

## ImagOnHD Intaglio Printmaking Film

### MSDS & Safe Handling, Waste Disposal Guide

#### Product identification and Uses

Manufactured in the USA

ImagOn is a UV light sensitive film used in fine art intaglio printing. It consists of three layers: a shiny Mylar(r) coversheet, photoreactive dry film, and a dull polyolefin support sheet. The Mylar(r) and polyolefin sheets protect the film until it is ready to be used. The composition of the film consists of: binders (polymers that act as film formers), acrylate monomers (ingredients polymerized during ultraviolet light exposure) photoinitiators (react with the UV light to cause the monomers to polymerize), plasticizers (impart softness and flexibility), colorants, adhesion-promoters (improve adhesion of the film), and chemical agents for printout image).

ImagOnHD films intended use is as an intaglio printmaking film for plate-making in the fine art field of printmaking. Due to the relatively low volume prints produced in printmaking studio's it is expected that there will be equally low volumes of film in use at any given time. Therefore a number of factors must be considered, including the photopolymer components that may affect health, their possible health effects, the means of exposure, and control of these components.

This information is provided, not only for intaglio printmaking use, but also, for the worst case scenario under large scale printed circuit board manufacturing, where massive volumes of this type of film are used daily.

#### Section 1 First Aid Measures

Eye contact: Wash effected eyes under slowly running water for at least 15 minutes. Contact physician immediately.

Skin contact: Remove contaminated clothing. Wash contaminated skin with soap and water. If irritation persists seek medical attention.

Hazardous skin contact: Not available

Slight inhalation: If inhaled remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Hazardous inhalation: If victim is not breathing, perform mouth-to-mouth resuscitation. Oxygen may be administered if breathing is difficult.

Slight ingestion: If ingested, rinse mouth and throat liberally with water. Have conscious person drink several glasses of water and induce vomiting. Contact physician.

Caution: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

Hazardous ingestion: Not available

## SECTION 2.

Hazardous Ingredients

Mono/Multi-Function Methacrylates % weight 1-45.

Benzophenone CAS#119-61-9, % by weight 1-6.

Michler's ketone CAS#90-94-8 % by weight <1.

Oxyalkylated alcohols % by weight <2.

Toxicity values of the hazardous ingredients: Not available.

## SECTION 3.

Physical Data

Odor: Slightly sweet

Taste: Not available

Color: Clear Blue/Green

Physical state and appearance: Solid film ph (product as is):  
Not applicable.

Specific gravity: Similar to water.

Vapor pressure: The highest known value is 0.1 kPa (1 mm Hg)

(at 20°C) (Benzophenone) The following; Odor threshold,

Volatility, Melting point, Boiling point, Vapor density,

Density, Water/oil dist. coeff, Ionicity (surface active

agent), Critical temperature, Instability temperature,

Conditions of instability, Dispersion properties.....Data is

not available.

#### SECTION 4. FIRE AND EXPLOSION DATA

The product is: Non-flammable.

Auto-ignition temperature: Not applicable.

Fire degradation products: When heated to decomposition it emits toxic fumes.

Flash points: Not applicable.

Flammable limits: Not applicable.

Fire extinguishing procedures: Use DRY chemicals, CO<sub>2</sub>, water spray foam. For massive fires, use unmanned hose holder or monitor nozzle. Do not allow any potentially contaminated water including rain water, runoff from fire fighting to enter any waterway, sewer or drain.

Flammability: Not applicable.

Remark: Not available.

Risk of explosion: Risk of explosion of the product in presence of mechanical impact: Not available. Risk of explosion of the product in presence of static discharge: Not available.

Remark: Not available.

#### SECTION 5.

##### Reactivity Data

Stability: This product is stable.

Hazardous decomp. Products: Thermal decomposition may yield carbon monoxide and/or carbon dioxide, aldehydes, carboxylic acids.

Degradability: Not available.

Products of Degradation: These products are carbon dioxide (CO, CO<sub>2</sub>) and water. The product itself and its products of degradation are not toxic. Remark; not available.

Corrosivity: Not available.

Remark: not available.

Reactivity: Slightly reactive to reactive with OXIDIZING AGENTS.

#### INCIDENCE OF HEALTH EFFECTS

Approximately 20,000 operators worldwide handle PCB photopolymer films daily, but there have only been a few inquiries per year regarding health effects. Although not every instance of related health effects is reported, the records show that few cases occur.

Casual contact with this film through normal handling, has not been shown to be a significant route of exposure. The film's photoreactive acrylate monomers are embedded in its polymeric matrix. They do not appear to be transferred to or absorbed by the skin in sufficient quantities to cause skin irritation. It should be noted that human sensitivity to chemicals will vary. Always follow good hygiene practices when handling any unprotected material.

#### HEALTH EFFECTS OF ACRYLATES

The photoreactive film is formulated with acrylate monomers. Historical and toxicological data have shown that acrylate monomers can produce potential health effects. These effects can occur with both normal use conditions and with variations anticipated, if the guidelines in this advisory are not followed. Overexposure to the acrylates in the film can have these known effects:

- \*Respiratory irritation
- \*Skin irritation (dermatitis)
- \*Skin sensitization

#### RESPIRATORY EFFECTS

Inhaling vapors from over-heated ImagOn film may result in dryness and irritation of the respiratory tract. More harmful effects are possible, if unexposed ImagOn is heated without the top Mylar in place and basic safety precautions are totally disregarded. ImagOn applications do require heating of the film for a few minutes, after film lamination and with the top Mylar in place, with a hand or hair dryer.

#### SKIN EFFECTS

The incidence of skin irritation resulting from exposure to the acrylates in photoreactive dry film is very low. Skin irritation may take the form of redness and itching of the affected area; there may also be slight blistering. In rare instances some people experience a condition that is very similar to poison ivy (*Rhus toxicodendron*), and is often diagnosed as such.

The degree of reaction will vary according to the amount of exposure and the sensitivity of the individual; some persons

will be unaffected by contact. If dermatitis effects occur, determining the source of the exposure and implementing the required controls should be given top priority. Make sure gloves are worn when handling unexposed material or developing solution.

## SENSITIZATION

Sensitization occurs when the body shows an allergic response to a substance, usually triggered by exposure to a much smaller quantity of the material than is necessary to cause dermatitis. Some people may develop sensitization over a period of time. A typical sensitized response to acrylates is swelling of the face, typically around the eyes, often nearly closing them. We are not aware of any more serious or life-threatening effects. Persons exhibiting sensitization symptoms should be referred to a physician. It is likely the sensitized persons should avoid exposure to acrylates.

## ROUTES OF EXPOSURE TO ACRYLATES

There are several places in the process where there is potential exposure to the acrylate monomers in the dry film. While handling of the film itself and coversheets have not been shown to be significant routes of exposure, they should be considered in any health evaluation especially if repetitive contact may occur.

## CONTACT WITH THE FILM

Because the coversheets are in place during most of the handling, there is minimum opportunity for exposure to the acrylates. However, constant and prolonged contact would increase the likelihood of skin irritation.

Contact may occur while:

- \*Trimming the film to correct size
- \*Placing film on the plate
- \*Developing the film
- \*Removing the used film
- \*Handling scraps and coversheets

Following exposure, the Mylar cover sheet is removed prior to placing the ImagOn and plate into the developing solution.

Unexposed areas of ImagOn should not be allowed to touch the skin. Care should be taken when disposing of the cover-sheets, since they may contain small amounts of residue. Cover-sheets may contain photopolymer residues and should never be reused for any purpose. Care should also be taken to avoid direct contact with the used developing solution.

#### PROTECTION FROM FILM CONTACT

Minimized contact with scraps and used cover-sheets by disposing of them immediately in a plastic trash bag. Trash bags should be open enough to allow easy disposal of cover-sheets without having to ball or fold them. Use neoprene or latex gloves to avoid direct contact with cover-sheets and scraps.

Contact with the film is possible during its removal from the plate. In this step, the plate is placed into the used developer solution and left overnight until the film lifts from the plate. Direct contact with the film and the used developer should be avoided by wearing neoprene gloves similar to dish washing gloves. Gloves should be changed or washed often to avoid buildup of dirt and contaminants. They should not be turned inside out or used until they look dirty. Wash hands routinely before using toilets, smoking, or eating. Any time skin is directly exposed to unexposed film or developing solution, it should be immediately washed. Careful washing with soap and water is truly effective. It has been shown that prompt washing is effective even for a sensitized person.

#### Section 6.

##### Toxicological Properties

Routes of entry: Dermal contact, inhalation, Ingestion.

Remark; Not available.

TLV, Not available.

##### Toxicity to animals

LD50 Not available

LC50, Not available.

Remark, Not available

Chronic effects on humans

Slightly hazardous in case of skin contact (irritant, sensitizer).

Carcinogenic effects: Not available.

Mutagenic effects: Not available.

Teratogenic effects: Not available.

Developmental toxicity: Not available.

Remark: Not available.

Acute effects on Humans

Eyes: May cause moderate, temporary irritation to the eyes.

Skin: May cause irritation to the skin. Prolonged or repeated contact may cause irritation. May cause skin sensitization.

Inhalation: Inhaled vapors from the lamination process may cause temporary respiration irritation.

Ingestion: Substance has relatively low level of toxicity.

Remark: Not available.

## SECTION 7.

### Preventative Measures

Precautions; Avoid inhaling mist from Pressurized Spray Developer system. Do not ingest. Avoid contact with eyes and skin. Wear suitable protective clothing. If ingested seek medical advice immediately.

Protective clothing: Safety glasses. Chemical resistant gloves and apron. Boots. For industrial application, where thousands of sq. ft. of film is used daily, ensure eyewash station and safety shower is proximal to the work station location.

Wear appropriate respirator when ventilation is inadequate.

Storage: A refrigerated room would be preferable.

Storage temperature; maximum 21°C (70°F), minimum 5°C (40°F).

Small spill and leak; Use appropriate tools to put the spilled solid in a convenient container.

Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authorities requirements.

Large spill and leak; Use shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Protective Clothing in case of a large spill:

Boots. Gloves. Wear appropriate respirator when ventilation is inadequate.

WASTE DISPOSAL (film & developer solution) Recycle, if possible. Consult your local or state authorities.

ImagOn films are fully biodegradable (BOD) and can be disposed of into normal municipal waste systems. Developer solutions such as soda ash (a mild pH enhancer) together with dissolved ImagOn film can be put into normal water drains (unless there are specific regulations posted at these drains). The amount of BOD material from these solutions is small unless extremely large amounts of film (thousand of square feet) are being consumed in short periods of time.

The cover-sheets on the ImagOn film which are polyester and polyethylene are non-hazardous waste and can be disposed of together with other materials going to municipal landfills. These cover-sheets may contain some trace quantities of photopolymer, so caution should be used to avoid skin contact.

#### SECTION 8. CLASSIFICATION

TDG ROAD / RAIL; Not a TDG controlled material. Not applicable.

Special Provisions: No additional remarks.

WHMIS Class D-2B; Material causing other toxic effects.

#### SECTION 9. OTHER REGULATORY INFORMATION

Canadian Environmental Protection Agency Act CEPA DSL: All ingredients are on the list.

Ozone depleting Substances. No

Hazardous Material Information System (U.S.A.) Health Hazard 2, Fire Hazard 1, Reactivity 0, Personal Protection C.

National Fire Protection association (U.S.A.) Fire Hazard 1, Reactivity 0, Health 2.

#### SECTION 10 ECOLOGICAL INFORMATION

Ecotoxicity; Not available.

BOD5 and COD; Not available.

Products of Biodegradation; These products are carbon

oxides (CO, CO<sub>2</sub>) and water.

Toxicity of the Products of Biodegradation; The products itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

#### SECTION. 11 PREPARATION

References Canadian Centre for Occupational Health and safety.

To the best of our knowledge, the information contained is correct. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemicals is the sole responsibility of the user. Users of any chemicals should satisfy themselves that the conditions and methods of use assure that the chemical is used safely.

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