

Safety Data Sheet

Product: TW-3196

Version: 0 (US)
Revision Date: April 21, 2014
Prepared in Accordance with: 29CFR 1910.1200

Section 1: Company and Product Identification

Company: Wikon Company Limited
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Product Name: TW-3196
Product Use: Conductive carbon based screen printable ink used as a variable force sensitive resistor.

Section 2: Hazards Identification

Emergency Overview: Combustible liquid and vapor. May affect the central nervous system causing dizziness, headache or nausea. May cause eye, skin and respiratory tract irritation.

Routes of Exposure: Skin and eye contact, inhalation of vapors, and ingestion.

Target Organs: Skin and eyes, respiratory system, kidney and liver.

Symptoms of Exposure:

Eye Contact: Will cause moderate to severe eye irritation including stinging, tearing, redness, and swelling of eyes.

Skin Contact: Will cause mild skin irritation including stinging, and redness. May be a skin sensitizer and cause allergic reactions characterized by rashes and hives. May be toxic if absorbed through skin due to prolonged contact. Wear gloves that are impervious to Diethylene Glycol Monobutyl Ether solvent.

Inhalation: Will be harmful if inhaled in large amounts. Overexposure may cause nausea and dizziness. Inhalation of vapors in high concentrations may cause lung edema and shortness of breath.

Ingestion: Will be harmful if swallowed in large amounts. Symptoms may include headache, dizziness, drowsiness, intoxication and vomiting, mental confusion and slurred speech, rapid heartbeat and breathing, and bluish skin and stupor.

Chronic: Repeated or prolonged ingestion may lead to kidney and liver damage.

HMIS Rating:


Health: 2*
Flammability: 2
Reactivity: 0
Personal Protection: C

Hazards Not Otherwise Classified (HNOC): Diethylene glycol monobutyl ether has been found to cause breakage of red blood cells following ingestion in rats. Injury to other organs including liver and kidneys was considered secondary to the effect on the blood.

Acute lethal exposure to ethylene glycol monobutyl ether in animal studies has resulted in congestion of organs including kidney, spleen, and lung., Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, mild, reversible liver effects, mild, reversible spleen effects, blood abnormalities.

Ethylene glycol monobutyl ether has been shown to cause cancer in laboratory animals. The relevance of this finding to humans is uncertain.

Sample Preparation/Mixture classification:

GHS Classification: 29 CFR 1910.1200 (d)		Eye Irr 2 Skin Sens 1 Skin Irr 2
	Signal Word:	Warning
Hazard classification(s)	Hazard phrases	
Eye Irr. 2	H319: Causes serious eye irritation	
Skin Sens 1	H317: May cause an allergic skin reaction	
Skin Irr 2	H315: Causes skin irritation	
Precautionary Statement (s)		
P261: Avoid breathing mists or vapors.		
P264: Wash hands and face thoroughly after handling.		
P272: Contaminated work clothing must not be allowed out of the workplace.		
P280: Wear protective gloves and clothing that will prevent skin contact. See Section 8 of this SDS for glove recommendations.		
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.		
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.		
P332 + P313: If skin irritation occurs: Get medical advice/attention		
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention		
P337+ P313: If eye irritation persists: Get medical advice/attention		
P363: Take off contaminated clothing and wash before reuse		
P501: Dispose of contents/container as hazardous waste in accordance with all local, state or country legislations.		

Section 3: Composition and information on Hazardous Ingredients

Ingredient	CAS #	GHS Classification(s)	% Weight
Diethylene glycol monobutyl ether	112-34-5	Eye Irr 2 H319	65-75%
Epoxy Resin	25068-38-6	Eye Irr 2 H319 Skin Irr 2 H315 Skin Sens 1 H317	15-25%
*Carbon Black	1333-86-4	Not classified as hazardous per GHS. Included because of occupational exposure limits. See section 8 of SDS.	≥1 % ≤ 5%
Ethylene glycol monobutyl ether	111-76-2	Acute Tox 4 H302 Acute Tox. 4 H312 Acute Tox. 4 H332 Eye Irr 2 H319 Skin Irr 2 H315	0.1-1%

*Note: Not in an airborne or unbound state in product form

Section 4: First Aid Measures

Eye Contact: Flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Get medical attention.

Skin Contact: Remove any contaminated clothing and flush the affected area of the skin thoroughly with plenty of water. Follow by washing with soap and water. Get medical attention if irritation persists. Do not reuse contaminated clothing until properly cleaned.

Inhalation: Remove victim to fresh air. Provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get immediate medical attention.

Ingestion: Dilute by giving plenty of water to drink, if victim is conscious and alert. Never give anything by mouth to a drowsy, unconscious, or convulsing person. Get immediate attention.

Notes to physician: Diglycol ethers may cause acidosis. Treat symptomatically.

Special Hazards: N/A

Section 5: Fire Fighting Measures

Flashpoint: 100°C (Tag closed cup)

Recommended Extinguishing Media: CO₂, dry chemical, water fog, foam.

Flammable Limits: Lower explosion Limit: Not determined for this preparation/mixture

Upper explosion Limit: Not determined for this preparation/mixture

Unusual Fire or Explosion Hazard: Toxic or irritating fumes may develop when material is exposed to open flame or extreme temperatures. Combustible liquid and vapor.

Special Fire Fighting Procedures: Firefighters/rescue personnel should wear self-contained breathing apparatus. Keep people away. Isolate fire area and deny unnecessary entry. Do not use direct water stream. Fire may spread. Use water spray to cool fire exposed containers and fire affected zones until fire is out and danger of re-ignition has passed. Move container from fire area if this is possible without hazard. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off, if possible. Fire water run-off, if not contained, may cause environmental damage. Fire fighters should wear positive pressure self contained breathing apparatus and protective fire fighting clothing. Clothing should include helmet, coat, pants, boots and gloves. Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with SCBA. If this is not available, wear full chemical resistant clothing with SCBA and fight fire from a remote location. For protective equipment in post-fire or non-fire clean up situations, refer to the relevant sections.

Section 6: Accidental Release Measures

Spill response operations must be conducted in accordance with the provisions of OSHA 29CFR 1910.120 or relevant Country provisions. Review the entire SDS before proceeding with spill response.

Small Spills: Activate available exhaust ventilation equipment in the immediate spill area. Wipe up or absorb spilled material with vermiculite or other similar material. Wash area with soapy water to remove residue. Collect absorbed material and water rinses in appropriate containers. Dispose of in accordance with current Federal, State, local or Country regulations.

Large Spills: Limit access to the immediate spill area. Shut off source of the release if this can be done without risk of injury. Activate available exhaust ventilation systems in the area. Dike area to contain the spill and prevent releases to sewers, drains, or other waterways. Collect spilled material for salvage or disposal. Apply absorbent material to soak up residue. Wash area with soapy water. Prevent runoff from entering waterways. Transfer absorbed material and water rinses to appropriate water containers. Dispose of in accordance with current Federal, State, local or Country regulations.

Section 7: Handling and Storage

The recommendations described in this section are provided as general guidance for minimizing exposure when handling this product. Because usage conditions will vary depending on customer application, specific safe handling procedures should be developed by a person knowledgeable in the intended usage conditions and equipment. Employees must be properly trained in safe handling of this product prior to use.

Ventilation Recommendations and Respiratory Protection: Provide effective mechanical exhaust ventilation to draw vapors, mists, or fumes generated during processing away from the worker and prevent routine inhalation. This is necessary especially during elevated temperature processing. Ventilation must be sufficient to maintain airborne levels of Section 8 ingredients below their PEL/TLV values. Use an appropriate, properly fitted respirator if exposures exceed PEL/TLV/OEL values. The type of protection selected (SCBA, air purifying, etc.) will depend upon the conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Storage: Store in a cool, dry location with adequate ventilation. Keep container tightly sealed when not in use. Keep away from open flames and heat sources. Consult the product Technical Bulletin for detailed storage information.

Section 8: Exposure Control / Personal Protection

Personal Protection: This product can cause eye irritation. Prevent eye contact through the use of chemical safety glasses, splash-proof goggles, or face shields. This product can cause skin irritation and may cause allergic skin reactions. Prolonged skin contact may cause toxic absorption. Wear appropriate gloves that are rated for oil resistance and breakthrough. Nitrile and latex glove material can be used for splash protection. Seek professional assistance in choosing glove material for prolonged contact processes. If necessary, a proper chemical resistant apron and additional impervious protective equipment should be used to prevent skin contact and contamination of clothing. Normal work clothing should be washed before re-use. Wash hands and face thoroughly after handling this product and before eating, drinking, or smoking. Emergency eye wash facilities and safety shower should be available.

Occupational Exposure Limits (OELs):

Material	OSHA PEL	ACGIH TLV
Diethylene glycol monobutyl ether	Not established	7 ppm TWA (inhalable fraction and vapor); TLV basis: hematologic, liver and kidney effects [Notice of Intended changes]
Carbon Black	3 mg/m ³ TWA (inhalable fraction);	3 mg/m ³ TWA (inhalable fraction);
Ethylene glycol monobutyl ether	50 ppm TWA; 240 mg/m ³ TWA	20 ppm 8 hr TWA

Section 9: Physical and Chemical Properties

Appearance: Black thixotropic paste

Odor: slight, butyl-like

Odor Threshold: Not determined for this preparation/mixture.

pH: No data available

Melting Point (°C): -68 °C (Diethylene glycol Monobutyl ether)

Boiling Point (°C): 230 °C (Diethylene glycol Monobutyl ether)

Evaporation rate: Not determined for this preparation/mixture.

Vapor Pressure: 0.027 hPa at 20 °C (Diethylene glycol Monobutyl ether)

Vapor density: Not determined for this preparation/mixture.

Specific Gravity: 10.15 lb./gal

Solubility: Not determined for this preparation/mixture.

Partition coefficient: n-octanol/water: Not determined for this preparation/mixture.

Auto-ignition temperature [NFPA]: 227.78 °C (Diethylene glycol Monobutyl ether)

Decomposition temperature: Not determined for this preparation/mixture.

Viscosity: Not applicable for this preparation/mixture.

% Solids: 32.5%

VOC's: 821.3 grams of solvent/liter

Explosive properties and Oxidizing properties: Refer to Section 10: Stability and Reactivity

Section 10: Stability and Reactivity

Reactivity:	Refer to possibility of hazardous reactions and/or incompatible materials sections.
Chemical Stability:	Stable in closed containers when stored away from prolonged heat, sparks and flames.
Conditions to avoid:	Will react exothermically with caustic soda at 200°C.

Incompatible materials:	Strong acids, strong alkalis, strong oxidizing agents and strong bases.
Hazardous Decomposition Products:	Formaldehyde, carbon monoxide and carbon dioxide, Hydrocarbons, ketones, sulfur and nitrogen oxides. Organic acids.

Section 11: Toxicological Information

Acute Toxicity Effects Data: Not determined for this preparation/mixture.

Component information:

Chemical name	Oral LD ₅₀ (rat)	Dermal LD ₅₀ (rabbit)	Inhalation LD ₅₀ (rat)
Epoxy Resin	11400 mg/kg	No data available	No data available
Diethylene glycol Monobutyl ether	3384 mg/kg	2700 mg/kg	No data available
Ethylene glycol monobutyl ether	470 mg/kg (Source: IUCLID);	220 mg/kg (Source: IUCLID)	450 ppm 4 h (Source: NLM_CIP)
Carbon Black	15400 mg/kg	> 3000 mg/kg	No data available

Irritation Effects Data: Eye irritant.

Chronic toxicity or effects from long term exposures:

Carcinogenicity:

Chemical Name	IARC	NTP	ACGIH	OSHA
Carbon Black	Group 2B Possibly carcinogenic to humans (Monograph 93 [in preparation]; Monograph 65 [1996])	Not established	A3 - confirmed animal carcinogen with unknown relevance to humans;	Not established
Ethylene glycol monobutyl ether	Group 3 (Not Classifiable) Monograph 88 [2006]	Male Rat - No Evidence; Female Rat - Equivocal Evidence; Male Mice - Some Evidence; Female Mice - Some Evidence (TR-484)	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans	Not established

No other components of this product, present at levels greater than or equal to 0.1%, are identified a carcinogen per IARC, ACGIH, NTP, or OSHA.

Reproductive hazard Diethylene glycol monobutyl ether did not cause harm to the fetus when given orally or when applied to the skin in laboratory animal studies., This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Section 12: Ecological Information

Not determined for this preparation/mixture. Follow spill and disposal recommendations.

Component information:

Biodegradability: Not determined for this preparation/ mixture

Bioaccumulation: Not determined for this preparation/ mixture

Ecotoxicity effects

Chemical name	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates.	Toxicity to algae	Toxicity to bacteria
Diethylene glycol Monobutyl ether	96 Hr LC50 Lepomis macrochirus: 1300 mg/L [static]	24 Hr EC50 Daphnia magna: 2850 mg/L; 48 Hr EC50 Daphnia magna: >100 mg/L	96 Hr EC50 Desmodesmus subspicatus: >100 mg/L	No data available
Carbon Black	No data available	24 Hr EC50 Daphnia magna: >5600 mg/L	No data available	No data available
Ethylene glycol monobutyl ether	96 Hr LC50 Lepomis macrochirus: 1490 mg/L [static]; 96 Hr LC50 Lepomis macrochirus: 2950 mg/L	24 Hr EC50 Daphnia magna: 1698 - 1940 mg/L; 48 Hr EC50 Daphnia magna: >1000 mg/L	No data available	No data available

Section 13: Disposal Considerations

Waste Disposal: Comply with all current Federal, State, local or Country regulations.. Incineration is acceptable and the preferred method of disposal. However, nitrogen oxide emission controls may be required to meet specifications. Chemical and/or biological degradation is feasible. A suitable industrial or municipal waste treatment system can be used depending on the quality and quantity. Dispose of in an approved landfill if allowed locally.

Section 14: Transport Information

D.O.T. Classification: Not hazardous for transport

IATA Classification: Not hazardous for transport

IMDG Classification: Not hazardous for transport

Severe Marine Pollutant or potential Marine Pollutant: (49 CFR § 172.101 Appendix B) No

Section 15: Regulatory Information

TSCA Status: All components of this product are listed in the EPA Toxic Substance Control Act Inventory.

EPA SARA Title III Chemical Listings

Section 302 Extremely Hazardous Substances:
None

Section 304 CERCLA Hazardous Substances:
None

Section 311/312 Hazard Class(es):

Acute: Yes
Chronic: Yes
Fire: Yes
Pressure: No
Reactive: No

Section 313 Toxic Chemicals:
Glycol Ethers N230

Chemical Inventories: All components of this product are listed or in compliance with the following global chemical inventories

Australian Inventory of Chemical Substances (AICS)

Canadian Domestic Substance List (DSL) or Non-Domestic Substance List (NDSL)

Chinese Inventory of Existing Chemicals (IECSC)

European Inventory of Existing Commercial Substances (EINECS), No Longer Polymers list (NLP) —or—

European Chemicals Agency (ECHA) Pre-registered Substance List

Korean Existing Chemicals Inventory (KECL)

New Zealand Inventory of Chemicals-(NZIoC)

Philippines - Inventory of Chemicals and Chemical Substances (PICCS)

State Right to Know (RTK) lists: Available upon request

Canada Workplace Hazardous Information System (WHMIS) Classification: B3, D2A
