



**ENVIROGUARD**  
COMPLIANCE, SAFETY, & SECURITY SOLUTIONS

# *“Raising the Bar”*

## UL Listed Spill Containment Systems

EnviroGuard™

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*Eastern Regional Manager*

*The Expert in Compliance, Safety & Security*



**Ask Yourself**

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- Do you have Standards for products currently being installed and maintained in your critical sites?
- How about Spill Containment?
- Are you paying too much for Non-UL Listed Systems?
- Are you using Old Spill Containment Technology ?

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**Ask Yourself**

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- Are your installers trained in the proper installation of spill containment systems?
- Are all your sites standardized or does each region buy whatever they want?
- Will the inspectors sign off on any system or do they require UL Listed containment systems?
- Should annual maintenance or inspections be conducted on these systems?

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**Why UL Listed Spill Containment?**

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- It standardizes the industry with respect to product reliability and performance
- Third party test facility (UL) ensures that spill containment systems meet national codes
- UL Listed containment systems have passed rigorous testing
- Overall quality is higher with a UL Listed Containment System

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*UL Laboratories Investigation in Establishing Classifications*

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- Article 6401 through 6404.9 (1999)
- National Building Code Assoc. Hazardous Materials 307.8, 807.8.13
- Hazardous Materials Storage Systems 417.0
- Floors and Construction 2315.2 Chapter 28 Storage Systems Liquid and Solid Corrosive materials 2802.2.1 in accordance with 2315.1/11996

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*UL Laboratories Investigation of Compliance Requirements*

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- Standard Fire Code Storage 407.1.1.1. Storage and Dispensing
- 407.2.3 Spill Control (1996)
- International Fire Code Section 608. Stationary Lead Acid Batteries 608.1 through 608.8
- OSHA 1928.441 Batteries and Charging systems

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*UL Laboratories Investigation of Compliance Requirements*

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- Code of Federal Regulations CFR Part 264.175
- IEEE recommendations currently in sub-committee
- State and Local requirements may be more stringent based on location
- Local communities may have codes and ordinances that do not use quantities of acid in the battery as the basis for requiring containment

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**System Selection for UL Testing**  
*New vs. Old Spill Containment Technology*

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**■ Liner (New Technology)**

- Installs with less labor
- Installs on all floors including computer room
- No fumes
- No drying time required
- No floor preparation required
- No cracking
- Movable rails for easy maintenance

**■ Epoxy (Old Technology)**

- ASTM floor preparation required
- Much more labor required & 72 hour drying time
- Potential cracking over time
- Non-uniform thickness
- Rails typically not removable (Glued down)
- Ventilation required

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**Non-UL Listed Liner Application**

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- Points of potential failure
- Anchor penetration
- Adhesive may become loose over time
- Entire perimeter where a seam exists is a point of failure
- Installer error is high



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**Flat Liner Application Alternative**

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- Must be secured with adhesives or tapes that are unreliable over time and not chemical resistant
- Point of failure is the entire perimeter of the system
- Uneven floors could contribute to premature failure
- Installer error rate is high



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**UL Listed Product Application**



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- 80 mil liner must extend up the interior wall
- Perimeter points of failure eliminated
- Pre-formed liner ensures liquid tightness
- Class 1 fire rating
- Uneven floors not a problem
- Installation error rate is low

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**UL Listed Checklist**



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- UL Listed requirement states that liquid tight liner must extend 4" up interior containment system wall
- Flexible design for movement and concrete settlement
- PVC Coated Metal

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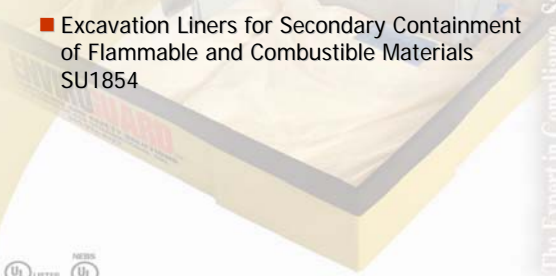
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**UL Laboratories Classification and Testing Criteria**



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- Excavation Liners for Secondary Containment of Flammable and Combustible Materials SU1854

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**UL Listed Liner Investigation & Testing**

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- **Volume Change and Extraction of Soluble Material** - Refers to ASTM- 471-79. This procedure was derived from ASTM 543-95 that addresses resistance of Plastics to Chemical agents
- **Air Oven Aging** - Establishes physical Properties of the materials after exposure to moderate Heat and Time

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- **Immersion** - Samples were exposed to 30 days of Sulfuric acid exposure.
  - 100 degrees at 1.3 Specific Gravity.
  - This test was considered aggressive since only one side of the material is exposed to acid.
- **Penetration Resistance** - In accordance with ASTM-D751-95. This is to establish no cracking or penetration
- **Leakage Test** - Establishes product is liquid tight upon completion of fabrication

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- **Flexural Strength** – ASTM D790-92 Test designed to ensure modulus retentions are to be at least 50% of original
- **Joint Strength** – ASTM D2517-81 Additional test for rigid plastic materials
- **Tensile Strength and Elongation** – ASTM D638-91 Test for non-rigid plastic materials for flexible liner
- **Tear Strength** – ASTM D624-91 Test for method for conventional Vulcanized Rubber and Thermoplastic Materials

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## UL Listed Liner Investigation & Testing



- **Seam Strength** – ASTM D638-91 The seam strength must be equal to the parent material.
- **Tensile Impact** – ASTM D1822-93 The tensile impact energy retention shall be at least 50% of original following immersion in acid for 30 days.
- **Electrolyte Neutralization** – Each pillow shall be immerse in sulfuric acid and set for 30 minutes



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## Neutralize the largest Container within a String of Batteries



- PH 7 to 9
- Sufficient amount of absorption and neutralizing pillows for the largest container in a string of batteries



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## Absorbent/Neutralizing Pillow Fabric Tested



- ASTM E648-99 test method for Critical Radiant Flux of floor coverings
- New customer driven requirement is Lower Oxygen Index of 30



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**Installation of UL Listed System**



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- Pre-formed Liner

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**Installation of UL Listed System**



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*Rack Location*

- Rack is Centered
- Holes Marked and drilled
- Anchors Installed and Sealant Applied
- Safety Yellow rails Installed
- Installer Friendly

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**Installation of UL Listed System**



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*Maximize Aisle Space*

- One Inch Clearance away from the rack
- Maximizes Aisle Widths

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*UL Listed Installation*



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*Always Insist on  
UL Listed Spill Containment*



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*Summary of Facts*

- Liner-based UL Listed Containment Systems require 50% less labor than epoxy based systems with no drying time required.
- Liner-based UL Listed Systems require no maintenance. In seismic zones, there is no need to re-surface due to cracking
- UL Listed Systems can be easily installed in retrofit battery system applications.
- Don't overpay for compliance...pay for Quality or don't pay at all.

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