



OREGON FIRE CODE

Interpretations and Technical Advisories

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Date: May 24, 2011

Ruling: Technical Advisory No. 11-15

Subject: Foundation criteria for permanent stationary installations of LP-gas cylinders, horizontal ASME containers and container/pump dispenser assemblies.

Code Reference: NFPA 58 (2008), Chapter 6 and LP – Gas Code Handbook (2008)

Content: This technical advisory is designed to give guidance on what would be acceptable foundations for setting cylinders, ASME containers and container/pump dispenser assemblies on.

- Section 6.6.2.1 of NFPA 58 states that cylinders shall be installed only above ground and shall be set on a **firm foundation** or otherwise be firmly secured. The cylinder shall not be in contact with the soil.

The LP – Gas Code Handbook, NFPA 58 (2008) explains “**what is meant by firm foundation**” as although traditional materials such as concrete blocks and treated wood may be used, the technical committee intentionally used the words “firm foundation” to provide a performance criterion that would avoid unnecessary restrictions on the use of innovative materials, such as plastics and composite materials. Wood can be used as a foundation for cylinders, but must be monitored. If the wood rots it no longer provides a “firm foundation” and can allow the cylinder to come in contact with the soil; corrosion of the cylinder can occur.

- Section 6.6.3.1 of NFPA 58 states that horizontal ASME containers designed for permanent installation in stationary service, above ground, shall be placed on masonry (saddles) or other noncombustible structural supports (legs) located on a concrete or masonry foundations with the container supports.

The LP – Gas Code Handbook, NFPA 58 (2008) explains the primary considerations in the installation of horizontal ASME containers are to ensure that the integrity of the supports is retained and that damage under fire conditions is minimized. Proper installations of large containers over 2000 gallons is usually accomplished through the use of masonry foundations and supports that are called “saddles”. Smaller containers of 2000 gallons or less usually utilize steel legs that are welded to the container. The

container is set with its legs placed on a **noncombustible foundation**, with a minimum distance from the container bottom to the ground as specified in Table 6.6.3.3(A). These minimum heights, together with the provisions that flexibility is provided in the piping, ensure that the installation will not be compromised if the container settles a reasonable amount. The requirements in Table 6.6.3.3(A) apply to horizontal ASME containers installed with attached steel “legs”.

- Section 6.6.3.1(G) of NFPA 58 (2008) explains that containers of 2000 gallons water capacity or less and container/pump dispenser assemblies mounted on a common base complying with Table 6.6.3.3(A) shall be placed either on paved surfaces or on concrete pads at ground level within 4 inches of ground level.

Summary. Because NFPA 58 is not clear on what a firm foundation, noncombustible foundation, concrete pads or masonry blocks are, the following will be approved methods for the placing of cylinders, container and container/pump dispenser assemblies.

- Cylinders may be set on
 - (a) Concrete pad minimum four inches (4”) thick and six inches (6”) wider than the cylinder diameter; or
 - (b) A minimum of three solid masonry/concrete blocks, four by eight by sixteen inches (4” x 8” x 16”), spaced evenly under the cylinder and centered on the block.
- Containers of 2000 gallons water capacity or less may be set on
 - (a) Concrete pad minimum four inches (4”) thick and six inches (6”) wider and longer than the container; or
 - (b) Solid masonry/concrete blocks, four by eight by sixteen inches (4” x 8” x 16”), centered under each leg.
- Container/pump dispenser assemblies may be set on
 - (a) Paved surfaces; or
 - (b) Concrete pad minimum four inches (4”) thick and six inches (6”) wider and longer than the container/pump assembly; or
 - (c) Solid masonry/concrete blocks, four by eight by sixteen inches (4” x 8” x 16”) centered along each rail so the entire section of rail rests on the blocks.
- Where soil conditions may subject the cylinders or containers to settling the pads or blocks must be placed on a firm base of coarse sand or gravel.

Other References: