

Material Safety Data Sheet

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

Product name: KODAK Medical X-Ray Developer

Product code: 1239425

Supplier: Carestream Health Canada Company, 6 Monogram Place, Suite 200, Toronto, Ontario, M9R 0A1

MSDS Prepared by: Health, Safety and Environment, Carestream Health, Inc., Rochester, New York, 14608.

For Emergency Health Information call: 1-800-424-9300.

For Other Information, call the Marketing and Distribution Center in Your Area.

Synonyms: PCD 10350, 10350

Product Use: photographic processing chemical

2. Hazards identification

CONTAINS: Hydroquinone (123-31-9)

WARNING!

**POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES
HARMFUL IF INHALED OR SWALLOWED
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION**

NFPA Hazard Ratings: Health - 2, Flammability - 1, Instability - 0

NOTE: NFPA 704 (2001) 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.)
100	Hydroquinone (123-31-9)

4. First aid measures

Inhalation: If inhaled, move to fresh air. Get medical attention.

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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 center immediately.

5. Fire-fighting measures

Extinguishing Media: Water spray Carbon dioxide (CO₂) Dry chemical

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing.

Hazardous Combustion Products: Carbon oxides

Unusual Fire and Explosion Hazards: Dust may form explosive mixture in air.

6. Accidental release measures

Methods for cleaning up: Shovel into suitable container for disposal. Avoid dust formation. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Do not breathe dust at concentrations greater than the exposure limits. Use only with adequate ventilation. Keep container tightly closed. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

Prevention of Fire and Explosion: Dust may form explosive mixture in air. Minimize dust generation and accumulation. Use only with adequate ventilation. Keep away from sources of ignition. Refer to NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids." Keep from contact with oxidizing materials.

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

8. Exposure controls / personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Hydroquinone	ACGIH OSHA Z1	time weighted average Permissible exposure limit	2 mg/m ³ 2 mg/m ³

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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: full-face organic vapour/N95. 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).

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

Recommended Decontamination Facilities: Safety shower, eye wash, washing facilities as appropriate to condition of use.

9. Physical and Chemical Properties

Physical form: solid (crystalline)

Colour: white white

Odour: odourless

Specific gravity: 1.33

Vapour pressure (at 132.0 °C (269.6 °F)) : 1.3 mbar (1.0 mm Hg)

Vapour density: 3.8

Volatile fraction by weight: negligible

Boiling point/range: 286.0 °C (546.8 °F)

Melting point/range: 170.0 - 171.0 °C (338.0 - 339.8 °F)

Water solubility: Moderate

pH: 4.1 - 4.7

Flash point: 165.0 °C (329.0 °F) (closed cup)

Autoignition temperature: 499.0 °C (930.2 °F)

10. Stability and reactivity

Stability: Stable under normal conditions.
No exotherm to 420 °C by DSC

Incompatibility: Strong oxidizing agents, Strong bases, combustible material, Ammonia.

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Hazardous decomposition products: None under normal conditions of use.

Hazardous Polymerization: Hazardous polymerization does not occur.

11. Toxicological information

Effects of Exposure

General advice: 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.

Inhalation: Harmful if inhaled.

Eyes: Causes irritation. Repeated exposure to dust may cause eye injury.

Skin: May cause allergic skin reaction based on human experience. May cause skin depigmentation. Prolonged or repeated contact may cause drying, cracking, or irritation.

Ingestion: Harmful if swallowed.

Acute Toxicity Data:

- Oral LD50: 70 - 170 mg/kg (estimated)
- Oral LD50 (rat): 400 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm² / hour
- Skin irritation: slight
- Skin Sensitization: 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.

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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:

- : NOEL for developmental toxicity; 75mg/kg/day
- : LOEL for maternal toxicity; 75mg/kg/day
- : NOEL for maternal toxicity; 25mg/kg/day
- (rat): NOEL for developmental toxicity; 100mg/kg/day
- (rat): NOEL for developmental toxicity; 100mg/kg/day

12. Ecological information

Data for this substance have been used to estimate its environmental impact.

Potential Toxicity:

Fish LC50:	< 1 mg/l
Fish LC50:	0.287 mg/l (Exposure time: 48 hr)
Fish LC50:	0.044 - 0.18 mg/l (Exposure time: 96 hr)
Fish LC50:	0.17 mg/l (Exposure time: 96 hr)
Fish LC50:	0.12 mg/l
Fish LC50:	0.15 - 0.16 mg/l (Exposure time: 48 hr)
Fish LC50:	0.1 mg/l
Fish LC50:	0.097 mg/l (Exposure time: 96 hr)
Daphnid EC50:	< 1 mg/l
Daphnid EC50:	0.162 mg/l (Exposure time: 48 hr)
Daphnid EC50:	0.12 mg/l (Exposure time: 24 hr)
Daphnid EC50:	0.05 mg/l (Exposure time: 24 hr)
Daphnid EC50:	0.09 mg/l (Exposure time: 24 hr)
Daphnid EC50:	0.04 mg/l (Exposure time: 24 hr)
Daphnid EC50:	0.05 mg/l (Exposure time: 96 hr)
Algal IC50:	1 mg/l
Waste treatment organisms EC50:	100 mg/l

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Organics Readily Degradable: Readily biodegradable

Potential Bioaccumulation: log Pow 0.59

COD (approximate): 1.9 g/g

BOD (approximate): 0.62 g/g

After dilution with a large amount of water, followed by secondary waste treatment, this material is not expected to cause adverse environmental effects.

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

The information given below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions. Please consult the product packaging for further details.

IATA:	UN Number:	UN2662
	Proper shipping name:	Hydroquinone, solid
	Class:	6.1
	Packaging group:	III
IMDG:	UN Number:	UN2662
	Proper shipping name:	HYDROQUINONE, SOLID
	Class:	6.1
	Packaging group:	III
TDG:	UN Number:	UN2662
	Proper shipping name:	HYDROQUINONE
	Class:	6.1
	Packaging group:	III
US DOT:	UN Number:	UN2662
	Proper shipping name:	Hydroquinone, solid
	Class:	6.1
	Packaging group:	III

For more transportation information, go to: <http://ship.carestreamhealth.com>.

15. Regulatory information

U.S. California Prop. 65: none

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Carcinogenicity Classification (components present at 0.1% or more):

International Agency for Research on Cancer (IARC): Hydroquinone: 3 (Classification not possible from current data.)
American Conference of Governmental Industrial Hygienists (ACGIH): Hydroquinone: Group A3 (Confirmed animal carcinogen with unknown relevance to humans.)
U.S. National Toxicology Program (NTP): none
U.S. Occupational Safety and Health Administration (OSHA): none

Chemical(s) subject to the reporting requirements of U.S. Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372:
Hydroquinone

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)

WARNING!

**POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES
HARMFUL IF INHALED OR SWALLOWED
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION**

Minimize dust generation and accumulation.
Use only with adequate ventilation.
Do not breathe dust.
Keep container tightly closed.
Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.

FIRST AID: If inhaled, move to fresh air. Get medical attention. 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 center immediately.

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: Water spray Carbon dioxide (CO₂) Dry chemical

IN CASE OF SPILL: Shovel into suitable container for disposal. Avoid dust formation. 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-2, S-2, F-1, C-0