Commodity Logistics and Import Project

Preliminary Hazard Analysis Report

BlueScope Steel (AIS) Pty Ltd

09 November 2022

→ **The Power of Commitment**

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The Power of Commitment

Executive summary

BlueScope Steel (AIS) Pty Ltd (BlueScope) owns and operates Port Kembla Steelworks (PKSW) located in the Wollongong Local Government Area in NSW. It is the largest steel production facility in Australia and is the only plant in Australia manufacturing upstream flat iron and steel products. Recent and emerging disruptions to key commodity supply chains have highlighted the importance of the upgrade to three of the five berths operated by BlueScope. This upgrade will allow for the berths to accommodate the increase in premium hard coking coal imports needed to replace the three-seam coal from South32's Dendrobium mine. This coal is currently transported by rail and is expected to cease supply by 2028.

GHD Pty Ltd (GHD) was commissioned BlueScope to prepare a preliminary risk screening in accordance with the Resilience and Hazard State Environment Planning Policy (R&H SEPP), formally named SEPP No. 33 - Hazardous and Offensive Development. To fulfill this requirement, a summary of Dangerous Goods (DGs) used on site during construction, a preliminary risk screening of DGs, a transport screening and a Level 1 Preliminary Hazard Analysis (PHA) were completed, as outlined in this report.

The results of the DG and preliminary risk screening indicate that the project does not exceed the R&H SEPP thresholds for the DGs expected to be used and/ or stored on-site during construction. It is not expected that any new DGs will be used or stored on site during operation. However, given the potential for dust explosions, the project was deemed to be 'potentially hazardous' and a Level 1 PHA was conducted.

The Level 1 PHA was conducted as a qualitative desktop study and systematically identified any potential off-site impacts and mitigation measures to eliminate or control identified hazards. The results of the hazard identification indicate that three hazards have the potential for off-site harm. These are listed below:

- Damage to bunker fuel pipeline during construction activities
- Coal and coke dust located on site conveyors
- Ship movements in port during operations

It was determined that the hazards with potential off-site impact would be suitably controlled with the control measures listed in Table 6.1. With these safeguards, the risk scenarios identified are controlled to an acceptable level and the project is not a hazardous industry.

It is recommended that management procedures be implemented that incorporate practices that will prevent risk scenarios occurring through:

- Construction management plan, including consideration of isolation and evacuation of the fuel pipeline during relocation and fire management, including fire events at the bunker fuel pipeline.
- Utilise existing conveyor design and safeguards.
- Inspection and maintenance regime for conveyor systems.
- Implement procedures for the wetting of dust areas prior to hot works taking place.
- Reduction of dust accumulation through regular housekeeping.

Any changes to the assumptions used in this report should result in a review of the screening and PHA process and update as required. This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.3 and the assumptions and qualifications contained throughout the report.

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Glossary and abbreviations

Abbreviation	Description
6BF	Number 6 Blast Furnace
BlueScope	BlueScope Steel (AIS) Pty Ltd
BSL	BlueScope Steel Limited
CLIP	Commodity Logistics and Import Project
CSSI	Critical State Significant Infrastructure
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
HAZID	Hazard identification
HIPAP	Hazardous Industry Planning Advisory Paper
LOC	Limiting Oxygen Concentration
MEC	Minimum Explosible Concentration
MIT	Minimum Ignition Temperature
PHA	Preliminary Hazard Analysis
PKSW	Port Kembla Steelworks
SDS	Safety Data Sheet
SEPP	State Environmental Planning Policy

1. Introduction

1.1 Background

BlueScope Steel (AIS) Pty Ltd (BlueScope) is one of Australia's leading manufacturers and is a global leader in finished and semi-finished steel products. Steelmaking operations are undertaken at the Port Kembla Steelworks (PKSW), within an industrial site of approximately 750 hectares located in the Wollongong Local Government Area.

PKSW is the largest steel production facility in Australia and is the only plant in Australia manufacturing upstream flat iron and steel products. PKSW supplies the essential feedstock that keeps all other domestic manufacturing facilities owned by BlueScope's parent entity, BlueScope Steel Limited (BSL), operational.

Recent and emerging disruptions to key commodity supply chains have highlighted the importance of an upgrade to three of the five berths operated by BlueScope, which is proposed as a key component of the Number 6 Blast Furnace (6BF) Reline Project. The upgrade will allow for the berths to accommodate the increase in premium hard coking coal imports needed to replace the three-seam coal from South32's Dendrobium mine. This coal is currently transported by rail and is expected to cease supply by 2028. The proposed upgrade is urgently required to support continued operations at PKSW, thus maintaining the provision of steel to the domestic and export markets, and the continuation of economic benefit to the Illawarra region.

The upgrade of PKSW's raw material import capabilities is referred to as the Commodity Logistics and Import Project (CLIP) or the project. CLIP is part of a larger Critical State Significant Infrastructure (CSSI) project involving both the reline of 6BF and CLIP.

The project has been declared CSSI in accordance with Section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Schedule 5 of the *State Environmental Planning Policy (Planning Systems) 2021*.

1.2 Purpose of this report

This Preliminary Hazard Analysis (PHA) report has been prepared by GHD Pty Ltd (GHD) as part of the EIS for the project. This report provides a preliminary risk screening in accordance with *State Environment Planning Policy (Hazards and Resilience) 2021* (R&H SEPP). This report addresses the relevant criteria in the NSW Secretary's Environmental Assessment Requirements (SEARs) for the project.This report provides sufficient information and assessment of risks to demonstrate that the project will prevent, or mitigate the identified impacts, including human health, the environment and property, associated with the project and that the residual risk levels are acceptable in relation to the surrounding land use.

As such, this report focuses on the impact of potential hazards associated with the use of dangerous goods and hazardous substances that may arise during the construction and operation of the project. Specifically, this report:

- Describes the existing environment with respect to the project.
- Screens the quantities of dangerous goods expected to be used during construction and operation of the project.
- Assesses the impacts of construction and operation of the project specific to dangerous goods and other hazardous substances.
- Recommends measures to mitigate the impacts identified.

1.3 Limitations

This report has been prepared by GHD for BlueScope Steel (AIS) Pty Ltd and may only be used and relied on by BlueScope Steel (AIS) Pty Ltd for the purpose agreed between GHD and BlueScope Steel (AIS) Pty Ltd as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than BlueScope Steel (AIS) Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by BlueScope Steel (AIS) Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.4 Assumptions

The following assumptions have been made in the preparation of this report:

- The chemical data was based on available Safety Data Sheets (SDSs) and are referenced and included in Appendix A.
- All plant and equipment is installed and operated in accordance with appropriate Australian Standards, codes, and guidelines.
- All equipment and systems are designed to be inherently safe.
- All equipment is maintained and operated as designed.

Any changes to the assumptions used in this report should result in a review of the screening process and update as required.

2. Legislative and policy context

2.1 Planning Secretary's Environmental Assessment Requirements

The SEARs relevant to hazards and risk, together with a reference to where they are addressed in this report, are outlined in Table 2.1.

Table 2.1 Hazard and risk SEARs

Requirements	Where addressed in this report
Consideration of hazards posed by shipping generated by the project	Section 6
If the project is classified as "potentially hazardous", in accordance with *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 SEPP 33* (DPE 2011b), a Preliminary Hazard Analysis prepared consistent with *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines of Hazard Analysis* (DPE, 2011), covering all aspects of the project which may pose a risk to the public	Section 7

2.2 Resilience and hazard SEPP

The NSW Department of Planning and Environment (DPE) consolidated certain state environmental planning policies (SEPPs) in March 2022. As a result, the previously named SEPP 33 – Hazardous and Offensive Development provisions have been transferred to the R&H SEPP. No policy changes have been made. The SEPP consolidation does not change the legal effect of the SEPPs being repealed and section 30A of the *Interpretation Act 1987* applies to the transferred provisions, meaning the transfer does not affect the operation or meaning of the SEPP provisions.

The *Applying SEPP 33: Hazardous and Offensive Development Application Guidelines* (DPE, 2011a) continue to provide the process for assessing if developments are potentially hazardous or offensive, including threshold levels that trigger the potentially hazardous or offensive status. *Applying SEPP 33* is the main guidance document that has been followed for this Preliminary Hazard Analysis (PHA).

2.3 Hazardous Industry Planning Advisory Paper No 4

The document, *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning* (HIPAP No 4) (DPE, 2011b) sets out risk criteria which must be complied with by industries that are considered hazardous. This document is used when *Applying SEPP 33* indicates a development is potentially hazardous. The process to be applied under HIPAP No 4 is illustrated in Figure 3.1.

2.4 Hazardous Industry Planning Advisory Paper No 6

The document *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (HIPAP No 6) (DPE, 2011c) lists the process required for undertaking a PHA. This document is used when *Applying SEPP 33* indicates a development is potentially hazardous.

3. Methodology

The method to determine whether a project would be deemed potentially hazardous or potentially offensive and the required follow up assessments is provided in Table 3.1.

Table 3.1 SEPP 33 method for potentially hazardous or offensive industries

Issue	Methodology to determine if potentially hazardous / offensive	Follow up assessment if confirmed as potentially hazardous / offensive industry
Potentially hazardous industry	*Applying SEPP 33* risk screening process	Preliminary Hazard Analysis (PHA) required
Potentially offensive industry	Review of potential impacts to the amenity of the site or discharges, such as emissions (e.g. noise, air)	Meeting any licencing requirements issued by relevant authorities e.g. NSW Environmental Protection Agency (EPA) is required

The SEPP 33 process is discussed in Sections 3.1 to 3.3.

3.1 Preliminary risk screening

Applying SEPP 33 relates to any project which falls under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'.

A 'potentially hazardous industry' is one in which when all locational, technical, operational, and organisational safeguards are employed, continues to pose a significant risk (as per the requirements of R&H SEPP). A 'potentially offensive industry' is one which would, in the absence of safeguards, emit a polluting discharge which would cause a significant level of offence.

SEPP 33 requires a screening process be undertaken. The overall risk screening process, as outlined in *Applying SEPP 33,* is summarised in Figure 3.1.

The risk screening process concentrates on the storage of specific dangerous good (DG) classes that have the potential for significant off-site effects. Specifically, the assessment involves the identification of classes and quantities of all DGs to be used, stored, or produced on site with an indication of storage locations. The quantities of DGs are then assessed against the *Applying SEPP 33* threshold quantities. If any of the *Applying SEPP 33* threshold quantities are exceeded, then the project is potentially hazardous and a preliminary hazard analysis (PHA) is required.

If the project is potentially offensive, after considering the quantity and nature of any discharges and the significance of the offence likely to be caused having regard to surrounding land use and the proposed controls, then additional controls are required.

3.2 Hazard Identification

Following screening, SEPP 33 requires a determination of whether the project poses significant hazard or risk. This requires identification of potential hazards to highlight any risks associated with the interaction of the project (as a whole) with the surrounding environment (i.e. a systematic process to identify any potential off-site impacts).

The Hazard Identification (HAZID) process is a desktop assessment and involves documenting possible events that could lead to a possible off-site incident. The assessment then lists the potential causes of the incident, as well as identification of operational and organisational safeguards to prevent the incidents from occurring or to mitigate their impact. The HAZID process identifies the scenarios relevant to the PHA, should it be required.

3.3 Preliminary Hazard Analysis (PHA)

For a development classified as 'potentially hazardous', a PHA is required to be completed to determine the risk to people, property, and the environment at the proposed location and in the presence of controls. Criteria of acceptability are used to determine if the development is classified as a 'hazardous industry'. If this is the case, the development may not be permissible within most industrial zonings in NSW.

The PHA identifies the potential hazards, analyses these hazards in terms of their impact to people and the environment and their likelihood of occurrence, quantifies the resulting risk to surrounding land uses and assesses the risk to demonstrate that the project will not impose an unacceptable level of risk.

Applying SEPP 33 (2011) identifies three levels of PHA. If a PHA is required, a judgement of the level of risk associated with the project is determined using the results of the screening and HAZID stages.

The three levels of PHA are:

- Level 1 – if low potential for harm is identified, a qualitative PHA is completed.
- Level 2 – if medium potential for harm is identified, a semi-quantitative PHA is completed.
- Level 3 – if high potential for harm is identified, a quantitative PHA is completed.

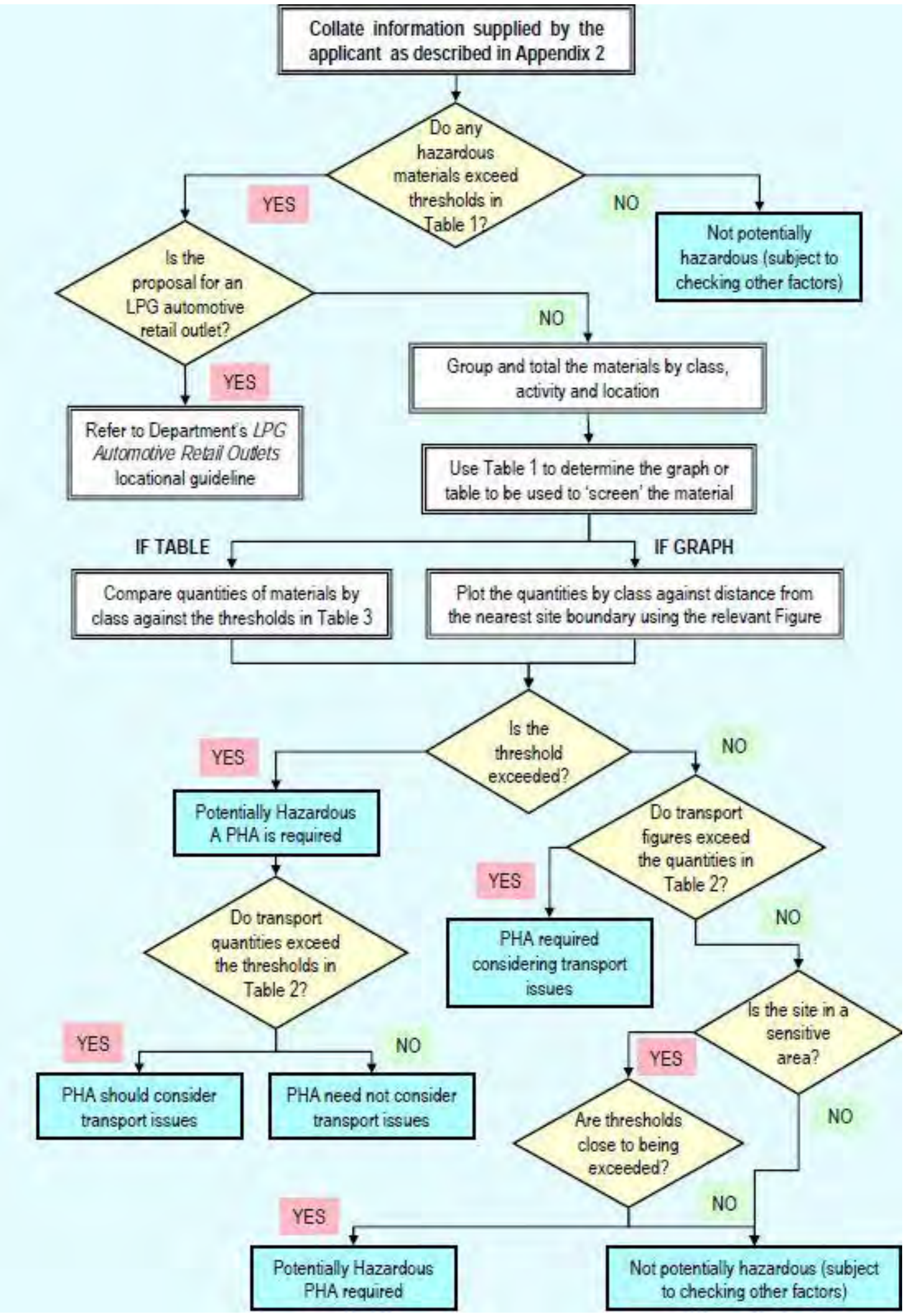


Figure 3.1 Hazard and risk screening process

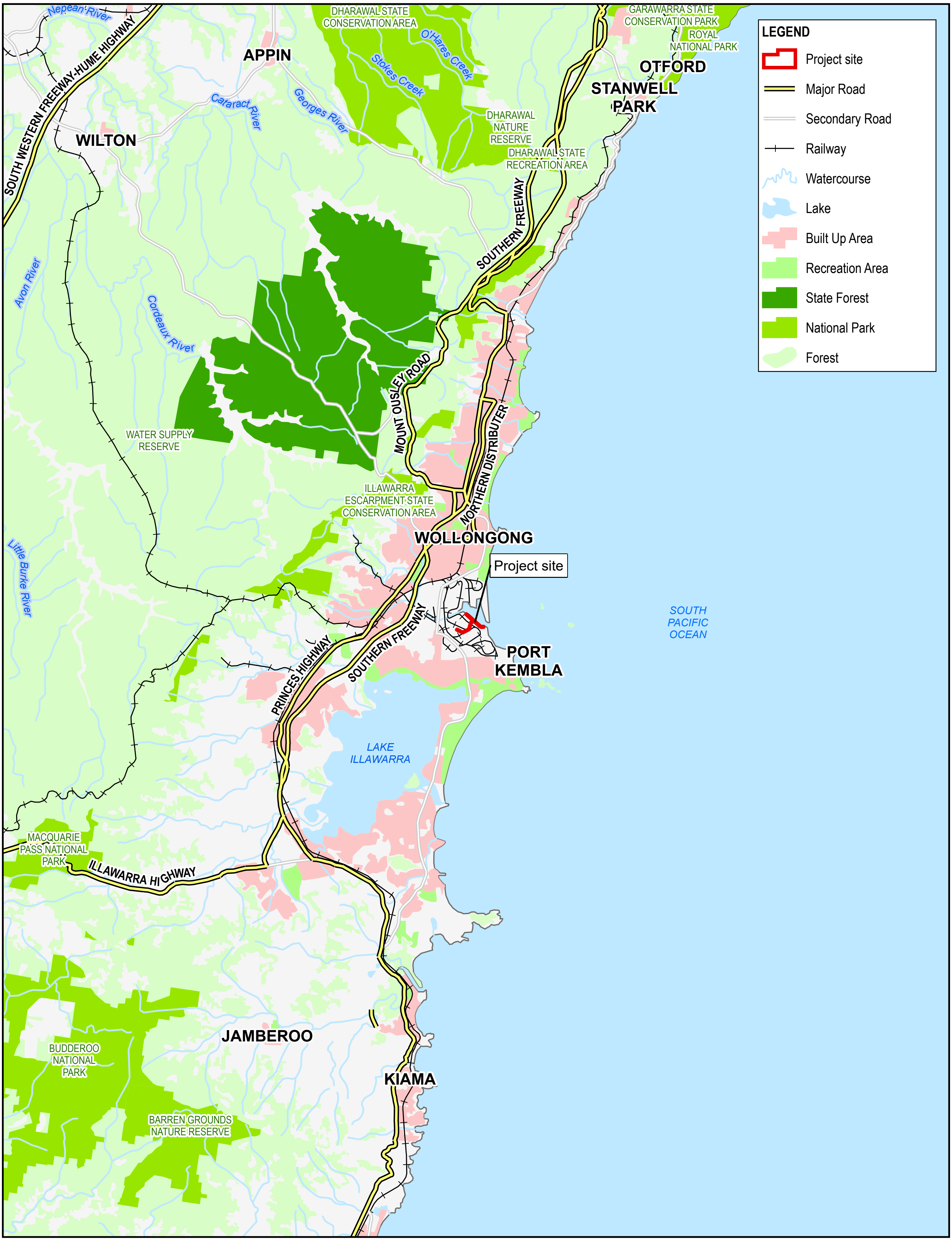
4. Project overview

4.1 Site location

The 750 hectare PKSW site is located in Port Kembla, NSW within the Wollongong Local Government Area. It is adjacent to several residential areas including Port Kembla, Warrawong, Spring Hill, Coniston, and Wollongong. The northern point of PKSW is located approximately 80 km southwest of Sydney as shown in Figure 4.1. The PKSW site comprises the No. 1 Works, No. 2 Works, Steelhaven and the Recycling area. The No. 2 Works is divided into two sections by Allans Creek. The southern half of the No. 2 Works comprises the Cokemaking, Ironmaking and Steelmaking facilities, while the northern half includes the Rolling Mills and Recycling Area. These areas are shown in Figure 4.2.

BlueScope leases and operates five berths in Port Kembla Inner Harbour to import raw materials and export finished goods. These include Berths 109, 110, 111, 112, and 113. These berths, and the lease boundary, are shown in Figure 4.3. The land to which CLIP applies is located within the southern section of the Number 2 Works, near Berths 111, 112, and 113.

All sectors of PKSW are internally linked by road and rail and are currently supplied with electricity, water, and gas services.



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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

BlueScope Steel (AIS) Pty Ltd
Commodities Logistics Infrastructure Project
Environmental Impact Statement

Project No. 12555409
Revision No. 0
Date 25/01/2022

Regional locality

FIGURE 4.1

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Data source: Commonwealth of Australia (Geoscience Australia): 250K Topographic Data Series 3, 2006. .
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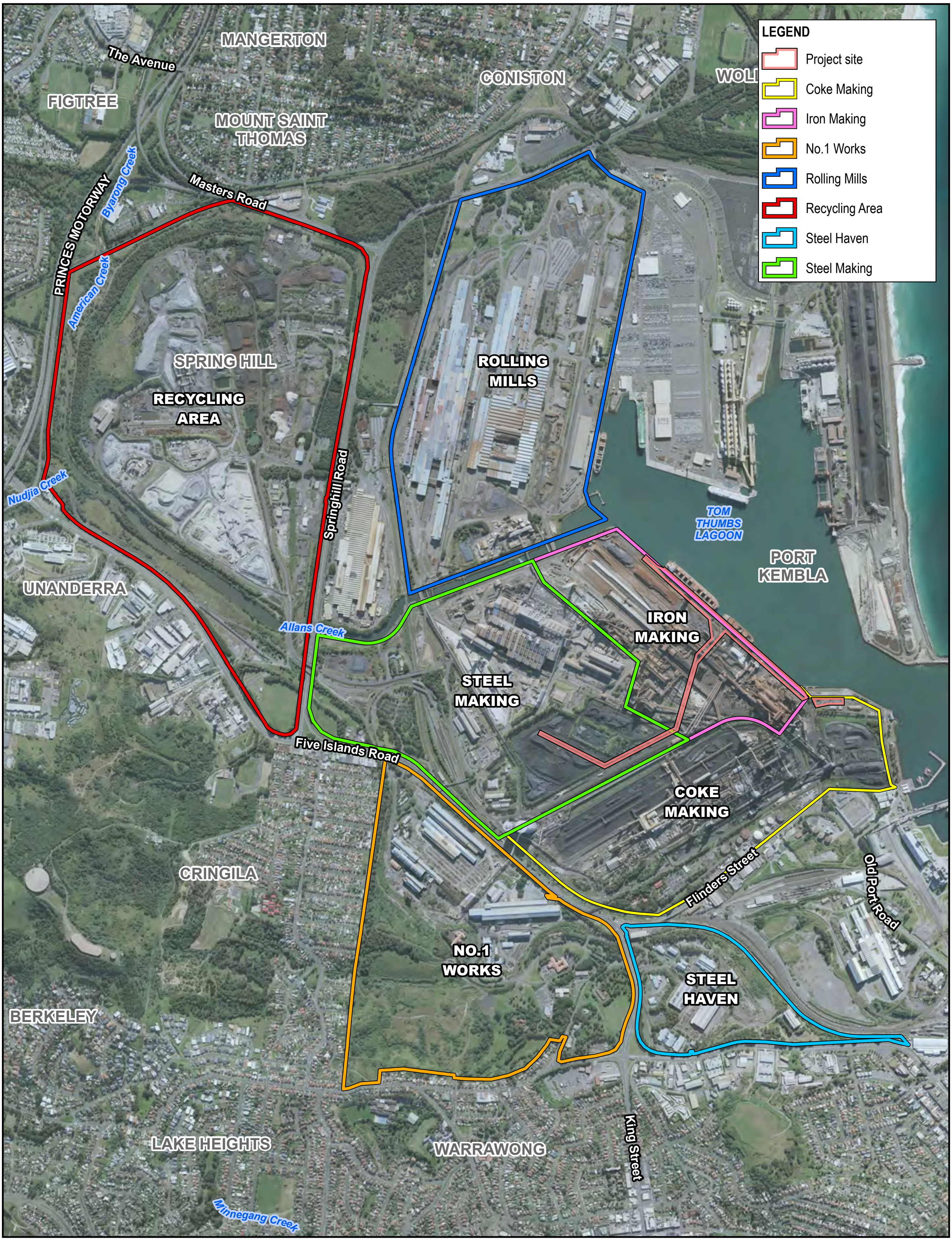

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

GHD

BlueScope Steel (AIS) Pty Ltd
Commodities Logistics Infrastructure Project
Environmental Impact Statement

Project No.	**12555409**
Revision No.	**0**
Date	**13/10/2022**

Existing site layout

FIGURE 4.2

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Data source: Roads, Suburbs, Waterbodies - LPI: DTDB, 2019. Imagery -Metromap Tile Service: 2022. Created by: pfernandes

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Grid: GDA 1994 MGA Zone 56

BlueScope Steel (AIS) Pty Ltd
Commodities Logistics Infrastructure Project
Environmental Impact Statement

Project No. **12555409**
Revision No. **0**
Date **13/10/2022**

Berth locations

FIGURE 4.3

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Data source: Roads, Suburbs, Waterbodies - LPI: DTDB, 2019. Imagery -Metromap Tile Service: 2022. Created by: pfernandes

4.2 Project description

The project will involve upgrade of the raw materials berths, and unloading and conveying infrastructure, which will allow BlueScope to continue to import raw materials operations including iron ore, scrap, coal and other materials for ongoing steelmaking operations. The project provides additional capacity for the import of supplemental coal following depletion of supply from Dendrobium Coal Mine and also increased scrap usage to assist with GHG reductions.

The project includes construction of a new CSU at Berth 111, new conveying infrastructure to facilitate transportation materials from the berth to stockpiling areas, and modifications to the berth to allow the relocation of the existing Coke Loader and Ship Unloaders, No.2 Ore Unloader (2OUL) and No.3 Ore Unloader (3OUL). The project includes the following major components:

- Installation of a new CSU at Berth 111.
- Relocation and modifications to 2OUL and 3OUL to operate across Berths 111, 112 and 113.
- Installation of new conveyors to allow the transportation of coal to the coal storage location (4 Area) in lieu of trucking.
- New truck wash.
- Installation of foundations, crane rails, and relocation of the Coke Loader and its supply conveyors to Berth 113.
- Modifications to berth infrastructure and supporting services infrastructure.

Receival of coal and distribution to the Cokemaking area will be undertaken within existing PKSW transportation and materials storage areas.

As the utilisation of the berth is already near full capacity, the relocation of the Coke Loader, 2OUL, and 3OUL will be undertaken to manage the current shortfall in ship discharge capacity and to provide flexibility during outage periods caused by structural works. It is proposed to split the existing CLIP scope into 2 stages:

- Stage 1- Relocation of the Coke Loader and associated Ship Unloader movements
- Stage 2- Installation of a CSU and associated conveyors

A flow diagram showing how the CSU operates as part of the wider site raw materials supply chain is provided in Figure 4.4.

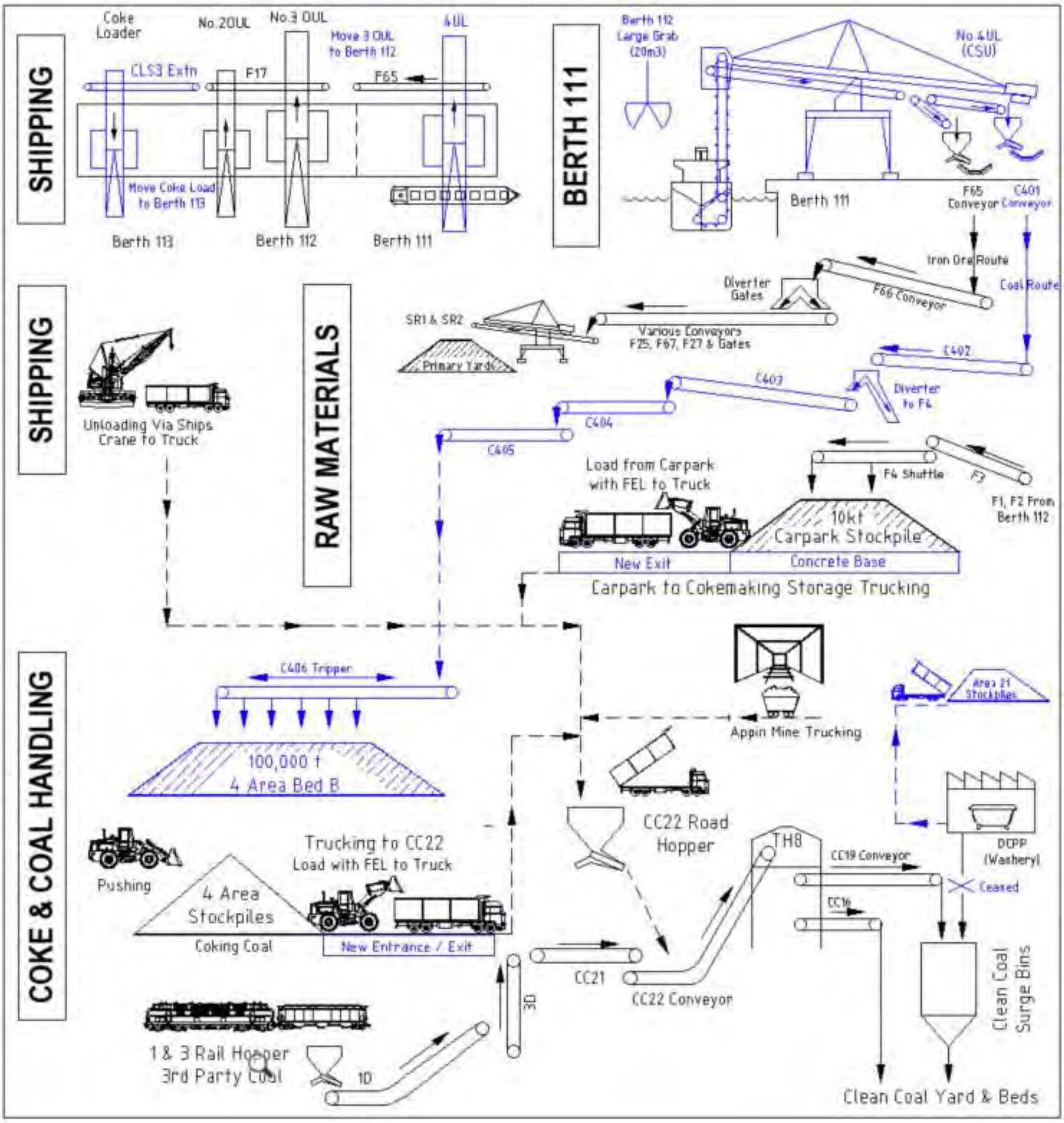

Figure 4.4 Simplified process flow diagram

5. Preliminary risk screening and emissions

5.1 Dangerous goods screening

5.1.1 Construction of the project

A summary of the chemicals used and / or stored on-site during construction of the project is shown in Table 5.1. The DG classifications, assumptions made about the use of these chemicals on-site, and the assumed on-site quantities have also been provided in the table.

Table 5.1 Construction dangerous goods screening

Chemical / product	UN #	DG class	Packing group	Expected storage quantity	Applying SEPP 33 combined storage threshold	Exceedance of SEPP 33 threshold	Comments / assumptions
Paint (Ref. 6)	1950	2.1	-	20L = 20kg	500kg	Does not exceed threshold	Use of aerosol-based paints for outline markings etc. of construction activities. It is assumed that there are a small number of spray cans stored on site at any one time, and additional paint is brought on site as required.
Acetylene (Ref. 7)	1001	2.1	-	100kg			Use of acetylene required for welding activities. It is assumed that minimal quantities are stored on the project site and only 100kg of acetylene stored in cylinders is present at any one time. Additional cylinders are brought on site as required.
Cleaning fluids (Ref. 8)	1987	3	III	5L = 4.4kg	5 tonnes	Does not exceed threshold	Cleaning fluids (e.g. hand sanitiser) required for personnel and vehicle washing. Only small quantities of cleaning fluids will be required on site during the construction phase.
Solvents (Ref. 9)	1307	3	III	40L = 35kg			Use of solvents for cleaning during heavy-duty construction activities. It is assumed that there are a small number of containers stored on site at any one time.
Degreasers (Ref. 10)	1268	3	III	40L = 34kg			It is assumed that there are a small number of containers stored on site at any one time.
Oxygen gas (Ref. 11)	1072	5.1	-	100kg	5 tonnes	Does not exceed threshold	Use of oxygen gas for oxyacetylene welding activities. It is assumed that minimal quantities are stored on site and only 100kg of oxygen stored in cylinders are present at any one time. Additional cylinders are brought on site as required.

Chemical / product	**UN #**	**DG class**	**Packing group**	**Expected storage quantity**	**Applying SEPP 33 combined storage threshold**	**Exceedance of SEPP 33 threshold**	**Comments / assumptions**
Diesel[1] (Ref. 12)	3082	9 (C1)	III	20,000 L = 17 tonnes	N/A[2]	Does not exceed threshold	Use of diesel required for construction vehicles / machinery and / or tools. It is assumed that it will be stored in a separate bund and located away from any Class 3 DGs. No other fuel storage e.g. for worker vehicles is included, as existing petrol stations will be utilised.
Concrete	*Not a DG*			As required mixing truck deliveries	*Not a DG*		Use of concrete for construction.
Concrete admixtures	*Not a DG*			As required mixing truck deliveries	*Not a DG*		Use of concrete admixtures, such as curing agents, for construction.
Fertiliser	*Not a DG*			As required deliveries during landscaping	*Not a DG*		Use of fertiliser for final site restoration and landscaping. It is assumed it would only come to site as required or stored in small volumes prior to use.
Herbicides	*Not a DG*			1,000L	*Not a DG*		Project may include the removal of vegetation in the area (use of herbicides required for this activity). It is assumed that one intermediate bulk container will be stored on site and additional small quantities will be brought on site as required.
Hydraulic oil/ fluid	*Not a DG*			200L	*Not a DG*		Use of hydraulic fluids / oils for gates. Delivered in 200L drums.
Oil	*Not a DG*			200L = 172kg	*Not a DG*		Use of oil required for construction tools / equipment e.g. lubrication oils, engine oils. It is assumed that this is stored in a 200L drum.

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[1] Petrol may be used instead of diesel depending on the type of vehicles / equipment used for construction. Given that the SEPP 33 threshold for diesel is lower than that of petrol, it was used in this assessment as a conservative assumption. The use of petrol in the same quantities as those estimated for diesel would not trigger SEPP 33.

[2] Class C1 liquids are not considered to be a potentially hazardous material if they are stored in a separate bund or are the only flammable liquid present. If stored with other flammable liquids (e.g. 3-I, 3-II or 3-III), they are then treated as Class 3-III as they may contribute to a fire. In this proposal, even if diesel was stored with the cleaning fluids (3-III), the SEPP 33 threshold would not be exceeded. It is assumed that the diesel in this proposal would be stored in a separate bund and away from any other Class 3 DGs.

5.1.2 Operation of the project

The berths at PKSW are used for the transfer on and off site of a range of materials, including iron ore, limestone, metallurgical coal, and coke. The coke which is exported via the berths can be further classified into the following:

- Lump (>25mm) and nut (10mm to 25mm), which are used to fuel the blast furnace and as sources of carbon for the production of reducing gas in the smelting process.
- Breeze (<15mm), which is used as a fuel for the Sinter Plant's sintering process.

Various other materials may also be handled by the project, however,for the purposes of this hazard and risk assessment, they are not considered to pose a risk necessitating further assessment in accordance with *Applying SEPP 33*.

As summarised in Table 5.2, neither metallurgical coal nor coke are classified as DGs according to the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (7th edition). As such, no further DG screening of these materials is required as per SEPP 33. However, due to the potential for dust explosions and fires from both metallurgical coal and coke, potential scenarios are discussed in Section 6 as part of the HAZID process.

Table 5.2 Summary of materials stored or processed during operation

Chemical / product	Health hazards and physical properties	Environmental hazards	Flammability	DG	Comments
Coke (Ref.17) Carbon 80 - 90% Crystalline silica <2.5% Sulphur 0.1 - 1%	May cause irritation to respiratory system or gastric tract if inhaled or ingested. Contact with skin or eyes may cause mechanical irritation. Crystalline silica is a known Group 1 Carcinogen to humans.	Recommended to keep from entering waterways, drains, and sewers.	Combustible, will burn if exposed to fire	No	The formation of coke dust may result in dust explosions.
Metallurgical coal (Ref.16) Carbon >90 - <100% Water 5 - 15% Silicon dioxide <3% Oils, recycled tars, and greases <1% Sulphur <0.5%	May cause irritation to respiratory system or gastric tract if inhaled or ingested. Contact with skin or eyes may cause mechanical irritation. Inhalation may aggravate pre-existing upper respiratory and lung disorders. May contain crystalline silica, which is a known Group 1 Carcinogen to humans.	Recommended to keep from entering waterways, drains, and sewers.	Combustible	No	The formation of coal dust may result in dust explosions.

5.2 Transport screening

5.2.1 Construction of the project

It is assumed that during construction of the project, there will be low volumes of DGs stored in the construction compound. Therefore, the transportation volumes of chemicals during construction are considered to be minimal. The transport screening thresholds for construction of the project are shown in Table 5.3. Based on this assumption, the *Applying SEPP 33* transport thresholds for construction of the project are not exceeded.

Table 5.3 SEPP 33 transport screening threshold figures for construction of the project

DG Class	Chemical / product	Combined quantity (as per Table 5.1)	Combined transport movements (annual)	Transport movements threshold (annual)	Exceedance of Applying SEPP 33 threshold
2.1	Paint, acetylene	120kg	12[3]	>500	Does not exceed threshold
3 – III	Cleaning fluids/ Solvents/ degreasers	73.4kg	12[3]	>1,000	Does not exceed threshold
5.1	Oxygen	100kg	12[3]	>500	Does not exceed threshold
9 – III (C1)	Diesel	17 tonnes	52[4]	>1,000	Does not exceed threshold

5.2.2 Operation of the project

As described in Section 5.1.2, no new DGs are expected on-site during standard operation. As such, no transport screening is required.

5.3 Summary of preliminary risk screening

The results from the DG screening in Section 5.1 and transport screening in Section 5.2 indicate that no materials exceed the DG or transport thresholds outlined by R&H SEPP. However, due to the potential for dust explosions and fires during the operation of the project, as outlined in Section 5.1.2, CLIP may be classified as a potentially hazardous industry as per R&H SEPP. In addition, the CLIP project is situated within the wider PKSW site which is identified as being potentially hazardous. Potential scenarios for dust explosions and fires due to the presence of coal and metallurgic coke are outlined in Section 6 of this report. Non-hazardous materials used during the construction of the project were not carried through to the HAZID process.

5.4 Summary of emissions

Assessments of air quality, and noise and vibration from CLIP have been undertaken as part of the Environmental Impact Statement (EIS) for the project and submitted independently of this report. It is recommended that any actions from these assessments are undertaken to comply with all Australian and NSW emissions standards.

The results from the air quality and noise and vibration assessments indicate that if appropriate control measures are in place during construction and operation, the impacts of the project on the relevant amenity criteria will be minimised. Over the lifecycle of the project, and with safeguards, the project is not expected to release a significant quantity of pollutant emissions and is not considered to be an 'offensive industry'.

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[3] It is assumed that delivery of paint, acetylene, solvents, cleaning fluids and oxygen to the site occurs once per month during the construction period

[4] It is assumed that the delivery of diesel to the site occurs once per week during the construction period

6. Hazard Identification

The results of the HAZID associated with CLIP are presented in Table 6.1, which includes safeguards required to contain the risk scenarios or, at a minimum, control them to an acceptable level. The HAZID was conducted as a desktop study by the GHD Risk Advisory team.

The BlueScope risk assessment criteria were used to assess the consequence and likelihood of each of the risk scenarios. The risk assessment criteria are included in Appendix B.

Results of the HAZID found that the risks most likely to cause off-site impact are:

- Damage to bunker fuel pipeline during construction activities
- Coal and coke dust located on site conveyors
- Ship movements in port during operations

Recommended safeguards for each of the hazard scenarios have been included in Table 6.1 These safeguards will contain or control each of the hazards to an acceptable level.

Table 6.1 HAZID table

Hazard scenario	Phase	Causes	Consequences	Potential for off-site impact	Identified / recommended safeguards	Consequence	Likelihood	Risk Ranking
1 – Damage to bunker fuel pipeline during construction activities	Construction	Change in pipeline location due to the rail extension at Berth 113	Fire or explosion at the berth causing multiple injuries or fatalities	Yes	– Construction Management Plan to include isolation and evacuation of the bunker fuel pipeline – Fire Management Plan to include the event of a fire at the bunker fuel pipeline – Appropriate fire management to be as per existing emergency response plans.	5	1	Medium (6)
2 – Coal and coke dust located on site conveyors	Operation	All five "dust explosion pentagon" pre-requisites are met (i.e. ignition, confinement of dust, oxygen, presence of small dust particles, high concentration of dust particles)	Dust explosion causing injury or single fatality	Yes	– Designs and safeguards are pre-existing and well established – Coal is Run Of Mne with moisture content reducing likelihood of fire – Procedures for the wetting of dust areas prior to hot works taking place – Reduction of dust accumulation through regular housekeeping – Smoking prohibited where coal dust is nearby – Elimination of fully enclosed spaces where coal and coke are located, where possible	4	1	Medium (5)
3 – Impact to wharf infrastructure by ships	Operation	Pilot error	Damage to wharf	Yes	– Project not introducing larger ship sizes – Use of licensed pilots	3	1	Low (4)
4 – Impact to port infrastructure by ships	Operation	Channel size too small Pilot error	Damage to navigational aids Disruption of port activities due to grounding of ship	Yes	– Project not introducing larger ship sizes – Use of licensed pilots	3	1	Low (4)

Hazard scenario	Phase	Causes	Consequences	Potential for off-site impact	Identified / recommended safeguards	Consequence	Likelihood	Risk Ranking
5 – Fuel/ ballast spill from ships	Operation	Damage/ corrosion of fuel storage compartments Operational error	Environmental damage	Yes	Existing environmental management plan and regulation pursuant to EPL.	3	2	Medium (5)

7. Preliminary Hazard Analysis

While the results of the SEPP 33 screening indicate that no DGs are expected to be present on-site, a PHA has been prepared due to the risk of dust explosions which present a potential for harm. A Level 1 PHA, which uses a qualitative approach based on hazard identification to demonstrate that the activity does not pose a significant risk, was considered appropriate. The PHA follows the process outlined in Figure 7.1.

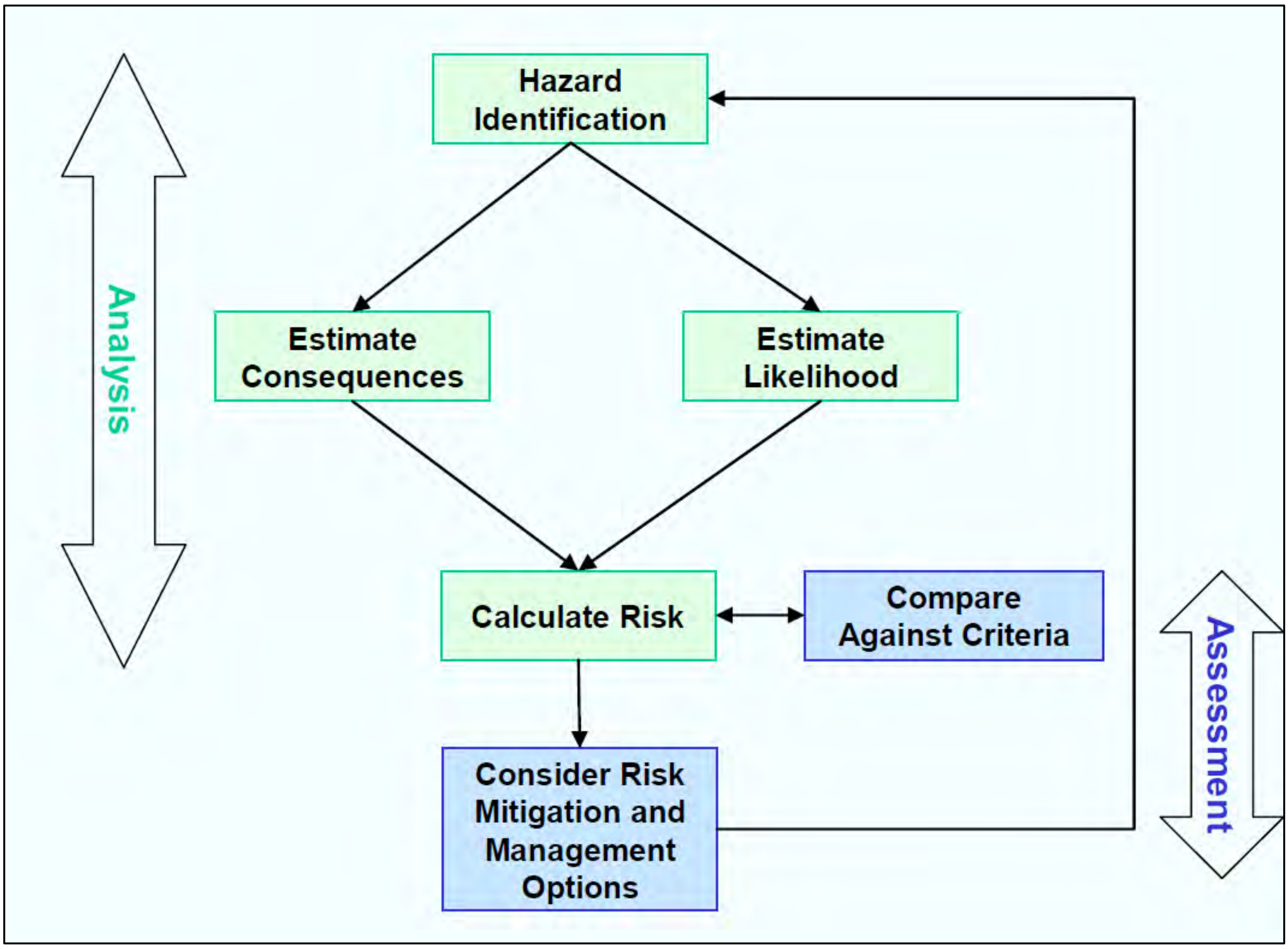

Figure 7.1 Risk analysis and assessment process

7.1 Summary of hazard scenarios

From the HAZID process undertaken in Section 6, five scenarios were found to have potential for off-site impacts. These are detailed in Table 7.1 below.

Table 7.1 Hazards with potential for off-site impact

Hazard	Comments
1 – Damage to bunker fuel pipeline during construction activities leading to a fire or explosion at Berth 113 causing multiple injuries or fatalities.	During construction activities, there is potential for the bunker fuel pipeline to be damaged resulting in a loss of containment. If exposed to a source of ignition, a fire or explosion may occur. Due to the berth's proximity to the border of PKSW, there is a potential for off-site impact. Industry standard construction management and utility relocation management will provide adequate controls to manage this risk suitably.
2 – Coal and coke dust located on site conveyors leading to a dust explosion causing injury or a single fatality.	Dust explosions are considered in greater detail in Section 7.2.
3 and 4 – Impact to wharf and port infrastructure by ships leading to damage to wharf and navigational aids, and disruption of port activities due to grounding of ship.	During operations, there is the potential for the new ship movements to impact existing wharf and port infrastructure. This may cause delays to other shipping activities in the Port. The project will not be introducing any larger ship sizes and BlueScope already satisfactorily manages shipments at its berths. Existing ship movement management, in conjunction with existing requirements from the Port Authority of NSW will provide adequate controls to manage this risk suitably.
5 – Fuel/ ballast spill from ships leading to environmental damage.	During operations, there is the potential for the new ship movements to spill fuel and/ or ballast. This may cause environmental damage within the Port. BlueScope already satisfactorily manages shipments at its berths and is regulated by an EPL. Existing spill management, in conjunction with existing requirements from the Port Authority of NSW will provide adequate controls to manage this risk suitably.

The qualitative risk assessment, as shown in Table 6.1 indicates that four (4) risks were rated as “Medium” and two (2) were as rated “Low” as per Table B.4 in Appendix B. This is considered acceptable, however, it is recommended that all risk mitigation and management options outlined in Table 6.1 be implemented and that all controls are monitored and maintained to reduce the likelihood of a risk occurring.

7.2 Dust explosions

A dust explosion takes place when combustible airborne dust particles are ignited resulting in a high-pressure airwave. This airwave can disturb other dust particles in the area, causing them to become airborne resulting in subsequent dust explosions. The following items are part of the “dust explosion pentagon” and must all be present for a dust explosion to take.

1. Delayed ignition source capable of igniting the suspended dust cloud (e.g. hot surface, flame, sparks)
2. Confinement of the dust cloud by full or partial enclosure
3. Enough oxygen to exceed the Limiting Oxygen Concentration (LOC)
4. Combustible dust particles small enough to burn rapidly when ignited
5. Dispersion of dust particles at a concentration above the Minimum Explosible Concentration (MEC)

BlueScope currently manages coal dust explosion hazards at the PKSW, including at the Berths. There is no history of coal dust fires or explosions. The coals being conveyed by the CLIP infrastructure is washed (moisture content of 8% - 12%) Run of Mine (ROM) coal and is not in a ground or dried state while transported by the infrastructure at the Berths. BlueScope will continue to manage the new material handling systems in a consistent manner, using existing engineering and management methods. For example, the risk of dust explosions at PKSW can be minimised through the use of various controls including wetting down of areas, ventilation, dust collection equipment, separating possible ignition sources from the dust, and reducing the number of enclosed dust spaces. These risk reduction methods have been integrated into Table 6.1.

8. Recommendations

It is recommended that management procedures be implemented that incorporate practices that will prevent risk scenarios occurring through:

- Construction management plan, including consideration of isolation and evacuation of the fuel pipeline during relocation and fire management, including fire events at the bunker fuel pipeline
- Utilise existing conveyor design and safeguards
- Inspection and maintenance regime for conveyor systems
- Implement procedures for the wetting of dust areas prior to hot works taking place
- Reduction of dust accumulation through regular housekeeping

It is important to note that any new equipment should have procedures developed for their safe operation. This is particularly important for the operation of any new fixed or mobile machinery to prevent injury to people.

8.1 Construction and utility management

Prior to construction starting, a site construction management plan will be prepared by relevant personnel. The purpose of the management plan is to describe how the construction team will manage and verify the environmental and safety compliance and risk aspects of the works for the construction, including a construction hazard assessment.

The construction hazard assessment will identify the proposed methodology for the site construction and/or installation for hazardous situations. The detailed methodology will indicate the potential hazards and the control measures required to mitigate risks to as low as reasonably practicable during the construction stage.

The construction hazard assessment will produce a risk register, to be treated as a live document to be regularly reviewed during the construction phase. Any information considered to be relevant to the operational phase will be carried forward in the risk register.

The plan will be developed to include any relevant requirements of the Australian Standard as well as BlueScope specific requirements for managing utility infrastructure.

9. Conclusion

This report includes a preliminary risk screening of CLIP in accordance with the requirements of *Applying SEPP 33*. The results indicate that the screening thresholds for DG storage and transportation during construction and operation of the project, as per the requirements of the SEARs, are not exceeded. Although none of the thresholds are exceeded, the project is deemed 'potentially hazardous' due to the possibility for dust fires and explosions, and a Level 1 PHA was developed.

The PHA was undertaken as a qualitative desktop study as a systematic way of identifying potential off-site impacts. The PHA identified three hazards with the potential for off-site impact. These are:

- Damage to bunker fuel pipeline during construction activities
- Coal and coke dust located on site conveyors
- Ship movements in port during operations

However, the PHA found that the hazards with potential off-site impact can be suitably controlled using the safeguards defined in Table 6.1. These safeguards were updated throughout the PHA process.

The hazard identification and analysis demonstrate that CLIP can be designed, constructed, and operated in a manner that will meet the relevant regulations, standards and policies and minimise hazardous impact to the public.

Any changes to the assumptions used in this report should result in a review and update of the screening, HAZID, and PHA processes.

10. References

1. Applying SEPP 33: Hazardous and Offensive Development Application Guidelines, Department of Planning (DoP), NSW, 2011a
2. Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning, Department of Planning (DoP), NSW, 2011b
3. Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis, Department of Planning (DoP), NSW, 2011c
4. REMBE's Booklet of Safety and Security (BOSS); Dust Explosions, 2009
5. Zalosh, R. Dust Explosion Fundamentals: Ignition Criteria and Pressure Development, Wellesley, MA 02481
6. Dy-Mark Line Marking All Colours Aerosol – Safety Data Sheet, Dy-Mark, Version No.: 9.1.1.1, Print Date: 27/03/2020
7. Safety Data Sheet – Acetylene, ChemAlert, Version No.: 2.9, SDS Date: 20 Mar 2015
8. Safety Data Sheet – Purell® Hand Sanitizer Gel, GOJO, Version 1.2, Revision Date: 24.05.2020
9. Safety Data Sheet – Forsroc Solvent 10, Fosroc, Version 2.1, Issue Date: 26.02.2018
10. Safety Data Sheet – WD-40 bulk liquid, WD-40 Company, Issue Date: 06.07.2018
11. Safety Data Sheet #076 – Oxygen, Compressed, ChemAlert, SDS Date: 11 Mar 2015
12. Safety Data Sheet – Automotive Diesel Fuel, BP Australia, Version 3, Date of issue: 08/06/2019
13. Davis, R. Determination of ignitability of 4 coal dusts from BlueScope Steel. QLD, 2010
14. Australian/New Zealand Standard AS/NZS 61241.14:2005, Electrical apparatus for use in the presence of combustible dust – Selection and installation
15. Engineering Technical Services. Coke Plant 2 – 7A Battery, Coal Handling, and 3 Battery Bunker Safety Hazardous Area Designation General Hazardous Area Classification Report, Document Number: SK 62862 BlueScope Steel. 2008
16. Safety Data Sheet – Coal, BlueScope Steel (AIS) Pty Ltd, Date of issue: 23/09/2016
17. Safety Data Sheet – Coke, BlueScope Steel (AIS) Pty Ltd, Date of issue: 12/10/2016

Appendices

Appendix A

Safety Data Sheets

SAFETY DATA SHEET

 # 001

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name	**ACETYLENE**
Synonym(s)	001 - SDS NUMBER • DISSOLVED ACETYLENE • ETHYNE • PRODUCT CODES: 040, 041

1.2 Uses and uses advised against

Use(s)	FUEL • INDUSTRIAL APPLICATIONS

1.3 Details of the supplier of the product

Supplier name	**BOC LIMITED (AUSTRALIA)**
Address	10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone	131 262, (02) 8874 4400
Fax	132 427 (24 hours)
Website	http://www.boc.com.au

1.4 Emergency telephone number(s)

Emergency	1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO AUSTRALIAN WHS REGULATIONS

GHS classification(s)	Gases Under Pressure: Dissolved gas Flammable Gases: Category 1

2.2 Label elements

Signal word	**DANGER**

Pictogram(s)

Hazard statement(s)

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Prevention statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Response statement(s)

P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.

Storage statement(s)

P410 + P403	Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s)

None allocated.

2.3 Other hazards

Asphyxiant. Effects are proportional to oxygen displacement.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content (v/v)
ACETYLENE	74-86-2	200-816-9	>98%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	Adverse effects not expected from this product.
Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.
Skin	Adverse effects not expected from this product.
Ingestion	Ingestion is not considered a potential route of exposure.
First aid facilities	No information provided.

4.2 Most important symptoms and effects, both acute and delayed

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility / consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

4.3 Immediate medical attention and special treatment needed

Treat for asphyxia.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve. If the gas source cannot be isolated, do not extinguish the flame, since re-ignition and explosion could occur. Await arrival of emergency services or manufacturer's advisor. Drench and cool cylinders with water spray from protected area at a safe distance. If it is absolutely necessary to extinguish the flame, use only a dry chemical powder extinguisher. Do not move cylinders for at least 24 hours. Avoid shock and bumps to cylinders.

5.2 Special hazards arising from the substance or mixture

Extremely flammable. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.

5.3 Advice for firefighters

Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. This material is capable of forming explosive mixtures in air.

5.4 Hazchem code

2SE

2	Fine Water Spray.
S	Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off.
E	Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate all sources of ignition. Consider the risk of potentially explosive atmospheres.

6.2 Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3 Methods of cleaning up

Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Use of safe work practices are recommended to avoid inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement. Never open an acetylene cylinder valve without the regulator attached. Gas regulator of suitable pressure and flow rating fitted to cylinder and manifold with low pressure gas distribution equipment which controls fuel gas mixture and flame. The regulator and other equipment must be compatible with the product and suited for the particular use. Never "sniff" acetylene as it may ignite spontaneously. Instead, carefully inspect the outlet and if there are any signs of dirt, blow it out with a jet of clean compressed air or nitrogen.

7.2 Conditions for safe storage, including any incompatibilities

Do not store near incompatible substances and sources of ignition. Cylinders should be stored: upright, prevented from falling, in a secure area; below 45°C, in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits. Post "No Smoking or Open Flames" signs in the storage areas. Refer to applicable legislation on flammable storage quantity restrictions. Never transfer acetylene to another cylinder or other container.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Acetylene	SWA (AUS)	Asphyxiant			

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Provide suitable ventilation to minimise or eliminate exposure. Confined areas (e.g. tanks) should be adequately ventilated or gas tested. Flammable/explosive vapours may accumulate in poorly ventilated areas.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather or cotton gloves.
Body	Wear coveralls and safety boots.
Respiratory	If using product in a confined area, wear an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	COLOURLESS GAS
Odour	GARLIC-LIKE ODOUR
Flammability	EXTREMELY FLAMMABLE
Flash point	< 23°C
Boiling point	-84°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	0.906 (Air = 1)
Specific gravity	NOT APPLICABLE
Solubility (water)	SOLUBLE
Vapour pressure	4700 kPa @ 25°C
Upper explosion limit	80 % to 85 %
Lower explosion limit	2.5 %
Partition coefficient	NOT AVAILABLE
Autoignition temperature	305°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

Critical temperature	36.3°C (dissolved in acetone and porous medium)
Cylinder pressure (when full)	1550 kPa @ 15°C
% Volatiles	100 %
Critical pressure	6,242 kPa

10. STABILITY AND REACTIVITY

10.1 Reactivity

Forms explosive acetylides with copper, silver and mercury. Do not use alloys containing more than 65% copper.

10.2 Chemical stability

Stable under recommended conditions of storage. However, sensitive to heat or shock and may become explosive.

10.3 Possibility of hazardous reactions

Polymerizes with evolution of heat. Avoid contact with curing agents, accelerators, and/or initiators.

10.4 Conditions to avoid

Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites), copper, copper alloys (>70% copper), silver and mercury to form explosive acetylides. May decompose violently at high temperatures and/or pressures or in the presence of a catalyst. Hazardous by-products may be produced when this gas/gas mixture is used in welding, cutting and associated processes.

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Based on available data, the classification criteria are not met.
Skin	Not classified as a skin irritant.
Eye	Not classified as an eye irritant.
Sensitization	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Not classified as a mutagen.
Carcinogenicity	Not classified as a carcinogen.

Reproductive	Not classified as a reproductive toxin.
STOT – single exposure	Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness.
STOT – repeated exposure	Not classified as causing organ effects from repeated exposure.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No ecological damage is expected to be caused by this product.

12.2 Persistence and degradability

This product is not readily biodegradable.

12.3 Bioaccumulative potential

This product is not expected to bioaccumulate.

12.4 Mobility in soil

Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	Cylinders should be returned to the manufacturer or supplier for disposal of contents.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	**SEA TRANSPORT (IMDG / IMO)**	**AIR TRANSPORT (IATA / ICAO)**
14.1 UN Number	1001	1001	1001
14.2 Proper Shipping Name	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED	ACETYLENE, DISSOLVED
14.3 Transport hazard class	2.1	2.1	2.1
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code	2SE
GTEPG	2A1
EMS	F-D, S-U
Other information	Ensure cylinder is separated from driver and that outlet of relief device is not obstructed.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes	E	Explosive
	F+	Extremely flammable
Risk phrases	R5	Heating may cause an explosion.
	R6	Explosive with or without contact with air.
	R12	Extremely Flammable.
Safety phrases	S9	Keep container in a well ventilated place.
	S16	Keep away from sources of ignition - No smoking.
	S33	Take precautionary measures against static discharges.

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders. When using this gas/gas mixture for welding, cutting and associated processes, additional hazards may be generated by the process such as radiation, noise and fume. Risk assessments should be made for each activity to identify and quantify the individual hazards involved. Please refer to the relevant Safety Data Sheets for the welding consumables being used or, if available, the materials being welded.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m^3	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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[End of SDS]

SAFETY DATA SHEET

COAL

Infosafe No.: LPVJA
ISSUED Date : 23/09/2016
ISSUED by: BLUESCOPE STEEL (AIS) PTY LTD

1. Identification

Chemical product and company identification
APPROVAL NO. 202

GHS Product Identifier
COAL

Company name
BLUESCOPE STEEL (AIS) PTY LTD (ABN 19 000 019 625)

Address
Five Islands Road Port Kembla
NSW 2505 AUSTRALIA

Telephone/Fax Number
Tel: 02 4275 7522 (24/7 switch board)
Fax: 02 4275 7159

Emergency phone number
131126 Poison Info

Recommended use of the chemical and restrictions on use
Used for coke production.

Other Names

Name	Product Code
CRUSHED COAL	
OILED COAL	
COAL FEED	
BATTERY COAL	
GROUND COAL	

2. Hazard Identification

GHS classification of the substance/mixture
Not classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.
Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

3. Composition/information on ingredients

Information on Composition

Product contains volatiles, moisture and ash. Product can also contain other non-hazardous oils used as additives at low amounts. Produced by blending coals purchased from supplers and a mixture of carbonaceous recycled materials and carbonaceous additives

Ingredients

Name	CAS	Proportion
Carbon	7440- 44- 0	> 90- <100 %
Water	7732- 18- 5	5- 15 %
Silicon Dioxide	14808- 60- 7	<3 %
A complex mixture of used oils and recycled tars and greases from many sources with carbon numbers predominantly in the range C22- C26		<1 %
Sulphur	7704- 34- 9	<0. 5 %
Ingredients determined not to be hazardous.		Balance

4. First-aid measures

Inhalation

If inhaled, remove affected person from contaminated area. Keep at rest until recovered. If symptoms develop and/or persist seek medical attention.

Ingestion

Do not induce vomiting. Wash out mouth thoroughly with water. Seek medical attention.

Skin

Wash affected area thoroughly with soap and water. If symptoms develop seek medical attention.

Eye contact

If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing for several minutes until all contaminants are washed out completely. If symptoms develop and/or persist seek medical attention.

First Aid Facilities

Eyewash and normal washroom facilities.

Advice to Doctor

Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media

Use carbon dioxide, dry chemical, foam, water mist or water spray.

Hazards from Combustion Products

Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide, oxides of sulphur, oxides of nitrogen, sulphur dioxide and methane.

Specific Hazards Arising From The Chemical

Combustible solid; will readily burn under fire conditions. The finely divided dust, in sufficient quantity, may form flammable/explosive mixtures with air. Dust clouds may present an explosion hazard in the presence of an ignition source.

Decomposition Temperature

Not available

Precautions in connection with Fire

Fire fighters should wear Self-Contained Breathing Apparatus (SCBA) operated in positive pressure mode and full protective clothing to prevent exposure to vapours or fumes. Water spray may be used to cool down heat-exposed containers. Fight fire from safe location. This product should be prevented from entering drains and watercourses.

6. Accidental release measures

Emergency Procedures

Shovel spillage of return to coal stream. Dispose of waste according to applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water and waste management authorities in accordance with local regulations.

If large quantities of this material enter waterways contact the EPA or your local Waste Management Authority.

7. Handling and storage

Precautions for Safe Handling

Avoid inhalation of dust, and skin or eye contact. Use only in a well ventilated area. Keep containers sealed when not in use. Prevent the build up of dust in the work atmosphere. Establish good housekeeping practices. Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds. Maintain high standards of personal hygiene i.e. washing hands prior to eating, drinking, smoking or using toilet facilities.

Wet activated carbon removes oxygen from air causing a severe hazard to workers inside carbon vessels and enclosed or confined spaces.

Conditions for safe storage, including any incompatibilities

Store in a well ventilated area away from heat and sources of ignition. Take precautions against static electricity discharges. Use proper grounding procedures. Store away from incompatible materials such as materials that support combustion (oxidising materials). Have appropriate fire extinguishers available in and near the storage area. Ensure that storage conditions comply with applicable local and national regulations.

For information on the handling of Combustible dusts and grounding procedure reference should be made to Australian Standard AS/NZS 4745.2004 - 'Code of Practice for Handling Combustible Dusts'.

8. Exposure controls/personal protection

Occupational exposure limit values

No exposure standards have been established for this material. However, the available exposure limits for ingredients are listed below:

Crystalline Silica

TWA: 0.1 mg/m^3 (respirable dust)

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

Biological Limit Values

No biological limits allocated.

Appropriate engineering controls

Use with good general ventilation. A flameproof exhaust ventilation system is required. If the engineering controls are not sufficient to maintain concentrations of particulates below the exposure standards, suitable respiratory protection must be worn.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable dust/particulate filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements.

Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with side shields, chemical goggles or full-face shield as appropriate should be used. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection devices should conform to relevant regulations.

Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 - Eye Protectors for Industrial Applications.

Hand Protection

Wear gloves of impervious material. Final choice of appropriate gloves will vary according to individual circumstances i.e. methods of handling or according to risk assessments undertaken. Occupational protective gloves should conform to relevant regulations. Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

Body Protection

Suitable protective work wear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

9. Physical and chemical properties

Properties	Description	Properties	Description
Form	Solid	**Appearance**	Fine, moist, black particulate solid.
Colour	Black	**Odour**	Oily smell
Decomposition Temperature	Not available	**Melting Point**	Not available
Boiling Point	Not applicable (solid)	**Solubility in Water**	Insoluble
Specific Gravity	1.3 (approximately – can range from 1.2 to 1.7)	**pH**	7
Vapour Pressure	Not applicable	**Vapour Density (Air=1)**	Not applicable
Evaporation Rate	Not available	**Odour Threshold**	Not available
Viscosity	Not available	**Partition Coefficient: n-octanol/water**	Not available
Flash Point	Not available	**Flammability**	Combustible
Auto-Ignition Temperature	Not available	**Explosion Limit - Upper**	Not available
Explosion Limit - Lower	Not available	**Melting/Freezing Point**	Not available

Other Information

Bulk density: 0.75 approximately

10. Stability and reactivity

Reactivity

Reacts with incompatible materials

Chemical Stability

Stable under normal conditions of storage and handling.

Reactivity and Stability

Reacts with incompatible materials

Conditions to Avoid

High temperatures or flame that may lead to combustion. Avoid dust generation to minimize explosive hazard. Eliminate ignition sources in areas of dust generation and accumulation to avoid explosion.

Incompatible materials

Strong oxidising agents.

Hazardous Decomposition Products

Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide, oxides of sulphur, oxides of nitrogen, sulphur dioxide and methane.

Possibility of hazardous reactions

Reacts with incompatible materials

Hazardous Polymerization

Will not occur.

11. Toxicological Information

Toxicology Information

No toxicity data available for this product.

Ingestion

Ingestion of this product may irritate the gastric tract causing nausea and vomiting.

Inhalation

Inhalation of dusts may irritate the respiratory system. Chronic exposure to this material may aggravate existing respiratory disorders and lung disorders such as bronchitis, emphysaema and asthma. Onset and progression are related to dust concentrations and duration of exposure.

Skin

Skin contact may cause mechanical irritation resulting in redness and itching.

Eye

Eye contact may cause mechanical irritation. May result in mild abrasion.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Skin Sensitisation

Not expected to be a skin sensitiser.

Germ cell mutagenicity

Not considered to be a mutagenic hazard.

Carcinogenicity

Not considered to be a carcinogenic hazard.

Exposure by inhalation may aggravate pre-existing upper respiratory and lung disorders such as bronchitis, emphysema and asthma. Chronic exposure or prolonged and repeated exposure to coal dust over years has the potential to cause coal worker’s pneumoconiosis or silicosis.

Coal dust - Group 3: Not classifiable as to carcinogenicity to humans - IARC has concluded that there is inadequate evidence in humans and experimental animals for the carcinogenicity of coal dust, and therefore that coal dust cannot be classified as to its carcinogenicity to humans.

This product contains crystalline silica (quartz). No exposure to free respirable crystalline silica is anticipated during normal use of this product as silica is bound in the liquid/paste. It should be noted, however, that respirable crystalline silica has been listed as a Group 1 human carcinogen by the IARC. Inhalation of respirable silica may cause cancer, silicosis or other serious delayed lung injury.

Reproductive Toxicity

Not considered to be toxic to reproduction.

STOT-single exposure

Not expected to cause toxicity to a specific target organ.

STOT-repeated exposure

Not expected to cause toxicity to a specific target organ.

Aspiration Hazard

Not expected to be an aspiration hazard.

12. Ecological information

Ecotoxicity
No ecological data available for this material.

Persistence and degradability
Not available

Mobility
Not available.

Bioaccumulative Potential
Not available

Other Adverse Effects
Not available

Environmental Protection
Prevent this material entering waterways, drains and sewers.

13. Disposal considerations

Disposal considerations
The disposal of the spilled or waste material must be done in accordance with applicable local and national regulations.

14. Transport information

Transport Information
Road and Rail Transport
Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) (7th edition).
Marine Transport (IMO/IMDG):
Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.
Air Transport (ICAO/IATA):
Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

U.N. Number
None Allocated

UN proper shipping name
None Allocated

Transport hazard class(es)
None Allocated

IMDG Marine pollutant
No

Transport in Bulk
Not available

Special Precautions for User
Not available

15. Regulatory information

Regulatory information
Not classified as Hazardous according to the Globally Harmonised System of Classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Poisons Schedule

Not Scheduled

16. Other Information

Date of preparation or last revision of SDS

MSDS Reviewed: September 2016
Supersedes: September 2011

References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.
Standard for the Uniform Scheduling of Medicines and Poisons.
Australian Code for the Transport of Dangerous Goods by Road & Rail.
Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.
Workplace exposure standards for airborne contaminants, Safe work Australia.
American Conference of Industrial Hygienists (ACGIH).
Globally Harmonised System of classification and labelling of chemicals.

User Codes

User Title Label	User Codes
Approval Number	000202

END OF SDS

SAFETY DATA SHEET

COKE

Infosafe No.: LPTIU
ISSUED Date : 12/10/2016
ISSUED by: BLUESCOPE STEEL (AIS) PTY LTD

1. Identification

Chemical product and company identification

Approval No 97

GHS Product Identifier

COKE

Product Code

Company name

BLUESCOPE STEEL (AIS) PTY LTD (ABN 19 000 019 625)

Address

Five Islands Road Port Kembla
NSW 2505 AUSTRALIA

Telephone/Fax Number

Tel: 02 4275 7522 (24/7 switch board)
Fax: 02 4275 7159

Emergency phone number

131126 Poison Info

Recommended use of the chemical and restrictions on use

Lump (>25mm) and nut (10mm to 25mm) used in the blast furnace process as fuel and source of carbon to produce reducing gas for smelting process. Breeze (<15mm) is used in the Sinter Plant as a fuel source in the sintering process.

Other Names

Name	Product Code
Metallurgical coke	

2. Hazard Identification

GHS classification of the substance/mixture

Not classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.
Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

3. Composition/information on ingredients

Information on Composition

Coke consists of carbon, sulphur and a complex of metal oxides including crystalline silica.

This product contains less than 2.5% Crystalline silica, but is not in a form which is respirable. Care must be taken to avoid inhalation of dusts following crushing of the material.

Ingredients

Name	CAS	Proportion
Carbon	7440- 44- 0	80- 90 %
Crystalline silica	Mixture	<2. 5 %
Sulphur	7704- 34- 9	0. 1- 1 %
Ingredients determined not to be hazardous		Balance

4. First-aid measures

Inhalation

If inhaled, remove affected person from contaminated area. Keep at rest until recovered. If symptoms develop and/or persist seek medical attention.

Ingestion

Do not induce vomiting. Wash out mouth thoroughly with water. Seek medical attention.

Skin

Wash affected area thoroughly with soap and water. If symptoms develop seek medical attention.

Eye contact

If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing for several minutes until all contaminants are washed out completely. If symptoms develop and/or persist seek medical attention.

First Aid Facilities

Eyewash and normal washroom facilities.

Advice to Doctor

Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media

Carbon dioxide, dry chemical, foam, water mist or water spray.

Hazards from Combustion Products

Under fire conditions this product may emit toxic and/or irritating fumes including carbon monoxide, carbon dioxide, oxides of sulphur, aluminium oxides and other metal oxides. Fire may generate dusts of respirable crystalline silica, which may cause lung damage.

Specific Hazards Arising From The Chemical

This product will burn if exposed to fire.

Decomposition Temperature

Not available

Precautions in connection with Fire

Fire fighters should wear Self-Contained Breathing Apparatus (SCBA) operated in positive pressure mode and full protective clothing to prevent exposure to vapours or fumes. Water spray may be used to cool down heat-exposed containers. Fight fire from safe location. This product should be prevented from entering drains and watercourses.

6. Accidental release measures

Emergency Procedures

Increase ventilation. Wear protective clothing to minimise skin and eye exposure. If large quantities of this material enter waterways contact the EPA or your local Waste Management Authority.

7. Handling and storage

Precautions for Safe Handling

Avoid inhalation of dust, and skin or eye contact. Use only in a well ventilated area. Keep containers sealed when not in use. Prevent the build up of dust in the work atmosphere. Establish good housekeeping practices. Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds. Maintain high standards of personal hygiene i.e. washing hands prior to eating, drinking, smoking or using toilet facilities.

Conditions for safe storage, including any incompatibilities

Store in a well ventilated area away from heat and sources of ignition, out of direct sunlight and moisture. Take precautions against static electricity discharges. Use proper grounding procedures. Store away from incompatible materials such as materials that support combustion (oxidising materials). Store in suitable, labelled containers. Inspect periodically for deficiencies such as damage or leaks. Have appropriate fire extinguishers available in and near the storage area. Ensure that storage conditions comply with applicable local and national regulations.

For information on the handling of Combustible dusts and grounding procedure reference should be made to Australian Standard AS/NZS 4745.2004 - 'Code of Practice for Handling Combustible Dusts'.

8. Exposure controls/personal protection

Occupational exposure limit values

Crystalline silica

TWA: 0.1 mg/m^3

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

Biological Limit Values

No biological limits allocated.

Appropriate engineering controls

Use with good general ventilation. A flameproof exhaust ventilation system is required. If the engineering controls are not sufficient to maintain concentrations of particulates below the exposure standards, suitable respiratory protection must be worn.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable dust/particulate filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements.

Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with side shields, chemical goggles or full-face shield as appropriate should be used. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection devices should conform to relevant regulations.

Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 - Eye Protectors for Industrial Applications.

Hand Protection

Wear gloves of impervious material. Final choice of appropriate gloves will vary according to individual circumstances. i.e. methods of handling or according to risk assessments undertaken. Occupational protective gloves should conform to relevant regulations.

Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

Body Protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

Other Information

No exposure standards have been established for this material, however, the TWA exposure standards for dust not otherwise specified is 10 mg/m³. As with all chemicals, exposure should be kept to the lowest possible levels. TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week. Source: Safe Work Australia

9. Physical and chemical properties

Properties	Description	Properties	Description
Form	Solid	**Appearance**	Black/grey, hard, granular, porous material. Most common is Lump (>25mm). Also in smaller size fractions, commonly called Nut (10mm to 25mm) and Breeze (<15mm).
Colour	Black/grey	**Odour**	Odourless
Decomposition Temperature	Not available	**Melting Point**	> 3,000°C
Boiling Point	Not applicable	**Solubility in Water**	Insoluble
pH	Not applicable	**Vapour Pressure**	Not applicable
Vapour Density (Air=1)	Not applicable	**Evaporation Rate**	Not available
Odour Threshold	Not available	**Viscosity**	Not available
Partition Coefficient: n-octanol/water	Not available	**Density**	0.49-0.60 kg/m³-Lump Coke(dry) 0.58-0.77 kg/m³-Coke Breeze(dry)
Flash Point	Not applicable	**Flammability**	Combustible solid. This product will burn if exposed to fire.
Auto-Ignition Temperature	Not applicable	**Explosion Limit - Upper**	Not available
Explosion Limit - Lower	Not available		

10. Stability and reactivity

Chemical Stability

Stable under normal conditions of storage and handling.

Reactivity and Stability

Reacts with incompatible materials

Conditions to Avoid

Dust accumulation, heat and other sources of ignition.

Incompatible materials

Strong oxidising agents

Hazardous Decomposition Products

Thermal decomposition may result in the release of toxic and/or irritating fumes including carbon monoxide, carbon dioxide, oxides of sulphur, aluminium oxides and other metal oxides. Fire may generate dusts of respirable crystalline silica, which may cause lung damage.

Possibility of hazardous reactions

Not available.

Hazardous Polymerization
Will not occur.

11. Toxicological Information

Toxicology Information
No toxicity data is available for this product.

Ingestion
Ingestion of this product may irritate the gastric tract causing nausea and vomiting.

Inhalation
Inhalation of dusts may irritate the respiratory system. Chronic exposure to this material may aggravate existing respiratory disorders and lung disorders such as bronchitis, emphysaema and asthma. Onset and progression are related to dust concentrations and duration of exposure.

Skin
Skin contact may cause mechanical irritation resulting in redness and itching.

Eye
Eye contact may cause mechanical irritation. May result in mild abrasion.

Respiratory sensitisation
Not expected to be a respiratory sensitiser.

Skin Sensitisation
Not expected to be a skin sensitiser.

Germ cell mutagenicity
Not considered to be a mutagenic hazard.

Carcinogenicity
Not considered to be a carcinogenic hazard.
Crystalline silica is listed as a Group 1: Carcinogenic to humans according to International Agency for Research on Cancer (IARC).

Reproductive Toxicity
Not considered to be toxic to reproduction.

STOT-single exposure
Not expected to cause toxicity to a specific target organ.

STOT-repeated exposure
Not expected to cause toxicity to a specific target organ.

Aspiration Hazard
Not expected to be an aspiration hazard.

12. Ecological information

Ecotoxicity
No ecological data are available for this material.

Persistence and degradability
Not available

Mobility
Not available

Bioaccumulative Potential
Not available

Other Adverse Effects
Not available

Environmental Protection

Prevent this material entering waterways, drains and sewers.

13. Disposal considerations

Disposal considerations

The disposal of the spilled or waste material must be done in accordance with applicable local and national regulations.

14. Transport information

Transport Information

Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

U.N. Number

None Allocated

UN proper shipping name

None Allocated

Transport hazard class(es)

None Allocated

IMDG Marine pollutant

No

Transport in Bulk

Not available

Special Precautions for User

Not available

15. Regulatory information

Regulatory information

Not classified as Hazardous according to the Globally Harmonised System of classification and labelling of chemicals (GHS) including Work, Health and Safety regulations, Australia.

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Poisons Schedule

Not Scheduled

16. Other Information

Date of preparation or last revision of SDS

SDS Reviewed: October 2016

Supersedes: January 2013

References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.

Standard for the Uniform Scheduling of Medicines and Poisons.

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants.
Adopted biological exposure determinants, American Conference of Industrial Hygienists (ACGIH).
Globally Harmonised System of classification and labelling of chemicals.

END OF SDS

Safety Data Sheet

Hazardous, Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: FOSROC SOLVENT 10

Synonyms	Product Code	Bar Code
FOSROC SOLVENT 10 4L	FC600800-4L	9330221081894
FOSROC SOLVENT 10 20L	FC600800-20L	9330221081887

Recommended use: A general purpose aromatic solvent for cleaning equipment and thinning solvent based sealers.

Supplier: Parchem Construction Supplies Pty Ltd
Company No.: 80 069 961 968
Street Address: 7 Lucca Road
Wyong NSW 2259
Australia
Telephone: (02) 4350 5000

Emergency Telephone number: Australia – 1800 033 111 New Zealand – 0800 734 607

2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of EPA New Zealand.

HSNO Approval Code: HSR000983

Signal Word
Warning

Hazard Classifications
3.1C - Flammable liquids
6.1D - Substances that are acutely toxic - Oral
6.1D - Substances that are acutely toxic - Dermal
6.1D - Substances that are acutely toxic - Inhalation - vapours, dusts or mists
6.3A - Substances that are irritating to the skin
6.4A - Substances that are irritating to the eye
6.7B - Substances that are suspected human carcinogens
6.8B - Substances that are suspected human reproductive or developmental toxicants
6.9B (Single exposure) - Substances that are harmful to human target organs or systems - Narcotic
6.9B (Repeated exposure) - Substances that are harmful to human target organs or systems
9.1D - Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action - Algae (H401)
9.1D - Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action - Crustacean (H401)
9.1D - Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action - Fish (H401)

9.3C - Substances that are harmful to terrestrial vertebrates

Hazard Statements

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer .
H361	Suspected of damaging fertility or the unborn child .
H373	May cause damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.
H433	Harmful to terrestrial vertebrates.

Prevention Precautionary Statements

P102	Keep out of reach of children.
P103	Read label before use.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical, ventilating, lighting and all other equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust, fume, gas, mist, vapours or spray.
P264	Wash hands, face and all exposed skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.

Response Precautionary Statements

P101	If medical advice is needed, have product container or label at hand.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTRE or doctor/physician if you feel unwell.
P314	Get medical advice/attention if you feel unwell.
P330	Rinse mouth.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.

Storage Precautionary Statements

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Disposal Precautionary Statement

P501	Dispose of contents/container in accordance with local, regional, national and international regulations.

DANGEROUS GOOD CLASSIFICATION

Classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

Dangerous Goods Class: 3

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO	PROPORTION
Benzene, dimethyl-	1330-20-7	>60 % (w/w)
Benzene, ethyl-	100-41-4	10-30 % (w/w)
Ingredients determined to be Non-Hazardous		Balance
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

Inhalation: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If breathing laboured and patient cyanotic (blue), ensure airways are clear and have a qualified person give oxygen through a facemask. If breathing has stopped apply artificial respiration at once. In the event of cardiac arrest, apply external cardiac massage. Seek immediate medical advice.

Skin Contact: This material, or a component of the material, can be absorbed through the skin with resultant toxic effects. If skin or hair contact occurs, immediately remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre or a Doctor; or for 15 minutes and transport to Doctor or Hospital. For gross contamination, immediately drench with water and remove clothing. Continue to flush skin and hair with plenty of water (and soap if material is insoluble). For skin burns, cover with a clean, dry dressing until medical help is available. If blistering occurs, do NOT break blisters. If swelling, redness, blistering, or irritation occurs seek medical assistance.

Eye contact: If in eyes, hold eyelids apart and flush the eyes continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a Doctor; or for at least 15 minutes and transport to Doctor or Hospital.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Immediately call Poisons Centre or Doctor.

PPE for First Aiders: Wear safety shoes, overalls, gloves, chemical goggles, respirator. Use with adequate ventilation. If inhalation risk exists wear organic vapour/particulate respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Notes to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazchem Code: 3Y

Suitable extinguishing media: If material is involved in a fire use alcohol resistant foam, standard foam or dry agent (carbon dioxide, dry chemical powder).

Specific hazards: Flammable liquid and vapour. May form flammable vapour mixtures with air. Flameproof equipment necessary in area where this chemical is being used. Nearby equipment must be earthed. Electrical requirements for work area should be assessed according to AS3000. Vapour may travel a considerable distance to source of ignition and flash back. Avoid all ignition sources. All potential sources of ignition (open flames, pilot lights, furnaces, spark producing switches and electrical equipment etc) must be eliminated both in and near the work area. Do NOT smoke.

Fire fighting further advice: Heating can cause expansion or decomposition leading to violent rupture of containers. If safe to do so, remove containers from path of fire. Keep containers cool with water spray. On burning or decomposing may emit toxic fumes. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion or decomposition.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILLS
Wear protective equipment to prevent skin and eye contamination. Avoid inhalation of vapours or dust. Wipe up with absorbent (clean rag or paper towels). Collect and seal in properly labelled containers or drums for disposal.

LARGE SPILLS
If safe to do so, shut off all possible sources of ignition. Clear area of all unprotected personnel. Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Use a spark-free shovel. Collect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred advise local emergency services.

Dangerous Goods - Initial Emergency Response Guide No: 16

7. HANDLING AND STORAGE

Handling: Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols.

Storage: Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Store away from sources of heat and/or ignition. Store locked up. Keep container standing upright. Keep containers closed when not in use - check regularly for leaks.

This material is classified as a Class 3 Flammable Liquid as per the criteria of the "New Zealand NZS5433: Transport of Dangerous Goods on Land" and/or the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and must be stored in accordance with the relevant regulations.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits:

	TWA		STEL		NOTICES
	ppm	mg/m3	ppm	mg/m3	

Ethyl benzene	100	434	125	543
Xylene (o-, m-, p-isomers) (Dimethylbenzene)	50	217		

As published by WorkSafe New Zealand.

WES-TWA (Workplace Exposure Standard - Time-weighted average). The average airborne concentration of a substance calculated over an eight-hour working day.

WES-Ceiling (Workplace Exposure Standard - Ceiling). A concentration that should not be exceeded at any time during any part of the working day.

WES-STEL (Workplace Exposure Standard - Short-term exposure limit). The 15-minute time weighted average exposure standard. Applies to any 15-minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both the short-term and time-weighted average exposures apply. Exposures at concentrations between the WES-TWA and the WES-STEL should be less than 15 minutes, should occur no more than four times per day, and there should be at least 60 minutes between successive exposures in this range.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept too as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

If the directions for use on the product label are followed, exposure of individuals using the product should not exceed the above standard. The standard was created for workers who are routinely, potentially exposed during product manufacture.

Biological Limit Values: As per the WorkSafe New Zealand the ingredients in this material do not have a Biological Limit Allocated.

Engineering Measures: Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Use only in well ventilated areas. Use with local exhaust ventilation or while wearing appropriate respirator. Vapour heavier than air - prevent concentration in hollows or sumps. Do NOT enter confined spaces where vapour may have collected.

Personal Protection Equipment: SAFETY SHOES, OVERALLS, GLOVES, CHEMICAL GOGGLES, RESPIRATOR.

Wear safety shoes, overalls, gloves, chemical goggles, respirator. Use with adequate ventilation. If inhalation risk exists wear organic vapour/particulate respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from nitrile rubber should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. When using do not eat, drink or smoke. Wash hands prior to eating, drinking or smoking. Avoid contact with clothing. Avoid eye contact and skin contact. Avoid inhalation of vapour, mist or aerosols. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid
Colour:	Colourless
Odour:	Aromatic

Solubility:	0.175 kg/m3
Specific Gravity:	0.87
Relative Vapour Density (air=1):	3.7
Vapour Pressure (20 °C):	4.5 kPa @ 50 oC
Flash Point (°C):	23 - 27 (ACC)
Flammability Limits (%):	1.0 - 7.1
Autoignition Temperature (°C):	432 - 530
Melting Point/Range (°C):	>-48
Boiling Point/Range (°C):	136 - 145
pH:	N App
Viscosity:	<0.9 mm2/s @ 20 oC
Evaporation Rate (n-Butyl acetate=1):	0.76
Total VOC (g/Litre):	N Av

(Typical values only - consult specification sheet)
N Av = Not available, N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: This material is thermally stable when stored and used as directed.

Conditions to avoid: Elevated temperatures and sources of ignition.

Incompatible materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

Hazardous reactions: No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

Inhalation: Harmful if inhaled. Material may be an irritant to mucous membranes and respiratory tract. Inhalation of vapour can result in headaches, dizziness and possible nausea. Inhalation of high concentrations can produce central nervous system depression, which can lead to loss of co-ordination, impaired judgement and if exposure is prolonged, unconsciousness.

Skin contact: Harmful in contact with skin. Can be absorbed through the skin with resultant toxic effects. Contact with skin will result in irritation.

Ingestion: Harmful if swallowed. Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.

Eye contact: An eye irritant.

Acute toxicity

Inhalation: This material has been classified as a 6.1D - Substances that are acutely toxic. Acute toxicity estimate (based on ingredients): 10.0 < LC50 ≤ 20.0 mg/L for vapours or 1.0 < LC50 ≤ 5.0 mg/L for dust and mist

Skin contact: This material has been classified as a 6.1D - Substances that are acutely toxic. Acute toxicity estimate (based on ingredients): 1,000 - 2,000 mg/Kg bw

Ingestion: This material has been classified as a 6.1D - Substances that are acutely toxic. Acute toxicity estimate (based on ingredients): 300 - 2,000 mg/Kg bw

Corrosion/Irritancy: Eye: this material has been classified as a 6.4A - Substances that are irritating to the eye. Skin: this material has been classified as a 6.3A - Substances that are irritating to the skin.

Sensitisation: Inhalation: this material has been classified as not a respiratory sensitiser. Skin: this material has been classified as not a skin sensitiser.

Aspiration hazard: This material has been classified as non-hazardous.

Specific target organ toxicity (single exposure): This material has been classified as non-hazardous.

Chronic Toxicity

Mutagenicity: This material has been classified as non-hazardous.

Carcinogenicity: This material has been classified as a 6.7B - Substances that are suspected human carcinogens.

Reproductive toxicity (including via lactation):

This material has been classified as a 6.8B - Substances that are suspected human reproductive or developmental toxicants.

Specific target organ toxicity (repeat exposure): This material has been classified as a 6.9B - Substances that are harmful to human target organs or systems.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Acute aquatic hazard: 9.1D - Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action. Acute toxicity estimate (based on ingredients): 1 - 10 mg/L

Long-term aquatic hazard: This material has been classified as non-hazardous. Non-rapidly or rapidly degradable substance for which there are adequate chronic toxicity data available OR in the absence of chronic toxicity data, Acute toxicity estimate (based on ingredients): >100 mg/L, where the substance is not rapidly degradable and/or BCF < 500 and/or log K_{ow} < 4.

Ecotoxicity in the soil environment: This material has been classified as non-hazardous.

Ecotoxicity to terrestrial vertebrates: This material has been classified as a 9.3C - Substances that are harmful to terrestrial vertebrates.

Ecotoxicity to terrestrial invertebrates: This material has been classified as non-hazardous.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Persons conducting disposal, recycling or reclamation activities should ensure that appropriate personal protection equipment is used, see "Section 8. Exposure Controls and Personal Protection" of this SDS.

If possible material and its container should be recycled. If material or container cannot be recycled, dispose in accordance with local, regional, national and international Regulations.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT

Classified as Dangerous Goods by the criteria of the “Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

UN No: 1307
Dangerous Goods Class: 3
Packing Group: III
Hazchem Code: 3Y
Emergency Response Guide No: 16

Proper Shipping Name: XYLENES

Segregation Dangerous Goods: Not to be loaded with explosives (Class 1), flammable gases (Class 2.1), if both are in bulk, toxic gases (Class 2.3), spontaneously combustible substances (Class 4.2), oxidising agents (Class 5.1), organic peroxides (Class 5.2), toxic substances (Class 6.1), infectious substances (Class 6.2) or radioactive substances (Class 7). Exemptions may apply.

MARINE TRANSPORT

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

UN No: 1307
Dangerous Goods Class: 3
Packing Group: III

Proper Shipping Name: XYLENES

AIR TRANSPORT

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

UN No:	1307
Dangerous Goods Class:	3
Packing Group:	III
Proper Shipping Name:	XYLENES

15. REGULATORY INFORMATION

This material is not subject to the following international agreements:
Montreal Protocol (Ozone depleting substances)
The Stockholm Convention (Persistent Organic Pollutants)
The Rotterdam Convention (Prior Informed Consent)
International Convention for the Prevention of Pollution from Ships (MARPOL)

This material is subject to the following international agreements:
Basel Convention (Hazardous Waste)

- Organic solvents excluding halogenated solvents

This material/constituent(s) is covered by the following requirements:

- All components of this product are listed on or exempt from the New Zealand Inventory of Chemical (NZIoC).
- All components of this product are listed on or exempt from the Australian Inventory of Chemical Substances (AICS).

HSNO Approval Code: HSR000983

Approved handler	Yes
Location test certificate	Yes
Fire extinguishers	Yes
Signage	Yes
Emergency response	Yes
Hazardous atmosphere zone	Yes

16. OTHER INFORMATION

Reason for issue: Minor Text Changes

This Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd (chemdata.com.au) on behalf of its client.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This SDS summarises at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since DuluxGroup (Australia) Pty Ltd and DuluxGroup (New Zealand) Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this SDS in the context of how the user intends to handle and use the product in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.

BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 076

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name	**OXYGEN, COMPRESSED**
Synonym(s)	076 - SDS NUMBER • BOC OXYGEN, COMPRESSED • OXYGEN • OXYGEN COMPRESSED • PRODUCT CODES: 020, 024, 025, 026, 027, 028, 128, 224, 226

1.2 Uses and uses advised against

Use(s)	CHEMICAL REAGENT • COMBUSTION AID • FUEL ADDITIVE • INDUSTRIAL APPLICATIONS • LASER APPLICATIONS

1.3 Details of the supplier of the product

Supplier name	**BOC LIMITED (AUSTRALIA)**
Address	10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone	131 262, (02) 8874 4400
Fax	132 427 (24 hours)
Website	http://www.boc.com.au

1.4 Emergency telephone number(s)

Emergency	1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s)	Oxidizing Gases: Category 1 Gases Under Pressure: Compressed gas

2.2 Label elements

Signal word	**DANGER**

Pictogram(s)

Hazard statement(s)

H270	May cause or intensify fire; oxidizer.
H280	Contains gas under pressure; may explode if heated.

Prevention statement(s)

P220	Keep/Store away from clothing/incompatible materials/combustible materials.
P244	Keep reduction valves free from grease and oil.

Response statement(s)

P370 + P376	In case of fire: Stop leak if safe to do so.

Storage statement(s)

P410 + P403	Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s)

None allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content (v/v)
OXYGEN	7782-44-7	231-956-9	>99.5%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	Adverse effects not expected from this product.
Inhalation	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.
Skin	Adverse effects not expected from this product.
Ingestion	Due to product form and application, ingestion is considered unlikely.
First aid facilities	No information provided.

4.2 Most important symptoms and effects, both acute and delayed

Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.

4.3 Immediate medical attention and special treatment needed

Treatment for hyperoxia.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use water fog to cool containers from protected area.

5.2 Special hazards arising from the substance or mixture

Non flammable - oxidising agent. Supports combustion and may cause fire/explosion in contact with incompatible substances, strong acids, reducing agents, combustibles and flammables. Materials which burn in air, will burn more vigorously in oxygen enriched atmospheres.

5.3 Advice for firefighters

Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. Remove cool cylinders from the path of the fire if safe to do so. Ensure working area is well ventilated before re-use. Notify the manufacturer that you will be returning a faulty cylinder. Residual product will be disposed of when the cylinder is returned.

5.4 Hazchem code

2S

2	Fine Water Spray.
S	Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS.

6.2 Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3 Methods of cleaning up

Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Use of safe work practices are recommended to avoid inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

7.2 Conditions for safe storage, including any incompatibilities

Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls No special precautions are normally required when handling this product.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather gloves.
Body	Wear safety boots.
Respiratory	Not required under normal conditions of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	COLOURLESS GAS
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	-183°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	NOT AVAILABLE
Specific gravity	NOT APPLICABLE
Solubility (water)	0.032 cm^3/cm^3
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	OXIDISING GAS
Odour threshold	NOT AVAILABLE

9.2 Other information

Critical pressure	5,043 kPa
Cylinder pressure (when full)	Refer to Product Manuals
Density	1.105 (Air = 1)
% Volatiles	100 %
Critical temperature	-118.6°C (Permanent gas)

10. STABILITY AND REACTIVITY

10.1 Reactivity

Unreactive under normal conditions.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Combustible materials such as oil and grease can spontaneously ignite at low temperatures in oxygen enriched atmospheres. Materials which burn in air, will burn more vigorously in oxygen enriched atmospheres. Metals can be ignited and will continue to burn in pure oxygen atmospheres under specific conditions of temperature and pressure.

10.6 Hazardous decomposition products

This material will not decompose to form hazardous products other than that already present.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Based on available data, the classification criteria are not met.
Skin	Not classified as a skin irritant.
Eye	Not classified as an eye irritant.
Sensitization	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Not classified as a mutagen.
Carcinogenicity	Not classified as a carcinogen.
Reproductive	Not classified as a reproductive toxin.
STOT – single exposure	Not classified as causing organ effects from single exposure.
STOT – repeated exposure	Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No ecological damage caused by this product.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	Cylinders should be returned to the manufacturer or supplier for disposal of contents.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	**SEA TRANSPORT (IMDG / IMO)**	**AIR TRANSPORT (IATA / ICAO)**
14.1 UN Number	1072	1072	1072
14.2 Proper Shipping Name	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED
14.3 Transport hazard classes	2.2, 5.1	2.2, 5.1	2.2, 5.1
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code	2S
GTEPG	2C6
EMS	F-C, S-W
Other information	Ensure cylinder is separated from driver and foodstuffs. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes	O	Oxidising
Risk phrases	R8	Contact with combustible material may cause fire.
Safety phrases	S2	Keep out of reach of children.
	S17	Keep away from combustible material.

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information

The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

APPLICATION METHOD: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m^3	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
2.2	Standard SDS Review
2.1	Standard SDS Review
2.0	Standard SDS Review.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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Revision: 2.2
SDS date: 11 March 2015

[End of SDS]

Dy-Mark Line Marking All Colours Aerosol

Dy-Mark

Chemwatch Hazard Alert Code: **3**

Chemwatch: **53-7171**
Version No: **9.1.1.1**
Safety Data Sheet according to WHS and ADG requirements

Issue Date: **01/11/2019**
Print Date: **27/03/2020**
S.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Dy-Mark Line Marking All Colours Aerosol
Synonyms	41015000 Clear, 41015001 Matt Black, 41015002 Red, 41015003 Blue; 41015004 Green, 41015005 Yellow, 41015006 Orange, 41015011 White; 41015013 Grey, 41015026 F/Orange 500g, 41027511 White Jumbo 750g, 41995002 Red S/Thru; 41995003 Blue S/Thru, 41995005 Yellow S/Thru, 41995011 White S/Thru
Proper shipping name	AEROSOLS
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Application is by spray atomisation from a hand held aerosol pack Use according to manufacturer's directions.

Details of the supplier of the safety data sheet

Registered company name	**Dy-Mark**
Address	89 Formation Street Wacol QLD 4076 Australia
Telephone	+61 7 3327 3004
Fax	+61 7 3327 3009
Website	http://www.dymark.com.au
Email	info@dymark.com.au

Emergency telephone number

Association / Organisation	**Dy-Mark**
Emergency telephone numbers	**+61 7 3327 3099**
Other emergency telephone numbers	**Not Available**

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

		Min Max
Flammability	3	
Toxicity	2	
Body Contact	2	
Reactivity	1	
Chronic	1	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	Not Applicable
Classification [1]	Flammable Aerosols Category 1, Acute Toxicity (Dermal) Category 4, Acute Toxicity (Inhalation) Category 4, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Acute Aquatic Hazard Category 3
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Continued...

Hazard pictogram(s)	
SIGNAL WORD	**DANGER**

Hazard statement(s)

H222	Extremely flammable aerosol.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H402	Harmful to aquatic life.
AUH044	Risk of explosion if heated under confinement.

Precautionary statement(s) Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P211	Do not spray on an open flame or other ignition source.
P251	Pressurized container: Do not pierce or burn, even after use.
P271	Use only outdoors or in a well-ventilated area.
P261	Avoid breathing mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

P321	Specific treatment (see advice on this label).
P322	Specific measures (see advice on this label).
P362	Take off contaminated clothing and wash before reuse.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P332+P313	If skin irritation occurs: Get medical advice/attention.

Precautionary statement(s) Storage

P405	Store locked up.
P410+P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
1330-20-7	20-55	xylene
Not Available	5-20	pigments determined not to be hazardous
67-64-1	5-15	acetone
Not Available	5-15	resin - proprietary
Not Available	1-12	filler determined not to be hazardous
68476-85-7.	10-20	hydrocarbon propellant
115-10-6	8-10	dimethyl ether

SECTION 4 FIRST AID MEASURES

Continued...

Description of first aid measures

Eye Contact	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 lids. - Transport to hospital or doctor without delay. - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	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. - **DO NOT** use solvents. - Seek medical attention in the event of irritation.
Inhalation	If aerosols, fumes or combustion products are inhaled: - Remove to fresh air. - Lay patient down. Keep warm and rested. - Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. - If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. - Transport to hospital, or doctor.
Ingestion	- 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.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
For acute or short term repeated exposures to xylene:

- Gastro-intestinal absorption is significant with ingestions. For ingestions exceeding 1-2 ml (xylene)/kg, intubation and lavage with cuffed endotracheal tube is recommended. The use of charcoal and cathartics is equivocal.
- Pulmonary absorption is rapid with about 60-65% retained at rest.
- Primary threat to life from 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 ($pO_2 < 50$ mm Hg or $pCO_2 > 50$ mm Hg) should be intubated.
- Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.

BIOLOGICAL EXPOSURE INDEX - BEI
These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
Methylhippu-ric acids in urine	1.5 gm/gm creatinine	End of shift	
	2 mg/min	Last 4 hrs of shift	

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

SMALL FIRE:
- Water spray, dry chemical or CO_2

LARGE FIRE:
- Water spray or fog.

Special hazards arising from the substrate or mixture

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

Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - May be violently or explosively reactive. - Wear breathing apparatus plus protective gloves. - Prevent, by any means available, spillage from entering drains or water course. - If safe, switch off electrical equipment until vapour fire hazard removed. - Use water delivered as a fine spray to control fire and cool adjacent area. - **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. - Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	- Liquid and vapour are highly flammable. - Severe fire hazard when exposed to heat or flame. - Vapour forms an explosive mixture with air. - Severe explosion hazard, in the form of vapour, when exposed to flame or spark. - Vapour may travel a considerable distance to source of ignition. - Heating may cause expansion or decomposition with violent container rupture. - Aerosol cans may explode on exposure to naked flames. - Rupturing containers may rocket and scatter burning materials. - Hazards may not be restricted to pressure effects. - May emit acrid, poisonous or corrosive fumes. - On combustion, may emit toxic fumes of carbon monoxide (CO). Combustion products include: carbon dioxide (CO_2)

Continued...

	other pyrolysis products typical of burning organic material. **Contains low boiling substance:** Closed containers may rupture due to pressure buildup under fire conditions.
HAZCHEM	Not Applicable

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	‣ Clean up all spills immediately. ‣ Avoid breathing vapours and contact with skin and eyes. ‣ Wear protective clothing, impervious gloves and safety glasses. ‣ Shut off all possible sources of ignition and increase ventilation. ‣ Wipe up. ‣ If safe, damaged cans should be placed in a container outdoors, away from all ignition sources, until pressure has dissipated. ‣ Undamaged cans should be gathered and stowed safely.
Major Spills	‣ **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. ‣ May be violently or explosively reactive. ‣ Wear breathing apparatus plus protective gloves. ‣ Prevent, by any means available, spillage from entering drains or water courses ‣ No smoking, naked lights or ignition sources. ‣ Increase ventilation. ‣ Stop leak if safe to do so. ‣ Water spray or fog may be used to disperse / absorb vapour. ‣ Absorb or cover spill with sand, earth, inert materials or vermiculite. ‣ If safe, damaged cans should be placed in a container outdoors, away from ignition sources, until pressure has dissipated. ‣ Undamaged cans should be gathered and stowed safely. ‣ Collect residues and seal in labelled drums for disposal. ‣ Remove leaking cylinders to a safe place if possible. ‣ Release pressure under safe, controlled conditions by opening the valve.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	The conductivity of this material may make it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m., Whether a liquid is nonconductive or semi-conductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid. ‣ **DO NOT** allow clothing wet with material to stay in contact with skin ‣ 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. ‣ When handling, **DO NOT** eat, drink or smoke. ‣ **DO NOT** incinerate or puncture aerosol cans. ‣ **DO NOT** spray directly on humans, exposed food or food utensils. ‣ 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 storage and handling recommendations contained within this SDS. ‣ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Other information	‣ 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. ‣ No smoking, naked lights, heat or ignition sources. ‣ Keep containers securely sealed. Contents under pressure. ‣ Store away from incompatible materials. ‣ Store in a cool, dry, well ventilated area. ‣ Avoid storage at temperatures higher than 40 deg C. ‣ Store in an upright position. ‣ Protect containers against physical damage. ‣ Check regularly for spills and leaks. ‣ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	‣ Aerosol dispenser. ‣ Check that containers are clearly labelled.
Storage incompatibility	‣ Avoid reaction with oxidising agents

Continued...

X — Must not be stored together
0 — May be stored together with specific preventions
+ — May be stored together

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	xylene	Xylene (o-, m-, p- isomers)	80 ppm / 350 mg/m3	655 mg/m3 / 150 ppm	Not Available	Not Available
Australia Exposure Standards	acetone	Acetone	500 ppm / 1185 mg/m3	2375 mg/m3 / 1000 ppm	Not Available	Not Available
Australia Exposure Standards	hydrocarbon propellant	LPG (liquified petroleum gas)	1000 ppm / 1800 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	dimethyl ether	Dimethyl ether	400 ppm / 760 mg/m3	950 mg/m3 / 500 ppm	Not Available	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
xylene	Xylenes	Not Available	Not Available	Not Available
acetone	Acetone	Not Available	Not Available	Not Available
hydrocarbon propellant	Liquified petroleum gas; (L.P.G.)	65,000 ppm	2.30E+05 ppm	4.00E+05 ppm
dimethyl ether	Methyl ether; (Dimethyl ether)	3,000 ppm	3800* ppm	7200* ppm

Ingredient	Original IDLH	Revised IDLH
xylene	900 ppm	Not Available
acetone	2,500 ppm	Not Available
hydrocarbon propellant	2,000 ppm	Not Available
dimethyl ether	Not Available	Not Available

Exposure controls

Appropriate engineering controls

CARE: Use of a quantity of this material in confined space or poorly ventilated area, where rapid build up of concentrated atmosphere may occur, could require increased ventilation and/or protective gear
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection.
Provide adequate ventilation in warehouse or closed storage areas.
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.

Type of Contaminant:	Speed:
aerosols, (released at low velocity into zone of active generation)	0.5-1 m/s
direct spray, spray painting in shallow booths, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Continued...

Personal protection	
Eye and face protection	▸ Safety glasses with side shields. ▸ Chemical goggles. ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent] ▸ Close fitting gas tight goggles **DO NOT** wear contact lenses. ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]
Skin protection	See Hand protection below
Hands/feet protection	▸ No special equipment needed when handling small quantities. ▸ **OTHERWISE:** ▸ For potentially moderate exposures: ▸ Wear general protective gloves, eg. light weight rubber gloves. ▸ For potentially heavy exposures: ▸ Wear chemical protective gloves, eg. PVC. and safety footwear.
Body protection	See Other protection below
Other protection	No special equipment needed when handling small quantities. **OTHERWISE:** ▸ Overalls. ▸ Skin cleansing cream. ▸ Eyewash unit. ▸ Do not spray on hot surfaces. ▸ 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. BRETHERICK: Handbook of Reactive Chemical Hazards.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
Dy-Mark Line Marking All Colours Aerosol

Material	CPI
BUTYL	C
BUTYL/NEOPRENE	C
CPE	C
HYPALON	C
NAT+NEOPR+NITRILE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PE/EVAL/PE	C
PVA	C
PVC	C
PVDC/PE/PVDC	C
SARANEX-23	C
SARANEX-23 2-PLY	C
TEFLON	C
VITON	C
VITON/NEOPRENE	C

* CPI - Chemwatch Performance Index
A: Best Selection

Respiratory protection

Type AX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.
Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AX-AUS / Class 1	-	AX-PAPR-AUS / Class 1
up to 50 x ES	Air-line*	-	-
up to 100 x ES	-	AX-3	-
100+ x ES	-	Air-line**	-

* - Continuous-flow; ** - Continuous-flow or positive pressure demand
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

Aerosols, in common with most vapours/ mists, should never be used in confined spaces without adequate ventilation. Aerosols, containing agents designed to enhance or mask smell, have triggered allergic reactions in predisposed individuals.

Continued...

B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Coloured flammable liquid with a characteristic solvent odour; not miscible with water.

Physical state	Liquid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	<-18	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	HIGHLY FLAMMABLE.	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	>1	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Elevated temperatures. ▸ Presence of open flame. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Inhalation of toxic gases may cause: ▸ Central Nervous System effects including depression, headache, confusion, dizziness, stupor, coma and seizures; ▸ respiratory: acute lung swellings, shortness of breath, wheezing, rapid breathing, other symptoms and respiratory arrest; ▸ heart: collapse, irregular heartbeats and cardiac arrest; ▸ gastrointestinal: irritation, ulcers, nausea and vomiting (may be bloody), and abdominal pain. Inhalation hazard is increased at higher temperatures. Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination. Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure. Symptoms of asphyxia (suffocation) may include headache, dizziness, shortness of breath, muscular weakness, drowsiness and ringing in the ears. If the asphyxia is allowed to progress, there may be nausea and vomiting, further physical weakness and unconsciousness and, finally, convulsions, coma and death. **WARNING**:Intentional misuse by concentrating/inhaling contents may be lethal. Headache, fatigue, tiredness, irritability and digestive disturbances (nausea, loss of appetite and bloating) are the most common symptoms of xylene overexposure. Injury to the heart, liver, kidneys and nervous system has also been noted amongst workers. Xylene is a central nervous system depressant

Continued...

Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments Not a likely route of entry into the body in commercial or industrial environments. The liquid may produce considerable gastrointestinal discomfort and be harmful or toxic if swallowed.
Skin Contact	Skin contact with the material may be harmful; systemic effects may result following absorption. The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering. Spray mist may produce discomfort Open cuts, abraded or irritated skin should not be exposed to this material
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. Not considered to be a risk because of the extreme volatility of the gas.
Chronic	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There is some evidence from animal testing that exposure to this material may result in toxic effects to the unborn baby. Main route of exposure to the gas in the workplace is by inhalation. Women exposed to xylene in the first 3 months of pregnancy showed a slightly increased risk of miscarriage and birth defects. Evaluation of workers chronically exposed to xylene has demonstrated lack of genetic toxicity. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis). Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS]

Dy-Mark Line Marking All Colours Aerosol	TOXICITY	IRRITATION
	Not Available	Not Available
xylene	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >1700 mg/kg[2]	Eye (human): 200 ppm irritant
	Inhalation (rat) LC50: 4994.295 mg/l/4h[2]	Eye (rabbit): 5 mg/24h SEVERE
	Oral (rat) LD50: 3523-8700 mg/kg[2]	Eye (rabbit): 87 mg mild
		Eye: adverse effect observed (irritating)[1]
		Skin (rabbit):500 mg/24h moderate
		Skin: adverse effect observed (irritating)[1]
acetone	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: =20 mg/kg[2]	Eye (human): 500 ppm - irritant
	Inhalation (rat) LC50: 100.2 mg/l/8hr[2]	Eye (rabbit): 20mg/24hr -moderate
	Oral (rat) LD50: 1800-7300 mg/kg[2]	Eye (rabbit): 3.95 mg - SEVERE
		Eye: adverse effect observed (irritating)[1]
		Skin (rabbit): 500 mg/24hr - mild
		Skin (rabbit):395mg (open) - mild
		Skin: no adverse effect observed (not irritating)[1]
hydrocarbon propellant	TOXICITY	IRRITATION
	Not Available	Not Available
dimethyl ether	TOXICITY	IRRITATION
	Inhalation (rat) LC50: 309 mg/l/4H[2]	Not Available
Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*	

Dy-Mark Line Marking All Colours Aerosol	Animal studies indicate that normal, branched and cyclic paraffins are absorbed from the gastrointestinal tract and that the absorption of n-paraffins is inversely proportional to the carbon chain length, with little absorption above C30. With respect to the carbon chain lengths likely to be present in mineral oil, n-paraffins may be absorbed to a greater extent than iso- or cyclo-paraffins. The major classes of hydrocarbons are well absorbed into the gastrointestinal tract in various species. In many cases, the hydrophobic hydrocarbons are ingested in association with fats in the diet. Some hydrocarbons may appear unchanged as in the lipoprotein particles in the gut lymph, but most hydrocarbons partly separate from fats and undergo metabolism in the gut cell. The gut cell may play a major role in determining the proportion of hydrocarbon that becomes available to be deposited unchanged in peripheral tissues such as in the body fat stores or the liver.
XYLENE	Reproductive effector in rats 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.
ACETONE	For acetone: The acute toxicity of acetone is low. Acetone is not a skin irritant or sensitizer, but it removes fat from the skin, and it also irritates the eye. Animal testing shows acetone may cause macrocytic anaemia. Studies in humans have shown that exposure to acetone at a level of 2375 mg/cubic metre has not caused neurobehavioural deficits.
HYDROCARBON PROPELLANT	inhalation of the gas
Dy-Mark Line Marking All Colours & HYDROCARBON	No significant acute toxicological data identified in literature search.

Continued...

PROPELLANT	
Dy-Mark Line Marking All Colours Aerosol & XYLENE	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Dy-Mark Line Marking All Colours Aerosol & XYLENE & ACETONE	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.

Acute Toxicity	✓	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✓	**Reproductivity**	✗
Serious Eye Damage/Irritation	✓	**STOT - Single Exposure**	✓
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Dy-Mark Line Marking All Colours Aerosol	Not Available	Not Available	Not Available	Not Available	Not Available
xylene	LC50	96	Fish	2.6mg/L	2
	EC50	48	Crustacea	1.8mg/L	2
	EC50	72	Algae or other aquatic plants	3.2mg/L	2
	NOEC	73	Algae or other aquatic plants	0.44mg/L	2
acetone	LC50	96	Fish	5-540mg/L	2
	EC50	48	Crustacea	>100mg/L	4
	EC50	96	Algae or other aquatic plants	20.565mg/L	4
	NOEC	240	Crustacea	1-866mg/L	2
hydrocarbon propellant	LC50	96	Fish	24.11mg/L	2
	EC50	96	Algae or other aquatic plants	7.71mg/L	2
	LC50	96	Fish	24.11mg/L	2
	EC50	96	Algae or other aquatic plants	7.71mg/L	2
dimethyl ether	LC50	96	Fish	1-783.04mg/L	2
	EC50	48	Crustacea	>4400.0mg/L	2
	EC50	96	Algae or other aquatic plants	154.917mg/L	2
	NOEC	48	Crustacea	>4000mg/L	1
Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*				

Harmful to aquatic organisms.
For Petroleum Hydrocarbon Gases:
Environmental Fate: Petroleum hydrocarbon gases are primarily produced in petroleum refineries, or in gas plants that separate natural gas and natural gas liquids. This category contains 99 petroleum hydrocarbon gas substances, the majority of which never reach the consumer. Petroleum hydrocarbon gases do not contain inorganic compounds, (e.g. hydrogen sulfide, ammonia, and carbon monoxide), other than asphyxiant gases; the low molecular weight hydrocarbon molecules are primarily responsible for the hazard associated with these gases.
Atmospheric Fate: All components of these gases will evaporate to the air where interaction with hydroxyl radicals is an important fate process. Substances in refinery gases that evaporate to air may undergo indirect, gas-phase oxidation reaction with hydroxyl radicals and this is an important fate process for these substances. Half-lives for refinery gases range from 960 days, (methane), to 0.16 days, (butadiene). The constituents of the C5- C6 hydrocarbon gases have light breakdown half-lives of approximately two days. The inorganic gases are chemically stable and may be lost to the atmosphere or simply become involved in the environmental recycling of their atoms.
Terrestrial Fate: Biological breakdown of these organisms is not expected to be an important fate process since they tend to evaporate to the air, however; some of the higher weight components may become available for microbial attack. Naphtha gases are also considered to be inherently biodegradable.
Aquatic Fate: The solubilities of these substances in water vary, ranging from approximately 22 parts per million to several hundred parts per million. Some of these gasses have substantial water solubility, but they will eventually evaporate to the atmosphere. Refinery gases are not broken down by water but, they will be broken down by microbes. Gaseous hydrocarbons are widespread in nature and numerous types of microbes have evolved which are capable of oxidizing these substances as their sole energy source.
Ecotoxicity: These substances vary in their toxicities to aquatic organisms from slightly toxic to moderately toxic. They are not expected to persist long enough in the environment to elicit toxicity. Emissions of petroleum hydrocarbon gases to the atmosphere would not likely result in acutely toxic concentrations in adjacent water bodies because such emissions will tend to remain in the atmosphere. Several of the constituents in refinery gases were shown to be highly hazardous to aquatic organisms in laboratory toxicity tests where exposure concentrations can be maintained over time. Hydrogen sulfide was shown to be the most toxic constituent to fish, and invertebrates.

For Xylenes:

Continued...

log Koc : 2.05-3.08; Koc : 25.4-204; Half-life (hr) air : 0.24-42; Half-life (hr) H2O surface water : 24-672; Half-life (hr) H2O ground : 336-8640; Half-life (hr) soil : 52-672; Henry's Pa m3 /mol : 637-879; Henry's atm m3 /mol - 7.68E-03; BOD 5 if unstated - 1.4,1%; COD - 2.56,13% ThOD - 3.125 : BCF : 23; log BCF : 1.17-2.41.
Environmental Fate: Most xylenes released to the environment will occur in the atmosphere and volatilisation is the dominant environmental fate process. Soil - Xylenes are expected to have moderate mobility in soil evaporating rapidly from soil surfaces. The extent of the degradation is expected to depend on its concentration, residence time in the soil, the nature of the soil, and whether resident microbial populations have been acclimated. Xylene can remain below the soil surface for several days and may travel through the soil profile and enter groundwater. Soil and water microbes may transform it into other, less harmful compounds, although this happens slowly. It is not clear how long xylene remains trapped deep underground in soil or groundwater, but it may be months or years.
Atmospheric Fate: Xylene evaporates quickly into the air from surface soil and water and can remain in the air for several days until it is broken down by sunlight into other less harmful chemicals. In the ambient atmosphere, xylenes are expected to exist solely in the vapour phase. Xylenes are degraded in the atmosphere with an estimated atmospheric lifetime of about 0.5 to 2 days. Xylene may contribute to photochemical smog formation. p-Xylene has a moderately high photochemical reactivity under smog conditions, higher than the other xylene isomers. The photooxidation of p-xylene results in the production of carbon monoxide, formaldehyde, glyoxal, methylglyoxal, 3-methylbenzylnitrate, m-tolualdehyde, 4-nitro-3-xylene, 5-nitro-3-xylene, 2,6-dimethyl-p-benzoquinone, 2,4-dimethylphenol, 6-nitro-2,4-dimethylphenol, 2,6-dimethylphenol, and 4-nitro-2,6-dimethylphenol.
Aquatic Fate: p-xylene may adsorb to suspended solids and sediment in water and is expected to volatilise from water surfaces. Estimated volatilisation half-lives for a model river and model lake are 3 hours and 4 days, respectively. Measurements taken from goldfish, eels and clams indicate that bioconcentration in aquatic organisms is low. Photo-oxidation in the presence of humic acids may play an important role in the abiotic degradation of p-xylene. p-Xylene is biodegradable and has been observed to degrade in pond water however; it is unclear if it degrades in surface waters. p-Xylene has been observed to degrade in anaerobic and aerobic groundwater; however, it is known to persist for many years in groundwater, at least at sites where the concentration might have been quite high. Ecotoxicity: Xylenes are slightly toxic to fathead minnow, rainbow trout and bluegill and not acutely toxic to water fleas. For Photobacterium phosphoreum EC50 (24 h): 0.0084 mg/L. and Gammarus lacustris LC50 (48 h): 0.6 mg/L.
DO NOT discharge into sewer or waterways.
For Acetone:
log Kow : -0.24;
Half-life (hr) air : 312-1896;
Half-life (hr) H2O surface water : 20;
Henry's atm m3 /mol : 3.67E-05
BOD 5: 0.31-1.76,46-55%
COD: 1.12-2.07
ThOD: 2.2BCF: 0.69.
Environmental Fate: The relatively long half-life allows acetone to be transported long distances from its emission source.
Atmospheric Fate: Acetone preferentially locates in the air compartment when released to the environment. In air, acetone is lost by photolysis and reaction with photochemically produced hydroxyl radicals; the estimated half-life of these combined processes is about 22 days. Air Quality Standards: none available.
Terrestrial Fate: Very little acetone is expected to reside in soil, biota, or suspended solids and has low propensity for soil absorption and a high preference for moving through the soil and into the ground water. Acetone released to soil volatilizes although some may leach into the ground where it rapidly biodegrades. Soil Guidelines: none available.
Aquatic Fate: A substantial amount of acetone can also be found in water. Acetone is highly soluble and slightly persistent in water, with a half-life of about 20 hours Drinking Water Standard: none available.
Ecotoxicity: Acetone does not concentrate in the food chain, is minimally toxic to aquatic life and is considered to be readily biodegradable. Testing shows that acetone exhibits a low order of toxicity for brook trout, fathead minnow, Japanese quail, ring-neck pheasant and water fleas. Low toxicity for aquatic invertebrates. For aquatic plants, NOEC: 5400-7500 mg/L. Acetone vapours were shown to be relatively toxic to flour beetle and flour moths and their eggs. The direct application of acetone liquid to the body of the insects or surface of the eggs did not, however, cause any mortality. The ability of acetone to inhibit cell multiplication has been examined in a wide variety of microorganisms. Mild to moderate toxicity occurred in bacteria exposed to acetone for 6-4 days however, overall data indicates a low degree of toxicity for acetone. The only exception to these findings was the results obtained with the flagellated protozoa (Entosiphon sulcatum).

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
xylene	HIGH (Half-life = 360 days)	LOW (Half-life = 1.83 days)
acetone	LOW (Half-life = 14 days)	MEDIUM (Half-life = 116.25 days)
dimethyl ether	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
xylene	MEDIUM (BCF = 740)
acetone	LOW (BCF = 0.69)
dimethyl ether	LOW (LogKOW = 0.1)

Mobility in soil

Ingredient	Mobility
acetone	HIGH (KOC = 1.981)
dimethyl ether	HIGH (KOC = 1.292)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	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 or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority. ▸ Consult State Land Waste Management Authority for disposal.

Continued...

	- Discharge contents of damaged aerosol cans at an approved site. - Allow small quantities to evaporate. - **DO NOT** incinerate or puncture aerosol cans. - Bury residues and emptied aerosol cans at an approved site.

SECTION 14 TRANSPORT INFORMATION

Labels Required

<table>
<tr><td></td><td></td></tr>
<tr><td>Marine Pollutant</td><td>NO</td></tr>
<tr><td>HAZCHEM</td><td>Not Applicable</td></tr>
</table>

Land transport (ADG)

<table>
<tr><td>UN number</td><td>1950</td></tr>
<tr><td>UN proper shipping name</td><td>AEROSOLS</td></tr>
<tr><td>Transport hazard class(es)</td><td><table><tr><td>Class</td><td>2.1</td></tr><tr><td>Subrisk</td><td>Not Applicable</td></tr></table></td></tr>
<tr><td>Packing group</td><td>Not Applicable</td></tr>
<tr><td>Environmental hazard</td><td>Not Applicable</td></tr>
<tr><td>Special precautions for user</td><td><table><tr><td>Special provisions</td><td>63 190 277 327 344 381</td></tr><tr><td>Limited quantity</td><td>1000ml</td></tr></table></td></tr>
</table>

Air transport (ICAO-IATA / DGR)

<table>
<tr><td>UN number</td><td>1950</td></tr>
<tr><td>UN proper shipping name</td><td>Aerosols, flammable (engine starting fluid); Aerosols, flammable</td></tr>
<tr><td>Transport hazard class(es)</td><td><table><tr><td>ICAO/IATA Class</td><td>2.1</td></tr><tr><td>ICAO / IATA Subrisk</td><td>Not Applicable</td></tr><tr><td>ERG Code</td><td>10L</td></tr></table></td></tr>
<tr><td>Packing group</td><td>Not Applicable</td></tr>
<tr><td>Environmental hazard</td><td>Not Applicable</td></tr>
<tr><td>Special precautions for user</td><td><table><tr><td>Special provisions</td><td>A145 A167 A802; A1 A145 A167 A802</td></tr><tr><td>Cargo Only Packing Instructions</td><td>203</td></tr><tr><td>Cargo Only Maximum Qty / Pack</td><td>150 kg</td></tr><tr><td>Passenger and Cargo Packing Instructions</td><td>203; Forbidden</td></tr><tr><td>Passenger and Cargo Maximum Qty / Pack</td><td>75 kg; Forbidden</td></tr><tr><td>Passenger and Cargo Limited Quantity Packing Instructions</td><td>Y203; Forbidden</td></tr><tr><td>Passenger and Cargo Limited Maximum Qty / Pack</td><td>30 kg G; Forbidden</td></tr></table></td></tr>
</table>

Sea transport (IMDG-Code / GGVSee)

<table>
<tr><td>UN number</td><td>1950</td></tr>
<tr><td>UN proper shipping name</td><td>AEROSOLS</td></tr>
<tr><td>Transport hazard class(es)</td><td><table><tr><td>IMDG Class</td><td>2.1</td></tr><tr><td>IMDG Subrisk</td><td>Not Applicable</td></tr></table></td></tr>
<tr><td>Packing group</td><td>Not Applicable</td></tr>
<tr><td>Environmental hazard</td><td>Not Applicable</td></tr>
<tr><td>Special precautions for user</td><td><table><tr><td>EMS Number</td><td>F-D , S-U</td></tr><tr><td>Special provisions</td><td>63 190 277 327 344 381 959</td></tr><tr><td>Limited Quantities</td><td>1000 ml</td></tr></table></td></tr>
</table>

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

Continued...

Safety, health and environmental regulations / legislation specific for the substance or mixture

XYLENE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

ACETONE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

HYDROCARBON PROPELLANT IS FOUND ON THE FOLLOWING REGULATORY LISTS

- Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
- Chemical Footprint Project - Chemicals of High Concern List

DIMETHYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

- Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

National Inventory Status

National Inventory	Status
Australia - AICS	Yes
Canada - DSL	Yes
Canada - NDSL	No (acetone; xylene; dimethyl ether; hydrocarbon propellant)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - ARIPS	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Revision Date	01/11/2019
Initial Date	04/09/2015

SDS Version Summary

Version	Issue Date	Sections Updated
8.1.1.1	14/12/2016	Classification, Name
9.1.1.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification

Other information

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.

The 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.

Definitions and abbreviations

PC－TWA: Permissible Concentration-Time Weighted Average
PC－STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value

Continued...

BCF: BioConcentration Factors
BEI: Biological Exposure Index

SAFETY DATA SHEET

PURELL® Hand Sanitizer Gel

Version	Revision Date:	MSDS Number:	Date of last issue: 10.02.2015
1.2	24.05.2016	37169-00002	Date of first issue: 16.12.2014

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : PURELL® Hand Sanitizer Gel

Manufacturer or supplier's details

Company : GOJO Australasia Pty Ltd

Address : Suite 14A, Unit 1, Level 1
Lakes Business Park, 2B Lord Street
Botany NSW 2019

Telephone : +612 9016 3885

Emergency telephone number : 1800 634 340

Recommended use of the chemical and restrictions on use

Recommended use : Hand Sanitizer

Restrictions on use : This is a personal care or cosmetic product that is safe for consumers and other users under normal and reasonably foreseeable use. Cosmetics and consumer products, specifically defined by regulations around the world, are exempt from the requirement of an SDS for the consumer. While this material is not considered hazardous, this SDS contains valuable information critical to the safe handling and proper use of the product for industrial workplace conditions as well as unusual and unintended exposures such as large spills. This SDS should be retained and available for employees and other users of this product. For specific intended-use guidance, please refer to the information provided on the package or instruction sheet.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 3

Serious eye damage/eye irritation : Category 2A

GHS Label element

Hazard pictograms :

Signal word : Warning

Hazard statements : H226 Flammable liquid and vapour.
H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. -

No smoking.
P233 Keep container tightly closed.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.

Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification

Vapours may form explosive mixture with air.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical Name	CAS-No.	Concentration (%)
Ethanol	64-17-5	>= 60 - <= 100
Propan-2-ol	67-63-0	< 10

SECTION 4. FIRST AID MEASURES

General advice	: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	: If inhaled, remove to fresh air. Get medical attention if symptoms occur.
In case of skin contact	: Wash with water and soap as a precaution. Get medical attention if symptoms occur.
In case of eye contact	: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Causes serious eye irritation.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

Notes to physician : Treat symptomatically and supportively.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Dry chemical
Carbon dioxide (CO2)

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Do not use a solid water stream as it may scatter and spread fire.
Flash back possible over considerable distance.
Vapours may form explosive mixtures with air.
Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon oxides

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.

Hazchem Code : •3Y

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Remove all sources of ignition.
Use personal protective equipment.
Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions : Discharge into the environment must be avoided.

Prevent further leakage or spillage if safe to do so.
Prevent spreading over a wide area (e.g. by containment or oil barriers).
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Non-sparking tools should be used.
Soak up with inert absorbent material.
Suppress (knock down) gases/vapours/mists with a water spray jet.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.
Clean up remaining materials from spill with suitable absorbent.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : Use with local exhaust ventilation.
Use only in an area equipped with explosion proof exhaust ventilation.

Advice on safe handling : Avoid inhalation of vapour or mist.
Do not swallow.
Do not get in eyes.
Avoid prolonged or repeated contact with skin.
Handle in accordance with good industrial hygiene and safety practice.
Non-sparking tools should be used.
Keep container tightly closed.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.

Conditions for safe storage : Keep in properly labelled containers.
Keep tightly closed.
Keep in a cool, well-ventilated place.
Store in accordance with the particular national regulations.

Keep away from heat and sources of ignition.

Materials to avoid : Do not store with the following product types:
Self-reactive substances and mixtures
Organic peroxides
Oxidizing agents
Flammable gases
Pyrophoric liquids
Pyrophoric solids
Self-heating substances and mixtures
Poisonous gases
Explosives

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Ethanol	64-17-5	TWA	1,000 ppm 1,880 mg/m3	AU OEL
		STEL	1,000 ppm	ACGIH
Propan-2-ol	67-63-0	TWA	400 ppm 983 mg/m3	AU OEL
		STEL	500 ppm 1,230 mg/m3	AU OEL
		TWA	200 ppm	ACGIH
		STEL	400 ppm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Propan-2-ol	67-63-0	Acetone	Urine	End of shift at end of workweek	40 mg/l	ACGIH BEI

Engineering measures : Minimize workplace exposure concentrations.
Use only in an area equipped with explosion proof exhaust ventilation.
Use with local exhaust ventilation.

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type : Organic vapour type

Hand protection

Material : Impervious gloves

Material : Flame retardant gloves

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety goggles

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Wear the following personal protective equipment:
Flame retardant antistatic protective clothing.
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : gel

Colour : clear, Colorless to pale yellow

Odour : alcohol-like

Odour Threshold : No data available

pH : 6.5 - 8.5

Melting point/freezing point : No data available

Initial boiling point and boiling range : No data available

Flash point : 23.7 °C

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Upper explosion limit : No data available

Lower explosion limit : No data available

Vapour pressure : No data available

Relative vapour density	No data available
Density	0.8810 g/cm3
Solubility(ies)	
Water solubility	soluble
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature	No data available
Decomposition temperature	The substance or mixture is not classified self-reactive.
Viscosity	
Viscosity, kinematic	3,500 - 23,000 mm2/s (20.00 °C)
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	Not classified as a reactivity hazard.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Flammable liquid and vapour. Vapours may form explosive mixture with air. Can react with strong oxidizing agents.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Oxidizing agents
Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Exposure routes	Inhalation Skin contact Ingestion Eye contact

Acute toxicity

Not classified based on available information.

Components:

Ethanol:

Acute oral toxicity	LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity	:	LC50 (Rat): 124.7 mg/l Exposure time: 4 h Test atmosphere: vapour

Propan-2-ol:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 72.6 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	:	LD50 (Rat): > 5,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Product:

Result: No skin irritation

Components:

Ethanol:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Propan-2-ol:
Species: Rabbit
Result: No skin irritation

Serious eye damage/eye irritation

Causes serious eye irritation.

Components:

Ethanol:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Method: OECD Test Guideline 405

Propan-2-ol:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days

Respiratory or skin sensitisation

Skin sensitisation: Not classified based on available information.
Respiratory sensitisation: Not classified based on available information.

Product:

Assessment: Does not cause skin sensitisation.

Components:

Ethanol:
Test Type: Local lymph node assay (LLNA)

Exposure routes: Skin contact
Species: Mouse
Result: negative

Propan-2-ol:
Test Type: Buehler Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Chronic toxicity

Germ cell mutagenicity

Not classified based on available information.

Components:

Ethanol:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Result: negative

Genotoxicity in vivo : Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Application Route: Ingestion
Result: negative

Propan-2-ol:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Carcinogenicity

Not classified based on available information.

Components:

Propan-2-ol:
Species: Rat
Application Route: inhalation (vapour)
Exposure time: 104 weeks
Method: OECD Test Guideline 451
Result: negative

Reproductive toxicity

Not classified based on available information.

Components:

Ethanol:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Mouse

Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative

Propan-2-ol:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative
Effects on foetal development	:	Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative

STOT - single exposure

Not classified based on available information.

Components:

Propan-2-ol:
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Components:

Ethanol:
Species: Rat
NOAEL: 2,400 mg/kg
Application Route: Ingestion
Exposure time: 2 y

Propan-2-ol:
Species: Rat
NOAEL: 5000 ppm
Application Route: inhalation (vapour)
Exposure time: 104 w
Method: OECD Test Guideline 413

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Ethanol:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l Exposure time: 48 h
Toxicity to algae	: EC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 9.6 mg/l Exposure time: 9 d
Toxicity to bacteria	: EC50 (Photobacterium phosphoreum): 32.1 mg/l Exposure time: 0.25 h

Propan-2-ol:

Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 10,000 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 24 h
Toxicity to algae	: ErC50 (Scenedesmus quadricauda (Green algae)): > 1,800 mg/l Exposure time: 8 d
Toxicity to bacteria	: EC50 (Pseudomonas putida): > 1,050 mg/l Exposure time: 16 h

Persistence and degradability

Product:

Biodegradability : Result: Readily biodegradable

Components:

Ethanol:

Biodegradability	: Result: Readily biodegradable Biodegradation: 84 % Exposure time: 20 d

Propan-2-ol:

Biodegradability : Result: rapidly degradable

Bioaccumulative potential

Components:

Ethanol:

Partition coefficient: n-octanol/water : log Pow: -0.35

Propan-2-ol:

Partition coefficient: n-octanol/water : log Pow: 0.05

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION

International Regulation

UNRTDG

UN number : UN 1987
Proper shipping name : ALCOHOLS, N.O.S. (Ethanol, Propan-2-ol)
Class : 3
Packing group : III
Labels : 3

IATA-DGR

UN/ID No. : UN 1987
Proper shipping name : Alcohols, n.o.s. (Ethanol, Propan-2-ol)
Class : 3
Packing group : III
Labels : Flammable Liquids
Packing instruction (cargo aircraft) : 366
Packing instruction (passenger aircraft) : 355

IMDG-Code

UN number : UN 1987
Proper shipping name : ALCOHOLS, N.O.S. (Ethanol, Propan-2-ol)
Class : 3
Packing group : III
Labels : 3
EmS Code : F-E, S-D
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

ADG

UN number	UN 1987
Proper shipping name	ALCOHOLS, N.O.S. (Ethanol, Propan-2-ol)
Class	3
Packing group	III
Labels	3
Hazchem Code	•3Y

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Standard for the Uniform Scheduling of Medicines and Poisons	No poison schedule number allocated
Prohibition/Licensing Requirements	There is no applicable prohibition or notification/licensing requirements, including for carcinogens under Commonwealth, State or Territory legislation.

The components of this product are reported in the following inventories:

REACH	All ingredients (pre-)registered or exempt.
TSCA	All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.
DSL	All chemical substances in this product comply with the CEPA 1999 and NSNR and are on or exempt from listing on the Canadian Domestic Substances List (DSL).
AICS	All ingredients listed or exempt.

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), NECSI (Taiwan), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

Sources of key data used to compile the Safety Data Sheet	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/

Date format : dd.mm.yyyy

Full text of other abbreviations

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
AU OEL	Australia. Workplace Exposure Standards for Airborne Contaminants.
ACGIH / TWA	8-hour, time-weighted average
ACGIH / STEL	Short-term exposure limit
AU OEL / TWA	Exposure standard - time weighted average
AU OEL / STEL	Exposure standard - short term exposure limit

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information pro- vided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, un- less specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.

AU / EN

Safety Data Sheet
California CARB Compliant

1 - Chemical Product and Company Identification

Trade Name: WD-40 Multi-Use Product 25% VOC Bulk Liquid **Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion** **Restrictions on Use: None identified** **SDS Date Of Preparation: August 2, 2021**	**Manufacturer: WD-40 Company** **Address: 9715 Businesspark Avenue, San Diego, California, USA 92131** **Telephone:** **Emergency: 1-888-324-7596** **Information: 1-888-324-7596** **Chemical Spills: 1-800-424-9300 (Chemtrec)** **1-703-527-3887 (International Calls)**

2 – Hazards Identification

Hazcom 2012/GHS Classification:
Flammable Liquid Category 3
Aspiration Toxicity Category 1
Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)

Note: The 1 gallon size product is a consumer product and is labeled in accordance with the US Consumer Product Safety Commission regulations which take precedence over OSHA Hazard Communication labeling. The actual container label will not include the label elements below. The labeling below applies to larger containers sold for industrial/professional use.

Label Elements:

DANGER!
Flammable liquid and vapor.
May be fatal if swallowed and enters airways.
May cause drowsiness or dizziness.

Prevention
Keep away from heat, sparks, open flames, hot surfaces. – No smoking.
Keep container tightly closed.
Ground and bond containers and receiving equipment.
Use explosion-proof electrical equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing mists or vapors.
Use only outdoors or in a well-ventilated area.
Wear eye protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
In case of fire: Use water fog, dry chemical, carbon dioxide or foam to extinguish.

Storage
Store locked up.
Store in a well-ventilated place. Keep cool. Keep container tightly closed.
Disposal
Dispose of contents and container in accordance with local and national regulations.

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	GHS Classification
LVP Aliphatic Hydrocarbon	64742-47-8	40-50%	Aspiration Toxicity Category 1
Petroleum Base Oil	64742-56-9 64742-65-0 64742-53-6 64742-54-7 64742-71-8	<35%	Not Hazardous
Aliphatic Hydrocarbon	64742-47-8	<25%	Flammable Liquid Category 3 Aspiration Toxicity Category 1 Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)

Note: The specific chemical identity and exact percentages are a trade secret.

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.
Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.
Signs and Symptoms of Exposure: Harmful or fatal if swallowed. Aspiration of liquid into the lungs during swallowing or vomiting may cause lung damage. May cause eye and respiratory irritation. Inhalation of mists or vapors may cause drowsiness, dizziness and other nervous system effects. Skin contact may cause drying of the skin.
Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.
Specific Hazards Arising from the Chemical: Flammable liquid and vapor. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.
Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.
Methods and Materials for Containment/Cleanup: Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use with adequate ventilation. Keep away from heat, sparks, hot surfaces and open flames. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children.
Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials. NFPA 30 Class II Liquid.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
LVP Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m3 TWA (Inhalable) ACGIH TLV (as Mineral oil) 5 mg/m3 TWA OSHA PEL (as Oil mist, mineral)
Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)

The Following Controls are Recommended for Normal Consumer Use of this Product
Engineering Controls: Use in a well-ventilated area.
Personal Protection:
Eye Protection: Avoid eye contact. Safety glasses or goggles recommended.
Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended
Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
Personal Protection:
Eye Protection: Safety goggles recommended where eye contact is possible.
Skin Protection: Wear chemical resistant gloves.
Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light green to amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.8% UEL: 5.6%
Odor:	Mild petroleum odor	Vapor Pressure:	1 psi @38°C (100°F) ASTM D323
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 @ 60°F
Melting/Freezing Point:	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	322 - 388°F (161 - 198°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	138°F (59°C) Tag Closed Cup	Autoignition Temperature:	Not established
Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas):	Not Applicable	Viscosity:	2.79-2.96 cSt @ 100°F
VOC:	24.9% MIR=0.44 gO3/gVOC (204 grams/liter)	Pour Point:	-63°C (-81.4°F) ASTM D-97

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions
Chemical Stability: Stable
Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:
Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.
Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
Chronic Effects: None expected.
Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.
Reproductive Toxicity: None of the components is considered a reproductive hazard.

Numerical Measures of Toxicity:
Acute Toxicity Estimates: Oral > 5,000 mg/kg; Dermal >2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available; however components of this product are not expected to be harmful to aquatic organisms
Persistence and Degradability: Components are readily biodegradable.
Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.
Mobility in Soil: No data available
Other Adverse Effects: None known

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: Excepted from Hazmat (49CFR 173.150 (F)) in non-bulk packaging.
Bulk Packaging: UN1268, Petroleum Distillates, n.o.s., Combustible Liquid, PG III
IMDG Shipping Description: UN1268, Petroleum Distillates, n.o.s. 3, PG III
ICAO Shipping Description: UN1268, Petroleum Distillates, n.o.s. 3, PG III

NOTE: WD-40 Company does not test containers to assure that they meet the pressure differential and other requirements for transport by air. We do not recommend that our products be transported by air.

15 – Regulatory Information

U.S. Federal Regulations:
CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have

more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA TITLE III:

Hazard Category For Section 311/312: Refer to Section 2 for the OSHA Hazard Classification.

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

VOC Regulations: This product complies with the consumer product VOC limits of CARB, the US EPA and states adopting the OTC VOC rules.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not require a California Proposition 65 warning.

Canadian Environmental Protection Act: All of the ingredients are listed on the Canadian Domestic Substances List or exempt from notification

16 – Other Information

HMIS Hazard Rating:
Health – 1 (slight hazard), Fire Hazard – 2 (moderate hazard), Physical Hazard – 0 (minimal hazard)

Revision Date: August 2, 2021 Supersedes: March 5, 2019

Revision Summary: Section 9: Appearance

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

Reviewed By: I. Kowalski Regulatory Affairs Dept.

1022200/No.0084606

Appendix B

BlueScope Risk Matrix

The BlueScope risk matrix (including consequence and likelihood definitions) used to complete the HAZID process is presented below.

Table B.1 Consequence Descriptors

Consequence	Health and Safety	Environment
5	Harm ranging from the fatal injury of **2+ people i.e. multiple fatalities**	LAWWNE impact that is widespread on and off-site, requiring long term remediation and leaving major residual damage both on and off-site.
4	Harm ranging from health impacts and injuries with serious permanent effects up to and including the **fatal injury of 1 person**	LAWWNE impact that is widespread on-site, requiring long-term remediation and leaving some residual damage on site, with localised effect off-site that can be addressed in the medium term.
3	Harm ranging from **Lost Time Injuries** up to and including health impacts and injuries requiring hospitalisation and/or ongoing medical treatment with possibility of some moderate permanent effects	LAWWNE impact that is localised on-site and can be addressed in the medium term, with localised effect off-site that can be addressed in the short term.
2	Harm ranging from injuries resulting in temporary impairment and short-term recovery up to and including **Medically Treated Injuries**	LAWWNE impact that is localised on-site and can be addressed in the short term, with little (nuisance) effect off-site that can be promptly addressed.
1	Harm ranging from minor cuts, scratches, bruises up to and including **First Aid Treatment**	LAWWNE impact that is localised on-site and can be promptly addressed, with little or no effect off-site.

Table B.2 Likelihood Descriptors

Likelihood	Conventional Description	Supporting Indicators
5	**Almost certain** - expected to occur in most circumstances.	Risk controls based on internal or external guidance material No auditing and reporting on effectiveness of risk controls Incidents during review period are actual incidents or close calls
4	**Very likely** – will probably occur in most circumstances.	Risk controls based on internal or external guidance material Informal auditing in place to monitor and report risk control effectiveness Auditing not reported. Suspect serious risk control effectiveness issues Maybe some actual incidents, otherwise mostly close calls
3	**Possible** - might occur occasionally.	Risk controls based on a standard, meeting the law and comparable with industry peers Informal auditing in place to monitor and report risk control effectiveness Auditing indicates a few serious risk control effectiveness issues No actual incidents, some close calls, some proactive reporting
2	**Unlikely** - could happen at some time.	Risk controls based on a standard, meeting the law and comparable with industry peers. Formal auditing in place to monitor and report risk control effectiveness Auditing indicates no serious risk control effectiveness issues No actual incidents. Few close calls. Mostly proactively reported control failures
1	**Rare** - may happen only in exceptional circumstances.	Risk controls based on a standard, meeting the law and comparable with industry peers. Formal auditing in place to monitor and report risk control effectiveness Auditing indicates risk control effectiveness in all areas No actual incidents, few isolated control failures reported proactively

Table B.3 Risk Matrix

	CONSEQUENCE				
LIKELIHOOD	**1**	**2**	**3**	**4**	**5**
5	Medium (6)	High (7)	High (8)	Very High (9)	Very High (10)
4	Medium (5)	Medium (6)	High (7)	High (8)	Very High (9)
3	Low (4)	Medium (5)	Medium (6)	High (7)	High (8)
2	Low (3)	Low (4)	Medium (5)	Medium (6)	High (7)
1	Low (2)	Low (3)	Low (4)	Medium (5)	Medium (6)

Table B.4 Risk Treatment

Risk Rating	Risk Treatment
LOW	Risk and associated controls must be monitored and maintained. Further risk treatment if required to meet changed regulatory or industry standards.
MEDIUM	Risk and associated controls must be monitored and maintained. Further actions are considered during risk review to reduce so far as is reasonably practicable.
HIGH	Action required to reduce the risk in the short term (before next review). Risk and controls must be monitored and maintained.
VERY HIGH	Activity is not to be undertaken until risk reduction action has been taken.

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