
Environmental damage limitation from fire-fighting water run-off

*Limitation des dommages environnementaux dus au ruissellement
des eaux de lutte contre l'incendie*



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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.

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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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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Introduction

Fires involving commercial storage facilities and industrial plants are generally controlled by applying large volumes of water. These facilities routinely store or use large quantities of materials and manufactured products, often flammable and combustible. These substances, whether combusted or not, can be transported by uncontrolled water run-off in the event of a fire and could give rise to severe environmental pollution problems.

The latest Organisation for Economic Co-operation and Development (OECD) report in the series *Environmental Outlook for the Chemicals Industry*^[1], notes that, in the European Union, chemical accidents that cause ecological harm often involve water pollution; this pollution is frequently the result of fire-water run-off.

The seriousness of these threats depends on various factors, including the nature and quantity of the materials involved, the emergency planning measures in place, and the location of the fire relative to susceptible populations and environments. Contamination far beyond the locality of the fire can result from fire scenarios that generate large quantities of harmful combustion products and fire suppression that involves large quantities of water. The environmental hazard can be worsened by interactions between the product that is burning, the combustion products produced and the extinguishing agent.

This Technical Report provides a summary of current approaches to controlling and reducing adverse environmental impacts caused by fire-water run-off. The intended audience for this Technical Report includes, but is not necessarily limited to:

- Fire-fighters and investigators.
- Building owners and managers.
- Storage facility operators.
- Materials and product manufacturers.
- Insurance providers.
- Environmental regulatory authorities.
- Civil defence organizations.
- Public health authorities.
- Industrial safety authorities.

Environmental damage limitation from fire-fighting water run-off

1 Scope

This Technical Report provides information for the development of specifications and procedures aimed at limiting adverse environmental impacts caused by fire-water run-off (see References [2] to [7]). The information is applicable to commercial facilities, such as warehouses, chemical storage facilities, refineries, process plants which handle and/or store products with a potential pollution potency, and vehicles for the transport of such substances. It is only applicable to land-based operations (i.e. not oil tankers or off-shore oil drilling platforms), and to wildland fires.

As such, this Technical Report provides a summary of current potential approaches for controlling and eliminating adverse environmental impacts caused by fire-fighting water run-off. It offers relevant information for the design and sizing of water basins to limit the dispersion of contaminated water into the environment at large (see References [8] to [12]). This Technical Report is divided into three main parts: a description of the hazards of fire run-off, environmental damage limitation and details concerning the possible design of water basins.

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 13943, *Fire safety — Vocabulary*

ISO 14001, *Environmental management systems — Requirements with guidance for use*

ISO 14050, *Environmental management — Vocabulary*

ISO 26367-1, *Guidelines for assessing the adverse environmental impact of fire effluents — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943, ISO 14001, ISO 14050, ISO 26367-1 and the following apply.

3.1

fire effluent

totality of gases and aerosols, including suspended particles, created by combustion or pyrolysis in a fire

NOTE For the purpose of this Technical Report, fire effluent also includes run-off water generated during fire-fighting activities.

3.2

fire-water run-off

aqueous fire effluent containing dissolved and waterborne materials

NOTE Materials that may be present include substances affected by the fire, combustion products, and substances used to fight the fire.

3.3

biochemical oxygen demand

BOD

indirect measure of the concentration of biologically degradable material present in water

NOTE This definition is based on OECD documents (References [13] and [14]).