コスモ・バイオ株式会社

Bradley Products, Inc.

Manufacturers of

The Davidson Marking System®

P.O. Box 201405
Bloomington, MN
55420

Phone:
800-325-7785

Fax:
952-881-1873

E-mail:
msbdms@mail.com

Internet:
www.bradleyproducts.com

The original tissue marking system for a variety of applications requiring the orientation of tissue specimens in medical laboratories.

Dear Customer:

This MSDS (Material Safety Data Sheet) contains the latest information relating to our product. Please discontinue using any former Bradley Products, Inc. MSDS for this product. The format of this MSDS has changed substantially from previous versions and has been modified to follow the ANSI recommended 16 section format. It continues to be prepared in accordance with the OSHA Hazard Communication Standard (29CFR 1910.1200). Please:

- Review this MSDS and ensure you understand and comply with its content.
- Inform all employees and other users of the information contained in this MSDS before handling the product.
- Bradley Products updates MSDSs when substantial new information is obtained. Newly modified MSDSs should be forwarded to all downstream users.

This MSDS contains information which may be helpful for you to comply with certain regulations and laws. It is not all inclusive information and could not be. Only you are in a position to determine what legal and other requirements are associated with the use of this product in your particular process and operation. It is your obligation to understand and comply with all information contained in this MSDS as well as all applicable laws, rules and regulations relating to your handling, use, storage and processing of this material.

If you want additional copies of this MSDS, we are happy to provide them to you, at no charge, via mail, fax, e-mail, or you can download a PDF copy from our web site. If you have questions or desire additional information in the handling, storage, use, or disposal of this product, please contact us.

Sincerely,
Bradley Products, Inc.

Important Note: The Davidson Marking System dyes, manufactured by Bradley Products, Inc. are not intended for use on a living patient. These dyes are only intended for use on excised tissues.

Bradley Products, Inc.
MATERIAL SAFETY DATA SHEET

Product: Item #1163-2 Davidson Marking System® Yellow Dye 2 oz.
Product: Item #3408-2 Davidson Marking System® Yellow Dye 8 oz.

Bradley Products, Inc. encourages safe handling of this product. To promote safe handling, each recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material or 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.

Section I – Product and Company Information

1.1 PRODUCT IDENTIFICATION

Product: Item #1163-2 Davidson Marking System® Yellow Dye 2 oz.
Product: Item #3408-2 Davidson Marking System® Yellow Dye 8 oz.
HMIS Ratings: Health - 0 Flammability - 1 Reactivity - 0

1.2 COMPANY IDENTIFICATION

Bradley Products, Inc.
P.O. Box 201405
Bloomington, MN 55420
Phone: 952-881-1430
Toll-free: 800-325-7785
Fax: 952-881-1873
e-mail: msbdms@mail.com
web site: www.bradleyproducts.com

Section II – Composition – Right to Know

Product	CAS #	Product	CAS #
Water	7732-18-5	polymer	proprietary
Pigment Yellow	proprietary	**Tributyl phosphate (<1%)	126-73-8
surfactant	proprietary	**OSHA Hazardous Ingredients	

Section III – Hazardous Identification and Health Effects

3.1 EMERGENCY OVERVIEW

Appearance: Yellow
Physical State: Liquid
Odor: Odorless
Carcinogenicity: This product does not contain ingredients listed as carcinogens by NTP, IARC, or OSHA.
Hazards: Irritating to skin and eyes.
Inhalation may cause difficulty in breathing and irritation to respiratory tract.

3.2 POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

Inhalation: Inhalation may cause difficulty in breathing and irritation of respiratory tract.
Eye Contact: Contact with eyes may result in an irritation.
Skin Contact: Contact with skin may result in an irritation.
Ingestion: No information currently available.

3.3 POTENTIAL ENVIRONMENTAL EFFECT

See Section XV - Regulatory Information

Section IV – First Aid Procedures

4.1 INHALATION
Move to fresh air. Aid in breathing, if necessary, and get medical attention if irritation develops or if breathing becomes difficult.

4.2 EYE CONTACT
Immediately wash eyes with running water for 15 min. If irritation develops, consult a physician.

4.3 SKIN CONTACT
Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.

4.4 INGESTION
If swallowed, dilute with water and induce vomiting. Never give fluids if victim is unconscious or having convulsions. Get medical attention if irritation develops.

4.5 NOTES TO PHYSICIAN
No information currently available.

Section V – Fire and Explosion Data

5.1 FLAMMABLE PROPERTIES

Flash Point (Test Method):	N/A
Autoignition Temp:	N/A
Flammability Limits in Air (% by Vol)**:**	Lower: N/A Upper: N/A

5.2 EXTINGUISHING MEDIUM
Use water mist, foam, carbon dioxide or dry chemical extinguishing media.

5.3 EXTINGUISHING MEDIUM TO AVOID
No information currently available.

5.4 SPECIAL FIREFIGHTING PROCEDURES
No information currently available.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIRFIGHTERS
Firefighters should be equipped with self-contained breathing apparatus.

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS
No information currently available.

5.7 HAZARDOUS DECOMPOSITION PRODUCTS
Burning may produce oxides of carbon and nitrogen, chlorine compounds as well as other toxic gases and vapors.

Section VI – Accidental Spill / Leak Procedures

ACCIDENTAL RELEASE MEASURES
Absorb onto sand or other absorbent material. Shovel into closable container for disposal.

Section VII – Handling and Storage

7.1 HANDLING
Single Word: "NOTICE!"
General Handling
In accordance with good industrial practice, handle with care and avoid personal contact. Use only with adequate ventilation. Avoid breathing mist or vapors. Wash hands and face thoroughly after handling and before eating, drinking, or using tobacco products. For industrial use only.
Ventilation
General room ventilation is expected to be satisfactory.

7.2 STORAGE
Store in closed containers. Store containers in diked areas. Keep from freezing.

Section VIII – Exposure Controls and Personal Protection

8.1 EXPOSURE LIMITS

No information currently available.

8.2 PERSONAL PROTECTION

Respiratory Protection: NIOSH approved chemical respirator or dust mask, if needed.

Eye Protection: Wear safety glasses or goggles to protect against dust particles.

Protective Clothing: Protective gloves to prevent skin contact>
(The preservative in this product is a skin sensitizer. Though it is present at a concentration less than 1%, individuals already sensitized to this benzisothiazolinone containing preservative should exercise care in handling.)

Ventilation: Use local exhaust.

Other: N/A

8.3 ENGINEERING CONTROLS

A properly grounded dust collection system is recommended.

Section IX – Physical and Chemical Properties

Physical State:	Liquid	Freezing Point:	0°C (32°F)
Appearance:	Yellow	Specific Gravity (g/ml):	>1 (H20 = 1 g/cm3)
pH:	8.5-9.5	Vapor Pressure:	ND
Solubility in Water:	Miscible	Vapor Density:	ND
Odor:	Odorless	Evaporation Rate:	ND
Percent Volatile:	0 to nil	Melting Point	ND
Boiling Point:	100°C (212°F)	Decomposition Temp:	>200°C (>392°F)

Section X – Stability and Reactivity

10.1 STABILITY / INSTABILITY

This product is stable.

Conditions to Avoid: None known.

Chemical Incompatibility: No unusual hazards.

10.2 HAZARDOUS POLYMERIZATION

Will not occur.

Hazardous Decomposition Products:

Burning may product oxides of carbon and nitrogen, chlorine compounds as well as other toxic gases and vapors. This product is not recommended for use in polymers processed at temperatures about 200°C (392°F). Experiments with similar products have indicated that diarylide pigments can decompose at height temperatures producing several aromatic amine type decomposition products, among them 3,3'-dichlorobenzidine which is a suspect carcinogen.

Conditions to Avoid: No information currently available.

10.3 INHIBITORS / STABALIZERS

no information currently available.

Section XI – Toxicological Information

Additional Information:

For Pigment Yellow:

Acute oral LD50 (Rats): Greater than 5,000 mg/kg
Skin irritation (Rabbits): non-irritating
Eye irritation (Rabbits): non-irritating
Carcinogenicity: Not listed as a carcinogen by TP, IARC, or OSHA. Inhalation LC50 (Rats): 4-hour aerosol exposure; 14-days aerosol inhalation study (Rats): No observable effects level (NOEL): Less than 52 mg/m3 air
Overexposure effects: Not available.
Signs and symptoms of exposure: Not available.
Medical conditions aggravated by exposure: Not available.

Section XII – Ecological Information

Ecotoxicity:

For Pigment Yellow:

Biological degradation: Barely soluble in water (not tested).

Section XIII – Disposal Considerations

13.1 WASTE DISPOSAL METHOD

Dispose in accordance with Federal, State, and Local regulations.
Dispose empty containers by crushing or whatever means will prevent unauthorized reuse.

Section XIV – Transport Information

14.1 U.S. DOT

Not regulated as a hazardous material by the U.S. Dept. of Transportation (DOT) 49 CFR 172.

Additional Information:

Not regulated by IATA or IMDG.

Section XV – Regulatory Information

OSHA Status: This MSDS (Material Safety Data Sheet) hsa been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered a hazardous chemical under that standard.

TSCA Inventory Status: All chemical components in this product are listed on the U.S. EPA Toxic Substances Control Act Chemical Substances Inventory.

Additional Federal Information: Chemical Weapons Convention: This product does not contain any Schedule 1, 2, or 3 chemicals under the Chemical Weapons Convention.

SARA Title III: Section 302 - Extremely Hazardous Substance(s): This product contains the following chemicals regulated under Section 302 as extremely hazardous substance(s): None known.

SARA Title III: Section 313 - Toxic Chemical(s): This product does not contain a toxic chemical for routine annual toxic chemical release reporting under Title III of the Emergency Planning and Community Right-To-Know Act (SARA 313).

RCRA: Not a hazardous waste under RCRA (40 CFR 261)

Clean Air Act (CAA): None known.

Canadian Inventory Status (CEPA): All chemical components are listed on the Canadian Domestic Substance List (DSL).

Europe EINECS: All chemical components are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS).

California Proposition 65: No ingredient in this product is regulated by the California Safe Drinking Water and Toxic Enforcement Act of 1986.

New Jersey Right-to-Know: The following is required composition information:
Water (CAS #7732-18-5). Not on New Jersey Right To Know Hazardous Substance List.
Pigment Yellow: Not on New Jersey Right To Know Hazardous Substance List.
NJTS #29943300001-4019 (Surfactant). Not on new Jersey Right To Know Hazardous Substance List.
NJTS #29943300001-5537 (Polymer). Not on the New Jersey Right To Know Hazardous Substance List.
Tributyl phosphate (CAS #126-73-8). On New Jersey Right To Know Hazardous Substance List.

Pennsylvania Right-to-Know: The following is required composition information:
Water (CAS #7732-18-5). Not on Pennsylvania Right To Know Hazardous Substance List.
Pigment Yellow: Not on Pennsylvania Right To Know Hazardous Substance List.
NJTS #29943300001-4019 (Surfactant). Not on Pennsylvania Right To Know Hazardous Substance List.
NJTS #29943300001-5537 (Polymer). Not on the Pennsylvania Right To Know Hazardous Substance List.
Tributyl phosphate (CAS #126-73-8). On Pennsylvania Right To Know Hazardous Substance List.

VOC's: Nil to 6%

Section XVI – Other Information

16.1 AVAILABLE LITERATURE AND BROCHURES
Additional product safety information on this product may be available and may be obtained by calling Bradley Products, Inc. or visit the web site at www.bradleyproducts.com

16.2 SPECIFIC HAZARD RATING SYSTEM
No information currently available.

16.3 RECOMMENDED USES AND RESTRICTIONS
For industry use only. This material is not intended for use in products for which prolonged contact with mucous membranes or abraded skin or implantation within the human body is specifically intended. Bradley Products, Inc. is not able to recommend this material as safe and effective for such uses and assumes no liability for such use.

16.4 REVISION
Version: 2
Revision: March 31, 2004

Bradley Products, Inc.

P.O. Box 201405, Bloomington, MN 55420 U.S.
Phone: 952-881-1430 or toll-free from US & Canada: 800-325-7785 Fax: 952-881-1873
e-mail: msbdms@mail.com Internet: www.bradleyproducts.com

The Davidson Marking System® Products

Prices Effective January 1, 2005

ITEM #	DESCRIPTION
2401	Original Davidson Marking System 5-Color Set Includes 5 – 2 oz. bottles of tissue marking dye (1 ea. of green, yellow, black, red and blue) in a holding tray with 50 applicator sticks and instructions.
2406	Davidson Marking System 6-Color Set Includes 6 – 2 oz. bottles of tissue marking dye (1 ea. of green, yellow, black, Red, blue and orange) in a holding tray with 50 applicator sticks and instructions.
2403	Davidson Marking System 3-Color Set Includes 3 – 2 oz. bottles of tissue marking dye (please choose your own colors) in a holding tray with 50 applicator sticks and instructions.
5364	Davidson Cryocup System Includes 4 Cryocups, 1 Cryocup holder and instructions.
6601	Davidson Small Specimen Kit Includes 3 – 1 oz. bottles of small specimen dye (1 ea. of green, red and blue) in a holding tray with 1 packet of 250 cassette paper and instructions.
5360	Cryocup (one cup only)
5361	Cryocup Holder
1163-1	2 oz. bottle of green tissue marking dye
1163-2	2 oz. bottle of yellow tissue marking dye
1163-3	2 oz. bottle of black tissue marking dye
1163-4	2 oz. bottle of red tissue marking dye
1163-5	2 oz. bottle of blue tissue marking dye
1163-6	2 oz. bottle of orange tissue marking dye
3408-1	8 oz. bottle of green tissue marking dye
3408-2	8 oz. bottle of yellow tissue marking dye
3408-3	8 oz. bottle of black tissue marking dye
3408-4	8 oz. bottle of red tissue marking dye
3408-5	8 oz. bottle of blue tissue marking dye
3408-6	8 oz. bottle of orange tissue marking dye
1873	5-Dye Holding tray
1866	6-Dye Holding tray
1833	3-Dye Holding tray
8553	500 Wooden Applicator Sticks (10 packs of 50)
8554	Brush Caps for 2 oz. bottles (bag of 10)
8555	250 Tapered end cotton tipped applicator sticks (10 bags of 25)
8556	250 Round end cotton tipped applicator sticks (10 bags of 25)
6605	Refill packet of 500 casßœsette papers for The Davidson Small Specimen Kit

Bradley Products, Inc.

Since 1984, Manufacturers and Distributors of

THE DAVIDSON MARKING SYSTEM®

The original tissue marking system for a variety of applications requiring orientation of tissue specimens

NEW!

Davidson Cryocup System®

NEW!

Davidson Small Specimen Kit™

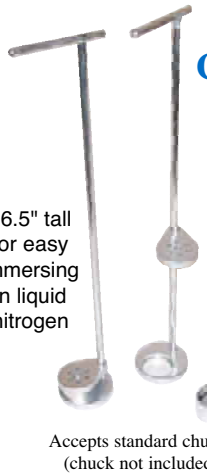
Product Brochure

New Items, New Pricing and Ordering Information

THE BRADLEY PRODUCTS

FAMILY OF PRODUCTS FOR THE MEDICAL LABORATORY

The Davidson Cryocup System®



16.5" tall for easy immersing in liquid nitrogen

Item # 5364
4 Cryocups and 1 holder

Item # 5361
Cryocup holder

Accepts standard chucks (chuck not included)

Item # 5360
Cryocup

The Davidson Small Specimen Kit™

Item # 6601
1 oz. green, red & blue dyes in wood tray, with 250 cassette papers

not for use as margin marking dyes

Item # 6605
500 cassette papers
2.25" by 3.25"

The Davidson Marking System®

Item #2401 (2 oz. Green, Yellow, Black, Red, Blue)

complete with 50 applicator sticks and instructions

Item #2406 (2 oz. Green, Yellow, Black, Red, Blue, Orange)

Replacement Tissue Dyes for the Davidson Marking System®

2 oz. (59 ml) Dyes

Item # 1163-1 Green
1163-2 Yellow
1163-3 Black
1163-4 Red
1163-5 Blue
1163-6 Orange

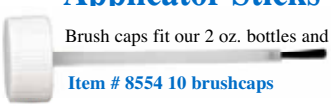
Individual two-ounce (59 ml) bottles of tissue dye with instructions.

Item # 3408-1 Green
3408-2 Yellow
3408-3 Black
3408-4 Red
3408-5 Blue
3408-6 Orange

Individual eight-ounce (237 ml) bottles of tissue dye with instructions.

Item # 8553 500 applicator sticks
Plain wood pplicator sticks are 5.75" in length, and are sold in packages of 500 (10 bags of 50 each).

Applicator Sticks & Brush Caps



Brush caps fit our 2 oz. bottles and are sold in bags of 10.

Item # 8554 10 brushcaps

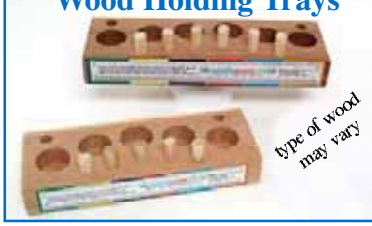
New! Cotton Tipped Applicator Sticks

6" in length — sold in lots of 250

Item # 8555 250 tapered end cotton tip

Item # 8554 250 rounded end cotton tip

Wood Holding Trays



Item #1866 6-dye tray
Item #1873 5-dye tray
for 2 oz. bottles of Davidson Marking System® dyes

To Order Call 800-325-7785

Or, you may place your Purchase Order by:

- **Fax:**
  952-881-1873
- **Mail:**
  Bradley Products, Inc.
  P.O. Box 201405
  Bloomington, MN 55420
- **Internet:**
  www.bradleyproducts.com
- **Phone:**
  952-881-1430
  or toll-free at 800-325-7785

Payment may be made by:

- **Check** drawn on a U.S. bank
- **Credit Card**
  (VISA, MasterCard and Discover cards are accepted.)
- **Electronic Funds Transfer**
  (International customers are responsible for bank charges incurred en route.)

Terms: Net 30 Days

Federal I.D. # 41-0979462

THE DAVIDSON MARKING SYSTEM

New Pricing Effective May 1, 2001

NEW ITEMS!

Item #	Description
	The Davidson Cryocup System®
5364	Complete Cryocup System (4 cryocups, 1 holder)
5360	Cryocup only
5361	Cryocup holder only
	The Davidson Small Specimen Kit™
6601	Set of green, red & blue 1 oz. bottles with applicator caps, in wood holding tray, 1 packet of 250 cassette papers
6605	Refill packet of 500 cassette papers

DAVIDSON MARKING SYSTEM® PRODUCTS

	The Davidson Marking System®
2401	Original 5-color System
2406	6-color System (all 6 colors)
	Individual Two-Ounce Dyes
1163-(x)	2 oz. dye (each color)
	Eight-Ounce Refill Dyes
3408-(x)	8 oz. dye (each color)
	Wood Holding Trays (no dyes)
1866	6-dye Tray
1873	5-dye Tray
	Applicator Sticks & Brushes
8553	Plain wood applicator sticks (500)
8554	Brush Caps for 2 oz. bottles (10)
8555	Tapered end cotton tipped app. sticks (250)
8556	Round end cotton tipped app. sticks (250)

NOTE: Shipping Charges to be "Prepay and Add" beginning 5/1/2001

Beginning May 1, 2001 we will be changing from a flat shipping charge to a "prepay and add" system, with UPS Ground as our standard service. UPS Next Day, Second Day, 3rd Day, et al will continue to be an available option. **Outside of the United States**, our shipping and handling charge is **$9.00 per order plus shipping charges**. Our International packages are shipped via UPS Worldwide Express, Expedited or Standard (Canada only).

Dear Colleague,

It has now been over 17 years since Bradley Products, Inc. introduced The Davidson Marking System®. These high quality tissue marking dyes including green, yellow, black, red, blue and orange continue to enjoy wide acceptance in hospitals, clinics and research facilities around the world.

These dyes are visible, reliable and safe. The dyes were originally developed and continue to have importance for orienting tissues. Their major application continues to be marking peripheral tumor or surgical margins. By applying one dye to the superior border, another to the inferior border, etc., one can identify the location of tumor or other pathology within a specimen. This has obvious use for Microscopically Oriented Histologic Sections (MOHS), a technique which is now being used increasingly in tumor surgery.

The dyes are also used to process multiple specimens in a single cassette. Specimens are marked with different colors, processed together, and then are all sectioned and stained on a single slide. This is both efficient and economical. The specimens retain their marking colors and so are easily distinguished.

Now, Bradley Products is introducing our newest products for the medical laboratory—the Davidson Cryocup System® and the Davidson Small Specimen Kit™.

The **Davidson Cryocup System®** **will revolutionize frozen section processing, greatly simplifying and speeding up the preparation of specimens.** By immersing the loaded cryocup holder in liquid nitrogen, freezing is completed in seconds rather than minutes. The chuck and specimen are easily removed from the cryocup, ready for the microtome. Its simple, intuitive design provides a flat specimen which offers a usable initial cut by traditional microtome methods.

The **Davidson Small Specimen Kit™** solves the increasingly common problem of tracking small specimens during histologic preparation. The unique colors mark the tissue during fixation and embedding, reducing small specimen loss and improving ease and efficiency.

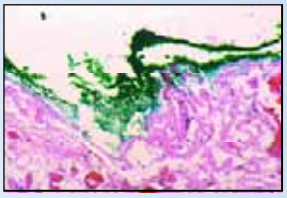
These two new products have been developed jointly by Bradley Products and myself in response to needs identified by ourselves and others in the medical laboratory community. They are available immediately from Bradley Products, Inc.

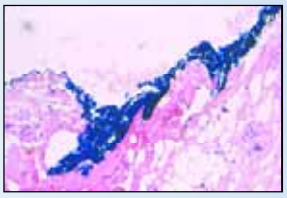
As always, I appreciate the letters sent to me describing issues, uses and concerns regarding our products, and strongly encourage that communication.

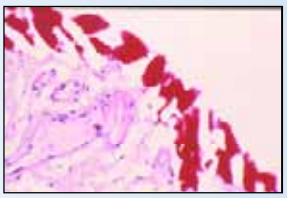
Sincerely,

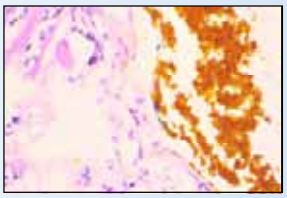
Terence Davidson, M.D.
Professor of Head and Neck Surgery
University of California at San Diego
200 W. Arbor Dr., San Diego, CA 92103-8895
E-mail: msbdms@mail.com

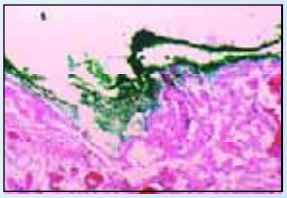
Lab Slides of Davidson Marking System® Dyes in Use











Caution:
These dyes are permanent. Never apply these dyes to a living patient. Only use them on tissue that has been removed.

Bradley Products, Inc.
P. O. Box 201405 Bloomington, MN 55420
phone: 952-881-1430 toll-free: 800-325-7785 fax: 952-881-1873
e-mail: msbdms@mail.com internet: www.bradleyproducts.com

INSTRUCTIONS FOR THE USE OF
THE DAVIDSON MARKING SYSTEM®

BRADLEY PRODUCTS, INC. — P.O. BOX 201405 — BLOOMINGTON, MN 55420
(952)-881-1430, (800)-325-7785, or fax (952)-881-1873

The Davidson marking dyes are used to mark and orient surgical and other tissue specimens submitted for histopathology.

Never apply any of the dye materials to a living patient. Only use them on tissue which has been removed. These are pigments which if placed in the living tissue will cause permanent coloration.

There are a variety of other uses for these dyes. None should be tried without appropriate laboratory investigation first.

The normal application of these dyes is to mark surgical tissue margins. The dyes are most effective when applied to fresh tissue, but work well when applied to tissues already fixed in formalin. Fresh tissue should be patted dry. Fixed tissues should be wiped gently to remove the fluids covering the tissue surfaces. The dyes can be applied in a variety of fashions. Many have found it useful to use wooden orange sticks. The stick is dipped into the dye, the orange stick is scraped along the bottom, excess fluid is removed from the stick by touching it to the top of the bottle and the side of the stick is applied to the appropriate tissue margin. If large surfaces are to be dyed, a cotton-tipped applicator is often useful. This too can be dipped into the dye and then the dye painted on the tissue surface.

ALWAYS SHAKE THE BOTTLE PRIOR TO USE.

The dyes require 2 to 5 minutes to bond to the tissue surface and should be left alone for this period of time. It is not necessary to dry the tissue (such as with a hair dryer). Simply allowing them to sit in the open air is sufficient. The tissue can then be placed in a cassette and put in formalin for permanent fixation or can be placed on a chuck and prepared for frozen section. Only small amounts of dye are necessary for effective marking.

Note on Processing Fatty Tissue

Adherence of marking dyes to fatty tissue, especially for frozen sections, can be a challenge. A recent observation by Brian Datnow, M.D., a pathologist at UCSD, improves this issue. The tissue surface can be defatted with acetone prior to dye application. Squirt or spray a little acetone from a squeeze bottle onto the tissue surface. Pat dry and then apply the dyes and process in the usual fashion, both for frozen and permanent sectioning. This is especially effective for breast and subcutaneous tissues.

AFTER USE, THE CAPS SHOULD BE KEPT ON THE BOTTLES, FOR WHEN THE MATERIALS DEHYDRATE THEY WILL BECOME INEFFECTIVE. DO NOT DILUTE OR ATTEMPT TO RECONSTITUTE THE DYES.

The following represents a typical MOHS marking application. Imagine a 2cm diameter circular piece of skin removed in the excision of a skin cancer (as noted in the illustration below). The tissue is cut into 4 appropriate-sized pieces and prepared for frozen section. The pathologist maintains precise orientation for each piece of tissue. The dyes are applied to the various tissue surfaces and a map is made documenting this application and orientation. Different symbols are used for each color. It is best to develop a consistent set of symbols. Commonly used symbols are shown in the figure below.

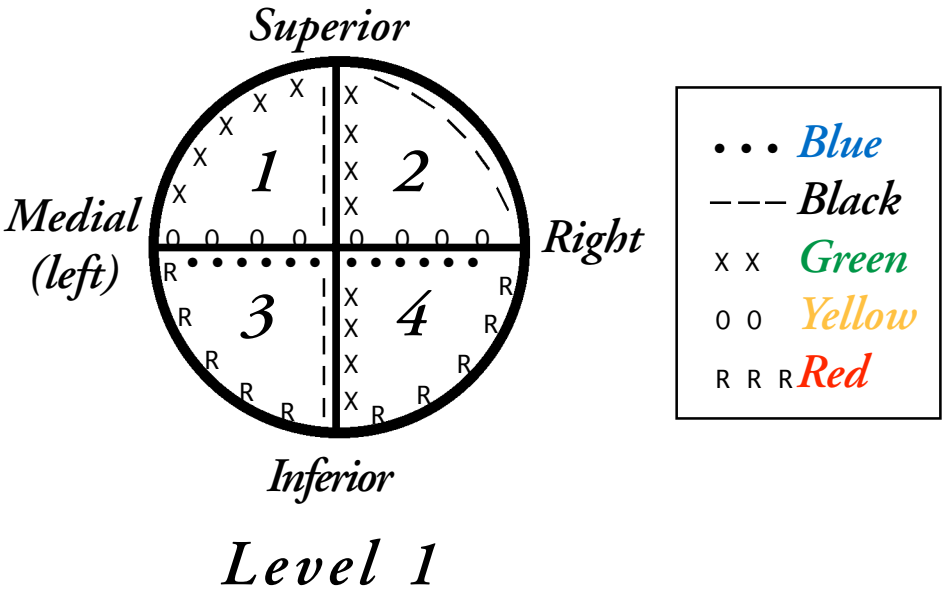
An alternate application system is to put an ounce of dye into a small plastic squeeze bottle such as those that contain oil for oil immersion microscopy. The dye can then be placed on the tissue simply by squeezing the bottle and rubbing the tip of the spout along the tissue.

The principal application for the marking dyes is to assist in the orientation of surgical specimens. While the dyes are useful in marking the surface of any surgical specimen, many have found the multiplicity of colors superior to a single color. There appears to be a wide variation in color preference, in part due to personal preferences, and in part due to variability in the adherence of the dyes to fixing chemicals and techniques, as these vary from one laboratory to another.

Another interesting application for the multi-color marking dyes is the ability to process multiple specimens in a single cassette. For example, if several skin tags are removed and one chooses to examine all of them microscopically, each can be dyed a different color, all placed in a single cassette, and processed as a single specimen. The cost savings is obvious. Before using the dyes for this application, each laboratory should validate the consistency of the dyes in their own institution. While it seems prudent to use this concept on multiple benign skin lesions where the probability of malignancy is very small, it would <u>not</u> seem wise to use this application to process specimens with a high probability of malignancy.

Surely there are many interesting and useful applications for these dyes. Each new application must be carefully explored prior to general recommendation. If questions, problems, or ideas arise, I would be interested in your comments.

Terence M. Davidson, M. D.
UCSD Medical Center
200 Arbor Street
San Diego, CA 92103-8895



Level 1