Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
DY-MARK FLAWCHEK STEP 4 DEVELOPER AEROSOL

PROPER SHIPPING NAME
AEROSOLS

PRODUCT USE
■ Application is by spray atomisation from a hand held aerosol pack.
Flaw detection spray; one step in a four-part process.

SUPPLIER
Company: Dy- Mark Pty Ltd
Address:
89 Formation Street
Wacol
QLD, 4076
AUS
Telephone: +61 7 3271 2222
Fax: +61 7 3271 2751

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE
None

RISK

Risk Codes	Risk Phrases
R12	■ Extremely flammable.
R36/38	■ Irritating to eyes and skin.
R44	■ Risk of explosion if heated under confinement.

SAFETY

Safety Codes	Safety Phrases
S401	■ To clean the floor and all objects contaminated by this material use water and detergent.
S46	■ If swallowed IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).
S60	■ This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ethanol	64-17-5	30-60
propylene glycol monomethyl ether - alpha isomer	107-98-2	10-30
filler		10-30
hydrocarbon propellant	68476-85-7.	10-30

Section 4 - FIRST AID MEASURES

SWALLOWED
■ - Avoid giving milk or oils.
- Avoid giving alcohol.
- Not considered a normal route of entry.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE
■ If aerosols come in contact with the eyes:
- Immediately hold the eyelids apart and flush the eye continuously for at least 15 minutes 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

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lids.

SKIN
■ If solids or aerosol mists are deposited upon the skin:
- Flush skin and hair with running water (and soap if available).
- Remove any adhering solids with industrial skin cleansing cream.

INHALED
■ If aerosols, fumes or combustion products are inhaled:
- Remove to fresh air.
- Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
■ For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:
- Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 50 mm Hg) should be intubated.
Treat symptomatically.
For acute or short term repeated exposures to ethanol:
- Acute ingestion in non-tolerant patients usually responds to supportive care with special attention to prevention of aspiration, replacement of fluid and correction of nutritional deficiencies (magnesium, thiamine pyridoxine, Vitamins C and K).
- Give 50% dextrose (50-100 ml) IV to obtunded patients following blood draw for glucose determination.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
■ - Alcohol stable foam.
- Dry chemical powder.
SMALL FIRE:
- Water spray, dry chemical or CO2
LARGE FIRE:
- Water spray or fog.

FIRE FIGHTING
■ FOR FIRES INVOLVING MANY GAS CYLINDERS:
- To stop the flow of gas, specifically trained personnel may inert the atmosphere to reduce oxygen levels thus allowing the capping of leaking container(s).
- Reduce the rate of flow and inject an inert gas, if possible, before completely stopping the flow to prevent flashback.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
When any large container (including road and rail tankers) is involved in a fire,
consider evacuation by 100 metres in all directions.

FIRE/EXPLOSION HAZARD
■ - Liquid and vapour are highly flammable.
- Severe fire hazard when exposed to heat or flame.
Combustion products include: carbon monoxide (CO).
Combustible. Will burn if ignited., carbon dioxide (CO2), sulfur oxides (SOx), other pyrolysis products typical of burning organic material.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

FIRE INCOMPATIBILITY
■ - Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

HAZCHEM: 2YE

Personal Protective Equipment
Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
■ - Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.

MAJOR SPILLS
■ - Remove leaking cylinders to a safe place.
- Fit vent pipes. Release pressure under safe, controlled conditions.
- DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

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Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
■ 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.
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.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

SUITABLE CONTAINER
■ - Aerosol dispenser.
- Check that containers are clearly labelled.

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.
Propylene glycol monomethyl ether:
- reacts violently with strong oxidisers, alkalis
- is incompatible with aliphatic amines, boranes, sulfuric acid, nitric acid, perchloric acid, caustics, isocyanates.
- Avoid oxidising agents, acids, acid chlorides, acid anhydrides, chloroformates.
- Avoid strong bases.
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STORAGE REQUIREMENTS
■ - Keep dry to avoid corrosion of cans. Corrosion may result in container perforation and internal pressure may eject contents of can.
- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³
Australia Exposure Standards	ethanol (Ethyl alcohol)	1000	1880		
Australia Exposure Standards	propylene glycol monomethyl ether - alpha isomer (Propylene glycol monomethyl ether)	100	369	150	553
Australia Exposure Standards	hydrocarbon propellant (LPG (liquified petroleum gas))	1000	1800		

PERSONAL PROTECTION

RESPIRATOR
Type AXNO Filter of sufficient capacity

EYE
■ - Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET
■ - No special equipment needed when handling small quantities.
- OTHERWISE:

OTHER
■ No special equipment needed when handling small quantities.
OTHERWISE:
- Overalls.
- Skin cleansing cream.
- The clothing worn by process operators insulated from earth may develop static charges far higher (up to 100 times) than the minimum ignition energies for various flammable gas-air mixtures. This holds true for a wide range of clothing materials including cotton.
- Avoid dangerous levels of charge by ensuring a low resistivity of the surface material worn outermost.

ENGINEERING CONTROLS
■ General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
■ Note that all of the monopropylene glycol ethers may exist in two isomeric forms, alpha or beta. The alpha form, which is thermodynamically favored during synthesis, consists of a secondary alcohol configuration.
Supplied as an aerosol pack. Contents under PRESSURE.
White highly flammable liquid aerosol with sweet solvent odour; mixes with water.

PHYSICAL PROPERTIES
Liquid.
Gas.
Mixes with water.

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Solubility in water (g/L): Miscible
pH (1% solution): Not Applicable
Volatile Component (%vol): >60
Relative Vapour Density (air=1): >1
Lower Explosive Limit (%): Not Available
Autoignition Temp (°C): Not Available
State: Liquid

Boiling Range (°C): 78
Specific Gravity (water=1): <1
pH (as supplied): Not Applicable
Vapour Pressure (kPa): 5.7 @ 20 C
Evaporation Rate: Fast
Flash Point (°C): - 81 propellant
Upper Explosive Limit (%): Not Available
Decomposition Temp (°C): Not Available
Viscosity: Not Available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
■ - Elevated temperatures.
- Presence of open flame.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS
ACUTE HEALTH EFFECTS
■ Irritating to eyes and skin.
■ Vapours may cause dizziness or suffocation.

CHRONIC HEALTH EFFECTS
■ Not applicable.

TOXICITY AND IRRITATION
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

■ for propylene glycol ethers (PGEs):
Typical propylene glycol ethers include propylene glycol n-butyl ether (PnB); dipropylene glycol n-butyl ether (DPnB); dipropylene glycol methyl ether acetate (DPMA); tripropylene glycol methyl ether (TPM).
Testing of a wide variety of propylene glycol ethers Testing of a wide variety of propylene glycol ethers has shown that propylene glycol-based ethers are less toxic than some ethers of the ethylene series.
The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis.
Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.

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

TOXICITY
Oral (rat) LD50: 7060 mg/kg
Oral (human) LDLo: 1400 mg/kg
Oral (man) TDLo: 50 mg/kg
Oral (man) TDLo: 1.40 mg/kg
Oral (woman) TDLo: 256 mg/kg/12 wks
Inhalation (rat) LC50: 20, 000 ppm/10h
Inhalation (rat) LC50: 64000 ppm/4h

IRRITATION
Skin (rabbit):20 mg/24hr- Moderate
Skin (rabbit):400 mg (open)- Mild
Eye (rabbit):100mg/24hr- Moderate
Eye (rabbit): 500 mg SEVERE

■ The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis.

PROPYLENE GLYCOL MONOMETHYL ETHER - ALPHA ISOMER:
■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY
Oral (rat) LD50: 3739 mg/kg
Inhalation (human) TCLo: 3000 ppm
Inhalation (rat) LC50: 10000 ppm/5 h.
Dermal (rabbit) LD50: 13000 mg/kg
■ for propylene glycol ethers (PGEs):

IRRITATION
Skin (rabbit) 500 mg Open - Mild
Eye (rabbit) 230 mg Mild
Eye (rabbit) 500 mg/24 h. - Mild
Eye (rabbit): 100 mg SEVERE

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Typical propylene glycol ethers include propylene glycol n-butyl ether (PnB); dipropylene glycol n-butyl ether (DPnB); dipropylene glycol methyl ether acetate (DPMA); tripropylene glycol methyl ether (TPM).
Testing of a wide variety of propylene glycol ethers Testing of a wide variety of propylene glycol ethers has shown that propylene glycol-based ethers are less toxic than some ethers of the ethylene series.
NOTE: For PGE - mixed isomers: Exposure of pregnant rats and rabbits to the substance did not give rise to teratogenic effects at concentrations up to 3000 ppm. Foetotoxic effects were seen in rats but not in rabbits at this concentration; maternal toxicity was noted in both species.

HYDROCARBON PROPELLANT:
■ Not available. Refer to individual constituents.

CARCINOGEN

Ethanol in alcoholic beverages	International Agency for Research on Cancer (IARC) Carcinogens	Group	1

Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
Dy- Mark Flawchek Step 4 Developer Aerosol		No data		
ethanol		No data		
propylene glycol monomethyl ether - alpha isomer		No data		
hydrocarbon propellant		No data		

Section 13 - DISPOSAL CONSIDERATIONS

■ - DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- Consult State Land Waste Management Authority for disposal.
- Discharge contents of damaged aerosol cans at an approved site.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: FLAMMABLE GAS
HAZCHEM: 2YE (ADG7)

ADG7:

Class or division:	2	Subsidiary risk:	None
UN No.:	1950	UN packing group:	None
Special provisions:	63, 190, 277, 327	Packing Instructions:	None
Notes:	None	Limited quantities:	See SP 277
Portable tanks and bulk containers - Instructions:	None	Portable tanks and bulk containers - Special provisions:	None
Packagings and IBCs - Packing instruction:	P003, LP02	Packagings and IBCs - Special packing provisions:	PP17, PP87, L2

Shipping Name:AEROSOLS

Land Transport UNDG:

Class or division:	2	Subsidiary risk:	None
UN No.:	1950	UN packing group:	None

Shipping Name:AEROSOLS

Air Transport IATA:

Maritime Transport IMDG:

IMDG Class:	2.1	IMDG Subrisk:	SP63
UN Number:	1950	Packing Group:	None
EMS Number:	F- D, S- U	Special provisions:	63 190 277 327 959
Limited Quantities:	See SP277		

Shipping Name: AEROSOLS

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Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: None

REGULATIONS
Regulations for ingredients

ethanol (CAS: 64-17-5) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Illicit Drug Reagents/Essential Chemicals - Catego
"Australia National Pollutant Inventory","Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5","IMO IBC Code Chapter 18: List of products to which
not apply","IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances","IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99%
components already assessed by IMO","International Agency for Research on Cancer (IARC) Carcinogens","International Air Transport Association (IATA) Dangerous Goods Regulations
Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals"

propylene glycol monomethyl ether - alpha isomer (CAS: 107-98-2) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Council of Chemica
(ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals"

hydrocarbon propellant (CAS: 68476-85-7,68476-86-8) is found on the following regulatory lists;
"Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","OECD Representative List of High Production Volume (HPV

No data for Dy-Mark Flawchek Step 4 Developer Aerosol (CW: 117341)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
hydrocarbon propellant	68476- 85- 7, 68476- 86- 8

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ 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.

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This is the end of the MSDS.