Manual of Petroleum Measurement Standards Chapter 19.2

Evaporative Loss from Floating-roof Tanks

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Contents

Contents

Figures

Tables

Contents

Evaporative Loss from Floating-roof Tanks

1 Scope

This standard contains methodologies for estimating the total evaporative losses of hydrocarbons from external floating-roof tanks (EFRTs), freely vented internal floating-roof tanks (IFRTs), and domed external floating-roof tanks (domed EFRTs).

The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data.

Types of floating roofs, rim-seal systems, and deck fittings are described for information only.

The equations estimate average annual losses from floating-roof tanks for various types of tank construction, floating-roof construction, rim-seal systems, and deck fittings, as well as for various liquid stocks, stock vapor pressures, tank sizes, and wind speeds (EFRTs).

The equations were developed for:

a) stocks with a true vapor pressure greater than ~0.1 psia;

b) average wind speeds ranging from 0 miles per hour (mph) to 15 mph (EFRTs); and

c) tank diameters greater than 20 ft.

The estimation techniques become more approximate when these conditions are not met.

When this standard is used to estimate losses from non-freely vented (closed vent) internal or domed external floating-roof tanks (tanks vented only through a pressure-vacuum relief vent, blanketed with an inert gas, vented to a vapor processing unit, or otherwise restricted from being freely vented), refer to the methodology in API TR 2569 [7].

The equations are not intended to be used in the following applications.

a) to estimate losses from unstable or boiling stocks (i.e. stocks with a true vapor pressure greater than the atmospheric pressure at the tank location) or from petroleum liquids or petrochemicals for which the vapor pressure is not known or cannot readily be predicted;

b) to estimate losses from tanks in which the materials used in the rim seal, deck fittings, or deck seams have either deteriorated or been significantly permeated by the stored stock;

c) to estimate losses from storage tanks that do not have a floating roof (API MPMS 19.1[53] addresses this);

d) to estimate losses from landing floating roofs (API MPMS 19.6.1 [8] addresses this);

e) to estimate losses from cleaning storage tanks (API MPMS 19.6.2 [9] addresses this).

The estimation procedures were developed to provide estimates of typical losses from floating-roof tanks that are properly maintained and in normal working condition. Losses from poorly maintained tanks can be greater. Because the loss equations are based on equipment conditions that represent a large population of tanks, a loss estimate for a group of floating-roof tanks will be more accurate than a loss estimate for an individual tank. The estimation can be improved by using detailed field information, including climatic data and operational data for the appropriate time period.