CLIFFORD POWER

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Information Sheet # 01

Your Reliable Guide for Power Solutions

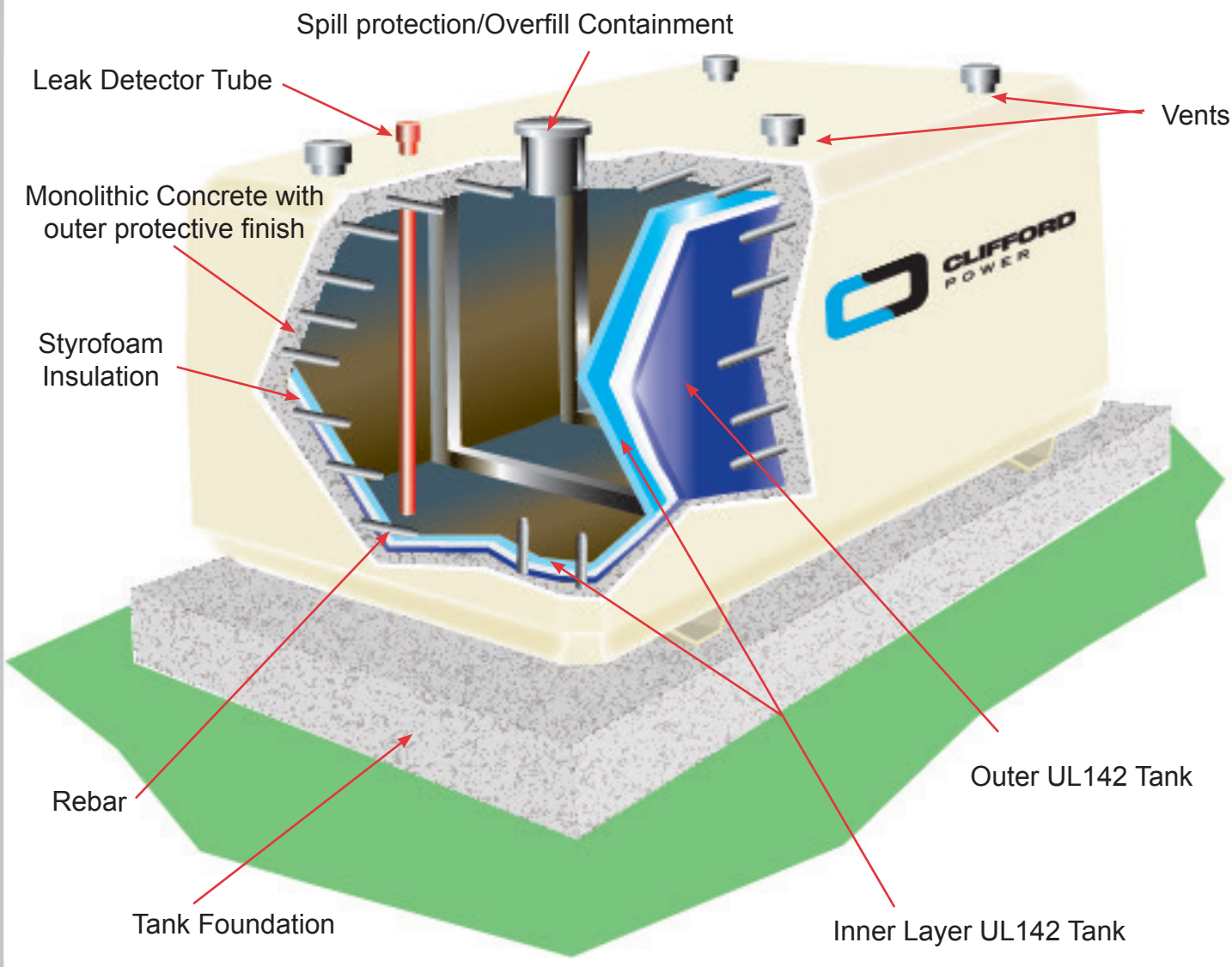
Protected Above-Ground Tanks for Flammable & Combustible LiquidsCovered by UL2085

1.0 Introduction

We note an emerging trend towards UL2085 for above ground generator fuel tanks with secondary containment. Stringent EPA controls on Underground Storage Tanks (UST's), and larger penalties for ground contamination, have led to much greater usage of Above-Ground Storage Tanks (AST's).

This Information Sheet discusses once above ground in addition to environmental factors we have to consider the safe use and storage of flammable fuels. (Continued over)

Diagram of Fuel Tank to UL 2085



To fulfill our commitment to be the leading supplier and preferred service provider in the Power Generation Industry, the Clifford Power Systems, Inc. team maintains up-to-date technology and information standards on Power Industry changes, regulations and trends. As a service, our **Information Sheets** are circulated on a regular basis, to existing and potential Power Customers to maintain awareness of changes and developments in engineering standards, electrical codes, and technology impacting the Power Generation Industry.

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2.0 Codes Covering Above Ground Diesel Fuel Tanks:

The codes to be considered, in additional to environmental factors, also cover the safe use and storage of flammable fuels.
Key safety factors and codes to be considered in fuel tank design are:

- Ability to withstand fire (UL 2085 Section 17)
- Vehicle Impact Resistance (UL 2085 Section 20)
- Projectile Resistance (UL 2085 Section 21)

In addition to UL 2085 and UL 142 standards, fuel tanks also have to meet all NFPA Fire Code requirements covered in NFPA 30, 37 and 110.

3.0 Typical Designs Fuel Tank Manufacturers are Adopting:

Manufacturers have taken the concept of the UL142 double-walled fuel tanks, and achieved compliance to UL 2085 by a combination of rigid design, stronger carbon steel materials, and insulation between outside and inside containment walls.

These additional features give the fuel tank the ability to:

Withstand fire: With 2-hour liquid pool and furnace fire tests, the primary internal tank sees on average a temperature rise of no more than 260° F.

Resist Vehicle Impact: Maintain fuel containment after an impact of 12,000 lbs force @ 10mph.

Resist Projectiles: One manufacturer quotes a test with 150-grain, 30-caliber bullet, muzzle velocity 2,700 feet per sec. from 100'.

3.0 See page 1 for illustration of typical UL 2085 fuel tank that meets the above parameters:

The illustration, shown on page one, details a typical design for a "beside installation" vaulted fuel tank. Other forms of vaulted tanks to UL 2085 permit the generator set to be mounted above the tank. Above 500 gallons, many Cities, such as Austin, specify these tanks and, in most cases, NFPA 37 requires extra precautions above 500 gallons.

Fire departments are demonstrating a keen preference for this type of tank and we foresee this as the standard tank for the future.

4.0 Other Sources of Information Regarding Above Ground Tanks:

Useful Web-Sites for further information:

Underwriters Laboratory:	www.ulstandardsinfonet.ul.com/scopes/2085
NFPA	www.nfpa.org

The Clifford Power Systems technical support team will be very happy to discuss specific needs with you, and provide you with further information and details of all available options to satisfy the requirements of UL 2085 and any other questions concerning your power needs.

Clifford Power with branches throughout Texas, Oklahoma, Missouri and Kansas with full sales and support capabilities with 24-hour local support.

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