolation**

StiP3

- **CLUE:** Smooth. Darker Blue
- **Primary Containment*:*** Steel
- **Secondary Containment:** Steel
- **Annular:** Dry Interstitial*.*
- *Cathodic Protection Testing*

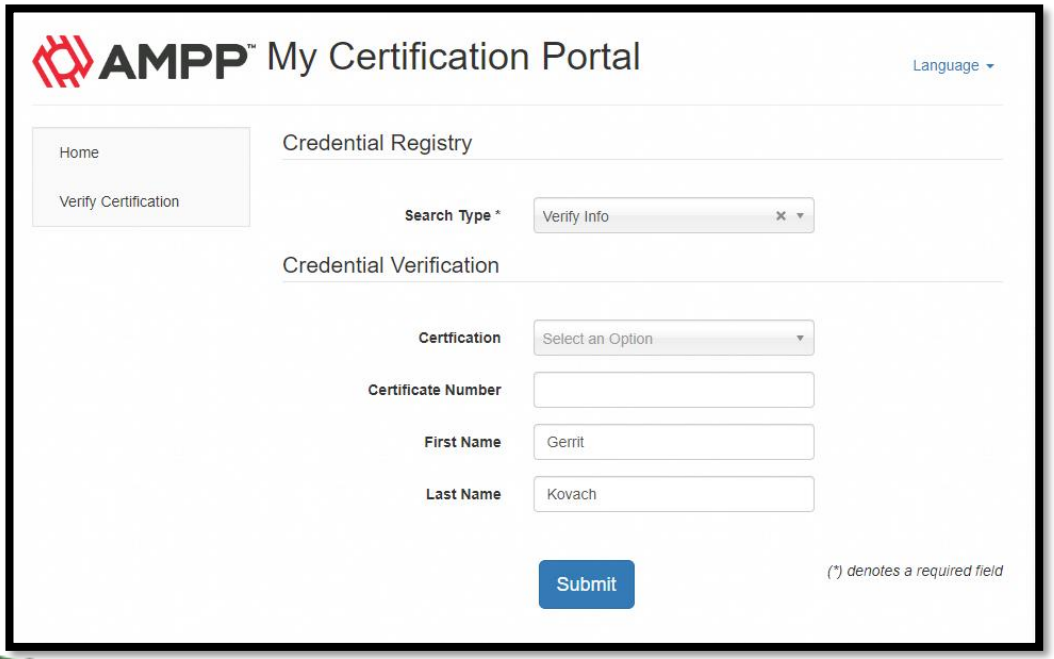
  Every Three (3) Years.



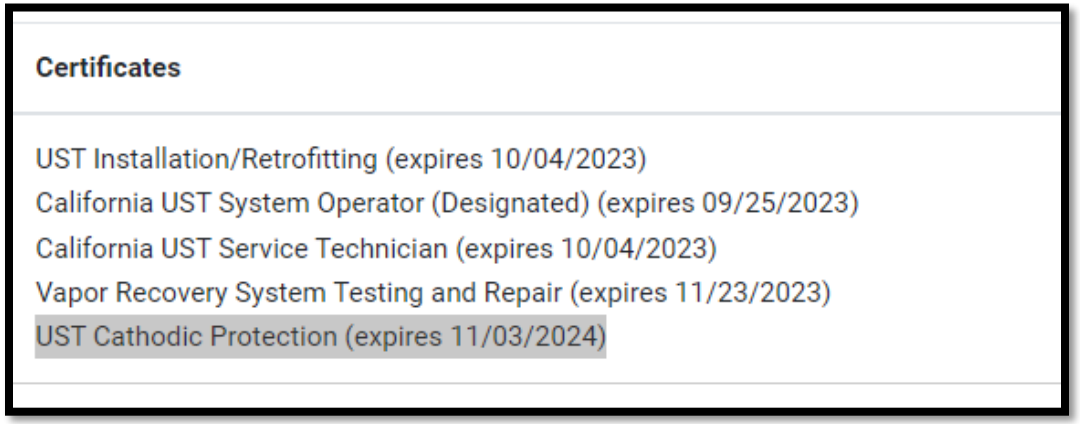


StiP3 – Cathodic Protection

The Association of Materials Protection and Performance
AMPP (Formerly NACE)



UST ICC



Ace Buehler

- **AB:** No Longer Manufactured
- **SW:** Steel
- **Primary Containment*:*** Steel
- **Secondary Containment:** Fiberglass
- **Annular:** Dry, Straight Drop
- **CLUE:** Smooth, light gray/blue

TRUSCO

- **Trusco:** No Longer Manufactured
- **Primary Containment:** Steel
- **Secondary Containment:** Fiberglass
- **Annular:** Dry
- **CLUE:** Smooth, Light Yellow Tint

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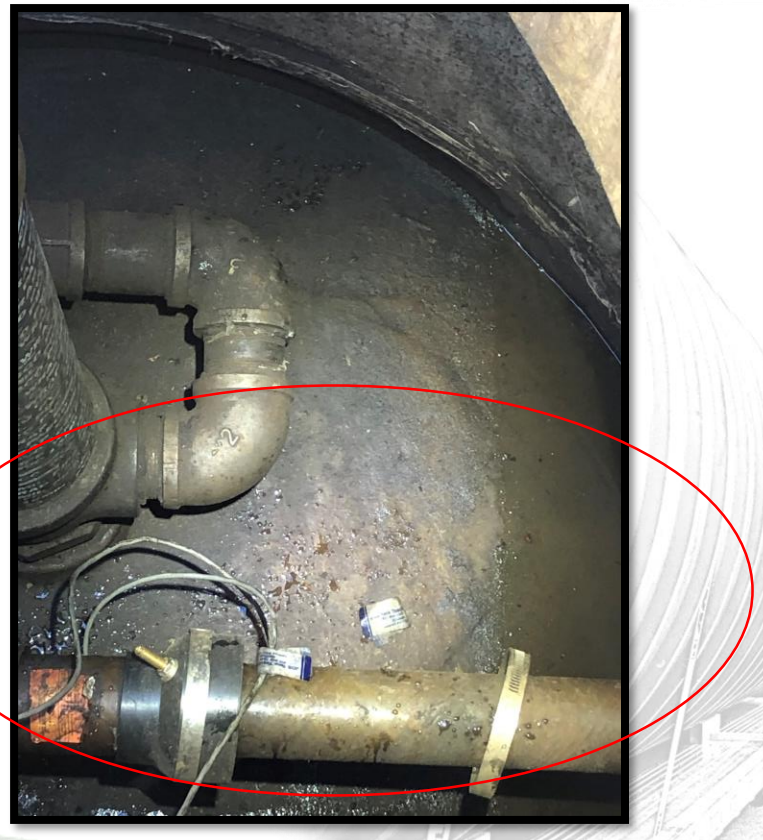
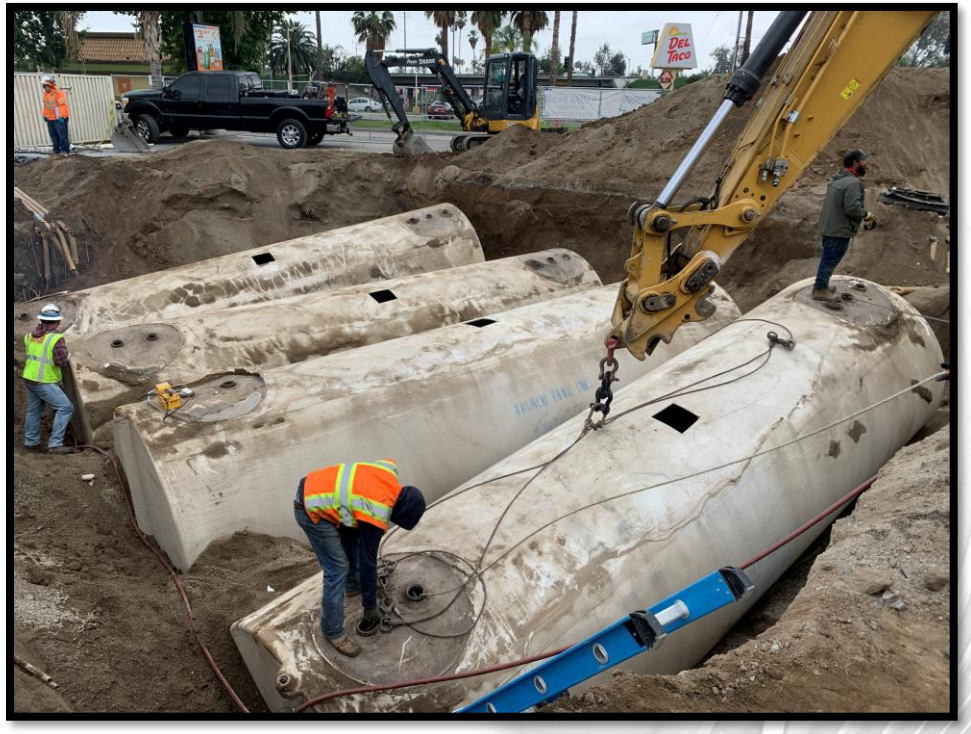
TRUSCO

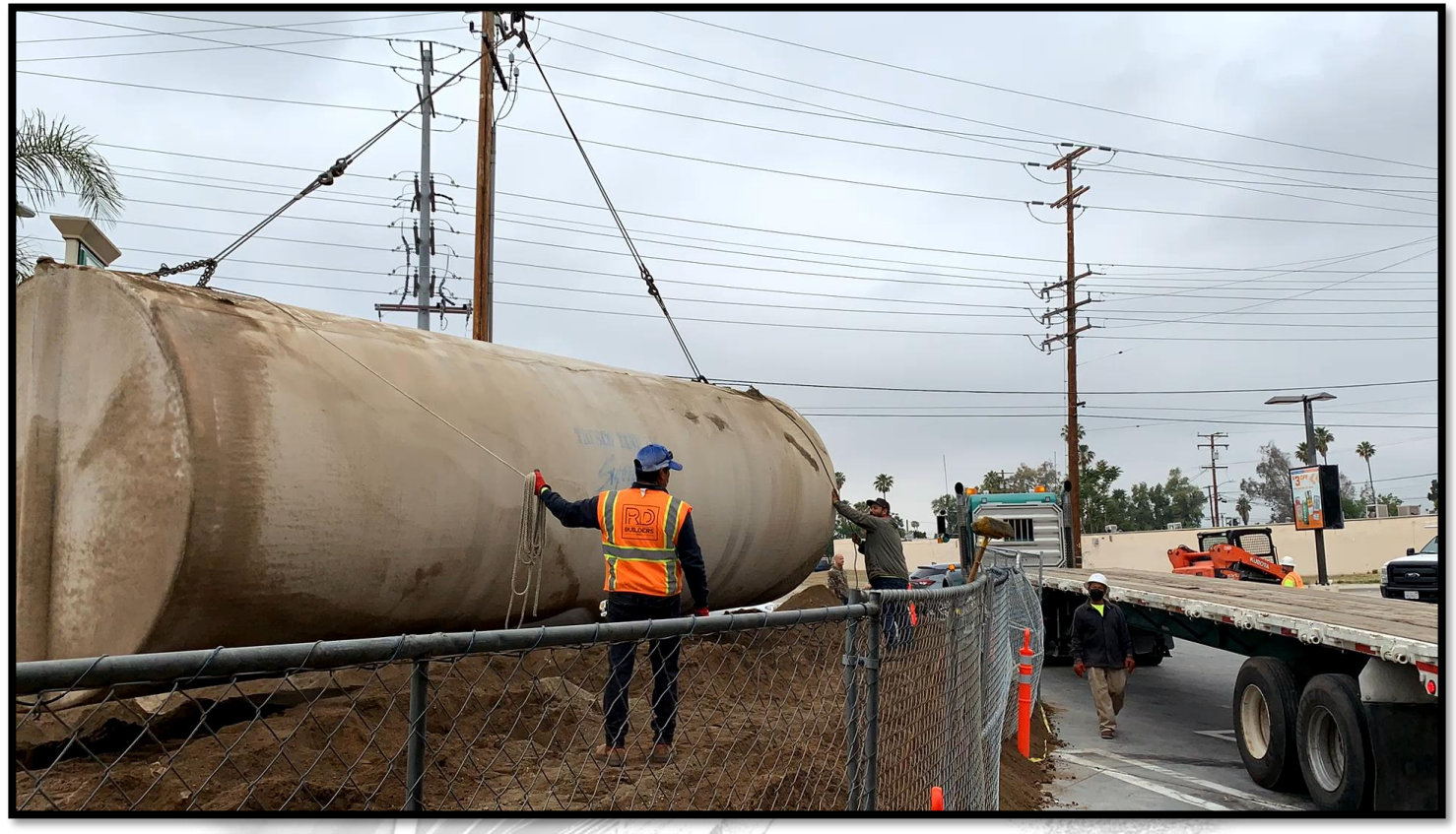


TRUSCO



ANNULAR SPACE

TRUSCO



UST Typical Construction

UST MANUFACTURER	PRIMARY	SECONDARY
Xerxes	Fiberglass	Fiberglass
Containment Solutions (CSI)	Fiberglass	Fiberglass
Modern Welding	Steel	Fiberglass
Joor	Steel	Fiberglass
Owens Corning/Fluid	Fiberglass	Fiberglass
Ace Beuhler	Steel	Fiberglass
Total Containment	Steel	Plastic
STI P3	Steel	Steel
Trusco	Steel	Fiberglass

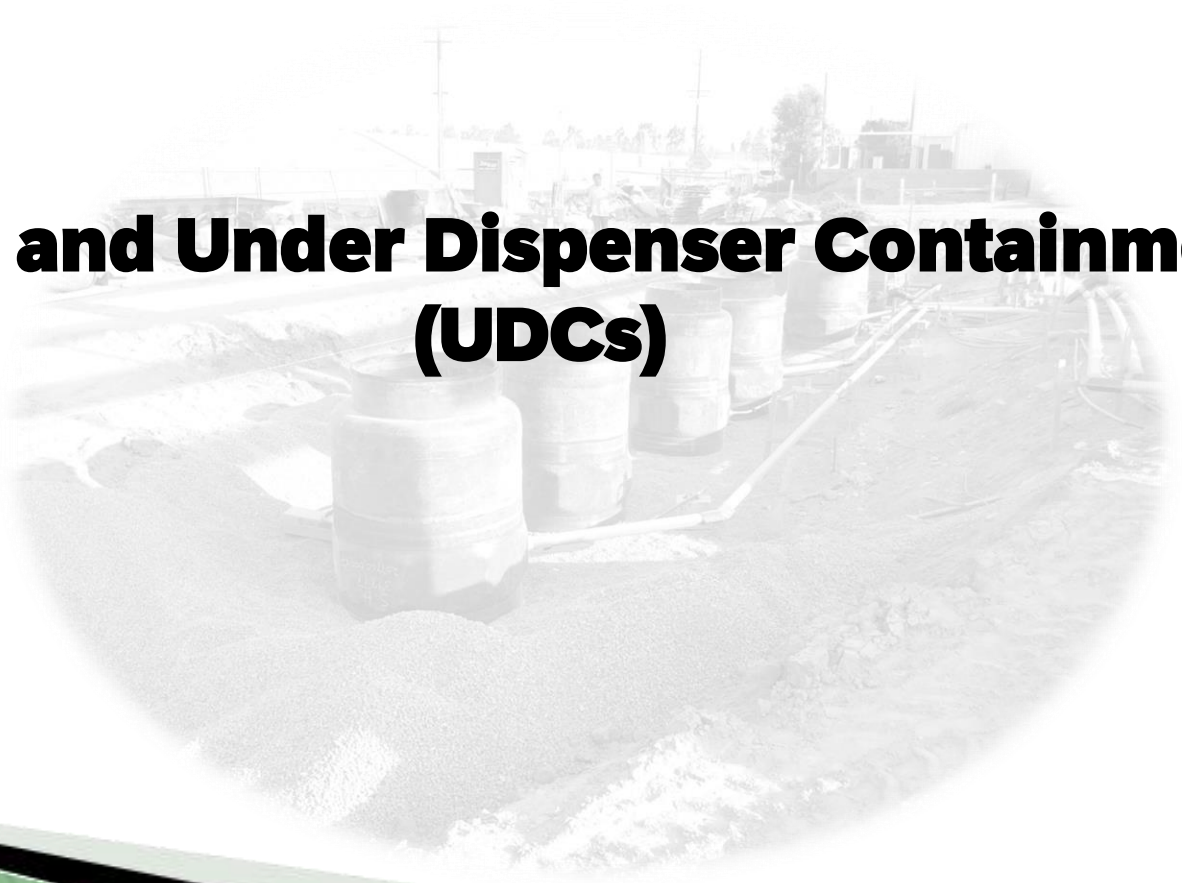
But wait! There's More....

Residence Tank in Rancho Cucamonga

Found USTs in Fontana

Found UST in Redlands

UST Sumps and UDCs



Sumps and Under Dispenser Containments (UDCs)

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UST Sumps and UDCs

- **Piping/Turbine Sump or aka (STP) Sump?**
- **Single-walled or Double-walled?**
- **Check install Date. 2004 on will be Double Walled.**
- **What's it look like?**
- **CERS and Certifications.**
- **UDC = Under Dispenser Containment.**

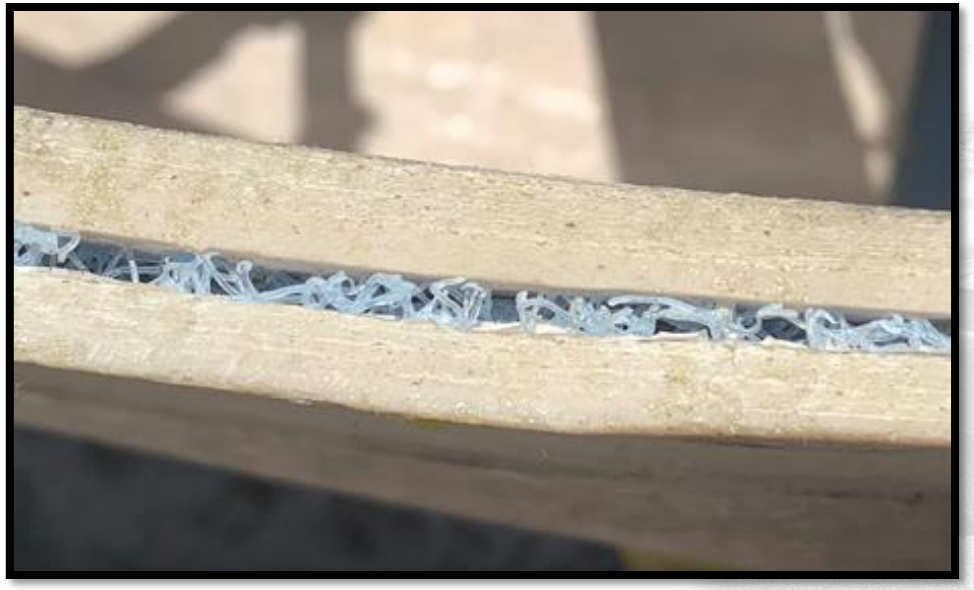
UST Sumps – Double/Single Wall

How do you tell if it's double wall?

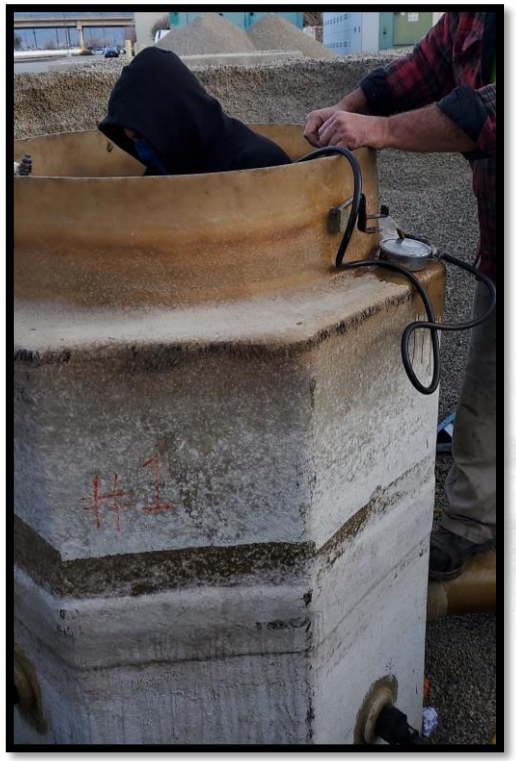
CLUE: Look for the Reservoir or Vacuum Line (Vacuum or Brine). Required for all UST Systems installed (set) July 1, 2004.

UST Sumps – Double/Single Wall

Double Wall Interstitial



UST Sumps



Western Fiberglass

Xerxes

Containment Solutions

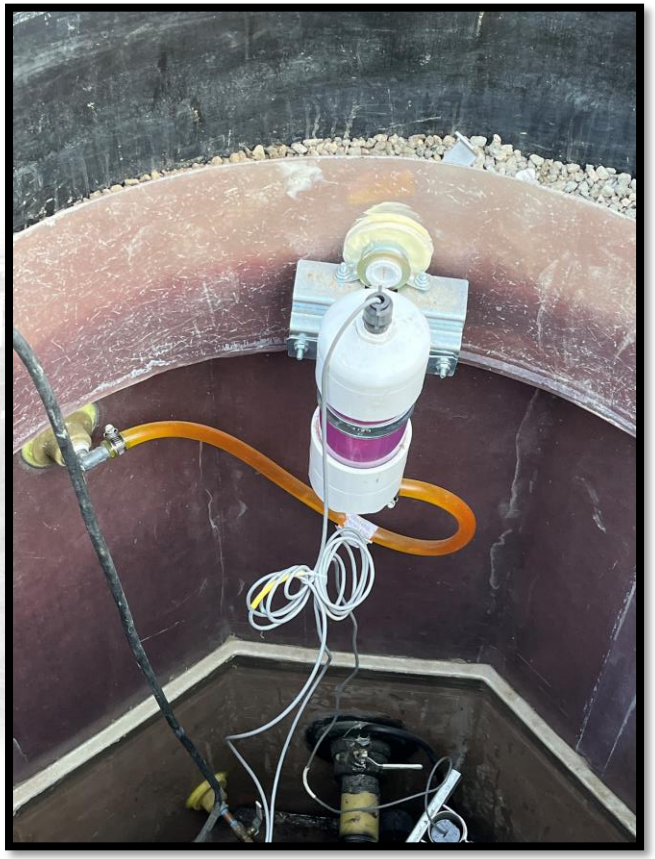
UST Sumps: BRAVO

- **Hexagonal**
- **Will see with Modern Welding USTs**
- **MW does not make Sumps.**

UST Sumps – Interstitial Fluids (Brine)

CSI = GREEN

XERXES = GREEN/BLUE



BRAVO = PINK

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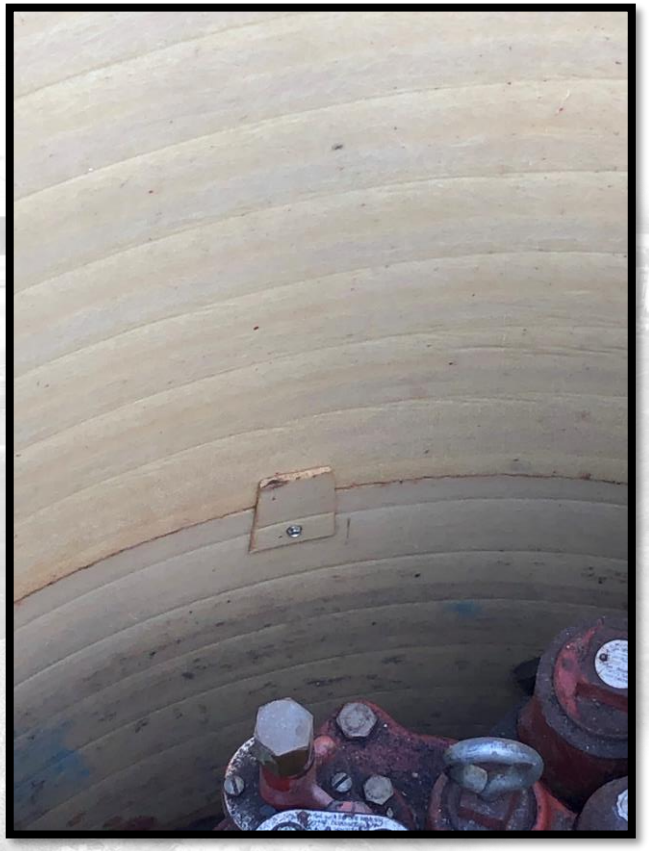
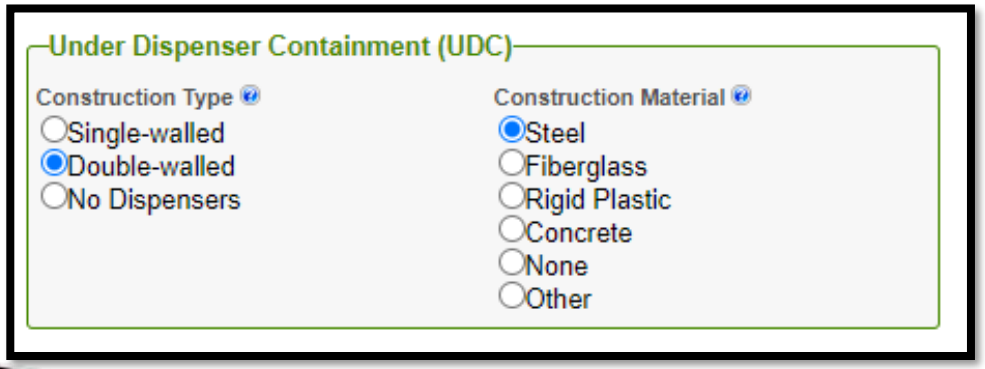
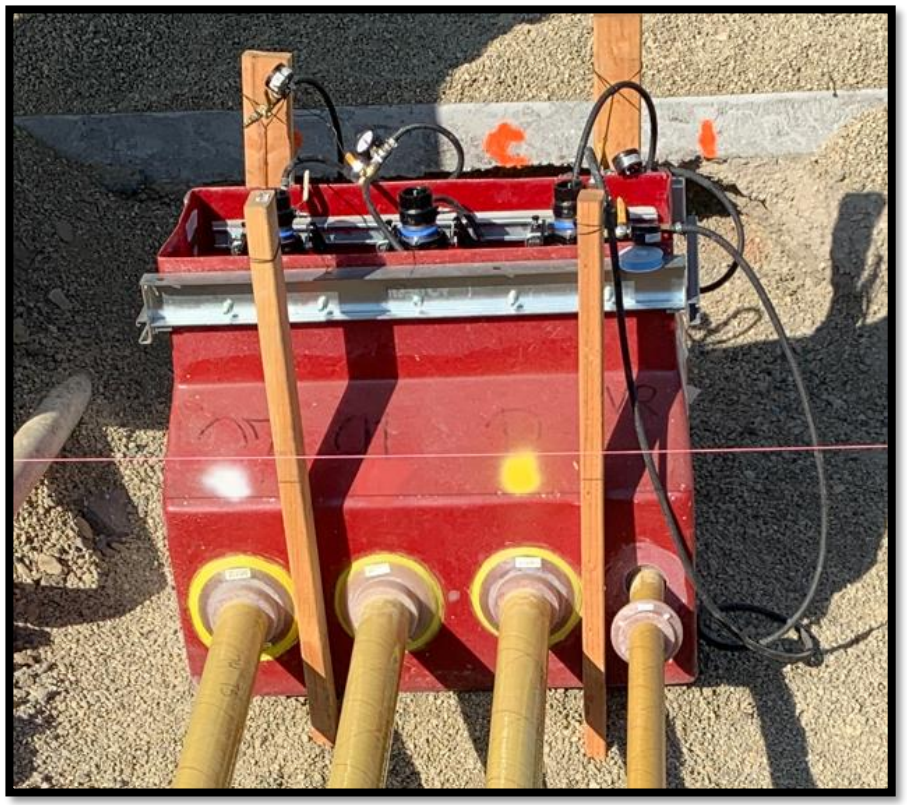
UST Sumps – Single Wall or Double Wall?



UDC – BRAVO (Newer Sites)

- **New Sites:** Mostly you'll see BRAVO. Double Wall (Brine or Vacuum Monitored).
- **Older:** Plastic, Steel





UDC – Older Sites

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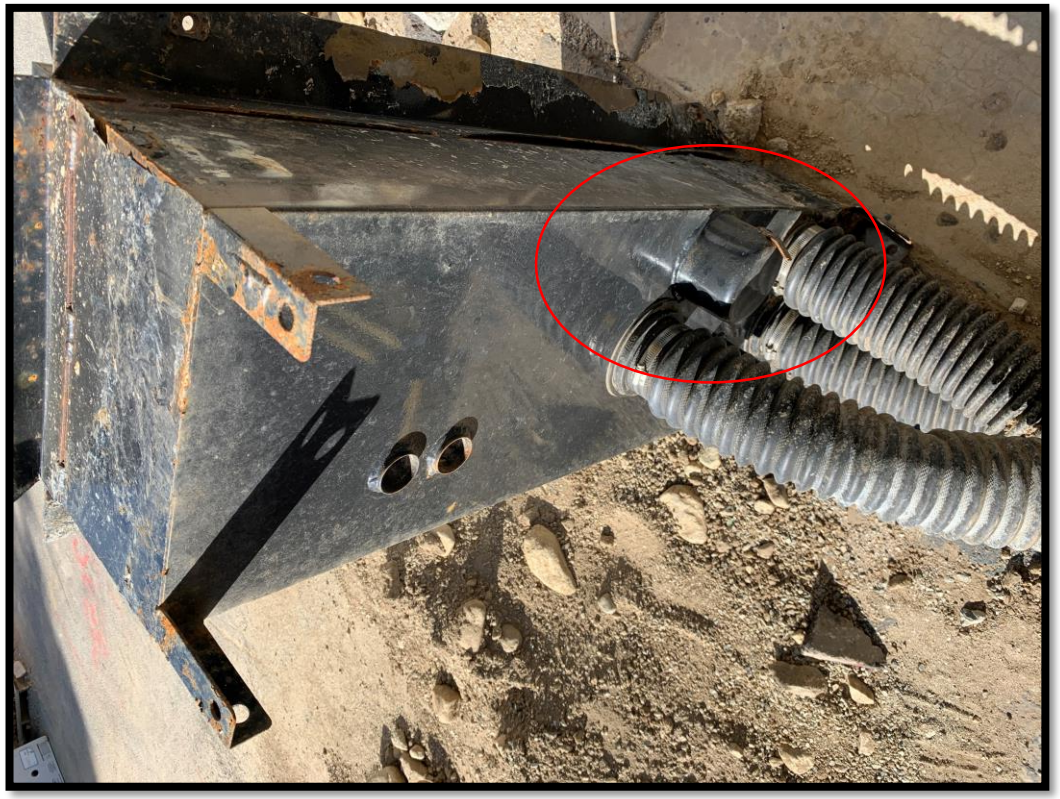
UDC – Shallow BRAVOs

- Single Wall Steel UDCs
- Piping Comes Up through the Bottom of the UDC.
- You'll see corrugated secondary with flex primary to fiberglass secondary.

UDC – Shallow BRAVOs



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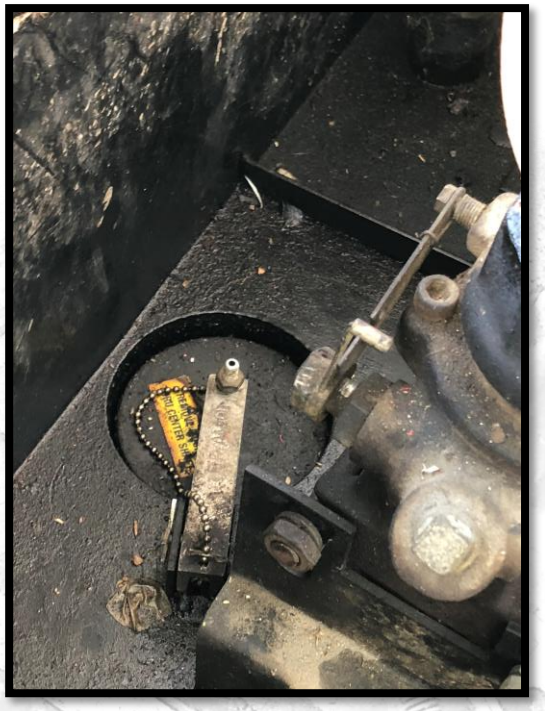
BRAVO Float and Chain

- **A Float that trips the Shear Valve by a chain connection.**
- **Tested by adding water to raise the float to trip the Shear Valve.**

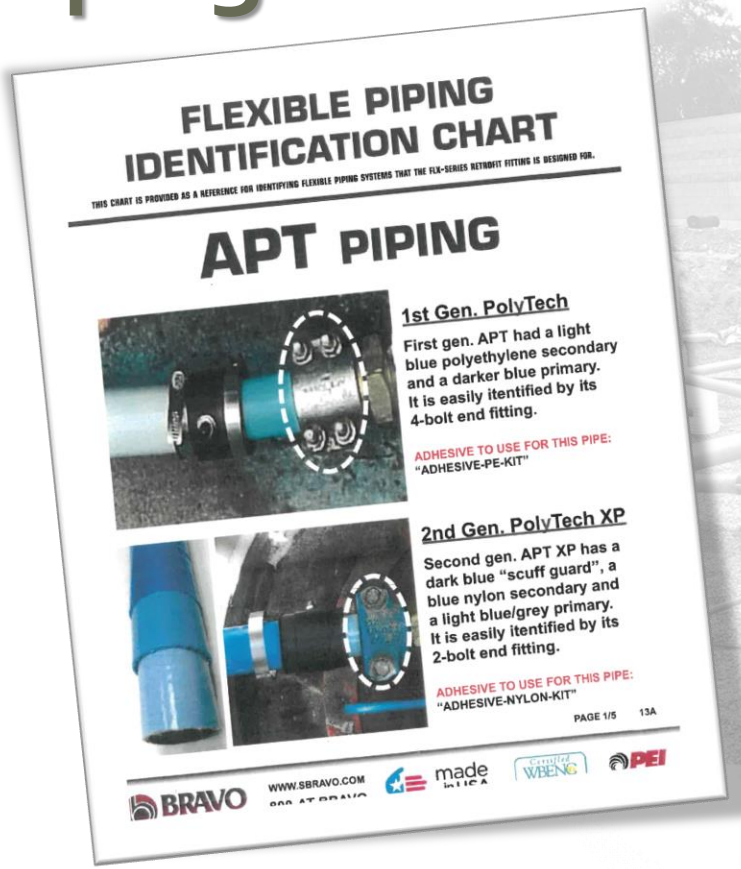


BRAVO Float and Chain Testing

UST Piping

Underground Storage Tank Piping

UST Piping



FLEXIBLE PIPING IDENTIFICATION CHART

THIS CHART IS PROVIDED AS A REFERENCE FOR IDENTIFYING FLEXIBLE PIPING SYSTEMS THAT THE FLX-SERIES RETROFIT FITTING IS DESIGNED FOR.

APT PIPING

1st Gen. PolyTech

First gen. APT had a light blue polyethylene secondary and a darker blue primary. It is easily itentified by its 4-bolt end fitting.

ADHESIVE TO USE FOR THIS PIPE: "ADHESIVE-PE-KIT"

2nd Gen. PolyTech XP

Second gen. APT XP has a dark blue "scuff guard", a blue nylon secondary and a light blue/grey primary. It is easily itentified by its 2-bolt end fitting.

ADHESIVE TO USE FOR THIS PIPE: "ADHESIVE-NYLON-KIT"

PAGE 1/5 13A

BRAVO WWW.SBRAVO.COM

PRODUCT PIPING GUIDE

SMITH FIBERCAST RED THREAD®

- Smith fiberglass pipe has always been this yellow-gold color and may be identified by the red thread that winds through the pipe.

APT Poly-Tech®

- This is APT's double-walled (coaxial) pipe.
- APT uses a "clamshell" type fitting that is easily recognized by the bolts that hold it together (2 or 4 bolts - depending on pipe size). A swivel fitting that is swaged on is also available.
- The primary (inner) pipe is blue and the secondary jacket is a light blush-gray.

AMERON DUALOY 3000/L®

- Earlier Ameron fiberglass pipe was reddish-brown and later production (mid 2006 and later) is greenish in color.

APT POLY-TECH®

- This is an older single-walled version of APT's pipe intended for suction applications.
- It is easily recognized by the distinctive orange color.
- This pipe was discontinued in 1998.

AMERON DUALOY 3000/LCX®

- This is the coaxial version of Ameron fiberglass pipe ("LCX") and it is greenish in color. The tight fitting secondary has the interstitial space filled with fine sand or beads.

APT POLY-TECH®

- "Test" boots may or may not be present with coaxial APT piping systems.
- APT does not typically utilize "observation" tubes since the test boots are slid back after start-up testing is complete at installation.

AMERON FLX®

- In the early to mid-1990's (approx. 92-97) Ameron offered a thermoplastic pipe.
- The primary pipe was black and the secondary was red in color.

APT POLY-TECH XP®

- APT XP pipe with the test boot loosened after installation and integrity testing. Note that the dark blue scuff guard has been removed (as is required) from the pipe within the containment sump. All clamshell fittings now have only 2 bolts, are painted blue and "XP" is stamped on the fittings.

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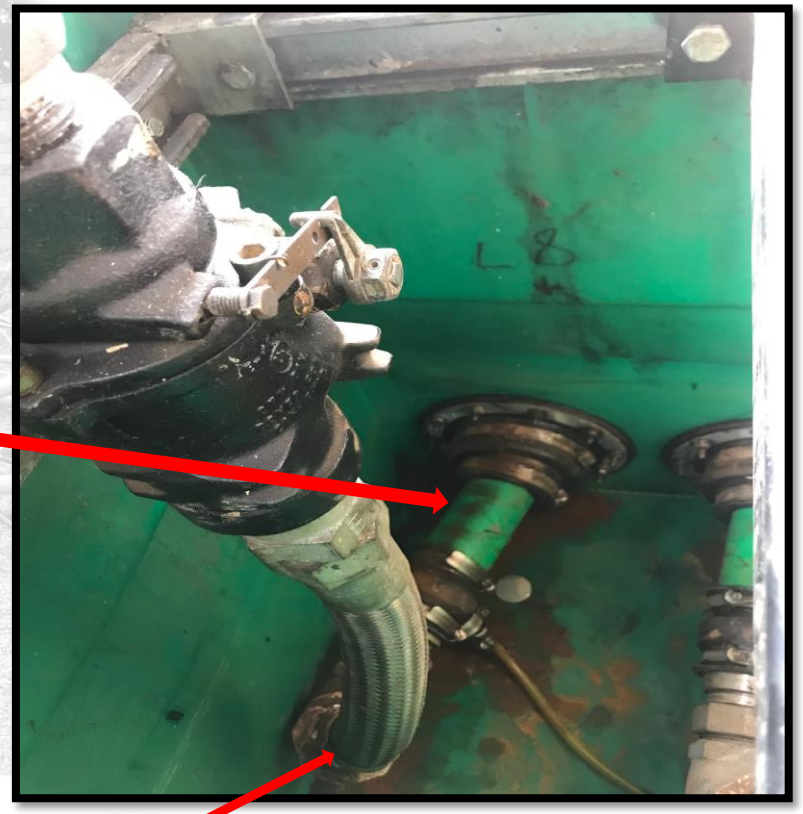
Piping – Fiberglass

- **CLUE:** Rigid Piping (look for fibers) will require couplings and elbows
- **Most Common**: NOV
- **Formerly:** Smith and/or Ameron Piping.

Piping – Fiberglass

Piping – Flexible

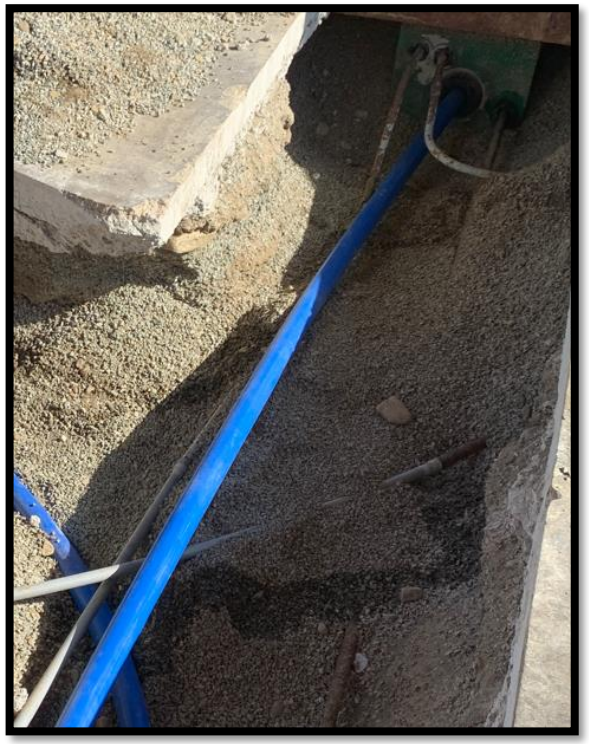
- **CLUE:** Colors. Not rigid, Continuous in rolls
- Think straw - when there is a breach entire run must be replaced.
- Most often used with plastic UDCs.

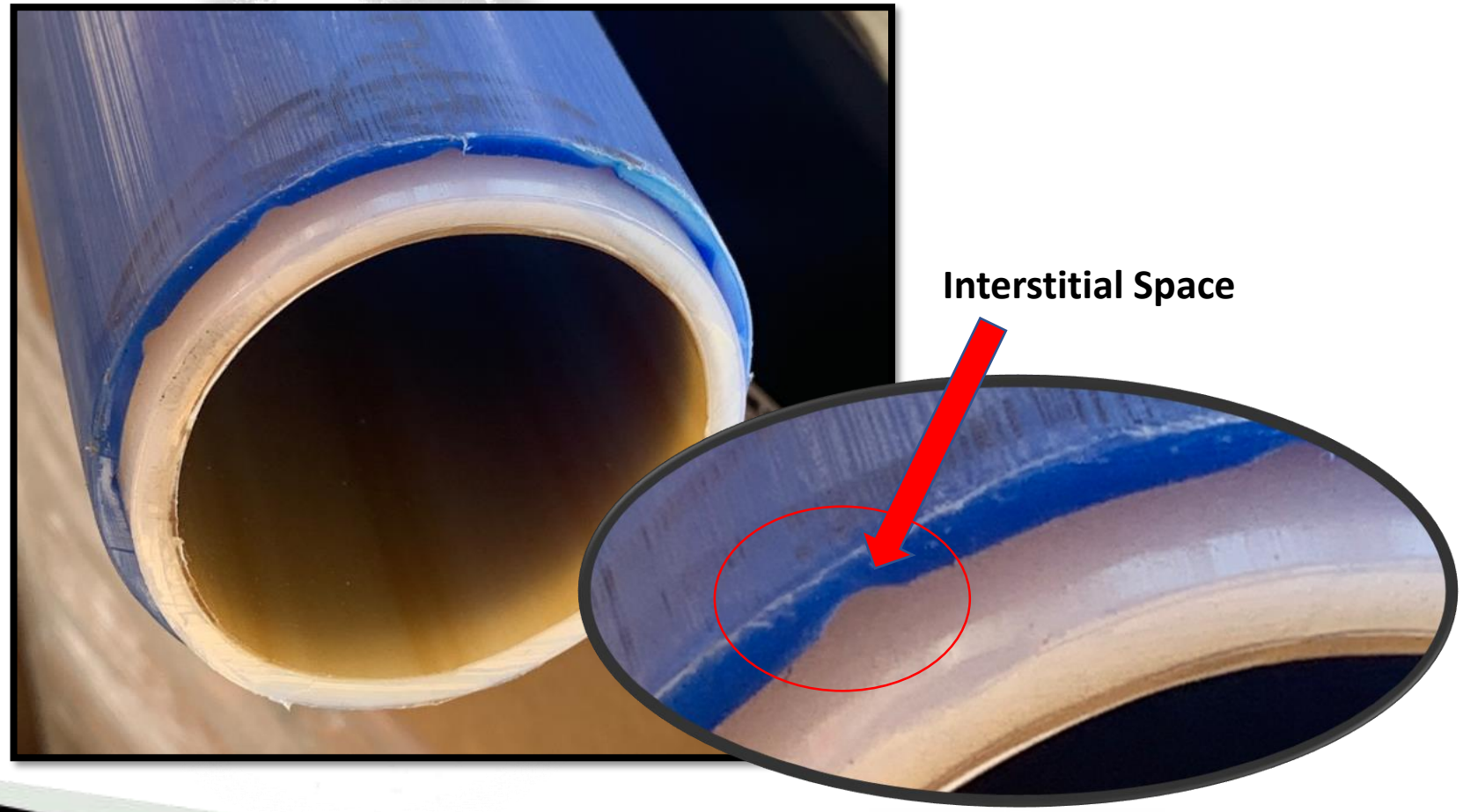


Piping – Flexible

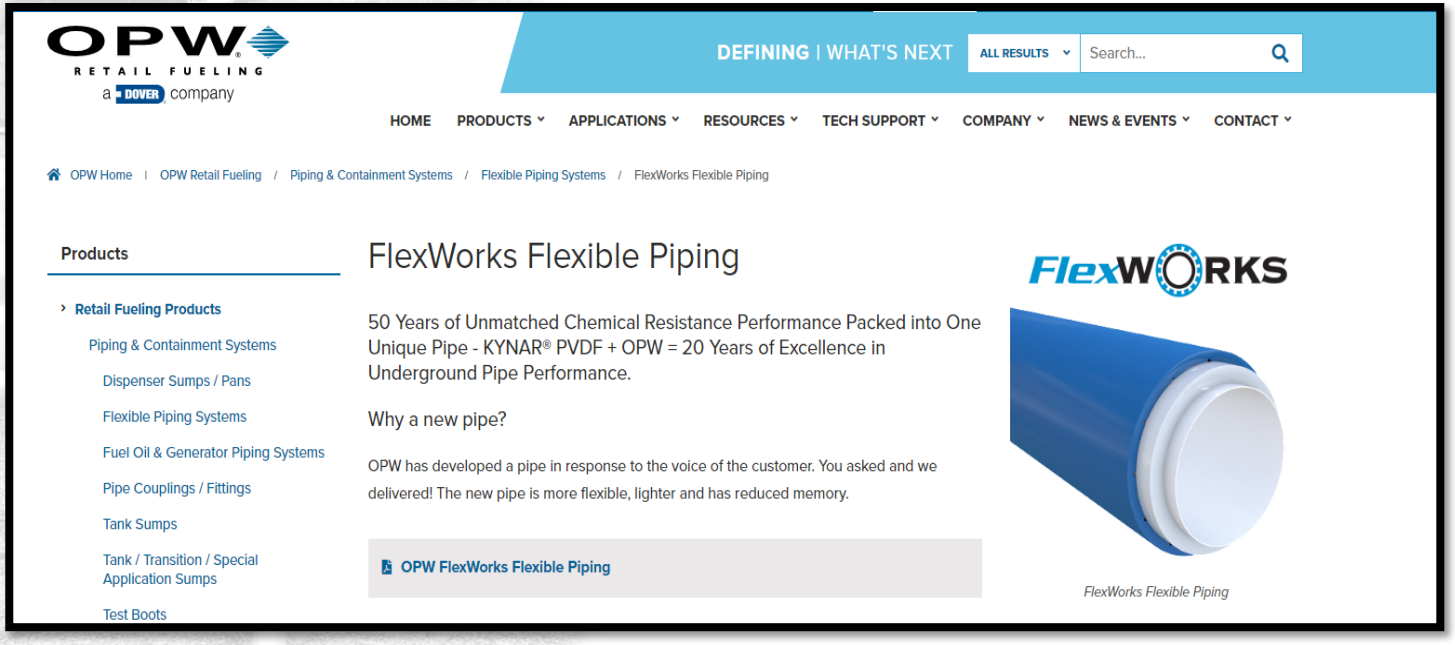
Environ (Green) **Old APT/Ameron (Orange?)**

Piping – Flexible OPW





Piping – Flexible OPW



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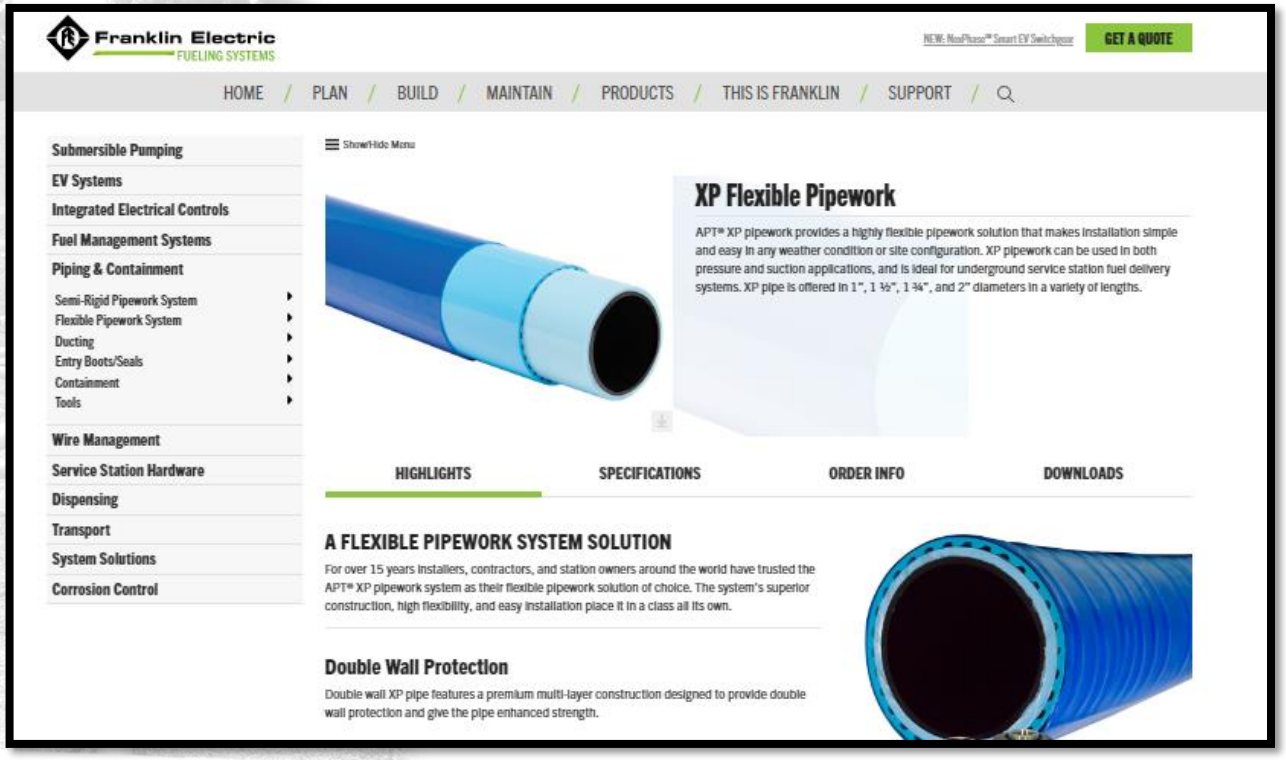
Piping – Flexible XP APT (Franklin)



Piping – Steel Wrapped (Brugg)

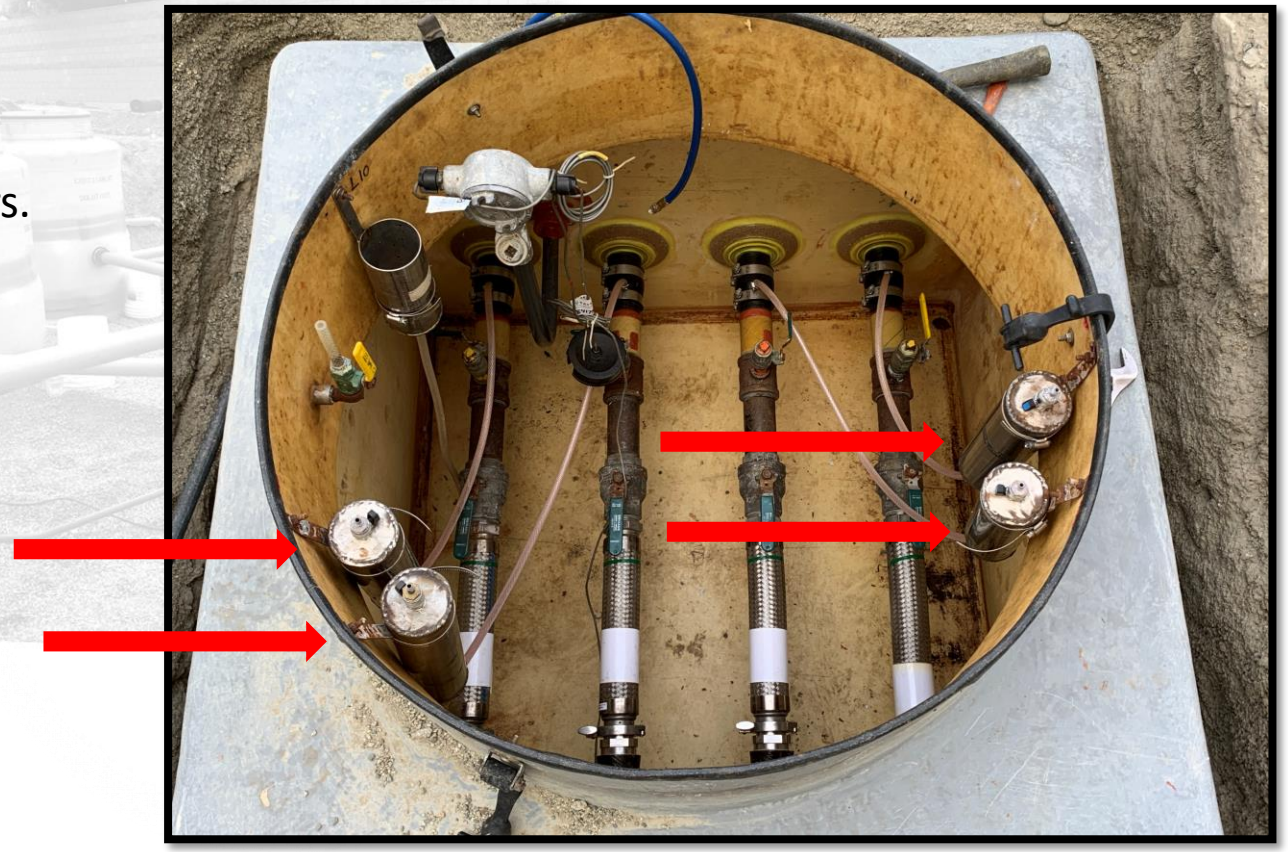
- **Primary Containment :** Steel
- **Secondary Containment:** Steel/Polyethylene Wrap
- Can do Primary and Secondary Containment at the same time.

Piping – Ameron Dualoy (Now NOV)

- **Primary Containment :** Fiberglass
- **Secondary Containment:** Fiberglass Reinforced Epoxy Resin Rich Liner.
- **Monitoring:** Brine for VPH

Piping – Ameron Dualoy

- **How is Brine Different from Vacuum?**
- **Answer:** More Reservoirs. 304 Sensors.



Piping – Nupi Smatflex

- **Primary Containment:** Polyethylene
- **Secondary Containment:** Polyethylene

nupi AMERICAS

WE HEREBY CERTIFY THAT

JUSTIN BECHARA

Wayne Perry Inc.

has been trained and certified as a

SMARTFLEX-SMARTCONDUIT WELDER

Smartcard Number: *4310*

Date of first training: *17th February 2020*

Expiry date: *17th February 2023*

On Behalf of NUPI Americas Inc. **1st January 2021**

NUPI AMERICAS Inc. - 1511 Superior Way - US-77039 HOUSTON TEXAS U.S.

Piping – Certifications

BRUGG PIPESYSTEMS

CERTIFICATE OF TRAINING

This is to certify that

ANGIE SAMAYOA

Has been certified to install

BRUGG FLEXWELL-HL PIPE AND END FITTINGS

Authorized Signature – Office Manager Brandon Lovering

12/14/17

Date

BRUGG PIPESYSTEMS

THIS CERTIFICATE IS VALID TWO YEARS FROM ISSUE DATE

FORECOURT SPECIALIST

Franklin Fueling Systems

Alonso Meija

has been certified in:

Pipework (APT® Brand)

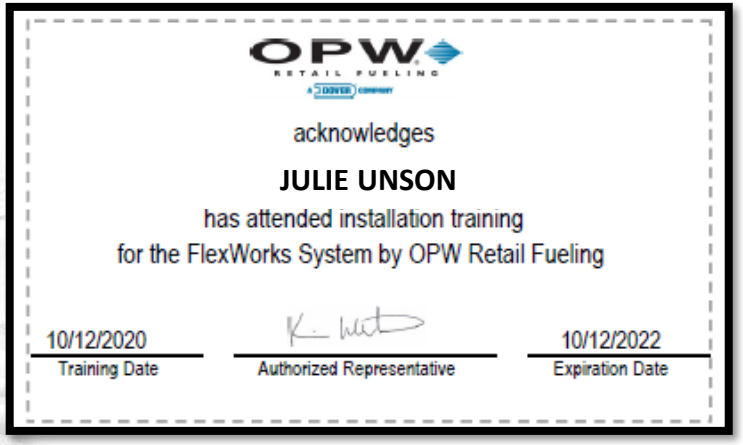
Training Date: Dec 1, 2020

Certification # 1010723711

Expiration Date: Dec 1, 2022

FFS PRO

The person named on this certificate of completion has demonstrated knowledge of the listed products and installation by completing an exam provided by Franklin Fueling Systems via FFS PRO: University. This certification is valid for two years from the training date listed.



OPW RETAIL FUELING

acknowledges

JULIE UNSON

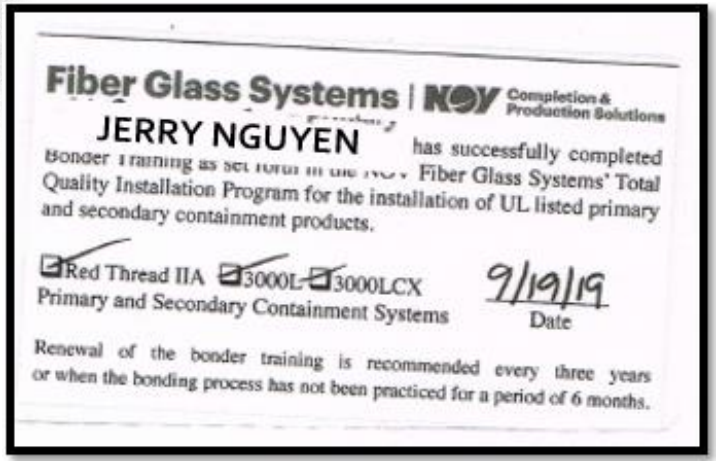
has attended installation training

for the FlexWorks System by OPW Retail Fueling

10/12/2020 Training Date

Authorized Representative

10/12/2022 Expiration Date



Fiber Glass Systems | NOV Completion & Production Solutions

JERRY NGUYEN has successfully completed Bonder Training as set forth in the NOV Fiber Glass Systems' Total Quality Installation Program for the installation of UL listed primary and secondary containment products.

☑ Red Thread IIA ☑ 3000L ☑ 3000LCX Primary and Secondary Containment Systems

9/19/19 Date

Renewal of the bonder training is recommended every three years or when the bonding process has not been practiced for a period of 6 months.

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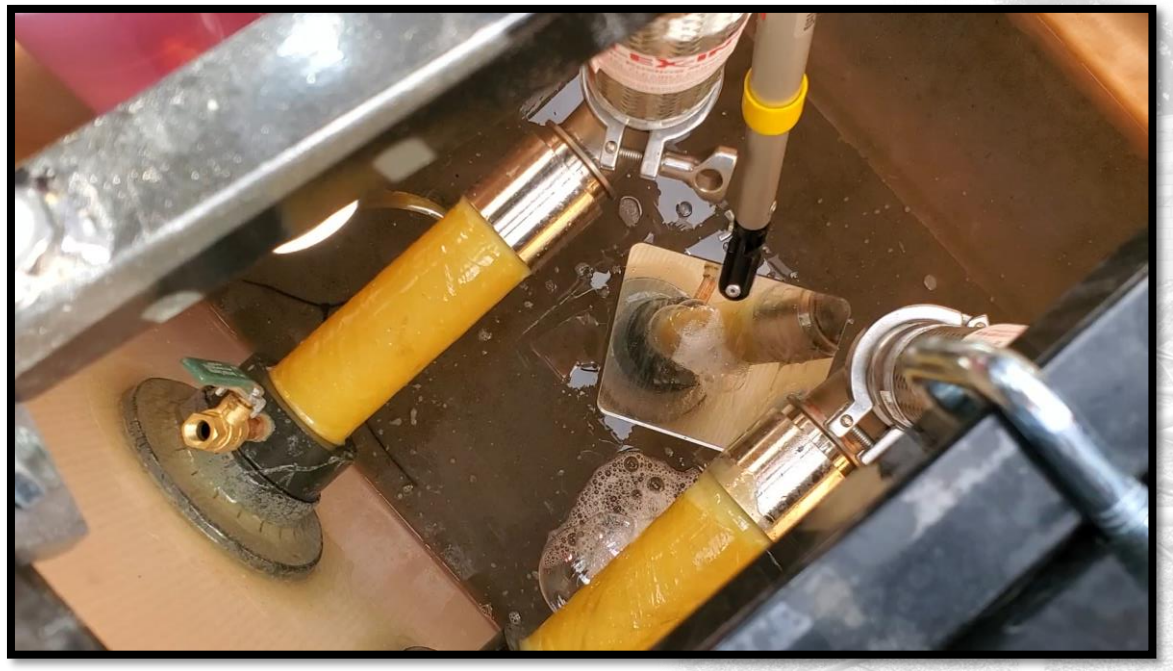
Piping – Leaks!



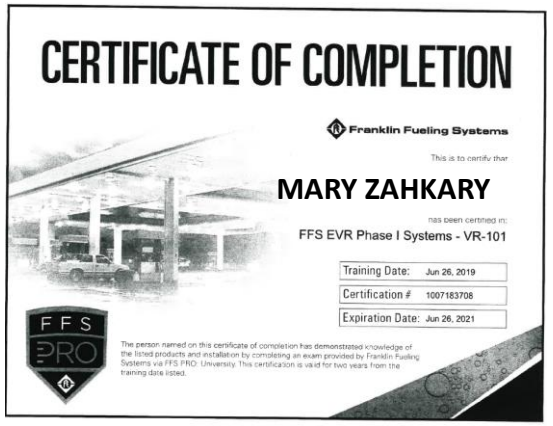
Overfill Protection/Spill Buckets

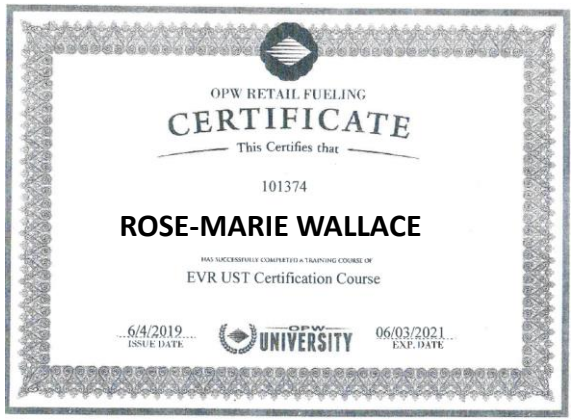
- **Plenty of Overfill Presentations out there!**
- **What's Important:** Certifications and CERS
- **A lot of time has been spent on overfill since 2018.**

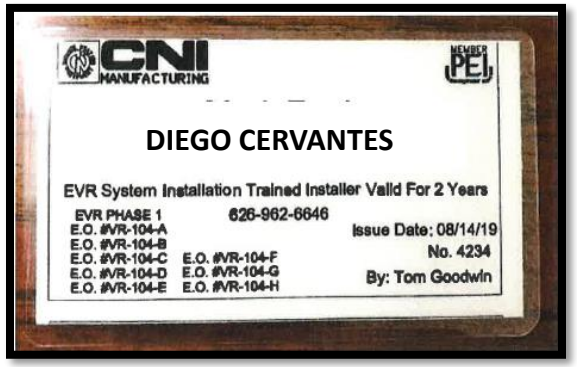
Overfill Protection			
No	Audible/Visual Alarms	Yes	Fill Tube Shut-Off Valve
No	Ball Float	No	Exempt

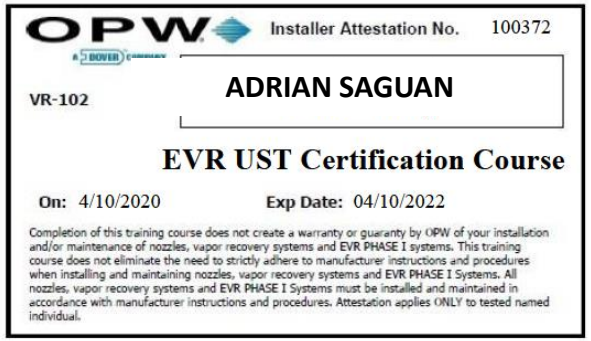
Overfill/Spill - Certifications

- **Certifications:** Phase I EVR manufacturer certification is required for testing spill containers and overfill prevention equipment.









Monitoring Systems

What happens when……

You expect to see….

Monitoring Panel

Sump/UDC Sensor

But then you see….

UST Monitoring Systems

- **DISCLAIMER (Again….)**

This is NOT Veeder Root Presentation!

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LG 113 – What is it

State Water Resources Control Board (SWRCB)

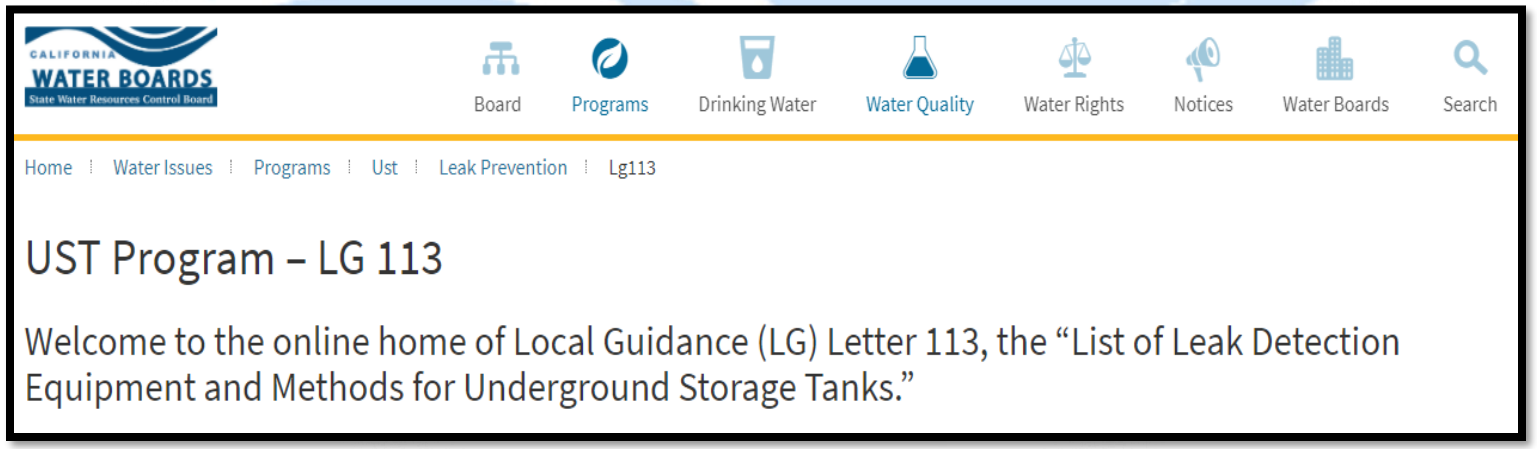
- CCR Title 23 Section 2643 (f) requires UST leak detection equipment to be evaluated by 3rd party testing organization.
- They are evaluated and APPROVED together a unit with its sensors and other items.
- Evaluation must demonstrate that equipment/method can detect leaks >95% of time with false alarm <5%
- SWRCB identifies this equipment in LG-113.

LG 113 – What is it

Bottom Line

If it is used to monitor a UST system in CA

then it must be listed on LG-113



UST Monitoring Systems

Monitoring panel and sensor components are evaluated and approved as a unit.

What does that mean?

Can't use PS Controllers with Xbox Controllers

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UST Monitoring Systems: *What do they actually need to do?*

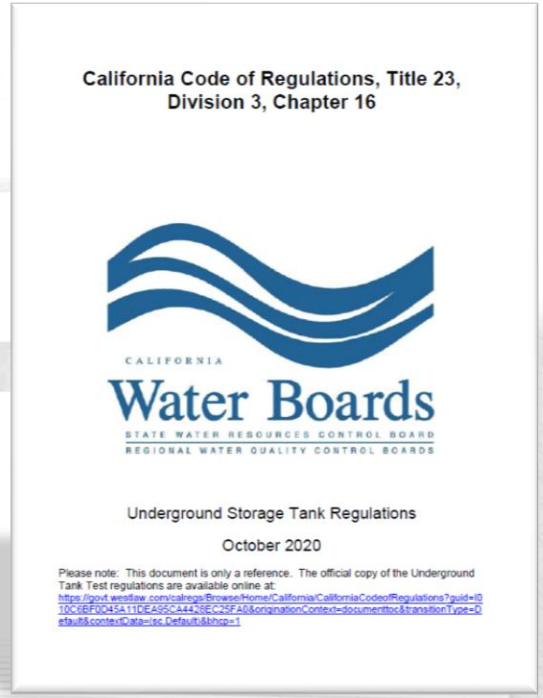
1.) Continuously Monitor.

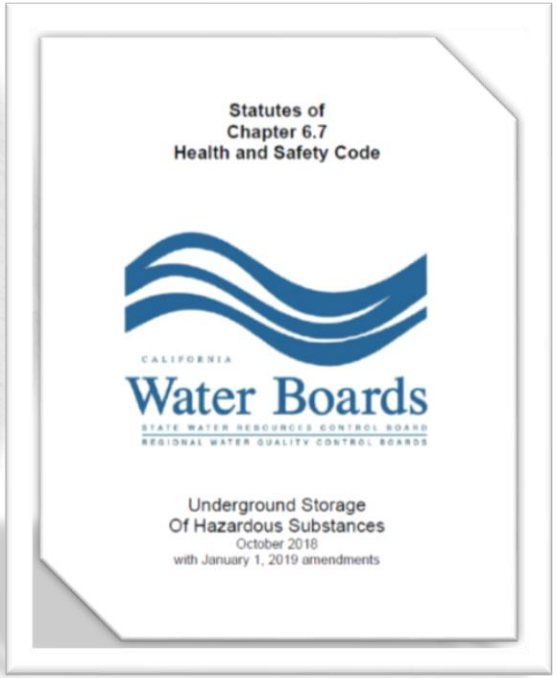
2.) Notify that a leak is detected with Audible and Visual Alarm.

3.) The monitoring system has to be evaluated and approved for use (See SWRCB LG-113).

CCR 2634

CCR 2712





Leak Detection – Annular Sensors

- **Annular Sensors also called Interstitial Sensors.**
- **Only Double Wall (DW) Tanks will have an annular sensors.**
- **Wet vs Dry Annular: Detects leak in different ways (Intrusion vs Loss of liquid/vacuum).**
- **VPH Tanks will have Hydrostatic or Vacuum monitored annular spaces. Have Not Seen Pressure.**
- ***Wet Annular doesn't mean VPH System***

Leak Detection – Annular Sensors

Single Wall (SW) Tanks: Will have what type of Annular?

NONE

Double Walled (DW) steel/fiberglass tanks: will have straight annular risers and sensors that hang down vertically (be sure it's on the bottom).

Double Walled fiberglass/fiberglass tanks: Will have wrap around annular, wrapping all the way around diameter of tank (*may sometimes get stuck……*)

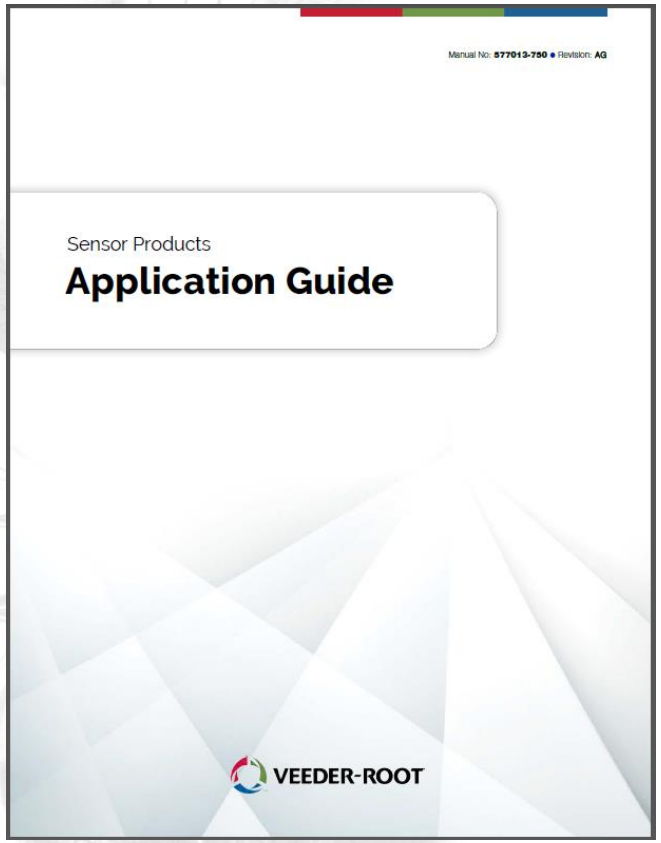
Annular Spaces

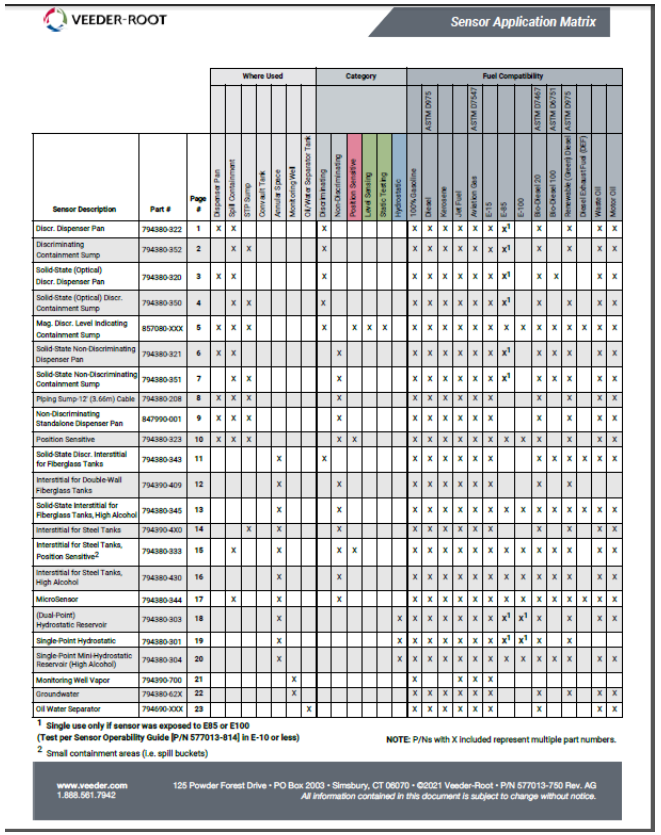
Annular Spaces

Let's Start with Veeder Root

Let's Start with Veeder Root

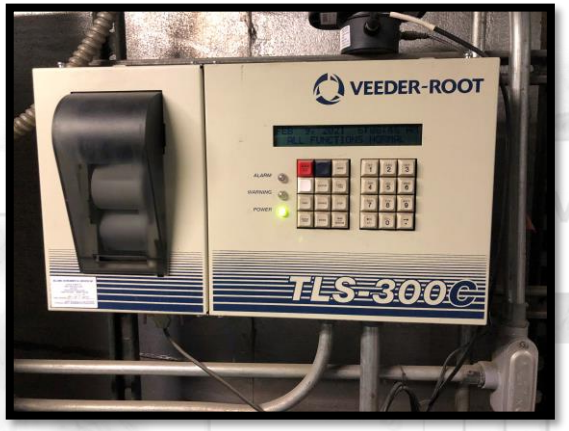
- We will start with Interstitial Sensors
- Move to UDC and Sump Sensors
- Information is from the Sensor Application Guide from Veeder Root
- Guide goes in a certain order ad does not have older sensors or models.





Let's Start with Veeder Root

- Majority of Systems in SB County (96%)
- Panel TLS Series
- Printer for Alarms
- Various Software Versions
- Only System subject to COLD START
- Not the 450.



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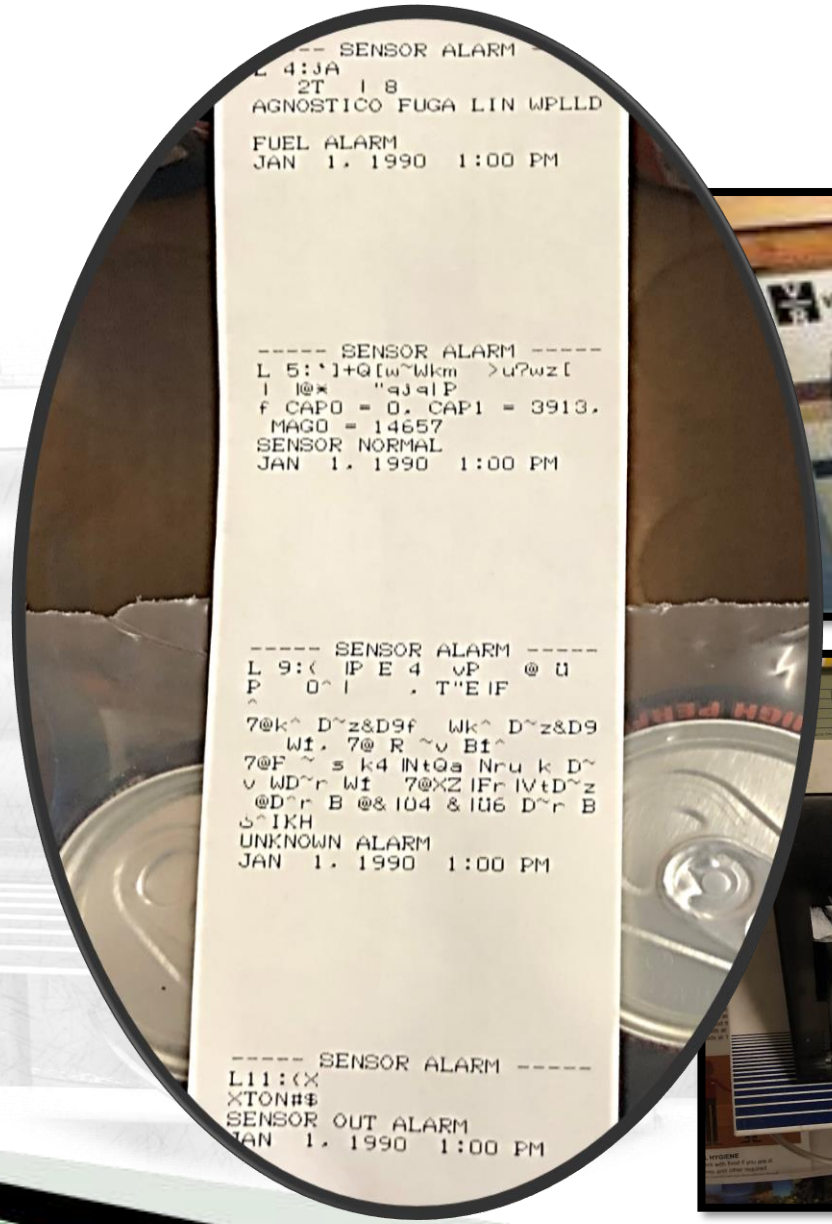
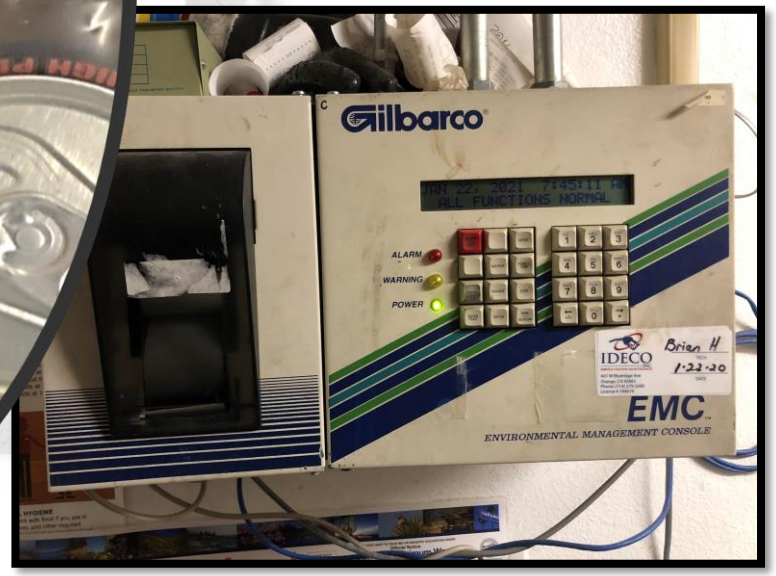
Veeder Root

- TLS 250 1981 (Photo From Web)
- Purchased Gilbarco in 2002
- Gilbarco EMC, TLS 300C, TLS 350, TLS 350 PLUS
- 300 C cannot support PLLDs
- Alarm History only shows 3 most recent Alarms
- *Cold Start vs Warm Start*
  - Cold: Full Re-Set (Lose Data and re-program)
  - Warm: Unplug Plug





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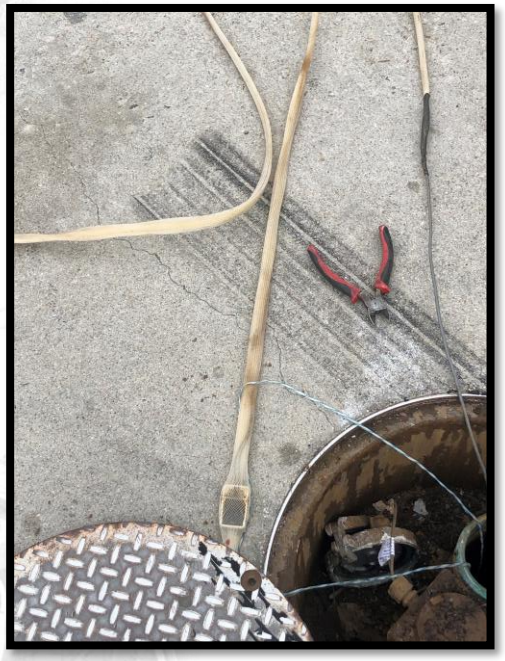
Sensor Terminology

- **Discriminating:** Detects the presence of, and differentiates between, hydrocarbons and other liquids.
- **Optical (Solid State):** Looking at phase changes in the light beams by causing them to interact or interfere with one another. No moving parts means it can work in colder temperatures.
- **Position Sensitive:** Housing must compress position indicator switch (Tamper Foot) against the bottom of the sump.
- **Stand Alone:** When liquid is detected in the dispenser pan, the sensor shuts down AC power to the dispenser only.

VR Annular Sensors: 407 and 409

- **Model:** VR 407/409
- **What UST Found:** DW Fiberglass
- **Type:** Annular Sensor (Wrap Around)
- **Type of Annular:** Dry
- **Sensor Aspects:** 25 Foot Cable Length. 407 as a smaller diameter.
- **Other:** Could have white and black sleeves for older models.

VR 409 (Older Model)



VR 409 (Current Model)

409 may monitor tanks 4-10 Feet in diameter

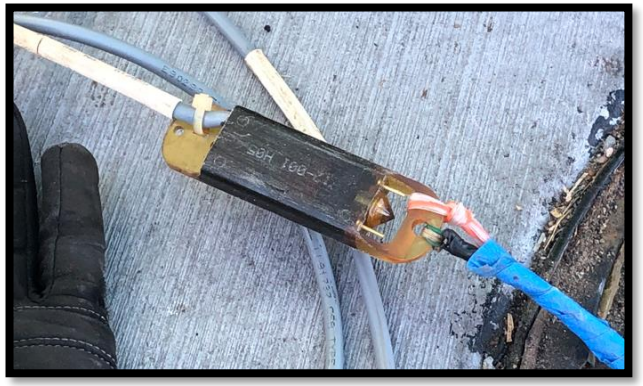
VR Annular Sensors: 341/343/345

- **Model:** VR 341/343/345
- **What UST Found:** DW Fiberglass
- **Type:** Annular Sensor (Wrap Around)
- **Type of Annular:** Dry
- **Sensor Aspects:** 25 Foot Cable Length.
- **Other:** All Optical Sensors
- **343/345**: They look the same.

341 (Predecessor to VR 343)

VR 343: Discriminating

VR 345: Non-Discriminating



VR Annular Sensors: 343 and 345

- **343/345**: Two Questions.
- **How Can I Tell?** Look at the Cord
- **Why do I care?** Compatibility

VR 343: Discriminating

B100 Compatible

Part Number	794380-343		
Category	☑ Discriminating ☐ Non-Discriminating ☐ Position Sensitive	☐ Level Sensing ☐ Static Testing ☐ Hydrostatic	
Fuel Compatibility	☑ Gas ☑ Diesel ☑ Kerosene ☑ Jet Fuel ☑ Aviation Gas	☑ E-15 ☐ E-85 ☐ E-100 ☑ Bio-Diesel 20 ☑ Bio-Diesel 100	☑ Green Diesel ☑ DEF ☑ Waste Oil ☑ Motor Oil

VR 345: Non-Discriminating

E85 and B100 Compatible

Part Number	794380-345		
Category	☐ Discriminating ☑ Non-Discriminating ☐ Position Sensitive	☐ Level Sensing ☐ Static Testing ☐ Hydrostatic	
Fuel Compatibility	☑ Gas ☑ Diesel ☑ Kerosene ☑ Jet Fuel ☑ Aviation Gas	☑ E-15 ☑ E-85 ☑ E-100 ☑ Bio-Diesel 20 ☑ Bio-Diesel 100	☑ Green Diesel ☑ DEF ☑ Waste Oil ☑ Motor Oil

**Veeder Root Website Sensor Guide*

VR Annular Sensors: 420 and 460

- **Model:** VR 420 and 460
- **What UST Found:** DW Steel (Fiberglass/Steel Secondary) (Modern Welding/Joor/STIP3)
- **Type:** Annular Sensor (Straight Drop)
- **Type of Annular:** Dry
- **Sensor Aspects:** 420 16’ Cable Length, 460 30’ Cable Length (Higher Risers).
- **Other:** Bell Shaped. Very Common

- Old 420 Sensors had different materials and black housing.
- Materials would split and sensors would get stuck!

VR Annular Sensors: 430

- **Model:** VR 430
- **What UST Found:** Steel USTs (Fiberglass/Steel Secondary)
- **Type:** Annular Sensor “Straight Drop”
- **Type of Annular:** Dry
- **Sensor Aspects:** Float Sensor. High Alcohol.
- **Compatibility:** ***E85, E100, B100***

VR Annular Sensors: 340 and 344

- **Model:** VR 340 and 344
- **What UST Found:** DW Steel (Fiberglass/Steel Secondary)
- **Type:** Annular Sensor, Micro
- **Type of Annular:** Dry (Straight Drop)
- **Sensor Aspects:** 25 ft Cable (344)
- **Other:** Optical/Orange Tip (344)
- **Compatibility:** ***E85, E100, B100*** (344)
- Would need to contact VR about 340.

340
Predecessor to VR 344

344

Micro

☑ Gas	☑ E-15	☑ Green Diesel
☑ Diesel	☑ E-85	☑ DEF
☑ Kerosene	☑ E-100	☑ Waste Oil
☑ Jet Fuel	☑ Bio-Diesel 20	☑ Motor Oil
☑ Aviation Gas	☑ Bio-Diesel 100	

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VR Annular Sensors: 301 and 303

- **Model:** VR 301 and 303
- **What UST Found:** Hydrostatically Monitored USTs
- **Type:** Hydrostatic
- **Sensor Aspects:** Single Float
- **Other:** Transparent Plastic Exterior
- **Compatibility:** ***E85***

VR 301

VR 303

301 vs 303

- **301: Single Point.** Low Liquid Alarm Only. Ideal for Low Groundwater Area.
- **303: Dual Point.** Alarms at high and low liquid. Ideal for High groundwater area.

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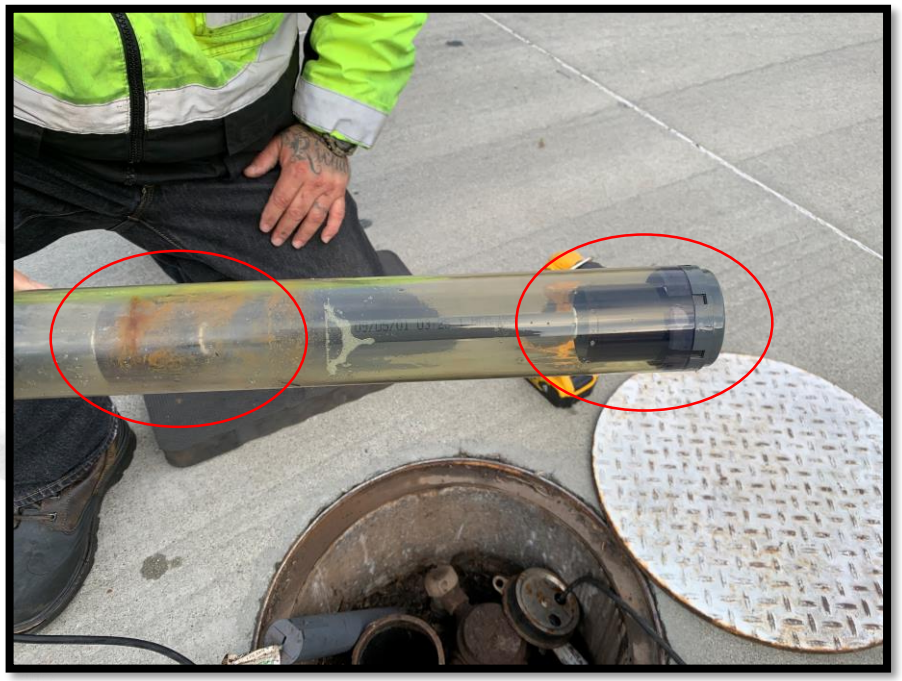
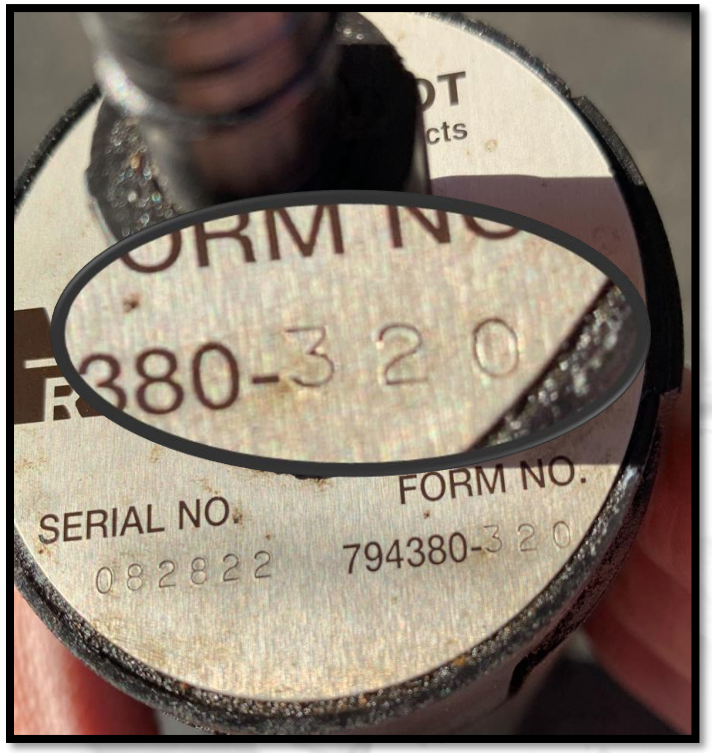
VR Annular Sensors: 302 (Discontinued)

- **Model:** VR 302
- **What UST Found:** Hydrostatically Monitored USTs
- **Type:** Hydrostatic
- **Sensor Aspects:** Two Floats.
- High Liquid and Low Liquid Alarms.
- **Other:** Transparent Plastic Exterior
- **Compatibility:** ***E85***



302 has been discontinued but still out there

VR Sensors ID Help: Look at the "Top"



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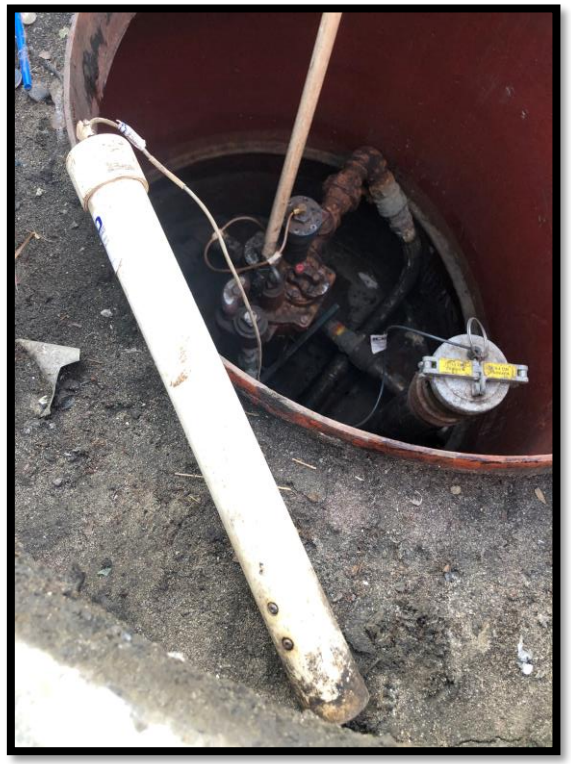
VR Sensors ID Help: Look at the Cord

May not always be there

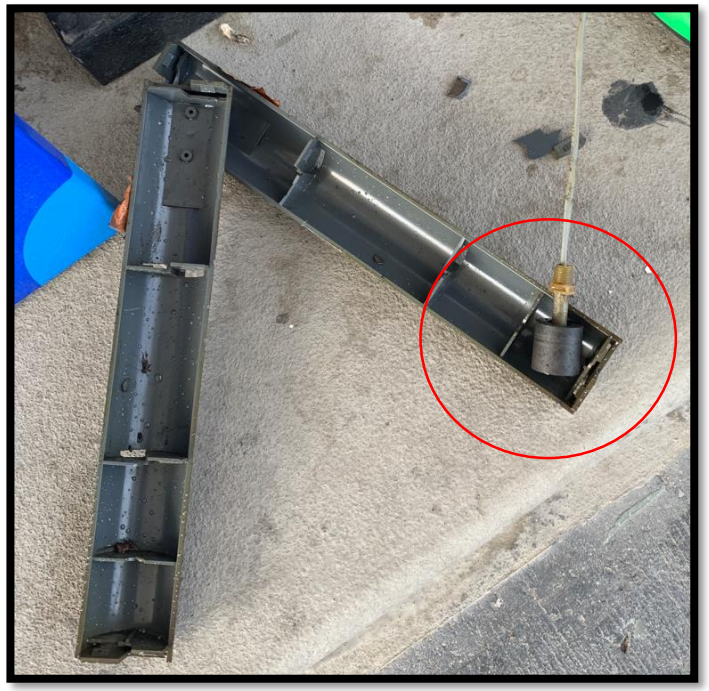
Veeder-Root Sensors: 205

- **Model:** VR 205 (Predecessor to the 208)
- **Type:** Sumps (Haven't Seen it in UDCs)
- **Sensor Aspects:** One Float
- **Length:** ~ 15 Inches
- **Other:** PVC Exterior



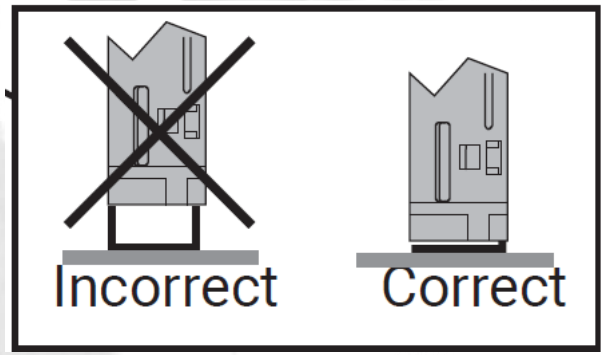
Veeder-Root Sensors: 208 and 209

- **Model:** VR 208 and 209
- **Type:** Sump and UDCs
- **Sensor Aspects:** One Float
- **Length Sensor:** 12 Inches
- **Length Cable:** 12 Feet
- **Other:** Safe to say the most commonly seen sensor.
- **VR 209:** Longer Cord for deeper sumps.



Veeder-Root Sensors: 323

- **Model:** 323
- **Type:** Sump and UDCs
- **Sensor Aspects:** Position Sensitive
- **Length Sensor:** 12 Inches
- **Length Cable:** 12 Feet
- **Other:** Alarms if Not set correct (Sensor Out). Much easier to change.
- **Compatibility:** ***E85, E100***

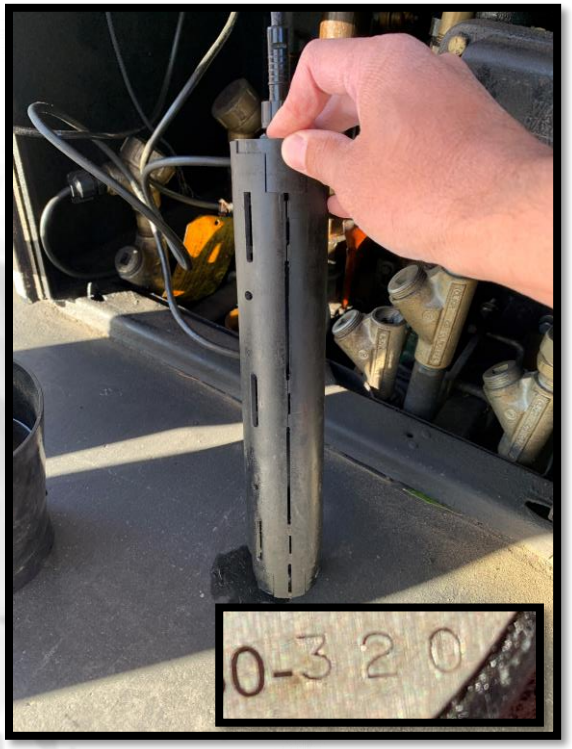


Veeder-Root Sensors: 001 (Stand Alone)

- **Model:** 001
- **Type:** Sump and UDCs
- **Sensor Aspects:** Stand Alone
- **Length Sensor:** 11.6 Inches
- **Length Cable:** 5 Feet
- **Stand Alone:** Shuts Power off at the Dispenser through Sensor Controller.
- **Other:** Not Connected to Panel so you may see it with another system (ie Franklin).

Veeder-Root Sensors: 320 (UDC), 350 (Sump)

- **Model:** 320 and 350 (VR Guide Pairs Together). Look at the "Top".
- **Type:** 320 (UDC), 350 (Sump)
- **Sensor Aspects:** Discriminating, Optical (Solid State) | No Floats
- **Length Sensors:** 11.6" (320), 22.1" (350)
- **Length Cable:** 12 Feet
- **Compatibility:** ***E85***



VR 320

VR 350

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Veeder-Root Sensors: 321 (UDC), 351 (Sump)

- **Model:** 321 and 351
- **Type:** 321 (UDC), 351 (Sump)
- **Sensor Aspects:** Non-Discriminating, Optical (Solid State) | No Floats | Red “Tops”
- **Length Sensors:** 11.6” (321), 22.1” (351)
- **Length Cable:** 12 Feet
- **Compatibility:** ***E85, B100***

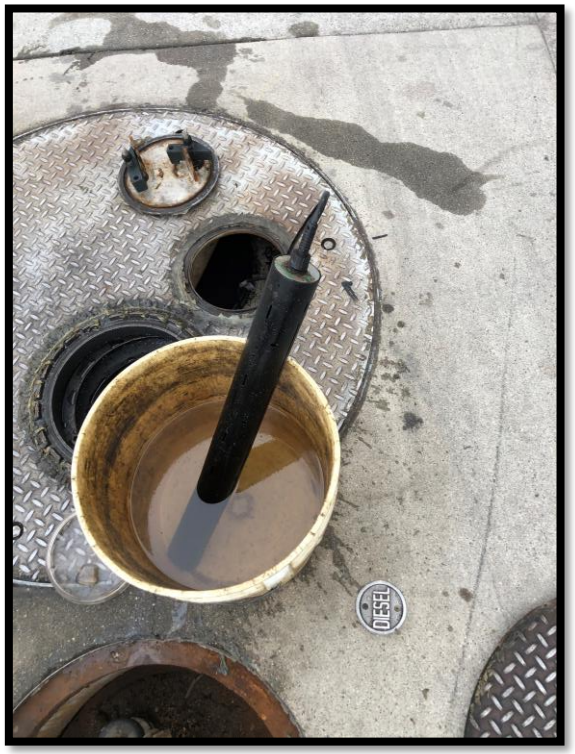
VR 321

VR 351

Veeder-Root Sensors: 322 (UDC), 352 (Sump)

- **Model:** 322 and 352
- **Type:** 322 (UDC), 352 (Sump)
- **Sensor Aspects:** Discriminating, Float| Blue “Tops”
- **Length Sensors:** 11.6” (322), 22.1” (352)
- **Length Cable:** 12 Feet
- **Compatibility:** ***E85***

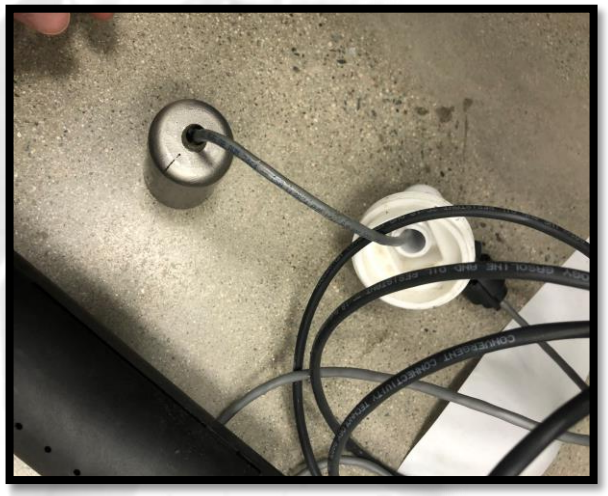
VR 322



VR 352

Veeder-Root Sensors: 304 Mini Hydrostatic

- **Model:** 304 (You'll See these at VPH Sites)
- **Type:** Mini Hydrostatic Interstitial for Sump and UDCs.
- **Sensor Aspects:** Single-Point Float Sensor
- **Length Cable:** 8 Feet
- **Other:** Looks like the VR 420. Can be used with the VR 2-1 Box.
- **Compatibility:** ***E85, E100, B100***



Veeder-Root Sensors: 304 Reservoir

Veeder-Root Sensors: 2-1 Box

The Veeder-Root 2 to 1 Sensor Input Box

- Designed for use in brine filled, double wall dispenser sumps.
- Connects to a sump or position sensitive sump sensor installed on the base of the sump and to a mini-hydrostatic sensor monitoring the interstice brine.

Veeder-Root Sensors: 2-1 Box

The Veeder-Root 2 to 1 Sensor Input Box

- The Sensor Input Box permits the TLS console to increase from 8 to 16, the number of sump/hydrostatic sensor pairs that can be monitored by one module.

Veeder-Root Sensors: 463 and 464 (Vacuum)

- **Model:** 463/464 (Not on the VR Guide)
- **Type:** Vacuum for UST, UDC and Piping Interstitial
- **Sensor Aspects:** Two Components:
  - 463: Vac Sensor
  - 464: Liquid Sensor
- **Other:** Unit Number depends on how many (ie 001 vs 485). Sometimes referred as “Smart” Sensors
- **Compatibility:** ***E85, E100, B100***

Veeder-Root Sensors: Unit Boxes

- **Model:** Unit Modules
- **Type:** Varies with type of sensors.
- **UST:** Vacuum Sensor Only (Modern Welding) will have no float.
- **CERS:** Can be confusing on how to report.

Veeder-Root Sensors: Unit Boxes

Source: Veeder Root Website

Vacuum Sensor Monitoring Kits (Pre-Assembled)

Vacuum Sensor Kit P/Ns begin with 330020-, followed by the 3-digit grouping ID (i.e. 330020-467)

Description	Sensors	Tanks	Sumps & Pipes	No Tank	Steel	Fiberglass
4 Vacuum Sensor Kit With Tank	4	1	3		-467	-471
4 Vacuum Sensor Kit Without Tank	4	0	4	-486		
3 Vacuum Sensor Kit With Tank	3	1	2		-472	-476
3 Vacuum Sensor Kit Without Tank	3	0	3	-485		
2 Vacuum Sensor Kit With Tank	2	1	1		-479	-484
2 Vacuum Sensor Kit Without Tank	2	0	2	-480		
1 Vacuum Sensor Kit With Tank	1	1	0		-549	
Vacuum Sensor Kit Without Tank	1	0	1	-495		

Vacuum Sensor Modules (Unassembled)

Description	Part Number
Vacuum Sensor for 1 Sump or 1 Pipe	857280-100
Vacuum Sensor for 1 Steel Tank	857280-200
Vacuum Sensor for 1 Fiberglass Tank up to 10' Dia.	857280-304
Vacuum Sensor Mounting Kit (Cage Holds up to 4 Sensors)	330020-448
Vacuum Sensor Relief Valve Assembly (Required for Fiberglass Tanks)	332217-002

CALIFORNIA CUPA FORUM

EBW Inc. (Now Franklin Fueling)

EBW Inc. (Now Franklin Fueling)

- **Panels:** Autostik Jr (2/4) (Atari?)
- **Printer:** Yes (Ribbon Printer)
- **Certification:** Franklin Fueling

  Certifies. Purchased EBW.

EBW Inc. Sensors: LS-3A

- **Model:** LS-3A
- **Type:** Steel Tank Interstitial, UDC and Sumps
- **Sensor Aspects:** Non Discriminating Float Sensor
- **Other:** Predecessor to the Franklin Universal Leak Sensors (ULS).

EBW Inc. Sensors: LS-7A

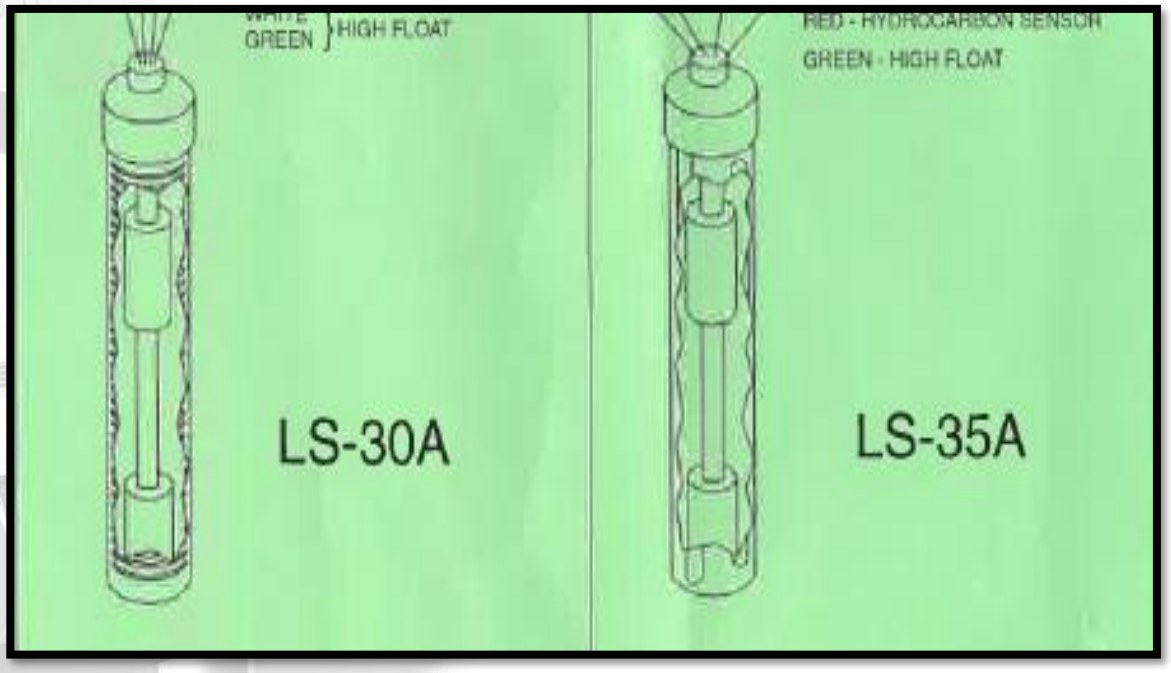
- **Model:** LS-7A
- **Type:** Fiberglass UST Interstitial
- **Sensor Aspects:** Non Discriminating Switch Horizontal Sensor
- **Other:** Predecessor to the Franklin Horizontal Float Switch (HFS) Sensor.
- **LG-113:** LG-113 shows only Autostik Compatibility. Contact Franklin Fueling for details if one fails. No longer manufactured.

EBW Inc. Sensors: LS-5A

- **Model:** LS-5A
- **Type:** UDC and Sump Sensor
- **Sensor Aspects:** Discriminating Float Sensor
- **LG-113:** LG-113 shows only Autostik Compatibility. Contact Franklin Fueling for details if one fails. No longer manufactured.
- **Other:** Never Seen It (Came from eBay).

EBW Inc. Sensors: LS-30A and LS-35A

- **Model:** LS-30A and LS-35A
- **Type:** Hydrostatic Reservoir for Fiberglass USTs
- **Sensor Aspects:** Dual Float Sensors
- **Other:** LS-35A has a hydrocarbon sensing strip.



Franklin Fueling Systems

Franklin Fueling/Incon: EVO Series

- **Panels:** EVO Series

EVO™ Series
EVO™ 200 & EVO™ 400
EVO™ 550 & EVO™ 5000
EVO™ 600 & EVO™ 6000
EVO™ Series Accessories
Legacy Replacement Parts

Franklin Fueling/Incon: TS Series

TS-1001
Also TS 1000 Series

TS-2000 (No Printer)
Also TS 2001

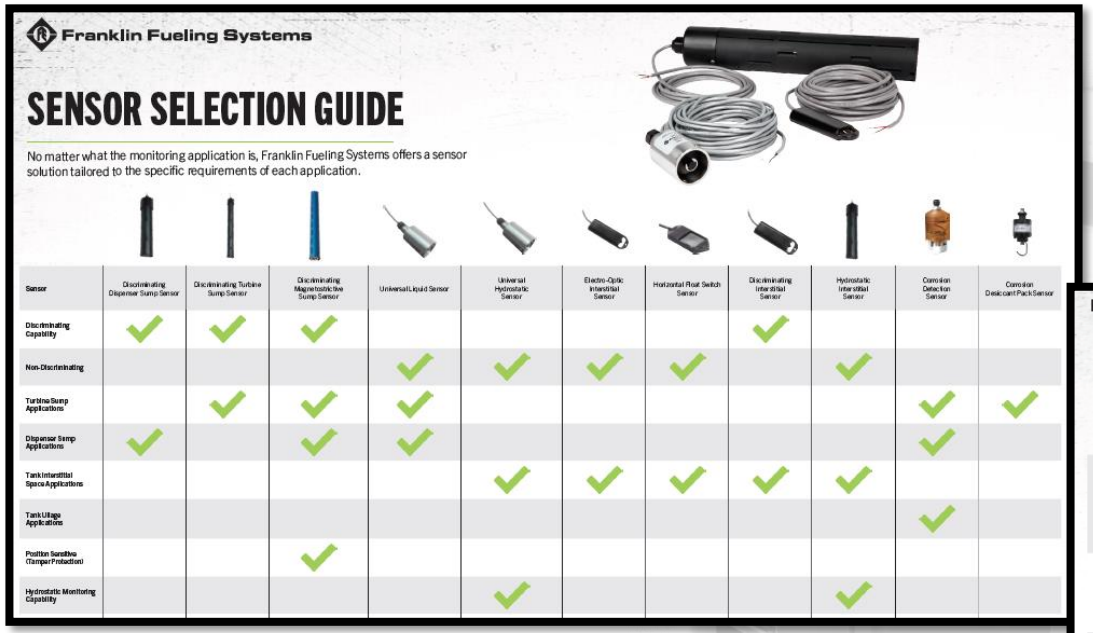
TS-5000
T5 Series

- **Still Supported but EVO is on the website.**
- **Can still find material on them.**

Franklin Fueling Certifications

- **Multiple Franklin Certifications**

FF/Incon Sensors: Sensor Guide



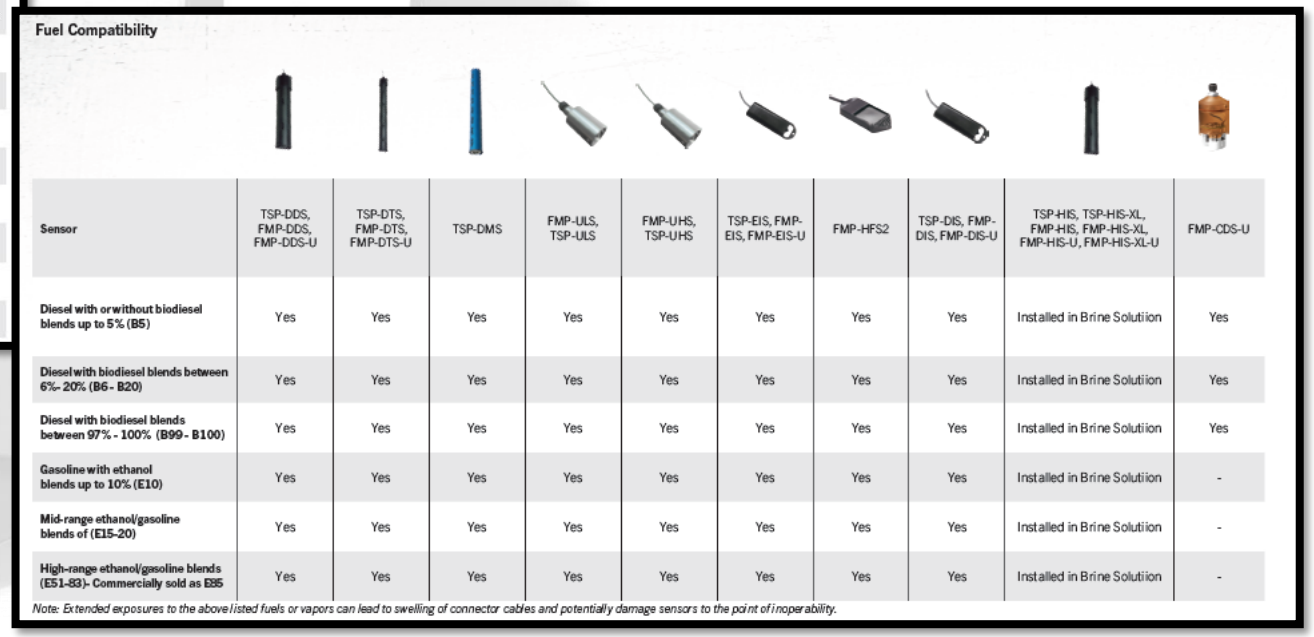
Franklin Fueling Systems

SENSOR SELECTION GUIDE

No matter what the monitoring application is, Franklin Fueling Systems offers a sensor solution tailored to the specific requirements of each application.

Sensor	Discriminating Dispenser Sump Sensor	Discriminating Turbine Sump Sensor	Discriminating Magnetostrictive Sump Sensor	Universal Liquid Sensor	Universal Hydrostatic Sensor	Electro-Optic Interstitial Sensor	Horizontal Float Switch Sensor	Discriminating Interstitial Sensor	Hydrostatic Interstitial Sensor	Corrosion Detection Sensor	Corrosion Desiccant Pack Sensor
Discriminating Capability	✓	✓	✓					✓			
Non-Discriminating				✓	✓	✓	✓		✓		
Turbine Sump Applications		✓	✓	✓						✓	✓
Dispenser Sump Applications	✓		✓	✓						✓	
Tank Interstitial Space Applications					✓	✓	✓	✓	✓		
Tank Ullage Applications										✓	
Position Sensitive (Tamper Protection)			✓								
Hydrostatic Monitoring Capability					✓				✓		

- **Guide located on the Website.**
- **Emailed out to attendees.**
- **Only current sensor information.**



Fuel Compatibility

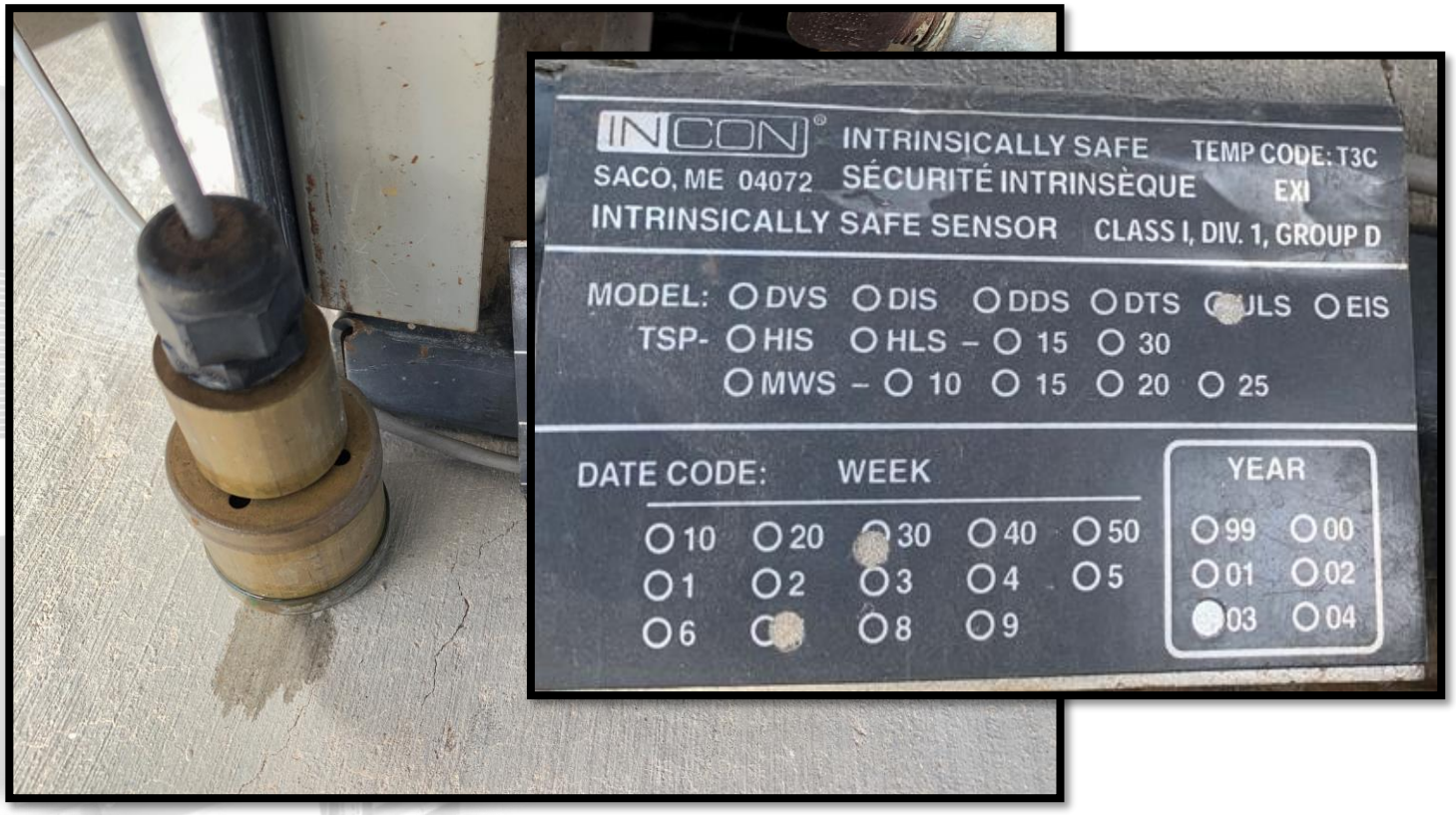
Sensor	TSP-DDS, FMP-DDS, FMP-DDS-U	TSP-DTS, FMP-DTS, FMP-DTS-U	TSP-DMS	FMP-ULS, TSP-ULS	FMP-UHS, TSP-UHS	TSP-EIS, FMP-EIS, FMP-EIS-U	FMP-HFS2	TSP-DIS, FMP-DIS, FMP-DIS-U	TSP-HIS, TSP-HIS-XL, FMP-HIS, FMP-HIS-XL, FMP-HIS-U, FMP-HIS-XL-U	FMP-CDS-U
Diesel with or without biodiesel blends up to 5% (B5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	Yes
Diesel with biodiesel blends between 6%- 20% (B6 - B20)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	Yes
Diesel with biodiesel blends between 97% - 100% (B99 - B100)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	Yes
Gasoline with ethanol blends up to 10% (E10)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	-
Mid-range ethanol/gasoline blends of (E15-20)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	-
High-range ethanol/gasoline blends (E51-83)- Commercially sold as E85	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Installed in Brine Solutiion	-

Note: Extended exposures to the above listed fuels or vapors can lead to swelling of connector cables and potentially damage sensors to the point of inoperability.

CALIFORNIA CUPA FORUM

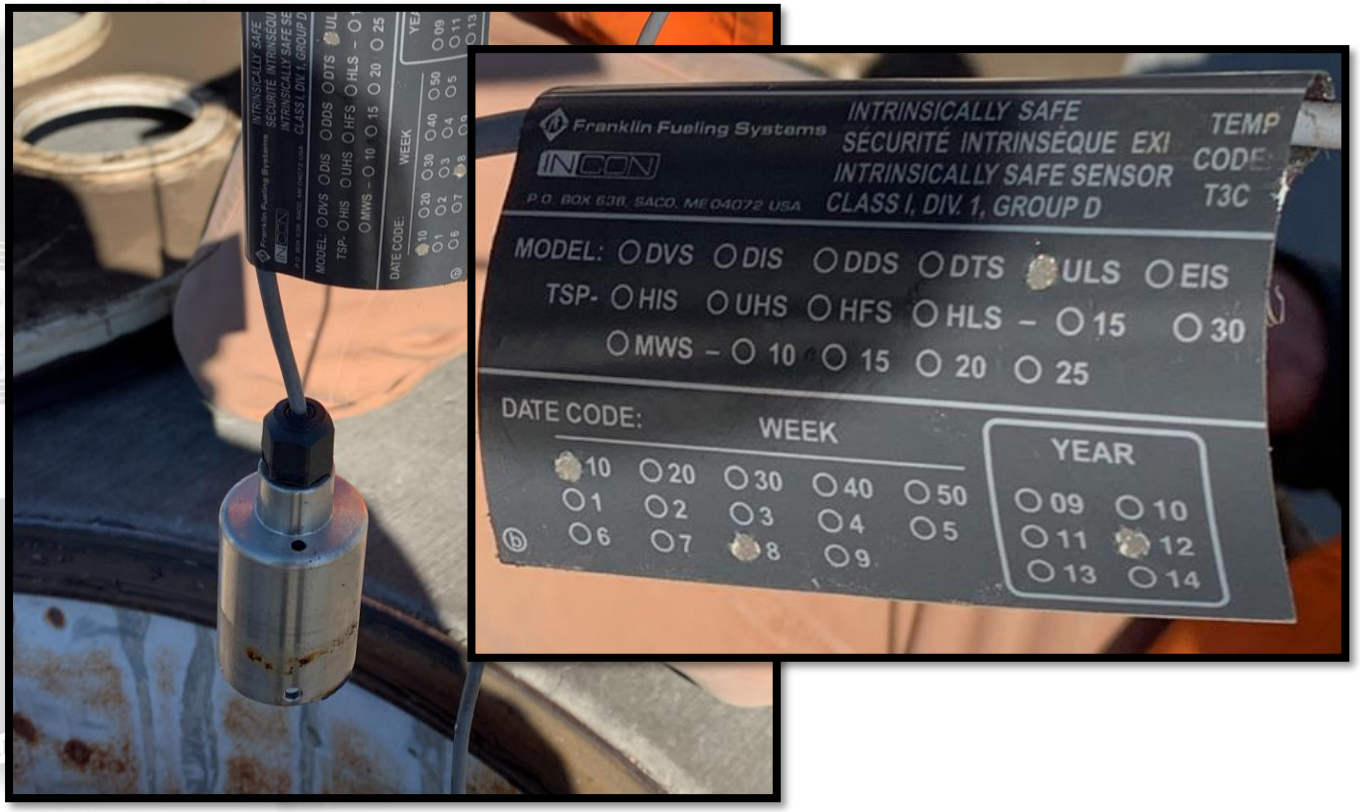
FF/Incon Sensors: Universal Leak Sensors (ULS)

- **Model:** ULS Older Model
- **Type:** Sump and UDCs
- **Sensor Aspects:** Look like EBW LS-3A
- **Data Tag:** Shows 7-30-2003 (Install Date?)
- **Compatibility:** ***?***



FF/Incon Sensors: ULS Current Model

- **Model:** ULS Current Model
- **Type:** Sump and UDCs
- **Sensor Aspects:** Silver Bell Shape
- **Cable Length:** 25 Feet
- **Data Tag:** Shows 10-8-2012 (Install Date?)
- **Compatibility:** ***E85, E100, B100, Other***



FF/Incon Sensors: LS-3A, ULS (Old and Current)

EBW LS-3A

ULS Old Model

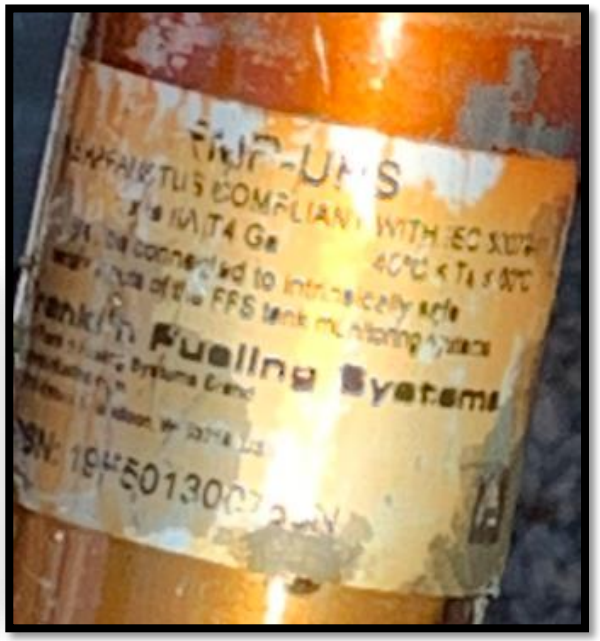
ULS Current Model

FF/Incon Sensors: Universal Hydrostatic Sensor

- **Model:** UHS Older Model
- **Type:** UDC, Sump and Tank Interstitial
- **Data Tag:** May have a data Tag.
- **Compatibility:** ***?***

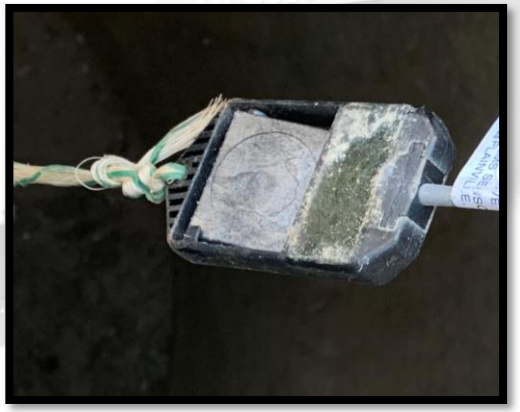
FF/Incon Sensors: UHS Current Model

- **Model:** UHS Current Model
- **Type:** UDC, Sump and Tank Interstitial
- **Data Tag:** May have a data Tag.
- **Compatibility:** ***E85, E100, B100, Other***



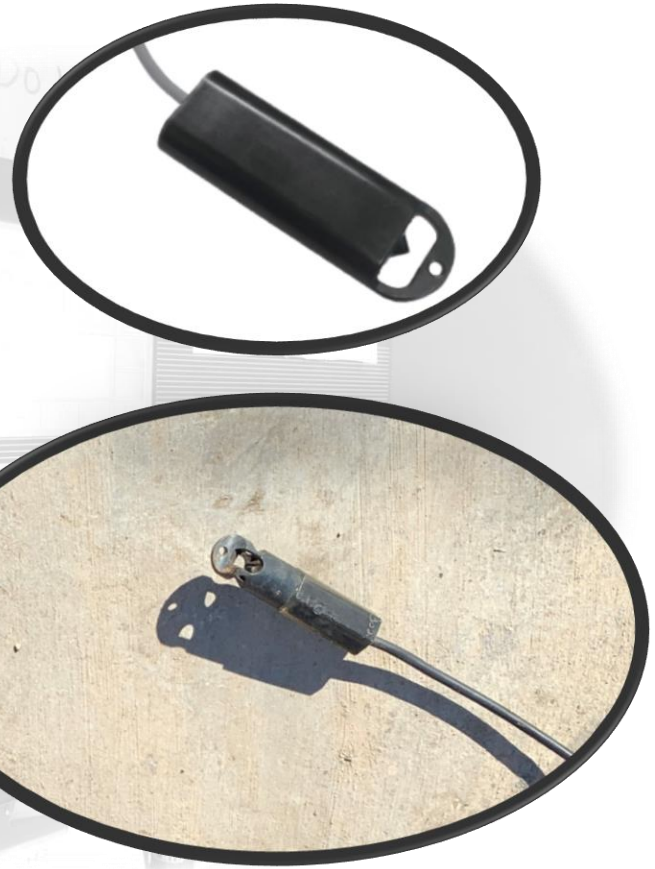
FF/Incon Sensors: Horizontal Float Switch HFS

- **Model:** HFS Current Model (HFS2)
- **Type:** Interstitial for Dry DW Fiberglass USTs “Wrap Around”
- **Data Tag:** May have a data Tag
- **Cable Length:** 25 Feet
- **Compatibility:** ***E85, E100, B100, Other***



FF/Incon: Electro-Optic Interstitial Sensor (EIS)

- **Model:** EIS
- **Type:** Interstitial for both Steel AND Fiberglass
- **Data Tag:** May have a data Tag
- **Cable Length:** 25 Feet
- **Compatibility:** ***E85, E100, B100, Other***

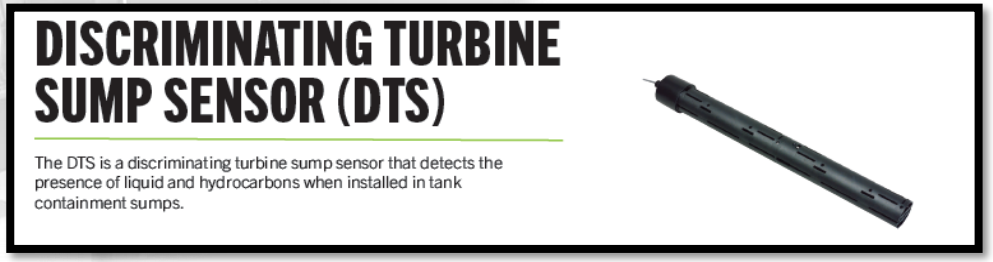


FF/Incon: Hydrostatic Interstitial Sensor

- **Model: HIS**
- **Type:** Interstitial Hydrostatically Monitored USTs
- **Data Tag:** May have a data Tag
- **Compatibility:** ***E85, E100, B100, Other***

FF/Incon: Other Sensors on the FF Guide

- **Models: DIS, DPS, DTS**
- **Type:** Interstitial and Sump and UDC
- **Data Tag:** May have a data Tag
- **Compatibility:** ***E85, E100, B100, Other***

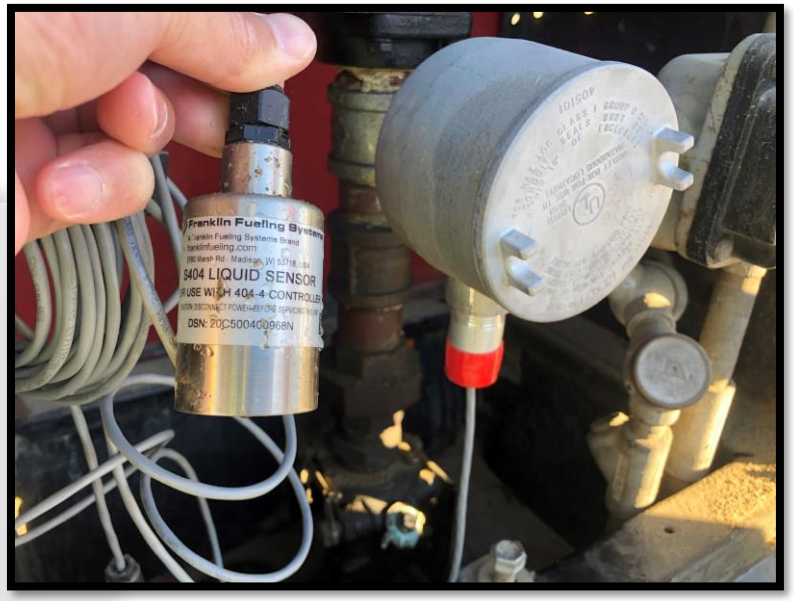


FF/Incon: Sensor Designs

- **Model: LS-5A, HIS, DDS**
- **Type:** Look Familiar?
- **Issue:** Without Tag or Marking, maybe hard to tell.

FF/Incon: s404 DC400, s406 (Beaudreau)

- **Model:** DC 400 Dispensing Cutoff
- **Type:** Stand Alone (Not on the Guide)
- **Type:** Dispenser UDC and Sump Sensor
- **Controller:** 404 is the Current Controller
- **Compatibility:** ***?***
- **Certification:** DC400 Cutoff Required



FF/Incon: s404 DC400, s406 (Beaudreau)

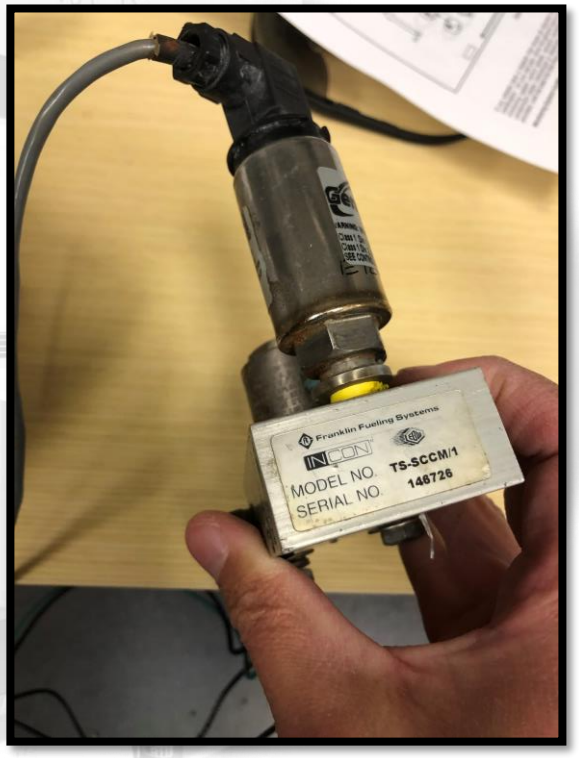
- **Model:** Beaudreau s406, Controller 404-4 (Older)
- **Type:** Stand Alone Optical
- **Type:** Dispenser UDC and Sump Sensor
- **Controller:** 404-4 is the Controller
- **Older Versions:** Old Versions of 404-4 Controller Box (Right Photo) is not compatible with the new S404.

Franklin Beaudreau Certifcations

Old Beaudreau Certification!

FF/Incon Vacuum Sensors

- **Model:** TS SCCM Vacuum Sensor
- **Type:** Vacuum, Piping and Tank Interstitial
- **Type:** Interstitial Vacuum
- **Other:** Auto Learn Capability per Website
- **Other:** No Liquid Float like Veeder Root. Not Compatible with Older TS Systems.



Pneumercator Systems

PNEUMERCATOR
Liquid Level Control Systems

CALIFORNIA CUPA FORUM

Monitoring System: Pneumercator TMS

TMS 3000

TMS 2000

- **Multiple Models:** LC and TMS Series
- Some have printers, some do not
- Some have a light and a button only!

Monitoring System: Pneumercator LC Series

LC 2000

LC 1000 and 1001 (Hi Level Panel)

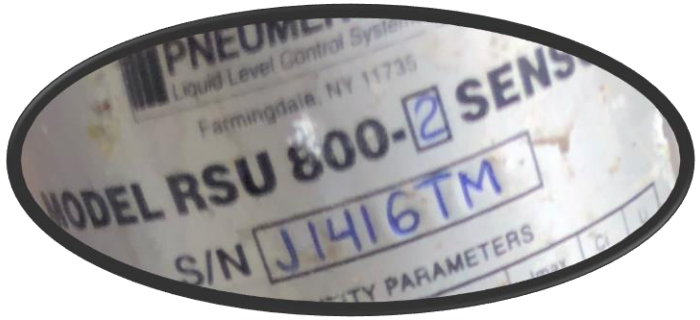
Pneumercator Sensors: Annular

- **Model**: LS 610
- **Type:** Float Switch for DW Fiberglass USTs (Wrap Around)
- **Type of Annular:** Dry

Photo from Website PDF

Pneumercator Sensors: Annular

- **Model**: RSU 800
- **Type:** Hydrostatic
- **Type of Annular:** Wet
- **Other:** Dual Float Sensor with High Level and Low Level Alarms.



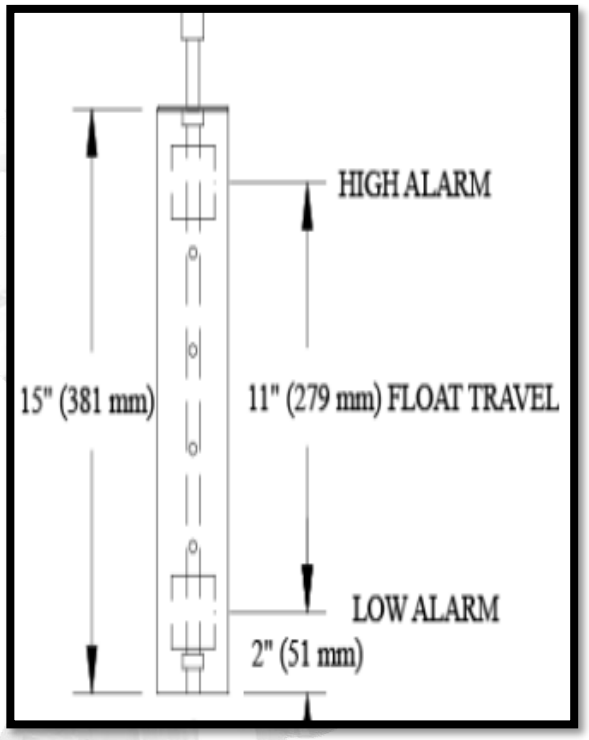


Photo from Website PDF

Pneumercator Sensors: LS 600 LDBN-1 and 2

- **Model**: LS 600 LD (Older and Current Models)
- **Type:** Float Sensor for Sumps, UDCs, Annular for DW Steel USTs
- **Type of Annular:** Dry
- **Models:** Older Model is the Narrow Sensor.
- **LDBN-2:** 32 mm Wide (Current)
- **LDBN-1:** 38 mm Wide (Current)

Photo from Website PDF

Current Model

Older Model

Pneumercator Sensors: LS 6oo LDSS

- **Model**: LS 600 LDBN
- **Type:** Float Sensor for Sumps, UDCs, Annular for DW Steel USTs
- **Type of Annular:** Dry
- **Models: "**The LS600LD Leak Switch is available with a Buna-N or stainless steel float for monitoring in ***most petrochemical and chemical storage*** tank applications"

Photo from Website PDF

Pneumercator Sensors: ES 825 100 Series

- **Model**: ES825-100 and 100CF
- **Type:** Solid State Optical
- **Type:** Dry. Compact Size for Sumps,, UDCs, Annular (Steel AND Fiberglass).
- **Models: "…**resistant to most acids, alkalines and solvents." Model CF

Photo from Website PDF

Pneumercator LC/TMS Certifications

Certificate of Completion

Theresa Congdon

Name

Belshire Environmental Services, Inc.

Company

has successfully completed the

Pneumercator Co., Inc. Factory Training Program

for the following Liquid Level Control and Leak Detection Systems

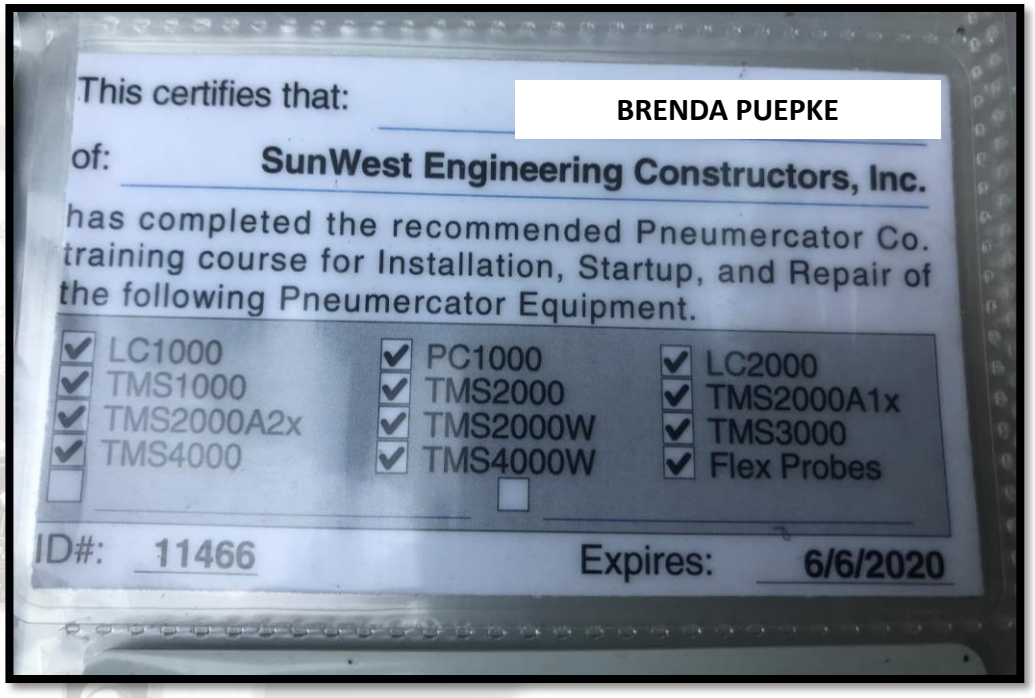
☑ LC1000 ☑ PC1000 ☑ LC2000 ☑ TMS1000 ☑ TMS2000 ☑ TMS2000A1x
☑ TMS2000A2x ☑ TMS2000W ☑ TMS3000 ☑ TMS4000 ☑ TMS4000W ☑ Flex Probes
☐ _____ ☐ _____

Certification ID: 10329 Expires: Saturday, April 25, 2020

Peter Sinkiwskij
Instructor

Peter Sinkiwskij
Authorized Signature

PNEUMERCATOR CO., INC. • 1785 Expressway Drive North, Hauppauge, NY 11788 • (631) 293-8450 • Fax (631) 293-8533



This certifies that: BRENDA PUEPKE

of: SunWest Engineering Constructors, Inc.

has completed the recommended Pneumercator Co. training course for Installation, Startup, and Repair of the following Pneumercator Equipment.

- ☑ LC1000
- ☑ TMS1000
- ☑ TMS2000A2x
- ☑ TMS4000
- ☐
- ☑ PC1000
- ☑ TMS2000
- ☑ TMS2000W
- ☑ TMS4000W
- ☐
- ☑ LC2000
- ☑ TMS2000A1x
- ☑ TMS3000
- ☑ Flex Probes

ID#: 11466 Expires: 6/6/2020

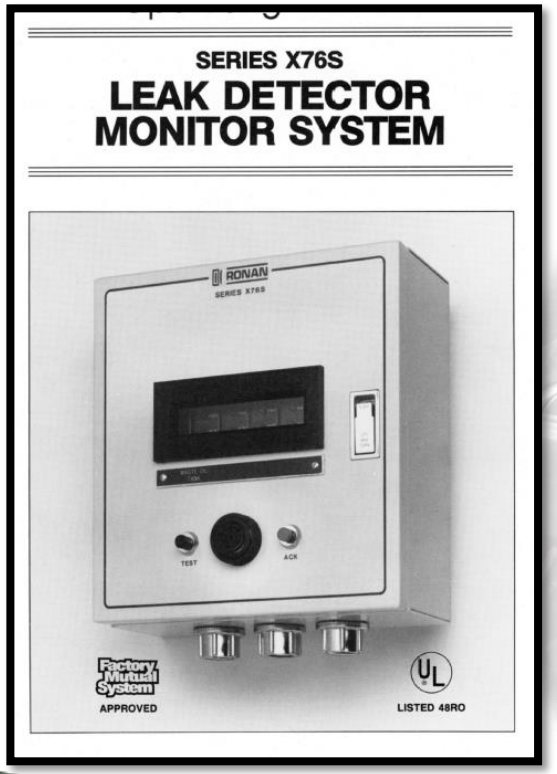
CALIFORNIA CUPA FORUM

Monitoring Systems: Ronan

RONAN SYSTEMS

CALIFORNIA CUPA FORUM

Monitoring Systems: Ronan



X76S Leak Detection System

Ronan Sensors: LS-3

- **Model:** LS-3
- **Type:** Float Sensor for Sumps, UDCs, Annular for DW Steel USTs
- **Type of Annular**: Dry
- **Main Clue:** Top NPT Connection (The "Screw Cap Looking" Tip)

Photo from Website PDF

Ronan Sensors: LS-7

- **Model:** LS-7
- **Type:** Horizontal Sensor for DW Fiberglass USTs.
- **Type of Annular**: Dry

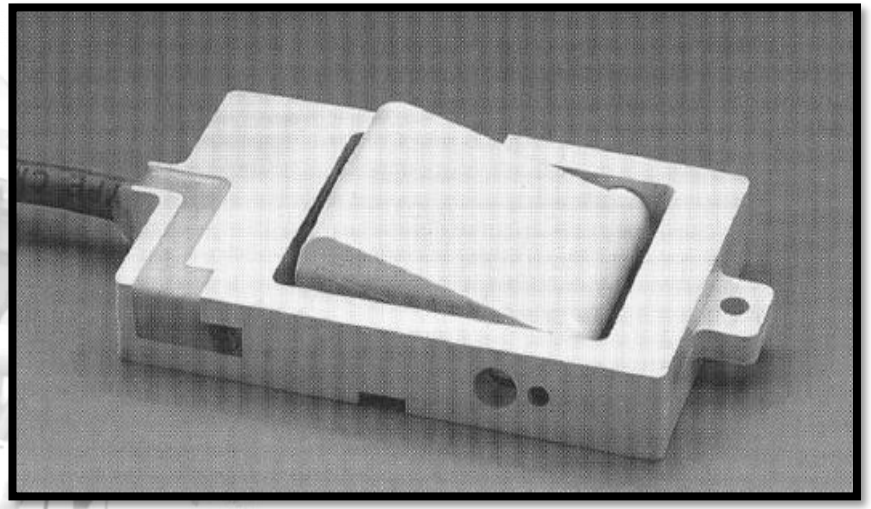
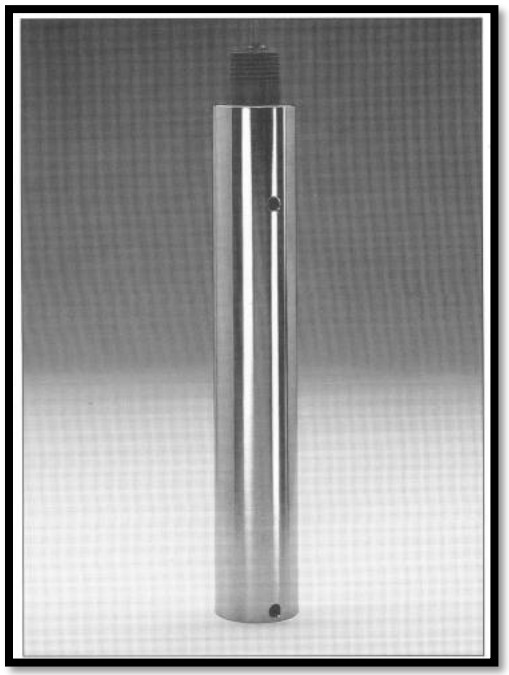


Photo from Website PDF

Ronan Sensors: LS-1, LS-30

- **Model:** LS-1 (Narrow Version of LS-3)
- **Type:** Horizontal Sensor for DW Fiberglass USTs.
- **Type of Annular**: Dry
- **Model:** LS-30
- **Type:** Hydrostatic Reservoir Dual Float Sensor.
- **Type of Annular**: Hydrostatic



Photos from Website PDF

Ronan Certification

RONAN
Engineering Company

CERTIFICATE OF COMPLETION

RONAN ENGINEERING COMPANY
LEAK DETECTION MEASUREMENT DIVISION
AUTHORIZED SERVICE CONTRACTOR

Presented to:

MINH LE

Has successfully completed training course for
Ronan Series X76 Leak Detection Monitors

Signed _____

Issue Date: June 26, 2020
Certification No.: 76140701

Monitoring Systems: Omntec

OMNTEC
Advanced Tank Monitoring & Leak Detection

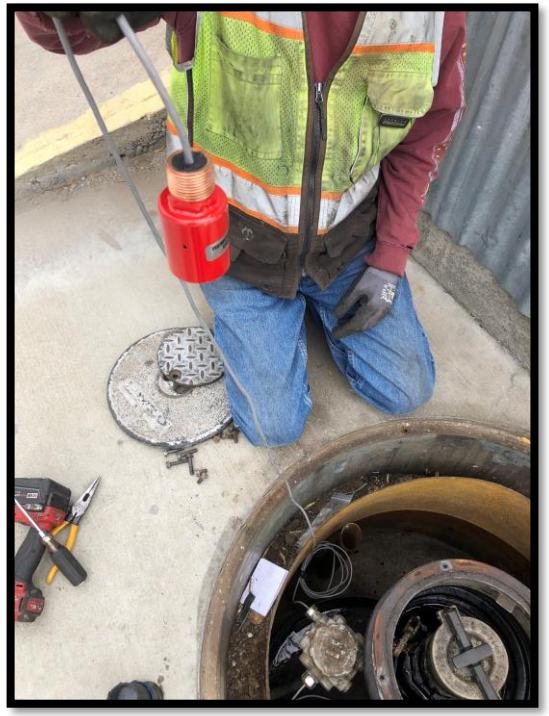
CALIFORNIA CUPA FORUM

Monitoring Systems: Omntec

- **Model:** LU-X Series (X = Number of sensors)
- **Model:** Many More, but only one (1) seen in SB County for a Waste Oil UST.

Omntec Sensors: LS-ASC

- **Model:** LS-ASC
- **Type:** Optical Solid State for DW Steel USTs. Can be used for Sumps, UDCs.
- **Type of Annular**: Dry

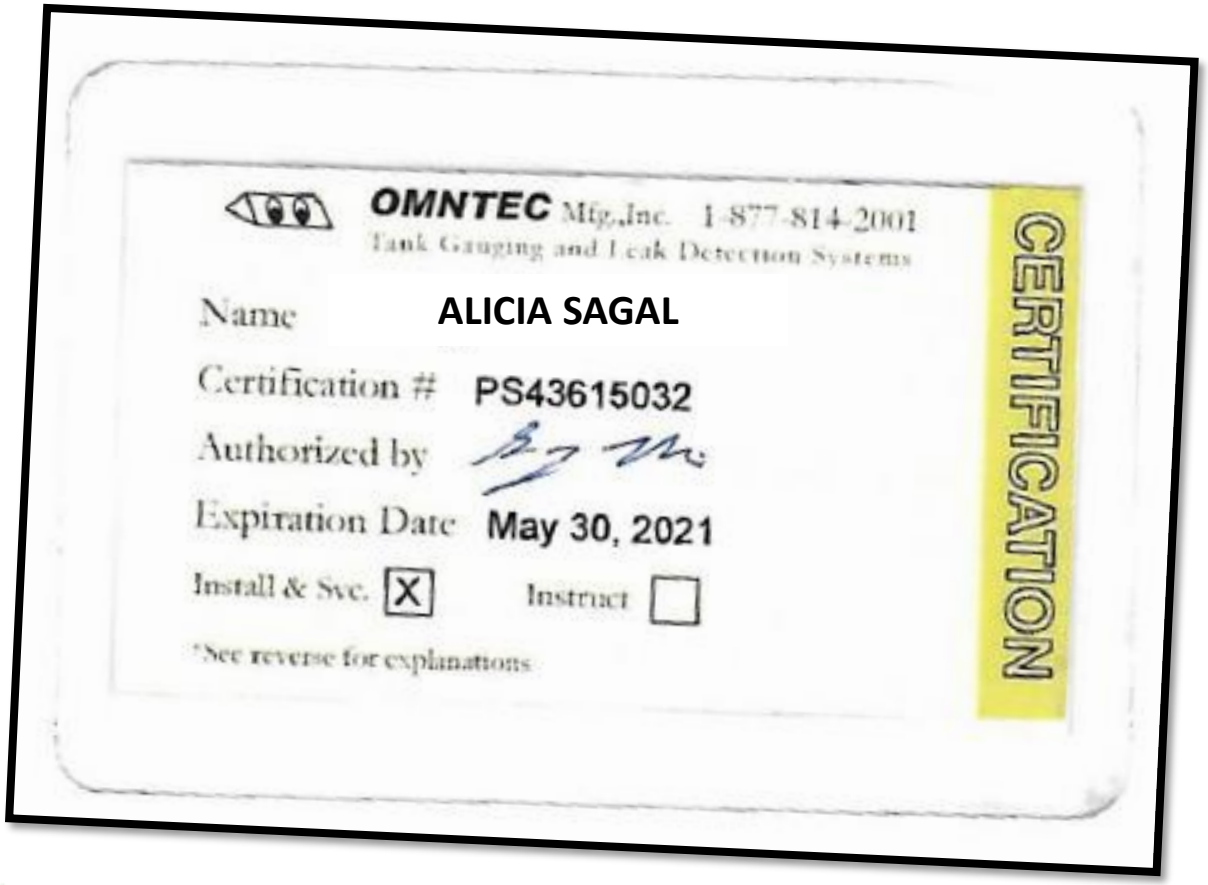


Omntec Sensors: LS-ASC-.895

- **Model:** LS-ASC-.895
- **Type:** Optical Solid State for DW Steel USTs. Can be used for Sumps, UDCs.
- **Type of Annular**: Dry
- **Other:** Can detect liquids at any angle. Narrow for narrow annular spaces.

Photos from Website

Omntec Certification



Monitoring Systems: Simmons/Clearview

- **Model:** Simmons TMW 650 CITLDS
- It is in LG 113 Under Caldwell.
- Caldwell Systems Corporation now Dover.

  There is still Support.
- Digital Alarm Software.
- Does not do Fail Safe/Shut Down (Have to

  Shut off at the Panel)
- 2 only in the California, other is in

  Hayward.

Simmons/Caldwell: TM LIQ

- **Model:** TMLIQ
- **Type:** Float Sensor for DW Steel USTs, Sumps, UDCs.
- **Type of Annular**: Dry
- **Other:** Tanknology and Fuel Pros have Certified Testers.
- **Contact:** There is a contact Number. But you wont have to worry about it.

Simmons/Caldwell: Certification

Simmons Sirvey Corporation

presents

TMW650 Certification

to

ANGIE SAMAYOA

Has successfully completed the TMW650 Certification Course and is hereby Authorized to Inspect and Certify Simmons TMW650 Tank Gauge System for Annual Tank Gauge Certification

Certification Expires April 12, 2022

John P. Nesbit, General Manager March 2, 2020

CALIFORNIA CUPA FORUM

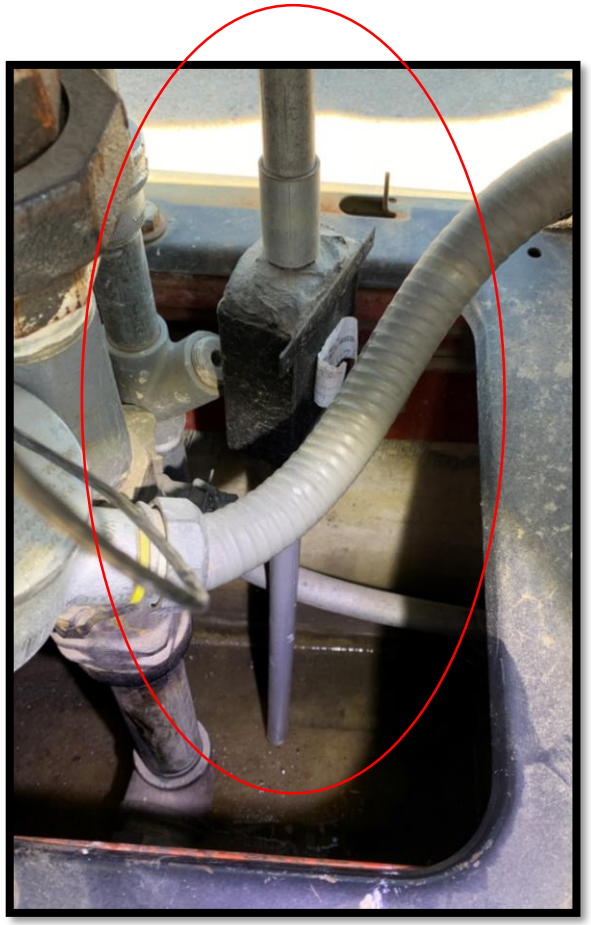
Monitoring Systems: Leak Alert/Universal

- **Model:** LA-X
- **Type:** Float Sensor for DW Steel USTs, Sumps, UDCs.
- **Other:** No Longer in Existence.
- **Contact:** None.
- **Certification:** Good Luck

Photos from J. Unson Ventura City.

Leak Alert/Universal: Sensors

- **Model:** DLS-01
- **Type:** A sensor…
- **Other:** No Longer in Existence.
- **Contact:** None.



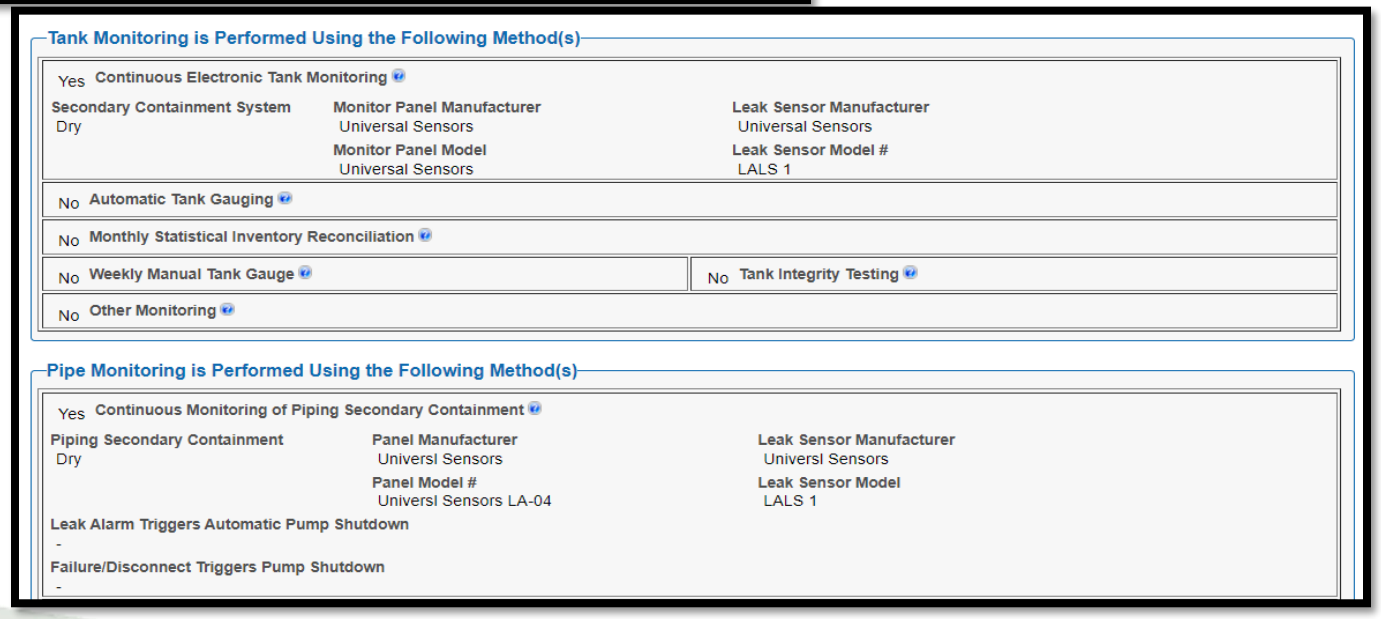
Leak Alert/Universal: Sensors

- **Model:** LALS-1
- **Type:** A sensor…
- **Other:** No Longer in Existence.
- **Contact:** None.

Leak Alert/Universal: Sensors

Universal Sensors and Devices, Inc.

- TICS-1000 (Magnetostrictive Probe)
- LTC-1000 (Mass Buoyancy Probe)
- LTC-2000 (Differential Pressure Probe)
- Leak Alert System Models LAL-100, LA-01, LA-02, LA-04, LA-X4, LA-08, DLS-01, LS-20, LS-36, LS-70, CATLAS with LALS-1Liquid Sensor
- Leak Alert System Models LAV-100, LA-01, LA-02, LA-04, LA-X4, LA-08, CATLAS with LAVS-1 MOS Vapor Sensor



Tank Monitoring is Performed Using the Following Method(s)

Yes **Continuous Electronic Tank Monitoring**

Secondary Containment System	Monitor Panel Manufacturer	Leak Sensor Manufacturer
Dry	Universal Sensors	Universal Sensors
	Monitor Panel Model	**Leak Sensor Model #**
	Universal Sensors	LALS 1

No **Automatic Tank Gauging**

No **Monthly Statistical Inventory Reconciliation**

No **Weekly Manual Tank Gauge** | No **Tank Integrity Testing**

No **Other Monitoring**

Pipe Monitoring is Performed Using the Following Method(s)

Yes **Continuous Monitoring of Piping Secondary Containment**

Piping Secondary Containment	Panel Manufacturer	Leak Sensor Manufacturer
Dry	Universl Sensors	Universl Sensors
	Panel Model #	**Leak Sensor Model**
	Universl Sensors LA-04	LALS 1

Leak Alarm Triggers Automatic Pump Shutdown
-

Failure/Disconnect Triggers Pump Shutdown
-

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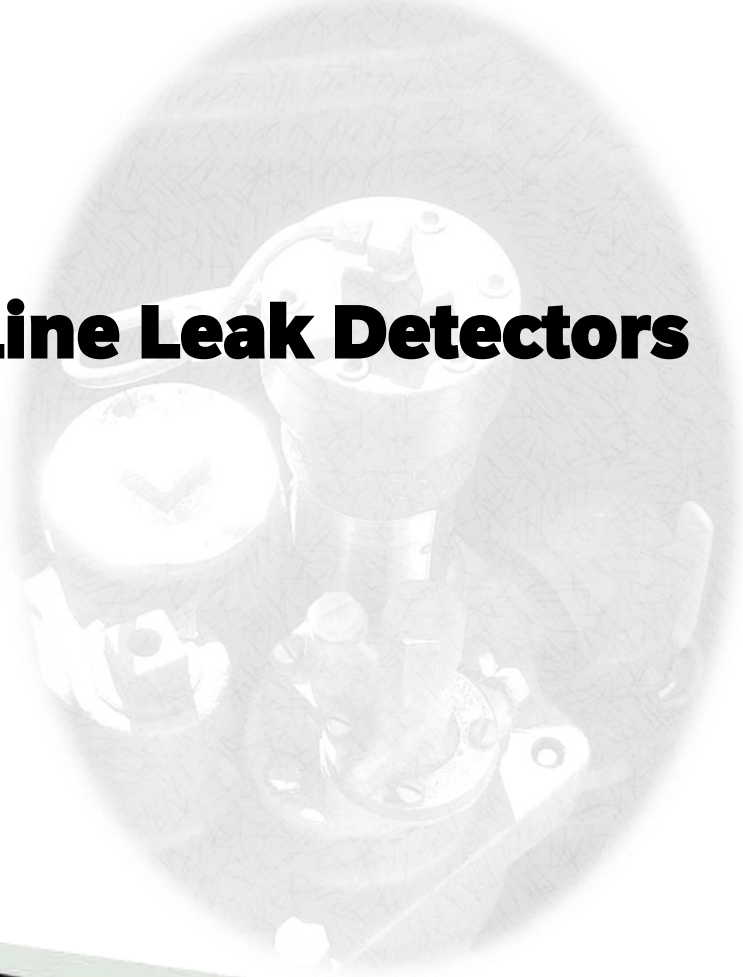
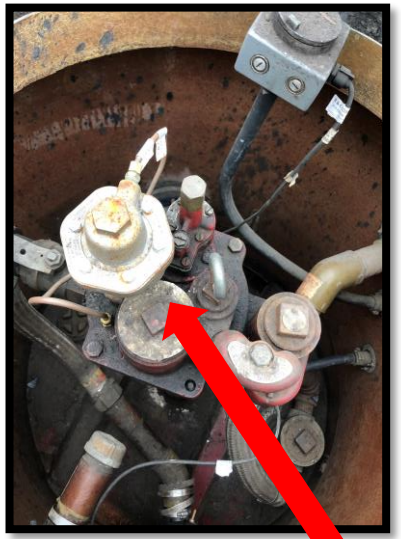
USTs: Line Leak Detectors

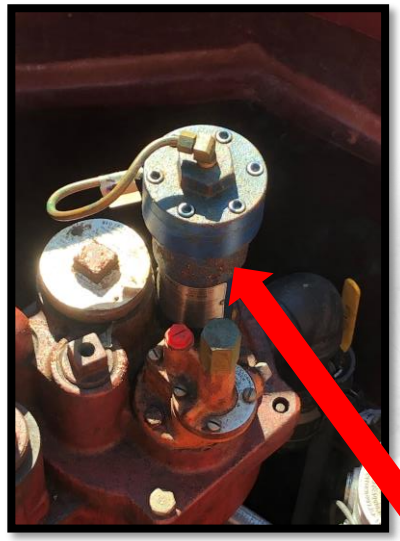


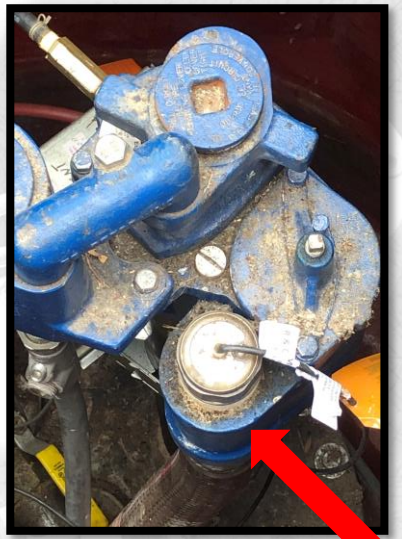
Line Leak Detectors

Line Leak Detectors - General

Typically, they are located on the submersible turbine pump (STP) head in the sump above your tank.







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Mechanical vs Electronic

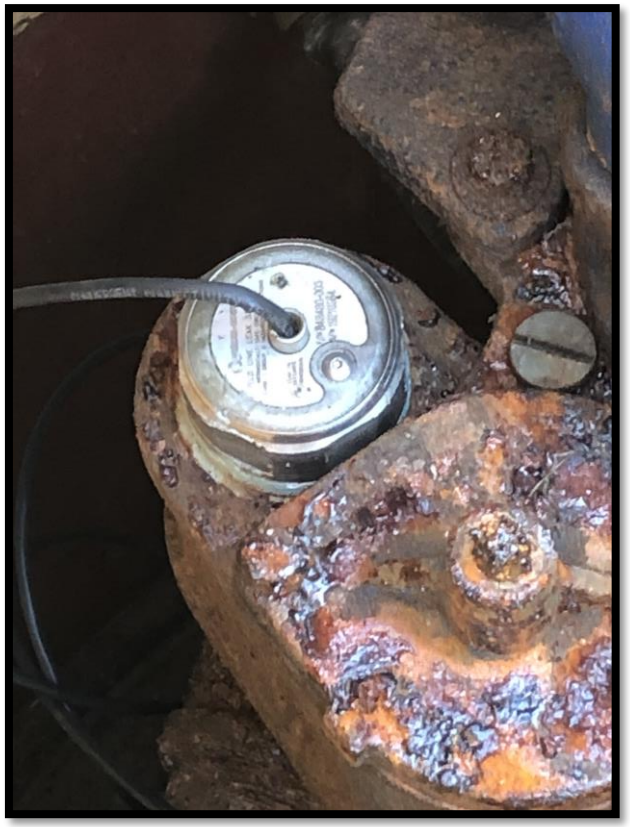
Mechanical LLD: Are mechanically operated pressure valves that test for piping leaks each time the pump is turned on. Mechanical will restrict flow (Slow Flow) when a leak of 3 gallons per hour is detected.

Electronic LLD: have an electronic detection element that connects a control panel (and continuously monitors for piping releases). Electronic can detect smaller leaks and can shut off flow to the turbine.

Electronic: VR PLLD

- **CLUE:** Look for more of a wire/cable.
- **Model:** Electronic PLLD.
- Sensors may also run through the PLLD to the VR (Showing Q and Fuel Alarms).
- ***Must be on SW Piping Sites. (Refer to Waterboard Guide).***
- Can be programmed for 0.2 and 0.1 Line Tests.

Photo from Website

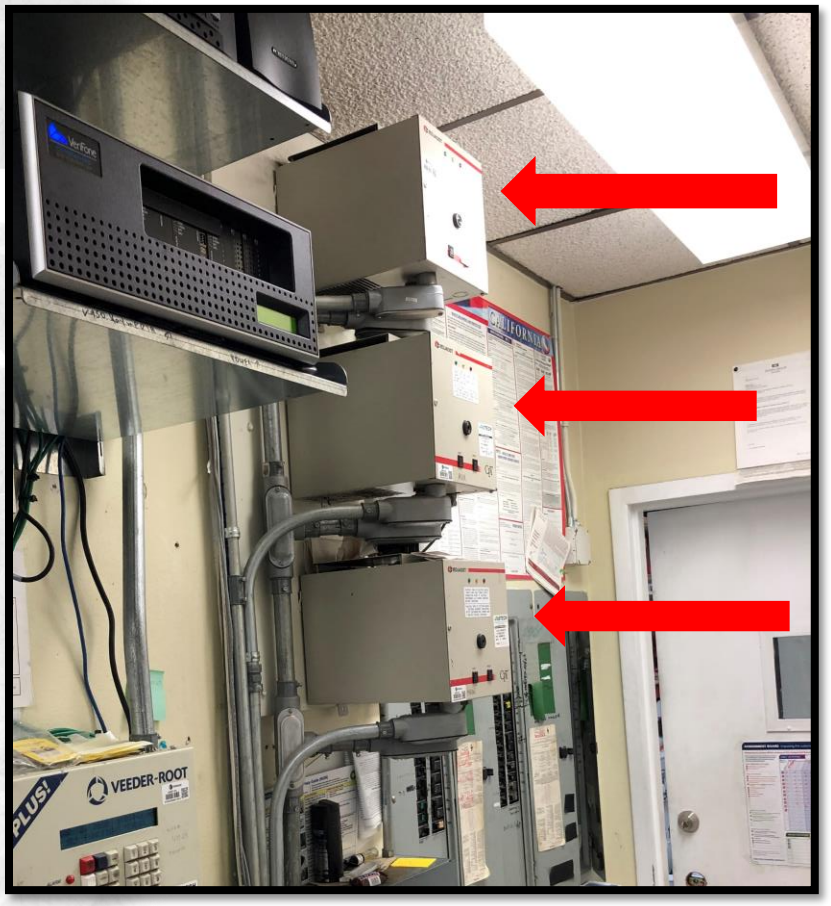


Electronic: Red Jacket CPT

- **Model:** Red Jacket CPT
- **Veeder Root acquired Red Jacket in 2002.**
- **PERK:** Each Leak Detector needs a box and may take 6 minutes to shut down turbine. Refer to LG 113.
- **Box Panel:** Each LLD requires one Alarm Box. Not Connected to the Monitoring Panel.

Electronic: Red Jacket (Veeder Root) CPT

Site with Two (2)



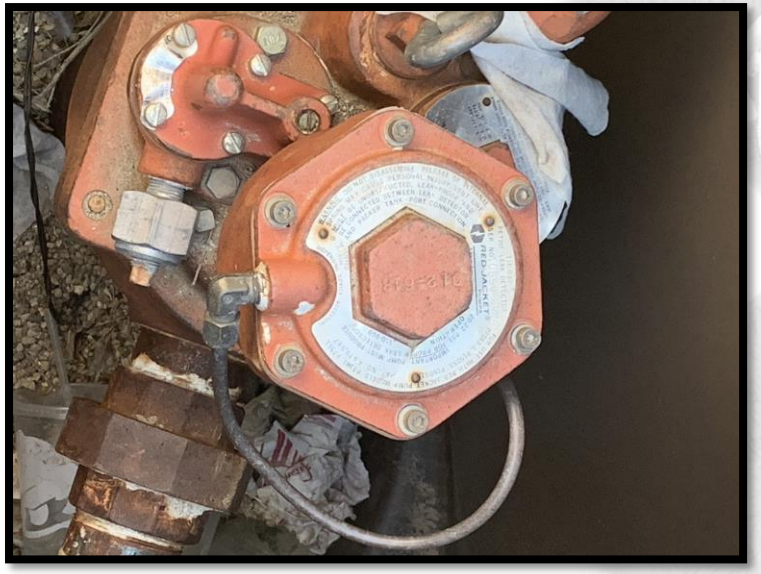
Site with Three (3)

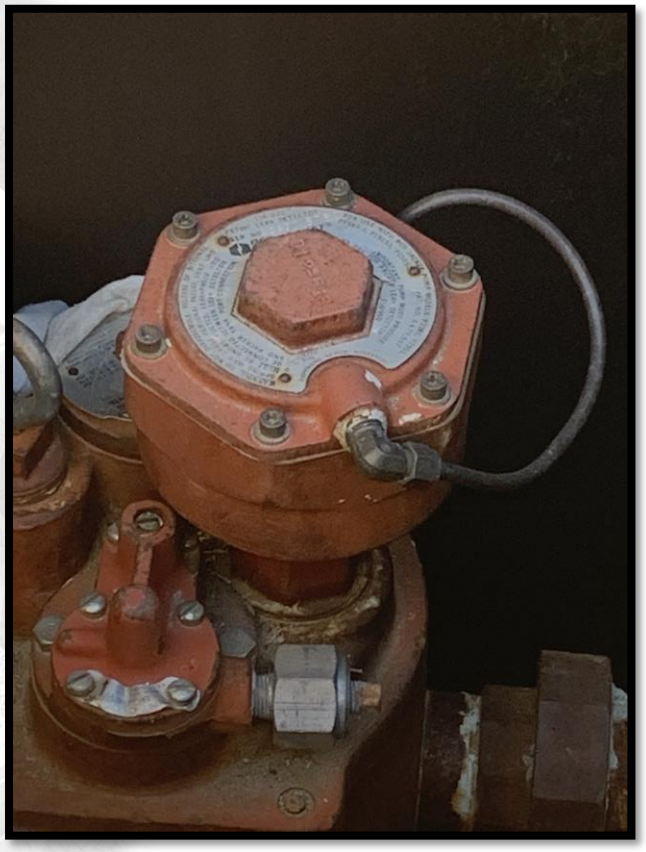
Mechanical: Red Jacket (VR) FX Series

- **Model:** FX Series Current Model
- **Models:** Gasoline and Diesel Versions
- VR Certifications required for testing
- FX1V: Gasoline | FX1DV: Diesel
- **Compatibility:** Only up to 10% Ethanol

Mechanical: Red Jacket (VR) FX Series

- **Model:** FX Series Old Model
- **Models:** Gasoline and Diesel Versions





Red Jacket Leak Detector Certifications

Electronic: Franklin INCON LS 500

LS500 Electronic Line Leak Detection

INCON® electronic line leak detection including calibration, programming, and troubleshooting.

$45.00 Approx.
60 min duration.

AUTO-LEARN® TECHNOLOGY

With AUTO-LEARN®, the TS-LS500 pressure transducer learns the characteristics of each line, eliminating possible configuration errors and ensures unparalleled leak detection accuracy.

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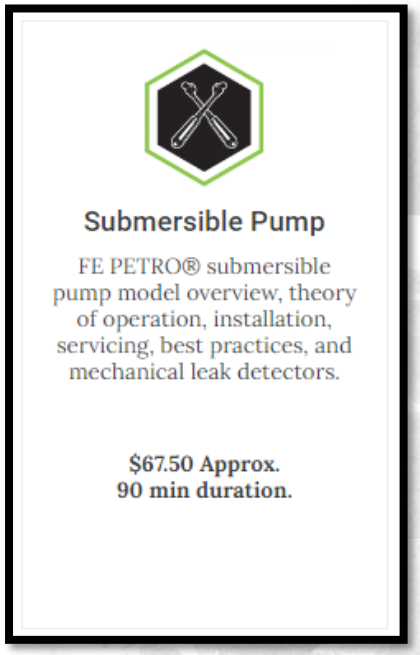
Mechanical: STP MLD (Franklin/FE Petro)

- **Model:** STP-MLD
- Newer Is More Narrow.
- Yellow = Diesel; Blue = Gasoline
- Need the appropriate Franklin Fueling Cert



Vaporless Manufacturing (VMI)

- **Model:** LD 2000 (Current)
- **Type:** Mechanical
- **VMI:** VMI has stated that the Leak Detectors can only be certified by the VMI LDT-890 Testing Apparatus.

Vaporless Manufacturing (VMI)

- **Model:** LD 2000 (Older)
- **Type:** Mechanical
- **VMI:** VMI has stated that the Leak Detectors can only be certified by the VMI LDT-890 Testing Apparatus.

Vaporless (VMI) LDT-890 Tester

- **Model:** LDT-890 Tester
- **For:** Certifying Leak Detectors for 3 Gallon per Hour at 10 PSI Leaks.
- **Other:** Can be used for all LLDs. Must be sent in annually for Calibration.

Vaporless (VMI): Certifications

Vmi
Vaporless
Manufacturing, Inc.
Quality Petroleum Equipment
Solutions for Over 30 Years

Recognizes

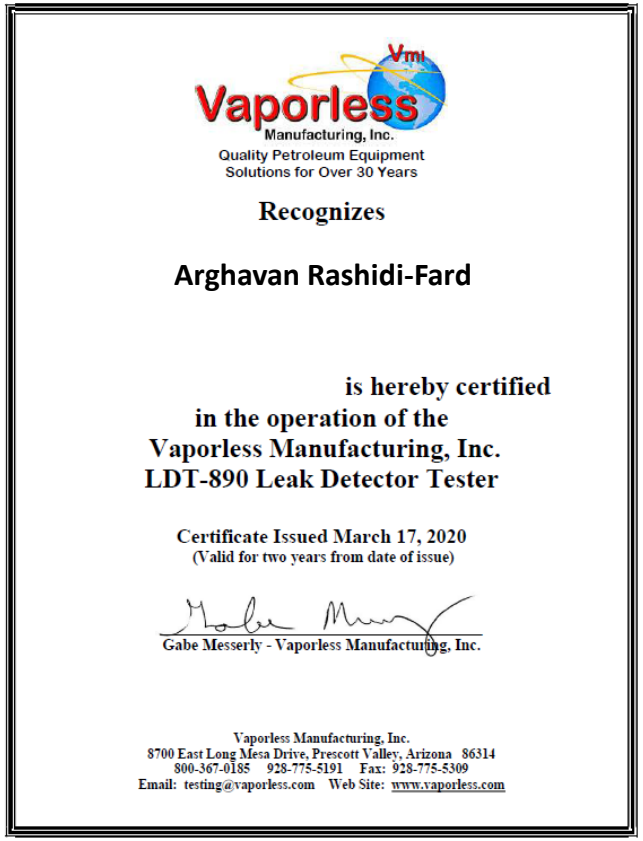
Sha Rashidi-Fard

is now certified
in installation and replacement of
Vaporless Manufacturing, Inc.
Mechanical Line Leak Detectors

Certificate Issued March 17, 2020
(Valid for two years from date of issue)

Gabe Messerly - Vaporless Manufacturing, Inc.

Vaporless Manufacturing, Inc.
8700 East Long Mesa Drive, Prescott Valley, Arizona 86314
800-367-0185 928-775-5191 Fax: 928-775-5309
Email: testing@vaporless.com Web Site: www.vaporless.com



Vmi
Vaporless
Manufacturing, Inc.
Quality Petroleum Equipment
Solutions for Over 30 Years

Recognizes

Arghavan Rashidi-Fard

is hereby certified
in the operation of the
Vaporless Manufacturing, Inc.
LDT-890 Leak Detector Tester

Certificate Issued March 17, 2020
(Valid for two years from date of issue)

Gabe Messerly - Vaporless Manufacturing, Inc.

Vaporless Manufacturing, Inc.
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Email: testing@vaporless.com Web Site: www.vaporless.com

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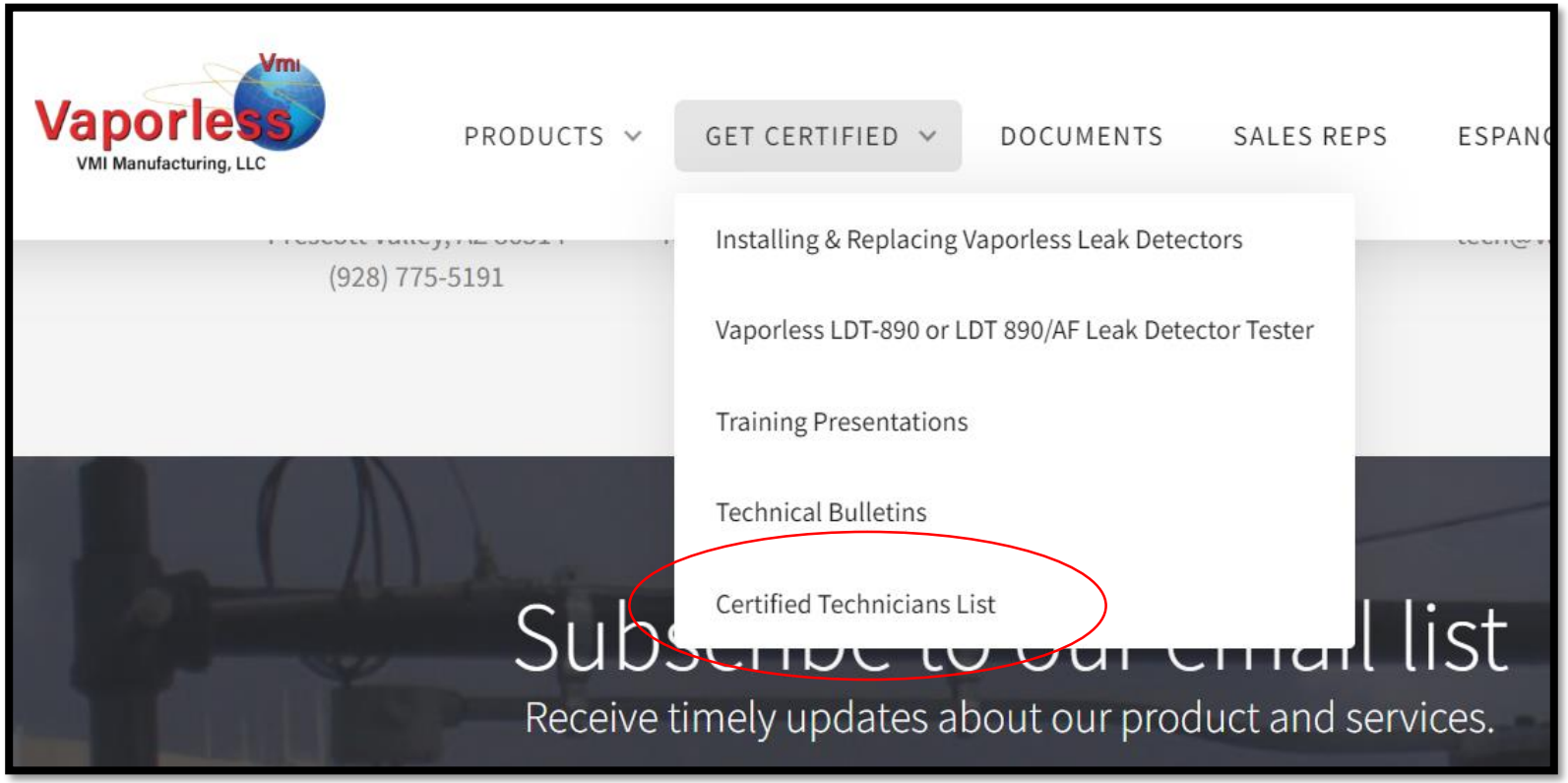
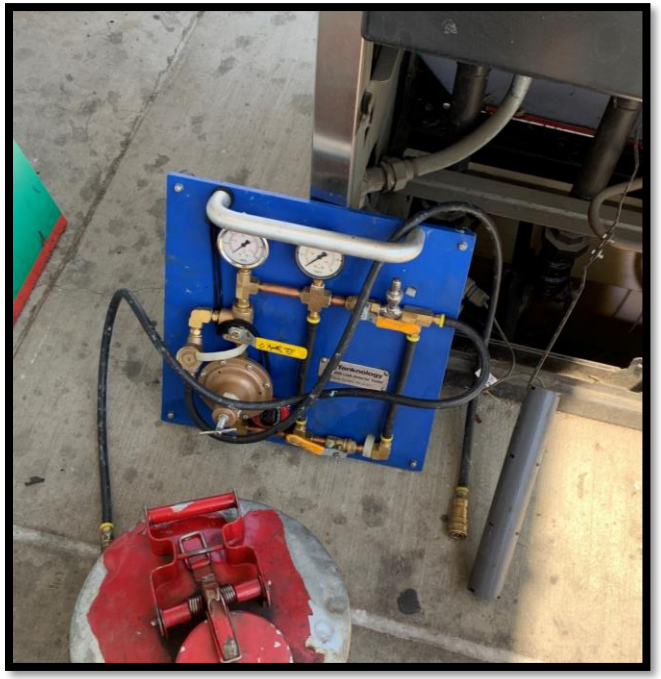
Vaporless (VMI): Certifications



Other Field Test Boxes



TANKNOLOGY

FX BOX

THE TOM BENSON BOX

TO RECAP

- Don’t Take my Word for it. Check the Manufacturer and your Solid Resources.
- Learn From the GOOD Techs (But don’t believe all of them….)
- UST TAG.
- We’ve been at the UST Sites since its Birth so go to the archives if you can.
- Non Regulators: We always want to help also.

TANK YOU!

Theresa Congdon and Greg Beach

50 YEARS OF TANK EXPERIENCE

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TANK PARTS CAN BE AWARDS

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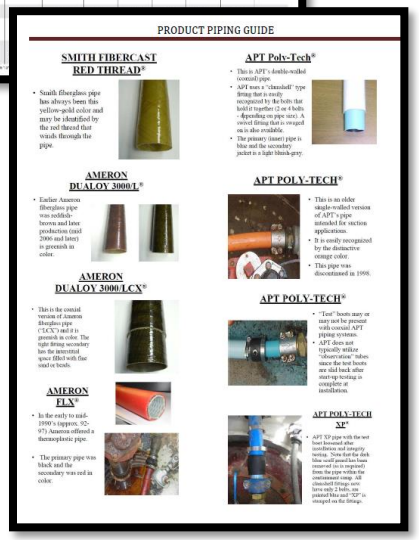
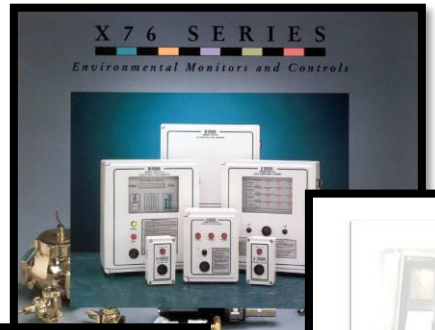
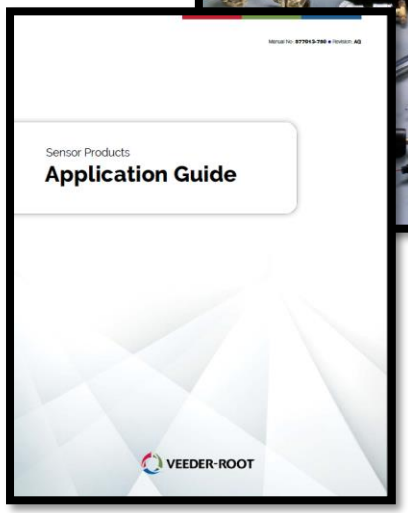
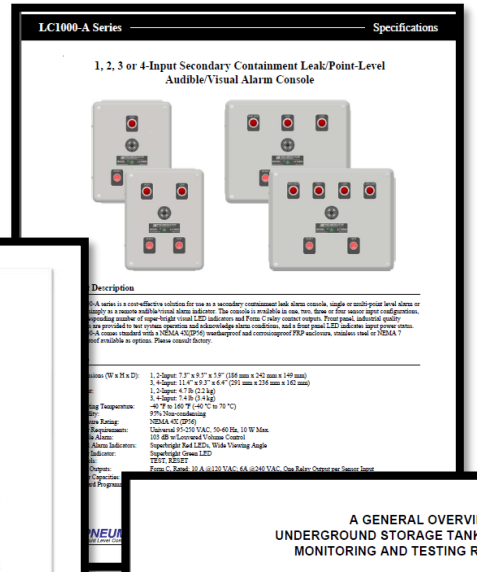
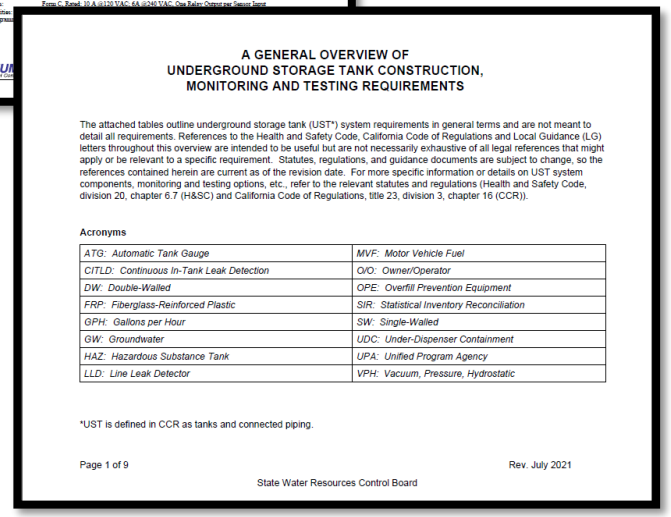
Resources and Guides











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QUESTIONS?

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Brenda Puepke | Brenda@puepkeconsulting.com