



# Material Safety Data Sheet

HCS Risk Phrases
Not controlled under the HCS (United States).

Section I. Chemical Product and Company Identification	
Common Name/ Trade Name	<b>Benzoflex® 9-88</b>
In Case of Emergency	In the continental U.S.A. call CHEMTREC 800-424-9300 (24 hours)  Outside the continental U.S.A. call CHEMTREC 703-527-3887 (24 hours)
Supplier	Velsicol Chemical Corporation 10400 W. Higgins Road Rosemont, IL 60018 U.S.A. Phone: 847-298-9000 Fax: 847-298-9015
Manufacturer	Velsicol Chemical Corporation 10400 W. Higgins Road Rosemont, IL 60018 U.S.A. Phone: 847-298-9000 Fax: 847-298-9015
Synonym	Dipropylene Glycol, Dibenzoate
Chemical Name	Propanol, oxybis-, dibenzoate
Chemical Family	Ester
Chemical Formula	C20 H22 O5
Material Uses	Coatings: Plasticizer for adhesives, caulks, flooring and paints.

Section II. Composition and Information on Ingredients				
Name	CAS#	% by Weight	TLV/PEL	OSHA Hazardous Ingredients
1) Dipropylene glycol dibenzoate	27138-31-4	89.4	Not established.	No
2) Dipropylene glycol monobenzoate	32686-95-6	4.98	Not established.	No
	197178-94-2	2.35	Not established.	No
3) Propenyl Propyl Benzoate	19224-26-1	2.29	Not established.	No
4) Propylene glycol dibenzoate	37086-84-3	0.28	Not established.	No
5) Propylene glycol monobenzoate				

Section III. Hazards Identification	
Emergency Overview	Off-white. Clear, oily liquid. Mild odor. <b>HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES.</b>
Potential Health Effects	Inhalation and skin contact are expected to be the primary routes of occupational exposure to Benzoflex 9-88. This material is not expected to cause significant adverse human health effects when used in accordance with good industrial hygiene and safety practices are followed.

Section IV. First Aid Measures	
Eye Contact	Flush with plenty of water. Seek medical attention if irritation persists.
Skin Contact	Flush the area with plenty of water. Remove material from clothing. Wash clothing before reuse.
Inhalation	Remove to fresh air.
Ingestion	If swallowed, induce vomiting as directed by medical personnel. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Section V. Fire and Explosion Data	
Flammability of the Product	Combustible
Auto-Ignition Temperature	>400°C (752°F)
Flash Points	CLOSED CUP: 192°C (377.6°F)
Flammable Limits	Not applicable.
Fire and Explosion Hazards	Products of combustion are carbon oxides (CO, CO2). Slightly flammable in presence of open flames and sparks, of heat. Not considered to present risks of explosion.
Fire Fighting Media	Use dry chemicals, CO2, water spray or foam. Water or foam may cause frothing.

Firefighters and others who may be exposed to products of combustion should wear full firefighting turnout gear and self-contained breathing apparatus. Firefighting equipment should be thoroughly decontaminated after use.

### Section VI. Accidental Release Measures

Small Spill	Absorb with an inert material and place in an appropriate waste disposal container.
Large Spill	Stop the leak, if possible. Remove all ignition sources. Ventilate the area involved. Absorb with an inert material and put the spilled material in an appropriate waste disposal container.

### Section VII. Handling and Storage

Handling	Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin, and clothing. Keep away from heat, sparks, and sources of ignition.
Storage	Store in well ventilated area away from sources of ignition.

### Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Investigate engineering controls to reduce exposures. If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Provide ventilation if necessary to minimize exposure.
Personal Protection	Safety glasses. Lab coat. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Section IX. Physical and Chemical Properties

Physical State / Appearance	Clear oily liquid.
Color	Off-white.
Odor	Mild ester odor.
Boiling Point	Decomposes at >270°C (518°F) without boiling.
Melting Point	Not available.
Critical Temperature	Not available.
Specific Gravity	1.12 (Water = 1)
Vapor Pressure	0.000012 mm of Hg (@ 25°C)
Vapor Density	11.8 (Air = 1)
Volatility	Volatile Organics Content (VOC) = 5.90 +/- 0.75% (w/w) [ASTM Method D2369; EPA Method 24]
Odor Threshold	Not available.
Evaporation Rate	Lower than 1. compared to Butyl acetate.
Viscosity	Approximately 110 cP @ 250 C.
Solubility	8.96 mg/l for Dipropylene Glycol Dibenzoate component. Dipropylene glycol monobenzoate is significantly soluble relative to the dibenzoate.
pH (1% soln/water)	Not available.
Molecular Weight	342

### Section X. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	No additional remark.
Incompatibility with Various Substances	Slightly reactive to reactive with oxidizing agents, acids, and alkalis.
Corrosivity	Not considered to be corrosive for metals and glass according to our database.
Hazardous Polymerization	Will not occur.
Hazardous Decomposition Products	Not available.

### Section XI. Toxicological Information

Toxicity to Animals	Velsicol Chemical Corporation has conducted toxicity test on Benzoflex 9-88. The results are summarized below.  Oral (LD50) Rat: 5,313 mg/kg, Practically non-toxic Dermal (LD50) Rat: > 2,000 mg/kg, No more than slightly toxic Inhalation (LC50) (mist) > 200 mg/l, Practically non-toxic
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No dermal reaction was reported following a single semi-occlusive application of Benzoflex 9-88 to intact rabbit skin for 4 hours. A single instillation of Benzoflex 9-88 into the eye of the rabbit elicited transient very slight conjunctival irritation only. No allergic skin reaction was reported in guinea pigs after repeated skin contact (intradermal and topical) using the Magnusson and Kligman method.

Decreased body weight gain and blood, liver and caecum effects were reported in rats given up to 2500 mg/kg/day in their diet for 13 weeks. The non-toxicologically significant NOEL was judged to be 1000 mg/kg/day. All treatment related changes showed evidence of, or complete, recovery after 4 weeks without treatment. No effects were reported in dogs administered up to 1200 mg/kg/day Benzoflex 9-88 in their diet for 90 days.

Benzoflex 9-88 did not induce mutagenic activity in bacteria (Salmonella or E.coli) or mammalian cells (mouse lymphoma). This material did not induce clastogenic activity (chromosome aberrations) in Chinese hamster lung (CHL) cell in vitro.

Benzoflex 9-88 did not induce vaginal cornification at doses up to 2000 mg/kg/day for 7 days, by oral gavage, in ovariectomized adult rats. Benzoflex 9-88 did not increase uterine weight or uterine weight to final body weight ratio at doses up to 2000 mg/kg/day for 7 days, by oral gavage, in ovariectomized adult rats. This demonstrates that 9-88 does not exhibit estrogenic activity up to and including the maximum tolerated dose (MTD).

### Ecological Information

Velsicol Chemical Corporation has conducted ecotoxicity tests on Benzoflex 9-88. The results are summarized below.

No observed effect level: 1000 ppm, earthworm

EC50: > 10 mg/l, Bacteria (*Pseudomonas putida*) 10 mg/l was the highest attainable concentration that could be prepared due to the limited solubility of the test material in water and auxiliary solvent and the limitations imposed by the addition of nutrient solutions and bacterial suspension to the test material stock solution.

Benzoflex 9-88 had no inhibitory effect on the respiration rate of activated sludge at concentrations up to 100 mg/l.

Velsicol Chemical Corporation has conducted chemical fate tests on Benzoflex 9-88. The results are summarized below.

Benzoflex 9-88 is considered readily biodegradable in the CO<sub>2</sub> evolution test (modified Sturm test). The mean CO<sub>2</sub> production by mixtures of Benzoflex 9-88 was equivalent to 6% of the theoretical value (TCO<sub>2</sub>, 106.4 mg C<sub>02</sub>) after 2 days of incubation and 62% after 12 days; a mean level of 87% degradation was achieved by the end of the test on Day 29.

The BOD<sub>5</sub> of Benzoflex 9-88 was 34% of it's COD. Substances are generally considered readily biodegradable in the Closed Bottle test if the ratio of BOD<sub>5</sub>:COD or ThOD is >50. Benzoflex 9-88 therefore cannot be considered readily biodegradable in the screening test.

Benzoflex 9-88 is considered ultimately biodegradable under anaerobic conditions in the biogas production test. The level of anaerobic biodegradation, based on biogas measurements alone, was equivalent to 40% by Day 60 and the total level of biodegradation (dissolved inorganic carbon plus biogas) was calculated to be 46% of the theoretical level. The total level of biodegradation by Day 120 was 75% of the initial nominal carbon level (12 mg C/culture) and 90% of the level (10 mg C/culture) calculated assuming carbon was removed when samples were taken for dissolved inorganic content analysis.

### Disposal Considerations

Recycle to process, if possible. Consult your local or regional authorities for disposal options.

### Transport Information

Shipping Name	Not applicable.
Number	Not a DOT controlled material (United States).
Number	Not applicable.

Packing Group

Not applicable.

**Section XV. Other Regulatory Information and Pictograms**

Federal and State Regulations

On TSCA Inventory  
**Dipropylene Glycol Dibenzoate**  
**Propylene Glycol Dibenzoate**  
**Propylene Glycol Monobenzoate**

Not listed on the TSCA Inventory (By products of production process, not subject)  
**Dipropylene Glycol Monobenzoate**  
**Propenyl Propyl Benzoate**

Flavor and Extract Manufacturers' Association. FEMA. Generally Recognized (GRAS) listing.  
**Propylene Glycol Dibenzoate**

Other Classifications

WHMIS (Canada)

Not controlled under WHMIS (Canada).

HMIS (U.S.A.)

Health Hazard

1

National Fire Protection  
Association (U.S.A.)

Health

1

Fire Hazard

1

Fire Hazard

1

Reactivity

0

Reactivity

0

Personal Protection

Specific Hazard

**Section XVI. Other Information**

References

- REGISTRY Database, Chemical Abstract Service
- CHEMLIST Database, Chemical Abstract Service
- Registry of Toxic Effects of Chemical Substances (RTECS)
- Chemical Hazard Response Information System (CHRIS), Micromedex Inc.
- LOLI Database, Chem Advisor via Micromedex Inc.
- ICRMS European Database, Ariel Research Corporation
- ICRMS Inventories Database, Ariel Research Corporation
- Velsicol Chemical Corporation, unpublished studies.
- Product Information Bulletin, Velsicol Chemical Corporation

Other Special  
Considerations

Not applicable.

Prepared By &amp; Date

Emily Clark on 10/29/01

Supercedes

7/9/98

Revision

Re-validated

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