

SAFETY DATA SHEET

CW2000 CircuitWorks(R) Nickel Conductive Pen

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the substance or preparation

Product name : CW2000 CircuitWorks(R) Nickel Conductive Pen
 Chemical name : Nickel Conductive Pen
 Product type : Liquid.

Company/undertaking identification

Manufacturer : ITW Chemtronics
 8125 Cobb Center Drive
 Kennesaw, GA 30152
 Tel. 770-424-4888 or toll free 800-645-5244

Distributor :

Supplied by:
RS Components Ltd,
 Birchington Road, Corby, Northants, NN17 9RS.
 Tel: +44 (0) 1536 402888 (8am to 8pm)
 Email: technical.help@rs-components.com

Importer : ITW Contamination Control
 Skejby Nordlandsvej 307
 DK-8200 Aarhus N
 Denmark
 Tel +45 87 400 220
 Fax +45 87 400 222
 Email: info@itw-cc.com

e-mail address of person responsible for this SDS : askchemtronics@chemtronics.com

Emergency telephone number (with hours of operation) : Emergency telephone number (with hours of operation)

2. HAZARDS IDENTIFICATION

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : R10
 Carc. Cat. 3; R40
 R43

Physical/chemical hazards : Flammable.

Human health hazards : Limited evidence of a carcinogenic effect. May cause sensitisation by skin contact.

See section 11 for more detailed information on health effects and symptoms.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation : Preparation

Ingredient name	CAS number	%	EC number	Classification
nickel	7440-02-0	45 - 65	231-111-4	Carc. Cat. 3; [1] [2] R40 R43
2-methoxy-1-methylethyl acetate	108-65-6	2 - 20	203-603-9	R10 [1] [2] Xi; R36
2-butoxyethyl acetate	112-07-2	2 - 20	203-933-3	Xn; R20/21 [1] [2]
n-butyl acetate	123-86-4	2 - 20	204-658-1	R10 [1] [2] R66, R67
See section 16 for the full text of the R-phrases declared above				

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in section 8.

4. FIRST AID MEASURES

First-aid measures

Inhalation : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4. FIRST AID MEASURES

- Ingestion** : Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

See section 11 for more detailed information on health effects and symptoms.

5. FIRE-FIGHTING MEASURES

Extinguishing media

- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.
- Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. HANDLING AND STORAGE

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and

7. HANDLING AND STORAGE

confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Packaging materials

Recommended : Use original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<u>Ingredient name</u>	<u>Occupational exposure limits</u>
nickel	EH40-WEL (United Kingdom (UK), 8/2007). Skin Notes: As Ni WEL 8 hrs limit: 0.5 mg/m ³ , (As Ni) 8 hour(s).
2-methoxy-1-methylethyl acetate	EH40-WEL (United Kingdom (UK), 8/2007). Skin WEL 15 min limit: 548 mg/m ³ 15 minute(s). WEL 15 min limit: 100 ppm 15 minute(s). WEL 8 hrs limit: 274 mg/m ³ 8 hour(s). WEL 8 hrs limit: 50 ppm 8 hour(s).
2-butoxyethyl acetate	EH40-WEL (United Kingdom (UK), 8/2007). Skin WEL 15 min limit: 50 ppm 15 minute(s). WEL 8 hrs limit: 20 ppm 8 hour(s).
n-butyl acetate	EH40-WEL (United Kingdom (UK), 8/2007). WEL 15 min limit: 966 mg/m ³ 15 minute(s). WEL 15 min limit: 200 ppm 15 minute(s). WEL 8 hrs limit: 724 mg/m ³ 8 hour(s). WEL 8 hrs limit: 150 ppm 8 hour(s).

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Exposure controls

Occupational exposure controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this necessary.

Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable level.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance

- Physical state : Liquid.
 Colour : Dark grey. [Dark]
 Odour : Pleasant, ester-like. [Slight]

Important health, safety and environmental information

- Boiling point : Lowest known value: 126.3°C (259.3°F) (n-butyl acetate). Weighted average: 154.72°C (310.5°F)
 Melting point : May start to solidify at the following temperature: -63.4°C (-82.1°F) This is based on data for the following ingredient: 2-Butoxyethyl acetate. Weighted average: -69.2°C (-92.6°F)
 Flash point : Closed cup: Between 23°C (73°F) and 37.8°C (100°F).(Tagliabue.)
 Relative density : Weighted average: 2.1 (Water = 1)
 Vapour density : Highest known value: 4.6 (Air = 1) (2-Methoxy-1-methylethyl acetate). Weighted average: 4.3 (Air = 1)
 Evaporation rate (butyl acetate = 1) : <1 compared with Butyl acetate.

Other information

- Auto-ignition temperature : Lowest known value: 340.05°C (644.1°F) (2-Butoxyethyl acetate).

10. STABILITY AND REACTIVITY

- Stability : The product is stable. Under normal conditions of storage and use, hazardous polymerisation will not occur.
 Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
 Materials to avoid : Reactive or incompatible with the following materials:
 oxidizing materials
 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Potential acute health effects

- Inhalation : No known significant effects or critical hazards.
 Ingestion : No known significant effects or critical hazards.
 Skin contact : May cause skin irritation. May cause sensitisation by skin contact.
 Eye contact : May cause eye irritation.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-Methoxy-1-methylethyl acetate	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	8532 mg/kg	-
2-Butoxyethyl acetate	LD50 Dermal	Rabbit	1500 mg/kg	-
	LD50 Oral	Rat	2400 mg/kg	-
n-butyl acetate	LD50 Dermal	Rabbit	>17600 mg/kg	-
	LD50 Oral	Rat	10768 mg/kg	-

Potential chronic health effects

- Chronic effects : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
 Carcinogenicity : May cause cancer, based on animal data. Limited evidence of a carcinogenic effect. Risk of cancer depends on duration and level of exposure.
 Mutagenicity : No known significant effects or critical hazards.
 Teratogenicity : No known significant effects or critical hazards.
 Developmental effects : No known significant effects or critical hazards.
 Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Inhalation : No specific data.
 Ingestion : No specific data.
 Skin : Adverse symptoms may include the following:
 irritation
 redness
 Eyes : No specific data.
 Target organs : Contains material which causes damage to the following organs: blood, kidneys, liver, lymphatic system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
 Contains material which may cause damage to the following organs: lungs, nose/sinuses.

12. ECOLOGICAL INFORMATION

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure	
nickel	-	Acute EC50 1000 ug/L Marine water	Daphnia - Water flea - Daphnia magna	48 hours	
	-	Acute LC50 40 to 47.4 mg/L Marine water	Fish - Square tail mullet - Liza vaigiensis	96 hours	
	-	Acute LC50 47.5 ng/L Fresh water	Fish - Indian catfish - Heteropneustes fossilis	96 hours	
	-	Acute LC50 2.3 ppm Fresh water	Fish - Cyprinus carpio	96 hours	
	-	Acute LC50 1.64 ppm Fresh water	Fish - Cyprinus carpio	96 hours	
	-	Acute LC50 1.54 ppm Fresh water	Fish - Cyprinus carpio	96 hours	
	-	Acute LC50 1.3 ppm Fresh water	Fish - Cyprinus carpio	96 hours	
	-	Acute LC50 55.5 to 67.2 mg/L Marine water	Fish - Square tail mullet - Liza vaigiensis	96 hours	
	-	Acute LC50 100000 to 330000 ug/L Marine water	Crustaceans - Common shrimp, sand shrimp - Crangon crangon	48 hours	
	-	Acute LC50 8850 ug/L Marine water	Crustaceans - Greasyback shrimp - Metapenaeus ensis	48 hours	
	-	Acute LC50 9280 ug/L Marine water	Crustaceans - Greasyback shrimp - Metapenaeus ensis	48 hours	
	-	Acute LC50 8000 ug/L Fresh water	Fish - Pumpkinseed - Lepomis gibbosus	96 hours	
	-	Acute LC50 6300 ug/L Fresh water	Fish - Striped bass - Morone saxatilis	96 hours	
	-	Acute LC50 >5400 ug/L Marine water	Fish - Sheepshead minnow - Cyprinodon variegatus	96 hours	
	-	Acute LC50 1280 ug/L Marine water	Crustaceans - Greasyback shrimp - Metapenaeus ensis	48 hours	
	n-butyl acetate	-	Acute LC50 185000 ug/L Marine water	Fish - Inland silverside - Menidia beryllina	96 hours
		-	Acute LC50 100000 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
-		Acute LC50 62000 ug/L	Fish - Zebra danio - Danio rerio	96 hours	
-		Acute LC50 32000 ug/L Marine water	Crustaceans - Brine shrimp - Artemia salina	48 hours	
-		Acute LC50 18000 to 19000 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours	

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.
- Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

14. TRANSPORT INFORMATIONInternational transport regulations

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
ADR/RID Class	Not regulated.	-	-	III		-
ADNR Class	Not regulated.	-	-	III		-
IMDG Class	Not regulated.	-	-	-		-
IATA Class	Not regulated.	-	-	-		-

PG* : Packing group

15. REGULATORY INFORMATIONEU regulations

Classification and labeling have been determined according to EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use.

Hazard symbol or symbols :



Harmful

- Risk phrases** : R10- Flammable.
R40- Limited evidence of a carcinogenic effect.
R43- May cause sensitisation by skin contact.
- Safety phrases** : S36/37- Wear suitable protective clothing and gloves.
- Contains** : nickel
- Product use** : Industrial applications.
- Europe inventory** : **Europe inventory:** Not determined.

16. OTHER INFORMATION

- Full text of R-phrases referred to in sections 2 and 3 - United Kingdom (UK)** : R10- Flammable.
R40- Limited evidence of a carcinogenic effect.
R20/21- Harmful by inhalation and in contact with skin.
R36- Irritating to eyes.
R43- May cause sensitisation by skin contact.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapours may cause drowsiness and dizziness.

- Full text of classifications referred to in sections 2 and 3 - United Kingdom (UK)** : Carc. Cat. 3 - Carcinogen Category 3
Xn - Harmful
Xi - Irritant

History

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- Date of issue/Date of revision** : 12/16/2008.
- Date of previous issue** : No previous validation.
- Version** : 5
- Prepared by** : Not available.

☑ Indicates information that has changed from previously issued version.

Notice to reader

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.