

MQ POWER

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To: All MQ Power Field Sales Personnel
From: Jim Rose, Dir. Product Management
Reference: Whisperwatt™ Ultra Silent Generators
Subject: Factory Molded Fuel Tanks Used In
Trailer-Mounted, Portable Applications

April 25, 2005

There have been numerous inquiries from the field, requesting information and documentation regarding the poly molded, diesel fuel tanks used in the Denyo generator sets; including models DCA25USI, DCA45USI, DCA70USI, DCA70USJ, DCA85USJ, DCA125USJ & DCA150USJ.

Part One of this publication will document the design characteristics of the molded tanks. *Part Two* will address the facts regarding UL142 tank certification relative to trailer-mounted, portable generator sets.

PART ONE – DESIGN CHARACTERISTICS

The fuel tanks supplied with the Denyo generator models listed above, are manufactured using a UV-stabilized, 35 mesh, crosslinkable, #7004, high-density polyethylene (HDPE) resin. The manufacturing process is rotational molding. This type of molding exhibits high impact strength, tear strength and exceptional stress crack resistance.

The tanks are subjected to a variety of quality and durability tests including:

1. Static Pressure Test – 4.5 psig for 5-minutes.
2. Pressure Impulse Test – 25,000 cycles of pressure impulse by pressurizing the tank to 3 psig and then venting the pressure back to 0.25 psig.
3. Shock Test – 1,000 shock impacts at a maximum peak acceleration of 25g's and a duration of 8-milliseconds at the base of a half-sine wave pattern.
4. Fire Resistance Test – Fire test in accordance with ISO 10088 requirements; the tank is exposed to fire for 2.5 minutes continuously while filled to 25% of capacity with gasoline.

Note: The tanks must pass these tests without showing any signs of leakage or stress cracking.

PART TWO – TRAILER APPLICATIONS VERSUS UL142

There has been a lot pressure brought about in the field in general, regarding the use of UL listed diesel fuel tanks for trailer applications, more specifically, tanks that bear the UL142 label. It seems that the majority of inspectors or other “authority having jurisdiction” are mandating this requirement, quite possibly, without a full understanding of the ramifications of doing so.

By definition, UL142 tanks are defined as rectangular, steel tanks, intended for stationary installations only. They are not intended for mobile or trailerized applications. Beyond this interpretation of definition however, are fundamental engineering design parameters that are simply not right for trailerized generator sets.

For instance, a UL142 sub-base fuel tank sitting on a concrete pad is hardly going to be subjected to fuel sloshing, as will most certainly occur in a mobile environment. The UL tanks are not designed with the appropriate baffling necessary for a trailer application. This lack of baffling, in an extreme case, where the fuel tank is perhaps half full, could lead to fuel sloshing to a degree as to cause the trailer to whip around while being towed and become unstable.

Another problem is the engine suction tube or down tube. The UL listed tanks utilize an engine suction or down tube that drops near the bottom of the tank, allowing near maximum fuel capacity pickup. These down tubes will most certainly fatigue and break-off due to severe fuel sloshing without proper internal protection.

To help support our position regarding the UL labeling for trailer-mounted, portable generators, I made inquiry to one the largest UL tank manufacturers in the country. Attached is a copy of a letter they provided, indicating that UL142 tanks should not be used for mobile applications.

SUMMARY

In summary, the MQ Ultra Silent generators offer an industry best, environmental containment system, providing steel secondary containment, to capture *all* engine fluids without allowing any spillage onto the ground. The poly tank design is extremely durable, lightweight and, corrosion proof. This packaged system offers a high degree of protection for the user, helping prevent potentially hazardous and costly materials spills in the environment.



October 28, 2004

MQ Power
P.O. Box 6254
Carson, CA 90749

ATTN: Jim Rose

RE: Underwriters Laboratories Approval – Mobile Rectangular Fuel Tanks

Dear Jim,

Pursuant to our phone conversation pertaining to U.L. approval specific to mobile rectangular diesel fuel tanks, I wanted to write you to confirm the high points of the discussion.

There are primarily two U.L. approvals pertaining to rectangular diesel fuel tanks in the Power Generation Industry. Those approvals are U.L. #142, and U.L. #2085. Since U.L. #2085 is an approval for vaulted, fire rated diesel fuel tanks, the approval that is most commonly associated with mobile rectangular diesel fuel tanks is U.L. #142.

It is not uncommon for us as a manufacturer of both diesel fuel tanks and trailers to see an Engineering spec calling for a U.L. listed rectangular fuel tank within a trailer. The conflict in these requests is that U.L. #142 tanks are not intended for use on mobile equipment. The confusion often stems from the fact that UL #142 is a "manufacturing standard", with "installation and use" being areas that are typically covered within NFPA 30. Because of this, it is often assumed that a UL #142 manufactured tank can be installed on a trailer and used in a mobile application. The reality is that there is an area within UL #142 that addresses "installation and use" quite directly.

Section 48 of the UL #142 standard addresses "Marking Elements". Item 48.1 references "All tanks", with the following information:

48.1.1 Each tank shall be marked with:

c) The statement: "This Tank is Intended for Stationary Installation Only".

(Items a, b, d, e, and f were not shown as they are not applicable to this issue)

You will notice that on every UL #142 listed tank Sauk Technologies manufactures, this statement is clearly printed on the Warning Label on the end of the tank.

In summary, UL does not have an approval that addresses rectangular diesel fuel tanks for mobile applications, and UL #142 clearly states that UL #142 tanks cannot be used in this fashion.

I hope this information is helpful. If you require any additional information, please don't hesitate to contact me. You can reach me by phone at 866-243-8548, or via email at eparadowski@sauktech.com.

Sincerely,

A handwritten signature in black ink, appearing to read "E. Paradowski".

Edward F. Paradowski
Sauk Technologies – Senior Product Manager

MANUFACTURING AND PRODUCTION TESTS

45 Primary and Secondary Containment Tanks

45.1 Each primary and secondary containment tank, before painting, shall be tested by the manufacturer and determined to be tight against leakage using the method of the Tank Leakage Test, Section 39.

45.2 If leaks are noted during testing, the tank is to be made tight by welding and retested. Defects in welds are to be repaired by chipping or melting out from one or both sides of the joint, as required, and rewelding.

46 Diked Tanks

46.1 Each primary or secondary containment tank, before painting, shall be tested by the manufacturer and determined to be tight against leakage using the method of the Tank Leakage Test, Section 39.

46.2 Each dike shell is to be inspected before painting for welding defects with a dye penetrant, magnet-flux, or other acceptable non-destructive testing method. If all seams are double welded (inside and outside), visual inspection may be used. The Hydrostatic Load Test, Section 43, may also be used to determine welding defects.

46.3 If leaks are noted during testing, the tank is to be made tight by welding and retested. Defects in welds are to be repaired by chipping or melting out from one or both sides of the joint, as required, and rewelding.

MARKINGS

47 General

47.1 Each tank shall be marked as indicated in Marking Elements, Section 48, using the method described in Marking Method and Location, Section 49.

48 Marking Elements

48.1 All tanks

48.1.1 Each tank shall be marked with:

a) The manufacturer's name, trade name, or trademark or other descriptive marking which identifies the organization responsible for the product.

b) One of the following statements, as applicable:

1) "This Tank Requires Emergency Relief Venting. Capacity Not Less Than ____ Cubic Feet Per Hour," with the appropriate value derived from Table 8.1 inserted; or

2) For vertical cylindrical tanks of the weak shell-to-roof joint design: "Built To Weak Shell-To-Roof Joint Design"; or

3) For tanks provided with a manhole of the long bolt type in accordance with the requirements in 8.9, the manhole cover shall be marked: "This Manhole Is Provided With Long Bolts To Permit Emergency Relief Venting. Do Not Replace With Shorter Bolts."

c) The statement: "This Tank is Intended for Stationary Installation Only."

d) If a manufacturer produces tanks at more than one factory, each tank shall have a distinctive marking by which it can be identified as the product of a particular factory.

e) Identification of the emergency vent openings.

f) When the tank has integral welded steel supports the tank shall be marked: "On Supports."
The mark shall be adjacent to the conformity mark.

48.1.1 effective July 12, 2004

48.2 Compartment tanks

48.2.1 In addition to the markings required in 48.1.1, compartment tanks shall also be marked with the following:

a) The applicable venting statements as described in 48.1.1(b) for each compartment.

b) Identification of the emergency vent openings for each compartment.

48.3 Secondary containment tanks

48.3.1 In addition to the markings required in 48.1.1 and 48.2.1, as applicable, secondary containment tanks shall also be marked with the following statements:

a) "The Annular Space Requires Emergency Relief Venting. Capacity Not Less Than ____ Cubic Feet Per Hour," with the appropriate value derived from Table 8.1 inserted.

b) "Pressurize Primary Tank When Pressure Testing Annular Space" or equivalent wording.

48.4 Diked tanks

48.4.1 In addition to the markings required by 48.1.1 and 48.2.1, diked tanks shall also be marked with the statements:

a) "Open Top Diked" or "Closed Top Diked". The mark shall be adjacent to the conformity mark.

b) The capacity of the diked area in U.S. gallons. The capacity may also be expressed in terms of percent containment of the primary tank.

c) (For closed top diked tanks only where the cover is used for emergency venting) "Cover Used For Emergency Venting. Do Not Secure Cover."

48.4.1 effective July 12, 2004