



Safety Data Sheet

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SECTION 1: Identification

1.1. Product identifier

3M (TM) Piezo Inkjet Ink 4482 Light Yellow

Product Identification Numbers

75-3471-8823-9

1.2. Recommended use and restrictions on use

Recommended use

Piezo Ink Jet Ink, Ink

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Commercial Solutions Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number

1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification

Flammable Liquid: Category 4.

Acute Toxicity (inhalation): Category 4.

Serious Eye Damage/Irritation: Category 2A.

Specific Target Organ Toxicity (repeated exposure): Category 2.

2.2. Label elements

Signal word

Warning

Symbols

Exclamation mark | Health Hazard |

Pictograms

**Hazard Statements**

Combustible liquid.

Causes serious eye irritation.

Harmful if inhaled.

May cause damage to organs through prolonged or repeated exposure:
blood or blood-forming organs |

Precautionary Statements**Prevention:**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Do not breathe dust/fume/gas/mist/vapors/spray.

Use only outdoors or in a well-ventilated area.

Wear protective gloves and eye/face protection.

Wash thoroughly after handling.

Response:

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

If eye irritation persists: Get medical advice/attention.

In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

Storage:

Store in a well-ventilated place. Keep cool.

Disposal:

Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Hazards not otherwise classified

None.

8% of the mixture consists of ingredients of unknown acute oral toxicity.

8% of the mixture consists of ingredients of unknown acute dermal toxicity.

8% of the mixture consists of ingredients of unknown acute inhalation toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
2-BUTOXYETHYL ACETATE	112-07-2	60 - 70 Trade Secret *
1-METHOXY-2-PROPYL ACETATE	108-65-6	10 - 20 Trade Secret *
CYCLOHEXANONE	108-94-1	1 - 10 Trade Secret *
PIGMENT	Trade Secret*	1 - 5 Trade Secret *
VINYL COPOLYMER	Trade Secret*	1 - 5 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade

secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:

Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:

Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:

Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

If Swallowed:

Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required

Not applicable.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

In case of fire: Use a fire fighting agent suitable for flammable liquids such as dry chemical or carbon dioxide to extinguish.

5.2. Special hazards arising from the substance or mixture

Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Chloride	During Combustion

5.3. Special protective actions for fire-fighters

Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions

Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up

Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible using non-sparking tools. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

For industrial or professional use only. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.)

7.2. Conditions for safe storage including any incompatibilities

Store in a well-ventilated place. Keep cool. Protect from sunlight. Store away from heat. Store away from acids. Store away from oxidizing agents.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
1-METHOXY-2-PROPYL ACETATE	108-65-6	AIHA	TWA:50 ppm	
1-METHOXY-2-PROPYL ACETATE	108-65-6	CMRG	TWA:10 mg/m ³ ;STEL:90 ppm	
CYCLOHEXANONE	108-94-1	ACGIH	TWA:20 ppm;STEL:50 ppm	A3: Confirmed animal carcin., Skin Notation
CYCLOHEXANONE	108-94-1	OSHA	TWA:200 mg/m ³ (50 ppm)	
2-BUTOXYETHYL ACETATE	112-07-2	ACGIH	TWA:20 ppm	A3: Confirmed animal carcin.
2-BUTOXYETHYL ACETATE	112-07-2	CMRG	TWA:25 ppm	Skin Notation

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

CMRG : Chemical Manufacturer's Recommended Guidelines

OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls

Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:

Indirect Vented Goggles

Skin/hand protection

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.

Gloves made from the following material(s) are recommended: Butyl Rubber

Polyvinyl Alcohol (PVA)

Polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

General Physical Form:	Liquid
Specific Physical Form:	Liquid
Odor, Color, Grade:	Solvent Odor Light Yellow Color
Odor threshold	<i>No Data Available</i>
pH	<i>Not Applicable</i>
Melting point	<i>Not Applicable</i>
Boiling Point	146 °C
Flash Point	>=149 °F [Test Method: Closed Cup]
Evaporation rate	<i>No Data Available</i>
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	1.5 % volume
Flammable Limits(UEL)	10.8 % volume
Vapor Pressure	2.5 mmHg [@ 20 °C]
Density	0.92 g/ml
Specific Gravity	0.92 [Ref Std: WATER=1]
Solubility- non-water	<i>No Data Available</i>
Partition coefficient: n-octanol/ water	<i>No Data Available</i>
Autoignition temperature	> 788 °F
Decomposition temperature	<i>No Data Available</i>
Viscosity	<i>No Data Available</i>
Volatile Organic Compounds	<=910 g/l
Percent volatile	90 - 100
VOC Less H2O & Exempt Solvents	<=910 g/l

SECTION 10: Stability and reactivity

10.1. Reactivity

This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

Light
Heat
Sparks and/or flames

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

<u>Substance</u>	<u>Condition</u>
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:

Harmful if inhaled.

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:

May be harmful in contact with skin.

Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Eye Contact:

Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:

May be harmful if swallowed.

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Additional Health Effects:

Prolonged or repeated exposure may cause target organ effects:

Blood Effects: Signs/symptoms may include generalized weakness and fatigue, skin pallor, changes in blood clotting time, internal bleeding, and/or hemoglobinemia.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE 2,000 - 5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE 10 - 20 mg/l
Overall product	Ingestion		No data available; calculated ATE 2,000 - 5,000 mg/kg
2-BUTOXYETHYL ACETATE	Inhalation-Vapor	official classification	LC50 estimated to be 10 - 20 mg/l
2-BUTOXYETHYL ACETATE	Dermal	Rabbit	LD50 > 4,766 mg/kg
2-BUTOXYETHYL ACETATE	Ingestion	Rat	LD50 2,400 mg/kg
1-METHOXY-2-PROPYL ACETATE	Dermal	Rabbit	LD50 > 5,000 mg/kg
1-METHOXY-2-PROPYL ACETATE	Inhalation-Vapor (4 hours)	Rat	LC50 > 28.8 mg/l
1-METHOXY-2-PROPYL ACETATE	Ingestion	Rat	LD50 8,532 mg/kg
CYCLOHEXANONE	Dermal	Rabbit	LD50 948 mg/kg
CYCLOHEXANONE	Inhalation-Vapor (4 hours)	Rat	LC50 > 6.2 mg/l
CYCLOHEXANONE	Ingestion	Rat	LD50 1,296 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
2-BUTOXYETHYL ACETATE	Rabbit	Minimal irritation
1-METHOXY-2-PROPYL ACETATE	Rabbit	No significant irritation
CYCLOHEXANONE	Rabbit	Mild irritant

Serious Eye Damage/Irritation

Name	Species	Value
2-BUTOXYETHYL ACETATE	Rabbit	Mild irritant
1-METHOXY-2-PROPYL ACETATE	Rabbit	Mild irritant
CYCLOHEXANONE	Rabbit	Severe irritant

Skin Sensitization

Name	Species	Value
1-METHOXY-2-PROPYL ACETATE	Guinea pig	Not sensitizing
CYCLOHEXANONE	Guinea pig	Not sensitizing

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
1-METHOXY-2-PROPYL ACETATE	In Vitro	Not mutagenic
CYCLOHEXANONE	In vivo	Not mutagenic
CYCLOHEXANONE	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
CYCLOHEXANONE	Ingestion	Multiple animal species	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity**Reproductive and/or Developmental Effects**

Name	Route	Value	Species	Test Result	Exposure Duration
2-BUTOXYETHYL ACETATE	Dermal	Not toxic to female reproduction	Rabbit	NOAEL 10,000 mg/kg	24 hours
2-BUTOXYETHYL ACETATE	Ingestion	Not toxic to female reproduction	Rat	NOAEL 3,000 mg/kg	not applicable
2-BUTOXYETHYL ACETATE	Inhalation	Not toxic to female reproduction	Multiple animal species	NOAEL 0.7 mg/l	10 months
2-BUTOXYETHYL ACETATE	Dermal	Not toxic to male reproduction	Rabbit	NOAEL 10,000 mg/kg	24 hours
2-BUTOXYETHYL ACETATE	Ingestion	Not toxic to male reproduction	Rat	NOAEL 3,000 mg/kg	not applicable
2-BUTOXYETHYL ACETATE	Inhalation	Not toxic to male reproduction	Multiple animal species	NOAEL 0.7 mg/l	10 months
1-METHOXY-2-PROPYL ACETATE	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
1-METHOXY-2-PROPYL ACETATE	Ingestion	Not toxic to male reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
1-METHOXY-2-PROPYL ACETATE	Ingestion	Not toxic to development	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
1-METHOXY-2-PROPYL ACETATE	Inhalation	Not toxic to development	Rat	NOAEL 21.6 mg/l	during organogenesis
CYCLOHEXANONE	Inhalation	Not toxic to female reproduction	Rat	NOAEL 4 mg/l	2 generation
CYCLOHEXANONE	Inhalation	Some positive male reproductive data exist, but the data are not sufficient for classification	Rat	NOAEL 2 mg/l	2 generation
CYCLOHEXANONE	Ingestion	Some positive developmental data exist, but the data are not sufficient for classification	Mouse	LOAEL 1,100 mg/kg/day	during organogenesis
CYCLOHEXANONE	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 2 mg/l	2 generation

Target Organ(s)**Specific Target Organ Toxicity - single exposure**

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
2-BUTOXYETHYL ACETATE	Dermal	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rabbit	NOAEL Not available	24 hours

2-BUTOXYETHYL ACETATE	Dermal	blood	Some positive data exist, but the data are not sufficient for classification	Rabbit	LOAEL 3,191 mg/kg	24 hours
2-BUTOXYETHYL ACETATE	Dermal	heart endocrine system hematopoietic system liver nervous system	All data are negative	Rabbit	NOAEL 10,000 mg/kg	24 hours
2-BUTOXYETHYL ACETATE	Inhalation	central nervous system depression	Some positive data exist, but the data are not sufficient for classification	similar compounds	NOAEL Not available	
2-BUTOXYETHYL ACETATE	Inhalation	blood	Some positive data exist, but the data are not sufficient for classification	Multiple animal species	NOAEL 2.6 mg/l	4 hours
2-BUTOXYETHYL ACETATE	Inhalation	heart endocrine system hematopoietic system liver nervous system kidney and/or bladder respiratory system	All data are negative	Multiple animal species	NOAEL 2.6 mg/l	4 hours
2-BUTOXYETHYL ACETATE	Ingestion	blood	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 2,400 mg/kg	not applicable
2-BUTOXYETHYL ACETATE	Ingestion	hematopoietic system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 2,400 mg/kg	not applicable
2-BUTOXYETHYL ACETATE	Ingestion	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 2,400 mg/kg	not applicable
2-BUTOXYETHYL ACETATE	Ingestion	heart liver nervous system	All data are negative	Rat	NOAEL 3,000 mg/kg	not applicable
1-METHOXY-2-PROPYL ACETATE	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
CYCLOHEXANONE	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Guinea pig	LOAEL 16.1 mg/l	6 hours
CYCLOHEXANONE	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
2-BUTOXYETHYL ACETATE	Inhalation	blood	May cause damage to organs though prolonged or repeated exposure	Multiple animal species	NOAEL 0.7 mg/l	10 months
2-BUTOXYETHYL ACETATE	Inhalation	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Multiple animal species	LOAEL 0.7 mg/l	10 months
2-BUTOXYETHYL ACETATE	Inhalation	heart endocrine system hematopoietic system liver nervous system respiratory system	All data are negative	Multiple animal species	NOAEL 0.7 mg/l	10 months
1-METHOXY-2-PROPYL ACETATE	Inhalation	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 16.2 mg/l	9 days
1-METHOXY-2-PROPYL ACETATE	Inhalation	olfactory system	Some positive data exist, but the data are not sufficient for classification	Mouse	LOAEL 1.62 mg/l	9 days
1-METHOXY-2-PROPYL ACETATE	Inhalation	blood	All data are negative	Multiple animal species	NOAEL 16.2 mg/l	9 days
1-METHOXY-2-PROPYL ACETATE	Ingestion	endocrine system	Some positive data exist, but the data are not sufficient for	Rat	NOAEL 1,000	44 days

			classification		mg/kg/day	
CYCLOHEXANONE	Inhalation	liver kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rabbit	NOAEL 0.76 mg/l	50 days
CYCLOHEXANONE	Ingestion	liver	Some positive data exist, but the data are not sufficient for classification	Mouse	NOAEL 4,800 mg/kg/day	90 days

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information**Ecotoxicological information**

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations**13.1. Disposal methods**

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. As a disposal alternative, utilize an acceptable permitted waste disposal facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): D001 (Ignitable)

SECTION 14: Transport Information

For Transport Information, please visit <http://3M.com/Transportinfo> or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information**15.1. US Federal Regulations**

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient2-BUTOXYETHYL ACETATE (GLYCOL
ETHERS)**C.A.S. No**

112-07-2

% by Wt

60 - 70

15.2. State Regulations

Contact 3M for more information.

15.3. Chemical Inventories

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.**SECTION 16: Other information****NFPA Hazard Classification****Health: 2 Flammability: 2 Instability: 0 Special Hazards: None**

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

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