PANNIER CORPORATION
207 SANDUSKY STREET, PITTSBURGH, PA 15212-5823 U.S.A.

MATERIAL SAFETY DATA SHEET

IMPORTANT: Read this MSDS before handling and disposing of this product and pass this information on to employees, customers and users of this product.

SECTION I - GENERAL INFORMATION

24 HOUR EMERGENCY TELEPHONE NUMBER: 800-424-9300
INTERNATIONAL EMERGENCY TELEPHONE NUMBER: 703-527-3887

TRADE NAME: PANNIER "MASTER MARKER"
GENERIC NAME: Flexographic Ink Solvent
CHEMICAL FAMILY: Glycol Ether
CAS NO.: NOT AVAILABLE (MIXTURE)
DOT HAZARDOUS MATERIALS PROPER SHIPPING NAME: NONE
DOT HAZARD CLASS: Non-Restricted
UN/NA ID NO.: NONE
HMIS CODES: 1H, 1F, 0R

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT NAME	CAS NUMBER	PERCENTAGE	OCCUPATIONAL EXPOSURE LIMITS
Trade Secret	Not Disclosed	70	None Established
Ethylene Glycol	107-21-1	30	50 PPM CEILING VAPOR TWA OSHA & ACGHI

SECTION III - PHYSICAL DATA

BOILING POINT, 760 MM Hg: 195°C (383°F)
FREEZING POINT: -70°C (-94°F)
SPECIFIC GRAVITY (H_2O=1) 1.027 @ 20/20°C
VAPOR PRESSURE AT 20°C: 0.6 MM Hg
VAPOR DENSITY(AIR=1): 3.4
SOLUBILITY IN WATER BY WT: Complete
EVAPORATION RATE (Butyl Acetate=1): 0.011
APPEARANCE AND ODOR: Clear Liquid; Characteristic Odor
MATERIAL V.O.C.: 8.56 LB/GL (1025 G/L)

FLAMMABLE LIMITS IN AIR, % BY VOLUME: LOWER: 1.2% @ 275°F UPPER: 23.5% @ 360°F

SECTION V - REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: Do not distill to dryness. Avoid excessive temperature or prolonged reflux, such as in batch distillations, as required by good chemical practices.
HAZARDOUS POLYMERIZATION: Will not occur.
INCOMPATIBILITY (MATERIALS TO AVOID): Avoid strong alkali (caustic) at high temperature. Avoid acid and strong oxidizing agents. Do NOT distill to dryness at any temperature in the presence of strong base, acid or strong oxidizing agents. Strongly exothermic decompositions may occur under such conditions. Chemical processing operations involving glycol ethers with strong bases, acids or strong oxidizing agents should be carefully reviewed for safety and stability.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Burning can produce carbon monoxide and/or

carbon dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide is sufficient concentrations can act as an asphyxiate.

SECTION VI - HEALTH HAZARD DATA

EFFECTS OF ACUTE OVEREXPOSURE

SWALLOWING: May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, lumbar pain, oliguria, uremia, and central nervous system effects, including irregular eye movements, convulsions and coma. Cardiac failure and pulmonary edema may develop. Severe kidney damage follows the swallowing of large volumes of ethylene glycol. May be fatal. A few reports have been published describing the development of weakness of the facial muscles, diminished hearing, and difficulty with swallowing, during the late stages of severe poisoning.

SKIN ABSORPTION: No evidence of adverse effects from available information.

INHALATION: May cause irritation of the nose and throat with headache, particularly from mists. High vapor concentrations caused, for example, by heating the materials in an enclosed and poorly ventilated workplace may produce nausea, vomiting, headache, and dizziness and irregular eye movements.

SKIN CONTACT: Brief contact is not irritating. Prolonged contact, as from clothing wet with the material may cause redness and swelling at the site of contact.

EYE CONTACT: Causes stinging, pain and irritation seen as excess redness and swelling of the conjunctiva. Liquid, vapor, and mist may cause discomfort in the eye with persistent conjunctivitis, seen as slight excess redness of the conjunctiva. Serious corneal injury is not anticipated.

REPEATED OVEREXPOSURE: Prolonged exposure to mist generated at elevated temperatures may result in the inhalation of potentially harmful amounts of material and signs of central nervous system involvement, particularly dizziness.

OTHER HEALTH HAZARDS: Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

EMERGENCY FIRST AID PROCEDURES

SWALLOWING: If patient is fully conscious, give two glasses of water and induce vomiting. Call a physician immediately.

SKIN CONTACT: Remove contaminated clothing and flush skin with water. Wash clothing before reuse.

INHALATION: Remove to fresh air. Call a physician if discomfort persists.

EYES: Immediately flush eyes with water and continue washing for at least 15 minutes. Obtain medical attention.

NOTES TO PHYSICIAN: The principal toxic effects of ethylene glycol, when swallowed, are kidney damage and metabolic acidosis. Correction of metabolic acidosis with bicarbonate may be required. Ethanol is antidotal, and its early administration may block the formation of nephrotoxic metabolites of ethylene glycol in the liver. Ethanol should be given intravenously, as a 5% solution in sodium bicarbonate, at a rate of about 10 ML ethanol per hour. A desired therapeutic level of ethanol in blood is 100 MG.DL. Forced diuresis may be used to facilitate the secretion of the glycol. For severe cases, hemodialysis may be required. 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenase, has been used therapeutically to decrease the metabolic consequences of ethylene glycol poisoning before coma, seizure, and renal failure have occurred (20 MG/KG/DAY).

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be noncarcinogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-respiratory

pressure may be required.

There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

RESPIRATORY PROTECTION: Self-contained breathing apparatus in high vapor concentrations.

VENTILATION: General (mechanical) room ventilation is expected to be satisfactory.

PROTECTIVE GLOVES: PVC Coated

EYE PROTECTION: Safety Glasses

OTHER PROTECTIVE EQUIPMENT: Eye bath, safety shower.

SECTION VIII - CONTROL MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Small spills should be flushed with large amounts of water. Larger spills should be collected for disposal.

WASTE DISPOSAL METHOD: Incinerate in a furnace where permitted under appropriate federal, state and local regulations. In very dilute solutions, this material can be biodegraded in an activated sludge biological waste treatment system.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DANGER: Harmful or fatal if swallowed. Contains ethylene glycol which causes birth defects in laboratory animals. Prolonged or repeated breathing of mist or vapor harmful. Causes eye irritation. May cause kidney damage. May cause nervous system damage. Do NOT swallow. Avoid contact with eyes. Do NOT breath mist from spray. Avoid prolonged or repeated breathing of vapor. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

OTHER PRECAUTIONS:
Process Hazard: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published “autoignition” or “ignition” temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.
Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled “Ignition Hazards of Organic Chemical Vapors."

SECTION X - REGULATORY INFORMATION

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III TOXIC CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III AND OF 40 CFR 372.
Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	CONCENTRATION % PER GALLON
Glycol Ethers	Not Available	70%
Ethylene Glycol	107-21-1	30%

This act requires emergency planning based on threshold planning quantities (TPQs) and release reporting based on reportable quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are: NONE

CALIFORNIA PROPOSITION 65

This product does not contain materials which the State of California has found to cause cancer, birth defects, or other reproductive harm.

MASSACHUSETTS

Right-to-Know, substance list (MSL) hazardous substances and extraordinarily hazardous substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (=>1%)

CHEMICAL	CAS NUMBER	CONCENTRATION % PER GALLON
Ethylene Glycol	107-21-1	30%

PENNSYLVANIA

Right-to-Know, hazardous substance list hazardous substances and special hazardous substances on the list must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (=>1%)

CHEMICAL	CAS NUMBER	CONCENTRATION % PER GALLON
Ethylene Glycol	107-21-1	30%

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA) REQUIRES NOTIFICATION OF THE NATIONAL RESPONSE CENTER OF RELEASE OF QUANTITIES OF HAZARDOUS SUBSTANCES EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITIES (RQs) IN 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are: NONE

DISCLAIMER OF LIABILITY

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