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Second edition
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Oil and gas industries including lower carbon energy — Flare details for general refinery and petrochemical service

Industries du pétrole et du gaz, y compris les énergies à faible teneur en carbone — Détails sur les torches d'usage général dans les raffineries et dans les usines pétrochimiques

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 6, *Process equipment, piping, systems, and related safety,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Oil and gas industries including lower carbon energy,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 25457:2008), which has been technically revised.

This document supplements API Std 537, 3rd edition (2017) including Addendum 1.

The technical requirements of this document and API Std 537 used to be identical. In the meantime API Std 537 has been technically revised as API 537, 3rd edition (2017) with Addendum 1. The purpose of this edition of ISO 25457 is to bring it up to date, by referencing the current edition of API Std 537 and including its supplementary content.

The main changes are as follows:

— supplementary requirements edition for pellet flare ignition systems;

— update of the volumetric flow formula.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Oil and gas industries including lower carbon energy — Flare details for general refinery and petrochemical service

1 Scope

This document specifies requirements and provides guidance for the selection, design, specification, operation, and maintenance of flares and related combustion and mechanical components used in pressure-relieving and vapor-depressurizing systems for petroleum, petrochemical, and natural gas industries.

While this document is primarily intended for onshore facilities, guidance related to offshore applications is included. Guidance and best practices for the selection, specification, and mechanical details for flares and on the design, operation, and maintenance of flare combustion and related equipment is also provided.

This document is a supplement to API 537, 3rd edition (2017) including Addendum 1, the requirements of which are applicable with the exceptions specified in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

API Std 537, 3rd edition (2017), *Flare Details for Petroleum, Petrochemical, and Natural Gas Industries*

API Std 537, Addendum 1, *Addendum to Flare Details for Petroleum, Petrochemical, and Natural Gas Industries, Third Edition (2020)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in API 537, 3rd edition (2017) and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
ballistic/pyrotechnical ignition system
flare tip ignition system based on projectile technology that is launched from a cabinet via a guide tube to the flare deck

4 Supplements to API 537, 3rd edition (2017)

4.1 General requirements

The requirements specified in API 537, 3rd edition (2017) shall apply, with the exception specified in 4.2 and 4.3.

4.2 Limitations for design procedures

The requirements specified in API 537, 3rd edition (2017), Clause 4 shall apply with the following addition.

Direct flare ignition by ballistic/pyrotechnical ignition systems:

There are numerous ballistic/pyrotechnical ignition systems designs available from which to select the most appropriate for the application.

Direct flare ignition systems, i.e. ballistic/pyrotechnical ignition systems, shall include the following components:

— a manual or automatic launching system able to deliver the projectile to the flare top platform;

— a guide tube/pipe to ensure that the projectile is transported from launch location to delivery point on the flare top platform;

— a method for delivering by compressed dry nitrogen or air the projectile to the tip (some self-propelled projectiles can be considered as an alternative);

— a capture device to collect spent projectiles safely.

Several constraints shall be applied to these ignition systems:

a) The guide tube shall be purged in conformity with manufacturer's recommendation to avoid blockage within the tube from water or sand or dust and maintain a dry atmosphere. In addition, this purge shall be sufficient to prevent flammable gas from returning down the guide tube/pipe. This information should be provided at the bidding stage.

b) Projectiles shall be safe for handling, storage and loading, and for removal in their spent state. This information should be provided at the bidding stage.

c) The supplier shall have a system to contain spent projectiles in a safe location. Information on this system should be provided at the bidding stage.

d) The supplier shall ensure safe burn out of the sparks around the tip to ensure that there are no hot dropped objects.

4.3 Volumetric flow rate

The recommendations specified in API 537, 3rd edition (2017), E.2.3 Form General 3, Line 6, Equation (E.3) should apply with the following exception:

$$V_{eq} = 3.091 \times q_m \times \sqrt{\frac{T_{gas}}{M_{gas}}}$$

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