

Dibenzofuran; CASRN 132-64-9

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

STATUS OF DATA FOR Dibenzofuran

File First On-Line 10/01/1990

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	not evaluated	
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	yes	10/01/1990

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Dibenzofuran

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Not available at this time.

I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)

Substance Name — Dibenzofuran

CASRN — 132-64-9

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Dibenzofuran

CASRN — 132-64-9

Last Revised — 10/01/1990

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

II.A. Evidence for Human Carcinogenicity

II.A.1. Weight-of-Evidence Characterization

Classification — D; not classifiable as to human carcinogenicity

Basis — Based on no human data and no animal data for dibenzofuran alone.

II.A.2. Human Carcinogenicity Data

None. There are no data on the possible carcinogenicity of dibenzofuran alone in humans. Studies have evaluated exposure to a mixture of polychlorinated biphenyls (PCBs), polychlorinated dibenzofurans (PCDFs) and polychlorinated quinones (PCQs) by consumption of contaminated rice oil (Yusho incident) (reviewed in U.S. EPA, 1986, 1987). However, these studies have limited value because they do not assess dibenzofuran or correlate exposure with

cancer risk. Additionally, because of the multiple exposures, the extent to which the various components contributed to the increase in cancer mortality cannot be determined.

II.A.3. Animal Carcinogenicity Data

None. No animal carcinogenicity data on dibenzofuran are currently available. U.S. EPA (1986) noted that the biological activity of PCDFs varies greatly, so that risk assessment of dibenzofuran by analogy to any of these more widely studied compounds would not be recommended.

II.A.4. Supporting Data for Carcinogenicity

Dibenzofuran is not mutagenic with or without metabolic activation in several strains of *Salmonella typhimurium* assay (Schoeny, 1982).

In a comparison of Toxic Equivalency Factor (TEF) values for chlorinated dibenzofurans, mono-, di- and tri-chlorinated dibenzofuran had TEF values of 0 (U.S. EPA, 1989). Based on these results and the fact that toxicity of polychlorinated dibenzofurans (PCDF) depends on the number of chlorine substituents and their position (U.S. EPA, 1986), the TEF for dibenzofuran, with no chlorine substituents, is set equal to 0.

II.B. Quantitative Estimate of Carcinogenic Risk from Oral Exposure

None.

II.C. Quantitative Estimate of Carcinogenic Risk from Inhalation Exposure

None.

II.D. EPA Documentation, Review, and Contacts (Carcinogenicity Assessment)

II.D.1. EPA Documentation

Source Document — U.S. EPA, 1986, 1987, 1989

The 1986 Health Assessment for Polychlorinated Dibenzofurans is an external draft for review purposes only and does not constitute Agency policy.

The 1987 Health Effects Assessment Document for Dibenzofuran has been reviewed in accordance with the U.S. Environmental Protection Agency's peer and administrative review policies and has been approved for publication.

II.D.2. EPA Review (Carcinogenicity Assessment)

Agency Work Group Review — 10/05/1989

Verification Date — 10/05/1989

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the cancer assessment for Dibenzofuran conducted in September 2002 did not identify any critical new studies. IRIS users who know of important new studies may provide that information to the IRIS Hotline at hotline.iris@epa.gov or (202)566-1676.

II.D.3. EPA Contacts (Carcinogenicity Assessment)

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) or hotline.iris@epa.gov (internet address).

III. [reserved]

IV. [reserved]

V. [reserved]

VI. Bibliography

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VI.A. Oral RfD References

None

VI.B. Inhalation RfD References

None

VI.C. Carcinogenicity Assessment References

Schoeny, R. 1982. Mutagenicity testing of chlorinated biphenyls and chlorinated dibenzofurans. *Mutat. Res.* 101: 45-56.

U.S. EPA. 1986. Health Assessment Document for Polychlorinated Dibenzofurans. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA 600/8-86/018A. NTIS PB86-221256/AS.

U.S. EPA. 1987. Health Effects Assessment for Dibenzofuran. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Emergency and Remedial Response, Washington, DC. ECAO-CIN-H088.

U.S. EPA. 1989. Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update. Risk Assessment Forum, Washington, DC. EPA/625/3-89/016.

VII. Revision History

Substance Name — Dibenzofuran
CASRN — 132-64-9

Date	Section	Description
10/01/1990	II.	Carcinogen assessment on-line
12/03/2002	II.D.2.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Dibenzofuran

CASRN — 132-64-9

Last Revised — 10/01/1990

- 132-64-9
- (1,1'-BIPHENYL)-2,2'-DIYL OXIDE
- 2,2'-BIPHENYLENE OXIDE
- 2,2'-BIPHENYLYLENE OXIDE
- DIBENZOFURAN
- DIBENZO(B,D)FURAN
- DIPHENYLENE OXIDE
- HSDB 2163
- NSC 1245