

Venting Atmospheric and Low-pressure Storage Tanks

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Contents

Page

1	Scope	1
2	Terms, Definitions, and Abbreviated Terms	1
3	Nonrefrigerated Aboveground Tanks	3
3.1	General	3
3.2	Causes of Overpressure or Vacuum	4
3.3	Determination of Venting Requirements	7
3.4	Means of Venting	20
3.5	Considerations for Tanks with Potentially Flammable Atmospheres	21
3.6	Relief-device Specification	22
3.7	Installation of Venting Devices and Open Vents	23
4	Refrigerated Aboveground and Belowground Tanks	24
4.1	General	24
4.2	Causes of Overpressure or Vacuum	25
4.3	Relief-device Specification	28
4.4	Installation of Venting Devices	28
5	Testing of Venting Devices	29
5.1	General	29
5.2	Flow-test Apparatus	29
5.3	Method for Determining Capacities	33
5.4	Production Testing	34
6	Manufacturer's Documentation and Marking of Venting Devices	35
6.1	Documentation	35
6.2	Marking	35
	Annex A (informative) Alternative Calculation of Normal Venting Requirements	37
	Annex B (informative) Basis of Emergency Venting for Table 7 and Table 8	46
	Annex C (informative) Types and Operating Characteristics of Venting Devices	51
	Annex D (informative) Basis of Sizing Equations	59
	Annex E (informative) Basis for Normal Out-breathing and Normal Inbreathing	73
	Annex F (informative) Guidance for inert-gas Blanketing of Tanks for Flashback Protection	75
	Annex G (informative) Explanation of Differences in Thermal Inbreathing Using the General Method and Annex A Method	78
	Bibliography	83
Figures		
1	Test Apparatus for Flow Testing of Venting Devices	30
2	Typical Ratio Limits for Capacity Testing of Venting Devices Using the Coefficient of Discharge Method	33
B.1	Curve for Determining Requirements for Emergency Venting During Fire Exposure (SI Units)	49
B.2	Curve for Determining Requirements for Emergency Venting During Fire Exposure (USC Units)	50
C.1	Open Vent	51
C.2	Side-by-side Pressure/Vacuum Vent	54
C.3	Large, Weight-loaded Emergency Vent	54

Contents

	Page
C.4 Direct-acting Vents	55
C.5 Pilot-operated Pressure Vent (Single Diaphragm).....	56
C.6 Pilot-operated Pressure/Vacuum (Double Diaphragm).....	57
D.1 Isentropic Expansion Coefficient	70
F.1 Trip Pressure Diagram for Nitrogen Blanketing.....	77
G.1 Surface to Volume Ratio for Conical Roof Tanks	79
G.2 Rate of Change of Tank Vapor Space Temperature Used in the Two Sizing Methods	80
G.3 Maximum Inbreathing for Various Tanks Sizes; Solid Black Lines—Thermodynamic Model; Solid Crosses—Annex A Method; Red Line $V = 5 \cdot V^{0.7}$	81
G.4 Rate of Change of Tank Vapor Space Temperature vs Rain Density.....	82

Tables

1 Y-factor for Various Latitudes	10
2 C-factors	11
3 Heat Input, Q (Expressed in SI Units)	13
4 Heat Input, Q (Expressed in USC Units)	14
5 Venting Capacity (Expressed in SI Units).....	14
6 Venting Capacity (Expressed in USC Units).....	15
7 Emergency Venting Required for Fire Exposure vs Wetted Surface Area (Expressed in SI Units).....	16
8 Emergency Venting Required for Fire Exposure vs Wetted Surface Area (Expressed in USC Units) ..	17
9 Environmental Factors for Nonrefrigerated Aboveground Tanks (Expressed in SI and USC Units) ...	18
10 Maximum Allowable Leak Rates	34
A.1 Normal Venting Requirements (Expressed in SI Units)	40
A.2 Normal Venting Requirements (Expressed in USC Units)	40
A.3 Normal Venting Requirements for Thermal Effects (Expressed in SI Units)	41
A.4 Normal Venting Requirements for Thermal Effects (Expressed in USC Units)	42
D.1 Guidance on Converting Calculated Flows to Normal/Standard Conditions.....	67
G.1 Surface to Volume Ratio of Small, Medium, and Large Flat Roof Tanks	79
G.2 Assumptions Used in the Annex A Method and General Method.....	80

Introduction

This standard has been developed from the accumulated knowledge and experience of qualified engineers of the oil, petroleum, petrochemical, chemical, and general bulk liquid storage industry.

Engineering studies of a particular tank can indicate that the appropriate venting capacity for the tank is not the venting capacity estimated in accordance with this standard. The many variables associated with tank-venting requirements make it impractical to set forth definite, simple rules that are applicable to all locations and conditions.

In this standard, where practical, U.S. customary (USC) units are included in parentheses or in separate tables, for information.

Venting Atmospheric and Low-pressure Storage Tanks

1 Scope

This standard covers the normal and emergency vapor venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks designed for operation at pressures from full vacuum through 103.4 kPa (ga) (15 psig). Discussed in this standard are the causes of overpressure and vacuum; determination of venting requirements; means of venting; selection and installation of venting devices; and testing and marking of relief devices.

This standard is intended for tanks containing petroleum and petroleum products, but it can also be applied to tanks containing other liquids; however, it is necessary to use sound engineering analysis and judgment whenever this standard is applied to other liquids.

This standard does not apply to external floating-roof tanks.

2 Terms, Definitions, and Abbreviated Terms

For the purposes of this document, the following terms, definitions, and abbreviated terms apply.

2.1

accumulation

Pressure increase over the maximum allowable working pressure or design pressure of the vessel during discharge through the pressure-relief device.

NOTE Accumulation is expressed in units of pressure or as a percentage of maximum allowable working pressure or design pressure. Maximum allowable accumulations are established by pressure-design codes for emergency operating and fire contingencies.

2.2

adjusted set pressure

Inlet static pressure at which a pressure-relief valve is adjusted to open on the test stand.

See **set pressure** (2.20).

NOTE 1 Adjusted set pressure is equivalent to set pressure for direct-mounted end-of-line installations.

NOTE 2 The adjusted set pressure includes corrections for service conditions of superimposed back-pressure.

2.3

British thermal unit

Btu

Unit of heat that increases the temperature of one pound of water by one degree Fahrenheit.

2.4

bubble point

Temperature at which the first vapor bubble is produced from a liquid mixture of two or more components heated at constant pressure. For single component systems the bubble point is referred to as the boiling point.

2.5

emergency venting

Venting required for external fire or other abnormal conditions (see 3.2.5).