



Material Safety Data Sheet

Conforms to EU Directive 91/155/EEC and ISO 11014-1

Product name : Biocure Two-Pack Curing Screen Inks

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Version : 1.00

Date of issue : 24/10/2009.

Date of previous issue : No previous validation.

1. Identification of the substance/preparation and of the company

Product name : Biocure Two-Pack Curing Screen Inks
Product code : 482 / 488 / 487
Use of the substance/preparation : Screen Ink
Supplier : GL Specialized Inks (Pty) Ltd
 8 Hawthorne Place, Mahogany Ridge, Pinetown, Durban
Emergency telephone number : Office Hours:
 031 - 700 6455
 After hours:
 082 451 6588 (Jay)
 082 780 8837 (Julie)
 082 452 2143 (Gordon)

2. Composition/information on ingredients

Chemical characterization : Mixture.

Ingredient name	CAS number	%	EC number	Classification
resin mixtures		20 - 40		Not regulated.
pigment mixture (including cadmium yellow)		20 - 40		Not classified.
2-butoxyethanol	111-76-2	15 - 35	203-905-0	Xn; R20/21/22 Xi; R36/38
titanium dioxide	13463-67-7	0 - 40	236-675-5	Not classified.
butan-1-ol	71-36-3	3 - 8	200-751-6	R10 Xn; R22 Xi; R37/38, R41 R67
butanone	78-93-3	3 - 6	201-159-0	F; R11
carbon black	1333-86-4	0 - 8	215-609-9	Not classified.
c.i. pigment orange 20	12656-57-4	0 - 30	235-758-3	Not classified.
cadmium sulphoselenide red	58339-34-7	0 - 30	261-218-1	Not classified.
See section 16 for the full text of the R-phrases declared above				

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

This MSDS covers all formulations in the the range. Not all of the components listed will be present in an individual formulation. Formulae specific MSDS available on request.

3. Hazards identification

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

Classification : R10
 Xn; R20/21/22
 Xi; R36/38

Physical/chemical hazards : Flammable.

Human health hazards : Harmful by inhalation, in contact with skin and if swallowed.
 Irritating to eyes and skin.

Environmental hazards : No known significant effects or critical hazards.

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

4. First aid measures

- Inhalation** : Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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.
- 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** : Wash contaminated skin with soap and water. Get medical attention if irritation develops. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Eye contact** : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.

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

5. Fire-fighting measures

Extinguishing media

Suitable : In case of fire, use water spray (fog), foam or dry chemical.

Not suitable : Do not use water jet.

Special exposure hazards : Flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials: carbon oxides (CO, CO₂). Some metallic 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 : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilled material.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. Approach 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. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Avoid release to the environment. Refer to special instructions/safety data sheet. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and 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 grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Packaging materials

Recommended : Use original container.

8. Exposure controls/personal protection

Exposure limit values :

<u>Ingredient name</u>	<u>Occupational exposure limits</u>
2-butoxyethanol	EU OEL (Europe, 6/2000). Skin STEL: 246 mg/m ³ 15 minute(s). Form: All forms STEL: 50 ppm 15 minute(s). Form: All forms TWA: 98 mg/m ³ 8 hour(s). Form: All forms TWA: 20 ppm 8 hour(s). Form: All forms
titanium dioxide	ACGIH (United States). TWA: 10 mg/m ³ ACGIH TLV (United States, 1/2004). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1996 Adoption Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124) :36338-33351, June 30, 1993, for revised OSHA PEL. Refers to Appendix A -- Carcinogens. TWA: 10 mg/m ³ 8 hour(s). Form: All forms
Butan-1-ol	ACGIH (United States). Skin CEIL: 152 mg/m ³ TWA: 50 ppm CEIL: 50 ppm ACGIH TLV (United States, 1/2004). Notes: 2002 Adoption. TWA: 20 ppm 8 hour(s). Form: All forms
butanone	EU OEL (Europe, 6/2000). STEL: 900 mg/m ³ 15 minute(s). Form: All forms STEL: 300 ppm 15 minute(s). Form: All forms TWA: 600 mg/m ³ 8 hour(s). Form: All forms TWA: 200 ppm 8 hour(s). Form: All forms
carbon black	ACGIH TLV (United States, 1/2004). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1996 Adoption Refers to Appendix A -- Carcinogens. TWA: 3.5 mg/m ³ 8 hour(s). Form: All forms
c.i. pigment orange 20	EH40-WEL (United Kingdom (UK), 1/2005). TWA: 0.025 mg/m ³ 8 hour(s). Form: All forms TWA: 0.03 mg/m ³ 8 hour(s). Form: Respirable fraction
cadmium sulphoselenide red	EH40-WEL (United Kingdom (UK), 1/2005). TWA: 0.025 mg/m ³ 8 hour(s). Form: All forms TWA: 0.03 mg/m ³ 8 hour(s). Form: Respirable fraction

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 is necessary.
 Recommended:
 Neoprene gloves. Nitrile gloves.

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.

9. Physical and chemical properties

General information

Appearance

- Physical state** : Liquid. (Viscous liquid.)
- Color** : Various
- Odor** : Characteristic.
- Odor threshold** : Lowest known value: 1.2 ppm (Butan-1-ol)

Important health, safety and environmental information

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Boiling point	: Lowest known value: 79.57°C (175.2°F) (Butanone).
Melting point	: May start to solidify at the following temperature: -74.8°C (-102.6°F) This is based on data for the following ingredient: 2-butoxyethanol.
Flash point	: Closed cup: 38°C (100.4°F).
Explosive properties	: Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials.
Explosion limits	: Greatest known range: Lower: 1.4% Upper: 11.2% (Butan-1-ol)
Vapor pressure	: Highest known value: 28.3 kPa (212 mm Hg) (at 20°C) (2-butoxyethanol).
Solubility	: Easily soluble in the following materials: methanol. Soluble in the following materials: diethyl ether, acetone. Very slightly soluble in the following materials: n-octanol. Insoluble in the following materials: cold water, hot water.
Octanol/water partition coefficient	: The product is more soluble in octanol.
Vapor density	: Highest known value: 4.07 (Air = 1) (2-butoxyethanol).
Evaporation rate (butyl acetate = 1)	: Highest known value: 0.44 (Butan-1-ol) compared with butyl acetate

Other information

Auto-ignition temperature : Lowest known value: 244°C (471.2°F) (2-butoxyethanol).

10. Stability and reactivity

Stability	: The product is stable.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame).
Materials to avoid	: Highly reactive or incompatible with the following materials: oxidizing materials. Reactive or incompatible with the following materials: alkalis. Slightly reactive or incompatible with the following materials: organic materials and acids.
Hazardous decomposition products	: Evolves toxic fumes when heated to decomposition.

11. Toxicological information

Potential acute health effects

Inhalation	: Harmful by inhalation.
Ingestion	: Harmful if swallowed.
Skin contact	: Absorbed through skin. Irritating to skin.
Eye contact	: Irritating to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-butoxyethanol	LD50 Dermal	Rabbit	220 mg/kg	-
	LD50 Intraperitoneal	Rat	220 mg/kg	-
	LD50 Intravenous	Rat	307 mg/kg	-
	LD50 Oral	Rat	470 mg/kg	-
	LD50 Oral	Rat	917 mg/kg	-
	LD50 Unreported	Rat	917 mg/kg	-
	LDLo Oral	Rat	1500 mg/kg	-
	TDLo Unreported	Rat	250 mg/kg	-
	TDLo Oral	Rat	500 mg/kg	-
	butan-1-ol	LD50 Dermal	Rabbit	3400 mg/kg
LD50 Intraperitoneal		Rat	200 mg/kg	-
LD50 Intravenous		Rat	310 mg/kg	-
LD50 Oral		Rat	790 mg/kg	-
TDLo Intraperitoneal		Rat	400 mg/kg	-
carbon black	LD50 Dermal	Rabbit	>3 g/kg	-
	LD50 Oral	Rat	>15400 mg/kg	-

Potential chronic health effects

Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Reproductive toxicity	: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation	: Inhalation of vapors may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.
Ingestion	: Ingestion may cause nausea, weakness and central nervous system effects.
Skin	: Repeated skin exposure can produce local skin destruction or dermatitis.
	:

Target organs Contains material which causes damage to the following organs: blood, kidneys, lungs, the nervous system, liver, heart, lymphatic system, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
Contains material which may cause damage to the following organs: mucous membranes.

12. Ecological information

Ecotoxicity data

Ingredient name	Species	Period	Result
2-butoxyethanol	Lepomis macrochirus (LC50)	96 hour(s)	1490 mg/l
titanium dioxide	Daphnia magna (EC50)	48 hour(s)	>1000 mg/l
butan-1-ol	Daphnia magna (EC50)	48 hour(s)	1983 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	100 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1730 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1910 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1940 mg/l
butanone	Daphnia magna (EC50)	48 hour(s)	5091 mg/l
	Pimephales promelas (LC50)	96 hour(s)	3220 mg/l

Other ecological information

Persistence/degradability

Ingredient name	BOD ₅	COD	ThOD
2-butoxyethanol	>1 gO ₂ /g [10 d]	-	-
butan-1-ol	>1 gO ₂ /g [10 - 20 d]	-	-
butanone	2.14 gO ₂ /g >1 gO ₂ /g	2.2 gO ₂ /g	-

Ingredient name	Aquatic half-life	Photolysis	Biodegradability
2-butoxyethanol	-	1 day(s).	Readily
butan-1-ol	2 to 29 day(s)	2 day(s).	Readily
butanone	1 to 8 day(s)	14 day(s).	Readily

Bioaccumulative potential




Ingredient name	LogP _{ow}	BCF	Potential
2-butoxyethanol	-	2.5	low
butan-1-ol	0.88	3	low
butanone	0.26	1	low

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

13. Disposal considerations

Methods of disposal : Hazardous chemical waste.
Waste must be disposed to a landfill permitted in terms of the Department of Water Affairs and Forestry's minimum requirements for waste disposal to landfill, and the minimum requirements for the handling, classification and disposal of hazardous waste.

14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
ADR / SANS 10228 Class	UN1210	PRINTING INK	3	III		Hazard identification number 30 Limited quantity LQ7 CEFIC Tremcard 30GF1-III of 30GF1-sp
IMDG Class	UN1210	PRINTING INK	3	III		Emergency schedules (EmS) F-E, S-D
IATA Class	UN1210	PRINTING INK	3	III		Passenger and Cargo Aircraft Quantity limitation: 60 L Packaging instructions: 309 Cargo Aircraft Only Quantity limitation: 220 L Packaging instructions: 310 Limited Quantities - Passenger Aircraft Quantity

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limitation: 10 L
Packaging instructions: Y309**15. Regulatory information****SANS 10265 / EU Regulations****Hazard symbol or symbols**

Irritant, Harmful

Risk phrases: R10- Flammable.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R36/38- Irritating to eyes and skin.**Safety phrases**

: S36/37- Wear suitable protective clothing and gloves.

Contains

: 2-butoxyethanol 203-905-0

Product use: 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.
- Industrial applications.**16. Other information****Full text of R-phrases referred to in sections 2 and 3 - Europe**: R11- Highly flammable.
R10- Flammable.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R22- Harmful if swallowed.
R36/38- Irritating to eyes and skin.
R37/38- Irritating to respiratory system and skin.
R41- Risk of serious damage to eyes.
R67- Vapors may cause drowsiness and dizziness.**Prepared by**

: GL Inks EHS

Notice to reader

This MSDS summarises at the date of issue our best knowledge of the health, safety and environmental hazard information related to the product and, in particular, how to safely handle, use, and transport the product in the workplace. Since GL Specialized inks (Pty) Ltd cannot anticipate or control the conditions under which the product may be handled, used, stored or transported, each user must, prior to usage, review the MSDS in the context of how the user intends to handle, use, store or transport the product in the workplace and beyond; and communicate such information to all relevant parties. If clarification, or further information is required to ensure that an appropriate assessment can be made, the user should contact the company.

We shall not assume any liability of the accuracy or completeness of the information contained herein, or any advice given, unless there has been gross negligence on our part. In such an event, or liability shall be limited only to direct damages suffered. Our responsibility for the product as sold is subject to our standard terms and conditions. All risk with possession and application of the product passes on delivery.