SECTION 1 - CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME: GRADE 590 INK
PRODUCT USE: Flexographic Ink

CAS NO.: N/A Mixture
DOT HAZARD: Flammable Liquid, Class III
CLASS: UN/NA ID: UN 1210
NO.: 3H, 2F, 0R
HMIS CODES:

Not recommended for: Consumer Use

Manufacturer/Supplier:
PANNIER CORPORATION
207 SANDUSKY STREET
PITTSBURGH, PA 15212-5823 U.S.A.
412-323-4900
SALES@PANNIER.COM

24 Hr Emergency Telephone Number: INFOTRAC 1-800-535-5053

SECTION 2 - HAZARDS IDENTIFICATION

Signal word: Danger

Hazard statements:
- H227 Combustible liquid.
- H302+H312 Harmful if swallowed or in contact with skin.
- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H335 May cause respiratory irritation.
- H351 Suspected of causing cancer.

Precautionary statements:
- P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P501 Dispose of contents/container in accordance with national regulations.

Contains: Isophorone, Cyclohexanone
SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>CAS NUMBER</th>
<th>OCCUPATIONAL EXPOSURE LIMITS</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1</td>
<td>N/est</td>
<td>10-30</td>
</tr>
<tr>
<td>Isophorone</td>
<td>78-59-1</td>
<td>N/est</td>
<td>30-60</td>
</tr>
</tbody>
</table>

SECTION 4 - FIRST AID MEASURES

General information
Consult a physician for specific advice. Show this Safety Data Sheet to the medical personnel.

Inhalation
Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. If breathing stops, provide artificial respiration. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention immediately.

Ingestion
Get medical attention immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Do not induce vomiting unless under the direction of medical personnel.

Skin Contact
Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing. Wash clothing and clean shoes thoroughly before reuse.

Eye Contact
Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes and get medical attention.

Protection of first aiders
First aid personnel should wear appropriate protective equipment during any rescue. Most important symptoms and effects, both acute and delayed

General information
See Section 11 for additional information on health hazards.

Inhalation
May be harmful if inhaled. May cause eye and respiratory system irritation. Vapors in high concentrations are anesthetic. Overexposure to organic solvents may depress the central nervous system, causing dizziness and intoxication and, at very high concentrations, unconsciousness and death.

Ingestion
Harmful if swallowed. May cause nausea, headache, dizziness and intoxication. May cause stomach pain or vomiting.

Skin contact
Causes skin irritation. Prolonged or repeated contact with skin may cause irritation, redness and dermatitis.

Eye contact
This product is strongly irritating. Prolonged contact causes serious eye and tissue damage.

Indication of immediate medical attention and special treatment needed

SECTION 5 - FIRE FIGHTING MEASURES

Extinguishing media
Suitable extinguishing media: Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media
Water spray. media

Special hazards arising from the substance or mixture

Flammability Class
3.0 Combustible Liquid II

Specific hazards
Combustible liquid. Vapors are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back.

Hazardous combustion products
Thermal decomposition or combustion products may include the following substances: Carbon dioxide (CO2), Carbon monoxide (CO).
Protective actions during firefighting  Evacuate area. Stop leak if safe to do so. Use water to keep fire exposed containers cool and disperse vapors. Use water spray to reduce vapors.

Special protective equipment  Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective for firefighters clothing.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions  No smoking, sparks, flames or other sources of ignition near spillage. Avoid contact with skin, eyes and clothing. Avoid inhalation of vapors. Wash thoroughly after dealing with a spillage.

Environmental precautions

Methods and material for containment and cleaning up

Eliminate all sources of ignition. Stop leak if safe to do so. Contain and absorb spillage with sand, earth or other non-combustible material. Dilute contained spill with water. Collect and place in suitable waste disposal containers and seal securely.

Reference to other sections  For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling

Usage precautions  Wear protective clothing as described in Section 8 of this safety data sheet.

Advice on general occupational hygiene

Conditions for safe storage including any incompatibilities  Do not eat, drink or smoke when using this product. Provide eyewash station and safety shower. Good personal hygiene procedures should be implemented. Wash skin thoroughly after handling.

Storage precautions  Keep only in the original container in a cool, well-ventilated place.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters Occupational exposure limits

Isophorone
Ceiling exposure limit:  ACGIH 5 ppm  28 mg/m³
Long-term exposure limit (8-hour TWA):  OSHA 25 ppm  140 mg/m³ A3

Cyclohexanone
Long-term exposure limit (8-hour TWA):  ACGIH 20 ppm
Long-term exposure limit (8-hour TWA):  OSHA 50 ppm  200 mg/m³
Short-term exposure limit (15-minute):  ACGIH 50 ppm A3,
ACGIH = American Conference of Governmental Industrial Hygienists.
OSHA = Occupational Safety and Health Administration.
A3 = Confirmed Animal Carcinogen with Unknown Relevance to Humans. Sk = Danger of cutaneous absorption.

Ingredient comments  Data based on literature. Product not tested.

Isophorone (CAS: 78-59-1)
Immediate danger to life200 ppm and health
Cyclohexanone (CAS: 108-94-1)
Immediate danger to life700 ppm and health

Exposure controls

Appropriate engineering controls  As this product contains ingredients with exposure limits, process enclosures, local exhaust ventilation or other engineering controls should be used to keep worker exposure below any statutory or recommended limits, if use generates dust, fumes, gas, vapor or mist. Use explosion-proof ventilating equipment.

Eye/face protection  Wear tight-fitting, chemical splash goggles or face shield.

Hand protection  It is recommended that chemical-resistant, impervious gloves are worn. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. It is recommended that gloves are made of the following material: Butyl rubber. Nitrile rubber. Rubber (natural, latex).

Frequent changes are recommended.

Other skin and body protection  Wear appropriate clothing to prevent repeated or prolonged skin contact.

Hygiene measures  Provide eyewash station and safety shower.
Respiratory protection: If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Organic vapor filter.

Thermal hazards: If there is a risk of contact with hot product, all protective equipment worn should be suitable for use with high temperatures.

Environmental exposure controls: Keep container tightly sealed when not in use. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES
Appearance: Colored liquid.
Color: Various
Odor: Ketonic.
Odor threshold: Not available.
pH: pH (concentrated solution): 6.0 - 8.5
Melting point: -8°C/18°F
Initial boiling point and range: 155°C/311°F @ 760 mm Hg
Flash point: 44°C/111°F CC (Closed cup).
Evaporation rate: 0.01 (butyl acetate = 1)
Upper/lower flammability or explosive limits
Upper flammable/explosive limit: 9.4 % vol
Lower flammable/explosive limit: 0.8 % vol
Vapour pressure: 0.2 mm Hg @ 20°C/68°F
Vapour density: 3.39
Relative density: 1.21889 g/cc 1218.89 g/l 10.15 lbs/gal
Solubility: Soluble in the following materials: Ketones. Insoluble in water.
Partition coefficient: log Pow: 0.81
Auto-ignition temperature: 420°C/788°F
Decomposition Temperature: Not applicable.
Explosive properties: Not applicable.
Oxidising properties: Not applicable.
Comments: Data based on literature. Product not tested. Information given is applicable to the product as supplied. Information declared as "Not available" or "Not applicable" is not considered to be relevant to the implementation of the proper control measures.

SECTION 10 - STABILITY AND REACTIVITY
Reactivity: There are no known reactivity hazards associated with this product.
Stability: Stable at normal ambient temperatures and when used as recommended.
Possibility of hazardous reactions: Strong oxidizing agents.
Conditions to avoid: Heat, sparks, flames.
Materials to avoid: Strong oxidizing agents.
Hazardous decomposition products: Carbon dioxide (CO2). Carbon monoxide (CO).

SECTION 11 - TOXICOLOGICAL INFORMATION
Toxicological effects
Acute toxicity - oral: Data based on literature. Product not tested.
ATE oral (mg/kg)
Acute toxicity - dermal: 892.86
ATE dermal (mg/kg): 1,964.29
Acute toxicity - inhalation
ATE inhalation (vapours mg/l): 94.02
Specific target organ toxicity - single exposure
Target organs: Eyes Gastro-intestinal tract Respiratory system, lungs Skin
Specific target organ toxicity - repeated exposure
Target organs: Central nervous system Gastro-intestinal tract Reproductive organs Respiratory system, lungs
Aspiration hazard: Aspiration hazard: Not relevant.
Toxicological information on ingredients.
Isophorone
Acute toxicity - oral: LD₅₀ 1870 mg/kg, Oral, Rat
Notes (oral LD₅₀)
ATE oral (mg/kg)
Acute toxicity - dermal  500.0
ATE dermal (mg/kg)
Acute toxicity - inhalation  1,100.0
Notes (inhalation LC50)
Acute toxicity - oral  LD50 4600 ppm, Inhalation, Guinea pig
Cyclohexanone
ATE oral (mg/kg)
Acute toxicity - dermal  500.0
ATE dermal (mg/kg)
Acute toxicity - inhalation  1,100.0
ATE inhalation (vapours mg/l)
Carcinogenicity  11.0
IARC carcinogenicity  IARC Group 3  Not classifiable as to its carcinogenicity to humans.

SECTION 12 - ECOLOGICAL INFORMATION
Ecotoxicity
Toxicity Data based on literature. Product not tested.
Acute toxicity - aquatic  EC50, 24 hours: 820 mg/l, Daphnia magna invertebrates
Ecological information on ingredients.
Isophorone
Acute toxicity - fish  NOEC, 96 hours: 170 mg/l, Cyprinodon variegatus (Sheepshead minnow) LC50, 96 hours: 145 mg/l, Pimephales promelas (Fat-head Minnow)
Acute toxicity - aquatic  LC50, 48 hours: 120 mg/l, Daphnia magna invertebrates
Cyclohexanone
Acute toxicity - aquatic  EC50, 24 hours: 820 mg/l, Daphnia magna invertebrates
Persistancy and degradability
Biodegradation - 90 - 100:
Ecological information on ingredients.
Cyclohexanone
Biodegradation - 90 - 100:
Bioaccumulative potential
Partition coefficient  log Pow: 0.81

SECTION 13 - DISPOSAL CONSIDERATIONS
Waste treatment methods
General information  Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements.
Disposal methods  Dispose of contents/container in accordance with national regulations. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions. When handling waste, the safety precautions applying to handling of the product should be considered.

SECTION 14 - TRANSPORT INFORMATION
UN Number
UN No. (DOT)  1210
UN No. (IMDG)  1210
UN No. (ICAO)
UN proper shipping name  1210
Proper shipping name (DOT)  PRINTING INK
Proper shipping name (ICAO) PRINTING INK
Transport hazard class(es)
IMDG Class  3
IMDG packing group  III
ICAO class/division 3

Transport labels

Packing group
DOT pack group III
ICAO packing group III

Environmental hazards
Environmentally Hazardous Substance No.

Special precautions for user
EmS F-E, S-D

SECTION 15 - REGULATORY INFORMATION
Regulatory Status Hazardous Chemical
US Federal Regulations
CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)
Cyclohexanone
Final CERCLA RQ: 5000(2270) pounds (Kilograms)
Isophorone
Final CERCLA RQ: 5000(2270) pounds (Kilograms)

SARA (311/312) Hazard Categories
Cyclohexanone
Fire
Health:
Acute
Chronic
Isophorone
Health:
Acute
Chronic

Hazardous Air Pollutants Isophorone
(HAPS) - Clean Air Art
US State Regulations
California Air Toxics "Hot Spots" (A-I)
Isophorone
California Directors List of Hazardous Substances The following ingredients are listed or exempt:
Cyclohexanone Isophorone
Massachusetts "Right To Know" List
The following ingredients are listed or exempt:
Cyclohexanone Isophorone
Rhode Island "Right To Know" List
The following ingredients are listed or exempt:
Cyclohexanone
Isophorone
Minnesota "Right To Know" List
The following ingredients are listed or exempt:
Cyclohexanone Isophorone
New Jersey "Right To Know" List
The following ingredients are listed or exempt:
Cyclohexanone Present.
Isophorone Present.
Pennsylvania "Right To Know" List
The following ingredients are listed or exempt:
Cyclohexanone Present.
Isophorone Present.
Inventories
EU - EINECS/ELINCS
All the ingredients are listed or exempt.
Canada - DSL/NDSL
All the ingredients are listed or exempt.
US - TSCA
All the ingredients are listed or exempt.
Australia - AICS
The following ingredients are listed or exempt:
Cyclohexanone Isophorone
Japan - MITI
The following ingredients are listed or exempt:
Cyclohexanone Isophorone
Korea - KECI
The following ingredients are listed or exempt:
Cyclohexanone
Isophorone
China - IECSC
The following ingredients are listed or exempt:
Cyclohexanone
Isophorone
Philippines - PICCS
The following ingredients are listed or exempt:
Cyclohexanone Isophorone

SECTION 16 - OTHER INFORMATION

DISCLAIMER
THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN WERE OBTAINED FROM SOURCES BELIEVED TO BE GENERALLY RELIABLE, BUT, WE MAKE NO WARRANTY CONCERNING THEIR ACCURACY OR SUFFICIENCY, AND WE WILL NOT BE HELD LIABLE FOR CLAIMS RELATING TO ANY PARTY’S USE OF OR RELIANCE ON INFORMATION OR RECOMMENDATIONS CONTAINED HEREIN.

HMIS CODES:  H – 3,  F – 3,  R – 0,  P -
LEGEND:   NDA – NO DATA AVAILABLE  N/D - NOT DETERMINED  N/E – NOT ESTABLISHED