

Alcohols, Ethers, and Gasoline-Alcohol and -Ether Blends

A Report on Fire-Safety Considerations at Petroleum Marketing Facilities

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Manufacturing, Distribution, and Marketing Department

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**American
Petroleum
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0 Introduction

Gasoline blended with alcohols and ethers (oxygenates) has become a standard product since the implementation of reformulated gasoline regulations. When oxygenates are blended with gasoline, the properties of the resulting blend can differ from those of base gasoline. The objective of this report is to educate gasoline marketing personnel about how gasolines blended with oxygenates might impact fire-safety during transport, storage and dispensing. This publication also addresses storage and handling of oxygenates at terminals and bulk plants, and storage and handling of M85 (a blend of 85 volume percent methanol and 15 volume percent gasoline). Examination of fire safety characteristics of neat oxygenates and oxygenate blends suggests that current industry fuel handling practices are adequate for these fuels.

The term "oxygenated gasoline" will be used throughout this report to denote gasoline blended with alcohols and ethers. Thus, all reformulated gasolines are included in the definition of oxygenated gasolines. In this report "base gasoline" will refer to gasoline that has not had any oxygenates added to it, i.e., gasoline that is all hydrocarbons. Reformulated blendstock for oxygenate blending is an example of base gasoline. "Neat alcohols" and "ethers" refer to these oxygenate constituents before being blended with gasoline. "Ethanol" for blending in base gasoline will be assumed to have five volume percent hydrocarbons as denaturant.

Section 4 is devoted to a general discussion of the impact of fuel fire-safety characteristics. Section 5 addresses specific fire-safety issues for handling and storing oxygenates in terminals and bulk plants. Section 6 addresses the same issues at service stations. Neat oxygenates are covered only in Section 5 because these blending components are not present at service stations.

1 Scope

This publication examines the fire safety considerations for fuels at petroleum marketing facilities. It focuses on gasoline blended with oxygenates, and M85, but also includes neat alcohols and ethers since they may be present at terminals and bulk plants for blending purposes. Diesel fuels and "clean" or reformulated diesel fuels are not addressed. Current reformulated gasolines are included within the scope of this report.

This publication is not an API recommended practice for handling these fuels, nor is it intended to be a primer on fuel marketing operations fire-safety. Readers not already familiar with recommended practices for gasoline handling and storage fire-safety should obtain and review the appropriate API and NFPA publications cited in Section 2 before reading this report. This publication does not address health considerations associated with use or exposure to these fuels.

Figure 1 illustrates the portion of the gasoline marketing system covered in this report.

2 References

2.1 STANDARDS

Unless otherwise specified, the most recent editions or revisions of the following standards, codes, and specifications shall, to the extent specified herein, form a part of this publication.

API

Manual of Petroleum Measurement Standards (MPMS), Chapter 1, "Vocabulary"

Pub 2026 *Safe Descent Onto Floating Roofs of Tanks in Petroleum Service*

Pub 2219 *Safe Operation of Vacuum Trucks in Petroleum Service*

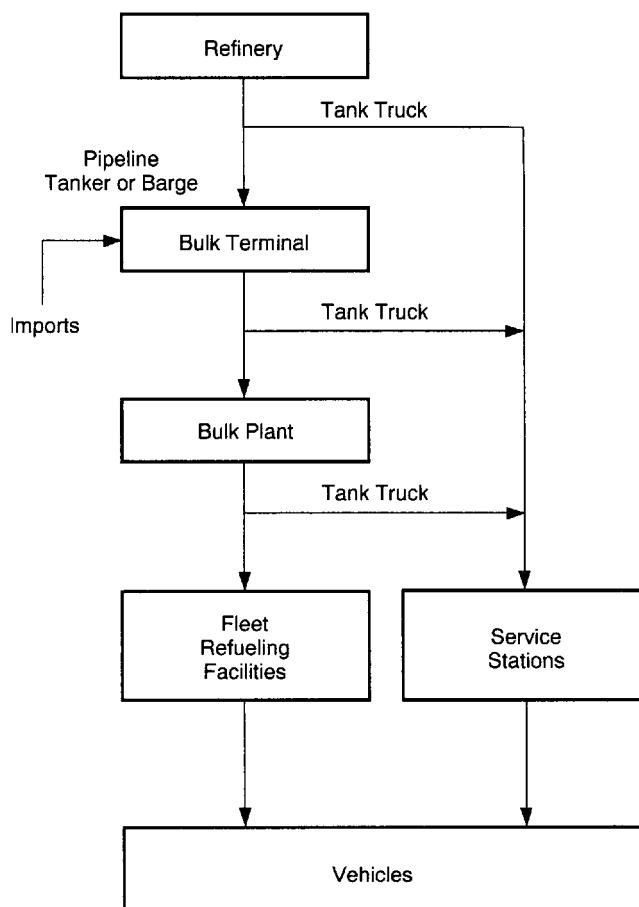


Figure 1—Typical Gasoline Distribution System Flow path