



UNION CARBIDE CORPORATION
MATERIAL SAFETY DATA SHEET



Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 1 of 15

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; 2) Furnish this same information to each of its customers for the product; and 3) Request its customers to notify their employees, customers, and other users of the product of this information.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name	CARBOWAX(TM) SENTRY(TM) POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
Chemical Name	Polyethylene Glycol
Chemical Family	Oxyalkylene Polymer
Formula	HO-(CH ₂ CH ₂) _n -H
Synonym	Polyoxyethylene 1450

1.2 COMPANY IDENTIFICATION

Union Carbide Corporation
39 Old Ridgebury Road
Danbury, CT 06817-0001

MARKETED BY
**HARWICK STANDARD
DISTRIBUTION CORPORATION**
60 S. Selberling Street - Akron, Ohio 44305

1.3 EMERGENCY TELEPHONE NUMBER

24 hours a day: 1-800-UCC-HELP (1-304-744-3487)
Number for non-emergency questions concerning MSDS (732) 563-5522
Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 2 of 15

2. COMPOSITION INFORMATION

Component	CAS #	Amount
Polyethylene glycol	25322-68-3	≤ 100%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance Transparent colorless, Above freezing point, White, Below freezing point

Physical State Liquid above freezing point, Solid below freezing point

Odor Mild

Hazards of product CAUTION! STATIC IGNITION HAZARD CAN RESULT FROM HANDLING AND USE.

3.2 POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation Short-term harmful health effects are not expected from vapor generated at ambient temperature.

Eye Contact No evidence of harmful effects from available information.

Skin Contact No evidence of harmful effects from available information.

Skin Absorption No evidence of harmful effects from available information.

Swallowing No evidence of harmful effects from available information.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 3 of 15

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure Although this material is not a skin irritant, submersion by workers of unprotected skin in highly concentrated solutions of this material for prolonged periods of time could result in skin dehydration.

Other Effects of Overexposure Overexposure to vapor generated at high temperatures may result in eye and respiratory tract irritation, dizziness, nausea and the inhalation of harmful amounts of material.

Medical Conditions Aggravated by Exposure

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

No emergency care anticipated.

4.2 EYE CONTACT

Flush eyes thoroughly with water for several minutes. Remove contact lenses, if worn. For thermal burns: Immediately flush eyes with water and continue washing for several minutes. DO NOT remove contact lenses, if worn. Obtain medical attention without delay, preferably from an ophthalmologist.

4.3 SKIN CONTACT

Wash skin with soap and water. For thermal burns: Remove clothing, any jewelry, and loose debris from the burned area. Leave any blisters intact. Wash the area thoroughly with room temperature tap water. DO NOT use ice. Cover the wounded area with gauze dressing moistened with cool water; keep the dressing moist. Seek medical attention.

4.4 SWALLOWING

No emergency care anticipated.

4.5 NOTES TO PHYSICIAN

Toxicology studies have shown this or similar material to be of very low acute toxicity and nonirritating.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 4 of 15

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Flash Point - Closed Cup: *Pensky-Martens Closed Cup ASTM D 93* 196 °C 385 °F

Flash Point - Open Cup: *Cleveland Open Cup ASTM D 92* 260 °C 500 °F

Autoignition Temperature: *Not currently available.*

Flammable Limits In Air:

Lower *Not determined.*

Upper *Not determined.*

5.2 EXTINGUISHING MEDIA

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

5.3 EXTINGUISHING MEDIA TO AVOID

No information currently available.

5.4 SPECIAL FIRE FIGHTING PROCEDURES

Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

For flaked, granular or powdered material: Avoid dispersion of dust in the air to reduce the potential for dust ignition/rapid burning. Dust is easily ignited; avoid ignition sources. In the presence of flammable gases, liquids, or vapors, handle in inert nitrogen-blanketed equipment.

Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77.

See Section 8.3 - Engineering Controls

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 5 of 15

5.7 HAZARDOUS COMBUSTION PRODUCTS

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

6. ACCIDENTAL RELEASE MEASURES

Steps to be taken if Material is Released or Spilled:

Collect for disposal.

Personal Precautions: Wear suitable protective equipment. See Section 8.2 - Personal Protection.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling

Electrically bond and ground all containers, personnel and equipment before transfer or use of material.

Maintain proper grounding at all times.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

Ventilation

General (mechanical) room ventilation is expected to be satisfactory.

Other Precautions

This product may contain trace amounts of ethylene oxide (CAS No. 75-21-8), a condition which creates the potential for accumulation of ethylene oxide in the head space of shipping and storage containers and in enclosed areas where the product is being handled or used. Ethylene oxide is listed by OSHA as probably carcinogenic to humans, IARC as carcinogenic to humans, and NTP as reasonably anticipated to be carcinogenic. OSHA considers that, at excessive levels, ethylene oxide may present reproductive, mutagenic, genotoxic, neurologic and sensitization hazards. If this product is handled with adequate ventilation, the presence of these trace amounts is not expected to result in any short or long term hazard. This product may not be exempt from OSHA's ethylene oxide standard, 29CFR1910.1047. Users should comply with all applicable provisions. Personnel should be monitored to determine levels of exposure to ethylene oxide. If necessary, protective measures should be taken. The OSHA permissible exposure limit for ethylene oxide is 1 ppm TWA8, the action level is 0.5 ppm TWA8, the ACGIH TLV is 1 ppm TWA8 and OSHA has established an excursion limit of 5 ppm (15 minute average).

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 6 of 15

7.2 STORAGE

STORAGE AND HANDLING INSTRUCTIONS: Use product promptly after opening. Avoid prolonged exposure to heat and air.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin Form
Nuisance Dust	10 mg/m ³ TWA8 ACGIH	Inhalable Particulate Particulate matter containing no asbestos and crystalline silica <1%
	3 mg/m ³ TWA8 ACGIH	Respirable particulate Particulate matter containing no asbestos and crystalline silica <1%
	5 mg/m ³ TWA8 OSHA	Respirable fraction
	15 mg/m ³ TWA8 OSHA	Total dust

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

Particulates Not Otherwise Classified (PNOC) (Nuisance Particulates)

8.2 PERSONAL PROTECTION

Respiratory Protection: None expected to be needed.

Ventilation: General (mechanical) room ventilation is expected to be satisfactory.

Eye Protection: Safety glasses or monogoggles

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 7 of 15

**Protective
Gloves:** PVC-coated

**Other Protective
Equipment:** Eye Bath, Safety Shower

8.3 ENGINEERING CONTROLS

PROCESS HAZARD: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid above freezing point, Solid below freezing point

Appearance: Transparent colorless, Above freezing point, White, Below freezing point

pH: *Not currently available.*

Solubility in Water (by weight): 20 °C 70 %

Odor: Mild

Flash Point - Closed Cup: *Pensky-Martens Closed Cup ASTM D 93* 196 °C 385 °F

Flash Point - Open Cup: *Cleveland Open Cup ASTM D 92* 260 °C 500 °F

Molecular Weight: 1300 - 1600 g/mol

Boiling Point (760 mmHg): > 200 °C > 392 °F

Freezing Point: 47 °C 117 °F

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 8 of 15

Specific Gravity (H₂O = 1): 1.102 55 °C / 20 °C

Vapor Pressure at 20°C: < 0.001 kPa < 0.01 mmHg

Vapor Density (air = 1): > 10

Evaporation Rate (Butyl Acetate = 1): < 0.01

Melting Point: *Not applicable.*

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Stable

Incompatible Materials: Normally unreactive; however, avoid strong bases at high temperatures, strong acids, strong oxidizing agents and materials reactive with hydroxyl compounds.

Hazardous Decomposition Products: Thermal decomposition may produce aldehydes. Acute overexposure to aldehydes may result in irritation of the eyes, skin and respiratory tract. In addition, some aldehydes are skin sensitizers and/or probable carcinogens.

10.2 HAZARDOUS POLYMERIZATION Will Not Occur.

10.3 INHIBITORS/STABILIZERS Not applicable.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Peroral: Rat female 16000 mg/kg

Mortality: 0/5

Major Signs: encrustation on perinasal fur, diarrhea

Gross Pathology: lungs discolored

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 9 of 15

Peroral: Rat male 18000 mg/kg

Mortality: 0/5

Major Signs: encrustation on perinasal fur, diarrhea

Gross Pathology: lungs discolored

Percutaneous: Rabbit female 16 ml/kg

Mortality: 0/5

Major Signs: None.

Gross Pathology: lungs discolored; stomach and intestines fluid-filled

Percutaneous: Rabbit male 16 ml/kg

Mortality: 0/5

Major Signs: None.

Gross Pathology: lungs discolored; stomach and intestines fluid-filled

IRRITATION

Skin: Rabbit 4 hr occluded no irritation

Eye: Rabbit 0.1 ml minor transient iritis; minor conjunctival irritation; no corneal injury

SENSITIZATION (ANIMAL AND HUMAN STUDIES)

No information available.

CHRONIC TOXICITY AND CARCINOGENICITY

No information available.

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS

None currently known.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 10 of 15

ADDITIONAL STUDIES

Although this material is not a skin irritant, submersion by workers of unprotected skin in highly concentrated solutions of this material for prolonged periods of time could result in skin dehydration.

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Partial information may be available, call Union Carbide.

12.2 ECOTOXICITY

Partial information may be available, call Union Carbide.

12.3 FURTHER INFORMATION

None.

13. DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL METHOD

This product is resistant to rapid biodegradation. Therefore, incineration is the preferred method of disposal. Incinerate in a furnace where permitted under Federal, State, and local regulations. Dispose in accordance with all applicable Federal, State, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

13.2 DISPOSAL CONSIDERATIONS

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 11 of 15

See Section 13.1

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK

Proper Shipping Name : NOT REGULATED

BULK

Proper Shipping Name : NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 SECTION 103 (GERCLA)

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting:

Component	CAS #	Amount
Acetaldehyde	75-07-0	<= 0.0006%
1,4-Dioxane	123-91-1	<= 0.0005%
Ethylene oxide	75-21-8	<= 0.0005%
Formaldehyde	50-00-0	<= 0.0004%

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 12 of 15

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTIONS 302 AND 304

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning:

None.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTION 313

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

This product does not contain toxic chemicals at levels which require reporting under the statute.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTIONS 311 AND 312

Delayed Hazard : No
Fire Hazard : No
Immediate Health Hazard : No
Reactive Hazard : No
Sudden Release of Pressure Hazard : No

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS)

The component of this product is on the EINECS inventory.

CEPA - DOMESTIC SUBSTANCES LIST (DSL)

The components of this product are on the DSL.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 13 of 15

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS:

None.

MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

Component	CAS #	Amount
Acetaldehyde	75-07-0	<= 0.0006%
1,4-Dioxane	123-91-1	<= 0.0005%
Ethylene oxide	75-21-8	<= 0.0005%
Formaldehyde	50-00-0	<= 0.0004%

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains the following chemical(s), which the State of California has found to cause cancer and birth defects or other reproductive harm:

Component	CAS #	Amount
Acetaldehyde	75-07-0	<= 0.0006%
1,4-Dioxane	123-91-1	<= 0.0005%
Ethylene oxide	75-21-8	<= 0.0005%
Formaldehyde	50-00-0	<= 0.0004%

CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)

VOC: Vapor pressure <0.01 mmHg at 20° C
1 g/l VOC
1 g/l less water and less exempted solvents

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 14 of 15

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 AVAILABLE LITERATURE AND BROCHURES

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

Ask for the brochure:

CARBOWAX Polyethylene Glycols (Family Brochure) Ask about the availability of specific product and end-use bulletins.

16.2 SPECIFIC HAZARD RATING SYSTEM

HMIS ratings for this product are: H - 0 F - 1 S - 0

NFPA ratings for this product are: H - 0 F - 1 S - 0

These ratings are part of specific hazard communications program(s) and should be disregarded where individuals are not trained in the use of these hazard rating systems. You should be familiar with the hazard communication applicable to your workplace.

16.3 RECOMMENDED USES AND RESTRICTIONS

CAUTION! For food, feed, drug or cosmetic applications, use Union Carbide CARBOWAX® brand SENTRY® brand N. F., F. C. C. GRADE. Only SENTRY® brand products are tested to meet N. F. and F. C. C. standards for these applications.

FOR INDUSTRY USE ONLY

16.4 REVISION

Version: 3.

Revision: 07/15/1998

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

MATERIAL SAFETY DATA SHEET

Product Name: CARBOWAX(TM) SENTRY(TM)
POLYETHYLENE GLYCOL 1450 FLAKE NF, FCC GRADE
MSDS#: 875

Effective Date: 07/15/1998

Page 15 of 15

16.5 LEGEND

TS	Trade Secret
N/A	Not available
W/W	Weight/Weight

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.