

## Fonofos; CASRN 944-22-9

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 Fonofos

**File First On-Line 03/31/1987**

Category (section)	Assessment Available?	Last Revised
<b>Oral RfD (I.A.)</b>	yes	03/31/1987
<b>Inhalation RfC (I.B.)</b>	not evaluated	
<b>Carcinogenicity Assessment (II.)</b>	not evaluated	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

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Last Revised — 03/31/1987

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of

information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

**I.A.1. Oral RfD Summary**

Critical Effect	Experimental Doses*	UF	MF	RfD
<b>Cholinesterase inhibition, cholinergic symptoms, and increased liver weight</b>	NOEL: 0.2 mg/kg/day LEL: 1.5 mg/kg/day	100	1	2E-3 mg/kg/day
<b>2-Year Dog Feeding Study</b>				
<b>Stauffer Chemical Co., 1969</b>				

\*Conversion Factors: none

**I.A.2. Principal and Supporting Studies (Oral RfD)**

Stauffer Chemical Company. 1969. MRID 00082233. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Groups of purebred beagle dogs, four males and four females/group, were fed 0, 0.2, 1.5, and 12 mg/kg/day fonofos (dyfonate) in diets for 2 years. The following effects were observed at 1.5 mg/kg/day: moderate inhibition of red blood cell cholinesterase, an increase in liver weight, tremors, lacrimation and salivation. At 12 mg/kg/day, there were increases in liver weight, and tissue reactions (microscopically) in the small intestine and liver. No compound-related effects were observed at 0.2 mg/kg/day.

### **I.A.3. Uncertainty and Modifying Factors (Oral RfD)**

UF — Based on a chronic exposure study, an uncertainty factor of 100 was used to account for the inter- and intraspecies differences.

MF — None

### **I.A.4. Additional Studies/Comments (Oral RfD)**

The 2-year rat feeding study was not used to derive the RfD because of the equivocal ChE depression observed. The cholinergic and systemic effects observed in the dog, the NOEL in this species, and the appropriate UF provided, overall, a better basis and a more conservative level for an RfD.

Data Considered for Establishing the RfD:

1) 2-Year Feeding - dog: Principal study - see previous description; core grade minimum

2) 2-Year Feeding (oncogenic) - rat: NOEL=0.5 mg/kg/day (equivocal brain ChE inhibition); LEL=1.58 mg/kg/day (plasma and RBC ChE inhibition); core grade supplementary (Stauffer Chemical Co., 1968a)

3) 3-Generation Reproduction - rat: Fetotoxic NOEL=1.58 mg/kg/day (HDT); core grade minimum (Stauffer Chemical Co., 1968b)

4) Teratology - mice: Fetotoxic NOEL=2 mg/kg/day; Fetotoxic LEL=6 mg/kg/day (sternebrae malalignment and slight dilation of 4th cerebral ventricles); core grade minimum (Stauffer Chemical Co., 1982)

Data Gap(s): 2-Year Feeding/Oncogenic Rat Study; Rat Teratology Study; Rabbit Teratology Study

### **I.A.5. Confidence in the Oral RfD**

Study — Medium

Database — Medium

RfD — Medium

The principal study appears to be of fair quality and is given a medium confidence rating. Since the database for chronic toxicity is relatively complete, the database is given a medium confidence rating. Medium confidence in the RfD follows.

### **I.A.6. EPA Documentation and Review of the Oral RfD**

Pesticide Registration Standard, August 1983

Pesticide Registration Files

Agency Work Group Review — 06/24/1986

Verification Date — 06/24/1986

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for Fonofos conducted in November 2001 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](mailto:hotline.iris@epa.gov) or (202)566-1676.

### **I.A.7. EPA Contacts (Oral RfD)**

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](mailto:hotline.iris@epa.gov) (internet address).

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

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Not available at this time.

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## **II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — Fonofos

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This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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## **VI. Bibliography**

Substance Name — Fonofos  
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### **VI.A. Oral RfD References**

Stauffer Chemical Company. 1969. MRID 00082233. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Stauffer Chemical Company. 1968a. MRID 00082232. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Stauffer Chemical Company. 1968b. MRID 00082234. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Stauffer Chemical Company. 1982. MRID 00118423. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

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### **VI.B. Inhalation RfC References**

None

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### **VI.C. Carcinogenicity Assessment References**

None

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## VII. Revision History

Substance Name — Fonofos

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Date	Section	Description
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.

## VIII. Synonyms

Substance Name — Fonofos

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Last Revised — 03/31/1987

- 944-22-9
- DIFONATE
- DYFONATE
- DYPHONATE
- ENT 25,796
- Fonofos
- FONOPHOS
- N 2790
- O-AETHYL-S-PHENYL-AETHYL-DITHIOPHOSPHONAT
- O-ETHYL S-PHENYL ETHYLDI-THIOPHOSPHONATE
- O-ETHYL-S-PHENYL ETHYLPHOSPHONODITHIOATE
- PHOSPHONODITHIOIC ACID, ETHYL-, O-ETHYL S-PHENYL ESTER
- STAUFFER N 2790