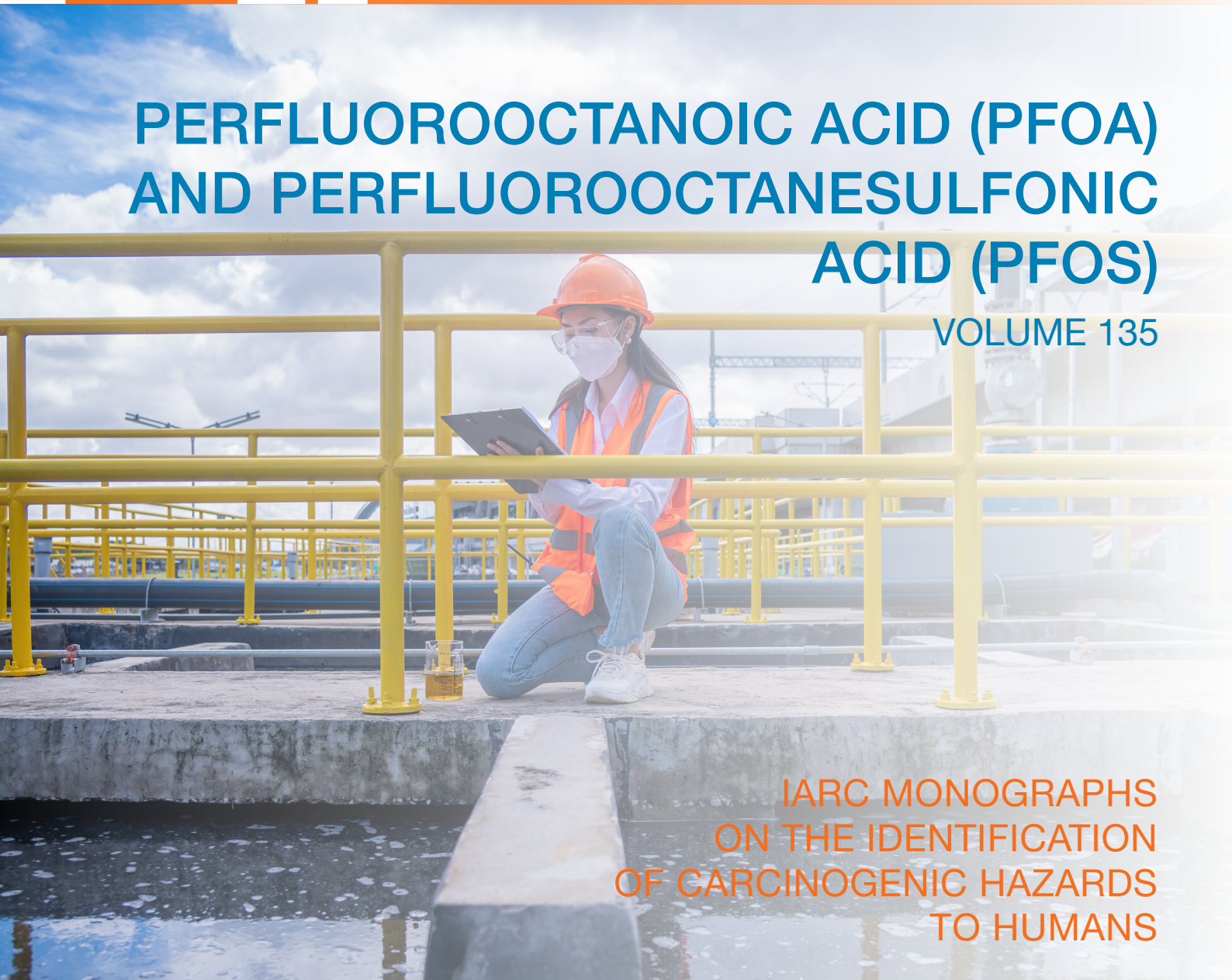


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IARC MONOGRAPHS

# PERFLUOROOCTANOIC ACID (PFOA) AND PERFLUOROOCTANESULFONIC ACID (PFOS)

VOLUME 135



IARC MONOGRAPHS  
ON THE IDENTIFICATION  
OF CARCINOGENIC HAZARDS  
TO HUMANS

International Agency for Research on Cancer



World Health  
Organization

## IARC MONOGRAPHS

In 1969, the International Agency for Research on Cancer (IARC) initiated a programme on the evaluation of the carcinogenic hazard of chemicals to humans, involving the production of critically evaluated monographs on individual chemicals. The programme was subsequently expanded to include evaluations of carcinogenic hazards associated with exposures to complex mixtures, lifestyle factors and biological and physical agents, as well as those in specific occupations. The objective of the programme is to elaborate and publish in the form of monographs critical reviews of data on carcinogenicity for agents to which humans are known to be exposed and on specific exposure situations; to evaluate these data in terms of cancer hazard to humans with the help of international working groups of experts in carcinogenesis and related fields; and to identify gaps in evidence. The lists of IARC evaluations are regularly updated and are available on the internet at <https://monographs.iarc.who.int/>.

This programme has been supported since 1982 by Cooperative Agreement U01 CA33193 with the United States National Cancer Institute, Department of Health and Human Services. Additional support has been provided since 1986 by the European Commission Directorate-General for Employment, Social Affairs, and Inclusion, initially by the Unit of Health, Safety and Hygiene at Work, and since 2014 by the European Union Programme for Employment and Social Innovation “EaSI” (for further information please consult: <https://ec.europa.eu/social/easi>). Support has also been provided since 1992 by the United States National Institute of Environmental Health Sciences, Department of Health and Human Services. The contents of this volume are solely the responsibility of the Working Group and do not necessarily represent the official views of the United States National Cancer Institute, the United States National Institute of Environmental Health Sciences, the United States Department of Health and Human Services, or the European Commission.



Co-funded by the European Union

Published by the International Agency for Research on Cancer,  
25 avenue Tony Garnier, CS 90627, 69366 Lyon Cedex 07, France  
©International Agency for Research on Cancer, 2025  
Online publication, February 2025

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*IARC Monographs* (and Corrigenda) are published online at <https://publications.iarc.who.int>.  
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Distributed by WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland  
(tel.: +41 22 791 3264; fax: +41 22 791 4857; website: <https://apps.who.int/bookorders>; email: [bookorders@who.int](mailto:bookorders@who.int)).

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About the cover: Worker at a wastewater treatment plant. PFOA and PFOS are ubiquitous in the environment and may contaminate drinking-water.

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How to cite: IARC (2025). Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). *IARC Monogr Identif Carcinog Hazards Hum.* 135:1–754.

#### **IARC Library Cataloguing-in-Publication Data**

Names: IARC Working Group on the Identification of Carcinogenic Hazards to Humans.

Title: Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS)

Description: Lyon: International Agency for Research on Cancer, 2025. | Series: IARC monographs on the identification of carcinogenic hazards to humans, ISSN 1017-1606; v. 135. | “This publication represents the views and expert opinions of an IARC Working Group on the Identification of Carcinogenic Hazards to Humans, which met in Lyon, France, 7–14 November 2023.” | Includes bibliographical references.

Identifiers: ISBN 9789283201748 (pbk.) | ISBN 9789283202929 (ebook)

Subjects: MESH: Neoplasms--etiology. | Environmental Exposure. | Alkanesulfonic Acids. | Fluorocarbons. | Risk Factors.

Classification: NLM W1



The IARC *Monographs* Working Group and Secretariat for Volume 135, Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), which met in Lyon, France, on 7–14 November 2023.

This volume of the *IARC Monographs* provides evaluations of the carcinogenicity of two agents, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), and their corresponding isomers and salts.

PFOA and PFOS are per- and polyfluoroalkyl substances (PFAS) that are extremely resistant to degradation. First produced in the 1940s, PFOA has extensive uses, including in fluoropolymer manufacture and applications; in surface coatings conferring stain-, oil-, and water-resistance on household products, carpets, textiles, leather products, and food and feed packaging; in electrics and electronics; and in construction materials. With some similar uses to those of PFOA, PFOS additionally has applications in aqueous film-forming foams used in firefighting; in the fabrication of imaging devices and semiconductors; in photolithography and electroplating; and in insulation, dyes, and ink.

PFOA and PFOS occur ubiquitously in the environment, with high levels at pollution sources such as industrial sites and in firefighter-training areas and waste deposits. They may also be present in contaminated food, especially fish, seafood, and eggs. Occupationally exposed populations can have high levels of exposure, mainly via inhalation. The general population in contaminated areas is mainly exposed via drinking-water, and the general population in communities that are not near pollution sources is mainly exposed via diet and drinking-water.

An *IARC Monographs Working Group* reviewed evidence from epidemiological studies, cancer bioassays in experimental animals, and mechanistic studies to assess the carcinogenic hazard to humans of exposure to these agents and concluded that:

- PFOA is *carcinogenic to humans (Group 1)*;
- PFOS is *possibly carcinogenic to humans (Group 2B)*.

