

# Material Safety Data Sheets

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

## 1. Product and Company Identification

Product Name	: SS21 Ink Black
Product Code	: SPC-0501K
General Use	: Ink for ink jet plotter
Product Description	: Solvent pigment ink
MSDS Number	: 031-33S08KC
Manufacture	
Company Name	: Mimaki Engineering Co., Ltd
Address	: 2182-3 Otsu, Shigeno, Tomi-shi, Nagano 389-0512 Japan
Telephone No.	: +81-268-64-2413
Importer/Distributor Established in USA	
Company Name	: MIMAKI USA. INC.
Address	: 150 Satellite Boulevard, suite A, Suwanee, Georgia 30024, U.S.A
Telephone No.	: 1-678-730-0100
Emergency Telephone No.	: +81-268-64-2413

## 2. Hazards Identification

Canadian  
WHMIS Symbols



Emergency Overview	: Risk May form explosive peroxides. Irritating to eyes.
Potential Health Effects	: Acute Health Effects
Swallowed	: Accidental ingestion of the material may be damaging to the health of the individual. Considered an unlikely route of entry in commercial/industrial environments.
Eye	: There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain. There may be damage to the cornea. Unless treatment is prompt and adequate there may be permanent loss of vision. Conjunctivitis can occur following repeated exposure.

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- Skin** : Skin contact with the material may damage the health of the individual; systemic effects may result following absorption. There is some evidence to suggest that the material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
- Inhaled** : Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

### 3. Composition / Information On Ingredients

Chemical Name	Wt%	CAS No.
gamma- butyrolactone	10-20	96-48-0

### 4. First Aid Measures

- Inhaled** : If fumes or combustion products are inhaled remove from contaminated area.  
Other measures are usually unnecessary.
- Eye** : If this product comes in contact with the eyes:  
Wash out immediately with fresh running water.  
Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.  
If pain persists or recurs seek medical attention.  
Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
- Skin** : If skin contact occurs:  
Immediately remove all contaminated clothing, including footwear  
Flush skin and hair with running water (and soap if available).

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Swallowed	<p>Seek medical attention in event of irritation.</p> <p>: If swallowed do NOT induce vomiting.</p> <p>If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</p> <p>Observe the patient carefully.</p> <p>Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</p> <p>Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</p> <p>Seek medical advice.</p>
Note To Physician	<p>: Treat symptomatically.</p> <p>for poisons (where specific treatment regime is absent):</p>
Basic Treatment	<p>: Establish a patent airway with suction where necessary.</p> <p>Watch for signs of respiratory insufficiency and assist ventilation as necessary.</p> <p>Administer oxygen by non-rebreather mask at 10 to 15 l/min.</p> <p>Monitor and treat, where necessary, for pulmonary edema .</p> <p>Monitor and treat, where necessary, for shock.</p> <p>Anticipate seizures .</p> <p>DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.</p>
Advanced Treatment	<p>: Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.</p> <p>Positive-pressure ventilation using a bag-valve mask might be of use.</p> <p>Monitor and treat, where necessary, for arrhythmias.</p> <p>Start an IV D5W TKO. If signs of hypovolemia are present use lactated Ringers solution. Fluid overload might create complications.</p> <p>Drug therapy should be considered for pulmonary edema.</p> <p>Hypotension with signs of hypovolemia requires the cautious administration of fluids. Fluid overload might create complications.</p> <p>Treat seizures with diazepam.</p> <p>Proparacaine hydrochloride should be used to assist eye irrigation.</p>

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BRONSTEIN, A.C. and CURRANCE, P.L.  
EMERGENCY CARE FOR HAZARDOUS MATERIALS  
EXPOSURE:2nd Ed. 1994.

### 5. Fire Fighting Measures

	Flash Point (°F): 159.98
	Lower Explosive Limit (%): 2.2
	Upper Explosive Limit (%): 33.0
	Autoignition Temp (°F): 336.2
Extinguishing Media	: Foam. Dry chemical powder. BCF (where regulations permit). Carbon dioxide. Water spray or fog - Large fires only.
Fire Fighting	: Alert Emergency Responders and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or water course. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. Do not approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.
General Fire	: Combustible.
Hazarads/Hazardous	Slight fire hazard when exposed to heat or flame.
Combustible Prodaucts	Heating may cause expansion or decomposition leading to violent rupture of containers. On combustion, may emit toxic fumes of carbon monoxide (CO). May emit acrid smoke. Mists containing combustible materials may be explosive. Combustion products include: carbon dioxide (CO <sub>2</sub> ), other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.

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- Fire Incompatibility : Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.
- Personal Protection : Glasses: Chemical goggles.  
Gloves: PVC chemical resistant type.  
Respirator: Type A- P Filter of sufficient capacity.

### 6. Accidental Release Measures

- Minor Spills : Remove all ignition sources.  
Clean up all spills immediately.  
Avoid breathing vapors and contact with skin and eyes.  
Control personal contact by using protective equipment.  
Contain and absorb spill with sand, earth, inert material or vermiculite.  
Wipe up.  
Place in a suitable labeled container for waste disposal.
- Major Spills : Clear area of personnel and move upwind.  
Alert Emergency Responders and tell them location and nature of hazard.  
Wear breathing apparatus plus protective gloves.  
Prevent, by any means available, spillage from entering drains or water course.  
No smoking, naked lights or ignition sources. Increase ventilation.  
Stop leak if safe to do so.  
Contain spill with sand, earth or vermiculite.  
Collect recoverable product into labeled containers for recycling.  
Absorb remaining product with sand, earth or vermiculite.  
Collect solid residues and seal in labeled drums for disposal.  
Wash area and prevent runoff into drains.  
If contamination of drains or waterways occurs, advise emergency services.

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### 7. Handling And Storage

#### Procedure For Handling

: DO NOT allow clothing wet with material to stay in contact with skin. The tendency of many ethers to form explosive peroxides is well documented. Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe

DO NOT concentrate by evaporation, or evaporate extracts to dryness, as residues may contain explosive peroxides with DETONATION potential.

Any static discharge is also a source of hazard.

Before any distillation process remove trace peroxides by shaking with excess 5% aqueous ferrous sulfate solution or by percolation through a column of activated alumina.

Distillation results in uninhibited ether distillate with considerably increased hazard because of risk of peroxide formation on storage.

Add inhibitor to any distillate as required.

When solvents have been freed from peroxides by percolation through columns of activated alumina, the absorbed peroxides must promptly be desorbed by treatment with polar solvents such as methanol or water, which should then be disposed of safely. The substance accumulates peroxides which may become hazardous only if it evaporates or is distilled or otherwise treated to concentrate the peroxides. The substance may concentrate around the container opening for example. Purchases of peroxidizable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidized.

A responsible person should maintain an inventory of peroxidizable chemicals or annotate the general chemical inventory to indicate which chemicals are subject to peroxidation. An expiration date should be determined. The chemical should either be treated to remove peroxides or disposed of before this date.

The person or laboratory receiving the chemical should record a receipt date on the bottle. The individual opening the container should add an opening date.

Unopened containers received from the supplier should be safe to store for 18 months.

Opened containers should not be stored for more than 12 months.

Avoid all personal contact, including inhalation.

Wear protective clothing when risk of exposure occurs.

Use in a well-ventilated area.

Prevent concentration in hollows and sumps.

DO NOT enter confined spaces until atmosphere has been checked.

Avoid smoking, naked lights or ignition sources.

Avoid contact with incompatible materials.

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When handling, DO NOT eat, drink or smoke.

Keep containers securely sealed when not in use.

Avoid physical damage to containers.

Always wash hands with soap and water after handling.

Work clothes should be laundered separately.

Use good occupational work practice.

Observe manufacturer's storing and handling recommendations.

Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

Recommended Storage : Glass container.

Methods DO NOT use aluminum or galvanized containers.

Metal can or drum

Packing as recommended by manufacturer.

Check all containers are clearly labeled and free from leaks.

Storage Requirements : Store in an upright position.

Store in original containers.

Keep containers securely sealed.

No smoking, naked lights or ignition sources.

Store in a cool, dry, well-ventilated area.

Store away from incompatible materials and foodstuff containers.

Protect containers against physical damage and check regularly for leaks.

Observe manufacturer's storing and handling recommendations.

### 8. Exposure Controls / Personal Protection

Exposure Controls : The following materials had no OELs on our records  
- gamma- butyrolactone: CAS:96- 48- 0

Material Data : Ingredient data

GAMMA-BUTYROLACTONE:

No exposure limits set by NOHSC or ACGIH.

: Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety

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factors of 5 to 10 or more. On occasion animal noobservable- effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a fivecategory system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA. OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

### Personal Protection

#### Eye



: Safety glasses with side shields.

Chemical goggles.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

#### Hands/Feet



: Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

Suitability and durability of glove type is dependent on usage.

Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

#### Other



: Overalls. P.V.C. apron.

Barrier cream.

Skin cleansing cream.

Eye wash unit.

#### Respirator

: Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the



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contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level	Maximum Protection Factor	Half face Respirator	Full face Respirator
1000 ppm (volume)	10	A- 1 P	
1000	50		A- 1 P
5000	50	Airline*	
5000	100		A- 2 P
10000	100		A- 3 P
	100+		Airline* *

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## Engineering Controls

: Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

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### 9. Physical And Chemical Properties

Appearance	- Physical state	: liquid
	- Color	: Black
Odor		: Slight solvent odor
pH		: Not applicable
Boiling Point / Boiling Range		: 176 degree C or higher
Melting Point / Melting Range		: Not available
Flash Point		: 71.1 degree C
Auto-Ignition Temperature		: 169 degree C
Flammability(solid, gas)		: Not Applicable
Explosive Properties		: Flammable point: 2.2% to 33.0%
Vapour Pressure		: Less than 133Pa(20 degree C)
Specific Gravity		: 0.975±0.01(20 degree C)
Solubility		: Not available
Water solubility		: Not available
Viscosity		: 3.6±0.3mPa (20 degree C)
VOC		: 911.2 g/L

### 10. Stability And Reactivity

Conditions Contributing To Instability	: Presence of incompatible materials. Product is considered stable. Hazardous polymerization will not occur.
Storage Incompatibility	: Glycol ethers may form peroxides under certain conditions. In the presence of strong bases or the salts of strong bases, at elevated temperatures, the potential exists for runaway reactions. Contact with aluminium should be avoided. Release of hydrogen gas may result. Avoid reaction with oxidizing agents.

### 11. Toxicological Information

Toxicity and Irritation	: unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
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The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

: GAMMA-BUTYROLACTONE:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

### TOXICITY

Oral (rat) LD50: 1540 mg/kg  
Dermal (g.pig) LD50: >5000 mg/kg

### IRRITATION

Skin (rabbit): non-irritating \*  
Eye (rabbit): SEVERE

\* [Manuf. ISP]

The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

## 12. Ecological Information

: Ether groups are generally stable to hydrolysis in water under neutral conditions and ambient temperatures.

OECD guideline studies indicate ready biodegradability for several glycol ethers although higher molecular weight species seem to biodegrade at a slower rate. No glycol ethers that have been tested demonstrate marked resistance to biodegradative processes. Upon release to the atmosphere by evaporation, high boiling glycol ethers are estimated to undergo photodegradation (atmospheric half lives = 2.4-2.5 hr). When released to water, glycol ethers undergo biodegradation (typically 47-92% after 8-21 days) and have a low potential for bioaccumulation (log Kow ranges from -1.73 to +0.51).

Aquatic toxicity data indicate that the tri- and tetra ethylene glycol ethers are "practically non-toxic" to aquatic species. No major differences are observed in the order of toxicity going from the methyl- to the butyl ethers.

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

GAMMA-BUTYROLACTONE:

DO NOT discharge into sewer or waterways.

Aquatic toxicity: 48hr LC50 (minnow): 100-500 mg/l [ISP]

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### 13. Disposal Considerations

#### Disposal Instructions

: All waste must be handled in accordance with local, state and federal regulations.

Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction,
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorized landfill.

### 14. Transport Information

Not regulated for transport of dangerous goods: UN, IATA, IMDG.

### 15. Regulatory Information

#### Regulations

SS21 Ink (SPC-0501,0504) : No regulations applicable

(CAS: None)

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gamma-butyrolactone (CAS: 96-48-0) is found on the following regulatory lists;

Canada Domestic Substances List (DSL)

IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk

International Agency for Research on Cancer (IARC) Carcinogens

International Council of Chemical Associations (ICCA) - High Production Volume List

OECD Representative List of High Production Volume (HPV) Chemicals

US - Alabama Precursor Chemicals

US - Arizona Controlled Substances Schedule I

US DOE Temporary Emergency Exposure Limits (TEELs)

US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes

US Drug Enforcement Administration (DEA) List I or Precursor Chemicals

US Drug Enforcement Administration (DEA) Thresholds for Regulated Transactions in List I Chemicals

US EPA High Production Volume Program Chemical List

US Food Additive Database

US Toxic Substances Control Act (TSCA) - Inventory

### 16. Other Information

This information is furnished without warranty, express or implied, except that it is accurate to the best knowledge of Mimaki Engineering Corporation.

It relates only to the specific material designated herein, and does not relate to use in combination with any other material or process.

Mimaki Engineering Corporation assumes no legal responsibility for use or reliance upon this information.

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios.

Scale of use, frequency of use and current or available engineering controls must be considered. For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:

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OSHA Standards - 29 CFR:

1910.132 - Personal Protective Equipment - General requirements

1910.133 - Eye and face protection

1910.134 - Respiratory Protection

1910.136 - Occupational foot protection

1910.138 - Hand Protection

Eye and face protection - ANSI Z87.1

Foot protection - ANSI Z41

Respirators must be NIOSH approved.

For detailed advice on Personal Protective Equipment, refer to the following Canadian Standards:

CAN/CSA-Z195 - Protective Footwear

Z195.1 - Guideline on Selection, Use, and Care of Protective Footwear

CAN/CSA-Z94.3 - Industrial Eye and Face Protectors

Z94.3.1 - Protective Eyewear User's Guide

CSA-Z94.4 - Selection, Use, and Care of Respirators

CAN/CSA-Z180.1 - Compressed Breathing Air and Systems.

### Revision history

Version	Date	Content
1.0	2007/7/31	First issue
2.0	2008/03/22	Full-scale revision