Safety Data Sheet

Document Group:	25-5366-7	**Version Number:**	2.00
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SECTION 1: Identification

1.1. Product identifier
3M (TM) Piezo Inkjet Ink 4496 Cyan

Product Identification Numbers
75-3471-8828-8

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.
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.

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.

Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Get medical advice/attention if you feel unwell.
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.

10% of the mixture consists of ingredients of unknown acute oral toxicity.
10% of the mixture consists of ingredients of unknown acute dermal toxicity.
10% 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	15 - 25 Trade Secret *
VINYL COPOLYMER	Trade Secret*	1 - 10 Trade Secret *
PIGMENT	Trade Secret*	1 - 10 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 you feel unwell, get medical attention.

Eye Contact:
No need for first aid is anticipated.

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

Substance	Condition
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/m3;STEL:90 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
None required.

Skin/hand protection
No chemical protective gloves are required.

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, Cyan Color
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Boiling Point	146 ºC
Flash Point	>=149 ºF [*Test Method:* Closed Cup]
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	1.5 % volume
Flammable Limits(UEL)	10.8 % volume
Vapor Pressure	2.5 mmHg [@ 20 ºC]
Density	0.92 g/ml
Specific Gravity	0.92 [*Ref Std:* WATER=1]
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	> 788 ºF
Decomposition temperature	*No Data Available*
Viscosity	*No Data Available*
Volatile Organic Compounds	<=898 g/l
Percent volatile	90 - 100
VOC Less H2O & Exempt Solvents	<=898 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

Substance	Condition
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:
Contact with the skin during product use is not expected to result in significant irritation.

Eye Contact:
Contact with the eyes during product use is not expected to result in significant irritation.

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 > 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-	official	LC50 estimated to be 10 - 20 mg/l

	Vapor	classification	
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

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

Serious Eye Damage/Irritation

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

Skin Sensitization

Name	Species	Value
1-METHOXY-2-PROPYL ACETATE	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

Carcinogenicity

For the component/components, either no data are currently available or 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	premating & during

				mg/kg/day	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

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 | hematoppoitic 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 | hematoppoitic 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	hematoppoitic 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	

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 |	All data are negative	Multiple animal species	NOAEL 0.7 mg/l	10 months

		respiratory system				
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 classification	Rat	NOAEL 1,000 mg/kg/day	44 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):

Ingredient	C.A.S. No	% by Wt
2-BUTOXYETHYL ACETATE (GLYCOL ETHERS)	112-07-2	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: 1 **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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