WHITEPAPER

A DIGITAL EVOLUTION IN UST COMPLIANCE TESTING

COMPLIANCE PLUS

LEIGHTON O'BRIEN | Dri-sump® | Vaporless Manufacturing, Inc.

In today's digital world, UST compliance test methods have not kept pace with technological advances. Until now. *Compliance Plus*, by Leighton O'Brien, combines three best-in-class digital technologies to optimize the time, cost and safety of EPA-mandated line, containment and leak detector testing procedures.

By Reed Leighton

CEO, Leighton O'Brien

In 1986 the United States Congress created the Leaking Underground Storage Tank (LUST) Trust Fund to be administered by the U.S. Environmental Protection Agency (EPA). It was a response to the vast number of underground storage tanks (USTs) that had been unknowingly leaking for many years or even decades, in the process fouling groundwater supplies.

In the ensuing 34 years, according to the EPA, more than 557,000 confirmed fuel or hazardous-product releases have been reported, with 543,000 cleanup procedures initiated and nearly 494,000 completed. Today, the EPA estimates there are approximately 542,000 USTs nationwide that store petroleum products or hazardous substances.

All of these USTs and their associated equipment and monitoring systems have two things in common:

1. They can be prone to leaks, and
2. They are mandated to be tested regularly in order to ensure they are, in fact, not leaking. The reasons should be obvious as undetected leaks can be harmful to people, property and the environment.

Because of this, the EPA requires that site operators be extremely diligent in making sure their UST systems are leak-free. To aid in the cause, in July 2015, the EPA approved the new regulation *Revisions to Existing Requirements and New Requirements for Secondary Containment and Operator Training; Final Rule (40 CFR Parts 280 and 281)*, with all retail and commercial fueling sites expected to be compliant with the new rule by October 2018.

Specifically, the new rule mandated these testing guidelines:

- Sumps used as secondary containment for UST-system piping, and all spill-prevention and overfill-prevention equipment must be tested every three years by an approved technician with a 'Tank tightness testing' or 'Installation' license
- All electronic and mechanical components of the site's release detection system must be tested annually by a technician with a 'Tank tightness testing' license

While these mandates help ensure a safer and more robust fueling operation, the ways these tests can be performed have not evolved or kept pace with other technological advances that have been mainstreamed over the years. The result is that these critical tests are still being performed with outdated analog technology that is not completely accurate by often-unqualified technicians. The tests are also time-consuming, inconvenient and unverified, resulting in higher risks, lost sales and less profit for fuel retailers.

Expiring LUST Trust Fund means greater exposure for fuel retailers

While UST systems are'out of sight,' they cannot be'out of mind' for retail fuel networks.Years of empirical data indicate that 70% of all leaks in UST systems occur in fittings, welds and joints, while the average service life of some mechanical line-leak detectors (MLLD) is just 18 months before it fails.

Knowing this, with the average UST spending many years buried underground, one small, undetected leak can become one big problem for the operator. In addition to the unsafe operating conditions and potential for groundwater contamination, there is a financial aspect that must also be considered. Repairing, cleaning up and remediating a leaking UST can lead to excessive site downtime and associated lost revenue, not to mention the incalculable cost of reputational damage. In fact, the EPA estimates the average cleanup cost at a fouled fueling site where a small amount of soil needs to be removed or treated is $130,000. And the costs to remediate leaks that affect the groundwater supply can range from $100,000 to $1 million, depending on the extent of the contamination.

For years, the LUST Trust Fund has been a source of finance that site operators could rely on to help mediate the costs of cleanup and remediation programs, However, according to The Tax Foundation, a leading tax-policy watchdog organization, the LUST Trust Fund, which is financed by a 0.1-cent tax on every gallon of motor fuel sold in the U.S., is scheduled to expire in September 2022. Unless the fund is renewed between now and then, this obviously removes a source of cleanup funding for site operators in the event of a leak, which will result in significantly higher out-of-pocket costs.

So, at this point, we know that UST systems are prone to leaks, cleaning up those leaks is prohibitively costly and the funding used to assist in that cleanup process may soon be phased out. Can it get any worse for fuel retailers, you may ask? Unfortunately, yes. The overriding challenge lies in the fact that the methods used to identify the source of this potential catastrophic risk – a fuel leak – relies on outdated testing technology that was cutting edge when disco was still in its heyday 40-plus years ago.

These antiquated testing procedures rely greatly on the human element. An onsite visit must be made by a technician, with some states, such as California, requiring a certified regulator also be present when the test is performed, which increases the

The LUST Trust Fund is scheduled to expire in September 2022, removing a key source of cleanup funding in the event of a leak.

cost for the operator. When the technician is working alone, it is also fair to wonder if he or she has been properly trained. And while no one likes to suspect foul play, how can the operator be sure the proper tests are even being performed and not just a result of so-called "drive-by" testing with a falsified result? A tipoff here is if the leak rate is exactly the same three years in a row; statistically, that is impossible based on the many ambient conditions (time of year, temperature, ground expansion/contraction, etc.) that can affect a test. At the other end of the spectrum, there have also been documented instances where a technician has been pressured by site owners to give a "pass" so the site can keep operating.

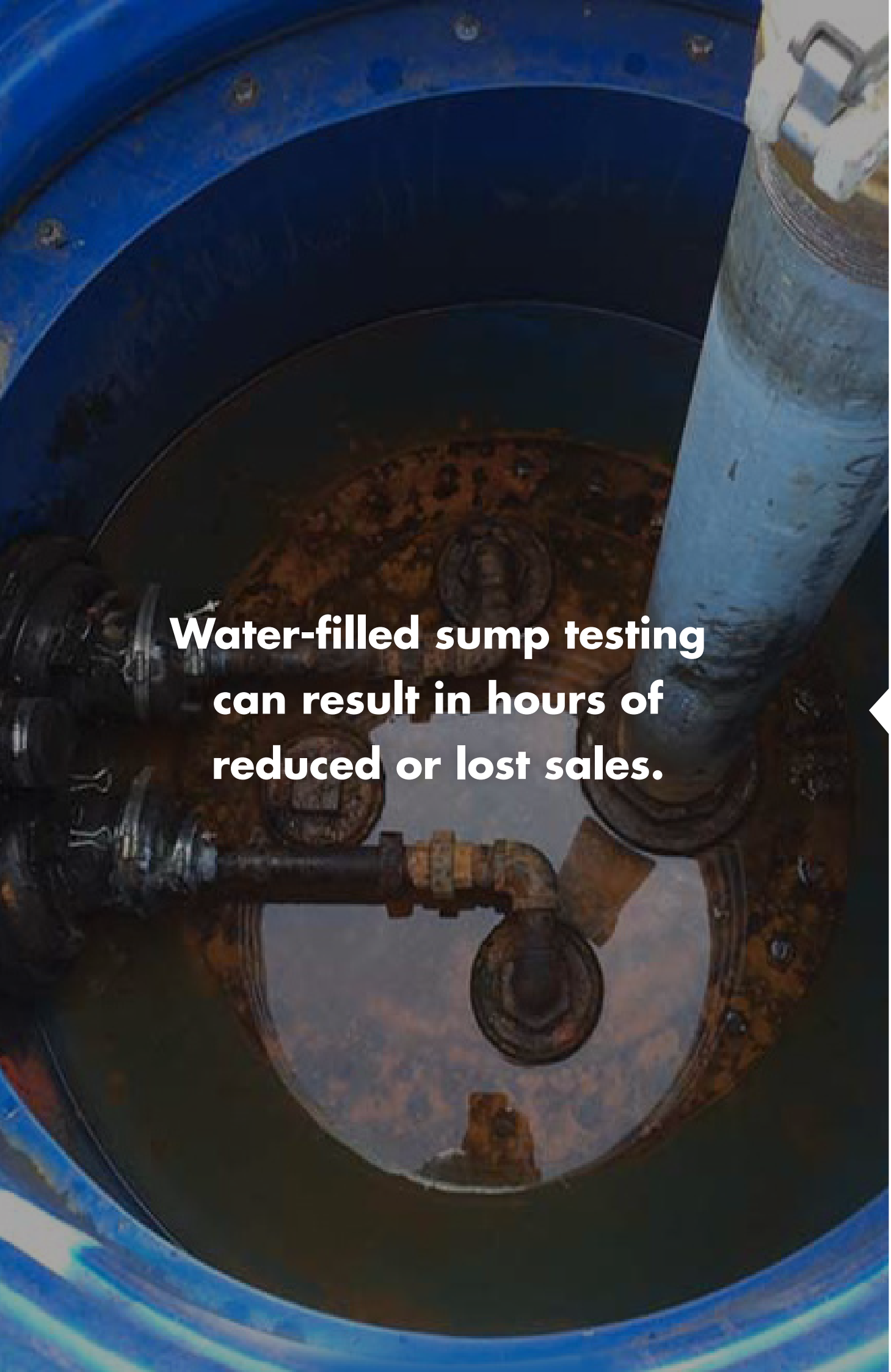
The human element also plays an oversized role in how the results of analog testing methods are interpreted. Old-school acoustic, pressure decay and pressure over volume testing require the use of an analog device that must be read by the technician. This means there will be questionable accuracy for all three methods, with two different technicians potentially arriving at two entirely different results for the same test.

In addition, many leak detector testing devices utilize a fixed orifice, with no ability to compensate for the viscosity of the fuel being tested and therefore the operator is unable to calibrate the flow (leak) rate accurately.

There are also various inefficiencies in analog-testing methods from an operational standpoint. The most obvious is that they are incredibly time-consuming, with hydrostatic sump testing taking up to six hours per site. This requires the tank or site to be taken out of service for at least several hours, resulting in lost sales that cannot be recouped.

Additionally, a testing company can haul up to 500 gallons of test water to a site to perform a test without requiring a license to move water around. Once that water is contaminated it then has to be disposed of which is an added cost. There are also legal ramifications if a technician is hurt while hauling the water around.

Keeping all of the potential pitfalls in dated hydrostatic-testing methods in mind, one wonders why fuel retailers have so readily relied on testing methods that can put their sites at a greater risk of incurring groundwater contamination, environmental damage, property damage, personal injury, compliance violations and fines, cleanup costs, lost revenue and reputational harm.



Water-filled sump testing can result in hours of reduced or lost sales.

Welcome to the digital age of Compliance testing

Compliance Plus is a new paradigm in leak-detection testing for UST systems. Developed by Leighton O'Brien, *Compliance Plus* integrates and digitizes three best-in-class compliance technologies into a single-source testing platform that dramatically reduces site downtime, lowers leak risks, and ensures verified compliance with all EPA regulations.

1. Leighton O'Brien Precision Tank & Line Testing

Certified to EPA standards, Leighton O'Brien's precision tank and line test is the most advanced, fastest, accurate and reliable test available, able to detect every possible leak scenario. The mass-based volumetric-tightness method of testing uses the latest sensor technology, data collection and analysis software to take continuous mass readings of the wet area while simultaneously taking pressure and vacuum readings of the tank ullage and associated lines in real-time.

Precision Tank Test

- US EPA certified as the most accurate tank test globally
- Uses multiple differential pressure sensors for automated mass readings
- Mass readings during ullage pressure/ vacuum decay test
- Tests the interstice as part of the tank test
- Ability to test all tank types at any fill level with any product
- Quality control built into the software, providing instant feedback to technicians including a live leak rate
- All readings are digitally stored and centrally analysed by qualified engineers

Precision Line Test

- The fastest and most accurate US EPA certified test – 3 minutes of data required for an empty line, 17 mins for a wet line test
- Volumetric test and can perform both pressure and vacuum testing
- All lines including steel, plastic, fiberglass, single and double walled in all conditions (dry, wet and partially wet lines)
- Proprietary software providing live volumetric results and feedback to technician
- Readings are digitally recorded, stored centrally and analysis completed by engineers

2. Dri-sump® Containment Testing

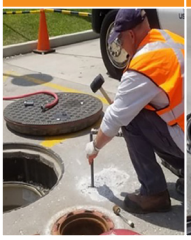
Developed by AC'CENT Environmental Services, Inc., Dri-sump® is an EPA-approved containment-tightness testing technology that delivers digitally recorded pinpoint testing accuracy to 0.05 gph in just 60 seconds and uses no water and creates zero waste.

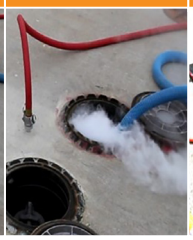
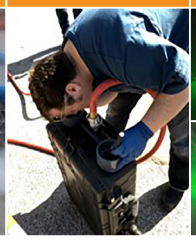
Instead of water, the system uses a food-grade, pH-neutral, non-petroleum vapor aerosol that is injected into the sump, filling a 300-gallon sump in 10-15 seconds; after the test, the vapor dissipates in about 10 minutes. After injecting the aerosol vapor, an air generator "pulls" the gases from the sump into a viewing chamber that is connected to a Vapor Stimulator Tube (VST), where a laser is introduced. If the viewer sees a green laser "dot," there is no leak and the sump passes the test. If a green "line" is observed, a leak has been detected.

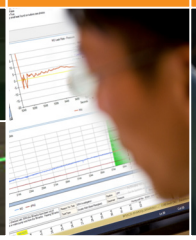
A mobile app captures the laser result that is time stamped with the GPS location and uploaded into Leighton O'Brien's data capture software for analysis and reporting.

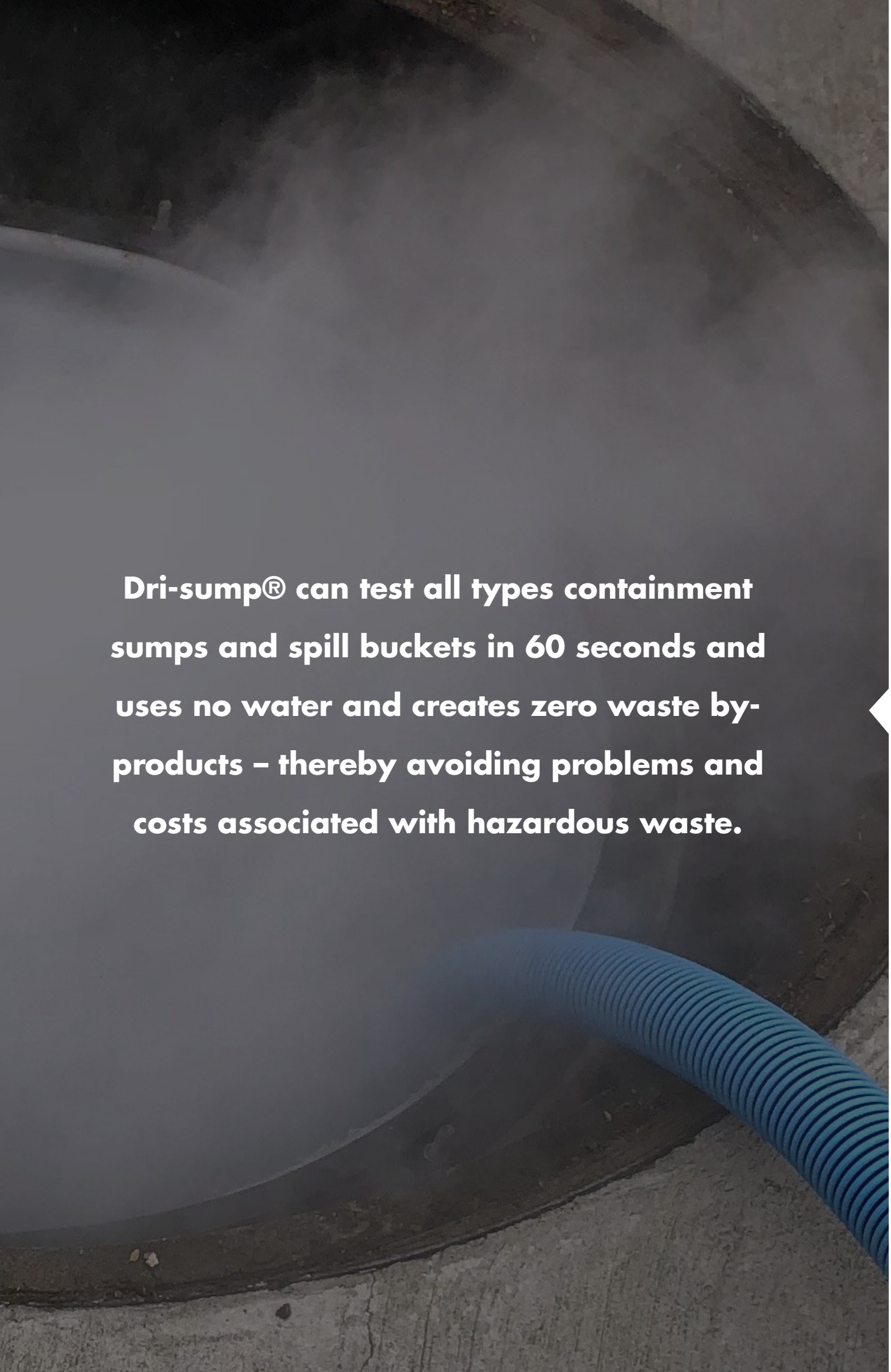
A VST (made from PVC) can also be installed through the surface adjacent to the sump or spill bucket in just a few minutes. PVC can last more than 100 years. The sealable top can be level or below-grade, which protects the VST from traffic or weather-caused damage. This gives retailers completely reliable and verifiable results with minimal disruption to site operations.

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Install the VST (Vapor Stimulator Tube)	Hook up the hoses to VSTs	Inject the Dri-Sump® heavy fog and draw a vacuum to viewing chamber	Laser Examination for 60 seconds in the view chamber	Pass or Fail Result	Test results are uploaded to the cloud & analysed for accuracy	Digital report issued to the customer



Dri-sump® can test all types containment sumps and spill buckets in 60 seconds and uses no water and creates zero waste by-products – thereby avoiding problems and costs associated with hazardous waste.

3. Vaporless Manufacturing Leak-Detector Testing System

The LDT-890D/AF Leak Detector System from Vaporless Manufacturing Inc. is the only certified test for all catastrophic leak detectors and can be used to test any manufacturer's pipe.

It can generate the EPA-mandated 3 gph at 10 pounds per square inch (psi) leak and, unlike other equipment, it can automatically compensate for different fuel viscosities, thereby setting the correct leak rate adjusted for temperature, fuel viscosity and pump variables.

Testing starts through the VMI TAP (Technician Access Port) or the VMI Safety Port (a permanently installed access port to reduce future set-up time and eliminate fuel spray onto the forecourt) at the fuel filter adapter. This test position enhances testing by including in-dispenser components, following recommended practices as per, among others, the March 2013, Bulletin 72, L.U.S.T. LINE by Marcel Moreau.

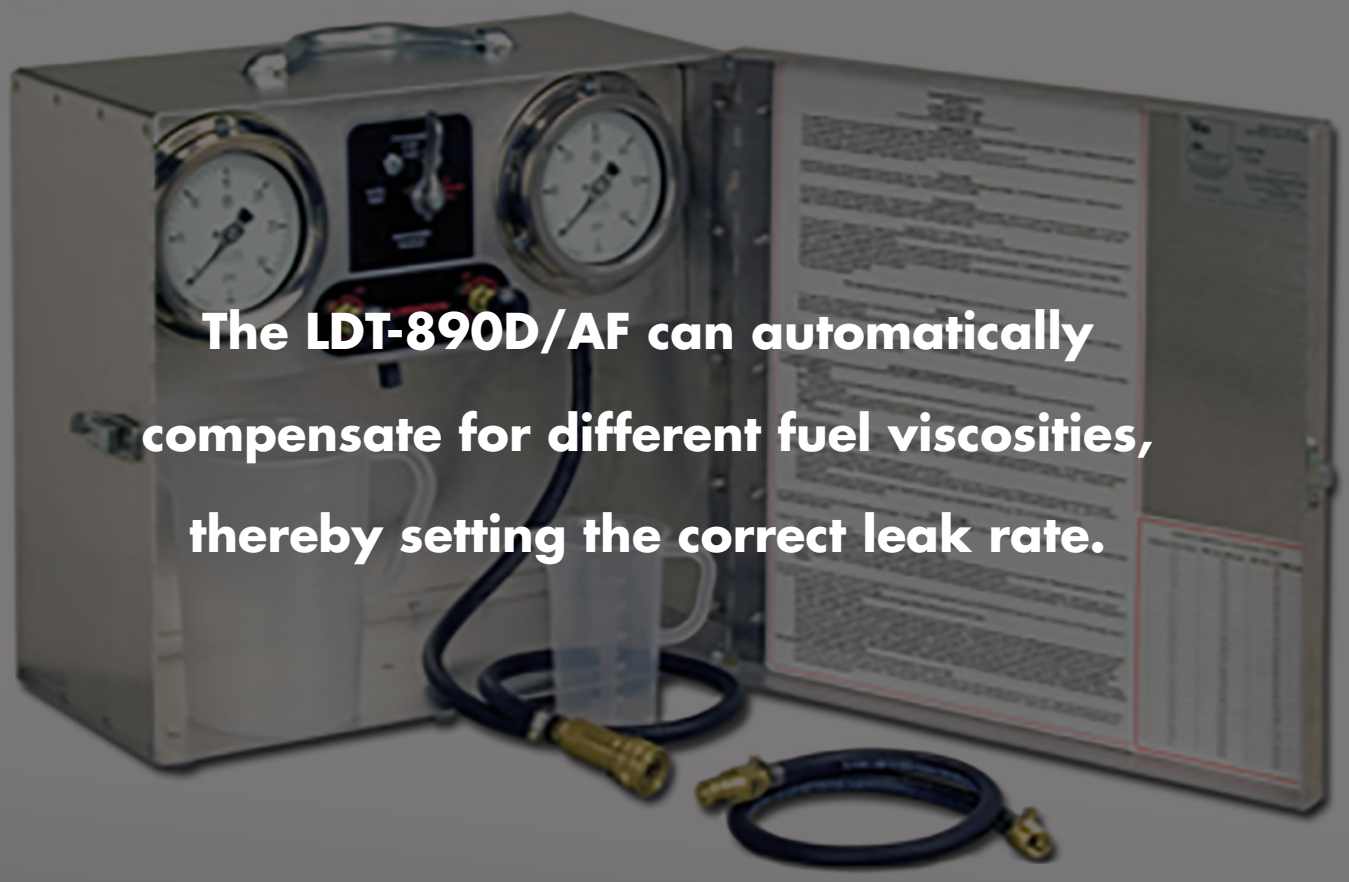
The Safety Port is also used to validate the functionality of the shear valve and make filter changes faster, safer and cleaner, eliminating fuel spray into the dispenser sump and onto the forecourt, employees and customers.

The compact control unit comes out of the box ready to use, resulting in streamlined set up and plug-and-play operation. The unit's clean dry-break fittings eliminate any chance that fuel leaks or spillage will occur. Calibration of the correct orifice size at the correct pressure is adjusted faster and with greater precision through Leighton O'Brien's hardware interface.

The results are also extremely easy to interpret by Leighton O'Brien's software – unrestricted pump pressure (full flow) means that the MLLD has failed, while restricted pressure (slow flow) indicates a pass. ELLDs are similarly identified by the line pressure falling to zero at the successful completion of the test (ELLD has detected the leak).

By connecting the flow meter and pressure sensor from the LDT890D into Leighton O'Brien's hardware interface, the flow rate and pressure set by the technician is digitally captured and validated at 3 gph at 10 psi.

This digital signature is critical given some mechanical line leak detectors are incorrectly 'failed' by technicians, resulting in unnecessary replacement costs incurred by site owners.



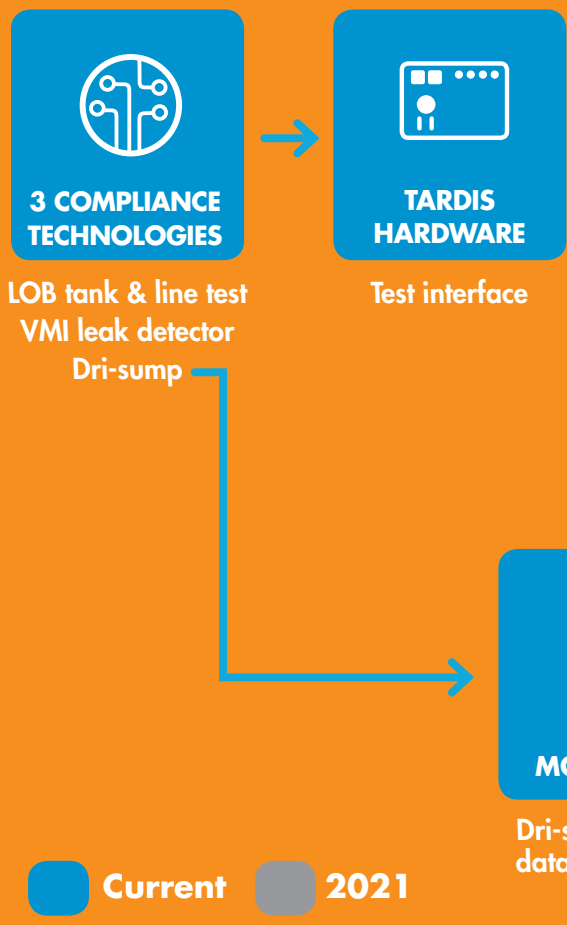
The LDT-890D/AF can automatically compensate for different fuel viscosities, thereby setting the correct leak rate.

Increased sales uptime, exceptional Compliance outcomes

Tank, sump and line-leak testing remain critical components in ensuring that a leaking UST system cannot damage the environment or hamper the overall viability of a retail fueling site, but despite the importance of these tests, the technology used to conduct them has remained stuck in the past.

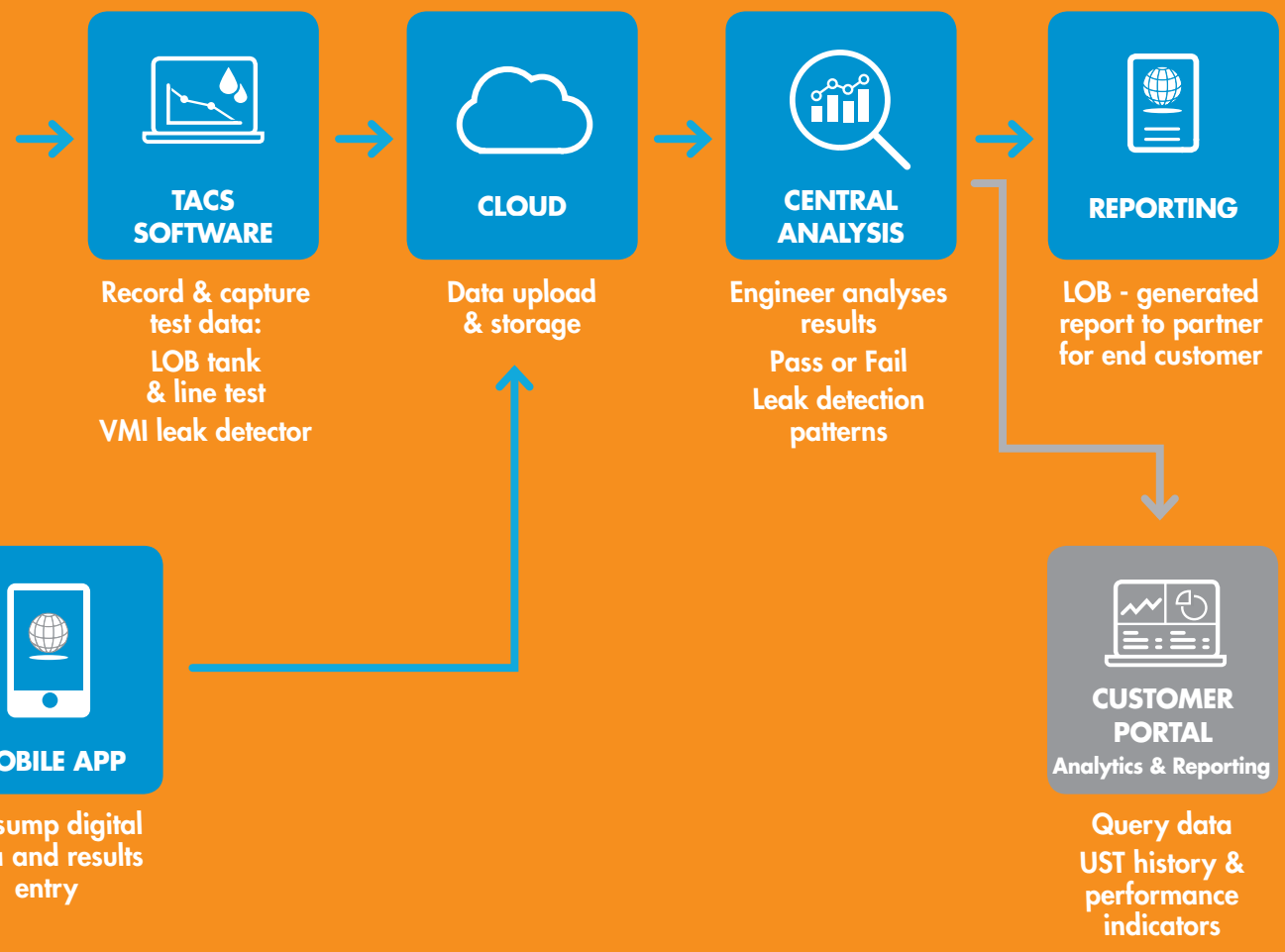
Compliance Plus from Leighton O'Brien addresses the shortcomings of traditional UST-testing regimes with significant benefits for retail networks, their customers and the environment.

Integrating three cutting-edge technologies into a single source testing platform, *Compliance Plus* delivers verified tests performed correctly every time while limiting site downtime and corresponding lost revenues, thus ensuring the station is truly compliant and operating at its highest level of safety and efficiency.



COMPLIANCE PLUS

Compliance Plus Digital Model



Time & Cost Saver:
Compliance Plus v Traditional Hydrostatic Testing

	Dri-sump® Containment Testing	Hydrostatic Testing
Time spent onsite	<2 hours	4 - 6 hours
Cost in lost fuel sales per Test	$3 - $6	$150 - $300
Wastewater disposal costs	$0	$2.50 p/gallon (average) (Additional contaminant disposal)

About Leighton O'Brien

Leighton O'Brien is a leading global fuel analytics technology provider that enables retail fuel networks to reduce environmental risk, prolong asset lifespan and optimize capital spend. We offer an integrated suite of software (Wetstock Live™, alarm management, forecasting) and field technologies (tank and line testing, fuel polishing and tank cleaning) to achieve the tightest fuel systems, lowest fuel losses, most accurate tank-gauge calibration and cleanest fuel. Leighton O'Brien operates in 33 countries through direct operations and partnerships with 55 licensed distributors.

info@leightonobrien.com

leightonobrien.com