SLOVENSKI STANDARD

SIST EN ISO 28300:2008

01-september-2008

Petrokemiļ na industrija ter industrija za predelavo nafte in zemeljskega plina - Prezraļ evanje atmosferskih in nizkotlaļ nih rezervoarjev za shranjevanje (ISO 28300:2008)

Petroleum, petrochemical and natural gas industries - Venting of atmospheric and low-pressure storage tanks (ISO 28300:2008)

Erdöl, petrochemische und Erdgasindustrie - Be- und Entlüftung von Lagertanks mit atomsphährischem Druck oder niedrigem Überdruck (ISO 28300:2008)

Industries du pétrole, de la pétrochimie et du gaz naturel - Ventilation des réservoirs de stockage a pression atmosphérique et a basse pression (ISO 28300:2008)

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English Version

Petroleum, petrochemical and natural gas industries - Venting of atmospheric and low-pressure storage tanks (ISO 28300:2008)

Industries du pétrole, de la pétrochimie et du gaz naturel - Ventilation des réservoirs de stockage à pression atmosphérique et à basse pression (ISO 28300:2008)

Erdöl, petrochemische und Erdgasindustrie - Be- und Entlüftung von Lagertanks mit atmosphährischem Druck oder niedrigem Überdruck (ISO 28300:2008)

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 28300:2008) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" in collaboration with Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2008, and conflicting national standards shall be withdrawn at the latest by December 2008.

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Endorsement notice

The text of ISO 28300:2008 has been approved by CEN as a EN ISO 28300:2008 without any modification.

INTERNATIONAL STANDARD

ISO 28300

First edition
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Petroleum, petrochemical and natural gas industries — Venting of atmospheric and low-pressure storage tanks

Industries du pétrole, de la pétrochimie et du gaz naturel — Ventilation des réservoirs de stockage à pression atmosphérique et à basse pression

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 28300 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

Introduction

This International Standard was developed from the 5th edition of API Std 2000 and EN 14015:2005, with the intent that the 6th edition of API Std 2000 be identical to this International Standard.

This International 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 International 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 International Standard, where practical, US Customary (USC) units are included in parentheses or in separate tables, for information.

Petroleum, petrochemical and natural gas industries — Venting of atmospheric and low-pressure storage tanks

1 Scope

This International Standard covers the normal and emergency vapour venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks designed as atmospheric storage tanks or low-pressure storage tanks. Discussed in this International 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 International 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 International Standard is applied to other liquids.

This International Standard does not apply to external floating-roof tanks.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4126-4, *Safety devices for protection against excessive pressure — Part 4: Pilot operated safety valves*

ISO 16852, *Flame arresters — Performance requirements, test methods and limits for use*

ISO 23251, *Petroleum, petrochemical and natural gas industries — Pressure-relieving and depressuring systems*

IEC 60079-10, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas*

DIN 4119[1)] (all parts), *Above-ground cylindrical flat-bottom tank structures of metallic materials*

3 Terms, definitions and abbreviated terms

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

3.1
accumulation
pressure increase over the maximum allowable working pressure or design pressure of the vessel allowed during discharge through the pressure-relief device

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

1) Deutsches Institut für Normung (DIN), Burggrafenstrasse 6, Berlin, Germany D-10787.

3.2
adjusted set pressure
inlet static pressure at which a pressure-relief valve is adjusted to open on the test stand

See **set pressure** (3.19).

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

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

3.3
British thermal unit
Btu
unit of heat that increases the temperature of one pound of water by one degree Fahrenheit

3.4
emergency venting
venting required when an abnormal condition, such as ruptured internal heating coils or an external fire, exists either inside or outside a tank

3.5
non-refrigerated tank
container that stores material in a liquid state without the aid of refrigeration, either by evaporation of the tank contents or by a circulating refrigeration system

NOTE Generally, the storage temperature is close to, or higher than, ambient temperature.

3.6
normal cubic metres per hour
Nm^3/h
SI unit for volumetric flow rate of air or gas at a temperature of 0 °C and pressure of 101,3 kPa, expressed in cubic metres per hour

3.7
normal venting
venting required because of operational requirements or atmospheric changes

3.8
overpressure
pressure increase at the PV valve inlet above the set pressure, when the PV valve is relieving

NOTE 1 Overpressure is expressed in pressure units or as a percentage of the set pressure.

NOTE 2 The value or magnitude of the overpressure is equal to the value or magnitude of the accumulation when the valve is set at the maximum allowable working pressure or design pressure and the inlet piping losses are zero.

3.9
petroleum
crude oil

3.10
petroleum products
hydrocarbon materials or other products derived from crude oil

3.11
PV valve
weight-loaded, pilot-operated, or spring-loaded valve, used to relieve excess pressure and/or vacuum that has developed in a tank

3.12
rated relieving capacity
flow capacity of a relief device expressed in terms of air flow at standard or normal conditions at a designated pressure or vacuum

NOTE Rated relieving capacity is expressed in SCFH or Nm^3/h.

3.13
refrigerated tank
container that stores liquid at a temperature below atmospheric temperature with or without the aid of refrigeration, either by evaporation of the tank contents or by a circulating refrigeration system

3.14
relief device
device used to relieve excess pressure and/or vacuum that has developed in a tank

3.15
relieving pressure
pressure at the inlet of a relief device when the fluid is flowing at the required relieving capacity

3.16
required flow capacity
flow through a relief device required to prevent excessive pressure or vacuum in a tank under the most severe operating or emergency conditions

3.17
rollover
uncontrolled mass movement of stored liquid, correcting an unstable state of stratified liquids of different densities and resulting in a significant evolution of product vapour

3.18
standard cubic feet per hour
SCFH
USC unit for volumetric flow rate of air or gas (same as free air or free gas) at a temperature of 15,6 °C (60 °F) and an absolute pressure of 101,3 kPa (14,7 psi), expressed in cubic feet per hour

3.19
set pressure
gauge pressure at the device inlet at which the relief device is set to start opening under service conditions

3.20
thermal inbreathing
movement of air or blanketing gas into a tank when vapours in the tank contract or condense as a result of weather changes (e.g. a decrease in atmospheric temperature)

3.21
thermal out-breathing
movement of vapours out of a tank when vapours in the tank expand and liquid in the tank vapourizes as a result of weather changes (e.g. an increase in atmospheric temperature)

3.22
wetted area
surface area of a tank exposed to liquid on the interior and heat from a fire on the exterior