SAFETY DATA SHEET
ISOPROPYL ALCOHOL

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

PRODUCT NAME \hspace{1cm} ISOPROPYL ALCOHOL
PRODUCT NO. \hspace{1cm} PAT536
SYNONYMS, TRADE NAMES \hspace{1cm} DIMETHYL CARBINOL, IPA, ISOPROPANOL, PROPA-2-OL
SUPPLIER \hspace{1cm} FLINT HIRE & SUPPLY LTD
QUEENS ROW
LONDON
SE17 2PX
Tel. 020 7703 9786
Fax. 020 7708 4189
Email. sales@flints.co.uk

EMERGENCY TELEPHONE \hspace{1cm} 020 7703 9786

2 HAZARDS IDENTIFICATION

Highly flammable. Irritating to eyes. Vapours may cause drowsiness and dizziness.
CLASSIFICATION \hspace{1cm} Xi;R36. F;R11. R67.

3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>EC No.</th>
<th>CAS-No.</th>
<th>Content %</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROPAN-2-OL</td>
<td>200-661-7</td>
<td>67-63-0</td>
<td>95-100 %</td>
<td>F;R11 Xi;R36 R67</td>
</tr>
</tbody>
</table>

The Full Text for all R-Phrases are Displayed in Section 16
EU INDEX NO. \hspace{1cm} 603-117-00-0
CAS-No. \hspace{1cm} 67-63-0

4 FIRST-AID MEASURES

GENERAL INFORMATION
Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INHALATION
Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Keep the affected person warm and at rest. Get prompt medical attention.

INGESTION
NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Drink plenty of water. DO NOT induce vomiting. Get medical attention immediately.

SKIN CONTACT
Remove affected person from source of contamination. Promptly wash contaminated skin with soap or mild detergent and water. Promptly remove clothing if soaked through and wash as above. Get medical attention immediately.

EYE CONTACT
Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA
Use: Water spray, fog or mist. Alcohol resistant foam. Carbon dioxide (CO2). Dry chemicals, sand, dolomite etc.

SPECIAL FIRE FIGHTING PROCEDURES
Move container from fire area if it can be done without risk. Containers close to fire should be removed or cooled with water. Cool containers exposed to flames with water until well after the fire is out. Keep run-off water out of sewers and water sources. Dike for water control. If risk of water pollution occurs, notify appropriate authorities. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
ISOPROPYL ALCOHOL

UNUSUAL FIRE & EXPLOSION HAZARDS
Heat may cause the containers to explode. Solvent vapours may form explosive mixtures with air. May travel considerable distance to source of ignition and flash back. May ignite at high temperature. Vapours are heavier than air and may spread near ground to sources of ignition.

SPECIFIC HAZARDS
Fire creates: Carbon monoxide (CO). Carbon dioxide (CO2).

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS
Wear protective clothing as described in Section 8 of this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS
Do not allow to enter drains, sewers or watercourses. Avoid release to the environment. To prevent release, place container with damaged side up. Contain spillages with sand, earth or any suitable adsorbent material.

SPILL CLEAN UP METHODS
Ventilate well, stop flow of gas or liquid if possible. Remove ignition sources. Do not allow chemical to enter confined spaces such as sewers due to explosion risk. Sewers designed to preclude formation of explosive concentrations of vapour may be permitted. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. Remove sources of ignition. Stop leak if possible without risk. Let evaporate. Keep out of confined spaces because of explosion risk. Provide ventilation and confine spill. Do not allow runoff to sewer. Should be prevented from entering drains. Do not contaminate water sources or sewer. Inform Authorities if large amounts are involved. Dike far ahead of larger spills for later disposal. Absorb in vermiculite, dry sand or earth and place into containers. Containers with collected spillage must be properly labelled with correct contents and hazard symbol. Avoid contact with skin or inhalation of spillage, dust or vapour. Clean-up personnel should use respiratory and/or liquid contact protection.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS
Keep away from heat, sparks and open flame. Avoid spilling, skin and eye contact. Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Avoid acids, moisture, and combustible materials. Wear full protective clothing for prolonged exposure and/or high concentrations. Do not use in confined spaces without adequate ventilation and/or respirator. Static electricity and formation of sparks must be prevented. Storage tanks and other containers must be grounded. Use explosion proof electric equipment. Do not handle broken packages without protective equipment.

STORAGE PRECAUTIONS
Flammable/combustible - Keep away from oxidisers, heat and flames. May attack some plastics, rubber and coatings. Ground container and transfer equipment to eliminate static electric sparks. Take precautionary measures against static discharges. Do not store near heat sources or expose to high temperatures. Unsuitable containers: aluminium. Keep away from food, drink and animal feeding stuffs.

STORAGE CLASS
Flammable liquid storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Name</th>
<th>Std</th>
<th>LT - ppm</th>
<th>LT - mg/m3</th>
<th>ST - ppm</th>
<th>ST - mg/m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROPAN-2-OL</td>
<td>OES</td>
<td>400 ppm</td>
<td>999 mg/m3</td>
<td>500 ppm</td>
<td>1250 mg/m3</td>
</tr>
</tbody>
</table>

INGREDIENT COMMENTS
WEL = Workplace Exposure Limits

PROTECTIVE EQUIPMENT

ENGINEERING MEASURES
Provide adequate general and local exhaust ventilation. Must not be handled in confined space without sufficient ventilation. Provide sufficient ventilation during operations which cause vapour formation.

RESPIRATORY EQUIPMENT
No specific recommendation made, but respiratory protection must be used if the general level exceeds the Recommended Workplace Exposure Limit. Respiratory protection must be used if air contamination exceeds acceptable level. If ventilation is insufficient, suitable respiratory protection must be provided. Gas cartridge suitable for organic substances.

HAND PROTECTION
Use suitable protective gloves if risk of skin contact. Use protective gloves made of: Butyl rubber. P.T.F.E (Teflon). Viton rubber (fluor rubber). Nitrile. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.
EYE PROTECTION
Wear approved chemical safety goggles where eye exposure is reasonably probable.

OTHER PROTECTION
Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact. Provide eyewash station.

HYGIENE MEASURES
DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>Characteristic Odour of alcohol</td>
</tr>
<tr>
<td>Solubility</td>
<td>Miscible with water. Miscible with Organic solvents</td>
</tr>
<tr>
<td>Mol. Weight</td>
<td>60.1</td>
</tr>
<tr>
<td>Relative Density</td>
<td>0.785 20</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>4100 Pa 20</td>
</tr>
<tr>
<td>Volatile by vol. (%)</td>
<td>100</td>
</tr>
<tr>
<td>Odour threshold, lower</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>12 CC (Closed cup)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>2.43 mPas 20</td>
</tr>
<tr>
<td>Flammability limit - lower (%)</td>
<td>2</td>
</tr>
<tr>
<td>Partition Coefficient</td>
<td>0.05</td>
</tr>
<tr>
<td>Boiling point (°C)</td>
<td>82 - 83 760 mm Hg</td>
</tr>
<tr>
<td>Vapour density (air=1)</td>
<td>2.08</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>1.5 BuAc=1</td>
</tr>
<tr>
<td>Odour threshold, upper</td>
<td>@30 ppm</td>
</tr>
<tr>
<td>Auto ignition</td>
<td>425</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td></td>
</tr>
<tr>
<td>Flammability limit - upper (%)</td>
<td>12</td>
</tr>
</tbody>
</table>

10 STABILITY AND REACTIVITY

STABILITY
Stable under normal temperature conditions and recommended use.

CONDITIONS TO AVOID
Avoid heat, flames and other sources of ignition. Avoid exposure to high temperatures or direct sunlight. Avoid contact with acids and oxidising substances.

MATERIALS TO AVOID

HAZARDOUS DECOMPOSITION PRODUCTS
Toxic gases/vapours/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2).

11 TOXICOLOGICAL INFORMATION

TOXIC DOSE 1 - LD 50  5840 mg/kg (oral rat)

INHALATION
Vapours may irritate the respiratory system and cause coughing, asthmatic breathing and breathlessness. Prolonged inhalation of high concentrations may damage respiratory system. Central nervous system depression. Vapours may cause headache, fatigue, dizziness and nausea.

INGESTION

SKIN CONTACT
Repeated exposure may cause skin dryness or cracking. Acts as a defatting agent on skin. May cause cracking of skin, and eczema.

EYE CONTACT
Extreme irritation of eyes and mucous membranes, including burning and tearing. Risk of corneal damage.

ROUTE OF ENTRY
Inhalation. Ingestion. Skin and/or eye contact.

TARGET ORGANS

MEDICAL SYMPTOMS
12 ECOLOGICAL INFORMATION

LC 50, 96 Hrs, FISH mg/l 9600
EC 50, 48 Hrs, DAPHNIA, mg/l 4600

MOBILITY
This product will dissolve rapidly in water if released to soil it will evaporate at a rapid rate Dissolves in water. Lost within a day by evaporation and dissolution.

BIOACCUMULATION
Does not bioaccumulate significantly

DEGRADABILITY
Readily biodegradable meeting the 10 day criterion. Expected to degrade under anaerobic conditions. Oxidises rapidly by photo-chemical reaction in air. Integrated environmental half-life expected to be 1 - < 10 days. Dominant loss process - biodegradation. Poses a significant risk of oxygen depletion in aquatic systems.

ACUTE FISH TOXICITY
Practically non toxic

13 DISPOSAL CONSIDERATIONS

GENERAL INFORMATION
Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority. Contaminated packages must be completely emptied before sending away for laundering and re-use

DISPOSAL METHODS
Dispose of waste and residues in accordance with local authority requirements. Confirm disposal procedures with environmental engineer and local regulations. Do not allow runoff to sewer, waterway or ground. Contact specialist disposal companies.

14 TRANSPORT INFORMATION

PROPER SHIPPING NAME
ISOPROPANOL (ISOPROPYL ALCOHOL)

UN NO. ROAD 1219  ADR CLASS NO. 3
ADR CLASS Class 3: Flammable liquids.  ADR PACK GROUP II
HAZARD NO. (ADR) 33  Highly flammable liquid (flash-point below 23°C).
ADR LABEL NO. 3  HAZCHEM CODE 2YE
RID CLASS NO. 3  RID PACK GROUP II
UN NO. SEA 1219  IMDG CLASS 3
IMDG PACK GR. II  EMS 3-06
MARINE POLLUTANT No.  UN NO. AIR 1219
AIR CLASS 3  AIR PACK GR. II

15 REGULATORY INFORMATION

LABELLING

Irritant

Highly Flammable

RISK PHRASES

R11 Highly flammable.
R36 Irritating to eyes.
R67 Vapours may cause drowsiness and dizziness.
ISOPROPYL ALCOHOL

SAFETY PHRASES

S9  Keep container in a well-ventilated place.
S16 Keep away from sources of ignition - No smoking.
S25 Avoid contact with eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S51 Use only in well-ventilated areas.
S60 This material and its container must be disposed of as hazardous waste.

ENVIRONMENTAL LISTING
Environmental Protection Act 1990 Hazardous Waste Regulations 2005

EU DIRECTIVES

APPROVED CODE OF PRACTICE
Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply.

GUIDANCE NOTES
Workplace Exposure Limits EH40.

NATIONAL REGULATIONS

16 OTHER INFORMATION

REVISION DATE 12/02/2007
REV. NO./REPL. SDS GENERATED ISSUE NO 5
SDS NO. 1003

SAFETY DATA SHEET STATUS
Approved.

RISK PHRASES IN FULL
R11 Highly flammable.
R36 Irritating to eyes.
R67 Vapours may cause drowsiness and dizziness.

DISCLAIMER
This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.