



# International Standard

Redline version  
compares Second edition  
to First edition



## ISO 23500-3

### Preparation and quality management of fluids for haemodialysis and related therapies —

#### Part 3: Water for haemodialysis and related therapies

*Préparation et management de la qualité des liquides  
d'hémodialyse et de thérapies annexes —*

*Partie 3: Eau pour hémodialyse et thérapies apparentées*

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions and deletions are displayed in red, with deletions being struck through.



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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 ~~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](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 150, *Implants for surgery*, Subcommittee SC 2, *Cardiovascular implants and extracorporeal systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 205, *Non-active medical devices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This ~~first~~ **second** edition cancels and replaces ~~the first edition (ISO 13959-2014)~~ **23500-3:2019**, which has been technically revised. ~~The main changes compared to the previous edition are as follows:~~

**The main changes are as follows:**

- ~~The document forms part of a revised and renumbered series dealing with the preparation and quality management of fluids for haemodialysis and related therapies. The series comprise ISO 23500-1 (previously ISO 23500), ISO 23500-2, (previously ISO 26722), ISO 23500-3, (previously ISO 13959), ISO 23500-4, (previously ISO 13958), and ISO 23500-5, (previously ISO 11663).~~
- the use of WHO Drinking Water Guideline as the drinking water quality reference has replaced the previously used EPA Water quality requirements;
- thallium has been removed from the list of contaminants of other trace elements in dialysis water as no published study reports that this contaminant is of particular concern in the setting of haemodialysis;
- alternatives to classic microbial analytical methods (endotoxin testing using recombinant Factor C [rFC]) have been incorporated.

A list of all parts in the ~~ISO 23500 series~~ **23500 series** can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

Assurance of adequate water quality is one of the most important aspects of ensuring a safe and effective delivery of haemodialysis, haemodiafiltration or haemofiltration.

This document contains ~~the~~ minimum ~~requirements~~, chemical and microbiological, ~~requirements~~ for the water to be used for preparation of dialysis fluids, ~~and~~ concentrates, and for the reprocessing of haemodialysers and the necessary steps to ensure conformity with those requirements.

Haemodialysis and related therapies such as haemodiafiltration can expose the patient to more than 500 l of water per week across the semi-permeable membrane of the haemodialyser or haemodiafilter. Healthy individuals seldom have a weekly oral intake above 12 l. This over 40-fold increase in exposure requires control and regular surveillance of water quality to avoid excesses of known or suspected harmful substances. Since knowledge of potential injury from trace elements and contaminants of microbiological origin over long periods is still growing and techniques for treating drinking water are continuously developed, this document will evolve and be refined accordingly. The physiological effects attributable to the presence of organic contaminants in dialysis water are important areas for research, however, the effect of such contaminants on patients receiving regular dialysis treatment is largely unknown, consequently no threshold values for organic contaminants permitted in water used for the preparation of dialysis fluids, concentrates and reprocessing of haemodialysers has been specified in this ~~revised~~ document.

Within this document, ~~current~~ measurement techniques ~~current~~ at the time of publication have been cited. Other standard methods can be used, provided that such methods have been appropriately validated and are comparable to the cited methods.

The final dialysis fluid is produced from concentrates or salts manufactured, packaged and labelled according to ISO 23500-4 mixed with water meeting the requirements of this document. ~~Operation~~ ~~The operation~~ of water treatment equipment and haemodialysis systems, including ~~on-going~~ ~~ongoing~~ surveillance of the quality of water used to prepare dialysis fluids, and handling of concentrates and salts are the responsibility of the haemodialysis facility and are addressed in ISO 23500-1. Haemodialysis professionals make choices about the various applications (haemodialysis, haemodiafiltration, haemofiltration) and should understand the risks of each and the requirements for safety for fluids used for each.

This document is directed towards manufacturers and providers of water treatment systems and also to haemodialysis facilities.

<https://standards.iteh.ai/catalog/standards/iso/89c28b50-0248-41d3-afb0-73d742f36334/iso-23500-3-2024>  
The rationale for the development of this document is given in ~~informative~~ Annex A.