

Material Safety Data Sheet

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1. Identification of the substance/preparation and of the company/undertaking

Product name: KODAK HC-110 Developer

Product code: 1408988

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York, 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For other information or to request an MSDS, call (800) 242-2424.

Synonyms: PCD 4987

Product Use: photographic processing chemical, For consumer and industrial use.

2. Hazards identification

CONTAINS: Hydroquinone (123-31-9), Ethanolamine (141-43-5), Diethanolamine (111-42-2), Diethylene glycol (111-46-6), Diethanolamine-sulphur dioxide complex (63149-47-3), Diethylenetriaminepentaacetic acid (67-43-6), 1,2-Benzenediol (120-80-9)

WARNING!

CAUSES SKIN AND EYE IRRITATION

HEAT SENSITIVE - CAN DECOMPOSE IF HEATED

CAN CAUSE KIDNEY DAMAGE AND CNS EFFECTS FOLLOWING INGESTION

MAY CAUSE LIVER DAMAGE BASED ON ANIMAL DATA

MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA

HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED

MAY CAUSE ALLERGIC SKIN REACTION

NFPA Hazard Ratings: Health - 2, Flammability - 1, Instability - 1

NOTE: NFPA 704 (2007) hazard indexes involves data review and interpretation that may vary among companies. It is intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight %	Components - (CAS-No.)
50 - 55	Diethanolamine-sulphur dioxide complex (63149-47-3)
5 - 10	Hydroquinone (123-31-9)
5 - 10	Diethylene glycol (111-46-6)
5 - 10	Ethanolamine (141-43-5)
1 - 5	Diethanolamine (111-42-2)
1 - 5	Diethylenetriaminepentaacetic acid (67-43-6)
0.1 - < 1	Ethylene glycol (107-21-1)
0.1 - < 1	1,2-Benzenediol (120-80-9)

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4. First aid measures

Inhalation: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, only induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

Notes to physician:

Treatment: Due to rapid absorption of material, evacuation of the stomach is effective only if performed immediately after ingestion. Whenever possible, stomach evacuation should be accomplished by gastric lavage with appropriate airway control to prevent aspiration.

5. Fire-fighting measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products. Use water spray to keep fire-exposed containers cool.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides (NO_x), sulfur oxides

Unusual Fire and Explosion Hazards: Elevated temperature can cause decomposition.

6. Accidental release measures

Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Do not breathe mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: Keep from contact with oxidizing materials. Keep away from heat and sources of ignition.

Storage: Keep container tightly closed. Store in cool place. Keep away from incompatible substances (see Incompatibility section.)

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8. Exposure controls / personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Hydroquinone	ACGIH	time weighted average	2 mg/m3
	OSHA Z1	Permissible exposure limit	2 mg/m3
Ethanolamine	ACGIH	time weighted average	3 ppm
	ACGIH	Short term exposure limit	6 ppm
	OSHA Z1	Permissible exposure limit	3 ppm 6 mg/m3
Diethanolamine	ACGIH	time weighted average	2 mg/m3
	ACGIH	Skin designation: <i>Remarks: Can be absorbed through the skin.</i>	
Ethylene glycol	OSHA Z1A	time weighted average	3 ppm 15 mg/m3
	ACGIH	Ceiling Limit Value	100 mg/m3
1,2-Benzenediol	ACGIH	time weighted average	5 ppm
	ACGIH	Skin designation: <i>Remarks: Can be absorbed through the skin.</i>	
	OSHA Z1A	time weighted average	5 ppm 20 mg/m3
	OSHA Z1A	Skin designation (Final Rule Limit applies):	
		<i>Remarks: Can be absorbed through the skin.</i>	

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. Controls should be sufficient so that applicable occupational exposure limits are not exceeded.

Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: organic vapour/P95. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: liquid

Colour: yellow

Odour: amine

Specific gravity: 1.24

Vapour pressure: 14.7 mbar (11.0 mm Hg)

Vapour density: 2.1

Volatile fraction by weight: 65 - 70 %

Boiling point/boilingrange: 100.0 °C (212.0 °F)

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Water solubility: complete

pH: 9.0

Flash point: does not flash

10. Stability and reactivity

Stability: Stable under normal conditions. Not fully evaluated. Materials containing similar structural groups can decompose if heated.

Incompatibility: Strong oxidizing agents.

Hazardous decomposition products: None under normal conditions of use.

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: Diethanolamine-sulphur dioxide complex. May cause liver damage based on animal data. May cause kidney damage based on animal data.

Contains: Diethylene glycol. Can cause kidney damage and CNS effects following ingestion. Repeated oral exposure to high doses can cause liver damage.

Contains: Diethanolamine. Based on animal data, may cause adverse effects on the following organs/systems: kidney, liver, blood, nervous system, testes.

Contains: Ethylene glycol. Harmful or fatal if swallowed. Can cause kidney damage and CNS effects based on human data. May cause adverse reproductive effects following ingestion based on animal data.

Inhalation: Harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract.

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Eyes: Causes eye irritation.

Skin: Harmful if absorbed through skin. Causes skin irritation. May cause allergic skin reaction based on human experience. May cause skin depigmentation.

Ingestion: Harmful if swallowed. May cause burns of the gastrointestinal tract if swallowed.

Acute Toxicity Data:

- Oral LD50 (rat): > 3,200 mg/kg
- Dermal LD50: > 20 ml/kg
- Skin irritation: strong
- Eye irritation: moderate

Data for Hydroquinone (CAS 123-31-9):

Acute Toxicity Data:

- Oral LD50 (rat): 400 mg/kg
- Oral LD50 (male rat): 400 mg/kg
- Oral LD50 (male mouse): 100 - 200 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm² / hour
- Skin irritation: slight
- Skin Sensitization (guinea pig): positive
- Eye irritation: moderate

Mutagenicity/Genotoxicity Data:

- Salmonella typhimurium assay (Ames test): negative (in presence and absence of activation)
- Chromosomal aberration assay: negative (in absence of activation)
- Chromosomal aberration assay: positive (in presence of activation)
- Sister chromatid exchange (SCE) assay: positive (in presence and absence of activation)

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Dermal (17-day, rat): NOEL; 3800 mg/kg/day
- Dermal (17-day): LOEL (Lowest observable effect level); 4800 mg/kg/day

Developmental Toxicity Data:

- Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day

Data for Diethanolamine-sulphur dioxide complex (CAS 63149-47-3):

Acute Toxicity Data:

- Oral LD50 (male rat): 1,903 mg/kg
- Oral LD50 (female rat): 1,131 mg/kg

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- Dermal LD50: >20 ml/kg
- Dermal LD50 (guinea pig): >20 ml/kg
- Skin irritation: slight
- Skin irritation: no exacerbation (repeated skin application)
- Skin Sensitization: none
- Skin Sensitization (guinea pig): none
- Skin Sensitization (guinea pig): negative
- Eye irritation: slight
- Eye irritation (washed eyes): slight
- Eye irritation (unwashed eyes): slight

Data for Diethylene glycol (CAS 111-46-6):

Acute Toxicity Data:

- Oral LD50 (rat): > 3,200 mg/kg
- Dermal LD50: > 10,000 mg/kg
- Skin irritation: slight to moderate
- Skin irritation: slight
- Eye irritation: slight

Data for Ethanolamine (CAS 141-43-5):

Acute Toxicity Data:

- Oral LD50 (rat): 400 - 800 mg/kg
- Oral LD50 (mouse): 1,600 mg/kg
- Dermal LD50 (guinea pig): 0.1 - 1.0 cc/kg
- Skin irritation: severe
- Skin irritation: moderate to strong
- Skin Sensitization (guinea pig): negative
- Skin Sensitization (guinea pig): positive
- Eye irritation: Corrosive

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Feeding study (, male rat): NOEL; 1 % in diet
- Feeding study (, male rat): NOEL; 770 mg/kg/day
- Inhalation (, male rat): LOEL (Lowest observable effect level);

Data for Diethylenetriaminepentaacetic acid (CAS 67-43-6):

Acute Toxicity Data:

- Oral LD50 (male rat): 3,200 mg/kg
- Oral LD50 (female rat): 2,539 mg/kg
- Dermal LD50 (guinea pig): > 1 g/kg
- Skin irritation: slight

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- Skin irritation: severe (repeated skin application)
- Skin Sensitization (guinea pig): none
- Skin Sensitization (guinea pig): negative
- Eye irritation: moderate
- Eye irritation (washed eyes): slight
- Eye irritation (unwashed eyes): moderate

Data for 1,2-Benzenediol (CAS 120-80-9):

Acute Toxicity Data:

- Oral LD50 (mouse): 100 - 200 mg/kg
- Oral LD50 (rat): 260 mg/kg
- Dermal LD50 (rabbit): 800 mg/kg
- Skin irritation: strong
- Skin Sensitization (guinea pig): positive
- Eye irritation: strong

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	1 - 10 mg/l
Toxicity to daphnia (EC50):	< 1 mg/l
Toxicity to algae (IC50):	10 - 100 mg/l
Toxicity to other organisms (EC50):	> 100 mg/l (sludge)

Persistence and degradability: Readily biodegradable.

Chemical Oxygen Demand (COD): ca. 1347 g/l

Biochemical Oxygen Demand (BOD): ca. 916 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

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15. Regulatory information

Notification status

Regulatory List	Notification status
EINECS	n (Negative listing)
TSCA	y (positive listing)
AICS	y (positive listing)
DSL	y (positive listing)
ENCS (JP)	n (Negative listing)
KECI (KR)	y (positive listing)
PICCS (PH)	y (positive listing)
INV (CN)	y (positive listing)

A N (Negative listing) indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	Hydroquinone: Group A3 (Confirmed animal carcinogen with unknown relevance to humans.), 1,2-Benzenediol: Group A3 (Confirmed animal carcinogen with unknown relevance to humans.)
International Agency for Research on Cancer (IARC):	1,2-Benzenediol: 2B (Possible carcinogen.) (No data.) (Sufficient data.)
U.S. National Toxicology Program (NTP):	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
California Prop. 65:	none
US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323):	Diethanolamine-sulphur dioxide complex, Water, Hydroquinone, Diethylene glycol, Ethanolamine, Diethanolamine
US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000):	Diethanolamine
US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5):	Diethanolamine-sulphur dioxide complex, Water, Hydroquinone, Diethylene glycol, Ethanolamine, Diethanolamine
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR	Hydroquinone, Diethanolamine, 1,2-Benzenediol

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372.65) - Supplier Notification Required:

US. EPA Emergency Planning and Community Right-To-Know Act
(EPCRA) SARA Title III Section 302 Extremely Hazardous
Substance (40 CFR 355, Appendix A):

SARA 302: No chemicals in this material
are subject to the reporting
requirements of SARA Title III, Section
302.

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

CONTAINS: Hydroquinone (123-31-9), Ethanolamine (141-43-5), Diethanolamine (111-42-2), Diethylene glycol (111-46-6), Diethanolamine-sulphur dioxide complex (63149-47-3), Diethylenetriaminepentaacetic acid (67-43-6), 1,2-Benzenediol (120-80-9)

WARNING!

CAUSES SKIN AND EYE IRRITATION

HEAT SENSITIVE - CAN DECOMPOSE IF HEATED

CAN CAUSE KIDNEY DAMAGE AND CNS EFFECTS FOLLOWING INGESTION

MAY CAUSE LIVER DAMAGE BASED ON ANIMAL DATA

MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA

HARMFUL IF INHALED, ABSORBED THROUGH SKIN, OR SWALLOWED

MAY CAUSE ALLERGIC SKIN REACTION

Do not breathe vapours or spray mist.

Store in cool place.

Avoid contact with eyes, skin, and clothing.

Use only with adequate ventilation.

Wash thoroughly after handling.

FIRST AID: If inhaled, remove to fresh air. Get medical attention if symptoms occur. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, only induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

Notes to physician: Due to rapid absorption of material, evacuation of the stomach is effective only if performed immediately after ingestion. Whenever possible, stomach evacuation should be accomplished by gastric lavage with appropriate airway control to prevent aspiration.

Keep out of reach of children.

Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

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IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

IN CASE OF SPILL: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-2, F-1, C-1HT