
**Guidelines for treatment and reuse of
leachate from municipal solid waste
(MSW) incineration plants**

*Lignes directrices pour le traitement et la réutilisation du lixiviat
provenant des installations d'incinération des déchets ménagers*



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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.

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 documents 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 282, *Water reuse*, Subcommittee SC 2, *Water reuse in urban areas*.

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.

Introduction

Commonly used methods for disposal of municipal solid waste (MSW) include landfilling, incineration and composting ([Annex D](#)), and each of these methods generates leachate. Leachate is a kind of wastewater containing highly concentrated organic contaminants that can pose a high risk to the environment. It is necessary for leachate to have proper treatment before being discharged or reused to avoid adverse impacts on the environment. Due to the differences in duration of waste stacking and fermenting, leachate from different MSW disposal methods varies significantly in the concentration and biodegradability of organic matter, which requires tailored treatment processes. Leachate generated from MSW incineration plants has a higher concentration of biodegradable organic pollutants, and thus degrades more easily than leachate from landfills and composting plants. Due to higher quality requirements for water reuse in MSW incineration plants, this document focuses on leachate treatment and reuse in MSW incineration plants.

In MSW incineration plants the MSW first enters the unloading platform and then goes to the MSW pit, where stacking and fermentation occurs. The stacking and fermenting process aims to reduce moisture content of the MSW before incineration. The MSW leachate has a strong odour and high concentrations of organic and inorganic compounds; it includes stacking and fermenting wastewater and unloading platform flushing water. Many kinds of wastewater, such as municipal wastewater, industrial wastewater and stormwater, are used as sources of reclaimed water to address worldwide water shortages caused by economic growth, increasing populations, climate change and other factors.

The quality and quantity of MSW leachate can vary based on climate, residents' living habits, composition of waste and waste collection and separation systems. Therefore, leachate treatment can be more challenging than other kinds of wastewater treatment. Due to the complex composition of leachate and the high concentrations of pollutants, a combined treatment process is usually necessary for leachate treatment to meet environmental requirements and intended reuse applications. The essential components of the leachate treatment and reuse system include pretreatment, biological treatment and advanced treatment.

In consideration of the problems in the treatment of MSW leachate and the absence of relevant International Standards, an integrated standard is needed to guide the treatment and reuse of MSW leachate.

This document aims to provide design and operation principles and advice for MSW leachate treatment and reuse in MSW incineration plants. It considers and addresses the critical issues and factors in the design and operation of treatment and reuse systems and is intended to assist engineers, authorities, decision-makers and stakeholders in providing a clear structure and feasible approach for safe and reliable treatment and reuse of MSW leachate.

Guidelines for treatment and reuse of leachate from municipal solid waste (MSW) incineration plants

1 Scope

This document provides guidelines for the treatment and reuse of MSW leachate.

It is applicable to personnel involved in the design, management, operation and supervision of the treatment and reuse of MSW leachate and environmental authorities engaged in regulation.

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.

ISO 20670, *Water reuse — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20670 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

municipal solid waste

MSW

waste stream consisting of end-of-life-materials

[SOURCE: ISO 16559:2022, 3.135, modified — Notes to entry removed.]

3.2

MSW leachate

mixture of flushing water from the waste unloading platform and wastewater generated during the *stacking and fermenting* (3.3) process

3.3

stacking and fermenting

process to reduce moisture content of MSW and to degrade the organic materials in a MSW pit, during which leachate is generated

3.4

leachate treatment system

treatment units that receive and treat municipal solid waste leachate

Note 1 to entry: Leachate treatment systems include those for preliminary treatment, biological treatment, advanced treatment, disposal of sludge and concentrate and odour control.