



*a member of the Roche Group*

## Material Safety Data Sheet

Material Name: DAB

MSDS ID: 00231325

### \*\*\* Section 1 - Chemical Product and Company Identification\*\*\*

#### Manufacturer Information

VENTANA MEDICAL SYSTEMS INC.  
1910 E. Innovation Park Drive  
Tucson, AZ 85755  
Phone: (520) 887-2155

EMERGENCY TELEPHONE NUMBER:  
(800) 424-9300 (USA/Canada)  
CHEMTREC: +1 (703) 527-3887 (International)

#### Material Name: DAB

#### Trade Names/Synonyms

iVIEW™ DAB

#### Product Number(s)

253-2190

#### Product Use

clinical/research

### \*\*\* Section 2 - Hazards Identification\*\*\*

**NFPA Ratings: Health: 2 Fire: 1 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

#### Preparation

Carc.Cat.1,,Xi; R:41-37/38-45

#### Risks

Irritating to respiratory system and skin.  
Risk of serious damage to eyes.  
May cause cancer.

#### EMERGENCY OVERVIEW

**Color:** colorless to amber

**Physical Form:** liquid

**Odor:** odorless

**Major Health Hazards:** respiratory tract irritation, skin irritation, eye irritation, allergic reactions, cancer

#### POTENTIAL HEALTH EFFECTS

##### Inhalation

**Short Term:** irritation, allergic reactions, difficulty breathing, headache, dizziness

**Long Term:** allergic reactions, tooth decay, cancer

##### Skin

**Short Term:** irritation, allergic reactions

**Long Term:** irritation, allergic reactions, cancer

##### Eye

**Short Term:** irritation

**Long Term:** irritation

##### Ingestion

**Short Term:** gastrointestinal irritation, allergic reactions, nausea, vomiting, diarrhea

**Long Term:** allergic reactions, tooth decay, cancer

#### OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

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## \*\*\* Section 3 - Composition/Information on Ingredients\*\*\*

CAS #	Component / EU Number	Percent	Symbol(s)	Risk Phrase(s)
5949-29-1	HYDROUS CITRIC ACID -	30-60	Xi	R:37-38-41
7681-57-4	SODIUM METABISULFITE 231-673-0	10-30	Xn	R:22-31-41
25322-68-3	POLYETHYLENE GLYCOL 8000 500-038-2	3-7	Xn	R:21/22
7411-49-6	3,3'-DIAMINOBENZIDINE TETRAHYDROCHLORIDE 231-018-9	<1	T N	R:45-22-50/53

### Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Citric acid (77-92-9), Salts of benzidine, Benzidine compounds, 3,3'-Diaminobenzidine salts.

## \*\*\* Section 4 - First Aid Measures\*\*\*

### Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

### Skin

Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Get medical attention, if needed.

### Eyes

Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

### Ingestion

If a large amount is swallowed, get medical attention.

## \*\*\* Section 5 - Fire-Fighting Measures\*\*\*

See Section 9 for Flammability Properties

### Flammable Properties

Slight fire hazard.

### Extinguishing Media

regular dry chemical, carbon dioxide, water, regular foam

### Fire Fighting Measures

Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products.

### Hazardous Combustion Products

**Thermal decomposition or combustion products:** oxides of carbon, oxides of sodium, oxides of sulfur

### Sensitivity to Mechanical Impact

Not sensitive

### Sensitivity to Static Discharge

Not sensitive

## \*\*\* Section 6 - Accidental Release Measures\*\*\*

### Occupational Spill/Release

Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.

## \*\*\* Section 7 - Handling and Storage\*\*\*

### Handling Procedures

Wash thoroughly after handling.

### Storage Procedures

Store and handle in accordance with all current regulations and standards. Store between 2 C and 8 C. Keep in the dark. See original container for storage recommendations. Keep separated from incompatible substances.

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## \*\*\* Section 8 - Exposure Controls/Personal Protection\*\*\*

### Exposure Limits

#### SODIUM METABISULFITE (7681-57-4)

ACGIH:	5 mg/m3 TWA
NIOSH:	5 mg/m3 TWA
OSHA:	5 mg/m3 TWA
Belgium:	5 mg/m3 TWA
Denmark:	5 mg/m3 TWA
France:	5 mg/m3 VME
Greece:	5 mg/m3 TWA
Ireland:	5 mg/m3 TWA
Portugal:	5 mg/m3 TWA
Spain:	5 mg/m3 VLA-ED (it is prohibited the partial or complete commercialization or use of this substance as a phytosanitary o biocide compound)
United Kingdom:	15 mg/m3 STEL (calculated) 5 mg/m3 TWA

#### POLYETHYLENE GLYCOL 8000 (25322-68-3)

Austria:	4000 mg/m3 STEL (average molecular weight 200-400, inhalable fraction, 4 X 15 min) 1000 mg/m3 MAK (average molecular weight 200-400, inhalable fraction)
Germany:	1000 mg/m3 TWA (average molecular weight 200-400, inhalable fraction, exposure factor 8)
Germany (DFG):	1000 mg/m3 MAK (average molecular weight 200-600, inhalable fraction) 8000 mg/m3 Peak (average molecular weight 200-600, inhalable fraction)

#### 3,3'-DIAMINO BENZIDINE TETRAHYDROCHLORIDE (7411-49-6)

Austria:	skin notation (related to Salts of benzidine)
Germany (DFG):	skin notation (related to Salts of benzidine)
Greece:	0.1 % (per weight concentration limit for exemption, related to Salts of benzidine)
Ireland:	0.1% per weight concentration limit for exemption (related to Salts of benzidine)

### Ventilation

Provide adequate ventilation. Ensure compliance with applicable exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

#### Eyes/Face

Safety glasses or goggles are recommended when there is a potential for eye contact. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

#### Protective Clothing

Lab coat or apron.

#### Glove Recommendations

Wear appropriate chemical resistant gloves.

#### Protective Materials

latex, vinyl

#### Respiratory Protection

No respirator is required under normal conditions of use.

## \*\*\* Section 9 - Physical and Chemical Properties\*\*\*

Physical State:	Liquid	Appearance:	clear
Color:	colorless to amber	Physical Form:	liquid
Odor:	odorless	Odor Threshold:	Not available
pH:	neutral	Decomposition:	Not available
Flash Point:	not flammable	Evaporation Rate:	Not available
LEL:	Not available	UEL:	Not available
Vapor Pressure:	Not available	Vapor Density (air = 1):	Not available
Density:	Not available	Water Solubility:	miscible
Log KOW:	Not available	Coeff. Water/Oil Dist.:	Not available
Auto Ignition:	Not available	Viscosity:	Not available
Volatility:	Not available		

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## \*\*\* Section 10 - Stability and Reactivity\*\*\*

### Chemical Stability

Stable at normal temperatures and pressure.

### Conditions to Avoid

None reported.

### Materials to Avoid

oxidizing materials

### Decomposition Products

**Thermal decomposition or combustion products:** oxides of carbon, oxides of sodium, oxides of sulfur

### Possibility of Hazardous Reactions

Will not polymerize.

## \*\*\* Section 11 - Toxicological Information\*\*\*

### Acute and Chronic Toxicity

#### Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

##### **HYDROUS CITRIC ACID (5949-29-1)**

Oral LD50 Rat 3000 mg/kg (related to Citric acid)

##### **SODIUM METABISULFITE (7681-57-4)**

Oral LD50 Rat 1131 mg/kg; Dermal LD50 Rat >2 g/kg

##### **POLYETHYLENE GLYCOL 8000 (25322-68-3)**

Oral LD50 Rat 28 g/kg; Dermal LD50 Rabbit >20 g/kg

#### RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

##### **HYDROUS CITRIC ACID (5949-29-1)**

**Oral:** 3 gm/kg Oral Rat LD50; 11700 mg/kg Oral Rat LD50 (related to Citric acid)

##### **SODIUM METABISULFITE (7681-57-4)**

**Oral:** 1131 mg/kg Oral Rat LD50

**Skin:** >1 gm/kg Skin Guinea pig LD50

##### **POLYETHYLENE GLYCOL 8000 (25322-68-3)**

**Oral:** 22 gm/kg Oral Rat LD50; >50 gm/kg Oral Rat LD50; 31600 mg/kg Oral Rat LD50; 28 gm/kg Oral Rat LD50; 31640 mg/kg Oral Rat LD50; 27500 mg/kg Oral Rat LD50; 50 gm/kg Oral Rat LD50; 30200 mg/kg Oral Rat LD50; 50 gm/kg Oral Rat LD50; >50 gm/kg Oral Rat LD50; 1054 mg/kg Oral Rat LD50; 600 mg/kg Oral Rat LD50; 51200 mg/kg Oral Rat LD50; 32 gm/kg Oral Rat LD50; 51310 mg/kg Oral Rat LD50; >4 gm/kg Oral Rat LD50; 45 gm/kg Oral Rat LD50; 44200 mg/kg Oral Rat LD50; 30 gm/kg Oral Rat LD50; 50 gm/kg Oral Rat LD50; 820 mg/kg Oral Rat LD50

**Skin:** >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 mL/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; >20 gm/kg Skin Rabbit LD50; 1800 uL/kg Skin Rabbit LD50

#### Acute Toxicity Level

##### **HYDROUS CITRIC ACID (5949-29-1)**

**Moderately Toxic:** ingestion (related to Citric acid)

##### **SODIUM METABISULFITE (7681-57-4)**

**Moderately Toxic:** ingestion

##### **POLYETHYLENE GLYCOL 8000 (25322-68-3)**

**Moderately Toxic:** dermal absorption, ingestion

**Non Toxic:** ingestion

#### Irritation/Corrosivity

##### RTECS Irritation

The components of this material have been reviewed, and RTECS publishes the following endpoints:

##### **HYDROUS CITRIC ACID (5949-29-1)**

5 mg/30 second(s) Eyes Rabbit mild

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## **SODIUM METABISULFITE (7681-57-4)**

100 mg/24 hour Eyes Rabbit mild; 500 mg Skin Rabbit

## **POLYETHYLENE GLYCOL 8000 (25322-68-3)**

500 mg/48 hour Skin Human; 500 mg/24 hour Eyes Rabbit mild; 500 mg Eyes Rabbit mild; 500 mg/24 hour Eyes Rabbit mild; 500 mg Eyes Rabbit mild; 500 mg Eyes Rabbit mild; 500 mg Eyes Rabbit mild; 500 mg/24 hour Eyes Rabbit mild; 100 uL Eyes Rabbit mild; 500 mg Eyes Rabbit mild; 500 mg/24 hour Eyes Rabbit mild; 500 mg/open Skin Rabbit mild; 500 mg/open Skin Rabbit mild; 500 mg/24 hour Skin Rabbit mild; 10 mg/24 hour open Skin Rabbit mild; 500 mg Skin Rabbit mild; 500 mg/24 hour Skin Rabbit mild

## **Local Effects**

### **HYDROUS CITRIC ACID (5949-29-1)**

**Irritant:** inhalation, skin

**Corrosive:** eye

### **SODIUM METABISULFITE (7681-57-4)**

**Irritant:** inhalation, skin, eye

## **Target Organs**

### **SODIUM METABISULFITE (7681-57-4)**

immune system (sensitizer)

## **Carcinogenicity**

### **Component Carcinogenicity**

#### **SODIUM METABISULFITE (7681-57-4)**

**ACGIH:** A4 - Not Classifiable as a Human Carcinogen

**IARC:** Monograph 54 [1992] (Group 3 (not classifiable))

**Portugal:** A4 - Not Classifiable as a Human Carcinogen

#### **3,3'-DIAMINO BENZIDINE TETRAHYDROCHLORIDE (7411-49-6)**

**Austria:** Group A1 Carcinogen (related to Salts of benzidine)

**Denmark:** Present (related to Salts of benzidine)

**Germany:** Category 3B (could be carcinogenic for man)

**Italy:** Category 1 Carcinogen (related to Salts of benzidine)

**Netherlands:** Present (related to Salts of benzidine)

**Spain:** Known human carcinogen (related to Salts of benzidine)

## **Mutagenic**

No information available for the mixture.

## **RTECS Mutagenic**

The components of this material have been reviewed, and RTECS publishes data for one or more components.

## **Reproductive Effects**

No information available for the mixture.

## **RTECS Reproductive Effects**

The components of this material have been reviewed, and RTECS publishes data for one or more components.

## **Tumorigenic**

No information available for the mixture.

## **RTECS Tumorigenic**

The components of this material have been reviewed, and RTECS publishes data for one or more components.

## **Medical Conditions Aggravated by Exposure**

blood system disorders, hormonal disorders, kidney disorders, respiratory disorders

## **Additional Data**

IARC has concluded that Benzidine and its salts are carcinogenic.

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## \*\*\* Section 12 - Ecological Information\*\*\*

### Component Analysis - Aquatic Toxicity

#### HYDROUS CITRIC ACID (5949-29-1)

Fish: 96 Hr LC50 Lepomis macrochirus: 1516 mg/L [static] (related to Citric acid)

Invertebrate: 72 Hr EC50 Daphnia magna: 120 mg/L (related to Citric acid)

#### SODIUM METABISULFITE (7681-57-4)

Fish: 96 Hr LC50 Lepomis macrochirus: 32 mg/L [static]

Algae: 72 Hr EC50 Desmodemus subspicatus: 48 mg/L; 96 Hr EC50 Desmodemus subspicatus: 40 mg/L

Invertebrate: 24 Hr EC50 Daphnia magna Straus: 89 mg/L

#### POLYETHYLENE GLYCOL 8000 (25322-68-3)

Fish: 24 Hr LC50 Carassius auratus: >5000 mg/L (PEG 200, 400, 800)

### Mobility

No information available for the mixture.

### Persistence & Degradation

No information available for the mixture.

### Bioaccumulative Potential

No information available for the mixture.

## \*\*\* Section 13 - Disposal Considerations\*\*\*

### Disposal Methods

Dispose in accordance with all applicable regulations.

### Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

## \*\*\* Section 14 - Transport Information\*\*\*

### US DOT Information

Not regulated.

### TDG Information

Not regulated.

### ADR Information

Not regulated.

### RID Information

Not regulated.

### IATA Information

Not regulated.

### ICAO Information

Not regulated.

### IMDG Information

Not regulated.

## \*\*\* Section 15 - Regulatory Information\*\*\*

### U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

### SARA 311/312

Acute Health: Yes Chronic Health: Yes Fire: No Pressure: No Reactive: No

### U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component / EC Number	CAS	CA	MA	MN	NJ	PA	RI
SODIUM METABISULFITE	7681-57-4	Yes	Yes	Yes	Yes	Yes	Yes
POLYETHYLENE GLYCOL 8000	25322-68-3	No	No	Yes	No	No	No

### California Proposition 65

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

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## Canadian Regulations

### Canada WHMIS

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

**HYDROUS CITRIC ACID (5949-29-1)**

1 % (related to Citric acid)

**SODIUM METABISULFITE (7681-57-4)**

1 %

### WHMIS Classification

D2A, D2B.

## European Regulations

This preparation has been classified for the European Union according to Annex VI Directives 67/548/EEC and 99/45/EC.

### Germany Water Classification

**HYDROUS CITRIC ACID (5949-29-1)**

ID Number 57, hazard class 1 - low hazard to waters (related to Citric acid)

**SODIUM METABISULFITE (7681-57-4)**

ID Number 1169, hazard class 1 - low hazard to waters

**POLYETHYLENE GLYCOL 8000 (25322-68-3)**

ID Number 279, hazard class 1 - low hazard to waters (footnote 11, >=4 EO)

## EU Marking and Labelling

### Symbols

**Xi** Irritant

**T** Toxic

### Risk Phrases

**R41** Risk of serious damage to eyes.

**R37/38** Irritating to respiratory system and skin.

**R45** May cause cancer.

### Safety Phrases

**S24/25** Avoid contact with skin and eyes.

**S26** In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**S39** Wear eye/face protection.

**S60** This material and its container must be disposed of as hazardous waste.

## Japanese Regulations

### Japan Designated Chemical Substances (PRTR Law)

No components of this material are subject to reporting requirements as specified by the "Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management" nor are they included in the "Pollutant Release and Transfer Register (PRTR)" of designated chemicals.

### Japan Poisonous and Deleterious Substances

No components of this material are specified as poisonous or deleterious substances, as regulated by Japan under the Poisonous and Deleterious Substances Control Law.

### Industrial Safety and Health Law - Flammable Materials

No components of this material are specifically identified in Table 6-2 of the Enforcement Order of the Industrial Safety and Health Law which, if used in the workplace, require designation of an Operations Chief during confined space work and periodic machine inspections.

### Industrial Safety and Health Law - Label Disclosure

No components of this material are specifically required to be indicated on a container label as specified by Article 18 of the Enforcement Order of the Industrial Safety and Health Law.

### Industrial Safety and Health Law - Organic Solvents

No components of this material are specifically identified in Table 6-2 of the Enforcement Order of the Industrial Safety and Health Law which, if used in the workplace, require designation of an Operations Chief during confined space work and periodic machine inspections.

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## \*\*\* Section 16 - Other Information \*\*\*

### Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

### Full text of R phrases in Section 3

**R21/22** Harmful in contact with skin and if swallowed.

**R22** Harmful if swallowed.

**R31** Contact with acids liberates toxic gas.

**R37** Irritating to respiratory system.

**R38** Irritating to skin.

**R41** Risk of serious damage to eyes.

**R45** May cause cancer.

**R50/53** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### Other Information

Limitations: The information and recommendations set forth in this MSDS are believed to be correct as of this date. Ventana Medical Systems, Inc. makes no warranty with respect to the content of this MSDS and disclaims all liability from reliance thereon.

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