Sujet ULC C80.1
ULC G 5.2
ULC CCF

Le 14 février 2012

BULLETIN D'INFORMATION 2012-01A

Deuxième édition de l'autre document reconnu ULC/ORD-C80.1

NONMETALLIC TANKS FOR OIL-BURNER FUELS AND OTHER COMBUSTIBLE LIQUIDS (réservoirs non métalliques pour combustibles de brûleurs à mazout et autres liquides combustibles)

Destinataires: Membres du Conseil consultatif des Laboratoires des assureurs du Canada

Les Laboratoires des assureurs du Canada ont rédigé une deuxième édition préliminaire de l'autre document reconnu ULC/ORD-C80.1. Nous distribuons cette version préliminaire afin que vous puissiez la passer en revue et nous faire part de vos commentaires.

L'autre document reconnu ULC/ORD-C80.1 porte sur les exigences relatives aux réservoirs de stockage sous pression atmosphérique primaires, secondaires et avec cuvette de rétention non métalliques ou en matériau composite d'une capacité allant de 227 à 2500 L (60 à 660 gallons US) conçus principalement pour le stockage et la distribution du combustible de chauffage destiné aux appareils de combustion au mazout ou, sinon, pour le stockage des carburants diesels destinés aux moteurs diesels et des huiles moteurs (huile neuve et usagée) destinées aux stations-services automobiles, dans des applications hors sol. Les exigences portent sur la fabrication de réservoirs destinés aux installations stationnaires.

Cette version préliminaire de l'autre document reconnu ULC/ORD-C80.1 a été établie à partir de la norme UL SU2258. Une fois ce document publié, il y aura une proposition pour qu'il soit converti en norme ULC sous le nom de CAN/ULC-S670.

Le bulletin de vote comprend également une question supplémentaire à laquelle vous devez répondre et faire parvenir vos bulletins de vote d'ici le 15 mars 2012.

Commentaires sur les questions supplémentaires doivent être remplies sur le formulaire du questionnaire et doivent être soumises par e-mail à: Madeleine.Martin@ul.com.

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Pour tout renseignement supplémentaire, veuillez communiquer avec Rae Dulmage par téléphone au numéro 613 755-2729, poste 61429 ou par courriel à l'adresse rae.dulmage@.ul.com.

Le présent bulletin d'information peut être transmis à des tiers pouvant être intéressés par ce document.

Laboratoires Des Assureurs du Canada Inc.

Gunsimar Paintal
Gestionnaire régional de la qualité et responsable
du programme de marque ULC

"Ce document est signé sur la compréhension que cette traduction est fidèle au contexte de la version anglaise"

Supplemental Questions on 2nd Edition of ULC/ORD-C80.1

To: Members of the Canadian Council of Fire Marshals and Fire Commissioners

During development of the second edition of ULC-C80.1 (2012), we intended to update the basic requirements for consistency with the current edition of UL SU2258 (2010), since the majority of currently Certified products in Canada meet the newer requirement in the United States. This soft harmonization would achieve the highest level of safety in the shortest time, with the lowest impact on manufacturers.

Please provide comments by March 15, 2012.

However, due to recent suggestions for changes in the fire test, we feel that it is important for the members to understand the historical development of this test and rationale through the Standard and Code bodies over a decade ago. Please see the attached for a summary, which we hope will be technically informative during the ballot and comment period.

We recognize that at the time of development, a very high level of fire resistance equivalency with steel tanks was desired by committee members and other industry interests, in order to establish confidence in nonmetallic tanks, which had previously not been allowed by Code, since they were formed from "combustible" materials. It is also generally accepted during the time of development, that environmental concerns for these tank applications were not as important as fire risk issues.

As Code and technical committee interests have evolved since then, we believe there is now more of a balance between fire and environmental safety concerns. So, when combined with the positive track record of nonmetallic tanks in service throughout North American, a reduction in the fire test and/or requirements may be an appropriate consideration. Therefore, we would like to have your opinion on keeping the existing oil pool fire test, or the following fire test alternatives to base our final decision on for the ULC-C80.1 next edition.

Q1. Oil pool fire reduced test time – Keep the existing pool fire test, but reduce the test time from 30 to 20 minutes, based on "total loss" time for a residential home fire.

☐ YES

☐ NO

Q2. Oil pool fire reduced test time related to use ratings - Keep the existing pool fire test, but revise the test time based on use locations (30 minutes for indoor/outdoor ratings and 20 minutes for outdoor ratings.

☐ YES

☐ NO

Q3. Wood crib fire test as a replacement – Replace the existing oil pool fire test with the standard European wood crib fire test (such as NO 560 from TC266) at 30 minutes.

☐ YES

☐ NO

Q4. Both methods related to fire ratings – Allow a choice of the oil pool or wood crib, and identify the test in ratings. This would permit users/AHJs to decide on the appropriate fire risk for each installation.

☐ YES

☐ NO

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Q5: Keep the existing oil pool fire test - We would also like to have your opinion on our technical position that based on our methodology assessment and knowledge of product performance for both fire tests we believe the oil pool is more severe than the wood crib. If you disagree, please provide a technical substantiation.

☐ YES

☐ NO (must be accompanied by a technical substantiation)

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UL SU2258 and ULC/ORD-C80.1 Fire Test Development History

During the late 1990's, several European tank manufacturers requested UL Certification for small plastic & composite type heating oil tanks that were commonly used in Europe. At that time, the NFPA 31 Installation Code for Oil Burning Equipment only allowed burner fuel to be stored in steel tanks, and the UL80 Standard for Tanks for Oil Burner Fuel only covered steel constructions.

Therefore, a New & Unusual project was conducted by UL to investigate if non-metallic tanks could be included within the Code & Standard, and if such products would be accepted by AHJ's. The conclusion reached, was that it was possible, if properly coordinated through the Code & Standards processes of each organization in a collaborative effort by the various stakeholders.

The summary result was that draft requirements were developed by UL and submitted for review & comment to the Code & Standards technical committees, with comment resolution conducted to address specific concerns. After several development rounds were completed from 1998 to 1999, the requirements were published by UL as SU2258 and referenced in NFPA 31 Code. Shortly thereafter, ULC published ORD-C80.1 for the Canadian market, based on essentially the same requirements.

During collaborative development, the full scale fire test type and severity was greatly debated in both technical committees. Plastic tank manufacturers proposed a wood crib fire test that was widely used and accepted in Europe. Steel tank manufacturers proposed an oil pool fire test that was previously used to validate venting size reductions.

Since UL witnessed both tests as an independent observer, we were requested by all stakeholders to present the technical information to the NFPA 31 Code TC for final consideration. The following is a summary of the test intent with key differences/similarities identified, and conclusions of the majority of 31 TC members:

Installation Simulation – Both tests are intended to simulate a typical residential installation, however, deviations are related to European vs US constructions and fuel sources.

The wood crib test simulates a small wood frame room where combustible materials (walls, ceiling, furniture, paper, etc.) are in close proximity to the tank located in the center of a room. The setup does not simulate tank piping or accessories.

The oil pool test simulates an unconfined concrete basement where leaked/spilled oil from the system (tank, pipe, filter, burner, etc.) may collect under/around the tank located next to a wall. The setup includes typical tank piping and accessories.

Fire Characteristics – Both tests simulate a half filled tank exposed to a 30 minute fire, with temperatures monitored, but not controlled. However, the pool fire test tank is filled with #2 oil and uses #2 oil as a fuel source, vs the crib fire test tank is filled with water and uses stacked spruce as a fuel source.

The wood crib "test room" will transfer energy to the tank directly from the fire on one side (primarily via radiation), and indirectly from one side wall and the ceiling. The room openings will control both combustion air inlet and exhaust gas outlet, but will generally trap heat. The total heat flux is dependent upon the type/quantity of wood and room specifications. For the tests witnessed, the maximum temperatures were in the 1000F-1200F range with reductions in the beginning and end.

The oil pool "test rig" will transfer energy to the tank directly from the fire on all sides (and under the tank for supported designs) and one wall. There are no restrictions on both combustion air inlet and exhaust gas outlet. The total heat flux is dependent upon the type/quantity of #2 oil and floor surface dependent

upon the tank "footprint". For the tests witnessed, the maximum temperatures were in the 1200-1400F range throughout the test except for the beginning.

NFPA 31 TC Conclusions – The 31 TC members preferred the oil pool test over the wood crib test, since it was considered more representative of typical installations in the USA, and more severe to address "worst case" fire scenarios.

It was felt that since oil was stored in the tank, it must be included in the test to determine if any tank wall distortions would result in a loss of containment and add fuel to the fire. Conversely, water would not simulate actual fire conditions to assess, for example, what happens if the oil stored in the tank became exposed to flames when the plastic top/sides melt around it, or was displaced when the plastic top/sides displace the liquid by slumping in it.

In addition, direct flame exposure on all sides (and bottom if applicable to the design) at a higher heat flux & temperature was more severe, and addressed the question of what effect the melting polymer(s) have on strength, containment, and addition to the fuel source.

The TC also provided input on pass/fail criteria, and considered different test times for different ratings. For AHJ acceptance, which was heavily weighted towards fire resistance to prove "equivalency" with the standard style steel tanks, the preferred test criteria was to contain the oil without contribution to/spread of the pool fire. Proposals to have a 20 min test for "outdoor" rated vs 30 min test for "indoor" rated tanks were rejected due to fears of "misuse".

Tank Design Fire Performance Results – At the time of development, most European oil tank manufacturers had two design types in use. All plastic tanks were either primary or diked constructions. Hybrid tanks consisted of a plastic primary in a metal dike. Both designs did not have any significant fire protection components, and the primary polymers were polyethylene (PE). Note "dikes" provide secondary containment, but can't be pressurized, and the equivalent Canadian term is "integrally contained" assembly.

Over the years, several fire tests were conducted or witnessed by UL for each design type, with all hybrid designs passing, and all plastic designs failing. We also know several manufacturers conducted their own R&D SU2258 fire tests on all plastic tanks w/wo fire protection ranging from fire resistant polymers & coatings to thermal shields & insulation. All were failures, except for a FRP design with proprietary construction features.

Although the SU2258 oil pool fire test was not designed to limit a design or material class, not all PE tanks have passed to date. In contrast, many primary PE tanks have passed the European wood crib fire test.