Meeting Fuel Compatibility Requirements: UL, EPA & PEI Member Perspectives

Regulatory Overview Introduction

Ryan Haerer
Release Prevention Division
EPA Office of Underground Storage Tanks
Are these compatible?
Regulations

EXTERNAL CORROSION PROTECTION

INTERNAL COMPATIBILITY REQUIREMENTS

UST System

Soil
Incompatibility in UST Systems

Delamination

Discoloration

Tank Wall Flaking

Softening

Swelling

Elongation ("creep")
Compatibility Requirements

Entire UST system must be compatible with substance stored. (1988 and 2015)

Biofuels (2015)

- Notify of Intent to Store
- Demonstrate Compatibility
- Keep Records
Compatibility

- **Notification** - Owners and operators must **notify** the implementing agency at least 30 days before switching to a regulated substance containing greater than 10 percent ethanol, 20 percent biodiesel, or any other regulated substance identified by the implementing agency.

- **Demonstration of compatibility** – Owners and operators must:
  - **demonstrate** compatibility of the UST system through a nationally recognized testing lab listing or manufacturer approval of UST equipment or components, or
  - **use an alternative option** identified by the implementing agency that is no less protective than demonstrating compatibility of the UST system.

- **Recordkeeping** - Owners and operators must **maintain records** for as long as the biofuel blend is stored to demonstrate compliance.
Example: Unleaded 88 / E15
Demonstrate Compatibility For:

• Tanks
• Piping
• Containment sumps
• Pumping equipment
• Release detection equipment
• Spill equipment
• Overfill equipment
Demonstrating Compatibility with Biofuels
Examples for Demonstrating Compatibility

Independent Laboratory Certification or Listing for Use with the Substance

Affirmative Statement of Compatibility from Manufacturer
Steps to Demonstrate Compatibility

Appendix 2: Sample Checklist For Determining UST System Compatibility

This sample checklist can help ensuring and operating determines and document the compatibility of these UST systems. Be sure to check with your implementing agency for their specific compatibility requirements. Their may require you submit a compatibility documentation statement that differs from the sample checklist provided below.

| Checklist For Determining And Documenting UST System Compatibility |
|-----------------------|-----------------------|
| Instructions: Complete all sections. This will help ensure you have the required information to demonstrate compatibility of an UST system with bases containing more than 10 percent ethanol or more than 20 percent biodiesel. |

<table>
<thead>
<tr>
<th>Facility Owner:</th>
<th>Facility Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Name]</td>
<td>[Company Name]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UST System Components</th>
<th>Documentation Demonstrating Compatibility with Substance Listed Above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Method B, C, or D, as listed in the 1983 USEPA Guide.</td>
</tr>
<tr>
<td></td>
<td>Description of Component Type, Model Number, and National Laboratory Certification or Manufacturer Approval.</td>
</tr>
</tbody>
</table>

- **NOTES:**
  
  A. Certification or listing of UST system equipment or components by a nationally recognized independent testing laboratory for use with the regulated substances above.
  
  B. Equipment or manufacturer approval. The manufacturer’s approval must be in writing, indicate an affinities statement of compatibility, specify the range of biocides the component is compatible with, and state from the equipment or component manufacturer.
  
  C. Use another option determined by your implementing agency to be no less protective of human health and the environment than methods A or B. If using C, list your implementing agency and immediately below describe the approved alternative method for meeting the compatibility requirement.

- **Method C:**

  - **Operating System Compatibility:**
    
  - **Storage Tanks:**
    - Documentation of compatibility with the applicable regulatory standards.
  
  - **Piping:**
    - Documentation of compatibility with the applicable regulatory standards.
  
  - **Containment Systems:**
    - Documentation of compatibility with the applicable regulatory standards.

- **Method B:**

  - **Equipment Certification:**
    - Certification or listing of UST system equipment or components by a nationally recognized independent testing laboratory for use with the regulated substances above.
  
  - **Manufacturer Approval:**
    - Manufacturer’s approval must be in writing, indicate an affinities statement of compatibility, specify the range of biocides the component is compatible with, and state from the equipment or component manufacturer.

- **Method A:**

  - **Regulatory Compliance:**
    - Compliance with the 1983 USEPA Guide. 
      
    - Conducting an affinity testing of compatibility with the regulated substances above.

For your records, you should update this checklist each time you repair or replace components of your UST system to ensure you have all the required compatibility documentation and testing results.
Example: Using a Manufacturer’s Statement of Compatibility

**Insufficient**

“Our friend, Larry, said that I can probably use this widget in my gas tank where we store ethanol fuel.”

Signed,

Curly & Moe

**Good**

From: National Widgets, Inc.

October 3, 2019

“This widget is compatible with and approved to be used with any gasoline-ethanol blend containing 0 to 55% ethanol.”
Issues with Larry’s “Manufacturer’s Letter” to Demonstrate Compatibility with His Widget

“My friend, Larry, said that I can probably use this widget in my gas tank where we store ethanol fuel.”

• Is it an affirmative statement of compatibility?

• Is it a letter from the manufacturer?

• Does it state the range of blends with which it is compatible?
Resources to Find Manufacturer Letters

- PEI UST Component Compatibility Library
- California Waterboards
- ASTSWMO Emerging Fuels Task Force
Example: National Laboratory Listing

Insufficient

<table>
<thead>
<tr>
<th>UST System Components</th>
<th>Compatibility Certification or Listing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widget Model Number XYZ6789</td>
<td>Meets National Certification Standard AB123</td>
</tr>
</tbody>
</table>

Inspector:

“It appears this **AB123 Standard** is the wrong one:

*only approves components* **for use with fuels up to 10% ethanol**.

This is not an applicable standard to demonstrate compatibility with E85.”
Example: National Laboratory Listing

**Good**

- Listing/Standard matches installed component.
- Listing/Standard approved for that component with that fuel.
Pipe Dope and Sealants

- Must be compatible
- Multiple versions available
- High ethanol compatible first came out around 2007
- Many pipe dope connections underground

Pipe dope, thread sealant is used with threaded ends to make threaded joints leak proof and pressure tight.

Diagram courtesy of Jeff Dzierzanowki, SOURCE Fueling Equipment Solutions
Can’t demonstrate compatibility?

- Complete targeted retrofits; or
- Install a new system; or
- Don’t store the substance
State Program Approval

Map of States with Approved UST Programs (2019)

Approved Program under the 1988 regulation
Approved Program under the 2015 regulation
Pennsylvania
SPA State
Different Compatibility Demonstration List
**Illinois Non-SPA State**

**Different Compatibility Demonstration List**

<table>
<thead>
<tr>
<th>UST SYSTEM COMPONENTS</th>
<th>COMPLIANCE WITH SUBSTANCE LISTED ABOVE</th>
<th>METHOD A OR B (FAST USE SIGHT)</th>
<th>DESCRIPTION OF COMPONENT TYPE, MODEL, MANUFACTURER, CERTIFICATION, TESTING OR OTHER PROOF OF APPROVAL (ATTACH TO CHECKLIST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELEASE EQUIPMENT</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>SPILL PREVENTION</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>OVERFLOW PREVENTION</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>SAFETY VESSEL W/ HOSES</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>CONTAINMENT DUMPS</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>FILLING EQUIPMENT</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
</tbody>
</table>

Methods:

A. Certification of listing of UST system equipment or components by a nationally recognized, independent testing laboratory is required with the regulatory submission.  
B. Establishment of manufacturer approval. The manufacturer’s approval must be in writing, and it must be an affidavit of compatibility stating the range of either device the component is compatible with, and be from the equipment or component manufacturer.

Note: Owners and operators must follow American Petroleum Institute Recommended Practice API 12O, Storing and Handling of Crude and Processed Oils at Distribution Facilities and Primary Storage, useful in interpreting the compatibility requirements.  
In order to be in compliance with the 2010 federal UST regulation requirements for storing butane, you must keep documentation of compatibility of the UST system components listed on this page as long as you store the fuel.  
For your records, you should update this checklist each time you install or replace components of your UST system to ensure you have all the required compatibility documentation while storing butane.

Checklist Completed By:  
print name: ___________________ date completed: ____________
  signature: __________________ position/title: ________________
Key Points to Remember

• All USTs must be made of or lined with materials compatible with the fuel.

• If over 10% ethanol or over 20% biodiesel (or any other regulated substance identified by the implementing agency)
  • Must demonstrate compatibility of components, no matter what the name of the fuel under which it is being sold.
  • Not just the tank and piping.

• Most existing systems likely not compatible for E15, E85
  • Unless you specifically requested compatible components.
  • Most UST systems will require retrofitting equipment to store greater than E10/B20.
  • Especially older systems, since compatible sealants were not really used prior to 2008 or 2009
ASTSMWO Degradation Reporting Tool

http://astswmo.org/astswmo-corrosion-observations-tool/

ASTSMWO Corrosion Observations

ASTSMWO’s Emerging Fuels Task Force created the Corrosion Observations Tool for the purpose of submitting information on UST system corrosion observed during inspections and assessments in the field. It is well known that some new fuel formulations are associated with accelerated corrosion, crusted filters, and other side effects. However, we do not have a complete understanding of how widespread these issues are, nor do we know if these issues are leading to increases in releases from UST systems.

We encourage UST regulators, inspectors, contractors, and owners to use the Corrosion Observations Tool to report incidences of corrosion. Our goal is that analyzing all this data will help identify trends, and especially we hope this toolkit will help identify potential problems before they become widespread.

Click here to access the Corrosion Observations Tool

The map below provides corrosion observation reports that have been submitted to ASTSMWO using the tool.

How to use

Simply click any state to read corrosion observation reports that have been submitted to ASTSMWO. Most states have no reports available yet. If you’d like to contribute to this tool please click on the link to the Tool above or contact the ASTSMWO staff.

What went wrong?

- Low to Moderate Corrosion
- Significant Corrosion
- Severe Corrosion

What is the estimated age of the component?

- Less than 10 years
- 1-10 years
- 11-25 years
- 26-30 years
- Greater than 30 years
- Unknown

Atlanta PEI

ATLANTA

PEI

AT THE

NACSS SHOW

2019

CONVENTION OCT. 9-11 | TRADE SHOW OCT. 10-12
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Release Prevention Division

202-564-0762
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EPA Office of Underground Storage Tanks
https://www.epa.gov/ust/emerging-fuels-and-underground-storage-tanks-usts
JASON CARR
DAVE PIERCEY
MEETING FUEL COMPATIBILITY REQUIREMENTS: UL, EPA & PEI MEMBER PERSPECTIVES

Jason Carr – Stantec
Dave Piercey – JD2 Environmental Inc.
 Compatibility

A state in which two things are able to exist or occur together without problems or conflict.

- Oxford University Press
Why is compatibility so critical?

Introduction of new fuels, blends, additives and system flexibility (i.e. changing products, biofuels, etc.). Protect against environmental, water intrusion, corrosion, and related safety issues.
Issues

Environmental

Tank Internal Corrosion

Dispenser and Hanging Hardware – Seals and Fittings

Tank Top Piping, specifically:
- Fill Ports
- Risers
- Pumps
- Tank Gauging Equipment
- Electrical
Problems In Tanks
Corrosion and Delamination
Biofuel Upgrade
Compatibility Problems With Sumps, STP’s and Piping
Solutions To Compatibility Problems With STP’s: New STP’s made of corrosion resistant materials
Internal Corrosion on A Riser Pipe!

“Cannot Remove The ATG Probe or Drop Tube”
Environmental

- Piping
- Cracked entry boots
- Failed Spill Buckets
- Failed Sumps
Other Riser Issues

• Coating
• Using New Materials of Construction
• Additional Testing to Identify Problems before it is too late
New Installations

- Design and upgrade for the future
- Ethanol and biofuels
- Corrosion Protection
Dispensers Biofuel Compatible

• New Dispensers with Ethanol and Biofuels options.
• Manufacturers are making E25 and B20 Standard
Corrosion Resistant Materials
Stainless and Coatings
Solutions to prevent corrosion on Risers: (Fiberglass risers and Stainless Steel Risers)
Electrical

• Raise electrical fittings to allow for hydrostatic testing, coat fittings to prevent corrosion
Design The Tank Systems To Last

Choose
Choose the correct equipment

Check
Check the UL Listing

Check
Check with manufacturers

Talk
Talk To Other in the Industry what works

Think
Think Outside the Box
“There's a way to do it better—find it.”
— Thomas Edison
S. Bravo Systems, Inc.

Manufacturer of

Secondary Containment Products
CHALLENGES OF COMPATIBILITY

- Regulations require equipment to be compatible but the standard to determine if something is compatible isn’t always clear.

- Manufacturers statements of compatibility may or may not be reliable in the eyes of customers and specifying engineers.

- Fuel formulations are constantly evolving which can make older testing standards obsolete.

- Testing outside of UL2447 doesn’t necessarily consider factors other than fuel compatibility, such as structural integrity and stresses of the underground environment.

Ex: Failed Fitting
Many Bravo products are designed for a 30-year service life, making accelerated long-term compatibility testing a necessity.

UL2447 provides the industry’s only 3rd party testing standard with test parameters specific to the harsh secondary containment environment.

Ex: Field Failure
The new UL2447 standard is current with modern fuel formulations.

As a manufacturer, UL testing is a tool we use to validate the results of our rigorous in-house testing and beta testing programs.

Ex: Field Failure
UL VS. INDEPENDENT STATEMENTS

- Bravo chooses to test with UL because the UL2447 standard is specific to secondary containment (sumps and fittings)

- UL tests long-term compatibility specifically in the sump environment
UL VS. INDEPENDENT STATEMENTS

- UL provides fact-based data that products have been tested to the most rigorous real-world standards of compatibility.

- Non compatible materials lead to failures in the field; UL2447 testing is the only tool today to assure long-term compatibility.
LOREN SWALHEIM
Meeting Fuel Compatibility Requirements

UL, EPA & PEI Member Perspectives-Franklin Fueling Systems
Franklin Fueling Systems – Compatibility Approach

Compatibility-FFS Approach
- Look to third part agencies such as UL for compatibility approval to established fuels standards - ASTM
- Standard test fuels-testing protocols-defined approach.
- Set standards and accepted by industry.

Franklin Fueling Systems-UL Certifications
- Piping & Containment- UL971, UL2447, ULCS679
- Hardware- UL842, ULC-S651, UL2039, ULCS633, UL2589, UL 2583
- Dispensing (Healy) – UL567, UL330, UL2586, UL79
- Submersible pumps- UL79, UL79A, UL79B, UL1238,
- ATG Sensors- Probes. UL1238, UL913,
- CableTight Conduit- UL6, UL651A, CSA-C22.2.45.1
- Global Requirements-EN-ATEX-KIWA-PESO-CARB.....
FFS Compatibility Resources Examples
FranklinFueling.com

UL listed biofuel compatibility is available as the Alcohol-Gasoline (AG) option in the following Submersible Turbine Pump (STP) and Pump Motor Assembly (PMA) models:

- STQAG75 (2 Hr Fixed Speed)
- STQAG150 (1 1/2 Hr Fixed Speed)
- STQAGH150 (1 Hr P&I 1 1/2 Hr Fixed Speed)
- STQAO200 (2 Hr Fixed Speed)
- STQAH200 (2 Hr 2 Hr Fixed Speed)
- ISTQ 2 Hr Variable Speed
- ISTV54 (4 Hr Variable Speed)

**Approvals/Certifications**
- UL 2039 listed for above and below ground installation for use with gasoline, gas alcohol blends (up to E85), diesel, and Biodiesel.
- UL 2039 approved for 10 psi working pressure.

**Approvals**
- UL-971 approved for fuels including:
  - Motor vehicle fuels typically found in consumer dispensing facilities like gasoline or diesel including blended fuels with maximum 15% MTBE, 15% Methanol or 30% Ethanol.
  - Concentrated fuels such as alternate un-blended fuels containing up to 100% concentrations of Toluene, Methanol or Ethanol.
  - High blend fuels with higher than normal gasoline blends with maximum 50% Methanol or 50% Ethanol.
  - Aviation and marine specialty fuels containing up to 100% kerosene or leaded gasoline.
- Michigan, Wisconsin, and Florida EQ-816.
Challenges with Compatibility

- **Best practice**
  - Only install UL listed products applicable to application.
  - UL listing and certifications provide compatibility to established fuel standards.
  - UL provides listing by manufacture
  - Product must have UL stamp
  - Removes guess work or requests for letters etc.

- **Existing site-compatibility**
  - Date of system installation-equipment installed
  - What approval was equipment tested to?
  - Is the existing approval enough to meet the requirements for compatibility?
  - Can a conclusion between prior approval and current approval be made?
Summary

Franklin Fueling System has made considerable investment to provide quality compatible products that have the UL stamp of approval.

Best approach is to use a UL approved product with compatibility listing for fuel/alternative fuels stored in underground system.

Challenges will exist in the coming months and years as sites age and alternative fuels increase in popularity.

Franklin Fueling System will continue to update approvals to meet compatibility requirements and provide total systems solutions with lowest total cost of ownership.
NEW UL TOOL to Help Meet FUEL COMPATIBILITY REQUIREMENTS
Problems Finding & Understanding Fuel Ratings of Different Fueling System Components

As we’ve heard from Fed & State Regulators, Designers, Contractors, and UL Listees, finding & navigating the complexities of UL’s old Certification Database was challenging.

At the 2018 PEI Show, UL, EPA & a Listee discussed the problems, and formed a plan to create a new tool to easily find Listings for common fueling system products & better understand what our Mark covers, including the many fuel ratings.

It is now available on ULs website, and via links to other’s soon!
UL Database Transition

The first step to transition from the old Certification Database to the new Product iQ Database was completed in Jan 2019.

File / Category / Subscriber / Party Site

Withdrawn files are EXCLUDED from searches on this page by default. If you want to view Withdrawn files, use the "Include Withdrawn Files" button.

For basic Recognized Component Files, the Conditions of Acceptability (CoA) can be accessed directly by clicking on the Model number or clicking on the Report Date or RRN link. [click here for examples of each]

File Number: 

CCN: 
- [ ] Guide Page Only
- [ ] Model Page Only

CCN Hierarchy (Main, Level 1, Level 2, etc.)

Keyword search within Guide Information Only:

Standard Number search within Guide Information Only:

Keyword Search within Product Category Title Only:

Enhanced Mark Attribute search within Guide Information Only:

Subscriber/Party Site:
If searching with a Party Site Number, prefix the number with the letter "P".

Keyword:
- [ ] Include Withdrawn Files

[SEARCH]
UL Database Transition

**Why?** The new platform has better search features for CCNs, Standards & key words, and is in the process of building out “smart search” capabilities.
Tool Concepts & Evolution

Initial Concepts – Extract the most useful content of each CCN, organize it on one page, and provide details of each fuel rating via links. As it evolved, the Tool was changed:

Expanded Coverage – Both Aboveground Dispensers & Underground Containment products are covered.

Compatibility Matrix – A Table for Common Fuel Blends vs Fueling System Products was added.

Updating Plan – UL PDEs will revise the technical content based on UL Standards revisions. UL Marketing owns & maintains the website. Future smart searches will be added.

Tell us what you think about the Tool - External feedback will be considered.
Table 1 – Underground Fueling System Products (Tank to Sump)

<table>
<thead>
<tr>
<th>UNDERGROUND TANKS – EGHX iQ Link</th>
<th>UNDERGROUND PIPING – QLXT iQ Link</th>
<th>CONTAINMENT SUMPS – QLWA iQ Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 UST Types with Different “Old” Fuel Ratings</td>
<td>All Pipe Products have 4 Fuel Rating Options</td>
<td>All Sump Products have “New” Fuel Ratings</td>
</tr>
<tr>
<td><strong>UL 58 Steel</strong> – Primary or Secondary Containment Types for “Flammable &amp; Combustible Liquids” (1)</td>
<td><strong>UL 971</strong> – Covers nonmetallic (FRP, HDPE...) pipes. <strong>UL 971A</strong> – Covers all metal &amp; metal/plastic pipes.</td>
<td><strong>UL 2447</strong> – Covers a variety of different sumps, fittings &amp; accessories evaluated as assembled systems per each manufacturer’s instructions. Pri, Sec or Coaxial types all rated for “Automotive Fuels” (4)</td>
</tr>
<tr>
<td><strong>UL 1746 External Corrosion Protected Tanks</strong> – 4 external system options (Cathodic, Composite, Jacketed or Coated) on any UL58 Tank all have a “Flammable &amp; Combustible Liquids” (1) rating.</td>
<td><strong>Both</strong> have almost identical performance test requirements for Pri, Sec &amp; Coaxial pipe types, with 4 progressive fuel ratings, which are different from the “Old” and “New” versions:</td>
<td><strong>Sumps</strong> – Dispenser, Tank, Transition &amp; Fill, Vent or Fill/Vent (aka Spill Buckets) types.</td>
</tr>
<tr>
<td><strong>UL 1316 Fiberglass</strong> – Primary or Secondary Containment Types with 3 progressive fuel ratings:</td>
<td>• “Motor Vehicle Fuels” (3)</td>
<td><strong>Fittings</strong>(*) – Penetration, Termination, Internal &amp; Test, Monitor or Test/monitor types.</td>
</tr>
<tr>
<td>• “Petroleum Products Only” (2)</td>
<td>• “High Blend Fuels” (3)</td>
<td><strong>Accessories</strong> – Covers, Lids, Frames, Brackets &amp; Chase Pipe.</td>
</tr>
<tr>
<td>• “Petroleum Products and Gasohol” (2)</td>
<td>• “Concentrated Fuels” (3)</td>
<td>(*) “Repair” or “Replacement” rating options.</td>
</tr>
<tr>
<td>• “Petroleum Products, Alcohols &amp; Alcohol/Gasoline Mixtures” (2)</td>
<td>• “Marine &amp; Aviation Fuels” (3)</td>
<td></td>
</tr>
<tr>
<td>See EGAF for Internal Retrofit options for old tanks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CCNs have iQ Hyperlinks. Fuel Ratings have Jump Links to Details!
<table>
<thead>
<tr>
<th>UST INTERNAL RETROFITS – EGAF iQ Link</th>
<th>FLEXIBLE CONNECTORS – QLWV iQ Link</th>
<th>TANK ACCESSORIES – EGVV iQ Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Retrofit Systems with “New” Fuel Ratings</td>
<td>3 Flex Pipe Types with “New” Fuel Ratings</td>
<td>Various Types with “New” Fuel Ratings</td>
</tr>
</tbody>
</table>

**UL 1856** – Covers pre-engineered nonmetallic retrofit systems intended for field installation in buried UST (Steel or FRP). The 3 systems have different structural integrity, but are all rated for “Automotive Fuels” (4)

**Liner** – Bonded to tank wall, provides primary containment, but no added structural integrity.

**Upgrade** – Bonded to tank wall, provides pri & sec containment w monitoring & is co-structural.

**Structural** – Optional bond to tank wall, provides pri & sec containment w monitoring & is self-structural.

**UL 2039** – Covers short (max 12’) of highly flexible pipes for connections in limited spaces, or to mitigate frequent movement. Pri, Sec or Coaxial types with 3 location rating options all rated for “Automotive Fuels” (4)

**Underground** – Buried, but accessible without digging, such as within a chase pipe.

**Sump** – Within an enclosed, but accessible protective structure (below, above or at grade).

**Aboveground** – Installed on or above the earth with/without additional protection.

**UL 2583** – Covers devices attached to tanks or pipes that perform safety functions and/or are critical components for fuel containment. All accessory types in 2 classes are all rated for “Automotive Fuels” (4)

**Vapor Control Products** – Normal (P/V) vents, fill, vapor or ATG adapters and caps for adapters, monitors or sensors.

**Liquid Control Products** – Spill Containers, Flow Restrictors & Overfill Preventers. Note “spill buckets” are covered under UL2447 for Sumps.

**UL Recognized** materials (resins) are in EGVV2.

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**Go to Live Demo - Table 1.**

**Tank & Sump CCNs.**

**Tank & Sump Fuel Ratings.**
**Table 2A – Aboveground Fuel Dispensing Products & Accessories**

**FLAMMABLE & COMBUSTIBLE LIQUID (FUEL) DISPENSING DEVICES – EWTV iQ Link**

Variety of completely assembled electrically powered fuel dispensers, typically constructed from the components below, for ordinary or hazardous locations. 

**UL Mark** = “Power-Operated Dispensing Devices for Flammable Liquids” w/wo “for Use in Class I, Group D, Division (1 or 2) Hazardous Locations” and additional Fuel Rating Options in each Standard:

**UL 87** – Covers Fuel Dispensers. Base “…Flammable Liquids” Rating Only
**UL 87A** – Similar to UL87 for High Blend Ethanol. Base UL87 + Rating Options: “Gasoline” and “E25”, “E40” or “E85”
**UL 87B** – Similar to UL87 for High Blend Biodiesel. Base UL87 + Rating Options: “Diesel Fuel” or “B5”, “B20” or “B99.9/B100” See Note 3 for “Fuel Oil”.

**EMERGENCY SHUTOFF (SHEAR) VALVES – EUCV iQ Link**

Various Non-Electric Emergency Valve Types all have a **UL Mark** = “Emergency Shutoff Valve for Flammable Liquids” and Fuel Rating Options in each Standard:

**UL 842** – Covers Flammable Fluid Valves. Rated for evaluated Fluid(s) - “Gasoline” max E10 and “Diesel” max B5 covered by base “Flammable Liquids” Rating.
**UL 842A** – Similar to UL842 for High Blend Ethanol. Base UL842 + Rating Options: “Gasoline” and “E25”, “E40” or “E85”.
**UL 842B** – Similar to UL842 for High Blend Ethanol. Base UL842 + Rating Options: “Diesel Fuel” and/or ”Fuel Oil” w/wo “B5”, “B20” or “B99.9/B100” & “Kerosene”.

**(FUEL) STRAINERS/FILTERS – VXYV iQ Link**

Various [Strainer/Filter] all have **UL Mark** = “Strainer for _X_…” where _X_ = “Gasoline”, “Diesel” and/or “Kerosene” and Fuel Rating Options in each Standard:

**UL 331** – Covers Flam & Comb Fuel Strainers/Filters. Rated for Base “…X” Fuels Only.
**UL 331A** – Similar to UL331 for High Blend Ethanol. Base UL331 + Rating Options: “Gasoline” and “E25” or “E85” See Note 4 for E40.
**UL 331B** – Similar to UL331 for High Blend Biodiesel. Base UL331 + Rating Options: “Diesel Fuel” and/or ”Fuel Oil” w/wo “B5”, “B20” or “B99.9/B100” and “Kerosene”

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Part 1 = Complete Dispensers & Accessories.
Product Name & Fuel Rating Options Highlighted.
Table 2A – Aboveground Fuel Dispensing Products & Accessories

<table>
<thead>
<tr>
<th>Flammable Liquids or Petroleum Products</th>
<th>D4814 Gasoline max E10, D3669 Kero, D975 Diesel max B5 &amp; D396 Fuel Oil max B5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>D4814 Gasoline max E10</td>
</tr>
<tr>
<td>Kerosene</td>
<td>D3669 Kerosene without any biofuel blends</td>
</tr>
<tr>
<td>Diesel Fuel</td>
<td>D975 Diesel max B5</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>D396 Fuel Oil max B5</td>
</tr>
</tbody>
</table>

E25 = Gasoline/Ethanol blends up to 25% (E0 - E25) evaluated using the CE25a test fuel. Max iBu16 is also covered per UL Iso-Butanol position letter.

E40 = Gasoline/Ethanol blends up to 40% (E0 - E40) evaluated using both the CE25a and CE40a test fuels, or;

E85 = Gasoline/Ethanol blends up to 85% (E0 - E85) evaluated using both the CE25a and CE85a test fuels.

B5 = Diesel Fuel or Fuel Oil/Biodiesel blends up to 5% (B0 - B5). Max B5 is also covered per UL Biodiesel position letter.

B20 = Diesel Fuel or Fuel Oil/Biodiesel blends up to 20% (B0 - B20) evaluated using the FB25a test fuel

B99.9/B100 = Diesel Fuel or Fuel Oil/Biodiesel blends from 20% to 100% (B20 - B100) evaluated using both the FB25a and B100a test fuels

**Note 1** – The Fuel Dispenser and many Dispenser Components Standards & Certifications also covers Vapor Recovery products, “Other” flammable or combustible liquid ratings or “Low Perm” ratings if optionally evaluated for them. DEF is covered by separate “C” Standards & DEF product rating. See each Guide for details.

**Note 2** – Although all these UL Standards covers biofuel ratings at commonly dispensed blends, Certification of either dispenser components or the complete dispenser may not be available at this time. Check the ratings on the Listed product for fuel blend coverage.

**Note 3** – Although not a specific Standard marking item, Fuel Oil is covered by either the “Flammable Liquids” or “Diesel Fuel” ratings

**Note 4** – Some Fuel Dispenser and Dispenser Component Standards do not currently have an E40 rating, but may in the future.

**Note 5** – There are no DFE or E100 ratings for Fuel Dispenser and Dispenser Component as there are currently no Standard requirements to cover them.

All Dispenser CCNs have consistent Fuel Ratings.

Important Notes & Links Provided!

Go to Live Demo - Table 2A.
<table>
<thead>
<tr>
<th>POWER OPERATED (FUEL) PUMPS – RCRX iQ Link</th>
<th>(FUEL) HOSE ASSEMBLIES – MVQJ iQ Link</th>
<th>(FUEL) METERS – PLRZ iQ Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various Pump Types all have a UL Mark = “_ * _ Pump for Petroleum Products” and Fuel Rating Options in each Standard: UL79 – Covers Flam &amp; Comb Fuel Dispenser Pumps. Base “…Petroleum Products”</td>
<td>Various Fuel Hose Assembly Types all have a UL Mark = “Flammable Liquid” Hose Assembly and Fuel Rating Options in each Standard: UL330 – Covers Flam &amp; Comb Fuel Hose Assemblies Base “Flammable Liquid…”</td>
<td>Various Meter Types all have a UL Mark = “Meter for Flammable Liquids” and Fuel Rating Options in each Standard: UL25 – Covers Flam &amp; Comb Fuel Meters. Base “…Flammable Liquids”.</td>
</tr>
</tbody>
</table>

**Most Components Have Identical Fuel Ratings.**

**Same Notes as 2A.**
## Table 2B – Aboveground Fuel Dispensing Components

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>CCN ID</th>
<th>UL Mark</th>
<th>Rating Options</th>
<th>See Note 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SWIVEL CONNECTORS</strong> – <a href="#">ERLV IQ Link</a></td>
<td></td>
<td>Various Swivel Connector Types all have a</td>
<td><strong>Flammable Liquids</strong> and Fuel Rating Options in each Standard:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UL Mark = “Swivel Connector for Flammable Liquids” and Fuel Rating Options in each Standard:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>UL567A</strong> – Similar to UL567 for High Blend Ethanol.</td>
<td>Base “Flammable Liquid…” Rating Options:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>UL567B</strong> – Similar to UL25 for High Blend Biodiesel.</td>
<td>“Flammable Liquids” Rating Options:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Diesel Fuel” w/wo “B5”, “B20” or “B99.9/B100”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EMERGENCY BREAKAWAY VALVES</strong> – <a href="#">ERBY IQ Link</a></td>
<td></td>
<td>Various Emergency Breakaway Valve Types all have a</td>
<td><strong>Flammable Liquids</strong> and Fuel Rating Options in each Standard:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UL Mark = “Emergency Breakaway Coupling for Flammable Liquids” and Fuel Rating Options in each Standard:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>UL567B</strong> – Similar to UL25 for High Blend Biodiesel.</td>
<td>“Flammable Liquids” Rating Options:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Diesel Fuel” w/wo “B5”, “B20” or “B99.9/B100”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(FUEL) HOSE NOZZLE VALVES</strong> – <a href="#">ETAZ IQ Link</a></td>
<td></td>
<td>Various Fuel Hose Nozzle Valve Types all have a</td>
<td><strong>Flammable Liquids</strong> and Fuel Rating Options in each Standard:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UL Mark = “Hose Nozzle Valve for Flammable Liquids” and Fuel Rating Options in each Standard:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UL2586</strong> – Covers Flam &amp; Comb Fuel Hose Nozzle Valves. Base “Flammable Liquid…” Only.</td>
<td><strong>UL2586A</strong> – Similar to UL2586 for High Blend Ethanol.</td>
<td>Base “Flammable Liquid…” Rating Options:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>UL2586B</strong> – Similar to UL25 for High Blend Biodiesel.</td>
<td>“Flammable Liquids” Rating Options:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Diesel Fuel” and/or &quot;Fuel Oil&quot; w/wo “B5”, “B20” or “B99.9/B100” and “Kerosene”.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Go to Live Demo - Table 2B.**

Dispenser & Hose CCNs. Jump Links to Fuel Ratings.
UL Positions on Specific Fuels & Blends

**Past Positions** – Applies to old Listings & available in the UL Fuel Tool.
- **B5** low blend biodiesel per Jan 7, 2009 UL Position Letter
- **iBu 16** low blend isobutanol per Dec 9, 2013 UL Position Letter

**Future Positions** - In process... but may not be a UL Letter or Bulletin.
- **Renewable Diesel** – UL Standards test case for specific coverage of renewable diesel without additional testing. If STP approves, it will be duplicated in all “B” Standards.
- **E15** – All UL Standards cover this blend in various rating options, so revisions are unnecessary. Table 3A can be used to determine the correct rating for each product.
Cautions and Misconceptions

**Time Sensitive** – The Tool will be frequently updated, so Tables & Ratings cover only current or transitioning Standards & Listing Marks, but not older versions.

**Old Systems** – Determining legacy system compliance may be difficult for some equipment. The production date and/or fuel rating is typically needed.

**UL Mark** – Applied by Listee per FUS Agreement indicates product represents those evaluated for initial Standards compliance by UL. Products without a UL Mark are not Listed, even if the same model is found on a Listing Card, Product iQ, UL Report, etc.

**Field Changes** – Product modifications & accessories are not covered by a Listing unless a manufacturer has them evaluated per the Standard and covered as options in the UL Report. They typically have separate UL Marks or OEM coverage instructions.
Common Misconceptions

• A Listee has a Series or Model **Listing on the UL Database** (old or new), so does that mean all products are Listed? **NO** – Only products with a UL Mark are Listed.

• A manufacturer has a **Listing to a Standard**, so does that mean the product is rated for all fuel types & blends covered in its Scope? **NO** – Most Standards have options. Only the fuels & blends of a specific Fuel Rating are covered.

• If a product spec sheet, advertisement or other document says it “meets UL __”, was “tested to the requirements of UL__”, does that mean its UL Listed? **NO** – Only products successfully tested by UL and with the UL Mark are UL Listed.

• If a product is UL Listed, that means it’s **good for any application & lifetime**. **NO** – Listing are suitable for the intended or rated applications, fuels, locations, etc. The Listee specifies an expected life and other limits. All equipment has the expectation it will be properly inspected, maintained, and replace if needed. This handshakes with the new regulations.
<table>
<thead>
<tr>
<th>System Component</th>
<th>Gasoline</th>
<th>E10</th>
<th>E15, E25 &amp; iBu16</th>
<th>E40</th>
<th>E85 or “Flex Fuel”</th>
<th>DFE or E100</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL58 Steel Tank or UL1746 CP Steel</td>
<td>“Flammable &amp; Combustible Liquids”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL1316 FRP Tank</td>
<td>“Petroleum Products Only” or (**)</td>
<td>“Petroleum Products &amp; Gasohol” or (**)</td>
<td>“Petroleum Products, Alcohols &amp; Alcohol/Gasoline Mixtures”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL1686 UST Internal Retrofit Systems</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
<td>Future Option?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL971 &amp; UL971A Underground Pipe</td>
<td>“Marine &amp; Aviation Fuels” or (**)</td>
<td>“Motor Vehicle Fuels” or (**)</td>
<td>“High Blend Fuels” or (**)</td>
<td>“High Blend Fuels and Concentrated Fuels”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL2447 Sumps &amp; Fittings</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
<td>Future Option?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2039 Flex Connector Pipe</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
<td>Future Option?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2583 Tank Accessories</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
<td>Future Option?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL87* Dispenser</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL842* Shear Valve</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL331* Fuel Filter</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E85” or E40 Future Option?</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL79* Fuel Pump</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E85” or E40 Future Option?</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL330* Hose Assembly</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL258* Fuel Meters</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL567* Swivel Connector</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL567* Emergency Breakaway Valve</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
<tr>
<td>UL5836* Hose Nozzle Valve</td>
<td>“Flammable Liquids” or “Gasoline”</td>
<td>“E25”, “E40” or “E85”</td>
<td>“E40” or “E85”</td>
<td>“E85”</td>
<td>Future Option?</td>
<td></td>
</tr>
</tbody>
</table>

Working on Future Smart Search Feature
### Table 3A – UL Fuel Ratings for Common Flammable Fuel Blends

<table>
<thead>
<tr>
<th>System Component</th>
<th>Gasoline</th>
<th>E10</th>
<th>E15, E25 &amp; iBu16</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL58 Steel Tank or UL1746 CP Steel</td>
<td>“Flammable &amp; Combustible Liquids”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL1316 FRP Tank</td>
<td>&quot;Petroleum Products Only&quot; or (**)</td>
<td>&quot;Petroleum Products &amp; Gasohol&quot; or (**)</td>
<td>&quot;Petroleum Products,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL1856 UST Internal Retrofit Systems</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL971 &amp; UL971A Underground Pipe</td>
<td>&quot;Marine &amp; Aviation Fuels&quot; or (**)</td>
<td>&quot;Motor Vehicle Fuels&quot; or (**)</td>
<td></td>
</tr>
<tr>
<td>UL2447 Sumps &amp; Fittings</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2039 Flex Connector Pipe</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2583 Tank Accessories</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL87* Dispenser</td>
<td>&quot;Flammable Liquids&quot; or &quot;Gasoline&quot;</td>
<td>&quot;E25&quot;, &quot;E40&quot; or &quot;E85&quot;</td>
<td></td>
</tr>
<tr>
<td>UL842* Shear Valve</td>
<td>&quot;Flammable Liquids&quot; or &quot;Gasoline&quot;</td>
<td>&quot;E25&quot;, &quot;E40&quot; or &quot;E85&quot;</td>
<td></td>
</tr>
<tr>
<td>UL331* Fuel Filter</td>
<td>&quot;Flammable Liquids&quot; or &quot;Gasoline&quot;</td>
<td>&quot;E25&quot;, &quot;E40&quot; or &quot;E85&quot;</td>
<td></td>
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<tr>
<td>UL70* Fuel Pump</td>
<td>&quot;Flammable Liquids&quot;</td>
<td>&quot;E25&quot;, &quot;E40&quot;</td>
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</tbody>
</table>

**Example for E15**
<table>
<thead>
<tr>
<th>System Component</th>
<th>Diesel Fuel/Fuel Oil</th>
<th>B5</th>
<th>B20</th>
<th>B30, B40</th>
<th>B50, B60</th>
<th>B99.9-B100</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL58 Steel Tank or UL1746 CP Steel</td>
<td>“Flammable &amp; Combustible Liquids”</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UL1316 FRP Tank</td>
<td>Any of the 3 Ratings</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UL1856 UST Internal Retrofit Systems</td>
<td>“Automotive Fuels”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL971 &amp; UL971A Underground Pipe</td>
<td>Any of the 4 Ratings</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UL2447 Jumps &amp; Fittings</td>
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</tr>
<tr>
<td>UL2039 Flex Connector Pipe</td>
<td>“Automotive Fuels”</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2583 Tank Accessories</td>
<td>“Automotive Fuels”</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Also Hyper & Jump Links to Fuels Info. Go to Live Demo!
Table 3B – UL Fuel Ratings for Common Combustible Fuel Blends

<table>
<thead>
<tr>
<th>System Component</th>
<th>Diesel Fuel/Fuel Oil</th>
<th>B5</th>
<th>B20</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL58 Steel Tank or UL1746 CP Steel</td>
<td>&quot;Flammable &amp; Combustible Liquids&quot;</td>
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<td></td>
</tr>
<tr>
<td>UL1316 FRP Tank</td>
<td>Any of the 3 Ratings</td>
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<td>Currently no coverage</td>
</tr>
<tr>
<td>UL1856 UST Internal Retrofit Systems</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL971 &amp; UL971A Underground Pipe</td>
<td>Any of the 4 Ratings</td>
<td></td>
<td>Currently no coverage</td>
</tr>
<tr>
<td>UL2447 Sumps &amp; Fittings</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2039 Flex Connector Pipe</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL2583 Tank Accessories</td>
<td>&quot;Automotive Fuels&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL87* Dispenser</td>
<td>&quot;Flammable Liquids&quot;, &quot;Diesel Fuel&quot; or “BS”</td>
<td>&quot;B20&quot;</td>
<td></td>
</tr>
<tr>
<td>UL842* Shear Valve</td>
<td>&quot;Flammable Liquids&quot;, &quot;Diesel Fuel&quot; or “BS”</td>
<td>&quot;B20&quot;</td>
<td></td>
</tr>
<tr>
<td>UL331* Fuel Filter</td>
<td>&quot;Flammable Liquids&quot;, &quot;Diesel Fuel&quot; or “BS”</td>
<td>&quot;B20&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Example for B20
Fuel Change Drivers – Continuous cycles of changes from combination of

- **Government Mandates** – MTBE, E10, E85, **E15 & iBu16**…   B5, B20...
- **Public Demand** – Increased desire for cleaner/greener & sustainable fuels
- **Technology and R&D** – Fuel, Vehicle & Other Collaborations. **Co-Optima?**
Regulation, Code & Standard Revisions

When new fuels are rolled out, Regulatory, Code & Standard bodies need to consider revisions that will safely permit the new fuel to be deployed throughout the infrastructure. In general, the members of these bodies try to coordinate the effort, but sometimes the different processes & timelines don’t synchronize.

- **Regulations** (EPA…) typically set high level general requirements, such as ...”shall be compatible with”, but don’t give details on how to achieve this.
- **Codes** (NFPA…) typically handle requirements for the installation & use of a facility (fueling stations), and reference applicable Standards for the different components.
- **Standards** (UL…) – Contain specific requirements to evaluate different products in the fueling system (tank to dispenser), and generally “handshake” with Codes & Regulations.
Certification Transitions

When a Standard is revised to cover new fuels, recertification is typically required by a future effective date that needs to consider the different stakeholders:

- **Component Material** Suppliers & **End Product** Manufacturers – Is R&D needed? New production methods?
- **Certification Organizations** – New test equipment? Eng & Lab Staff training? Overall capacity for many products.
- **Demand & Expectations** of the Government, Industry & Public.

A balance of interests is required, but longer times are typical. Avg = 2 yrs. Max = 4 yrs.
Thank You – Questions?

Roland Riegel – PDE for Flammable Liquid Containment Products
Roland.A.Riegel@ul.com

Bryan Michalik – Gas & Oil Engineering Manager
Bryan.J.Michalik@ul.com

Have More Questions?
Ask Ryan & Roland at a 1 on 1 Session
Thr Oct 3 @ 1:00 pm Maple Point Rm.