Australian Dangerous Goods Code Comprehensive Review

Working group paper #4

National Transport Commission

Leading change

Safety equipment for dangerous goods transport

May 2023

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Report outline

Title	Australian Dangerous Goods Code Comprehensive Review – Safety equipment for dangerous goods transport
Type of report	Discussion paper
Purpose	For public consultation
Abstract	In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road & Rail (the Code) This paper is the fourth of a series of topic specific discussion papers. It discusses the safety equipment required to be carried on vehicles that are transporting significant quantities of dangerous goods. This paper explores the differences between the current Code and ADR, with a view to making the system risk-appropriate and easier to use.
Submission details	The NTC will accept submissions until 9 July 2023 online at **www.ntc.gov.au** or by email to: **dkirk@ntc.gov.au**
Attribution	This work should be attributed as follows, Source: National Transport Commission, Safety equipment for dangerous goods transport – discussion paper #4. If you have adapted, modified or transformed this work in anyway, please use the following, Source: based on National Transport Commission, Safety equipment for dangerous goods transport – discussion paper #4.
Key words	Dangerous goods, ADG Code review, safety equipment, transport, ADR
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Have your say

What to submit

This paper asks several questions relating to the safety equipment that is required to be carried when transporting dangerous goods. It does not include information on fire extinguishing equipment, which is the subject of a separate paper.

Please provide any relevant supporting information, explanation for your reasons, or data that you have when answering these questions; or when providing information in addition to the questions.

The experiences of individuals or organisations with experience in transporting placard loads of dangerous goods, and who are responsible for emergency response will be useful in understanding the current and future needs of the dangerous goods industry.

When to submit

We are seeking submissions on this issues paper by 9 July 2023.

How to submit

Any individual or organisation can make a submission to the NTC.

Making a submission

- Visit **www.ntc.gov.au** and select 'Have your say' on the homepage.

  Or

- Email your submission to **dkirk@ntc.gov.au**

Where possible, you should provide evidence, such as data and documents, to support the views in your submission.

Publishing your submission

Unless you clearly ask us not to, we publish all the submissions we receive online. We will not publish submissions that contain defamatory or offensive content.

The *Freedom of Information Act 1982* (Cwlth) applies to the NTC.

Contents

Purpose of this paper

The National Transport Commission (NTC) is conducting a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road & Rail (the Code).

In conducting the review, the NTC will seek to achieve greater alignment with the internationally recognised land mode-specific requirements contained in the Agreement for the International Transport of Dangerous Goods by Road (ADR) and the Agreement for the International Transport of Dangerous Goods by Rail (RID).

The review is focused on outcomes that serve the best interest of all parties involved in the transport of dangerous goods. This includes those parties on which the requirements are imposed, those who regulate and administer the requirements, and those who must maintain them.

Responses to the questions in this paper will be used to draft requirements for the future code.

The changes that are drafted will be subjected to further consultation to ensure the proposed draft text is suitable.

This paper uses edition 7.7 of the Code, and the 2021 edition of ADR as the source for the provisions. While these editions have now been superseded, this does not affect the content of this paper.

This paper relates to:

the Code – Part No.	☐	Working group	☒	Discrete issue	☒
		Tanks, vehicles, and emergencies		Safety Equipment	

Executive summary

The current Code contains a complicated table of equipment to be carried when transporting a placard load of dangerous goods. This also means that the required safety equipment can vary significantly when the load changes. By contrast, the ADR provides a simpler list that is much easier to interpret and implement.

Further, in the case of escape breathing apparatus, the ADG Code mandates air supplied breathing apparatus in almost all circumstances where toxic or corrosive materials are being transported. ADR instead requires a filtering escape mask where toxic dangerous goods are transported.

Context

A full review of the Australian Dangerous Goods Code (the Code) has not been conducted for over a decade.

The Code is applicable across Australia, and adherence to it by all relevant parties ensures specific risks posed through transport of dangerous goods by land are effectively managed.

In 2020, transport and infrastructure ministers agreed for the NTC to conduct a full review of the Code. The NTC's responsibility for the Code's content and stakeholder engagement over several years, highlighted that the road and rail specific requirements of the Code in particular, do not fully support the smooth and safe movement of dangerous goods across borders and transport modes.

The purpose of the review, therefore, is to ensure that the Code is reflective of the Australian transport environment, draws upon road and rail mode specific concepts used elsewhere in the world where appropriate, and considers inclusion of explosives as regulated dangerous goods under the Code's requirements.

Given the scale of the review, the content of the code has been broken into a series of topics. This paper focuses on the approval of tanks, bulk containers, and vehicles for dangerous goods transport.

Themes

Chapter 1 – Project to Review the Australian Dangerous Goods Code

In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Code.

The review seeks to better align Australia with international practices contained in the road and rail mode specific versions of the UN Model Regulations and will focus on improving transport of dangerous goods safety outcomes.

Chapter 2 – Context

The carrying of safety equipment for use by the driver or vehicle crew in the event of an incident is a mandatory requirement in the Code. It's assumed that every item of safety equipment has an intended purpose. However, the intended use of equipment and expectations on what actions drivers should take are unclear in the current code.

Chapter 4 – Purpose of safety equipment

This chapter explores issues relating to the choice of safety equipment that is required to be carried on dangerous goods vehicles, when it is to be used, and training that needs to be provided to drivers and vehicle crew.

Chapter 5 – Safety equipment required by ADR

This chapter sets out the safety equipment that ADR requires for dangerous goods transport, and how it is selected. It also explores whether the ADG safety equipment is mandated in other legislation.

Chapter 6 – Specific items of safety equipment

This chapter provides a detailed analysis of each of the items of safety equipment that ADR and the current Code require to be carried. It explores issues relating to specification and how requirements will be carried forward into the future Code.

Chapter 7 – Escape breathing apparatus

This chapter deals with the specific topic of breathing apparatus for escape purposes. The current Code and ADR take markedly different approaches to escape breathing apparatus, and this chapter includes a detailed examination of potential future outcomes.

Chapter 8 – Safety equipment for rail transport

This chapter notes the requirements for equipment to be carried during rail transport of dangerous goods under RID. No requirements are currently applied under the ADG Code.

Next steps

The responses to this paper will be used to develop a consultation draft of the safety equipment for the future Code. It is likely that the responses to multiple papers will be combined and developed as a single draft.

List of questions

1 About this project

Key points

- In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code).
- Mode-specific requirements of the current code consist of a repository of often disjointed, contradictory requirements that fall apart when closely examined.
- The review seeks to better align Australia with international practices as set out in the ADR and RID.
- The review will focus on outcomes that serve the best interest of all parties involved in the transport of dangerous goods.
- Given the scale of the review, the content of the code has been broken into a series of topics, each allocated to a topic specific working group.

1.1 Project objectives

In November 2020, transport and infrastructure ministers approved the NTC's recommendation to conduct a comprehensive review of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code). Ministers also supported the proposal to incorporate into the Code principles from both:

- The Agreement for the International Transport of Dangerous Goods by Road (ADR);
- the Agreement for the International Transport of Dangerous Goods by Rail (RID).

The ADR and RID are used extensively throughout Europe, Africa, and Asia. As with the Australian code, both the ADR and RID are based on the United Nations Recommendations on the Transport of Dangerous Goods - Model Regulations (UN Model Regulations). In general, the requirements of the ADR and RID are the same. They only differ where requirements need to apply specifically to either road transport or rail transport.

Stakeholder feedback over the years and a literature review of relevant materials suggests that the mode-specific requirements of the current code consist of a repository of often disjointed, contradictory requirements that fall apart when closely examined. In many instances, there was no supporting evidence or data for their introduction and there is no evidence that they have contributed to safer outcomes. The lack of consistency and cohesiveness in these requirements coupled with a lack of a framework for maintaining the mode-specific requirements results in a continuing cycle of ad-hoc, random amendments without consideration of the consequential inconsistencies or contradictions.

Goal of the review

The goal of the review is to deliver a code that:

- addresses the specific risks of transport by land, while also recognising any risks unique to the Australian transport environment

- remains contemporary; and
- is aligned to international practices that support the smooth and safe movement of dangerous goods across borders and transport modes.

The review is focused on outcomes that serve the best interest of all parties involved in the transport of dangerous goods. This includes:

- parties that must meet the requirements;
- parties that regulate and administer the requirements; and
- parties that must maintain the requirements.

The aim of the review is to deliver more than just a cohesive and contemporaneous code. We also aim to deliver a framework for making sure the Code remains up to date and aligned with international standards.

1.2 Background

In 2020, the NTC released an issues paper on the land transport of dangerous goods. The paper focused on the legislative framework that supports the dangerous goods code. However, the responses we received highlighted several problems with the code itself.

A major concern raised in submissions centred on the Australia-specific chapters of the current code. The biennial maintenance cycle of the Code, which keeps it aligned to the UN Model Regulations, is appreciated. However, many submissions noted the Australia-specific chapters have not been reviewed or revised. Many of these chapters were carried over from the sixth edition of the Code (ADG 6), either in full or in part, without examination. They have not been critically reviewed for over 15 years and are now outdated. In the case of some requirements, no evidence base, or justification can be found to support their original introduction.

Industry and regulators also noted the Australian Explosives Code is outdated and has no responsible agency. They expressed a strong preference for the dangerous goods code to be expanded to include Class 1 Explosives, and for the Australian Explosives Code to be made obsolete.

After analysing the submissions received, the NTC made recommendations to infrastructure and transport ministers. All recommendations were endorsed, including the following:

Recommendation 4:

Conduct a full review of the Australian Dangerous Goods Code to update outdated chapters, identify and correct translation errors, incorporate relevant ADR concepts and incorporate requirements for Class 1 and Division 6.2. Note: the technical requirements for Class 1 and Division 6.2 will be incorporated into the [ADG] Code but the legal requirements will not be incorporated into the regulations.

1.3 Approach

A set of Review Principles has been developed to guide the review and give it the best chance of delivering the right outcome. These principles were developed with regard to the following key considerations:

- Impacts and benefits;
- stakeholder engagement; and
- maintaining currency of the Code and associated model laws.

Given the scale of the review, the content of the code has been broken into a series of topics, each allocated to a topic specific working group.

This discussion paper deals specifically with questions relating to emergency equipment that is required to be carried for when transporting dangerous goods. Fire extinguishers are out of scope for this paper and will be dealt with in a separate paper. This paper also includes some questions relating to the instructions in writing in ADR, these will also be dealt with separately.

Previous consultation papers for this review include:

- Classification of dangerous goods – Working group paper #1, January 2023
- Dangerous Goods List – UN entries – Working group paper #2, February 2023
- Tank provisions in ADR – Terminology – Supplementary paper #S1, March 2023
- Approval of tanks, bulk containers and vehicles – Working group paper #3

2 Context of issues

Key points

- The intended use of safety equipment specified in the Code is not clear.
- The variation in required safety equipment for different loads appears unnecessarily complicated.

The carrying of safety equipment for use by the driver or vehicle crew in the event of an incident is a mandatory requirement in the Code. The requirements, which are specified in Table 12.2 of the current code, vary depending on the classes of dangerous goods in the load.

It's assumed that every item of safety equipment has an intended purpose. Likewise, it can be assumed that equipment with no intended purpose should not be mandated. To determine the purpose of each required item, there needs to be a clear understanding of what actions the driver or vehicle crew are expected to take when involved in an incident. These expectations are unclear in the current code.

Scope of this paper

This paper deals with questions relating to the safety equipment that is required when transporting dangerous goods. It does not cover the required fire extinguishers for dangerous goods transport. Requirements relating to fire extinguishers are discussed in working group paper #4 – Fire extinguishers for dangerous goods transport.

Except for chapter 8, this paper has been written for road transport, while chapter 8 includes information on rail transport requirements from RID. Additionally, this paper has been prepared primarily considering dangerous goods other than explosives. Input from the explosives working group will be sought when the final requirements are developed.

This paper also does not discuss when safety equipment must be carried, which will be considered as part of the work on thresholds. Under the current Code, safety equipment is mandatory when transporting a placard load. Under ADR safety equipment is mandatory when transporting a load that is not a small load (a similar concept to that of a placard load).

Purpose of safety equipment (Chapter 4)

Safety equipment is required to be carried as part of the transport of dangerous goods, but no information is provided in the current Code about why, or when it is to be used. Some safety equipment may also have a secondary purpose for work health and safety. Such uses are out of scope for the Code and this paper.

Required safety equipment (Chapters 5 & 6)

The safety equipment that is required to be carried varies between dangerous goods transport regimes. Determining what equipment is appropriate to include in the list of equipment and how to select it is a complex topic. The current approach requires a change to the items of safety equipment each time the load changes or risk non-compliance.

Common industry practice is to provide a standard set of safety equipment that works for all loads. The exception to this is dedicated transport, e.g. tank vehicles.

Escape breathing apparatus (Chapter 7)

Breathing apparatus for escape purposes is a complex topic, and there are significant variations between ADR, the current Code, and past editions of the Code. Self-contained breathing apparatus is effective but is also expensive to supply and maintain.

3 Terminology

As used in the paper, the terms ‘safety equipment’ and ‘escape breathing apparatus’ are taken to mean the following.

Safety equipment

The term *“safety equipment”* is used in this paper to describe the equipment that is required to be carried in Chapter 12.1 of the current code, or by Section 8.1.5 of ADR. Other commonly used terms include personal protective equipment, PPE, or emergency equipment.

Escape breathing apparatus

The term *“self-contained breathing apparatus”* or *“SCBA”* is used in this paper to describe breathing apparatus where oxygen or breathable air is supplied directly to the user. Several terms have been used historically to describe this, including air-supplied breathing apparatus, emergency escape breathing apparatus, emergency escape breathing device. These may either supply oxygen from a bottle or by chemical generation.

The term “*filtering escape mask”* is used in this paper to describe a mask that does not provide an independent air supply but filters out contaminants. Filtering escape masks can be specified for different chemicals and provide different performance levels, so selection of filter properties is an important variable.

Instructions in writing

The term “*instructions in writing”* refers to the instructions in writing specified in 5.4.3.4 of the ADR. They are used as an aid during an accident emergency situation that may occur or arise during carriage. They are required to be carried in the vehicle crew’s cab and be readily available during transport. A copy of the ADR instructions in writing Is provided in Appendix A.

4 Purpose of safety equipment

Key points

- The current code does not define why safety equipment is to be carried, or when it is to be used. Training in its use is implied, but not explicitly stated.
- ADR provides some information on when equipment is to be used, and the mandatory training for drivers includes information on its use.

4.1 What is the safety equipment for?

The current code does not define the purpose of the safety equipment that is to be carried, but from the context it is obviously intended for the protection of the driver (or other personnel on the vehicle).

The ADR similarly does not clearly define the purpose of the equipment, but the reference to it in the instructions in writing clarifies that the equipment is for use in emergencies.

For the purposes of this paper, it is presumed that:

- the primary intent of the equipment is for the protection of the driver when responding to an incident
- some of this equipment may have a secondary purpose of supporting routine work around the vehicle.
  - The WHS (or similar) regulatory framework is the appropriate regime for selection and use of equipment for routine work purposes, and this overlapping use is considered incidental for the regulation of dangerous goods transport.

There is also an unwritten expectation that the driver will take action to alert other road users and members of the public to prevent them from accessing the incident area. This raises the question as to whether the driver should also take action, where safe to do so, to minimise harm to the environment, for example, by preventing dangerous goods entering drains and waterways. Edition 6 of the ADG Code included these actions as specific responsibilities of the driver in an emergency.

An important first step in determining the appropriate safety equipment to be carried is establishing the expectation on the driver. Is their role to protect themselves, the public and the environment, where safe to do so? Or should the driver be expected to actively respond to an incident. If the latter, then there are several factors that need to be considered, including:

- The dangerous goods involved, are they the same for each journey or are they different for each load?
- the physical ability of the driver
- the training provided
- safety of the driver.

These factors are likely to be different for each organisation, each driver and each operation. The decision for a driver to take an active role in responding to an incident involving dangerous goods in the load may be better considered in the context of WHS, rather than as a standard role of a driver.

This paper is based on the presumption that the safety equipment specified in the code is a generic list of the minimum requirements in the event of an emergency when transporting dangerous goods. A risk assessment of specific transport operations or activities tasked to a driver may identify additional safety equipment.

4.2 When is the safety equipment to be used?

The Code provides very limited information on expectations relating to the use of the mandatory safety equipment. It directs that the equipment must be carried, and that where it is for escape purposes it must be provided for anyone travelling in the vehicle.

However, the Code provides no information on how the driver is expected to respond to an incident. The Code requires emergency information in the form of the Australian & New Zealand Emergency Response Guide (ANZ-ERG) (or individual guides), which provides detailed first response information, to be carried in the vehicle. The ANZ-ERG does not differentiate between actions the driver may be expected to take (as compared to emergency services), and when they may need to use the equipment provided. The emergency response guides in the ANZ-ERG are replicated from the Emergency Response Guide (ERG) developed by Transport Canada, the US Department of Transportation and the Secretariat of Transport and Communications of Mexico, with help from the Centro de Informacion Quìmica para Emergencias of Argentina (CANUTEC). CANUTEC state that the ERG is intended for firefighters, police, and other emergency responders. While the information may be of use to a driver, they are not the primary audience for the ANZ-ERG.

With no clear expectations set on the role of the driver, there may be significant variations in how individual drivers, companies or regulators interpret the role of the driver in an incident. The lack of clarity of the driver's role in an incident also makes it difficult to assess if the equipment specified is appropriate. In edition 6 of the Code, the driver was provided with instructions to "take all safe and practicable steps to carry out any emergency procedures recommended in the emergency information".

The instructions in writing that are mandated by ADR note when the use of an emergency escape mask is required and provide information about expectations relating to the use of the other safety equipment. By contrast, no such information is provided in the Code or in the ANZ-ERG. A copy of the instructions in writing from ADR is provide in Appendix A.

For example, the following instructions are provided (note that this is an incomplete extract):

- Put on the warning vest and place the self-standing warning signs as appropriate
- Do not walk into or touch spilled substances and avoid inhalation of fumes, smoke, dusts, and vapours by staying up wind
- Fires in load compartments shall not be tackled by members of the vehicle crew
- Where appropriate and safe to do so, use on-board equipment to prevent leakages into the aquatic environment or the sewage system and to contain spillages.

4.2.1 Training in the use of safety equipment

There is an implicit expectation in the instruction and training requirements of the current regulatory framework that if a person is expected to do something in the transport of dangerous goods that they will "[receive] … appropriate instruction and training to ensure that he or she is able to perform the task safely and in accordance with [the] subordinate instrument". However, no explicit requirement or direction to do so is included in the current Code.

By contrast, ADR includes "what to do after an accident (first aid, road safety, basic knowledge about the use of protective equipment, instructions in writing, etc.)" as a component of the basic training course required in Section 8.2.2.3.2. This means that all drivers who will drive a dangerous goods vehicle that is required to carry safety equipment are provided with basic knowledge on the use of safety equipment.

Whether the future code mandates a training course for all placard load drivers, or not, inclusion of a requirement for training in the use of mandatory safety equipment would be a minimum expectation under work health and safety legislation (WHS). If there is an expectation that a driver should actively respond to an incident, then full emergency response training would be expected.

Question 1: Should a driver undertake emergency response actions once the dangerous goods in the load are involved (other than evacuation and minimising harm to the public and environment, where safe to do so)? Please include your reasoning.

Question 2: If you believe a driver should undertake emergency response, should this be a requirement within the ADG Code or left for organisations to determine on a case-by-case basis? Please provide your reasoning

Question 3: Should the Code include a requirement to carry written instructions about when and how the required emergency equipment is expected to be used?

Question 4: Should the Code use the format of the ADR instructions as a standardised in-cab "quick reference guide" for transport?

Question 5: Should this information be in addition to, or in place of, the required emergency information contained in the ANZ-ERG?

5 Safety equipment required by ADR

Key points

- ADR contains a simplified list of safety equipment when compared to the complex table in the Code
- ADR does not generally define standards that are required to be met for performance, with this being left to the transporter to determine.

5.1 List of safety equipment

Table 12.2 of the current code specifies the safety equipment that must be carried. The specific equipment required is dependent on the dangerous goods in the load. The list of safety equipment in the code is intended as a standard set of equipment, applicable to all loads. A risk assessment may identify additional equipment for specific transport operations.

Problem with the current code

Table 12.2 is complex and specifies different equipment depending on the dangerous goods in the load. This can result in multiple changes to the content of the drivers PPE bag, increasing the potential for items to be missed. While the purpose of specific items of equipment appears self-explanatory for some items, this is not the case for all included items.

The table also includes items that have the potential to increase risk to the driver. For example, the requirement for a chemically resistant suit or coveralls. Is it a realistic expectation that a driver will put this on while standing on the side of a road? This reiterates the question of what is expected of a driver in the event of an incident. A full excerpt of Table 12.2 and the associated requirements is provided in Appendix B.

Draft code

As part of the code review, the NTC proposes to introduce a simplified list of safety equipment, modelled on the list in the ADR. The equipment to be carried on the vehicle is specified in 8.1.5 of ADR. An excerpt of these requirements can be found in the instructions in writing, provided in Appendix A.

The following table provides a brief outline of the equipment required in the ADR for all loads above the small loads threshold in ADR section 1.1.3.6. Further discussion on each item of equipment is contained in section 6.

Equipment	Notes	When is it required
A wheel chock of a size suited to the maximum	Minimum of one required for each vehicle	All loads

mass of the vehicle and to the diameter of the wheel		
Two self-standing warning signs	Comparable to the requirement for AS 3790 breakdown triangles	All loads
Eye rinsing liquid	ADR does not provide guidance on size or being filled and ready for use.	All loads except classes 1 and 2

For each member of the vehicle crew:

Equipment	Notes	When is it required
A warning vest	EN ISO 20471 describes high-visibility workwear	All loads
Portable lighting apparatus conforming to ADR 8.3.4	A torch. Section 8.3.4 requires that the torch "shall not exhibit any surface liable to produce sparks."	All loads
A pair of protective gloves	No guidance is provided on these.	All loads
Eye protection	ADR provides the example of "protective goggles"	All loads

Additional equipment for certain classes or divisions of dangerous goods:

Equipment	Notes	When is it required
An emergency escape mask	emergency escape mask with a combined gas/dust filter of the A1B1E1K1-P1 or A2B2E2K2-P2	When transporting divisions 2.3 or 6.1
A shovel		When transporting solids and liquids of class/division 3, 4.1, 4.3, 8 or 9
A drain seal		
A collecting container		

5.2 Selection of safety equipment

ADR generally doesn't specify standards to apply, leaving the decision on the appropriateness of a particular item to the transporter. This paper seeks input on the following options for future use of Australian Standards to specify selection and performance.

Option 1: If there is a relevant Australian Standard, include it as mandatory.

Option 2: If there is a relevant Australian Standard, include it for reference only

Option 3: Do not include Australian Standards.

ADR does not provide a table of classes and divisions and the equipment to be carried for each. This was replaced by a simplified list in 2007.

Question 6: Which of the three options for Australian Standards do you prefer? Please include your reasoning.

Question 7: Do you believe simplifying the list of safety equipment in the future code would have a negative impact on safety? Please provide details.

Question 8: Are you aware of legislation (other than DG transport legislation) that references the equipment requirements of the Code? Please provide details.

6 Specific items of safety equipment

Key points

- This section discusses each of the items of safety equipment required by ADR and the current code.
- Potential outcomes for some items are included for illustration. Responses received during consultation will help shape the final draft.

6.1 Wheel chocks

The current code does not require wheel chocks to be carried on dangerous goods vehicles. While tank vehicles are required to be fitted with drive-away protection systems under recent editions of AS 2809, no similar requirement applies to other vehicles.

Preliminary information from the working group indicates that transport operations in Europe don't use the vehicle brakes in the same way as Australia, making the wheel chocks more important in those jurisdictions.

While there is anecdotal evidence of several incidents of inadvertent movement of parked vehicles, these appear to be the result of the vehicle being left in gear and the park brake not engaged.

There is no proposal to include wheel chocks in the future code unless there is an identified benefit to requiring them.

Note that the Australian Explosives Code requires wheel chocks to be provided in certain circumstances, this requirement for explosives vehicles will be considered by the Explosives working group.

Question 9: Are there any circumstances that you believe would require the use of wheel chocks? Please provide details.

6.2 Self-standing warning signs

Section 12.1.1(b) of the current code specifies portable warning devices as part of the equipment required to be carried, but no further information is provided. Additionally, the code provides for their use in 13.1.2 where a vehicle has broken down.

The Model Australian Road Rules (ARR)(Part 13, Division 4) requires all vehicles with a GVM exceeding 12 tonnes to carry at least 3 portable warning triangles. The ARR also specify how the warning triangles are to be used. There are no mandatory requirements in the ARR for warning triangles to be carried by vehicles with a GVM not exceeding 12 tonnes. The duplication of requirements in the ARR and the Code risks the potential for conflict or contradiction if the Code is not updated to reflect future changes in the ARR. However,

omitting the requirements from the Code would result in there being no specified requirements for vehicles not exceeding GMV 12 tonnes.

To ensure the future code does not create gaps in requirements or introduce potential conflict with the ARR, the following options are proposed.

Option 1: Specify requirements for portable warning triangles but only for vehicles not covered by the ARR, i.e., vehicles with a GVM not exceeding 12 tonnes.

Option 2: Continue to specify requirements for all vehicles with a clarification that if there is a conflict with the requirements in the ARR, the ARR takes precedence.

For consistency of terminology, it may also be appropriate to update the terminology in the future code to portable warning triangles to align with the ARR.

The ARR do not define a Standard for portable warning triangles, and no Australian Standard could be found for these items.

Question 10: Which of the two options for specifying portable warning triangles do you prefer? Please provide your reasoning.

Question 11: Are you aware of an Australian Standard for the design of portable warning triangles? Please provide details.

6.3 Eye rinsing liquid

The current code requires a portable eye-wash kit with a capacity of at least 250 mL, filled and ready for use to be carried. This requirement does not apply to dangerous goods of 2.1 or 2.2.

Under WHS legislation, the cabin of the vehicle is considered the drivers workplace. As such, it's likely that the requirement for access to portable eyewash would be an expectation for all drivers, whether transporting dangerous goods or general freight. However, the risks associated with dangerous goods is likely more significant, warranting a specific requirement in the code.

No Australian Standard exists for portable eyewash bottles, and AS 4775-2007 notes that these do not comply with this standard (Emergency eyewash and shower equipment).

The list of required safety equipment in the ADR includes a requirement to carry eye rinsing liquid but does not specify a minimum size. Additionally, the ADR does not require eye rinsing liquid for classes 1 or 2, while ADG does require it for division 2.3. In keeping with current workplace expectations and to simplify the list of standard safety equipment, this paper proposes to apply the eye rinsing liquid requirement to all loads.

Question 12: Should the requirement for eye rinsing liquid continue to specify a minimum of 250 mL?

Question 13: Are you aware of an Australian Standard for eye rinsing liquid? Please provide details.

6.4 Warning vest

There is currently no requirement in the code for a warning vest to be carried or worn.

The ADR specifically requires a “warning vest”, however an option would be to deem this to be met by complying high-visibility workwear. This clothing is quite common in the Australian transport industry, and garments suitable for day and night wear are routinely available in Australia.

AS/NZS 4602.1:2011 describes “high visibility safety garments for occupational wear by people who may be exposed to the hazard of moving traffic, moving plant or equipment in high-risk situations”.

Question 14: Should a requirement to carry high-visibility clothing be incorporated into the Code?

Question 15: If yes, should high-visibility (day and night) workwear be deemed to meet this requirement?

6.5 Portable lighting apparatus (torch)

An electric torch is required to be carried in all vehicles transporting dangerous goods. Where the load includes dangerous goods that are flammable materials or organic peroxides (2.1, 3, 4 or 5.2) the torch must comply with AS 60079.11 or another recognised standard. The requirement for compliance with AS 60079.11 considers the risks associated with the dangerous goods only, it does not consider the environment in which the torch may be used.

A review of several commercially available dangerous goods driver PPE kits shows that intrinsically safe torches are included as a standard item.

Extending the requirement for an intrinsically safe torch to all classes of dangerous goods would simplify the list of safety equipment required and algin with current industry practice.

The list of required safety equipment in the ADR includes a portable lighting apparatus (torch) for each member of the vehicle crew. Section 8.3.4 mandates that the torch “not exhibit any metal surface liable to produce sparks” but it does not otherwise require intrinsic safety. This requirement applies to all torches that are carried for the purposes of ADR. ADR does not define how this is to be interpreted. A review of commercially available devices for this purpose indicate that this is expected to be intrinsically safe. There are special provisions for infectious substances and radioactive substances that provide a concession from this requirement. Incorporating this requirement would mean that almost all loads of dangerous goods would require an intrinsically safe torch.

Question 16: Do you support extending the requirement for intrinsic safety to all torches required for dangerous goods? Please provide your reasoning.

6.6 Protective gloves

ADR requires that a pair of protective gloves are provided for all loads that require emergency equipment.

The current code does not impose a particular standard that protective gloves must meet, other than being chemically or thermally resistant. Thermally resistant gloves are required for class 2, elevated temperature substances, or dry ice. Chemically resistant gloves are required for all other loads of dangerous goods, except class 9.

The AS 2161 series of standards provides specifications for occupational protective gloves. Mandating this standard could introduce a need for several different types of gloves to be carried, particularly for loads of mixed dangerous goods. Where a driver performs other roles, e.g., product transfer, the requirement for protective gloves would be governed by WHS requirements and be additional to the Code.

In keeping with the proposal to simplify the list of safety equipment in the future code, we propose to specify protective gloves to be carried for all loads, leaving the transport provider to determine the type of gloves appropriate for their operations.

Question 17: Is it necessary to define the type of protective gloves that are required? Please provide your reasoning.

6.7 Eye protection

ADR requires eye protection for all loads. It defines eye protection as “protective goggles” rather than “safety glasses” or similar. No further guidance is provided on interpreting this.

The current code only requires gas tight goggles or a full-face shield for some materials.

It’s understood that eye protection is now a standard expectation on all transport and industrial sites in Australia. If this is the case, then every driver should have safety glasses in their vehicle.

Question 18: Should the list of required safety equipment include eye protection for all loads?

Question 19: Is there an appropriate standard to reference for eye protection (such as 1337)?

6.8 Shovel, drain seal and collecting container (spill kit)

The code does not currently require these items to be carried. The ADR includes a requirement for a shovel, drain seal and collecting container to be carried when transporting solids and liquids of class/division 3, 4.1, 4.3, 8 or 9.

There is a reasonable expectation that, where safe to do, action should be taken to prevent spills entering drains or waterways. This can only be achieved if the driver has the necessary equipment to do so, such as a drain seal, or a shovel to enable the construction of an improvised bund.

As a comparison, the NSW waste transport regulations require a licensed waste transport to carry “a spill kit that is appropriate for the type of waste being transported.” No guidance is available on how this is to be interpreted.

The transport emergency response plan (TERP) may identify specific items to be included in a spill kit for the types of loads carried. It’s important to distinguish between basic equipment to reduce harm to the environment and more tailored equipment required for clean-up of a spill. Where the TERP requires specific equipment, this should be in addition to the standards list of equipment.

Question 20: Should the list of general equipment to be carried include a shovel, drain seal and collecting container? Please provide your reasoning.

Question 21: If yes, should this requirement be extended beyond the ADR requirement (“when transporting solids and liquids of class/division 3, 4.1, 4.3, 8 or 9”)?

6.9 Chemically resistant suit/coveralls, and boots

ADR does not require dangerous goods vehicles to carry these items. Under the current code, these are required for divisions 5.1, 5.2, 6.1 and class 8. No guidance is provided in the Code for when a chemically resistant suit may be required. There is also no rationale as to why they are required for some classes and not for others.

If this requirement is considered for retention in the future code, there would need to be a clear understanding of when they should be worn and how they can be safely donned in a transport situation.

If the basic expectation of a driver during an incident is protection of themselves, the public and the environment, then chemically resistant clothing and boots may not be of benefit. If the expectation is that the driver should enter a spill, this may be better addressed through the organisation’s risk assessment and operational procedures.

Unless there is a demonstrated reason for retaining this requirement, we propose to remove it. Notwithstanding that it may be required for the driver to perform other tasks.

Question 22: Do you believe the requirements for a chemically resistant suit and boots should be retained in the standard list of safety equipment? If so, please provide your justification.

7 Escape breathing apparatus

Key points

- The current Code requires self-contained breathing apparatus for a wide range of materials. This is somewhat different to previous editions of the Code.
- ADR requires filtering escape masks for a more limited range of materials than the current Code.
- This chapter examines these differences, how the future Code may specify escape breathing apparatus, and potential modifications to align current practice and practices in ADR.

The most significant potential difference between ADR and the current Code are the requirements relating to escape breathing apparatus. Consequently, this issue is addressed separately in this section.

While self-contained breathing apparatus (SCBA) may be considered the “gold-standard” for supporting escape, this requirement is not without drawbacks. SCBA is expensive to purchase and maintain, especially given that it is not expected to be used on an ongoing basis. To use it successfully, the person using it must be sufficiently trained and confident in its use to deploy it in an emergency. SCBA fitted with cylinders may pose a significant risk to the vehicle crew in the event of a crash.

Filtering escape masks are much simpler to fit-check, train users on their correct application, and are cheaper to supply and maintain.

7.1 Requirements under Australian Codes

7.1.1 The current Code (Edition 7)

At present, all placard loads containing division 2.3 (toxic gases), division 6.1 (toxic liquids and solids) and class 8 (corrosives) require SCBA to be carried for the driver and any passengers in the vehicle.

The SCBA is required to provide 15 minutes of breathable air and can only be omitted in circumstances “where the dangerous goods will not give rise to harmful vapours, gases or dust, even in an emergency”. No additional criteria for assessing this condition are provided.

This requirement was a significant change from the requirement under earlier editions of the Code.

Special provision TP13 for portable tank transport

Approximately 320 entries in the current Code have special provision TP13 against their portable tank instructions. TP 13 requires SCBA to be carried whenever transport of these materials is undertaken in tanks or bulk containers.

When these materials are being transported, self-contained breathing apparatus is required. The UN Guiding Principles require this provision to be applied to substances that are toxic by inhalation. This recognises the significant risk from substances transported in large containers that carry a specific hazard related to toxicity by inhalation.

These entries include some materials that are not assigned to division 6.1, either as a primary or subsidiary hazard.

TP13 does not apply to any division 2.3 substances. As the only effect of TP13 is to require SCBA where portable tanks are being transported, extending this to any division 2.3 entries should not cause unnecessary maintenance or harmonisation issues.

A detailed list of these entries is included in Appendix C

7.1.2 Edition 6 (and earlier) of the Code

Under edition 6 of the Code the following requirements were imposed:

For division 2.3: self-contained breathing apparatus if required by other legislation where the driver attends to loading or transfer of goods. Otherwise, short-term breathing apparatus for escape purposes is required.

For division 6.1 and class 8: Where the dangerous goods may give rise to harmful vapours, gases, or dust, SCBA may be required by other legislation where the driver attends to loading or transfer of goods. Otherwise, short-term breathing apparatus for escape purposes is required. SCBA is not required for flat top vehicles loaded with IBCs or packages only.

The NTC has been unable to identify any specific discussion, information or risk basis to justify the increase in requirements when ADG 7 was introduced. Nor could a cost benefit analysis be found. The only information relating to breathing apparatus that could be found was in relation to updates to the emergency action codes.

7.1.3 NTC survey – 2021

In 2021, the NTC invited transport operators to participate in a survey on the requirements and use of escape respirators. In total, 73 responses were received. The responses received accounted for more than 2800 vehicles that regularly transport placard loads containing dangerous goods of Classes 2.3, 6.1 or 8. The actual number of vehicles is likely to be much higher, as one response simply said ‘many’ when asked to provide the number of vehicles. It’s expected that each vehicle would make at least one journey per day, with many vehicles making multiple journeys per day. In all, only two reports were received of a driver using the escape respirator in the event of an incident. No details could be obtained on the circumstances in which the respirators were used.

7.2 Safety equipment required under ADR and RID

ADR only requires an emergency escape mask for divisions 2.3 and 6.1. ADR defines an appropriate emergency escape mask as one with a combined gas/dust filter of the A1B1E1K1-P1 or A2B2E2K2-P2 (though SCBA would also meet these requirements). No masks are required by ADR for the transport of class 8.

Further, special provision TP13 was deleted from ADR and RID in 2002, meaning there are no scenarios where SCBA is required under ADR, though there may be other legislation that requires it to be provided or carried. In the paper proposing the deletion of TP13, the following justification was provided:

> "The requirement for a self-contained breathing apparatus may well be appropriate for marine transport but should not be recommended for drivers of transport units carrying dangerous goods by road or by rail. Rather than loosing [sic] time and endangering his life whilst putting on the breathing apparatus, a driver should make use of an escape mask and should leave the danger area as soon as possible in case of emergencies involving such dangerous goods. As far as road and rail transport is concerned, a self-contained breathing apparatus is reserved for trained fire fighters who can make an approach from outside the scene of the accident."

7.3 What is escape breathing apparatus intended to achieve?

SCBA provides breathable air for a person to escape a situation where breathable air is not available. Further, Table 4.7 of AS 1715:2009 provides selection criteria for escape purposes. Generally, SCBA is only called for where oxygen deficiency may occur, or where the respiratory protection (such as a filter) will be overwhelmed resulting in breakthrough by toxic materials.

In transport incidents, it is reasonable to question whether sufficient vapour will be generated to result in oxygen displacement or breakthrough of a filter, especially where the dangerous goods is in smaller packages. This is additionally the case where the purpose of the escape breathing apparatus is to facilitate escape from the incident, rather than facilitating combat.

AS 1716:2012 provides a standard for filtering self-rescuer for industrial situations and the selection of an appropriate filtering mask. ABEK filtering gas cartridges protect against a range of organic and inorganic gases and vapours, including toxic and acidic gases, and are readily available.

7.3.1 Breathing apparatus required for loading and unloading of dangerous goods

Under workplace health and safety legislation breathing apparatus may be required to be carried and used for loading and unloading processes, this was specifically referred to under ADG 6 and earlier. Changes to the Code requirements would not affect this.

7.4 Possible changes to escape breathing apparatus requirements

This section presents several potential outcomes, there is likely to be other legislation that requires a driver to be provided with escape breathing apparatus (such as WHS legislation). This only affects the prescribed escape breathing apparatus for dangerous goods transport.

The prescribed equipment also does not prevent a transporter from providing SCBA to their drivers and vehicle crew if they consider it necessary.

Option 1: Blended requirement of TP13 and ADR requirements

When transporting dangerous goods of division 2.3 or 6.1, a filtering emergency escape mask would be required. Further, when transporting dangerous goods in tanks or in bulk where TP13 applies, SCBA would be required.

TP13 does not apply to any division 2.3 substances, which may be seen as a significant gap. If this option is chosen, it is proposed to apply TP13 to all entries of division 2.3. This modification would be simple to maintain in future, by adding TP13 to any new division 2.3 entries be made.

The net effect of these changes would be:

- SCBA required when transporting division 2.3 or any entry with TP13 in tanks
- Filtering escape mask when transporting any other division 2.3 or 6.1 materials in packages
- No mask required to be carried when transporting class 8 (where not otherwise required).

To support awareness of this requirement, it would be valuable to note this additional requirement of TP13 in the list of personal protective equipment. This would mean that attention is drawn to the need to check this special provision for all users of the code. A requirement to include information on special provisions (generally) for the driver in transport documents would further enhance this protection.

An additional modification would be to require a filtering escape mask for class 8 substances. This would require consequential modifications to the instructions in writing.

This option would more closely resemble the requirements applied by the 6th edition of the Code.

Option 2: Aligning future requirements with the ADR

This would mean that a filtering emergency escape mask would be required to be provided when transporting dangerous goods of division 2.3 or 6.1. No emergency escape mask would be required for class 8 dangerous goods unless they had a subsidiary risk of 6.1. Aligning with the ADR would also more closely align to what was in place in ADG 6.

There would be no requirements for SCBA unless required for other tasks, e.g., product transfer.

Option 3: Retain requirements as currently included in ADG 7

This option would retain the requirement to provide SCBA whenever transport of division 2.3, 6.1 or class 8 is transported under any scenario. This option would continue to carry the significant costs associated with obtaining and maintaining the use of such equipment for all these loads, and the training associated with the use of such equipment.

This option will not be considered without evidence that:

- SCBA has contributed to safer outcomes in transport incidents, than would have been provided by a filtering escape emergency mask; and
- it is reasonable to expect that escape from a road vehicle is likely to take place in an oxygen depleted environment.

Question 23: Which of the three options do you prefer? Please provide your reasoning.

Question 24: If you support Option 3, do you have data or evidence to support the need for an escape respirator to be oxygen fed?

Question 25: Should the requirement for an escape respirator be extended to Class 8? Please provide your justification.

8 Safety equipment for rail transport

RID contains similar instructions in writing to ADR, and notes two items of safety equipment to be carried during rail transport of dangerous goods:

- Carried in the driver's cab:
  - Portable lighting apparatus
- For the driver:
  - suitable warning clothing

It also includes a note that "The equipment to be kept available shall, if necessary, be supplemented according to existing national specifications."

The current Code does not specify any safety equipment for rail transport, Chapter 12.1 of the Code only applies to road vehicles.

Input will be sought from the rail specific working group on safety equipment for rail.

9 Next steps

Consultation on this paper will close at 5:00 pm 9 July 2023.

Submissions received will be used to develop proposed provisions for the future code. Due to the complexity of these provisions, the proposed provisions may be prepared after other papers containing critical questions have completed consultation.

Opportunities to comment on other provisions in the code will be provided over the next 12 months. A complete draft code will be released for public comment in early 2024

Appendix A ADR Instructions in writing

ADR Section 5.4.3 Instructions in writing

5.4.3 Instructions in writing

5.4.3.1 As an aid during an accident emergency situation that may occur or arise during carriage, instructions in writing in the form specified in 5.4.3.4 shall be carried in the vehicle crew's cab and shall be readily available.

5.4.3.2 These instructions shall be provided by the carrier to the vehicle crew in language(s) that each member can read and understand before the commencement of the journey. The carrier shall ensure that each member of the vehicle crew concerned understands and is capable of carrying out the instructions properly.

5.4.3.3 Before the start of the journey, the members of the vehicle crew shall inform themselves of the dangerous goods loaded and consult the instructions in writing for details on actions to be taken in the event of an accident or emergency.

5.4.3.4 The instructions in writing shall correspond to the following four-page model as regards its form and contents.

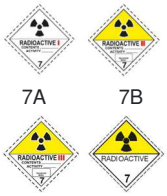
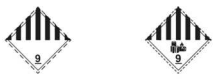
INSTRUCTIONS IN WRITING ACCORDING TO ADR

Actions in the event of an accident or emergency

In the event of an accident or emergency that may occur or arise during carriage, the members of the vehicle crew shall take the following actions where safe and practicable to do so:

- Apply the braking system, stop the engine and isolate the battery by activating the master switch where available;
- Avoid sources of ignition, in particular, do not smoke, use electronic cigarettes or similar devices or switch on any electrical equipment;
- Inform the appropriate emergency services, giving as much information about the incident or accident and substances involved as possible;
- Put on the warning vest and place the self-standing warning signs as appropriate;
- Keep the transport documents readily available for responders on arrival;
- Do not walk into or touch spilled substances and avoid inhalation of fumes, smoke, dusts and vapours by staying up wind;
- Where appropriate and safe to do so, use the fire extinguishers to put out small/initial fires in tyres, brakes and engine compartments;
- Fires in load compartments shall not be tackled by members of the vehicle crew;
- Where appropriate and safe to do so, use on-board equipment to prevent leakages into the aquatic environment or the sewage system and to contain spillages;
- Move away from the vicinity of the accident or emergency, advise other persons to move away and follow the advice of the emergency services;
- Remove any contaminated clothing and used contaminated protective equipment and dispose of it safely.

Additional guidance to members of the vehicle crew on the hazard characteristics of dangerous goods by class and on actions subject to prevailing circumstances		
Danger labels and placards	**Hazard characteristics**	**Additional guidance**
(1)	**(2)**	**(3)**
Explosive substances and articles  1 1.5 1.6	May have a range of properties and effects such as mass detonation; projection of fragments; intense fire/heat flux; formation of bright light, loud noise or smoke. Sensitive to shocks and/or impacts and/or heat.	Take cover but stay away from windows.
Explosive substances and articles  1.4	Slight risk of explosion and fire.	Take cover.
Flammable gases  2.1	Risk of fire. Risk of explosion. May be under pressure. Risk of asphyxiation. May cause burns and/or frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Non-flammable non-toxic gases  2.2	Risk of asphyxiation. May be under pressure. May cause frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Toxic gases  2.3	Risk of intoxication. May be under pressure. May cause burns and/or frostbite. Containments may explode when heated.	Use emergency escape mask. Take cover. Keep out of low areas.
Flammable liquids  3	Risk of fire. Risk of explosion. Containments may explode when heated.	Take cover. Keep out of low areas.
Flammable solids, self-reactive substances, polymerizing substances and solid desensitized explosives  4.1	Risk of fire. Flammable or combustible, may be ignited by heat, sparks or flames. May contain self-reactive substances that are liable to exothermic decomposition in the case of heat supply, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours or self- ignition. Containments may explode when heated. Risk of explosion of desensitized explosives after loss of desensitizer.	
Substances liable to spontaneous Combustion  4.2	Risk of fire by spontaneous combustion if packages are damaged or contents are spilled. May react vigorously with water	
Substances which, in contact with water, emit flammable gases  4.3	Risk of fire and explosion in contact with water.	Spilled substances should be kept dry by covering the spillages.

Additional guidance to members of the vehicle crew on the hazard characteristics of dangerous goods by class and on actions subject to prevailing circumstances		
Danger labels and placards	**Hazard characteristics**	**Additional guidance**
(1)	**(2)**	**(3)**
Oxidising substances  5.1	Risk of vigorous reaction, ignition and explosion in contact with combustible or flammable substances.	Avoid mixing with flammable or combustible substances (e.g., sawdust).
Organic peroxides  5.2	Risk of exothermic decomposition at elevated temperatures, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours or self- ignition.	Avoid mixing with flammable or combustible substances (e.g., sawdust).
Toxic substances  6.1	Risk of intoxication by inhalation, skin contact or ingestion. Risk to the aquatic environment or the sewerage system.	Use emergency escape mask.
Infectious substances  6.2	Risk of infection. May cause serious disease in humans or animals. Risk to the aquatic environment or the sewerage system.	
Radioactive material  7A 7B 7C 7D	Risk of intake and external radiation.	Limit time of exposure.
Fissile material  7E	Risk of nuclear chain reaction.	
Corrosive substances  8	Risk of burns by corrosion. May react vigorously with each other, with water and with other substances. Spilled substance may evolve corrosive vapours. Risk to the aquatic environment or the sewerage system.	
Miscellaneous dangerous goods and articles  9 9A	Risk of burns. Risk of fire. Risk of explosion. Risk to the aquatic environment or the sewerage system.	

NOTE 1: For dangerous goods with multiple risks and for mixed loads, each applicable entry shall be observed.

NOTE 2: Additional guidance shown in column (3) of the table may be adapted to reflect the classes of dangerous goods to be carried and their means of transport.

Additional guidance to members of the vehicle crew on the hazard characteristics of dangerous goods, indicated by marks, and on actions subject to prevailing circumstances		
Mark	**Hazard characteristics**	**Additional guidance**
(1)	**(2)**	**(3)**
 Environmentally hazardous substances	Risk to the aquatic environment or the sewerage system	
 Elevated temperature substances	Risk of burns by heat.	Avoid contact with hot parts of the transport unit and the spilled substance.

Equipment for personal and general protection to carry out general actions and hazard specific emergency actions to be carried on board the transport unit in accordance with section 8.1.5 of ADR

The following equipment shall be carried on board the transport unit:

- for each vehicle, a wheel chock of a size suited to the maximum mass of the vehicle and to the diameter of the wheel;
- two self-standing warning signs;
- eye rinsing liquid[a]; and

for each member of the vehicle crew

- a warning vest;
- portable lighting apparatus;
- a pair of protective gloves; and
- eye protection.

Additional equipment required for certain classes:

- an emergency escape mask for each member of the vehicle crew shall be carried on board the transport unit for danger label numbers 2.3 or 6.1;
- a shovel[b];
- a drain seal[b];
- a collecting container[b].

[a] Not required for danger label numbers 1, 1.4, 1.5, 1.6, 2.1, 2.2 and 2.3.

[b] Only required for solids and liquids with danger label numbers 3, 4.1, 4.3, 8 or 9.

Appendix B Current Code requirements

12.1.1 APPLICATION

Every road vehicle transporting a placard load of dangerous goods must be equipped with:

(a) fire extinguishers in accordance with 12.1.2; and

(b) at least three portable warning devices that comply with AS 3790 and are clean and in good condition; and

(c) personal protective equipment and safety equipment in accordance with 12.1.3.

⋮ *[Section 12.1.2 not included in this appendix]*

12.1.3 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

12.1.3.1 Table 12.2 specifies the minimum personal protective and safety equipment that must be provided, based on the classification of the dangerous goods being transported.

12.1.3.2 A road vehicle transporting a placard load of dangerous goods must carry the personal protective equipment and safety equipment specified in Table 12.2 for all the dangerous goods in the load, based on their primary hazards and any subsidiary hazard, subject to any conditions incorporated in the table and its explanatory notes.

12.1.3.3 All personal protective equipment and safety equipment provided in accordance with this section must be:

(a) clean; and

(b) suitable for purpose; and

(c) in sound operating condition, ready for use.

12.1.3.4 Personal protective equipment provided in accordance with this section must be in sufficient quantities for and suitable for use by:

(a) the driver of the vehicle; and

(b) where required for escape purposes, any other persons travelling in the vehicle.

12.1.3.5 Respiratory protection equipment required to be carried for escape purposes must be carried securely and in an accessible position in the cabin of the vehicle.

12.1.3.6 Other personal protective equipment and safety equipment provided for occupants of a road vehicle transporting dangerous goods must be carried securely and in a readily accessible position in the vehicle.

Table 12.2: Minimum Personal Protective and Safety Equipment on Road Vehicles transporting a Placard Load

Minimum Equipment Required	Class, Division or Subsidiary Hazard of Dangerous Goods in Load											
	2.1 [a]	**2.2**	**2.3**	**3**	**4**	**5.1 (solids)**	**5.1 (liquids)**	**5.2**	**6.1**	**6.2**	**8**	**9**
Respiratory protection equipment for escape purposes	No	No	**[b]**	No	No	No	No	No	**[b]**	No	**[b]**	No
Gas tight goggles or full face shield as appropriate	**[c]**	**[c]**	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No
Eye-wash kit **[d]**	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Chemically resistant gloves or gauntlets	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermally insulated gloves or gauntlets	Yes	Yes	Yes	No	No	No	No	No	No	No	No	**[e]**
Chemically resistant suit or coveralls	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No
Chemically resistant boots	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No
Any electric torch	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Electric torch complying with AS/NZS 60079.11 or other recognised Standard	Yes	No	No	Yes	Yes	No	No	Yes	No	No	No	No

Table Notes:

[a] A vehicle transporting unodourised LP Gas, Butane or Propane must additionally be equipped with a gas detector suitable for detection of LP Gas, in accordance with AS 1596.

[b] The minimum requirement is air supplied short term breathing apparatus suitable for escape purposes, except when, even in an emergency, the dangerous goods will not give rise to harmful vapours, gases or dust. Note that where a driver attends to the loading or transfer of goods, SCBA with a duration of greater than 15 minutes may be required by other (e.g. health and safety) legislation.

The minimum requirement is a compressed air or compressed oxygen self contained breathing apparatus, or chemical oxygen self-contained self-rescuer, certified to comply with AS/NZS 1716 and providing breathable air for not less than 15 minutes.

Respiratory protection equipment is not required where the dangerous goods will not give rise to harmful vapours, gases or dust, even in an emergency,

[c] Yes – if the goods are in receptacles with a capacity > 500 L or the goods are cryogenic liquids.

No – otherwise

“Gas tight goggles” means face hugging goggles with increased facial seal.

[d] Where an eyewash kit is required, it must be of at least 250 mL capacity, filled and ready for use.

[e] Yes – if the goods are elevated temperature substances or dry ice.

No – otherwise.

NOTE 1: *Where an item of Personal Protective or Safety Equipment is required based on the primary hazard or subsidiary hazard of any item of dangerous goods in the load, that item must be carried, except that where thermally insulated gloves or gauntlets are required and carried, any requirement for chemically resistant gloves or gauntlets may be ignored*

NOTE 2: *Under other legislation, it may be necessary to carry additional Personal Protective Equipment where it is specified for the purpose on the Safety Data Sheet.*

Appendix C List of TP13 entries

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
1092	ACROLEIN, STABILISED	6.1	3	I
1093	ACRYLONITRILE, STABILISED	3	6.1	I
1098	ALLYL ALCOHOL	6.1	3	I
1099	ALLYL BROMIDE	3	6.1	I
1100	ALLYL CHLORIDE	3	6.1	I
1131	CARBON DISULPHIDE	3	6.1	I
1135	ETHYLENE CHLOROHYDRIN	6.1	3	I
1143	CROTONALDEHYDE, or CROTONALDEHYDE, STABILISED	6.1	3	I
1162	DIMETHYLDICHLORO-SILANE	3	8	II
1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	3, 8	I
1182	ETHYL CHLOROFORMATE	6.1	3, 8	I
1183	ETHYLDICHLOROSILANE	4.3	3, 8	I
1185	ETHYLENEIMINE, STABILISED	6.1	3	I
1196	ETHYLTRICHLOROSILANE	3	8	II
1238	METHYL CHLOROFORMATE	6.1	3, 8	I
1239	METHYL CHLOROMETHYL ETHER	6.1	3	I
1242	METHYLDICHLOROSILANE	4.3	3, 8	I
1244	METHYLHYDRAZINE	6.1	3, 8	I
1250	METHYLTRICHLOROSILANE	3	8	II
1251	METHYL VINYL KETONE, STABILISED	6.1	3, 8	I
1295	TRICHLOROSILANE	4.3	3, 8	I
1298	TRIMETHYLCHLOROSILANE	3	8	II
1305	VINYLTRICHLOROSILANE	3	8	II
1553	ARSENIC ACID, LIQUID	6.1		I
1556	ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s., Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6.1		I
1556	ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s., Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6.1		II
1560	ARSENIC TRICHLORIDE	6.1		I

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
1569	BROMOACETONE	6.1	3	II
1580	CHLOROPICRIN	6.1		I
1595	DIMETHYL SULPHATE	6.1	8	I
1605	ETHYLENE DIBROMIDE	6.1		I
1613	HYDROCYANIC ACID, AQUEOUS SOLUTION (HYDROGEN CYANIDE, AQUEOUS SOLUTION) with not more than 20% hydrogen cyanide	6.1		I
1647	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURE, LIQUID	6.1		I
1649	MOTOR FUEL ANTI-KNOCK MIXTURE	6.1		I
1670	PERCHLOROMETHYL MERCAPTAN	6.1		I
1672	PHENYLCARBYLAMINE CHLORIDE	6.1		I
1694	BROMOBENZYL CYANIDES, LIQUID	6.1		I
1695	CHLOROACETONE, STABILISED	6.1	3, 8	I
1701	XYLYL BROMIDE, LIQUID	6.1		II
1722	ALLYL CHLOROFORMATE	6.1	3, 8	I
1723	ALLYL IODIDE	3	8	II
1724	ALLYLTRICHLOROSILANE, STABILISED	8	3	II
1728	AMYLTRICHLOROSILANE	8		II
1736	BENZOYL CHLORIDE	8		II
1737	BENZYL BROMIDE	6.1	8	II
1738	BENZYL CHLORIDE	6.1	8	II
1739	BENZYL CHLOROFORMATE	8		I
1744	BROMINE or BROMINE SOLUTION	8	6.1	I
1745	BROMINE PENTAFLUORIDE	5.1	6.1, 8	I
1746	BROMINE TRIFLUORIDE	5.1	6.1, 8	I
1747	BUTYLTRICHLOROSILANE	8	3	II
1752	CHLOROACETYL CHLORIDE	6.1	8	I
1762	CYCLOHEXENYLTRICHLOROSILANE	8		II
1763	CYCLOHEXYLTRICHLOROSILANE	8		II
1766	DICHLOROPHENYLTRICHLOROSILANE	8		II
1767	DIETHYLDICHLOROSILANE	8	3	II
1769	DIPHENYLDICHLOROSILANE	8		II
1771	DODECYLTRICHLOROSILANE	8		II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
1781	HEXADECYLTRICHLOROSILANE	8		II
1784	HEXYLTRICHLOROSILANE	8		II
1786	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE	8	6.1	I
1790	HYDROFLUORIC ACID, with more than 60% hydrogen fluoride	8	6.1	I
1796	NITRATING ACID MIXTURE with more than 50% nitric acid	8	5.1	I
1796	NITRATING ACID MIXTURE with not more than 50% nitric acid	8		II
1798	NITROHYDROCHLORIC ACID	8		I
1799	NONYLTRICHLOROSILANE	8		II
1800	OCTADECYL-TRICHLOROSILANE	8		II
1801	OCTYLTRICHLOROSILANE	8		II
1804	PHENYLTRICHLOROSILANE	8		II
1809	PHOSPHORUS TRICHLORIDE	6.1	8	I
1810	PHOSPHORUS OXYCHLORIDE	6.1	8	I
1816	PROPYLTRICHLOROSILANE	8	3	II
1818	SILICON TETRACHLORIDE	8		II
1826	NITRATING ACID MIXTURE, SPENT, with more than 50% nitric acid	8	5.1	I
1829	SULPHUR TRIOXIDE, STABILISED	8		I
1831	SULPHURIC ACID, FUMING	8	6.1	I
1834	SULPHURYL CHLORIDE	6.1	8	I
1836	THIONYL CHLORIDE	8		I
1838	TITANIUM TETRACHLORIDE	6.1	8	I
1891	ETHYL BROMIDE	3	6.1	II
1892	ETHYLDICHLOROARSINE	6.1		I
1898	ACETYL IODIDE	8		II
1917	ETHYL ACRYLATE, STABILISED	3		II
1919	METHYL ACRYLATE, STABILISED	3		II
1921	PROPYLENEIMINE, STABILISED	3	6.1	I
1935	CYANIDE SOLUTION, N.O.S.	6.1		I
1935	CYANIDE SOLUTION, N.O.S.	6.1		II
1935	CYANIDE SOLUTION, N.O.S.	6.1		III
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I
1991	CHLOROPRENE, STABILISED	3	6.1	I
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	6.1	I
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	6.1	II
1994	IRON PENTACARBONYL	6.1	3	I
2022	CRESYLIC ACID	6.1	8	II
2023	EPICHLOROHYDRIN	6.1	3	II
2030	HYDRAZINE AQUEOUS SOLUTION with more than 37% hydrazine, by mass	8	6.1	I
2030	HYDRAZINE AQUEOUS SOLUTION with more than 37% hydrazine, by mass	8	6.1	II
2031	NITRIC ACID, other than red fuming, with more than 70% nitric acid	8	5.1	I
2032	NITRIC ACID, RED FUMING	8	5.1, 6.1	I
2078	TOLUENE DIISOCYANATE	6.1		II
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6.1		II
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6.1		III
2232	2-CHLOROETHANAL	6.1		I
2240	CHROMOSULPHURIC ACID	8		I
2266	DIMETHYL-N-PROPYLAMINE	3	8	II
2281	HEXAMETHYLENE- DIISOCYANATE	6.1		II
2284	ISOBUTYRONITRILE	3	6.1	II
2295	METHYL CHLOROACETATE	6.1	3	I
2317	SODIUM CUPROCYANIDE SOLUTION	6.1		I
2328	TRIMETHYLHEXA-METHYLENEDIISOCYANATE	6.1		III
2333	ALLYL ACETATE	3	6.1	II
2334	ALLYLAMINE	6.1	3	I
2335	ALLYL ETHYL ETHER	3	6.1	II
2336	ALLYL FORMATE	3	6.1	I
2337	PHENYL MERCAPTAN	6.1	3	I
2353	BUTYRYL CHLORIDE	3	8	II
2354	CHLOROMETHYL ETHYL ETHER	3	6.1	II

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2356	2-CHLOROPROPANE	3		I
2360	DIALLYL ETHER	3	6.1	II
2363	ETHYL MERCAPTAN	3		I
2375	DIETHYL SULPHIDE	3		II
2381	DIMETHYL DISULPHIDE	3	6.1	II
2382	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	3	I
2389	FURAN	3		I
2396	METHACRYLALDEHYDE, STABILISED	3	6.1	II
2402	PROPANETHIOLS	3		II
2404	PROPIONITRILE	3	6.1	II
2411	BUTYRONITRILE	3	6.1	II
2434	DIBENZYLDICHLOROSILANE	8		II
2435	ETHYLPHENYL-DICHLOROSILANE	8		II
2437	METHYLPHENYLDICHLOROSILANE	8		II
2438	TRIMETHYLACETYL CHLORIDE	6.1	3, 8	I
2474	THIOPHOSGENE	6.1		I
2477	METHYL ISOTHIOCYANATE	6.1	3	I
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	3	6.1	III
2480	METHYL ISOCYANATE	6.1	3	I
2481	ETHYL ISOCYANATE	6.1	3	I
2482	n-PROPYL ISOCYANATE	6.1	3	I
2483	ISOPROPYL ISOCYANATE	6.1	3	I
2484	tert-BUTYL ISOCYANATE	6.1	3	I
2485	n-BUTYL ISOCYANATE	6.1	3	I
2486	ISOBUTYL ISOCYANATE	6.1	3	I
2487	PHENYL ISOCYANATE	6.1	3	I
2488	CYCLOHEXYL ISOCYANATE	6.1	3	I
2521	DIKETENE, STABILISED	6.1	3	I
2558	EPIBROMOHYDRIN	6.1	3	I

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
2571	ALKYLSULPHURIC ACIDS	8		II
2576	PHOSPHORUS OXYBROMIDE, MOLTEN	8		II
2584	ALKYSULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	8		II
2603	CYCLOHEPTATRIENE	3	6.1	II
2605	METHOXYMETHYL ISOCYANATE	6.1	3	I
2606	METHYL ORTHOSILICATE	6.1	3	I
2611	PROPYLENE CHLOROHYDRIN	6.1	3	II
2644	METHYL IODIDE	6.1		I
2646	HEXACHLOROCYCLO-PENTADIENE	6.1		I
2668	CHLOROACETONITRILE	6.1	3	I
2683	AMMONIUM SULPHIDE SOLUTION	8	3, 6.1	II
2692	BORON TRIBROMIDE	8		I
2740	n-PROPYL CHLOROFORMATE	6.1	3, 8	I
2743	n-BUTYL CHLOROFORMATE	6.1	3, 8	II
2744	CYCLOBUTYL CHLOROFORMATE	6.1	3, 8	II
2745	CHLOROMETHYL CHLOROFORMATE	6.1	8	II
2746	PHENYL CHLOROFORMATE	6.1	8	II
2748	2-ETHYLHEXYL CHLOROFORMATE	6.1	8	II
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	I
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	II
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	I
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	II
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	I
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23°C	3	6.1	II
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1		I
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1		II
2810	TOXIC LIQUID, ORGANIC, N.O.S. (see 3.2.5 for relevant [AUST.] entries)	6.1		I
2810	TOXIC LIQUID, ORGANIC, N.O.S. (see 3.2.5 for relevant [AUST.] entries)	6.1		II
2817	AMMONIUM HYDROGEN-DIFLUORIDE SOLUTION	8	6.1	II
2817	AMMONIUM HYDROGEN-DIFLUORIDE SOLUTION	8	6.1	III
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	6.1	II
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	6.1	III

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
2879	SELENIUM OXYCHLORIDE	8	6.1	I
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1		I
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1		II
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash point not less than 23 °C	6.1	3	I
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash point not less than 23 °C	6.1	3	II
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	6.1	I
2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	8	I
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	3	I
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	3	II
2965	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	3, 8	I
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, not more than 30% ethylene oxide	3	6.1	I
2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	II
2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	8	3	II
2987	CHLOROSILANES, CORROSIVE, N.O.S.	8		II
2988	CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.	4.3	3, 8	I
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		II
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1		I
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1		II
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1		I
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1		II
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1		I
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1		II
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		II
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1		I
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1		II
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1		I
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1		II
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1		I
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1		II
3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	6.1		I
3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	6.1		II
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1		I
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1		II
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1		I
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1		II
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash point less than 23 °C	3	6.1	I
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash point less than 23 °C	3	6.1	II
3023	2-METHYL-2-HEPTANETHIOL	6.1	3	I
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I
3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II
3073	VINYLPYRIDINES, STABILISED	6.1	3, 8	II
3079	METHACRYLONITRILE, STABILISED	6.1	3	I
3080	ISOCYANATES, TOXIC, FLAMMABLE, N.O.S. or ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	8	I
3246	METHANESULPHONYL CHLORIDE	6.1	8	I

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3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I
3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II
3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3	I
3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II
3276	NITRILES, LIQUID, TOXIC, N.O.S..	6.1		I
3277	CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II
3278	ORGANOPHOSPHORUS COMPOUND, LIQUID, TOXIC, N.O.S.	6.1		I
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	3	I
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1		I
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		I
3282	ORGANOMETALLIC COMPOUND, LIQUID, TOXIC, N.O.S.	6.1		I
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	6.1, 8	I
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	6.1, 8	II
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		I
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	8	I
3294	HYDROGEN CYANIDE, SOLUTION IN ALCOHOL with not more than 45% hydrogen cyanide	6.1	3	I
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	I
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	II
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	I
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		I
3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II
3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1	3, 8	II
3381	TOXIC BY INHALATION LIQUID, N.O.S with an LC_{50} lower than or equal to 200 ml/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1		I
3382	TOXIC BY INHALATION LIQUID, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1		I
3383	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 200 ml/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	3	I
3384	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	3	I
3385	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC_{50} lower than or equal to 200 ml/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	4.3	I
3386	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	4.3	I
3387	TOXIC BY INHALATION LIQUID, OXIDISING, N.O.S. with an LC_{50} lower than or equal to 200 ml/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	5.1	I
3388	TOXIC BY INHALATION LIQUID, OXIDISING, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	5.1	I
3389	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 200 ml/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	8	I
3390	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	8	I
3413	POTASSIUM CYANIDE SOLUTION	6.1		I
3413	POTASSIUM CYANIDE SOLUTION	6.1		II
3413	POTASSIUM CYANIDE SOLUTION	6.1		III
3414	SODIUM CYANIDE SOLUTION	6.1		I
3414	SODIUM CYANIDE SOLUTION	6.1		II
3414	SODIUM CYANIDE SOLUTION	6.1		III
3416	CHLOROACETOPHENONE, LIQUID	6.1		II

UN No.	Name and Description	Class or Division	Subsidiary Hazard	UN Packing Group
3483	MOTOR FUEL ANTI-KNOCK MIXTURE, FLAMMABLE	6.1	3	I
3484	HYDRAZINE AQUEOUS SOLUTION, FLAMMABLE, with more than 37% hydrazine, by mass	8	3, 6.1	I
3488	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	3, 8	I
3489	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	3, 8	I
3490	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC_{50}	6.1	4.3, 3	I
3491	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC_{50}	6.1	4.3, 3	I
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3	6.1	I

Glossary

Include a glossary of terms for complex or technical documents.

Term	Definition
the Code	Refers to the Australian Code for the Transport of Dangerous Goods by Road & Rail – np specific edition
current code	Refers to edition of 7.8 of the Code
future code	Revised to the revised Code
ADR	Agreement concerning the International Carriage of Dangerous goods by Road
ANZ-ERG	The Australian and New Zealand Emergency Response guide 2021
ERG	the Emergency Response Guide (ERG) developed by Transport Canada, the US Department of Transportation and the Secretariat of Transport and Communications of Mexico, with help from the Centro de Informaciòn Quìmica para Emergencias of Argentina (CANUTEC).
RID	Agreement concerning International Carriage of Dangerous Goods by Rail

References

Edition 7.7 of the Australian Code for the Transport of Dangerous Goods by Road and Rail (the Code).
https://www.ntc.gov.au/sites/default/files/assets/files/ADG%20Code%207.7_0.pdf

2021 edition of the Agreement for the International Transport of Dangerous Goods by Road (ADR). **https://unece.org/adr-2021-files**

2021 edition of the Agreement for the International Transport of Dangerous Goods by Rail (RID). **https://otif.org/fileadmin/new/3-Reference-Text/3B-RID/RID_2021_e_09_June_2022.pdf**

The Model Subordinate Instrument as approved by the Transport and Infrastructure Council on 5 June 2020. **https://pcc.gov.au/uniform/2020/Model-Subordinate-Instrument-on-Transport-of-Dangerous-Goods-2020-06-05.pdf**

Australian Standard 2809.1:2020 – Road tank vehicles for dangerous goods, Part 1: General requirements for road tank vehicles.

These documents have been revised since this analysis was commenced, and while it is unlikely that the significant changes have occurred, there may be some minor changes.

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