SAFETY DATA SHEET

Issuing Date 24-May-2015 **Revision Date** 15-Jun-2015 **Revision Number** 1

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product Code(s) 400609

Product Name **X-77**

Contains 1-Butoxy-2-propanol, Naphtha (petroleum), heavy aromatic, Naphthalene

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Etch Resist Ink

Uses advised against No information available

1.3. Details of the supplier of the safety data sheet

Company
Taiyo America, Inc.
2675 Antler Drive
Carson City, NV 89701
TEL: 775-885-9959

For further information, please contact

E-mail Address No information available.

1.4. Emergency telephone number

Emergency Telephone Number 775-885-9959

Europe	112

Section 2. Hazards identification

2.1. - Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Carcinogenicity	Category 2
Chronic Aquatic Toxicity	Category 2

Physical Hazards

None

2.2. Label Elements

Signal Word **Warning**

Hazard Statements
H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects
EUH210 - Safety data sheet available on request

Precautionary Statements
P201 - Obtain special instructions before use
P281 - Use personal protective equipment as required
P308 + P313 - IF exposed or concerned: Get medical advice/ attention
P273 - Avoid release to the environment
P391 - Collect spillage

2.3. Other information

Section 3. Composition/information on ingredients

3.1. Substances
Not applicable

3.2. Mixtures

Chemical Name	EC-No	CAS-No	Weight %	EU - GHS Substance Classification	REACH No.
Talc	238-877-9	14807-96-6	10-30		No data available
Barium sulfate	Present	7727-43-7	10-30		No data available
Naphtha (petroleum), heavy aromatic	Present	64742-94-5	10-30	Asp. Tox. 1 (H304) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	No data available
1-Butoxy-2-propanol	Present	5131-66-8	<10	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319)	No data available
Carbon black	215-609-9 435-640-3	1333-86-4	1-5		No data available
Naphthalene	Present	91-20-3	1-5	Acute Tox. 4 (H302) Carc. 2 (H351) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)	No data available

For the full text of the H-Statements mentioned in this Section, see Section 16

Section 4. First aid measures

4.1. Description of first-aid measures

General Advice If symptoms persist, call a physician. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing.

Eye Contact Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.

Skin Contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Consult a physician if necessary.

Ingestion Do NOT induce vomiting. Drink plenty of water. Rinse mouth. If symptoms persist, call a physician.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If symptoms persist, call a physician.

Protection of First-aiders Use personal protective equipment. Avoid contact with skin, eyes and clothing.

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

Most Important Symptoms/Effects No information available.

4.3. Indication of immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

Section 5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media
Water spray. Carbon dioxide (CO_2). Dry chemical. Dry powder.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases
Combustible material. Vapors may travel to source of ignition and flash back.

5.3. Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Section 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Evacuate personnel to safe areas. Pay attention to flashback. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system. Avoid release to the environment.

6.3. Methods and materials for containment and cleaning up

Use personal protective equipment. Dam up. Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Clean contaminated surface thoroughly.

6.4. Reference to other sections

See Section 12 for additional information.

Section 7. Handling and storage

7.1. Precautions for Safe Handling

Handling
Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Do not breathe vapors or spray mist. Use only in area provided with appropriate exhaust ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from heat, sparks and open flame. No smoking. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Do not take internally.

Hygiene Measures
When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs. Wash thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Keep out of the reach of children. Keep away from heat and sources of ignition. Keep in properly labeled containers. Keep containers tightly closed in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

Exposure Scenario
No information available.

Other Guidelines
No information available.

Section 8. Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical Name	EU	The United Kingdom	France	Spain	Germany
Talc 14807-96-6		STEL: 3 mg/m³ TWA: 1 mg/m³		TWA: 2 mg/m³	
Barium sulfate 7727-43-7		STEL: 30 mg/m³ STEL: 12 mg/m³ TWA: 10 mg/m³ TWA: 4 mg/m³		TWA: 10 mg/m³	TWA: 4 mg/m³ TWA: 1.5 mg/m³ Ceiling / Peak: 4 mg/m³
Carbon black 1333-86-4		STEL: 7 mg/m³ TWA: 3.5 mg/m³	VME: 3.5 mg/m³	VLA-ED: 3.5 mg/m³	
Naphthalene 91-20-3	TWA 10 ppm TWA 50 mg/m³		TWA: 10 ppm TWA: 50 mg/m³	S* STEL: 15 ppm STEL: 80 mg/m³ TWA: 10 ppm TWA: 53 mg/m³	Skin TWA: 0.1 ppm TWA: 0.5 mg/m³

Component	Italy	Portugal	The Netherlands	Finland	Denmark
Talc 14807-96-6 (10-30)		TWA: 2 mg/m³	TWA: 0.25 mg/m³	TWA: 0.5 fiber/cm3 TWA: 5 mg/m³	TWA: 0.3 fiber/cm3
Barium sulfate 7727-43-7 (10-30)		TWA: 10 mg/m³			
Carbon black 1333-86-4 (1-5)		TWA: 3.5 mg/m³		TWA: 3.5 mg/m³ STEL: 7 mg/m³	TWA: 3.5 mg/m³
Naphthalene 91-20-3 (1-5)		STEL: 15 ppm TWA: 10 ppm TWA: 50 mg/m³	Skin STEL: 80 mg/m³ TWA: 50 mg/m³	TWA: 1 ppm TWA: 5 mg/m³ STEL: 2 ppm STEL: 10 mg/m³	TWA: 10 ppm TWA: 50 mg/m³

Chemical Name	Austria	Switzerland	Poland	Norway	Ireland
Talc 14807-96-6	TWA: 2 mg/m³	TWA: 2 mg/m³	TWA: 4.0 mg/m³ TWA: 1.0 mg/m³	TWA: 6 mg/m³ TWA: 2 mg/m³ STEL: 12 mg/m³ STEL: 4 mg/m³	TWA: 10 mg/m³ TWA: 0.8 mg/m³
Barium sulfate 7727-43-7				TWA: 0.5 mg/m³ STEL: 1.5 mg/m³	TWA: 2 mg/m³ STEL: 6 mg/m³
Carbon black 1333-86-4			NDS: 4.0 mg/m³	TWA: 3.5 mg/m³ STEL: 7 mg/m³	TWA: 3.5 mg/m³ STEL: 7 mg/m³
Naphthalene 91-20-3	Skin TWA: 10 ppm TWA: 50 mg/m³	Skin TWA: 10 ppm TWA: 50 mg/m³	STEL: 50 mg/m³ TWA: 20 mg/m³	TWA: 10 ppm TWA: 50 mg/m³ STEL: 20 ppm STEL: 75 mg/m³	TWA: 10 ppm TWA: 50 mg/m³ STEL: 15 ppm STEL: 75 mg/m³

Component	Italy	Portugal	Netherlands	Finland	Denmark
Naphthalene 91-20-3 (1-5)	(ACGIH:) urine end of shift at end of workweek 1-Hydroxypyrene (with hydrolysis) Nonquantitative				

Component	Romania	Slovakia	Latvia	Bulgaria

Naphthalene 91-20-3 (1-5)		5.66 µg/L urine end of exposure or work shift 1-Hydroxypyrene Carcinogens, category 2		

Derived No Effect Level No information available
Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering Measures Ensure adequate ventilation, especially in confined areas.
Personal protective equipment
Eye Protection Safety glasses with side-shields.
Skin and Body Protection Lightweight protective clothing.
Hand Protection Impervious gloves.
Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Environmental Exposure Controls Do not allow material to contaminate ground water system.

Section 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State Viscous liquid **Appearance** Black
Odor Strong Solvent

Property	Values	Remarks/ - Method
pH	No data available	None known
Melting Point/Range	No data available	None known
Boiling Point/Boiling Range	No data available	None known
Flash Point	70 °C / 158 °F	None known
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Vapor Pressure	No data available	None known
Vapor Density	No data available	None known
Relative Density	1.46	None known
Water Solubility	No data available	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	No data available	None known
Autoignition Temperature	No data available	None known
Decomposition Temperature	No data available	None known
Viscosity	No data available	None known
Flammable Properties	Combustible material: may burn but does not ignite readily.	
Explosive Properties	No data available	
Oxidizing Properties	No data available	

9.2. Other information

VOC Content (%) 27
VOC (g/l) 400 gm/l
Flammability Limits in Air No data available

Section 10. Stability and reactivity

10.1. Reactivity
No data available.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
None under normal processing.

10.4. Conditions to avoid
Incompatible products.

10.5. Incompatible materials
Strong oxidizing agents. Strong acids. Strong bases.

10.6. Hazardous decomposition products
Carbon dioxide (CO_2). Carbon monoxide (CO). Sulfur oxides.

Section 11. Toxicological information

11.1. Information on toxicological effects

Acute Toxicity

Product Information

Inhalation There is no data available for this product.
Eye Contact There is no data available for this product.
Skin Contact There is no data available for this product.
Ingestion There is no data available for this product.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Naphtha (petroleum), heavy aromatic	> 5000 mg/kg (Rat)	> 2 mL/kg (Rabbit)	> 590 mg/m³ (Rat) 4 h
1-Butoxy-2-propanol	= 5660 µL/kg (Rat)	= 3100 mg/kg (Rabbit)	
Carbon black	> 15400 mg/kg (Rat)	> 3 g/kg (Rabbit)	
Naphthalene	= 1110 mg/kg (Rat) = 490 mg/kg (Rat)	= 1120 mg/kg (Rabbit) > 20 g/kg (Rabbit)	> 340 mg/m³ (Rat) 1 h

Sensitization No information available.
Mutagenic Effects No information available.
Carcinogenic Effects Contains a known or suspected carcinogen. May cause cancer.

Reproductive Toxicity No information available.
Developmental Toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure No information available.
Target Organ Effects Blood. Central nervous system (CNS). Eyes. Gastrointestinal tract (GI). Kidney. Liver. Respiratory system. Skin.
Aspiration Hazard No information available.

Section 12. Ecological information

12.1. Toxicity

Ecotoxicity Effects
Toxic to aquatic life with long lasting effects

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Talc		LC50 96 h: > 100 g/L semi-static (Brachydanio rerio)		

Naphtha (petroleum), heavy aromatic	EC50 72 h: = 2.5 mg/L (Skeletonema costatum)	LC50 96 h: = 19 mg/L static (Pimephales promelas) LC50 96 h: = 2.34 mg/L (Oncorhynchus mykiss) LC50 96 h: = 1740 mg/L static (Lepomis macrochirus) LC50 96 h: = 45 mg/L flow-through (Pimephales promelas) LC50 96 h: = 41 mg/L (Pimephales promelas)		EC50 48 h: = 0.95 mg/L (Daphnia magna)
Carbon black				EC50 24 h: > 5600 mg/L (Daphnia magna)
Naphthalene	EC50 72 h: = 0.4 mg/L (Skeletonema costatum)	LC50 96 h: 5.74 - 6.44 mg/L flow-through (Pimephales promelas) LC50 96 h: = 1.6 mg/L flow-through (Oncorhynchus mykiss) LC50 96 h: 0.91 - 2.82 mg/L static (Oncorhynchus mykiss) LC50 96 h: = 1.99 mg/L static (Pimephales promelas) LC50 96 h: = 31.0265 mg/L static (Lepomis macrochirus)		LC50 48 h: = 2.16 mg/L (Daphnia magna) EC50 48 h: = 1.96 mg/L Flow through (Daphnia magna) EC50 48 h: 1.09 - 3.4 mg/L Static (Daphnia magna)

12.2. Persistence and degradability

No information available.

12.3. Bioaccumulative potential.

Chemical Name	Log Pow
Naphtha (petroleum), heavy aromatic	2.9 - 6.1
Naphthalene	3.3

12.4. Mobility in soil

Adsorbs on soil.

12.5. Results of PBT and vPvB assessment

No information available.

12.6. Other adverse effects

Chemical Name	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Naphthalene	Group III Chemical		

Section 13. Disposal considerations

13.1. Waste treatment methods

Waste from Residues / Unused Products Dispose of in accordance with local regulations.

Contaminated Packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

Other Information	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

Section 14. Transport information

IMDG/IMO

14.1. UN-Number	UN3082
14.2. Proper Shipping Name	Environmentally hazardous substance, liquid, n.o.s.
14.3. Hazard Class	9
14.4. Packing Group	III
Description	UN3082, Environmentally hazardous substance, liquid, n.o.s. (Naphthalene, Naphtha (petroleum), heavy aromatic), 9, III, Marine Pollutant
14.5. Marine Pollutant	None.
Environmental hazard	yes
14.6. Special Provisions	None.
EmS No.	F-A, S-F
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available.

RID

14.1. UN-Number	UN3082
14.2. Proper Shipping Name	Environmentally hazardous substance, liquid, n.o.s.
14.3. Hazard Class	9
14.4. Packing Group	III
Description	UN3082, Environmentally hazardous substance, liquid, n.o.s. (Naphthalene, Naphtha (petroleum), heavy aromatic), 9, III
14.5. Environmental hazard	yes
14.6. Special Provisions	None.
Classification Code	M6

ADR

14.1. UN-Number	UN3082
14.2. Proper Shipping Name	Environmentally hazardous substance, liquid, n.o.s.
14.3. Hazard Class	9
14.4. Packing Group	III
Description	UN3082, Environmentally hazardous substance, liquid, n.o.s. (Naphthalene, Naphtha (petroleum), heavy aromatic), 9, III, (E)
14.5. Environmental hazard	yes
14.6. Special Provisions	None.
Classification Code	M6
Tunnel Restriction Code	(E)

ICAO

14.1. UN-Number	UN3082
14.2. Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
14.3. Hazard Class	9
14.4. Packing Group	III
Description	UN3082, Environmentally hazardous substance, liquid, n.o.s. (Naphthalene, Naphtha (petroleum), heavy aromatic), 9, III
14.5. Environmental hazard	yes
14.6. Special Provisions	None.

IATA

14.1. UN-Number	UN3082
14.2. Proper Shipping Name	Environmentally hazardous substance, liquid, n.o.s.
14.3. Hazard Class	9
14.4. Packing Group	III
Description	UN3082, Environmentally hazardous substance, liquid, n.o.s. (Naphthalene, Naphtha (petroleum), heavy aromatic), 9, III

14.5. Environmental hazard	yes
14.6. Special Provisions	None.
ERG Code	9L

Section 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

TSCA	Complies
EINECS/ELINCS	Complies
DSL/NDSL	-
PICCS	-
ENCS	-
IECSC	-
AICS	-
KECL	-

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
AICS - Australian Inventory of Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

15.2. Chemical Safety Assessment
No information available

Section 16. Other information

Full text of H-Statements referred to under sections 2 and 3
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H302 - Harmful if swallowed
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H411 - Toxic to aquatic life with long lasting effects
EUH210 - Safety data sheet available on request
H351 - Suspected of causing cancer

Key literature references and sources for data
www.ChemADVISOR.com/

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This safety data sheet complies with the requirements of Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No. 1907/2006

General Disclaimer

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End of Safety Data Sheet