Design and Construction of LPG Installations

API STANDARD 2510
EIGHTH EDITION, MAY 2001

American Petroleum Institute

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Downstream Segment

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FOREWORD

This standard provides minimum requirements for the design and construction of installations for the storage and handling of liquefied petroleum gas (LPG) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard takes into consideration the specialized training and experience of operating personnel in the type of installation discussed. In certain instances, exception to standard practices are noted and alternative methods are described.

This standard does not include information on the production or use of liquefied petroleum gas.

It is not intended that this standard be retroactive or that it take precedence over contractual agreements. Wherever practicable, existing codes and manuals have been used in the preparation of this standard.

This standard requires the purchaser to specify certain details and features. Although it is recognized that the purchaser may desire to modify, delete, or amplify sections of the standard, it is strongly recommended that such modifications, deletions, and amplifications be made by supplementing this standard rather than by rewriting or incorporating sections of this standard into another complete standard.

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Suggested revisions are invited and should be submitted to the standardization manager, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

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1 Scope

This standard covers the design, construction, and location of liquefied petroleum gas (LPG) installations at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, or tank farms. This standard covers storage vessels, loading and unloading systems, piping, or and related equipment.

1.1 The size and type of the installation; the related facilities on the site; the commercial, industrial, and residential population density in the surrounding area; the terrain and climate conditions; and the type of LPG handled shall be considered. Generally speaking, the larger the installation and the greater the population density of the surrounding area, the more stringent are the design requirements.

1.2 Design and construction considerations peculiar to refrigerated storage, including autorefrigerated storage, are covered in Section 9 of this standard.

1.3 In this standard, numerical values are presented with U.S. customary units only. These U.S. customary values are to be regarded as the standard values.

1.4 This standard shall not apply to the design, construction, or relocation of frozen earth pits, underground storage caverns or wells, underground or mounded storage tanks, and aboveground concrete storage tanks.

1.5 This standard does not apply to the following installations:

a. Those covered by NFPA 58 and NFPA 59.
b. U.S. Department of Transportation (DOT) containers.
c. Gas utility company facilities; refinery process equipment; refinery and gas plant processing equipment; and transfer systems from process equipment upstream LPG storage.
d. Those tanks with less than 2000 gallons of storage capacity.

1.6 RETROACTIVITY

The provisions of this standard are intended for application to new installations. This standard can be used to review and evaluate existing storage facilities. However, the feasibility of applying this standard to facilities, equipment, structures, or installations that were already in place or that were in the process of construction or installation before the date of this publication, must be evaluated on a case-by-case basis considering individual circumstances and sites.

1.7 CHARACTERISTICS OF LPG

LPG is customarily handled in a liquid state achieved by its liquefaction under moderate pressure. Upon release of the pressure, LPG is readily converted into the gaseous phase at normal ambient temperature.

1.8 SAFETY

The safety of LPG storage installations is enhanced by the employment of good engineering practices, such as those recommended by this standard, during design and construction.

2 Referenced Publications

The most recent edition or revision of each of the following manuals, codes, recommended practices, publications, standards, and specifications shall form a part of this standard to the extent specified:

API

RP 500	*Classification of Locations for Electrical Installations at Petroleum Facilities*
RP 505	*Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2*
RP 520	*Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries*
RP 521	*Guide for Pressure-Relieving and Depressuring Systems*
RP 550	*Manual on Installation of Refinery Instruments and Control Systems* (out of print)
RP 551	*Process Measurement Instrumentation*
Std 607	*Fire Test for Soft-Seated Quarter-Turn Valves*
Std 620	*Design and Construction of Large, Welded, Low-Pressure Storage Tanks*
RP 752	*Management of Hazards Associated with Location of Process Plant Buildings, CMA Manager's Guide*
RP 1102	*Steel Pipelines Crossing Railroads and Highways*
Std 2000	*Venting Atmospheric and Low-Pressure Storage Tanks: Nonrefrigerated and Refrigerated*
RP 2003	*Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*
Publ 2218	*Fireproofing Practices in Petroleum and Petrochemical Processing Plants*
Publ 2510A	*Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities*
Spec 6FA	*Specification for Fire Test for Valves*

Manual of Petroleum Measurement Standards, Chapter 5, "Metering"